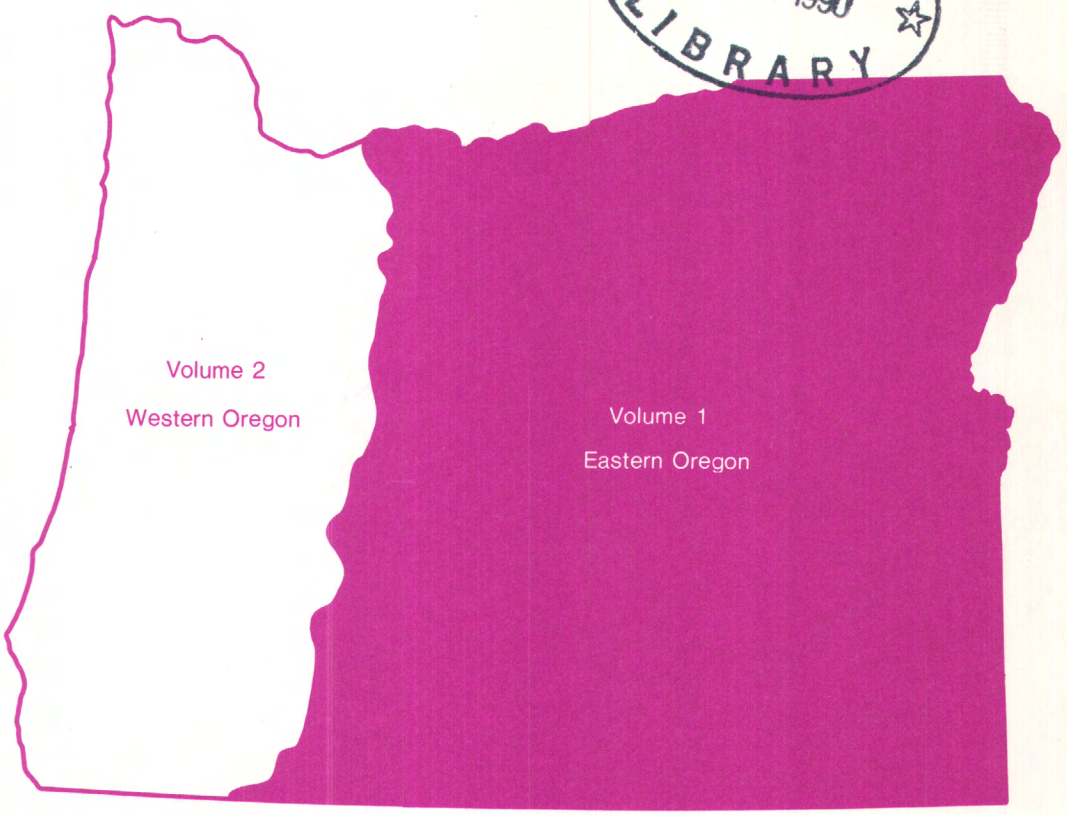
Water Resources Data Oregon Water Year 1989

Volume 1. Eastern Oregon



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OR-89-1
Prepared in cooperation with the Oregon Water Resources Department and with other agencies

CALENDAR FOR WATER YEAR 1989

1988

OCTOBER

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1989

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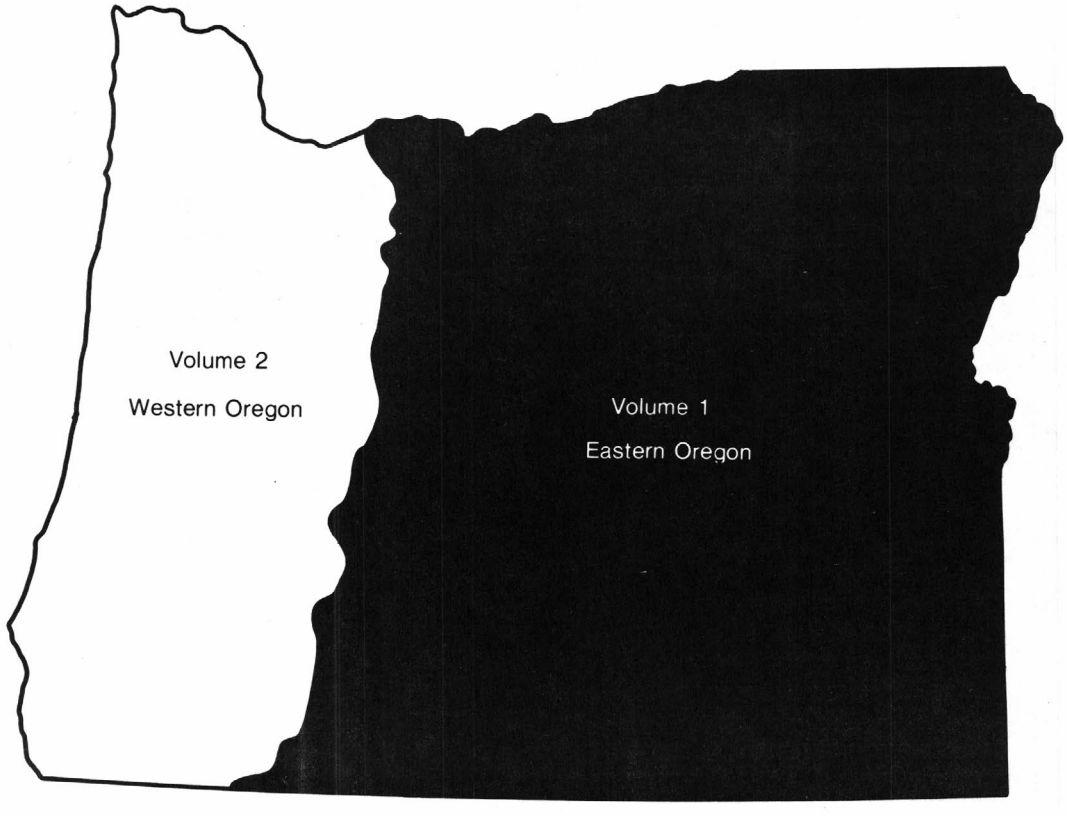
Water Resources Data Oregon Water Year 1989

Volume 1. Eastern Oregon

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



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OR-89-1
Prepared in cooperation with the Oregon Water Resources Department and with other agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

MANUEL LUJAN, JR., Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

For additional information write to:

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Portland, Oregon 97216

1990

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, State Chief, Oregon Office, Garald G. Parker, Jr., Pacific Northwest District Chief, and T. John Conomos, Regional Hydrologist, Western Region.

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16. Abstract (Limit: 200 words)

Water Resources Data for the 1989 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 251 gaging stations; stage only records for 7 gaging stations; stage and contents for 39 lakes and reservoirs; water quality for 43 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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ILLUSTRATIONS

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NOTE.--Data for chemical quality of precipitation and miscellaneous sites are published in separate sections of the data report. See references at the end of this list of page numbers for these sections.

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 radiochemical where applicable; (s) daily suspended sediment; (t) water temperature; and (k) specific conductance.

WATER RESOURCES DATA FOR OREGON 1989

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 251 stream-gaging stations, stage only records for 7 gaging stations, 20 partial-record or miscellaneous streamflow stations, and 5 crest-stage, partial-record streamflow stations; (2) stage and content records for 39 lakes and reservoirs; and (3) water-quality records for 38 streamflow-gaging stations and 5 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-89-1" and "U.S. Geological Survey Water-Data Report OR-89-2." 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 Office 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, J. R. Reeder, General Manager.
Douglas County, M. J. Youngquist, Coordinator.
City of McMinnville, J. L. Harshman, General Manager.
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; Pacific Power & Light Co.; Portland General Electric Co.; Middle Fork Irrigation District; Idaho Power Co., Idaho.

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 precipitation and snowpack resulted in near-normal streamflow for the 1989 water year, a departure from the two previous years of below-normal conditions.

Precipitation averaged near normal across the Pacific Northwest during the 1989 water year. Despite below-average precipitation during midyear, greater-than-normal precipitation during the latter half of the year resulted in the year's total precipitation being normal.

Temperatures across the Pacific Northwest were also near normal during the 1989 water year. A cold, dry, spell during the first two weeks of February set new record minimum temperatures at numerous weather stations.

The average Columbia Basin snowpack remained near or slightly below average throughout the 1989 accumulation season, representing a significant improvement over conditions for the past three years. Snow-accumulation season began in November. As of January 1, the snow water equivalent ranged from 100 percent of average in the Deschutes River basin to 180 percent of average in the Owyhee River basin. Snowmelt season, which began in April, found all basins in Oregon reporting above-average conditions.

In southeastern Oregon, streamflow at the Donner Und Blitzen River near Frenchglen (10396000) began the water year with flows ranging from slightly below normal to near normal. Outside of the snowmelt runoff season, flows were near average. The runoff during the snowmelt months of March through May were 190 percent of the 30-year median (1951-80 water years). The mean annual flow for this stream was 133 percent of the 30-year median. The Williamson River in south-central Oregon followed a similar pattern; flows were below the 30-year median value through February. During the months of March and April, flows were above the 30-year median. Beginning with May, flows returned to the normal to below-normal range and continued in this range for the remainder of the water year. The mean annual flow for the Williamson River near Chiloquin gage (11502500) was 93 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, streamflow followed the same general pattern, with the exception of November, which was above normal. The Wilson River near Tillamook (14301500) mean annual flow was 86 percent of the 30-year median. The mean annual flow for the Umpqua River near Elkton (14321000) was 91 percent of the 30-year median. Figure 1b compares the 1989 water year monthly and annual mean discharges to the 30-year median values for these two sites.

Peak discharges for the 1989 water year at selected Oregon sites are shown in Table 1. No new peaks of record were established at long-term gaging stations during the water year.

Table 1.--Comparison of peak discharge for the 1989 water year with peak discharge for the period of record at long-term stations

Station number	Station name	Drainage area (mi^2)	Peak discharge 1989 water year Date	Peak discharge 1989 water year ft^3/s	Exceedance probability	Peak discharge period of record Date	Peak discharge period of record ft^3/s
10396000	Donner und Blitzen River near Frenchglenn	a200	Mar. 9	3,450	.03	Apr. 26, 1978	4,270
11502500	Williamson River below Sprague River, near Chiloquin	a3,000	Mar. 14	5,290	.17	Dec. 26, 1964	16,100
13181000	Owyhee River near Rome	a8,000	Mar. 10	24,300	---	Feb. 19, 1986	41,400
13214000	Malheur River near Drewsey	a910	Mar. 11	3,550	.23	Dec. 23, 1964	12,000
13331500	Minam River at Minam	a240	June 15	2,930	.59	June 16, 1974	6,260
14048000	John Day River at McDonald Ferry	a7,580	May 11	21,600	.13	Dec. 24, 1964	42,800
14137000	Sandy River near Marmot	262	Jan. 9	20,900	.23	Dec. 22, 1964	61,400
14178000	North Santiam River below Boulder Creek, near Detroit	216	Nov. 22	5,670	.71	Dec. 22, 1964	26,700
14301000	Nehalem River near Foss	667	Jan. 10	b14,400	.99	Jan. 20, 1972	46,900
14321000	Umpqua River near Elkton	3,683	Jan. 10	100,000	.47	Dec. 23, 1964	265,000
14325000	South Fork Coquille River at Powers	169	Nov. 22	12,000	.66	Dec. 22, 1964	48,900

a Approximately.
b Estimate based on hydrologic comparison with nearby stations.

NOTE.--Exceedance probability refers to the probability that an event will exceed a specific magnitude in a given time period. A flow of 200 ft^3/s with an exceedance probability of 0.5 means that there is a 50 percent chance that the flow will exceed 200 ft^3/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 1989 water year that began October 1, 1988, and ended September 30, 1989. 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 indention in the "List of Stations" in the front of this report. Each indention represents one rank. This downstream order and system of indention 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 ft^3/s; the nearest tenth between 1.0 and 10 ft^3/s; whole numbers between 10 and 1,000 ft^3/s; and 3 significant figures for more than 1,000 ft^3/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:

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)

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 furnance 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 [$(ft^3/s)/d$] 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 [$(ft^3/s)/mi^2$] 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 (CaCO3).

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:

Classification	Size (mm)	Method of analysis
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 x 10E-12) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7 x 10E+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/(m^2 ,time)] for periphyton and macrophytes and [mg C/(m^3 ,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 02/(m^2 ,time)] for periphyton and macrophytes and [mg 02/(m^3 ,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 emersed 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 classificiation of organisms is based upon a hierarchial 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
Genus	Hexagenia
Species	Hexagenia limbata

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."

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8-B2. CALIBRATION AND MAINTENANCE OF VERTICAL-AXIS TYPE CURRENT METERS, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

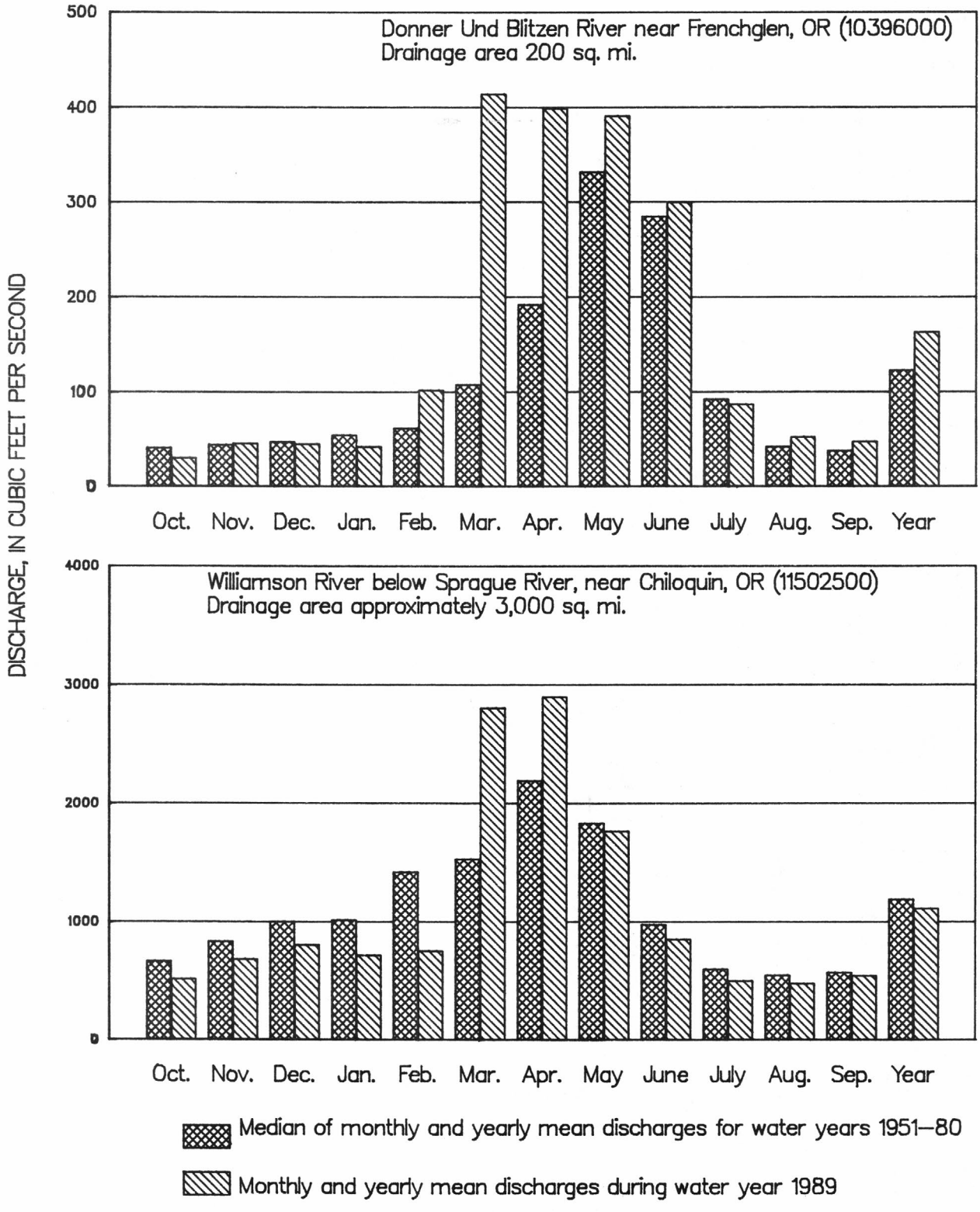

Figure 1a.--Discharge during 1989 water year compared with median discharge for period 1951-80 for two representative gaging stations in Eastern Oregon.

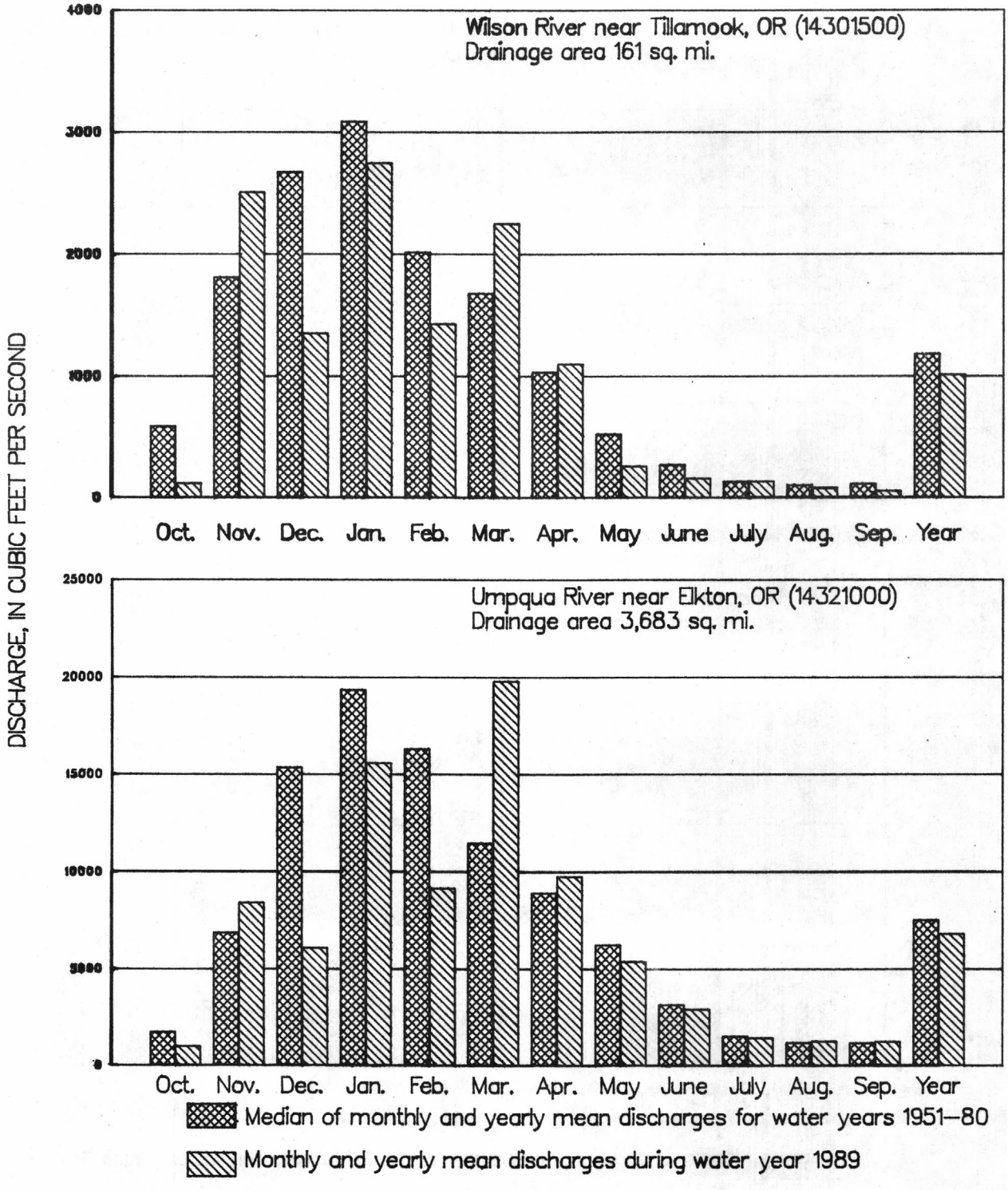

Figure 1b.--Discharge during 1989 water year compared with median discharge for period 1951-80 for two representative gaging stations in Western Oregon.

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)

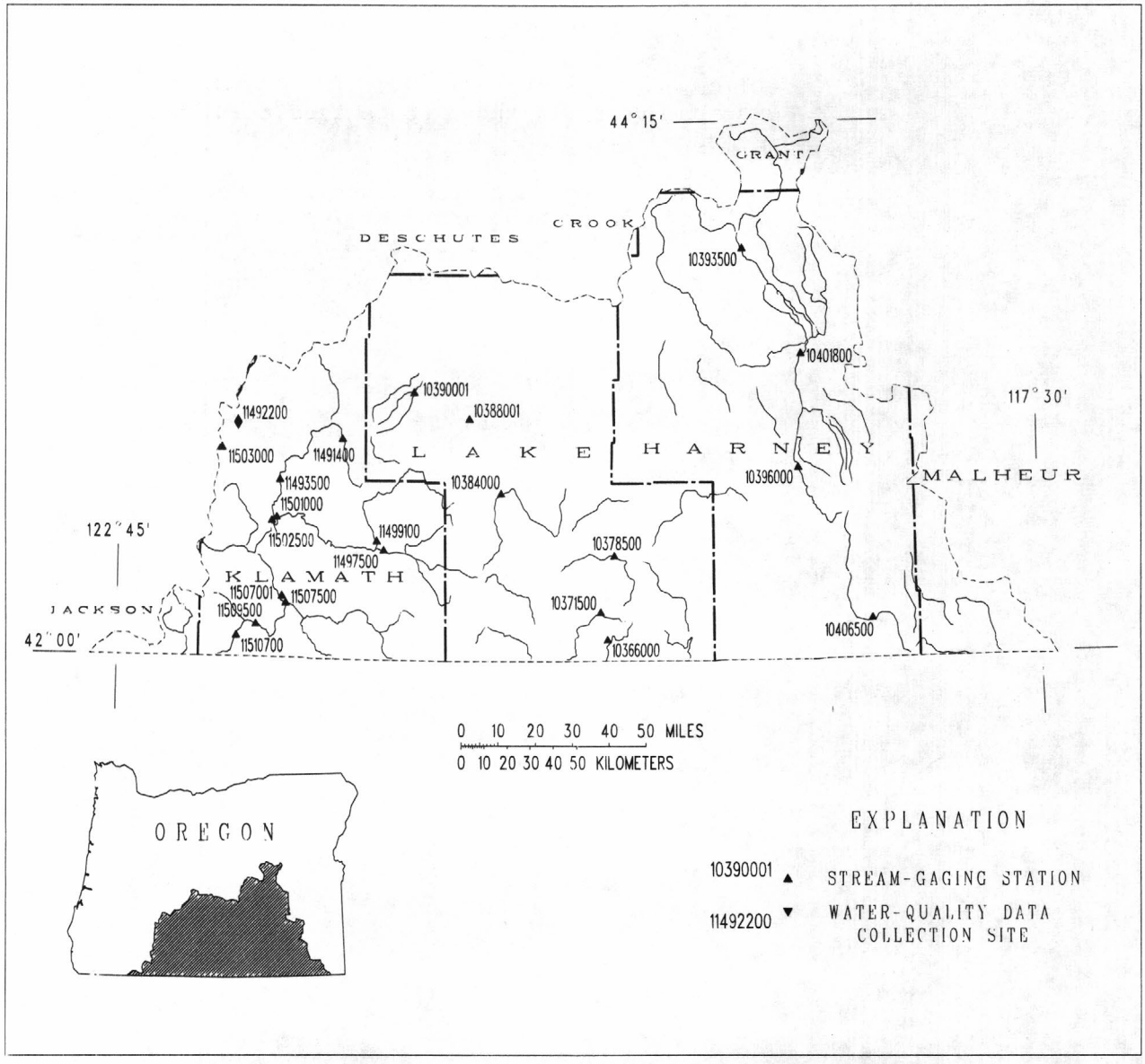

Figure 2.--Location of surface-water and water-quality stations in the Oregon Closed Basins and the Klamath River basin.

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 mi^2, including 46 mi^2 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 for flows below 10 ft^3/s, and estimated daily discharges, 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.--54 years (water years 1911-15, 1919, 1941-44, 1946-89), 53.6 ft^3/s, 38,830 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,400 ft^3/s Feb. 18, 1986, gage height, 16.94 ft, on basis of slope-area measurement; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 510 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	1900	3,030	10.34	Mar. 9	1900	*4,090	*11.66

Minimum discharge, 1.3 ft^3/s Dec. 14, result of freezeup.

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	3.1	4.3	11	e4.0	e4.2	169	203	57	32	13	3.6	2.9
2	3.2	4.6	8.3	e4.2	e3.5	106	243	68	38	12	3.8	2.5
3	3.1	6.9	10	e4.5	e3.0	78	254	79	48	11	4.1	3.7
4	3.2	6.6	5.8	e5.0	e2.7	61	139	101	56	8.9	4.1	6.0
5	3.3	5.6	6.0	e5.3	e2.3	116	114	107	60	7.7	3.4	6.3
6	3.2	5.7	6.6	e5.0	e2.1	1700	123	120	63	6.7	3.3	6.5
7	3.2	5.9	7.5	e5.0	e2.1	1380	119	132	61	5.7	3.4	6.8
8	3.2	5.5	9.1	e5.0	e3.0	1520	113	140	55	4.6	3.5	6.8
9	3.2	5.8	8.9	e4.5	e3.5	3000	108	142	53	3.5	5.9	6.7
10	3.2	7.6	7.8	e4.0	e3.8	1800	103	158	49	5.0	4.0	6.8
11	3.2	7.8	6.9	e3.8	e3.8	1030	103	117	45	5.4	2.7	7.4
12	3.3	7.0	7.7	e3.8	e3.8	416	101	98	42	4.7	2.2	7.3
13	3.3	7.9	9.7	e3.8	e3.8	267	100	88	42	4.1	2.9	7.4
14	3.4	8.1	e7.0	e4.0	e3.8	145	102	74	44	3.7	3.1	7.1
15	3.4	7.2	e5.0	e4.2	e5.0	126	120	69	47	3.5	3.8	7.0
16	3.4	7.4	e4.5	e4.5	5.1	150	134	70	48	3.5	4.0	7.6
17	4.1	e6.5	e4.5	4.9	6.1	86	133	73	38	4.2	4.2	6.7
18	4.1	e5.5	e5.0	4.8	7.0	100	127	85	34	4.0	4.8	6.9
19	4.2	6.3	5.8	5.1	8.0	118	133	63	30	4.0	3.9	6.7
20	4.2	7.0	5.2	5.0	7.6	83	143	60	27	5.4	4.8	6.1
21	4.1	6.6	4.8	5.1	8.3	128	143	61	23	5.4	4.7	5.3
22	4.3	9.9	5.1	e4.0	16	178	108	61	20	5.3	4.9	4.8
23	4.4	105	5.3	e3.0	44	89	95	60	20	4.4	5.9	4.7
24	4.4	39	5.5	e3.0	e84	163	82	54	19	3.1	5.1	4.9
25	4.3	20	5.1	e3.3	e150	252	70	52	15	3.4	3.3	4.3
26	4.4	14	e4.3	e3.3	268	161	65	47	14	3.8	2.2	5.6
27	4.4	8.9	e3.7	e3.7	243	83	57	46	14	3.7	2.0	6.2
28	4.4	15	e3.5	e4.2	194	152	54	44	14	3.9	1.7	5.9
29	4.5	25	e3.6	e4.6	---	201	50	40	13	3.5	2.1	5.1
30	4.4	18	e4.5	e4.8	---	126	53	38	13	3.2	2.5	5.5
31	4.5	---	e4.0	e4.6	---	254	---	35	---	3.2	3.3	---
TOTAL	116.6	390.6	191.7	134.0	1091.5	14238	3492	2439	1077	163.5	113.2	177.5
MEAN	3.76	13.0	6.18	4.32	39.0	459	116	78.7	35.9	5.27	3.65	5.92
MAX	4.5	105	11	5.3	268	3000	254	158	63	13	5.9	7.6
MIN	3.1	4.3	3.5	3.0	2.1	61	50	35	13	3.1	1.7	2.5
AC-FT	231	775	380	266	2160	28240	6930	4840	2140	324	225	352

CAL YR 1988 TOTAL 5773.4 MEAN 15.8 MAX 259 MIN 2.1 AC-FT 11450
WTR YR 1989 TOTAL 23624.6 MEAN 64.7 MAX 3000 MIN 1.7 AC-FT 46860

e Estimated

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 mi^2.

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. 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.--61 years, 133 ft^3/s, 96,360 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,420 ft^3/s Dec. 23, 1964, gage height, 10.64 ft, from floodmark, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurement of peak flow at gage height 7.3 ft; minimum discharge, 1.7 ft^3/s July 20, 27-29, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	2100	2,550	5.14	Apr. 11	0030	847	3.42
Mar. 9	1900	*3,570	*5.84	Apr. 15	2400	1,280	3.98
Mar. 25	0900	674	3.15	Apr. 26	2300	611	3.04
Mar. 31	1030	1,120	3.79	May 10	0200	924	3.53

Minimum discharge, 6.0 ft^3/s Nov. 18.

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	11	13	e50	e22	e20	98	649	360	175	50	12	13
2	11	16	e45	e22	e18	71	505	384	177	44	12	12
3	11	61	41	e24	e16	69	437	415	198	39	12	12
4	11	33	43	e26	e14	91	352	510	241	33	11	12
5	11	25	46	e28	e13	97	410	570	271	30	11	12
6	11	26	36	e30	e12	1030	538	648	290	27	11	12
7	11	24	38	e30	e14	1320	626	695	273	25	11	13
8	11	23	34	e27	e17	1230	672	727	252	23	11	13
9	10	19	34	e25	e18	2460	701	732	237	22	13	13
10	11	27	34	e21	e20	1770	723	839	220	21	12	12
11	11	26	e34	e22	e21	1390	724	637	202	21	11	12
12	11	25	e34	e24	e21	983	701	520	192	20	11	12
13	12	36	34	e25	e22	651	711	444	188	19	11	12
14	12	28	36	e25	e22	443	750	400	187	18	10	17
15	12	25	e30	e26	e24	411	1000	367	195	17	11	17
16	12	24	e28	e30	e26	400	1080	345	206	17	10	18
17	12	17	e27	e30	e28	303	998	352	168	17	10	26
18	12	16	e27	e30	30	292	957	396	142	17	11	34
19	13	22	e28	e30	30	316	991	326	125	16	13	26
20	12	22	e30	e30	29	256	1030	316	108	15	12	21
21	12	21	e30	e27	32	335	1020	308	98	14	12	20
22	12	33	e29	e23	47	399	865	293	85	14	12	19
23	13	168	e28	e18	59	337	691	315	79	14	16	19
24	13	94	e27	e16	88	419	554	356	74	13	17	18
25	13	66	e26	e16	95	625	473	344	71	13	15	18
26	13	53	e25	e17	96	474	490	277	69	13	14	22
27	12	57	e23	e18	101	369	454	246	64	12	13	20
28	13	61	e20	e20	100	441	381	240	60	12	13	20
29	13	58	e19	e23	---	405	347	213	57	12	13	19
30	12	55	e22	e23	---	353	349	195	54	11	13	20
31	13	---	e24	e23	---	856	---	182	---	11	13	---
TOTAL	367	1174	982	751	1033	18694	20179	12952	4758	630	377	514
MEAN	11.8	39.1	31.7	24.2	36.9	603	673	418	159	20.3	12.2	17.1
MAX	13	168	50	30	101	2460	1080	839	290	50	17	34
MIN	10	13	19	16	12	69	347	182	54	11	10	12
AC-FT	728	2330	1950	1490	2050	37080	40030	25690	9440	1250	748	1020

CAL YR 1988 TOTAL 23306.5 MEAN 63.7 MAX 576 MIN 5.7 AC-FT 46230
WTR YR 1989 TOTAL 62411 MEAN 171 MAX 2460 MIN 10 AC-FT 123800

e Estimated

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 mi^2, 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 for October to February, July 5 to Sept.30, which are fair and estimated daily discharges, which are poor. Slight regulation by five small reservoirs, combined capacity, 870 acre-ft. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--63 years (water years 1911-14, 1931-89), 30.6 ft^3/s, 22,170 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maxiumum discharge, 11,000 ft^3/s Dec. 23, 1964, gage height, 13.4 ft, from floodmark, from rating curve extended above 250 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 6	2100	293	4.22	Apr. 16	0300	257	4.03
Mar. 9	2230	*374	*4.50	Apr. 20	0400	224	3.88

Minimum discharge, 0.16 ft^3/s July 30, 31, Aug. 1.

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	.84	e1.1	5.3	e3.7	6.3	25	77	73	33	9.0	.20	.95
2	.80	e1.5	5.9	e3.7	5.8	17	70	71	30	8.2	.26	1.1
3	.75	e3.0	5.9	e3.8	e3.5	11	66	71	27	6.6	.30	2.7
4	.75	e4.5	5.9	e4.1	e2.4	10	61	79	28	5.3	.29	1.4
5	.79	e3.0	5.5	e4.5	e2.4	25	69	82	31	4.8	.28	.83
6	e.80	e2.2	6.0	e3.7	e2.5	209	93	89	27	4.3	.28	.69
7	e.80	e1.7	5.4	e3.7	e2.6	101	110	91	22	3.7	.29	1.1
8	e.80	e1.7	5.1	e4.5	e3.0	109	124	93	20	2.6	.81	1.3
9	e.80	e1.7	5.4	e4.3	e3.5	275	135	107	18	2.7	.92	1.1
10	e.80	e1.7	5.4	e4.1	e3.9	286	137	135	16	2.8	.42	1.2
11	e.90	e2.2	4.8	e4.0	e3.9	221	140	117	18	3.0	.32	.83
12	e1.0	e2.2	5.7	e3.9	e3.9	152	136	94	18	2.6	.31	.55
13	e1.0	e3.0	5.7	e3.8	e4.0	104	136	83	17	1.7	.31	.42
14	e1.0	e2.6	e4.5	e3.9	e4.0	67	147	75	17	1.0	.36	.73
15	e1.0	e2.2	e3.1	e4.0	e4.3	56	197	69	19	.84	.35	.64
16	e1.0	e2.0	e3.1	e4.5	4.9	54	216	61	25	.91	.36	.77
17	e1.0	e1.7	e3.2	e5.0	5.2	47	197	57	30	.91	.36	1.2
18	e1.0	e1.5	e3.5	e4.7	6.4	45	184	56	23	.95	.38	1.1
19	e1.0	e1.5	e4.5	e4.5	7.6	46	184	56	18	.80	.43	.78
20	e1.0	e1.6	e4.3	e4.9	11	41	192	53	13	.68	.47	.67
21	e1.0	e2.5	e4.0	e5.1	11	41	184	48	13	.55	.44	.55
22	e1.0	6.1	e3.9	e5.6	51	54	167	44	14	.47	.43	.50
23	e1.0	15	e3.9	e2.7	60	55	134	43	13	.39	.60	.51
24	e1.0	10	e4.0	e2.7	59	58	119	54	12	.35	.77	.60
25	e1.0	8.5	e3.5	e3.2	86	83	105	56	13	.32	1.2	.58
26	e1.0	e7.0	e2.9	e3.2	85	86	99	48	12	.26	1.7	.54
27	e1.0	e6.0	e2.9	e3.5	50	73	103	36	11	.23	1.2	.51
28	e1.0	e8.0	e2.9	e4.0	29	64	85	47	11	.23	.96	.72
29	e1.0	e7.0	e3.0	e4.5	---	60	77	43	11	.20	.81	.67
30	e1.0	e6.0	e3.5	e5.0	---	56	72	44	10	.18	.81	.63
31	e1.0	---	e4.0	5.8	---	73	---	42	---	.18	.75	---
TOTAL	28.83	118.7	136.7	128.6	522.1	2604	3816	2117	570	66.75	17.37	25.87
MEAN	.93	3.96	4.41	4.15	18.6	84.0	127	68.3	19.0	2.15	.56	.86
MAX	1.0	15	6.0	5.8	86	286	216	135	33	9.0	1.7	2.7
MIN	.75	1.1	2.9	2.7	2.4	10	61	36	10	.18	.20	.42
AC-FT	57	235	271	255	1040	5170	7570	4200	1130	132	34	51

CAL YR 1988 TOTAL 4145.81 MEAN 11.3 MAX 105 MIN .16 AC-FT 8220
WTR YR 1989 TOTAL 10151.92 MEAN 27.8 MAX 286 MIN .18 AC-FT 20140

e Estimated

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 mi^2.

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.--74 years, 147 ft^3/s, 106,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,490 ft^3/s Dec. 22, 1964, gage height, 8.35 ft, from rating curve extended above 900 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 9	2100	*unknown	*unknown	Mar. 31	1400	593	2.96
Mar. 22	0100	520	2.82	Apr. 21	0530	1,290	3.91
Mar. 25	1230	545	2.87	May 9	0700	1,160	3.77

Minimum discharge, 12 ft^3/s Dec. 15, result of feeezeup, but may have been lower during estimated period Dec. 15 to Mar. 13.

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	26	32	47	e44	e38	e98	458	392	254	106	37	36
2	26	35	58	e44	e35	e76	497	397	258	96	39	34
3	26	78	57	e44	e30	e60	421	409	282	87	38	33
4	26	47	52	e44	e22	e60	357	460	327	78	36	33
5	28	38	59	e38	e22	e99	377	532	330	75	35	33
6	28	37	61	e34	e25	e490	448	646	333	73	34	32
7	28	37	58	e40	e30	e479	546	750	333	70	35	32
8	28	35	56	e45	e35	e543	627	841	324	65	38	32
9	28	34	51	e50	e40	e1140	678	1030	311	61	54	32
10	28	36	53	e45	e45	e793	697	1030	288	59	43	32
11	28	36	49	e40	e45	e599	692	832	277	58	38	32
12	28	37	50	e40	e45	e415	709	728	267	56	35	33
13	29	51	49	e42	e46	e443	725	656	259	54	34	33
14	30	41	33	e45	e50	390	777	581	252	52	34	33
15	31	40	22	e50	e55	356	874	526	252	51	33	32
16	30	40	e32	e55	e60	353	965	505	263	50	33	34
17	30	35	e35	e55	e65	291	973	494	217	51	33	48
18	29	28	e42	e55	e65	277	962	499	197	50	33	65
19	29	42	e60	e55	e65	308	1030	443	184	48	35	48
20	29	43	e55	e55	e80	259	1120	424	171	46	35	43
21	29	34	e52	e48	e131	357	1150	410	158	44	34	40
22	30	71	e50	e40	e187	441	943	400	147	43	36	38
23	29	186	e47	e25	e200	373	783	412	140	43	55	37
24	29	87	e45	e28	e144	409	670	413	135	42	49	36
25	30	68	e35	e30	e127	510	583	386	128	41	43	35
26	30	66	e25	e32	e121	465	535	353	122	40	40	35
27	30	50	e25	e35	e118	402	483	326	115	39	37	37
28	30	91	e33	e38	e100	420	428	310	111	38	36	37
29	31	66	e40	e42	---	382	399	298	109	38	35	36
30	30	48	e43	e43	---	346	397	282	103	37	35	36
31	30	---	e43	e42	---	492	---	261	---	36	37	---
TOTAL	893	1569	1417	1323	2026	12126	20304	16026	6647	1727	1169	1097
MEAN	28.8	52.3	45.7	42.7	72.4	391	677	517	222	55.7	37.7	36.6
MAX	31	186	61	55	200	1140	1150	1030	333	106	55	65
MIN	26	28	22	25	22	60	357	261	103	36	33	32
AC-FT	1770	3110	2810	2620	4020	24050	40270	31790	13180	3430	2320	2180

CAL YR 1988 TOTAL 30286 MEAN 82.7 MAX 343 MIN 20 AC-FT 60070
WTR YR 1989 TOTAL 66324 MEAN 182 MAX 1150 MIN 22 AC-FT 131600

e Estimated

10388001 ANA RIVER NEAR SUMMER LAKE, OR

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.

DRAINAGE AREA.--Indeterminate; Ana River Springs, source of the stream located three-quarters of a mile upstream from station, are flooded by pondage behind diversion dam.

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.

GAGE.--Water-stage recorder. Elevation of gage is 4,160 ft from plans of Ana River diversion dam. Oct. 1, 1929, to Sept. 30, 1939, at site 80 ft downstream at different datum.

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.

AVERAGE DISCHARGE.--41 years (water years 1931-32, 1936, 1952-89), 90.6 ft^3/s, 65,640 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 188 ft^3/s Dec. 22, 1964, gage height, 2.81 ft, no flow in canal; minimum discharge, 1.0 ft^3/s Jan. 21, 22, 1970; minimum daily, 3.0 ft^3/s Oct. 31, 1970.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 97 ft^3/s Oct. 7; minimum daily, 61 ft^3/s Apr. 19.

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	89	88	85	86	84	85	86	87	87	81	81	78
2	89	88	85	86	83	85	86	76	86	82	80	78
3	89	88	85	87	83	85	86	77	85	82	81	78
4	89	88	85	87	83	85	85	79	85	82	81	77
5	88	88	85	87	83	86	85	79	85	82	80	77
6	94	87	86	87	83	86	85	80	84	82	80	77
7	97	86	86	87	83	86	85	80	84	82	80	76
8	96	86	86	87	83	86	85	80	83	81	79	78
9	95	86	86	85	83	86	85	81	83	81	80	79
10	93	85	86	86	83	87	85	81	83	81	80	80
11	93	85	86	85	83	87	82	81	82	81	80	80
12	93	85	86	85	83	87	74	80	82	83	79	80
13	93	85	86	85	83	87	75	78	82	82	79	81
14	92	85	86	85	83	87	75	82	83	82	79	81
15	91	84	86	85	83	87	76	79	84	82	79	79
16	91	85	86	85	82	87	73	82	84	82	79	79
17	90	84	86	85	82	87	61	82	84	83	79	79
18	90	84	86	85	82	87	62	82	84	86	80	76
19	90	84	86	85	82	87	63	81	83	84	80	72
20	89	84	87	85	84	87	64	82	83	83	81	75
21	89	85	87	85	84	86	65	82	82	81	81	76
22	89	86	87	85	84	86	66	83	81	79	81	76
23	89	86	86	84	84	86	68	82	80	78	80	76
24	89	85	86	84	84	86	76	82	79	78	80	78
25	89	85	86	84	84	86	87	83	78	79	79	77
26	89	85	86	84	84	86	88	84	80	80	78	82
27	89	85	86	84	84	86	88	84	81	81	78	83
28	88	85	86	84	84	86	87	84	81	81	78	81
29	88	85	86	84	---	86	87	85	82	79	79	82
30	88	85	86	84	---	86	86	84	81	80	78	86
31	88	---	86	84	---	86	---	86	---	81	78	---
TOTAL	2806	2567	2664	2641	2330	2673	2356	2528	2481	2521	2467	2357
MEAN	90.5	85.6	85.9	85.2	83.2	86.2	78.5	81.5	82.7	81.3	79.6	78.6
MAX	97	88	87	87	84	87	88	87	87	86	81	86
MIN	88	84	85	84	82	85	61	76	78	78	78	72
AC-FT	5570	5090	5280	5240	4620	5300	4670	5010	4920	5000	4890	4680

CAL YR 1988 TOTAL 31836 MEAN 87.0 MAX 108 MIN 68 AC-FT 63150
WTR YR 1989 TOTAL 30391 MEAN 83.3 MAX 97 MIN 61 AC-FT 60280

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 mi^2, 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 fair. Flow regulated by reservoir, capacity, 800 acre-ft, 1.5 mi upstream from station and by Thompson Valley Reservoir, capacity, 17,400 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.--77 years (water years 1906, 1910-27, 1930-41, 1944-89), 31.5 ft^3/s, 22,820 acre-ft/yr, including diversion by Silver Lake Irrigation District Canal.

EXTREMES FOR PERIOD OF RECORD.--Creek only, maximum discharge, 1,800 ft^3/s Mar. 20, 1907, gage height, 10.08 ft, present datum, from rating curve extended above 700 ft^3/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 ft^3/s Mar. 20, 1907, gage height, 10.08 ft, present datum, from rating curve extended above 700 ft^3/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, 201 ft^3/s Mar. 10, gage height, 3.70 ft; minimum daily discharge, 2.3 ft^3/s Feb. 4-7.

Combined flow, maximum daily discharge, 151 ft^3/s Mar. 10; minimum daily, 2.5 ft^3/s Feb. 4.

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	6.7	6.2	e5.5	e4.7	e4.1	6.7	56	98	45	53	46	36
2	6.6	6.3	e5.2	e5.1	e3.7	6.7	52	94	46	55	46	37
3	6.2	6.4	e5.4	5.3	e3.0	e6.4	43	94	46	54	43	37
4	6.0	6.3	e5.1	5.5	e2.5	e6.4	37	95	48	54	46	36
5	6.0	6.2	e5.5	5.6	e2.6	6.4	40	102	48	54	47	35
6	5.8	6.2	6.0	8.1	e2.6	6.6	48	113	49	55	47	36
7	5.8	6.1	5.9	6.0	e2.7	7.7	55	124	49	55	46	36
8	5.8	6.0	5.8	e4.9	e3.0	26	60	129	50	54	45	36
9	5.8	5.9	5.8	e4.9	e3.5	101	61	139	49	54	46	27
10	5.8	5.9	5.7	e5.7	e4.1	151	60	125	48	54	47	22
11	5.8	5.7	5.6	e7.4	e4.4	143	57	106	51	54	47	22
12	5.8	5.6	5.6	e6.2	e4.4	113	56	90	52	54	47	23
13	5.8	5.8	e5.3	e5.5	e4.5	88	56	77	55	53	45	23
14	5.6	5.6	e4.5	e5.0	e4.5	57	59	64	57	52	45	23
15	5.6	5.5	e4.3	e5.0	e4.7	52	63	54	57	51	44	25
16	5.5	5.7	e4.1	5.4	e5.2	55	67	48	57	52	45	25
17	5.5	5.5	e4.1	4.9	5.8	41	68	45	56	51	45	28
18	5.5	e4.7	e4.0	5.0	5.7	37	67	42	55	52	45	28
19	5.3	5.2	e5.7	e4.7	5.7	42	68	37	54	52	45	27
20	5.3	5.2	e5.4	e4.5	5.7	35	71	36	54	49	44	26
21	5.3	5.3	e5.1	4.9	5.7	49	77	34	53	45	44	26
22	5.3	6.8	e4.8	4.9	5.6	67	80	35	49	45	44	26
23	5.5	6.3	e4.8	e3.8	5.7	53	80	39	46	45	44	25
24	5.9	e6.2	e4.8	e3.4	6.3	54	91	42	47	45	41	23
25	6.0	e6.1	e4.0	e3.4	e5.7	73	113	41	53	44	40	17
26	6.1	6.4	e3.3	e3.6	e5.6	59	115	40	52	44	41	12
27	6.2	e6.4	e3.6	e4.1	e5.6	49	112	37	49	44	39	12
28	6.2	6.4	e4.0	e4.6	e6.2	56	112	35	50	45	37	11
29	6.2	e6.2	e4.2	5.7	---	60	109	36	56	45	36	11
30	6.2	e5.9	e4.5	5.0	---	47	101	43	53	47	36	11
31	6.2	---	e4.4	5.0	---	64	---	45	---	46	36	---
TOTAL	181.3	178.0	152.0	157.8	128.8	1618.9	2134	2139	1534	1557	1349	762
MEAN	5.85	5.93	4.90	5.09	4.60	52.2	71.1	69.0	51.1	50.2	43.5	25.4
MAX	6.7	6.8	6.0	8.1	6.3	151	115	139	57	55	47	37
MIN	5.3	4.7	3.3	3.4	2.5	6.4	37	34	45	44	36	11
AC-FT	360	353	301	313	255	3210	4230	4240	3040	3090	2680	1510

CAL YR 1988 TOTAL 6136.82 MEAN 16.8 MAX 48 MIN .92 AC-FT 12170
WTR YR 1989 TOTAL 11891.8 MEAN 32.6 MAX 151 MIN 2.5 AC-FT 23590

e Estimated

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 mi^2.

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 July 5 to Sept. 30, which are fair and estimated daily discharges, which are poor. No regulation. Diversions for irrigation upstream from station during periods of high flow only.

AVERAGE DISCHARGE.--76 years (water years 1904-5, 1910-12, 1918-21, 1923-89), 180 ft^3/s, 130,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,960 ft^3/s Apr. 6, 1952, gage height, 15.2 ft; no flow July 19 to Sept. 22, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,640 ft^3/s Mar. 12, gage height, 9.28 ft; minimum discharge, 9.3 ft^3/s Oct. 1, 3, 4, 6.

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	9.5	16	18	e22	e29	e100	1040	877	294	61	17	33
2	10	18	16	e20	e25	e115	984	830	259	61	17	31
3	9.8	21	15	e19	e18	e105	919	786	226	58	17	30
4	11	25	17	e19	e14	e60	848	766	220	54	18	30
5	10	26	15	e19	e12	e55	809	747	212	50	17	29
6	9.7	23	15	e19	e12	e70	891	741	206	48	16	29
7	9.9	22	17	e19	e13	120	1070	759	196	45	15	28
8	9.8	23	18	e19	e13	216	1310	765	180	42	15	27
9	9.9	23	20	e19	e16	453	1420	750	163	40	19	27
10	11	24	25	e28	e20	975	1380	875	152	39	21	27
11	11	25	29	e27	e24	1300	1350	1000	143	38	19	27
12	11	25	29	e24	e27	1370	1310	946	135	37	17	26
13	11	27	e25	e22	e27	1070	1260	985	126	36	17	26
14	12	28	e20	e22	e27	882	1220	928	121	34	16	26
15	12	27	e18	e22	e28	731	1220	797	129	33	15	26
16	12	26	e18	e21	e28	698	1250	707	142	32	15	26
17	13	28	e18	e21	e28	612	1230	650	137	33	15	30
18	13	27	e20	e21	e28	567	1200	592	131	34	15	35
19	13	25	e23	e22	e31	644	1180	536	115	33	15	36
20	13	25	e25	e23	e37	585	1130	512	105	31	15	33
21	13	27	e25	e24	e44	645	1060	496	100	29	15	31
22	13	27	e23	e25	e62	774	1060	472	95	27	18	31
23	13	37	e20	e25	e78	765	1030	447	88	25	29	31
24	14	38	e20	e20	e84	805	989	430	82	23	39	30
25	14	43	e18	e17	e78	974	1020	417	78	25	36	30
26	14	30	e15	e17	e74	1100	1030	414	74	21	33	31
27	15	23	e15	e19	e76	1060	1030	401	70	21	33	32
28	15	19	e15	e19	e85	1020	1030	379	68	20	33	31
29	15	30	e17	e19	---	1070	1000	364	67	20	33	30
30	16	e23	e19	e19	---	966	934	356	63	19	32	30
31	16	---	e25	e22	---	1010	---	323	---	18	32	---
TOTAL	379.6	781	613	654	1038	20917	33204	20048	4177	1087	664	889
MEAN	12.2	26.0	19.8	21.1	37.1	675	1107	647	139	35.1	21.4	29.6
MAX	16	43	29	28	85	1370	1420	1000	294	61	39	36
MIN	9.5	16	15	17	12	55	809	323	63	18	15	26
AC-FT	753	1550	1220	1300	2060	41490	65860	39770	8290	2160	1320	1760

CAL YR 1988 TOTAL 17636.4 MEAN 48.2 MAX 235 MIN 3.3 AC-FT 34980
WTR YR 1989 TOTAL 84451.6 MEAN 231 MAX 1420 MIN 9.5 AC-FT 167500

e Estimated

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 mi^2, 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.--Records excellent except those for Dec. 1 to Feb. 15, which are fair. 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.--59 years (water years 1912-13, 1915-16, 1918-21, 1939-89), 128 ft^3/s, 92,740 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,270 ft^3/s Apr. 26, 1978, gage height, 7.15 ft, from floodmarks, from rating curve extended above 1,900 ft^3/s on basis of slope-area measurement of peak flow; minimum discharge, 4.2 ft^3/s Dec. 9, 1972, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 650 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 22	1930	668	3.76	Apr. 15	2330	711	3.83
Mar. 9	1700	*3,450	*6.58	May 10	0830	1,150	4.44
Mar. 31	0930	2,240	5.59	June 16	0200	755	3.90

Minimum discharge, 8.3 ft^3/s Jan. 24, result of freezeup.

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	31	30	43	e46	52	135	339	243	229	130	55	50
2	31	32	43	e46	43	151	262	256	283	127	55	48
3	30	41	43	48	e35	91	311	263	361	124	56	48
4	30	34	35	41	e30	76	257	313	500	121	54	48
5	30	32	40	41	e24	528	221	400	524	119	53	47
6	30	34	48	36	e21	1180	270	510	524	113	55	47
7	30	35	47	47	e20	755	331	620	472	110	54	48
8	30	36	43	50	e20	945	417	661	416	119	54	47
9	30	32	45	52	e33	2000	475	700	400	107	56	47
10	30	37	60	42	e34	923	459	985	372	97	55	47
11	30	35	61	38	e35	587	482	623	321	92	52	47
12	30	35	56	36	e35	430	460	507	310	91	51	46
13	31	38	55	38	e38	338	453	440	316	89	50	46
14	31	35	45	34	e40	249	463	389	336	86	49	46
15	31	34	24	46	e40	221	555	359	399	88	49	45
16	31	36	27	48	41	233	575	359	500	81	49	45
17	31	35	36	40	44	194	559	373	311	81	49	53
18	31	30	44	38	56	171	555	430	277	81	50	59
19	31	35	54	37	94	169	582	344	274	79	49	52
20	31	38	53	36	77	145	564	331	224	78	49	50
21	31	33	49	45	92	260	517	343	185	75	49	49
22	31	41	45	46	374	273	449	352	179	71	50	48
23	30	151	40	27	341	196	385	353	177	69	63	47
24	31	68	49	20	326	252	354	304	175	65	64	46
25	31	45	47	41	293	299	332	273	166	63	56	46
26	30	43	39	49	258	250	299	252	168	62	53	47
27	30	42	36	47	198	217	281	256	176	61	51	47
28	31	125	51	51	150	202	257	244	159	59	50	46
29	31	78	54	52	---	201	245	221	139	58	49	46
30	31	50	e48	48	---	181	249	205	142	56	50	49
31	30	---	e48	49	---	979	---	208	---	55	54	---
TOTAL	947	1370	1408	1315	2844	12831	11958	12117	9015	2707	1633	1437
MEAN	30.5	45.7	45.4	42.4	102	414	399	391	300	87.3	52.7	47.9
MAX	31	151	61	52	374	2000	582	985	524	130	64	59
MIN	30	30	24	20	20	76	221	205	139	55	49	45
AC-FT	1880	2720	2790	2610	5640	25450	23720	24030	17880	5370	3240	2850

CAL YR 1988 TOTAL 28458 MEAN 77.8 MAX 424 MIN 21 AC-FT 56450
WTR YR 1989 TOTAL 59582 MEAN 163 MAX 2000 MIN 20 AC-FT 118200

e Estimated

10401800 MALHEUR LAKE NEAR VOLTAGE, OR

LOCATION.--Lat 43°16'16", long 118°50'12", on line between sections 35 and 36, T.26 S., R.31 E., Harney County, Malheur National Wildlife Refuge, Hydrologic Unit 17120001, 0.4 mi northeast of Refuge Headquarters, and 2.0 mi northwest of Voltage.

DRAINAGE AREA.--2,150 mi^2, approximately.

PERIOD OF RECORD.--March 1972 to September 1980, March 1983 to September 1989 (discontinued). Published as "at break in Cole Island Dike" (station 10401830) 1972-78.

GAGE.--Staff gage. Datum of gage is National Geodetic Vertical Datum (NGVD) of 1929. Prior to Jan. 25, 1989, water-stage recorders at various sites within 6 mi of present site, some at different datums, but all published gage heights reduced to NGVD of 1929.

COOPERATION.--Records collected in cooperation with U.S. Fish and Wildlife Service.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily elevation observed, 4,102.60 ft Apr. 24, 1986; minimum recorded, 4,090.60 ft Oct. 2, 3, 16, 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum elevation observed since 1938, 4,095.39 ft, occurred in 1952, from records of Malheur National Wildlife Refuge for staff gage in channel of Donner und Blitzen River; entire bed of lake dry September 1934.

EXTREMES FOR CURRENT YEAR.--Maximum elevation observed, 4,098.35 ft May 12; minimum observed, 4,096.50 ft Dec. 7.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	4097.84	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	4097.16	---
3	---	---	---	---	---	---	4097.49	4097.90	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	4097.10	---
5	---	---	---	---	---	---	4097.50	4097.92	4098.16	---	---	---
6	---	---	---	---	---	---	4097.55	---	---	---	---	---
7	---	---	4096.50	---	---	---	4097.50	---	---	---	---	4096.72
8	---	---	---	---	---	---	---	4097.96	---	---	4097.08	---
9	---	---	---	---	---	---	---	---	4098.14	---	---	---
10	---	---	---	---	---	---	4097.55	4098.12	---	4097.88	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	4097.55	4098.35	---	---	---	4096.62
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	4096.71	---	4097.55	---	---	---	4096.95	---
15	---	---	---	---	---	---	---	4098.14	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	4097.62	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	4096.62
19	---	---	---	---	---	---	4097.60	4098.16	---	---	---	---
20	---	---	---	---	---	4097.30	---	---	---	---	---	---
21	4096.85	---	---	---	---	---	4097.64	---	4098.04	4097.46	---	---
22	---	---	---	---	---	4097.74	---	4098.22	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	4097.68	4097.70	4098.16	---	4097.40	---	---
25	---	---	---	4096.69	---	---	---	---	---	---	---	4096.52
26	---	---	---	---	---	---	4097.72	---	4097.90	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	4097.83	---	---	---	---	---
29	---	---	---	---	---	4097.39	---	---	---	---	4096.84	---
30	---	---	---	---	---	---	---	4098.20	---	---	---	---
31	---	---	---	---	---	4097.44	---	---	---	---	---	---

ALVORD LAKE BASIN

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 mi^2, 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 those for October to April, which are fair, and estimated daily discharges, which are poor. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--58 years (water years 1923, 1933-89), 16.6 ft^3/s, 12,030 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 470 ft^3/s Aug. 1, 1933, gage height, 5.26 ft, from rating curve extended above 230 ft^3/s; minimum discharge observed, 0.10 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 10	2330	106	2.90	Apr. 21	0100	63	2.71
Mar. 31	1230	50	2.65	May 10	1400	*166	*3.33
Apr. 8	1300	105	2.89	May 18	0830	68	2.58
Apr. 11	1000	81	2.79	May 28	1830	76	2.65
Apr. 16	0900	98	2.86	June 6	0200	57	2.47

Minimum discharge, 1.7 ft^3/s Oct. 7.

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	2.4	3.6	e4.5	e4.3	7.8	e9.0	43	15	28	13	4.0	4.6
2	2.0	3.5	e4.6	e4.3	4.0	e7.0	38	14	29	17	4.3	4.5
3	2.1	4.2	e4.6	e4.4	e3.5	e5.0	39	18	32	17	4.0	4.6
4	2.3	4.0	e4.6	e4.3	e3.0	e5.0	45	23	40	15	4.2	4.4
5	2.4	3.8	e4.6	e4.3	e2.5	e7.0	46	32	46	14	5.7	4.0
6	2.0	3.4	e5.2	e4.0	e2.2	17	53	44	47	13	5.1	4.1
7	1.8	2.9	e5.2	e3.8	e2.2	20	73	65	38	11	3.4	5.0
8	1.9	2.5	e5.2	5.1	e2.2	33	89	80	35	8.0	3.4	4.5
9	1.9	2.3	e5.2	7.2	e2.2	68	64	91	31	8.3	3.5	4.3
10	2.4	4.3	e5.2	8.8	e3.5	81	63	149	29	8.7	4.0	4.2
11	2.7	5.1	e5.2	5.7	e3.6	84	72	112	27	8.8	3.5	4.2
12	2.9	4.7	6.4	4.4	e3.8	70	67	91	24	8.8	3.1	4.1
13	3.0	5.0	6.7	e4.3	e4.0	49	61	83	24	8.6	2.9	4.1
14	2.9	5.2	6.1	e4.5	e4.1	39	58	76	21	7.9	2.8	4.1
15	2.9	4.8	e4.4	e4.8	e4.2	31	67	67	20	8.2	2.7	3.7
16	3.1	4.6	e3.3	e4.8	e4.3	28	90	59	24	8.6	2.8	3.4
17	2.6	4.8	e3.3	e4.8	e4.7	24	81	55	21	9.4	2.7	5.6
18	2.3	4.4	e4.0	e4.8	e5.8	20	66	60	17	9.9	2.8	7.2
19	2.3	5.2	e7.6	e4.8	e5.8	18	52	57	14	7.6	2.9	5.6
20	3.0	5.3	e7.2	e4.8	e6.0	14	50	53	13	7.9	3.0	5.2
21	3.7	4.9	e5.9	e4.8	e7.0	20	53	48	13	7.5	2.9	5.9
22	3.7	5.1	e5.2	e4.8	e8.7	23	46	46	15	7.3	2.9	5.6
23	3.8	9.6	e4.8	e4.0	e12	23	32	47	14	6.5	4.8	5.5
24	3.7	10	e4.3	e3.5	e14	27	31	45	14	6.2	5.1	5.3
25	3.7	8.4	e3.7	e3.6	e15	39	26	44	12	5.8	5.5	5.2
26	3.6	9.0	e3.2	e3.7	e13	43	21	41	11	5.4	5.0	4.9
27	3.7	7.7	e2.9	e3.8	e10	43	18	35	11	5.0	4.6	5.1
28	3.8	12	e2.9	e3.8	e9.6	45	17	47	13	4.8	4.3	5.6
29	3.8	8.9	e3.1	e4.0	---	43	16	42	15	4.7	4.1	5.2
30	3.6	e6.4	e4.0	e5.8	---	44	15	34	13	4.4	3.8	5.3
31	3.5	---	e4.2	10	---	46	---	29	---	4.1	4.7	---
TOTAL	89.5	165.6	147.3	150.0	168.7	1025.0	1492	1702	691	272.4	118.5	145.0
MEAN	2.89	5.52	4.75	4.84	6.02	33.1	49.7	54.9	23.0	8.79	3.82	4.83
MAX	3.8	12	7.6	10	15	84	90	149	47	17	5.7	7.2
MIN	1.8	2.3	2.9	3.5	2.2	5.0	15	14	11	4.1	2.7	3.4
AC-FT	178	328	292	298	335	2030	2960	3380	1370	540	235	288

CAL YR 1988 TOTAL 2009.2 MEAN 5.49 MAX 25 MIN 1.3 AC-FT 3990
WTR YR 1989 TOTAL 6167.0 MEAN 16.9 MAX 149 MIN 1.8 AC-FT 12230

e Estimated

WILLIAMSON 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 mi^2.

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 except for Feb. 2 to Mar. 10, May 10 to July 19, which are fair. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--16 years, 71.6 ft^3/s, 51,870 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 246 ft^3/s May 9, 10, 1974, gage height, 3.51 ft; minimum discharge, 16 ft^3/s Dec. 13, 1980, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 142 ft^3/s Apr. 22, gage height, 2.10 ft; maximum gage height, 2.16 ft Dec. 16; minimum discharge, 33 ft^3/s Feb. 3.

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	48	51	e61	52	52	74	92	116	78	58	42	48
2	48	52	60	52	e52	76	92	115	76	55	42	47
3	48	56	59	53	e51	75	92	114	76	53	43	47
4	48	55	58	52	e50	74	90	114	78	53	43	47
5	48	54	58	53	e50	76	89	114	79	53	42	47
6	48	58	57	54	e49	82	89	114	80	53	43	47
7	49	59	58	e54	e50	88	91	115	78	54	42	47
8	49	60	57	54	e51	88	94	117	76	57	44	46
9	49	61	57	55	e52	96	96	129	76	57	46	46
10	49	64	56	57	e53	106	100	135	75	58	46	46
11	49	64	56	55	e54	103	101	128	74	57	47	46
12	49	64	55	e54	e55	99	104	121	74	55	47	46
13	49	64	55	e54	e56	96	107	118	73	55	46	46
14	49	64	55	e54	e56	95	108	114	73	54	46	46
15	49	64	e54	54	e56	94	110	110	73	53	46	46
16	50	64	e53	54	e57	94	114	106	74	53	45	46
17	51	64	e53	54	57	94	118	101	72	52	45	51
18	51	62	e53	54	59	93	121	96	70	51	43	56
19	51	60	53	54	60	94	123	96	68	50	42	53
20	51	60	53	54	61	92	125	95	66	51	44	51
21	51	60	53	54	61	92	131	94	65	51	45	51
22	51	66	53	54	64	93	141	93	64	50	45	50
23	51	73	54	54	67	92	136	97	62	50	45	50
24	51	66	53	e54	68	92	134	102	61	50	47	49
25	51	65	53	e53	68	92	135	99	61	49	48	49
26	51	64	e53	53	69	91	131	95	60	46	47	49
27	51	62	e52	52	71	89	133	91	58	44	47	51
28	51	64	e52	52	73	90	127	89	59	43	46	54
29	51	63	e52	52	---	91	119	85	59	42	45	55
30	51	e61	e53	52	---	89	116	82	58	42	46	55
31	51	---	53	52	---	94	---	79	---	40	47	---
TOTAL	1544	1844	1702	1659	1622	2794	3359	3274	2096	1589	1392	1468
MEAN	49.8	61.5	54.9	53.5	57.9	90.1	112	106	69.9	51.3	44.9	48.9
MAX	51	73	61	57	73	106	141	135	80	58	48	56
MIN	48	51	52	52	49	74	89	79	58	40	42	46
AC-FT	3060	3660	3380	3290	3220	5540	6660	6490	4160	3150	2760	2910

CAL YR 1988 TOTAL 19655 MEAN 53.7 MAX 74 MIN 41 AC-FT 38990
WTR YR 1989 TOTAL 24343 MEAN 66.7 MAX 141 MIN 40 AC-FT 48280

e Estimated

11492200 CRATER LAKE NEAR CRATER LAKE, OR
(Hydrologic bench-mark station)

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.

DRAINAGE AREA.--26.2 mi^2, of which 20.5 mi^2 is lake area at elevation 6,176 ft.

WATER-ELEVATION RECORDS

PERIOD OF RECORD.--October 1961 to current year. 1878 to September 1961 (fragmentary records) available in files of U.S. Geological Survey.

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, 6,174.36 ft May 27; minimum, 6,172.39 ft Oct. 31, Nov. 1.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6172.92	6172.41	6173.35	6173.26	6173.53	6173.35	6174.24	6174.26	6174.33	6174.18	6173.80	6173.39
2	6172.91	6172.55	6173.33	6173.26	6173.54	6173.40	6174.26	6174.25	6174.32	6174.17	6173.78	6173.37
3	6172.89	6172.65	6173.31	6173.25	6173.52	6173.36	6174.25	6174.25	6174.33	6174.15	6173.76	6173.36
4	6172.88	6172.64	6173.30	6173.27	6173.50	6173.37	6174.24	6174.25	6174.33	6174.13	6173.75	6173.35
5	6172.87	6172.71	6173.30	6173.28	6173.46	6173.46	6174.24	6174.25	6174.33	6174.13	6173.74	6173.32
6	6172.85	6172.68	6173.29	6173.30	6173.44	6173.52	6174.23	6174.25	6174.33	6174.12	6173.73	6173.28
7	6172.83	6172.67	6173.27	6173.28	6173.41	6173.50	6174.23	6174.25	6174.32	6174.11	6173.73	6173.27
8	6172.83	6172.67	6173.27	6173.35	6173.38	6173.54	6174.22	6174.27	6174.32	6174.09	6173.74	6173.26
9	6172.80	6172.68	6173.25	6173.53	6173.36	6173.62	6174.21	6174.33	6174.32	6174.09	6173.73	6173.23
10	6172.78	6172.74	6173.24	6173.60	6173.36	6173.61	6174.20	6174.33	6174.31	6174.07	6173.71	6173.22
11	6172.76	6172.74	6173.23	6173.58	6173.35	6173.62	6174.19	6174.31	6174.31	6174.06	6173.70	6173.18
12	6172.74	6172.77	6173.23	6173.57	6173.33	6173.68	6174.18	6174.31	6174.30	6174.05	6173.68	6173.16
13	6172.73	6172.82	6173.20	6173.61	6173.31	6173.74	6174.17	6174.30	6174.30	6174.04	6173.65	6173.14
14	6172.71	6172.80	6173.15	6173.61	6173.30	6173.74	6174.16	6174.28	6174.30	6174.03	6173.63	6173.13
15	6172.69	6172.82	6173.09	6173.65	6173.29	6173.72	6174.16	6174.28	6174.34	6174.02	6173.62	6173.12
16	6172.67	6172.94	6173.08	6173.64	6173.33	6173.75	6174.15	6174.27	6174.32	6174.03	6173.60	6173.10
17	6172.66	6172.97	6173.07	6173.62	6173.34	6173.78	6174.14	6174.28	6174.31	6174.03	6173.59	6173.12
18	6172.64	6172.95	6173.06	6173.61	6173.41	6173.86	6174.14	6174.27	6174.30	6174.02	6173.56	6173.09
19	6172.62	6172.97	6173.07	6173.60	6173.41	6173.85	6174.14	6174.26	6174.29	6174.01	6173.55	6173.08
20	6172.61	6172.93	6173.14	6173.58	6173.39	6173.88	6174.15	6174.25	6174.27	6174.00	6173.54	6173.06
21	6172.58	6172.99	6173.23	6173.62	6173.37	6174.01	6174.16	6174.24	6174.26	6173.97	6173.57	6173.04
22	6172.56	6173.22	6173.30	6173.61	6173.42	6173.99	6174.15	6174.28	6174.26	6173.96	6173.58	6173.02
23	6172.55	6173.26	6173.30	6173.60	6173.41	6173.97	6174.23	6174.34	6174.24	6173.95	6173.56	6173.02
24	6172.54	6173.27	6173.33	6173.57	6173.38	6174.01	6174.26	6174.34	6174.24	6173.94	6173.54	6173.00
25	6172.53	6173.35	6173.31	6173.56	6173.36	6174.04	6174.32	6174.33	6174.23	6173.93	6173.52	6172.97
26	6172.51	6173.34	6173.28	6173.55	6173.35	6174.05	6174.30	6174.32	6174.22	6173.92	6173.51	6172.97
27	6172.49	6173.43	6173.27	6173.53	6173.33	6174.06	6174.29	6174.35	6174.21	6173.90	6173.49	6172.95
28	6172.45	6173.41	6173.25	6173.52	6173.32	6174.15	6174.28	6174.35	6174.20	6173.88	6173.48	6172.95
29	6172.43	6173.40	6173.28	6173.51	---	6174.14	6174.27	6174.35	6174.21	6173.86	6173.47	6172.92
30	6172.42	6173.35	6173.29	6173.51	---	6174.19	6174.27	6174.34	6174.20	6173.84	6173.44	6172.93
31	6172.39	---	6173.27	6173.50	---	6174.17	---	6174.33	---	6173.82	6173.43	---
MAX	6172.92	6173.43	6173.35	6173.65	6173.54	6174.19	6174.32	6174.35	6174.34	6174.18	6173.80	6173.39
MIN	6172.39	6172.41	6173.06	6173.25	6173.29	6173.35	6174.14	6174.24	6174.20	6173.82	6173.43	6172.92

CAL YR 1988 MAX 6175.03 MIN 6172.39
WTR YR 1989 MAX 6174.35 MIN 6172.39

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued
(Hydrologic bench-mark station)

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, 15.0°C July 29, 30; minimum, 2.0°C Feb. 13, 18, Mar. 3.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	HARDNESS (MG/L AS CACO3)	HARD NESS NONCARB MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)
OCT										
11...	1445	117	7.8	12.0	1.0	29	0	6.9	2.8	11
JUL										
06...	1100	112	7.8	9.0	0.4	28	0	6.7	2.7	--
SEP										
06...	1130	108	7.8	12.5	0.1	28	0	6.8	2.7	10

DATE	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY WATER DIS IT FIELD (MG/L AS CACO3)	BICARBONATE WATER DIS IT FIELD (MG/L AS HCO3)	CARBONATE WATER DIS IT FIELD (MG/L AS CO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
OCT										
11...	43	0.9	1.9	28	34	0	11	9.9	0.1	18
JUL										
06...	--	--	1.7	31	38	0	10	10	0.1	18
SEP										
06...	42	0.8	1.5	30	36	0	10	9.1	0.1	18

DATE	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS TOTAL (MG/L AS P)
OCT								
11...	79	79	0.03	<0.1	<0.2	0.02	0.15	0.24
JUL								
06...	76	--	<0.01	<0.1	0.2	<0.01	0.01	0.02
SEP								
06...	69	76	0.03	<0.1	<0.2	0.02	<0.01	0.01

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT 11...	100	3	6	<0.5	<1	<1	<3	8	9	<5
JUL 06...	<10	3	6	<0.5	<1	<1	<3	<1	<3	<1
SEP 06...	80	3	6	<0.5	<1	2	<3	2	24	1

DATE	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
OCT 11...	45	<1	<0.1	<10	1	<1	<1	58	<6	13
JUL 06...	45	2	<0.1	<10	<1	<1	1	57	<6	5
SEP 06...	45	1	<0.1	<10	2	<1	<1	57	<6	7

DATE	GROSS ALPHA, DISSOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DISSOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DISSOLVED (PCI/L AS SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L)	URANIUM NATURAL DISSOLVED (UG/L AS U)
OCT 11...	<0.4	<0.4	2.1	<0.4	1.9	<0.4	0.02	<0.01
JUL 06...	--	--	--	--	--	--	--	--
SEP 06...	--	--	--	--	--	--	--	--

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	12.0	12.0	12.0	11.0	10.5	11.0	5.5	5.5	5.5	4.0	4.0	4.0
2	12.0	12.0	12.0	10.5	10.5	10.5	5.5	5.5	5.5	4.0	4.0	4.0
3	12.0	12.0	12.0	10.5	10.0	10.0	5.5	5.5	5.5	4.0	4.0	4.0
4	12.0	12.0	12.0	10.0	9.5	9.5	5.5	5.0	5.5	4.0	4.0	4.0
5	12.0	12.0	12.0	9.5	9.0	9.5	5.5	5.0	5.0	4.0	4.0	4.0
6	12.0	12.0	12.0	9.0	9.0	9.0	5.0	5.0	5.0	4.0	3.5	4.0
7	12.0	12.0	12.0	9.0	9.0	9.0	5.0	5.0	5.0	4.0	4.0	4.0
8	12.0	12.0	12.0	9.0	8.5	8.5	5.0	5.0	5.0	4.0	4.0	4.0
9	12.5	12.0	12.0	8.5	8.5	8.5	5.0	5.0	5.0	4.0	4.0	4.0
10	12.0	12.0	12.0	8.5	8.0	8.5	5.5	5.0	5.0	4.0	3.5	3.5
11	12.0	11.5	12.0	8.0	8.0	8.0	5.5	5.0	5.0	4.0	3.5	3.5
12	12.0	11.5	11.5	8.0	8.0	8.0	5.0	5.0	5.0	4.0	3.5	3.5
13	11.5	11.5	11.5	8.0	7.5	7.5	5.0	5.0	5.0	4.0	3.5	3.5
14	11.5	11.5	11.5	7.5	7.5	7.5	5.0	4.5	5.0	3.5	3.5	3.5
15	12.0	11.5	11.5	7.5	7.0	7.5	5.0	4.5	5.0	3.5	3.5	3.5
16	12.0	11.5	11.5	7.0	7.0	7.0	5.0	4.5	4.5	3.5	3.5	3.5
17	11.5	11.5	11.5	7.0	7.0	7.0	4.5	4.5	4.5	3.5	3.5	3.5
18	11.5	11.5	11.5	7.0	6.5	7.0	4.5	4.5	4.5	3.5	3.5	3.5
19	12.0	11.5	11.5	6.5	6.5	6.5	4.5	4.5	4.5	3.5	3.5	3.5
20	11.5	11.5	11.5	6.5	6.5	6.5	4.5	4.5	4.5	3.5	3.5	3.5
21	11.5	11.0	11.5	6.5	6.5	6.5	4.5	4.5	4.5	3.5	3.5	3.5
22	11.5	11.0	11.5	6.5	6.0	6.5	4.5	4.0	4.0	3.5	3.5	3.5
23	11.5	11.0	11.0	6.0	6.0	6.0	4.0	4.0	4.0	3.5	3.0	3.0
24	11.5	11.0	11.5	6.0	5.5	6.0	4.0	4.0	4.0	3.5	3.0	3.0
25	11.5	11.0	11.5	6.0	5.5	5.5	4.0	4.0	4.0	3.5	3.0	3.0
26	11.5	11.0	11.0	5.5	5.5	5.5	4.0	4.0	4.0	3.5	3.5	3.5
27	11.0	11.0	11.0	5.5	5.5	5.5	4.0	4.0	4.0	3.5	3.0	3.5
28	11.0	11.0	11.0	5.5	5.5	5.5	4.0	4.0	4.0	3.5	3.5	3.5
29	11.0	11.0	11.0	5.5	5.5	5.5	4.0	4.0	4.0	3.5	3.5	3.5
30	11.0	11.0	11.0	5.5	5.5	5.5	4.0	4.0	4.0	3.5	3.5	3.5
31	11.0	11.0	11.0	---	---	---	4.0	4.0	4.0	3.5	3.5	3.5
MONTH	12.5	11.0	11.5	11.0	5.5	7.5	5.5	4.0	4.5	4.0	3.0	3.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	3.5	3.5	3.5	3.0	2.5	2.5	3.0	3.0	3.0	4.0	3.5	4.0
2	3.5	3.5	3.5	3.0	2.5	2.5	3.0	2.5	3.0	4.0	3.5	4.0
3	3.5	3.0	3.5	2.5	2.0	2.5	3.0	2.5	3.0	4.0	3.5	4.0
4	3.0	2.5	3.0	2.5	2.5	2.5	3.0	3.0	3.0	4.0	3.5	4.0
5	3.0	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	4.0	3.5	4.0
6	3.0	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	4.0	4.0	4.0
7	3.0	2.5	3.0	3.0	2.5	2.5	3.0	3.0	3.0	4.5	4.0	4.0
8	3.0	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	4.5	4.0	4.0
9	3.0	2.5	2.5	2.5	2.5	2.5	3.0	3.0	3.0	4.0	4.0	4.0
10	3.0	2.5	2.5	2.5	2.5	2.5	3.5	3.0	3.0	4.0	4.0	4.0
11	2.5	2.5	2.5	3.0	2.5	2.5	3.5	3.0	3.0	4.5	4.0	4.0
12	2.5	2.5	2.5	2.5	2.5	2.5	3.5	3.0	3.5	4.5	4.0	4.0
13	3.0	2.0	2.5	2.5	2.5	2.5	3.5	3.0	3.5	4.5	4.0	4.0
14	3.0	3.0	3.0	3.0	2.5	2.5	3.5	3.0	3.5	4.0	4.0	4.0
15	3.0	2.5	3.0	3.0	2.5	2.5	3.5	3.5	3.5	4.5	4.0	4.0
16	3.0	2.5	3.0	2.5	2.5	2.5	3.5	3.5	3.5	4.5	4.0	4.5
17	2.5	2.5	2.5	2.5	2.5	2.5	3.5	3.5	3.5	4.5	4.0	4.5
18	2.5	2.0	2.0	2.5	2.5	2.5	3.5	3.5	3.5	4.0	4.0	4.0
19	2.5	2.5	2.5	3.0	2.5	2.5	3.5	3.5	3.5	4.5	4.0	4.0
20	2.5	2.5	2.5	2.5	2.5	2.5	3.5	3.5	3.5	4.5	4.0	4.0
21	2.5	2.5	2.5	3.0	2.5	2.5	3.5	3.5	3.5	4.5	4.0	4.5
22	2.5	2.5	2.5	3.0	2.5	2.5	3.5	3.5	3.5	4.5	4.0	4.0
23	3.0	2.5	3.0	3.0	2.5	2.5	3.5	3.5	3.5	4.0	4.0	4.0
24	3.0	2.5	3.0	3.0	2.5	3.0	3.5	3.0	3.5	4.5	4.0	4.5
25	3.0	2.5	3.0	3.0	2.5	3.0	3.5	3.5	3.5	4.5	4.0	4.5
26	3.0	2.5	2.5	3.0	2.5	3.0	4.0	3.5	3.5	4.5	4.0	4.5
27	3.0	2.5	2.5	3.0	3.0	3.0	3.5	3.5	3.5	4.5	4.0	4.5
28	3.0	2.5	2.5	3.0	3.0	3.0	3.5	3.5	3.5	4.5	4.0	4.5
29	---	---	---	3.0	3.0	3.0	4.0	3.5	3.5	4.5	4.0	4.5
30	---	---	---	3.0	3.0	3.0	3.5	3.5	3.5	4.5	4.0	4.5
31	---	---	---	3.0	3.0	3.0	---	---	---	5.0	4.5	4.5
MONTH	3.5	2.0	2.5	3.0	2.0	2.5	4.0	2.5	3.5	5.0	3.5	4.0

11492200 CRATER LAKE NEAR CRATER LAKE, OR--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	5.0	4.5	5.0	8.5	8.0	8.5	13.5	13.0	13.5	13.0	13.0	13.0
2	5.0	4.5	5.0	8.5	8.0	8.5	13.0	12.5	13.0	13.0	12.5	12.5
3	5.5	4.5	5.0	8.5	8.5	8.5	12.5	12.5	12.5	13.0	12.5	12.5
4	5.0	4.5	5.0	9.0	8.5	8.5	13.0	12.5	12.5	12.5	12.5	12.5
5	5.5	5.0	5.0	9.0	8.5	9.0	13.0	12.5	13.0	13.0	12.5	13.0
6	5.5	5.0	5.0	9.0	9.0	9.0	13.0	12.5	13.0	13.0	11.5	12.5
7	5.5	5.0	5.5	10.5	9.0	10.0	13.5	13.0	13.0	12.5	11.5	12.0
8	7.0	5.5	6.5	9.5	9.0	9.5	14.0	13.0	13.5	12.5	12.0	12.0
9	7.5	6.0	6.5	10.0	8.5	9.5	14.0	13.0	13.5	12.5	12.0	12.0
10	7.5	6.5	7.0	10.0	9.5	10.0	14.5	13.5	14.0	12.5	12.0	12.0
11	8.0	7.5	7.5	11.0	9.5	10.5	14.5	14.0	14.5	12.5	12.0	12.0
12	8.0	7.0	7.5	10.5	10.0	10.5	14.0	13.5	14.0	12.0	12.0	12.0
13	10.0	7.5	8.5	10.5	10.0	10.5	14.0	13.5	14.0	12.0	11.5	12.0
14	11.0	9.5	10.0	11.0	10.0	10.5	14.0	14.0	14.0	12.0	12.0	12.0
15	9.5	7.5	8.0	13.0	10.5	12.5	14.5	14.0	14.0	12.5	12.0	12.0
16	8.5	7.5	8.0	13.0	12.0	12.5	14.0	13.5	14.0	12.0	12.0	12.0
17	8.5	7.5	8.0	12.5	11.5	12.0	14.0	13.5	14.0	12.0	11.5	12.0
18	8.5	7.5	8.0	12.0	11.0	11.5	14.0	14.0	14.0	11.5	11.5	11.5
19	8.5	7.5	8.0	12.0	11.0	11.5	14.5	13.0	14.0	11.5	11.5	11.5
20	9.0	8.0	8.5	12.5	11.0	12.0	14.5	14.0	14.0	12.0	11.5	11.5
21	9.0	8.0	8.5	13.5	12.0	13.0	14.5	14.5	14.5	11.5	11.5	11.5
22	8.5	7.5	8.0	13.0	11.0	12.0	14.5	14.0	14.5	12.0	11.5	11.5
23	7.5	6.5	7.0	14.0	12.0	13.5	14.0	13.5	13.5	11.5	11.5	11.5
24	7.5	6.5	7.0	14.0	13.5	14.0	13.0	13.0	13.0	12.0	11.5	12.0
25	9.0	7.5	8.5	14.0	13.0	13.5	13.0	13.0	13.0	12.0	11.5	11.5
26	9.5	8.0	9.0	14.0	12.5	13.5	13.0	13.0	13.0	11.5	11.5	11.5
27	10.0	8.5	9.5	14.5	14.0	14.5	13.0	13.0	13.0	11.5	11.0	11.5
28	10.5	9.5	10.0	14.5	12.0	13.5	13.5	13.0	13.0	11.5	11.0	11.0
29	9.5	9.0	9.0	15.0	14.0	14.5	13.5	13.5	13.5	11.0	11.0	11.0
30	9.0	8.0	8.5	15.0	14.0	14.5	13.5	13.0	13.0	11.0	11.0	11.0
31	---	---	---	13.5	13.5	13.5	13.0	13.0	13.0	---	---	---
MONTH	11.0	4.5	7.5	15.0	8.0	11.5	14.5	12.5	13.5	13.0	11.0	12.0
YEAR	15.0	2.0	7.0									

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 mi^2, 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 excellent 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.--35 years (water years 1955-89), 209 ft^3/s, 151,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 1,590 ft^3/s Mar. 13, 1910, gage height, 3.7 ft, site and datum then in use, from rating curve extended above 800 ft^3/s; maximum gage height, 5.57 ft Mar. 3, 1958; no flow at times during 1960-74, 1977-81, 1988-89.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 866 ft^3/s Mar. 21, gage height, 5.22 ft; maximum gage height, 5.34 ft Feb. 6, affected by ice; no flow Oct. 1 to Nov. 1, Aug. 1 to Sept. 30.

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	.00	.00	161	e130	98	118	678	366	172	37	.00	.00
2	.00	e.10	169	125	e95	126	671	359	164	33	.00	.00
3	.00	e.10	176	123	e90	136	668	351	161	27	.00	.00
4	.00	e.10	178	123	e90	136	666	345	157	23	.00	.00
5	.00	e.10	180	e122	e90	140	664	336	147	18	.00	.00
6	.00	e.10	184	e120	e90	155	660	325	141	17	.00	.00
7	.00	e.20	190	e110	e90	178	655	314	135	15	.00	.00
8	.00	e.20	193	e110	e90	201	649	304	129	15	.00	.00
9	.00	e.20	199	110	e90	233	638	306	123	12	.00	.00
10	.00	e.20	201	e110	e90	278	613	303	119	11	.00	.00
11	.00	e.20	203	e110	e90	343	594	296	109	8.5	.00	.00
12	.00	e.30	203	e110	e90	432	571	288	103	6.0	.00	.00
13	.00	e.30	203	e110	e90	527	545	286	98	4.4	.00	.00
14	.00	e.40	202	e100	e90	596	518	278	93	3.7	.00	.00
15	.00	e.60	185	e100	e85	687	494	267	90	3.2	.00	.00
16	.00	e.80	178	102	e85	728	476	255	87	2.7	.00	.00
17	.00	e1.0	177	100	e85	760	457	237	84	2.5	.00	.00
18	.00	e1.0	174	e100	e85	781	441	228	80	2.3	.00	.00
19	.00	2.0	172	e100	e90	825	418	227	74	2.2	.00	.00
20	.00	2.0	170	e100	e90	843	393	222	72	2.1	.00	.00
21	.00	2.7	165	e100	e90	844	394	217	67	2.1	.00	.00
22	.00	18	159	99	e95	820	387	210	67	e2.0	.00	.00
23	.00	55	155	e100	e95	826	389	204	64	e1.0	.00	.00
24	.00	73	151	e100	e100	816	395	203	60	e.80	.00	.00
25	.00	85	e150	e100	e100	776	395	200	54	e.60	.00	.00
26	.00	96	e150	e99	e110	757	401	197	49	e.50	.00	.00
27	.00	112	e140	e98	e110	725	406	188	45	e.30	.00	.00
28	.00	132	140	e96	115	703	405	187	40	e.20	.00	.00
29	.00	145	136	e95	---	695	394	185	39	e.20	.00	.00
30	.00	153	133	e94	---	703	377	181	38	e.10	.00	.00
31	.00	---	e130	94	---	693	---	177	---	e.10	.00	---
TOTAL	0.00	881.60	5307	3290	2608	16581	15412	8042	2861	253.50	0.00	0.00
MEAN	.00	29.4	171	106	93.1	535	514	259	95.4	8.18	.00	.00
MAX	.00	153	203	130	115	844	678	366	172	37	.00	.00
MIN	.00	.00	130	94	85	118	377	177	38	.10	.00	.00
AC-FT	.0	1750	10530	6530	5170	32890	30570	15950	5670	503	.0	.0

CAL YR 1988 TOTAL 46635.90 MEAN 127 MAX 462 MIN .00 AC-FT 92500
WTR YR 1989 TOTAL 55236.10 MEAN 151 MAX 844 MIN .00 AC-FT 109600

e Estimated

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 mi^2.

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 fair except those for May 19 to Aug. 23, which are poor. No regulation. Diversions for irrigation upstream from station in the vicinity of Bly.

AVERAGE DISCHARGE.--39 years (water years 1914-15, 1920, 1954-89), 311 ft^3/s, 225,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,980 ft^3/s Dec. 23, 1964, gage height, 12.19 ft; minimum discharge, 50 ft^3/s Aug. 25, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,550 ft^3/s Mar. 10, gage height, 8.64 ft; minimum discharge, 65 ft^3/s Jan. 24.

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	104	132	161	127	130	348	1070	642	341	221	124	143
2	103	137	165	125	113	324	1040	637	330	221	130	140
3	107	174	158	133	110	259	1080	649	309	208	132	141
4	107	161	146	128	101	208	954	689	340	191	136	143
5	109	152	145	128	94	208	773	752	361	186	131	143
6	109	153	154	122	94	695	790	852	360	169	123	136
7	114	153	149	124	106	1220	884	970	357	163	120	124
8	128	154	144	124	109	1290	1000	1050	346	163	125	133
9	126	151	145	126	111	1770	1090	1130	341	162	153	127
10	123	152	148	131	117	2450	1150	1180	332	160	135	131
11	120	151	141	120	118	2000	1180	1120	318	153	121	125
12	114	149	143	106	112	1640	1170	979	308	145	112	107
13	115	168	145	108	110	1320	1180	874	298	139	108	106
14	117	178	136	128	106	947	1200	799	279	136	108	106
15	132	167	108	128	105	719	1250	707	284	137	109	104
16	136	168	e110	127	109	707	1350	664	328	130	103	101
17	132	178	e110	123	116	674	1400	644	304	129	101	138
18	133	156	e120	120	121	563	1400	621	275	137	97	234
19	132	151	137	117	126	571	1390	574	264	136	99	232
20	130	157	136	116	125	579	1430	548	263	137	100	202
21	130	155	133	124	126	581	1440	520	237	131	104	167
22	127	178	131	128	170	898	1440	494	233	132	98	150
23	128	504	126	112	409	836	1320	507	200	134	134	142
24	129	393	133	91	612	765	1130	540	214	131	166	144
25	129	221	130	123	629	911	993	511	219	126	157	148
26	130	189	97	122	639	995	929	490	225	124	157	147
27	129	172	108	120	529	821	896	449	207	122	164	147
28	130	216	130	119	406	756	794	443	209	128	156	150
29	133	280	131	120	---	794	702	435	211	116	155	153
30	132	186	135	122	---	724	657	400	218	114	149	154
31	132	---	131	124	---	782	---	363	---	112	149	---
TOTAL	3820	5636	4186	3766	5753	27355	33082	21233	8511	4593	3956	4318
MEAN	123	188	135	121	205	882	1103	685	284	148	128	144
MAX	136	504	165	133	639	2450	1440	1180	361	221	166	234
MIN	103	132	97	91	94	208	657	363	200	112	97	101
AC-FT	7580	11180	8300	7470	11410	54260	65620	42120	16880	9110	7850	8560

CAL YR 1988 TOTAL 68668 MEAN 188 MAX 640 MIN 81 AC-FT 136200
WTR YR 1989 TOTAL 126209 MEAN 346 MAX 2450 MIN 91 AC-FT 250300

e Estimated

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 mi^2.

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 except for estimated daily discharges, which are fair. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--16 years, 171 ft^3/s, 123,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,550 ft^3/s Feb. 21 or 22, 1982, gage height, 12.22 ft, from floodmarks; minimum discharge, 3.0 ft^3/s Nov. 21, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 3,300 ft^3/s Mar. 12; minimum discharge, 20 ft^3/s July 23.

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	23	28	44	32	34	58	833	463	185	46	23	26
2	23	30	41	33	34	58	824	435	166	44	23	27
3	23	36	39	33	e31	49	766	420	151	43	24	26
4	22	32	34	33	e29	46	662	409	142	39	24	27
5	23	30	35	34	e28	66	625	405	139	37	22	27
6	23	32	39	33	e28	145	620	423	134	36	22	27
7	23	30	36	33	e29	145	629	463	129	34	23	27
8	23	30	35	33	e30	183	651	506	121	32	30	27
9	23	30	36	34	31	453	678	553	112	32	32	26
10	23	32	39	36	31	1180	707	584	96	31	27	26
11	23	32	36	34	31	e2400	707	598	82	31	25	26
12	23	33	39	33	30	e3300	704	584	73	30	23	26
13	23	39	38	33	30	e2300	702	546	68	29	22	27
14	23	40	33	33	29	e1900	701	497	63	29	23	27
15	25	41	32	33	29	e900	720	448	64	28	24	27
16	27	45	31	34	30	803	737	405	66	27	24	27
17	26	44	33	34	32	658	758	364	65	26	25	45
18	26	34	32	34	35	539	792	324	65	26	24	50
19	25	38	32	33	37	575	797	307	67	26	23	33
20	25	41	32	33	38	665	794	297	66	26	23	30
21	23	39	32	33	39	752	827	276	62	24	24	29
22	24	56	33	34	51	968	965	255	61	23	25	28
23	27	82	31	33	53	898	933	257	58	22	26	28
24	28	62	32	32	55	844	848	261	55	22	27	27
25	26	49	31	32	57	869	774	268	53	24	26	27
26	26	53	31	32	56	824	725	266	51	23	26	28
27	26	41	31	32	55	725	687	252	48	23	26	29
28	27	60	32	32	56	709	607	241	47	23	25	28
29	26	51	32	32	---	712	546	231	46	22	26	28
30	27	45	33	33	---	642	494	218	47	22	26	29
31	27	---	33	33	---	788	---	202	---	23	26	---
TOTAL	762	1235	1067	1026	1048	25154	21813	11758	2582	903	769	865
MEAN	24.6	41.2	34.4	33.1	37.4	811	727	379	86.1	29.1	24.8	28.8
MAX	28	82	44	36	57	3300	965	598	185	46	32	50
MIN	22	28	31	32	28	46	494	202	46	22	22	26
AC-FT	1510	2450	2120	2040	2080	49890	43270	23320	5120	1790	1530	1720

CAL YR 1988 TOTAL 17325 MEAN 47.3 MAX 255 MIN 16 AC-FT 34360
WTR YR 1989 TOTAL 68982 MEAN 189 MAX 3300 MIN 22 AC-FT 136800

e Estimated

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 mi^2, 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 McCready 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.--68 years (water years 1922-89), 586 ft^3/s, 424,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,900 ft^3/s Dec. 26, 1964, gage height, 10.37 ft; minimum daily discharge, 50 ft^3/s May 26, 1926.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,570 ft^3/s Mar. 14, gage height, 6.24 ft; minimum discharge, 109 ft^3/s July 25.

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	219	244	470	e270	e200	898	1750	1530	647	316	139	218
2	208	254	413	e270	e210	786	1760	1370	587	314	143	221
3	195	263	369	e260	e190	701	1930	1260	539	301	161	207
4	196	267	363	e250	e180	649	2050	1210	508	291	166	210
5	211	285	353	e250	e180	571	2090	1180	484	285	168	213
6	218	301	343	e250	e170	597	2020	1170	484	269	175	216
7	224	281	341	e250	e180	849	1810	1190	500	284	166	218
8	224	280	349	e240	e190	1210	1650	1230	488	279	161	216
9	228	276	348	e240	e200	1550	1620	1340	487	234	171	216
10	232	277	342	e240	e220	1920	1660	1420	478	207	184	205
11	240	278	341	e230	e230	2280	1730	1490	472	198	212	217
12	238	281	344	e220	e230	2970	1800	1550	473	200	214	218
13	242	287	342	e210	e230	3810	1860	1610	457	203	187	219
14	239	291	340	e220	e230	4450	1880	1600	458	189	169	218
15	230	302	342	e240	e220	4410	1880	1520	458	176	162	224
16	219	316	e280	e240	e230	3850	1880	1400	446	164	155	233
17	227	318	e320	e230	e250	2810	1890	1270	458	163	160	290
18	234	315	e330	e230	e250	2160	1920	1150	494	154	167	321
19	227	320	e340	e220	e270	1900	1980	1070	488	153	175	352
20	227	301	e330	e220	e300	1600	2030	996	453	149	173	402
21	231	296	e320	e210	e350	1470	2090	928	434	136	170	397
22	227	343	e310	e220	e400	1530	2130	885	410	121	181	362
23	224	395	e310	e230	451	1590	2210	876	372	118	195	331
24	227	457	306	e210	680	1790	2340	841	361	120	210	308
25	237	604	300	e200	850	2000	2480	832	316	113	214	285
26	238	667	e280	e210	989	2000	2420	838	329	116	241	281
27	233	519	e250	e220	1010	1980	2210	821	324	115	246	288
28	228	440	e260	e210	991	2040	2000	792	320	124	240	292
29	229	407	e260	e210	---	2000	1850	741	328	136	236	292
30	233	428	e270	e200	---	1840	1710	706	313	131	237	294
31	238	---	e270	e200	---	1830	---	672	---	130	215	---
TOTAL	7023	10293	10136	7100	10081	60041	58630	35488	13366	5889	5793	7964
MEAN	227	343	327	229	360	1937	1954	1145	446	190	187	265
MAX	242	667	470	270	1010	4450	2480	1610	647	316	246	402
MIN	195	244	250	200	170	571	1620	672	313	113	139	205
AC-FT	13930	20420	20100	14080	20000	119100	116300	70390	26510	11680	11490	15800

CAL YR 1988 TOTAL 125308 MEAN 342 MAX 810 MIN 113 AC-FT 248500
WTR YR 1989 TOTAL 231804 MEAN 635 MAX 4450 MIN 113 AC-FT 459800

e Estimated

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 mi^2, 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. Some regulation by diversion dams and logpond operations on Sprague River. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--72 years, 1,058 ft^3/s, 766,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,100 ft^3/s Dec. 26, 1964, gage height, 10.56 ft; minimum discharge, 320 ft^3/s Oct. 14, 1920.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,290 ft^3/s Mar. 14, gage height, 6.11 ft; minimum discharge, 413 ft^3/s July 25.

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	490	554	928	786	725	1240	2920	2280	1200	612	453	493
2	482	582	892	792	e660	1170	2890	2100	1140	606	459	502
3	473	587	850	799	e600	1090	3030	1980	1080	596	472	486
4	472	580	847	786	e540	1050	3150	1910	1030	583	478	486
5	487	596	842	790	e520	1000	3190	1860	995	575	482	485
6	490	619	836	770	e530	1030	3120	1830	979	558	484	486
7	492	595	833	760	e580	1260	2900	1840	979	559	474	493
8	488	595	846	728	e620	1650	2710	1880	966	562	472	492
9	494	588	848	731	e640	2090	2650	2030	952	521	475	494
10	504	599	848	e720	658	2540	2670	2100	923	500	483	483
11	517	592	848	e710	663	2990	2720	2150	898	493	501	489
12	516	598	854	e700	669	3680	2780	2210	887	497	507	490
13	526	608	851	e670	663	4450	2830	2260	865	498	484	493
14	522	606	846	686	654	5120	2830	2260	847	494	467	487
15	518	617	834	680	645	5230	2810	2170	840	488	459	491
16	517	639	743	817	649	4830	2770	2030	827	478	450	496
17	523	639	708	784	672	4000	2760	1880	821	474	450	580
18	534	625	798	e740	697	3370	2780	1720	844	473	456	601
19	530	632	854	e720	717	3110	2820	1630	846	473	463	622
20	530	617	848	e700	729	2810	2850	1560	804	474	461	679
21	536	616	819	e680	758	2690	2900	1490	786	466	456	685
22	531	707	817	e700	781	2730	2940	1440	794	452	463	658
23	529	751	797	e640	799	2780	3020	1440	754	445	473	623
24	531	812	783	e620	982	2990	3180	1400	718	445	489	597
25	545	957	712	e630	1150	3220	3350	1380	666	432	494	580
26	547	1050	e640	e650	1270	3220	3300	1390	653	431	511	578
27	544	938	e620	e670	1310	3160	3080	1370	649	440	518	578
28	537	882	e670	e690	1300	3230	2850	1340	633	492	512	582
29	538	854	733	e710	---	3190	2680	1280	635	507	507	585
30	542	875	804	713	---	3020	2500	1250	617	482	515	585
31	545	---	809	717	---	3010	---	1220	---	452	494	---
TOTAL	16030	20510	24958	22289	21181	86950	86980	54680	25628	15558	14862	16379
MEAN	517	684	805	719	756	2805	2899	1764	854	502	479	546
MAX	547	1050	928	817	1310	5230	3350	2280	1200	612	518	685
MIN	472	554	620	620	520	1000	2500	1220	617	431	450	483
AC-FT	31800	40680	49500	44210	42010	172500	172500	108500	50830	30860	29480	32490

CAL YR 1988 TOTAL 274517 MEAN 750 MAX 1580 MIN 390 AC-FT 544500
WTR YR 1989 TOTAL 406005 MEAN 1112 MAX 5230 MIN 431 AC-FT 805300

e Estimated

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 good. 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.--12 years, 3.06 ft^3/s, 2,220 acre-ft/yr, adjusted for diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18 ft^3/s July 6, 1984, gage height, 1.56 ft; minimum discharge, 0.33 ft^3/s Nov. 20, 22, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9.4 ft^3/s June 16-18, 22, 23, gage height, 1.46 ft; minimum discharge, 0.39 ft^3/s Mar. 24, 26, 30, Apr. 1-3.

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	1.5	1.1	.87	.72	.51	.51	.43	2.7	5.9	8.3	5.1	2.9
2	1.5	1.2	.85	.69	.51	.51	.42	2.6	5.9	8.0	5.0	2.9
3	1.4	1.2	.85	.67	.51	.51	.43	2.5	6.0	8.0	4.9	2.9
4	1.4	1.2	.83	.66	.51	.51	.47	2.5	6.2	8.1	4.9	2.9
5	1.4	1.2	.78	.64	.51	.51	.52	2.5	6.4	7.9	4.7	2.8
6	1.4	1.2	.78	.63	.51	.51	.53	2.6	6.7	7.7	4.6	2.8
7	1.4	1.2	.75	.63	.51	.51	.53	3.4	7.3	7.6	4.6	2.8
8	1.4	1.2	.75	.63	.51	.51	.52	4.1	7.7	7.6	4.6	2.8
9	1.4	1.1	.74	.63	.51	.54	.56	4.5	8.0	7.6	4.4	2.8
10	1.4	1.2	.74	.60	.51	.53	.60	5.4	8.3	7.5	4.3	2.7
11	1.3	1.1	.75	.54	.51	.50	.63	5.8	8.3	7.3	4.2	2.6
12	1.3	1.1	.74	.60	.51	.44	.68	6.0	8.5	7.2	4.1	2.6
13	1.3	1.1	.75	.60	.51	.44	.98	6.1	8.5	7.0	4.0	2.6
14	1.3	1.1	.74	.60	.51	.44	1.2	6.1	8.5	6.9	4.1	2.6
15	1.3	1.0	.72	.60	.51	.44	1.4	6.1	8.7	6.8	4.0	2.6
16	1.3	1.1	.71	.60	.51	.42	1.8	6.1	9.0	6.7	3.9	2.6
17	1.3	1.0	.72	.60	.51	.41	2.0	6.1	9.3	6.6	3.9	2.6
18	1.3	.96	.72	.59	.51	.41	2.2	6.2	9.3	6.4	3.8	2.6
19	1.2	.96	.71	.58	.51	.42	2.5	6.2	9.0	6.3	3.7	2.5
20	1.3	.92	.72	.54	.51	.42	2.7	6.2	9.0	6.1	3.5	2.5
21	1.3	.93	.72	.54	.51	.50	3.7	6.2	9.0	6.1	3.4	2.6
22	1.3	.95	.72	.53	.51	.44	4.1	6.2	9.0	6.0	3.3	2.5
23	1.2	.96	.72	.51	.51	.42	4.2	6.2	9.1	6.0	3.2	2.5
24	1.2	.90	.72	.60	.51	.44	4.2	6.1	8.9	5.9	3.2	2.5
25	1.2	.89	.72	.69	.51	.46	4.2	6.2	8.7	5.8	3.1	2.5
26	1.1	.89	.72	.69	.51	.42	4.1	6.2	8.7	5.7	3.1	2.4
27	1.2	.89	.72	.69	.51	.46	3.8	6.2	8.7	5.6	3.1	2.4
28	1.2	.92	.72	.69	.51	.50	3.2	6.1	8.7	5.5	3.1	2.5
29	1.2	.89	.72	.68	---	.45	2.9	6.0	8.6	5.4	3.0	2.4
30	1.2	.90	.72	.62	---	.43	2.8	6.0	8.5	5.3	3.0	2.5
31	1.2	---	.72	.53	---	.45	---	6.0	---	5.2	3.0	---
TOTAL	40.4	31.26	23.14	19.12	14.28	14.46	58.30	161.1	244.4	208.1	120.8	78.9
MEAN	1.30	1.04	.75	.62	.51	.47	1.94	5.20	8.15	6.71	3.90	2.63
MAX	1.5	1.2	.87	.72	.51	.54	4.2	6.2	9.3	8.3	5.1	2.9
MIN	1.1	.89	.71	.51	.51	.41	.42	2.5	5.9	5.2	3.0	2.4
AC-FT	80	62	46	38	28	29	116	320	485	413	240	156
MEAN†	1.34	1.06	0.77	0.64	0.54	0.49	1.97	5.24	8.22	6.81	3.98	2.69
AC-FT†	82.1	63.3	47.2	39.6	30.0	30.1	117	322	489	419	245	160

CAL YR 1988 TOTAL 687.47 MEAN 1.88 MAX 5.9 MIN .66 AC-FT 1360 MEAN† 1.94 AC-FT† 1401
WTR YR 1989 TOTAL 1014.26 MEAN 2.78 MAX 9.3 MIN .41 AC-FT 2010 MEAN† 2.82 AC-FT† 2043

† Adjusted for diversion by pumping.

UPPER KLAMATH LAKE BASIN-OREGON

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 mi^2, approximately, including 26.2 mi^2 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, 4,143.14 ft June 3; minimum daily, 4,138.50 ft Oct. 13.

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 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4138.68	4138.62	4139.92	4140.56	4141.07	4141.35	4142.44	4142.93	4143.11	4142.28	4140.92	4139.88
2	4138.69	4138.60	4139.95	4140.57	4141.08	4141.44	4142.48	4142.92	4143.12	4142.26	4140.89	4139.84
3	4138.69	4138.64	4139.97	4140.59	4141.08	4141.48	4142.50	4142.93	4143.14	4142.23	4140.85	4139.82
4	4138.67	4138.69	4140.00	4140.61	4141.06	4141.54	4142.46	4142.94	4143.10	4142.21	4140.81	4139.79
5	4138.66	4138.68	4140.01	4140.66	4141.03	4141.62	4142.47	4142.96	4143.07	4142.17	4140.76	4139.77
6	4138.65	4138.73	4140.04	4140.68	4141.00	4141.69	4142.47	4142.97	4143.01	4142.12	4140.73	4139.79
7	4138.63	4138.75	4140.06	4140.70	4140.97	4141.75	4142.47	4142.98	4143.01	4142.09	4140.70	4139.71
8	4138.62	4138.74	4140.08	4140.71	4140.94	4141.83	4142.49	4142.98	4143.01	4142.07	4140.65	4139.67
9	4138.62	4138.74	4140.09	4140.73	4140.92	4141.96	4142.51	4143.03	4142.99	4142.00	4140.62	4139.68
10	4138.60	4138.78	4140.12	4140.78	4140.87	4142.02	4142.53	4143.05	4142.96	4141.94	4140.58	4139.64
11	4138.58	4138.82	4140.14	4140.80	4140.84	4142.06	4142.54	4143.03	4142.95	4141.89	4140.55	4139.64
12	4138.57	4138.84	4140.17	4140.81	4140.82	4142.09	4142.58	4143.02	4142.94	4141.84	4140.53	4139.58
13	4138.50	4138.91	4140.19	4140.83	4140.79	4142.13	4142.60	4143.02	4142.91	4141.81	4140.50	4139.53
14	4138.54	4138.94	4140.25	4140.84	4140.77	4142.17	4142.65	4143.01	4142.87	4141.77	4140.48	4139.50
15	4138.55	4138.97	4140.28	4140.86	4140.76	4142.21	4142.67	4143.03	4142.86	4141.73	4140.44	4139.47
16	4138.56	4139.00	4140.28	4140.86	4140.75	4142.28	4142.70	4143.01	4142.84	4141.66	4140.40	4139.43
17	4138.58	4139.12	4140.24	4140.88	4140.76	4142.29	4142.72	4143.01	4142.81	4141.64	4140.35	4139.48
18	4138.59	4139.13	4140.23	4140.90	4140.81	4142.32	4142.74	4143.02	4142.78	4141.61	4140.31	4139.55
19	4138.61	4139.13	4140.24	4140.91	4140.86	4142.39	4142.76	4143.00	4142.77	4141.57	4140.28	4139.54
20	4138.62	4139.16	4140.27	4140.92	4140.90	4142.37	4142.78	4143.01	4142.75	4141.52	4140.24	4139.56
21	4138.61	4139.18	4140.29	4140.94	4140.94	4142.38	4142.85	4143.01	4142.71	4141.47	4140.17	4139.58
22	4138.62	4139.31	4140.35	4140.99	4140.99	4142.39	4142.87	4143.01	4142.69	4141.42	4140.13	4139.58
23	4138.62	4139.46	4140.39	4141.00	4141.03	4142.37	4142.92	4143.02	4142.64	4141.35	4140.12	4139.59
24	4138.62	4139.48	4140.43	4141.01	4141.07	4142.36	4143.02	4143.05	4142.60	4141.30	4140.06	4139.59
25	4138.63	4139.62	4140.45	4141.02	4141.12	4142.41	4143.04	4143.07	4142.56	4141.25	4140.05	4139.57
26	4138.64	4139.68	4140.47	4141.03	4141.18	4142.38	4143.08	4143.09	4142.51	4141.19	4140.02	4139.56
27	4138.66	4139.71	4140.49	4141.04	4141.24	4142.37	4143.07	4143.11	4142.47	4141.14	4140.01	4139.60
28	4138.64	4139.81	4140.51	4141.04	4141.29	4142.42	4143.03	4143.11	4142.34	4141.11	4139.98	4139.61
29	4138.64	4139.84	4140.51	4141.05	---	4142.45	4142.99	4143.13	4142.28	4141.04	4139.95	4139.58
30	4138.65	4139.89	4140.53	4141.06	---	4142.44	4142.93	4143.13	4142.31	4141.01	4139.92	4139.59
31	4138.65	---	4140.54	4141.07	---	4142.47	---	4143.12	---	4140.96	4139.90	---
MEAN	4138.62	4139.10	4140.24	4140.85	4140.96	4142.11	4142.71	4143.02	4142.80	4141.67	4140.38	4139.62
MAX	4138.69	4139.89	4140.54	4141.07	4141.29	4142.47	4143.08	4143.13	4143.14	4142.28	4140.92	4139.88
MIN	4138.50	4138.60	4139.92	4140.56	4140.75	4141.35	4142.44	4142.92	4142.28	4140.96	4139.90	4139.43
(†)	168200	257000	302800	340700	360000	451800	494000	508400	440900	330900	254200	234700
(‡)	-6100	+88800	+45800	+37900	+19300	+91800	+42200	+14400	-67500	-110000	-76700	-19500

CAL YR 1988 MEAN 4141.07 MAX 4143.13 MIN 4138.50 AC-FT‡ -2900
WTR YR 1989 MEAN 4141.01 MAX 4143.14 MIN 4138.50 AC-FT‡ +60400

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

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 mi^2, approximately, including 26.2 mi^2 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.--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 ft^3/s, 1,154,000 acre-ft/yr, not adjusted for "A" Canal.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,400 ft^3/s May 12, 1904, gage height at Main Street Bridge, 7.30 ft, datum then in use, from floodmarks; minimum daily discharge, 17 ft^3/s Dec. 13, 1937.

EXTREMES FOR CURRENT YEAR.-- Maximum discharge, 4,920 ft^3/s Mar. 25; minimum, 49 ft^3/s Nov. 30, result of regulation from Upper Klamath Lake, minimum daily, 115 ft^3/s Feb. 21-23.

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	443	1120	546	844	1130	134	4590	e3100	e1080	e820	945	504
2	443	1110	569	886	1550	135	4620	e1990	e499	e780	1110	580
3	672	1120	570	763	1850	132	4640	e1740	e945	e735	1080	667
4	727	982	571	563	2050	133	4590	e1740	e1460	e758	955	515
5	689	932	609	427	2160	136	4600	e1740	e2010	e758	778	445
6	703	787	1040	593	2120	137	4300	e1740	e1020	e746	805	342
7	802	895	1030	948	2310	147	3620	e1870	e358	e924	820	416
8	803	849	855	987	2310	726	e3010	e2140	e506	e903	814	520
9	803	592	712	891	2300	818	e3010	e2270	e471	e935	686	530
10	804	514	709	641	2250	2900	e2510	e2310	e581	e543	511	611
11	800	554	702	615	2200	4020	e2020	e2690	e692	e661	436	615
12	798	572	778	681	2190	4080	e2020	e2390	e1040	e769	353	598
13	864	574	945	1010	2010	4320	e2020	e2080	e985	e820	352	729
14	862	573	1080	1020	1820	4550	e2020	e2200	e1070	852	431	823
15	723	571	1030	1080	1820	4540	e2020	e1940	e1000	703	747	978
16	581	541	894	801	1560	4580	e2020	e1440	e945	597	985	950
17	582	508	955	584	720	4510	e2060	e1270	e800	666	910	420
18	581	506	1090	884	241	4590	e2040	e1270	e800	564	669	309
19	878	502	1090	995	124	4670	e2060	e1120	e551	795	517	134
20	899	557	1010	811	119	4650	e2060	e340	e810	523	775	134
21	901	554	866	479	115	4650	e1920	e235	e620	473	667	184
22	902	524	779	367	115	4670	e1820	e478	e882	532	727	392
23	919	447	808	559	115	4630	e1840	e650	e975	657	978	417
24	987	282	862	910	122	4590	e2310	e892	e1050	485	863	416
25	926	208	673	738	132	4700	e3340	e714	e1040	644	520	410
26	862	207	751	741	132	4630	e4370	e566	e1040	850	416	412
27	874	247	1090	999	132	4620	e4900	e450	e1090	667	411	423
28	1060	277	1100	988	133	4690	e4680	e416	e1070	512	430	421
29	1060	211	1080	990	---	4720	e4410	e416	e769	425	517	417
30	1050	260	852	1060	---	4690	e4410	e820	e924	572	492	422
31	1070	---	749	1090	---	4740	---	e1190	---	592	603	---
TOTAL	25068	17576	26395	24945	33830	101238	93830	44207	27083	21261	21303	14734
MEAN	809	586	851	805	1208	3266	3128	1426	903	686	687	491
MAX	1070	1120	1100	1090	2310	4740	4900	3100	2010	935	1110	978
MIN	443	207	546	367	115	132	1820	235	358	425	352	134
AC-FT	49720	34860	52350	49480	67100	200800	186100	87680	53720	42170	42250	29220

CAL YR 1988 TOTAL 284670 MEAN 778 MAX 1960 MIN 207 AC-FT 564600
WTR YR 1989 TOTAL 451470 MEAN 1237 MAX 4900 MIN 115 AC-FT 895500

e Estimated

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 mi^2, 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.--69 years, 1,692 ft^3/s, 1,226,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,300 ft^3/s Feb. 28, 1986, gage height, 12.82 ft, caused by regulation from Keno powerplant 0.9 mi upstream; minimum discharge, 26 ft^3/s Sept. 23, 1956; minimum daily, 60 ft^3/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 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,910 ft^3/s Mar. 11, gage height, 11.49 ft, caused by regulation from Keno powerplant 0.9 mi upstream; minimum discharge, 277 ft^3/s June 9; minimum daily, 319 ft^3/s July 28.

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	526	865	924	1290	1350	920	5930	3770	1410	433	674	860
2	526	812	971	1290	1800	799	5900	2310	2240	433	769	852
3	691	773	972	1070	2010	897	5920	2220	1680	433	770	855
4	765	778	972	866	2170	1000	5920	2270	1040	430	771	852
5	800	779	970	783	2290	939	5850	2270	459	427	764	747
6	802	779	1040	1010	2470	956	5520	2270	788	431	759	585
7	778	772	1090	1370	2560	2150	4560	2250	425	427	767	749
8	780	724	1080	1370	2590	2570	3680	2250	423	429	769	844
9	782	679	1040	1260	2590	3910	3490	2370	409	430	766	931
10	786	681	982	1020	2590	6370	3040	2850	425	343	760	930
11	788	680	980	1020	2580	7430	2520	3190	425	329	762	862
12	787	683	1030	1160	2580	6260	2410	2870	422	334	855	938
13	788	687	1080	1440	2570	5850	2480	2560	411	387	861	1040
14	778	687	1090	1460	2540	5900	2480	2600	410	427	865	1040
15	779	690	1080	1460	2510	5880	2480	2280	406	427	864	1270
16	777	687	1070	1200	2310	5920	2480	1890	406	427	861	1270
17	779	677	1070	988	1100	6040	2480	1740	404	429	855	1270
18	780	674	935	1190	697	5920	2480	1440	403	470	855	1230
19	779	665	1020	1330	687	5920	2480	1240	403	514	760	904
20	780	658	1080	1130	680	5940	2490	773	402	515	765	850
21	778	696	1080	968	676	5930	2500	732	409	515	767	939
22	772	701	1070	963	675	5930	2500	733	410	512	798	943
23	771	701	1070	962	1120	5910	2500	849	409	511	856	1030
24	774	847	879	1120	1870	5910	2960	1020	407	516	860	1130
25	775	867	874	1110	1700	5690	3970	1020	407	515	861	1150
26	764	841	873	1160	1400	5730	5310	1020	415	518	859	1040
27	541	718	1120	1330	968	5890	5870	1020	418	430	856	1050
28	779	683	1180	1330	916	5960	5510	1020	428	319	843	1120
29	776	792	1230	1330	---	5960	5150	1010	428	410	841	831
30	776	878	1290	1330	---	5760	5100	1430	429	524	854	769
31	827	---	1290	1330	---	5820	---	1790	---	514	858	---
TOTAL	23384	22154	32432	36640	49999	146061	115960	57057	17551	13759	25125	28881
MEAN	754	738	1046	1182	1786	4712	3865	1841	585	444	810	963
MAX	827	878	1290	1460	2590	7430	5930	3770	2240	524	865	1270
MIN	526	658	873	783	675	799	2410	732	402	319	674	585
AC-FT	46380	43940	64330	72680	99170	289700	230000	113200	34810	27290	49840	57290

CAL YR 1988 TOTAL 330246 MEAN 902 MAX 2500 MIN 268 AC-FT 655000
WTR YR 1989 TOTAL 569003 MEAN 1559 MAX 7430 MIN 319 AC-FT 1129000

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 mi^2, 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.--30 years, 1,899 ft^3/s, 1,376,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,000 ft^3/s Mar. 5, 1972, gage height, 9.33 ft; minimum discharge, 283 ft^3/s Feb. 17, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,500 ft^3/s Mar. 11, gage height, 8.47 ft; minimum discharge, 326 ft^3/s July 12, 13, 28.

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	737	1150	1160	1490	1500	1160	6090	4140	1910	644	1050	1110
2	643	1160	1210	1500	2000	1060	6060	2910	2440	644	1060	1120
3	1050	1060	1210	1280	2520	1250	6040	2560	1820	645	1070	1110
4	1060	1050	1220	1110	2660	1060	5990	2680	1280	643	1070	1120
5	1000	834	1240	856	2660	1000	5960	2670	648	785	965	1010
6	959	832	1290	1310	2660	1320	5730	2680	1080	646	974	351
7	958	1060	1290	1530	2660	2420	4810	2680	661	781	1020	1230
8	927	1100	1300	1560	2660	2910	4060	2690	658	693	1030	1100
9	926	974	1290	1470	2660	3750	3830	2800	647	673	1020	1200
10	1110	971	1240	1230	2660	6310	3490	2930	639	724	1070	1200
11	1100	925	1240	1250	2660	7780	2960	3360	638	356	829	1110
12	1060	732	1300	1680	2660	6440	2960	3240	639	347	974	1110
13	1060	732	1290	1610	2660	5910	2960	2940	646	480	975	1210
14	1060	998	1290	1560	2660	5930	2960	2930	650	625	1160	1240
15	834	1160	1290	1510	2660	5970	2960	2630	647	634	1150	1480
16	829	1010	1290	1450	2630	5960	2960	2220	730	614	1160	1280
17	1050	960	1290	1200	1900	6070	2960	1970	545	636	1170	1560
18	1270	889	1240	1670	1120	5970	2950	1980	628	672	931	1400
19	756	724	1240	1500	1020	5990	2950	1470	783	721	978	1020
20	1210	726	1290	1420	1110	5970	2960	1020	639	678	976	1410
21	1170	1020	1290	1220	1020	6020	2960	1010	738	736	978	1170
22	752	975	1290	1160	990	6030	2970	1010	731	716	928	1160
23	754	972	1210	1160	1330	6000	2970	1160	591	689	1070	1160
24	1160	798	1120	1520	2270	6020	3280	1300	600	708	1150	1160
25	1210	1200	1030	1600	2080	5830	4090	1300	611	685	1070	1550
26	1300	1010	1190	1530	1570	5820	5320	1310	738	785	1020	1260
27	715	885	1350	1500	1340	5970	5870	1310	648	679	1020	1250
28	590	1210	1370	1530	1070	6070	5600	1320	648	482	1060	1650
29	949	1060	1480	1500	---	6070	5200	1310	647	758	1110	939
30	907	1150	1510	1500	---	5880	5140	1830	650	724	1120	1230
31	1160	---	1500	1490	---	5960	---	1960	---	724	1110	---
TOTAL	30266	29327	39550	43896	57390	149900	125040	67320	24930	20327	32268	35900
MEAN	976	978	1276	1416	2050	4835	4168	2172	831	656	1041	1197
MAX	1300	1210	1510	1680	2660	7780	6090	4140	2440	785	1170	1650
MIN	590	724	1030	856	990	1000	2950	1010	545	347	829	351
AC-FT	60030	58170	78450	87070	113800	297300	248000	133500	49450	40320	64000	71210

CAL YR 1988 TOTAL 419136 MEAN 1145 MAX 2810 MIN 375 AC-FT 831400
WTR YR 1989 TOTAL 656114 MEAN 1798 MAX 7780 MIN 347 AC-FT 1301000

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 mi^2, 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 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.--29 years, 2,238 ft^3/s, 1,621,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,400 ft^3/s Dec. 22, 1964, gage height, 13.63 ft, from rating curve extended above 15,000 ft^3/s, on basis of slope-area measurement of peak flow; minimum daily discharge, 539 ft^3/s July 7, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,200 ft^3/s Mar. 11, gage height, 9.24 ft; minimum daily discharge, 731 ft^3/s July 16.

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	1040	1020	1320	1320	1780	1770	6690	5290	2200	748	1030	1330
2	1040	1020	1320	1330	1780	1830	6800	3340	2050	746	1030	1340
3	1040	1020	1320	1330	1770	1800	6790	2960	1790	745	1030	1330
4	1040	1020	1320	1330	2270	1790	6610	2910	1530	745	1030	1330
5	1040	1020	1320	1330	2700	1760	6530	2900	1310	746	1030	1330
6	1040	1030	1320	1560	3040	1850	6480	2880	980	745	1030	1330
7	1040	1020	1320	1770	2810	2100	6110	2850	733	747	1030	1330
8	1040	1020	1320	1770	2780	3650	4890	2860	733	741	1040	1330
9	1040	1020	1320	1780	2610	5890	4530	3070	733	735	1030	1330
10	1040	1020	1320	1890	2560	8150	4070	3320	733	737	1030	1340
11	1040	1020	1320	1800	2730	9780	3450	3450	734	733	1030	1340
12	1040	1020	1320	1780	2780	8520	3040	3830	733	734	1030	1330
13	1040	1030	1330	1770	2780	7110	3050	3230	733	735	1030	1340
14	1040	1020	1330	1770	2650	6740	3270	3190	734	735	1030	1340
15	1040	1020	1320	1760	2620	6660	3310	3170	738	736	1030	1340
16	1040	1020	1320	1770	2440	6690	3290	2720	741	731	1030	1340
17	1040	1020	1320	1770	1670	6990	3280	2290	736	734	1040	1380
18	1040	1020	1320	1770	1360	6770	3270	1830	735	736	1040	1330
19	1040	1020	1320	1620	1360	6780	3250	1780	762	737	1040	1320
20	1040	1020	1330	1410	1350	6590	3230	1770	756	740	1040	1330
21	1040	1030	1330	1330	1350	6650	3310	1770	740	735	1040	1340
22	1040	1360	1330	1390	1390	6750	3370	1610	742	739	1040	1340
23	1040	1620	1330	1340	1560	6690	3510	1230	738	740	1030	1340
24	1030	1790	1330	1340	1780	6690	4060	1400	749	747	1030	1340
25	1030	1710	1330	1340	1910	6790	4880	1400	739	749	1030	1340
26	1030	1510	1330	1510	1940	6560	5590	1480	741	751	1030	1340
27	1040	1420	1320	1770	1900	6480	6280	1580	738	739	1030	1340
28	1030	1430	1340	1780	1820	6650	6290	1570	736	736	1030	1340
29	1030	1360	1320	1770	---	6670	5620	1320	740	736	1040	1340
30	1030	1320	1320	1770	---	6630	5420	1450	768	737	1060	1340
31	1020	---	1320	1770	---	6660	---	2030	---	744	1060	---
TOTAL	32160	34970	41030	49740	59490	176440	140270	76480	27625	22939	32070	40110
MEAN	1037	1166	1324	1605	2125	5692	4676	2467	921	740	1035	1337
MAX	1040	1790	1340	1890	3040	9780	6800	5290	2200	751	1060	1380
MIN	1020	1020	1320	1320	1350	1760	3040	1230	733	731	1030	1320
AC-FT	63790	69360	81380	98660	118000	350000	278200	151700	54790	45500	63610	79560

CAL YR 1988 TOTAL 455204 MEAN 1244 MAX 2870 MIN 539 AC-FT 902900
WTR YR 1989 TOTAL 733324 MEAN 2009 MAX 9780 MIN 731 AC-FT 1455000

12472800 COLUMBIA RIVER BELOW PRIEST RAPIDS DAM, WA

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.

DRAINAGE AREA.--96,000 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1917 to current year. January 1917 to September 1930, at site 3.4 mi downstream, published as "at Vernita." October 1930 to July 27, 1959, at site 46.5 mi upstream, published as "at Trinidad."

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

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1930, nonrecording gages at site 3.4 mi downstream at datum 388.7 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1930, to July 27, 1959, water-stage recorder at site 46.5 mi upstream at datum 499.3 ft above National Geodetic Vertical Datum of 1929 (river-profile survey).

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.

AVERAGE DISCHARGE.--72 years, 119,000 ft^3/s, 86,220,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 692,600 ft^3/s June 12, 1948, gage height, 59.35 ft, site and datum then in use; minimum discharge, 4,120 ft^3/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 ft^3/s, based on information obtained at other points.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 264,000 ft^3/s May 18, elevation, 415.31 ft; minimum discharge, 35,600 ft^3/s Oct. 2, elevation, 396.27 ft.

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	56000	102000	135000	129000	143000	116000	70400	154000	154000	73400	68400	76300
2	47800	95400	137000	130000	143000	139000	70800	163000	161000	57900	65800	69100
3	79900	86400	123000	105000	171000	123000	70500	150000	154000	73400	64800	54100
4	86400	93500	125000	123000	155000	90800	70200	145000	150000	63600	79800	63000
5	90900	76200	133000	139000	152000	77400	71400	163000	142000	79800	62200	71700
6	88900	82800	126000	179000	135000	73400	74900	167000	152000	98200	55600	103000
7	93700	84300	123000	174000	130000	72700	83900	134000	155000	97800	79700	77900
8	76600	92400	132000	162000	131000	72200	76200	131000	152000	82600	78300	71300
9	76100	97800	141000	166000	110000	72000	75000	147000	154000	70500	76600	71100
10	84800	96700	142000	166000	88900	71500	75000	172000	141000	94000	67300	40400
11	85700	101000	102000	156000	100000	71200	74500	162000	131000	96600	68100	61200
12	79300	96900	110000	135000	101000	70900	71800	151000	128000	105000	65500	62000
13	113000	95100	120000	122000	114000	72400	70900	134000	137000	85100	57300	69700
14	114000	100000	121000	120000	125000	72200	71400	131000	174000	70700	80700	67400
15	63000	105000	135000	133000	130000	70800	70600	155000	145000	51700	81100	82600
16	58100	111000	152000	104000	120000	71600	71100	171000	84400	48200	73700	65300
17	67200	114000	157000	111000	108000	71500	95800	176000	61200	79800	74400	51000
18	83800	127000	146000	117000	119000	71300	116000	191000	59300	74400	73300	69600
19	96100	120000	131000	118000	91900	72000	119000	193000	94300	99900	57200	87800
20	96400	105000	141000	115000	91100	71500	81000	165000	97800	89900	57100	79200
21	87200	127000	139000	98500	86500	71500	97100	167000	82500	74600	68600	67600
22	88200	102000	134000	75200	83100	70900	98900	157000	83200	53500	54000	73900
23	75700	118000	145000	118000	82700	70600	82400	180000	88500	49500	63800	73500
24	77700	107000	114000	124000	87800	70300	106000	171000	62200	73300	61800	54300
25	95100	105000	95300	127000	71700	70600	130000	184000	64400	82800	60100	67300
26	92200	104000	117000	130000	71200	70100	148000	162000	97500	83200	50200	82400
27	102000	95400	139000	125000	81400	70900	151000	137000	101000	61000	46400	80100
28	111000	109000	145000	133000	93300	70500	162000	156000	92200	69600	71000	87400
29	103000	125000	155000	108000	---	70300	135000	142000	97300	54100	67900	90600
30	95200	123000	140000	115000	---	70400	109000	141000	78100	55100	75000	57800
31	93300	---	108000	130000	---	70400	---	152000	---	67300	72400	---
TOTAL	2658300	3097900	4063300	3987700	3116600	2399900	2799800	4904000	3473900	2316500	2078100	2128600
MEAN	85750	103300	131100	128600	111300	77420	93330	158200	115800	74730	67040	70950
MAX	114000	127000	157000	179000	171000	139000	162000	193000	174000	105000	81100	103000
MIN	47800	76200	95300	75200	71200	70100	70200	131000	59300	48200	46400	40400
AC-FT	5273000	6145000	8060000	7910000	6182000	4760000	5553000	9727000	6890000	4595000	4122000	4222000

CAL YR 1988 TOTAL 36387500 MEAN 99420 MAX 161000 MIN 42900 AC-FT 72170000
WTR YR 1989 TOTAL 37024600 MEAN 101400 MAX 193000 MIN 40400 AC-FT 73440000

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, 21.5°C Aug. 7; minimum, 1.0°C Feb. 6-9.

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	18.5	17.0	17.5	14.5	14.0	14.0	10.0	10.0	10.0	5.0	5.0	5.0
2	19.0	17.0	17.5	14.5	14.0	14.0	10.0	10.0	10.0	5.0	5.0	5.0
3	18.0	17.5	17.5	14.5	14.0	14.0	10.0	9.5	9.5	5.0	5.0	5.0
4	18.0	17.5	17.5	14.5	13.5	14.0	9.5	9.5	9.5	5.5	5.0	5.0
5	18.0	17.5	17.5	14.0	13.5	14.0	9.5	9.5	9.5	5.0	5.0	5.0
6	18.0	17.0	17.5	14.0	13.0	13.5	9.5	9.5	9.5	5.0	4.5	5.0
7	18.0	17.5	18.0	13.5	13.0	13.0	9.5	9.5	9.5	4.5	4.5	4.5
8	18.5	17.5	18.0	13.5	13.0	13.0	9.5	9.5	9.5	4.5	4.0	4.5
9	18.5	17.5	18.0	13.0	12.5	13.0	9.5	9.5	9.5	4.5	4.0	4.0
10	18.5	17.5	18.0	13.0	12.5	13.0	9.5	9.0	9.5	4.0	4.0	4.0
11	18.5	17.5	18.0	13.0	12.0	12.5	9.5	9.0	9.5	4.0	4.0	4.0
12	18.5	17.5	18.0	13.0	12.0	12.5	9.0	9.0	9.0	4.5	4.0	4.0
13	18.0	18.0	18.0	12.0	11.5	12.0	9.0	8.5	9.0	4.0	3.5	4.0
14	18.0	17.5	17.5	12.0	11.5	12.0	8.5	8.0	8.5	3.5	3.5	3.5
15	18.0	17.0	17.5	12.0	11.5	11.5	8.0	8.0	8.0	4.0	3.5	3.5
16	18.0	17.0	17.5	12.0	11.5	11.5	8.0	8.0	8.0	4.0	4.0	4.0
17	17.5	16.5	17.0	12.0	11.5	11.5	8.0	7.5	7.5	4.5	4.0	4.0
18	17.0	16.5	16.5	11.5	11.5	11.5	7.5	7.0	7.5	4.0	4.0	4.0
19	17.0	16.0	16.5	12.0	11.5	11.5	7.0	7.0	7.0	4.0	4.0	4.0
20	17.0	16.0	16.5	12.0	11.5	11.5	7.0	6.5	7.0	4.5	4.0	4.0
21	16.5	16.0	16.0	11.5	11.5	11.5	7.0	6.5	6.5	4.0	4.0	4.0
22	16.0	15.5	16.0	11.5	11.5	11.5	6.5	6.5	6.5	4.5	4.0	4.0
23	16.5	15.0	15.5	11.5	11.0	11.0	6.5	6.0	6.5	4.0	3.5	4.0
24	16.0	15.0	15.5	11.0	11.0	11.0	6.0	6.0	6.0	3.5	3.5	3.5
25	16.0	15.0	15.5	11.0	11.0	11.0	6.0	5.5	6.0	3.5	3.0	3.5
26	15.5	15.0	15.5	11.0	10.5	10.5	5.5	5.5	5.5	3.5	3.5	3.5
27	15.0	14.5	15.0	10.5	10.5	10.5	5.5	5.0	5.5	3.5	3.0	3.5
28	15.0	14.5	14.5	10.5	10.0	10.5	5.5	5.5	5.5	3.5	3.0	3.0
29	15.0	14.0	14.5	10.5	10.0	10.5	5.5	5.0	5.5	3.5	3.0	3.5
30	15.0	14.0	14.5	10.0	10.0	10.0	5.5	5.0	5.5	3.5	3.0	3.5
31	14.5	14.0	14.5	---	---	---	5.5	5.0	5.5	3.5	3.5	3.5
MONTH	19.0	14.0	16.7	14.5	10.0	12.0	10.0	5.0	7.8	5.5	3.0	4.0

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

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	3.5	2.5	3.0	3.5	3.0	3.0	6.0	5.5	5.5	9.5	9.0	9.0
2	2.5	2.0	2.5	3.0	2.5	2.5	6.5	5.0	5.5	9.5	9.0	9.5
3	2.0	2.0	2.0	3.0	2.5	3.0	6.5	5.5	6.0	10.0	9.5	9.5
4	2.0	1.5	2.0	3.0	2.5	3.0	6.5	5.5	6.0	10.0	10.0	10.0
5	1.5	1.5	1.5	3.0	2.5	3.0	7.0	6.0	6.5	10.5	10.0	10.5
6	1.5	1.0	1.5	3.5	2.5	3.0	7.0	6.0	6.5	10.5	10.5	10.5
7	1.5	1.0	1.0	3.5	2.5	3.0	7.5	6.5	7.0	11.0	10.5	11.0
8	1.0	1.0	1.0	3.5	3.0	3.0	7.5	6.5	7.0	11.0	11.0	11.0
9	2.0	1.0	1.5	3.5	3.0	3.0	7.5	6.5	7.0	11.0	11.0	11.0
10	2.0	1.5	1.5	3.5	3.0	3.0	7.5	6.5	7.0	11.0	11.0	11.0
11	2.0	1.5	1.5	4.0	3.0	3.5	8.0	6.5	7.5	11.0	11.0	11.0
12	2.0	1.5	2.0	4.0	3.5	3.5	8.0	7.0	7.5	11.0	11.0	11.0
13	2.0	1.5	2.0	4.0	3.5	3.5	9.0	7.0	8.0	11.5	11.0	11.0
14	2.0	2.0	2.0	4.5	3.5	3.5	8.5	7.5	8.0	11.5	11.0	11.5
15	2.0	2.0	2.0	4.0	3.5	4.0	8.5	8.0	8.0	11.5	11.0	11.5
16	2.5	2.0	2.5	4.0	3.5	4.0	9.0	8.0	8.5	12.0	11.5	11.5
17	2.5	2.0	2.0	4.0	3.5	4.0	8.5	8.0	8.5	12.0	11.5	11.5
18	2.5	2.0	2.0	4.5	4.0	4.0	8.5	8.0	8.0	11.5	11.5	11.5
19	3.0	2.0	2.5	5.0	4.0	4.5	8.5	8.0	8.5	11.5	11.5	11.5
20	2.5	2.5	2.5	5.0	4.0	4.5	9.0	8.5	8.5	11.5	11.5	11.5
21	3.0	2.5	2.5	5.5	4.5	5.0	9.0	8.0	8.5	12.0	11.5	11.5
22	3.0	2.5	3.0	5.0	4.5	5.0	9.0	8.0	8.5	12.0	11.5	12.0
23	3.0	2.5	3.0	5.5	4.5	5.0	9.0	8.0	8.5	12.5	12.0	12.0
24	3.5	3.0	3.0	5.5	4.5	5.0	9.0	8.0	8.5	12.0	11.5	12.0
25	3.5	3.0	3.5	5.5	5.0	5.0	8.5	8.0	8.5	12.0	11.5	12.0
26	4.0	3.0	3.5	5.5	5.0	5.0	8.5	8.0	8.0	12.5	12.0	12.0
27	4.0	3.0	3.5	5.5	5.0	5.0	8.5	8.0	8.5	12.5	12.0	12.0
28	3.5	3.0	3.5	6.0	5.0	5.5	8.5	8.0	8.5	12.5	12.0	12.0
29	---	---	---	6.0	5.5	5.5	9.0	8.5	9.0	12.5	12.0	12.5
30	---	---	---	6.0	5.5	5.5	9.5	8.5	9.0	13.0	12.5	12.5
31	---	---	---	6.5	5.5	5.5	---	---	---	13.0	12.5	13.0
MONTH	4.0	1.0	2.3	6.5	2.5	4.0	9.5	5.0	7.7	13.0	9.0	11.3
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	13.5	13.0	13.0	17.0	16.5	17.0	20.0	19.5	20.0	19.5	19.0	19.0
2	14.0	13.5	13.5	18.0	16.5	17.0	20.0	19.0	19.5	19.5	18.5	19.0
3	14.0	13.5	14.0	17.5	16.5	17.0	20.0	19.0	19.5	19.5	18.5	19.0
4	14.5	14.0	14.0	18.0	16.5	17.0	20.0	19.0	19.5	20.0	18.5	19.0
5	15.0	14.0	14.5	17.5	16.5	17.0	21.0	19.5	20.0	19.5	18.5	19.0
6	15.0	14.5	15.0	18.0	17.0	17.0	21.0	19.5	20.5	19.0	18.5	19.0
7	15.0	14.5	14.5	17.5	16.5	17.0	21.5	20.0	20.5	19.5	18.5	19.0
8	15.5	15.0	15.0	18.0	16.5	17.0	21.0	20.0	20.5	19.5	18.5	19.0
9	15.5	15.0	15.0	18.5	17.0	17.5	21.0	20.0	20.5	19.5	18.5	19.0
10	15.5	15.0	15.0	17.5	17.0	17.0	20.5	19.5	20.5	20.0	18.0	19.0
11	15.5	15.0	15.5	18.0	17.0	17.5	20.5	19.5	20.0	19.0	18.5	19.0
12	15.5	15.0	15.5	18.0	17.0	17.5	20.5	19.5	20.0	19.5	18.0	19.0
13	16.0	15.5	15.5	18.5	17.5	18.0	20.5	19.5	20.0	19.5	18.5	19.0
14	15.5	15.5	15.5	19.5	18.0	18.5	20.0	19.5	20.0	20.0	18.5	19.0
15	15.5	15.0	15.5	19.5	17.5	18.5	19.5	19.0	19.5	19.5	18.5	19.0
16	16.0	15.0	15.5	19.0	17.5	18.5	19.5	19.0	19.5	19.0	18.5	19.0
17	16.0	14.5	15.5	19.0	18.0	18.5	20.0	19.0	19.5	18.5	17.5	18.5
18	16.5	15.0	16.0	19.0	18.0	18.5	20.5	19.5	20.0	18.5	17.5	18.0
19	16.0	15.5	15.5	19.0	18.5	19.0	20.5	19.5	20.0	18.5	17.5	18.0
20	15.5	15.0	15.5	19.5	18.5	19.0	20.5	19.5	20.0	19.0	18.0	18.5
21	16.0	15.0	15.5	20.0	18.5	19.0	20.0	19.5	20.0	19.0	18.0	18.5
22	16.0	15.0	15.5	20.0	18.5	19.0	20.0	19.0	19.5	19.0	18.5	18.5
23	16.5	15.0	15.5	20.5	18.5	19.5	19.5	19.0	19.5	19.5	18.5	19.0
24	17.5	15.5	16.5	20.0	18.5	19.5	19.5	18.0	18.5	19.5	18.0	19.0
25	17.5	16.5	17.0	20.0	19.0	19.5	19.5	18.5	19.0	19.0	18.5	18.5
26	17.0	16.5	17.0	20.0	19.0	19.5	20.0	18.5	19.5	18.5	18.0	18.5
27	17.0	16.0	16.5	20.5	19.0	20.0	20.5	19.0	19.5	19.0	18.0	18.5
28	17.0	16.0	16.5	20.5	19.5	20.0	20.0	19.0	19.5	19.0	18.0	18.5
29	17.0	16.5	16.5	21.0	19.5	20.5	20.5	19.5	20.0	19.0	18.5	18.5
30	17.5	16.5	17.0	21.0	20.0	20.5	20.0	19.0	19.5	18.5	18.0	18.5
31	---	---	---	20.5	19.5	20.0	19.5	18.5	19.0	---	---	---
MONTH	17.5	13.0	15.4	21.0	16.5	18.4	21.5	18.0	19.8	20.0	17.5	18.8
YEAR	21.5	1.0	11.6									

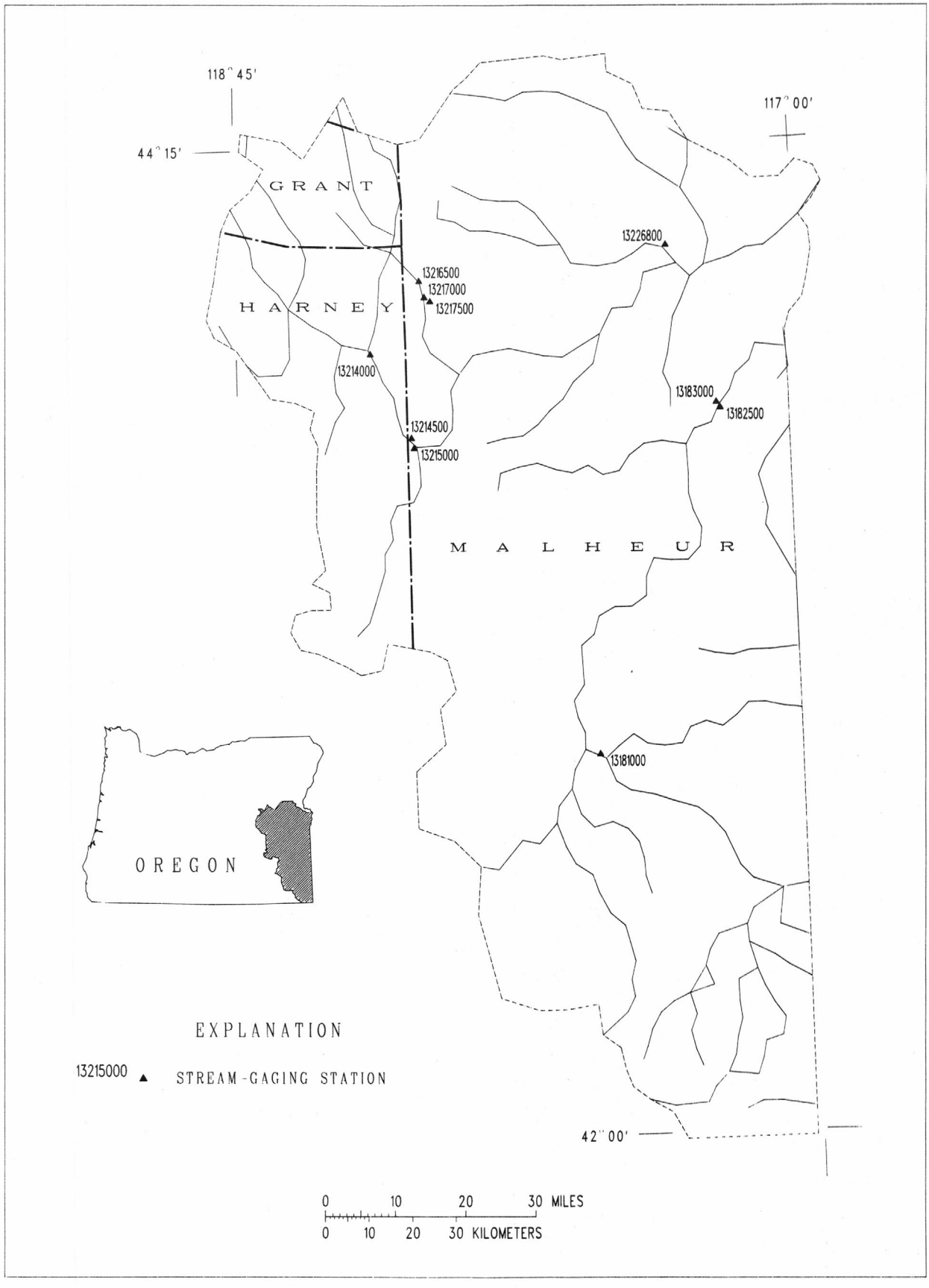

Figure 3.--Location of surface-water and water-quality stations in the Owyhee River, Malheur River, and Bully Creek basins.

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 mi^2.

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 those for Nov. 28 to Jan. 22, which are fair and estimated daily discharges for Jan. 23 to Feb. 15, which are poor. 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.--40 years, 1,008 ft^3/s, 730,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 41,400 ft^3/s Feb. 19, 1986, gage height, 19.09 ft; minimum, 42 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 10	1300	*24,300	*14.95	Apr. 9	0830	5,750	7.02
Mar. 26	1715	11,500	10.13				

Minimum discharge, 99 ft^3/s Oct. 1.

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	99	126	e300	212	e200	2640	6350	1800	408	281	162	165
2	101	131	e250	213	e185	e2300	5860	1750	395	287	163	161
3	101	133	225	206	e170	e2100	5710	1600	397	281	159	161
4	101	134	263	202	e150	e2000	4940	1480	401	256	161	155
5	101	134	257	199	e140	2150	4400	1440	371	243	166	160
6	101	141	248	209	e140	4080	4600	1450	367	234	164	161
7	101	141	252	198	e140	12500	4980	1430	340	226	166	154
8	101	145	270	191	e150	13600	5240	1320	334	217	169	145
9	101	153	273	195	e170	16200	5550	1360	332	217	175	138
10	103	157	268	202	e200	21000	5390	1370	350	215	182	136
11	104	157	304	198	e225	16800	4940	1460	352	210	185	137
12	106	153	364	205	e250	16600	4730	1520	331	209	203	131
13	106	161	383	211	e240	14200	4460	1570	316	205	209	131
14	106	159	614	206	e220	10300	4260	1420	304	206	202	128
15	106	162	673	198	e210	7260	4090	1260	294	204	190	126
16	106	172	478	205	269	5910	4170	1140	288	201	175	123
17	112	172	367	207	479	5540	4200	1050	274	199	157	139
18	113	173	253	199	548	4650	4170	1010	254	202	152	152
19	114	171	227	210	625	4290	4110	942	238	184	160	161
20	117	171	e260	213	623	4800	4050	859	225	175	166	162
21	117	172	e270	216	530	4040	3910	822	219	171	160	155
22	119	177	293	223	552	3990	3760	745	217	174	165	151
23	119	184	271	e200	1240	4680	3460	653	224	174	170	149
24	119	425	240	e180	1780	5300	3210	578	229	174	172	150
25	119	897	225	e175	2130	7870	3090	542	231	184	179	153
26	120	842	e205	e175	2570	10100	2900	509	241	202	175	153
27	121	651	e190	e170	2550	8610	2620	479	242	194	168	149
28	121	526	182	e170	2770	7530	2170	475	275	180	168	146
29	121	469	172	e175	---	8020	2060	472	286	172	162	145
30	121	377	185	e180	---	7090	1920	455	284	164	164	145
31	122	---	199	e190	---	5660	---	430	---	165	168	---
TOTAL	3419	7766	8961	6133	19456	241810	125300	33391	9019	6406	5317	4422
MEAN	110	259	289	198	695	7800	4177	1077	301	207	172	147
MAX	122	897	673	223	2770	21000	6350	1800	408	287	209	165
MIN	99	126	172	170	140	2000	1920	430	217	164	152	123
AC-FT	6780	15400	17770	12160	38590	479600	248500	66230	17890	12710	10550	8770

CAL YR 1988 TOTAL 98743 MEAN 270 MAX 2430 MIN 59 AC-FT 195900
WTR YR 1989 TOTAL 471400 MEAN 1292 MAX 21000 MIN 99 AC-FT 935000

e Estimated

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 mi^2, 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, 1,120,000 acre-ft May 3, elevation, 2,669.84 ft; maximum elevation, 2,670.02 ft May 6, top of seiche; minimum contents recorded, 411,200 acre-ft Oct. 21, elevation, 2,590.97 ft, but may have been lower during period of missing record Oct. 1-20.

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 1988 TO SEPTEMBER 1989
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	2591.95	2595.83	2600.06	2603.37	2611.40	2661.87	2669.72	2667.36	2660.92	2652.74	2644.96
2	---	2592.12	2596.01	2600.12	2603.46	2612.21	2662.09	2669.78	2667.20	2660.68	2652.47	2644.76
3	---	2592.11	2596.15	2600.24	2603.46	2613.32	2662.09	2669.82	2667.06	2660.47	2652.17	2644.61
4	---	2592.20	2596.26	2600.34	2603.62	2614.50	2662.01	2669.80	2666.93	2660.18	2651.88	2644.41
5	---	2592.28	2596.43	2600.55	2603.69	2615.25	2661.88	2669.77	2666.77	2659.96	2651.61	2644.17
6	---	2592.38	2596.57	2600.65	2603.72	2615.99	2662.13	2669.86	2666.58	2659.69	2651.34	2643.99
7	---	2592.43	2596.66	2600.74	2603.77	2618.43	2662.47	2669.70	2666.41	2659.44	2651.14	2643.78
8	---	2592.52	2596.78	2600.70	2603.95	2622.01	2662.88	2669.68	2666.21	2659.19	2650.80	2643.59
9	---	2592.64	2596.92	2601.03	2603.89	2625.91	2663.43	2669.64	2665.99	2658.91	2650.53	2643.37
10	---	2592.80	2597.06	2601.09	2604.01	2630.58	2664.04	2669.57	2665.77	2658.67	2650.26	2643.19
11	---	2592.89	2597.19	2601.18	2604.07	2634.97	2664.66	2669.51	2665.58	2658.41	2649.99	2642.96
12	---	2592.99	2597.36	2601.27	2604.09	2638.47	2665.21	2669.49	2665.36	2658.13	2649.73	2642.77
13	---	2593.14	2597.50	2601.42	2604.57	2641.62	2665.75	2669.49	2665.13	2657.90	2649.43	2642.57
14	---	2593.19	2597.69	2601.54	2604.68	2643.84	2666.25	2669.49	2664.87	2657.60	2649.15	2642.36
15	---	2593.26	2597.85	2601.57	2604.79	2645.25	2666.81	2669.49	2664.66	2657.34	2648.89	2642.15
16	---	2593.43	2598.04	2601.68	2604.94	2646.35	2667.27	2669.39	2664.47	2657.09	2648.64	2641.94
17	---	2593.53	2598.27	2601.79	2604.95	2647.29	2667.82	2669.30	2664.24	2656.87	2648.34	2641.77
18	---	2593.62	2598.42	2601.87	2605.19	2648.13	2668.22	2669.26	2664.04	2656.60	2648.08	2641.59
19	---	2593.70	2598.54	2601.96	2605.79	2648.82	2668.52	2669.13	2663.79	2656.34	2647.81	2641.40
20	2590.98	2593.79	2598.69	2602.05	2606.16	2649.59	2668.72	2669.01	2663.57	2656.09	2647.57	2641.24
21	2591.01	2593.93	2598.87	2602.18	2606.48	2650.33	2668.83	2668.89	2663.34	2655.82	2647.33	2641.08
22	2591.09	2594.13	2599.03	2602.29	2606.86	2650.90	2668.89	2668.85	2663.07	2655.56	2647.07	2640.89
23	2591.17	2594.17	2599.10	2602.39	2607.20	2651.56	2668.97	2668.67	2662.86	2655.30	2646.81	2640.74
24	2591.28	2594.28	2599.24	2602.48	2607.78	2652.44	2669.02	2668.48	2662.63	2654.98	2646.57	2640.57
25	2591.33	2594.38	2599.37	2602.58	2608.38	2653.46	2669.12	2668.35	2662.41	2654.73	2646.36	2640.45
26	2591.43	2594.68	2599.49	2602.66	2609.09	2655.11	2669.18	2668.19	2662.16	2654.47	2646.14	2640.25
27	2591.49	2594.99	2599.54	2602.86	2609.84	2656.64	2669.26	2668.05	2661.94	2654.18	2645.95	2640.05
28	2591.56	2595.28	2599.65	2602.87	2610.58	2657.91	2669.38	2667.93	2661.71	2653.90	2645.75	2639.89
29	2591.65	2595.47	2599.68	2602.99	---	2659.07	2669.54	2667.77	2661.41	2653.63	2645.56	2639.78
30	2591.74	2595.67	2599.83	2603.08	---	2660.32	2669.63	2667.61	2661.21	2653.35	2645.37	2639.60
31	2591.81	---	2599.93	2603.24	---	2661.27	---	2667.49	---	2653.06	2645.19	---
MAX	---	2595.67	2599.93	2603.24	2610.58	2661.27	2669.63	2669.86	2667.36	2660.92	2652.74	2644.96
MIN	---	2591.95	2595.83	2600.06	2603.37	2611.40	2661.87	2667.49	2661.21	2653.06	2645.19	2639.60
(†)	416000	438900	465800	487900	539600	1015000	1117000	1090000	1014000	921300	838500	783500
(‡)	+6200	+22900	+26900	+22100	+51700	+475400	+102000	-27000	-76000	-92700	-82800	-55000

CAL YR 1988 AC-FT‡ -109700
WTR YR 1989 AC-FT‡ +373700

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

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 mi^2, 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.--Records fair. 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.

COOPERATION.--Water-stage recorder inspected by irrigation district employees.

AVERAGE DISCHARGE.--57 years (water years 1933-89), 438 ft^3/s, 317,300 acre-ft/yr, not adjusted for storage or diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,900 ft^3/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, 7,820 ft^3/s Apr. 3, gage height, 9.56 ft; minimum discharge, 1.1 ft^3/s Dec. 27.

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	109	2.9	2.8	1.9	1.9	2.5	3440	237	249	249	213	240
2	114	2.9	2.8	1.9	1.9	2.2	6010	242	236	252	239	229
3	151	2.9	2.8	1.9	1.9	2.1	7210	262	249	252	241	236
4	194	2.8	2.8	1.9	1.9	2.0	7420	264	249	249	237	235
5	195	2.8	2.8	1.9	2.0	2.1	6250	264	249	247	235	235
6	224	2.7	2.6	1.8	2.0	2.4	3510	255	251	246	237	235
7	238	2.7	2.4	1.9	2.0	2.4	3140	263	252	247	239	235
8	237	2.8	2.3	1.9	2.0	2.4	3110	264	251	218	243	235
9	240	2.8	2.2	1.9	2.0	2.4	2450	249	252	220	227	237
10	237	2.8	2.1	2.0	2.0	2.8	1760	263	252	233	219	237
11	186	2.8	2.1	2.0	2.0	3.9	1150	260	252	246	240	237
12	98	2.8	2.1	2.0	2.0	2.8	1340	261	252	246	240	237
13	176	2.8	2.0	2.0	2.0	220	1170	261	252	246	240	237
14	250	2.8	1.9	1.8	2.0	777	916	261	252	245	240	237
15	253	2.8	1.8	1.8	1.9	832	756	249	249	244	240	236
16	259	2.8	1.8	1.8	1.9	830	605	249	249	246	240	235
17	258	2.8	1.8	1.8	1.9	827	725	249	252	244	240	237
18	264	2.8	1.8	1.8	3.7	816	1250	247	251	239	240	223
19	233	2.8	1.8	1.8	4.0	834	1870	246	226	239	240	235
20	206	2.8	1.8	1.8	3.9	837	2470	246	186	223	240	235
21	87	2.8	1.8	1.8	3.8	836	2760	246	240	218	240	235
22	4.4	2.8	1.8	1.8	3.1	836	3000	247	247	237	239	235
23	3.7	2.8	1.7	1.8	2.8	836	3080	248	249	237	237	235
24	3.4	2.8	1.7	1.8	2.7	839	2650	246	249	237	238	228
25	3.1	2.8	1.8	1.8	2.6	840	1930	246	249	227	237	235
26	2.9	2.8	1.7	1.8	2.5	841	705	246	249	237	237	235
27	2.9	2.8	1.7	1.8	2.5	844	405	247	242	237	237	234
28	2.9	2.8	1.8	1.9	2.5	847	237	249	245	237	237	232
29	2.9	2.8	1.8	1.9	---	853	237	249	249	237	237	232
30	2.9	2.8	1.9	1.9	---	825	237	248	249	237	239	233
31	2.9	---	1.9	1.9	---	713	---	249	---	237	240	---
TOTAL	4241.0	84.1	64.1	57.8	67.4	15113.0	71793	7813	7379	7409	7348	7037
MEAN	137	2.80	2.07	1.86	2.41	488	2393	252	246	239	237	235
MAX	264	2.9	2.8	2.0	4.0	853	7420	264	252	252	243	240
MIN	2.9	2.7	1.7	1.8	1.9	2.0	237	237	186	218	213	223
AC-FT	8410	167	127	115	134	29980	142400	15500	14640	14700	14570	13960
MEAN†	238	388	440	361	933	8219	4568	1131	361	239	242	299
AC-FT†	14610	23070	27030	22220	51830	505400	271800	69570	21460	14700	15330	17780

CAL YR 1988 TOTAL 31613.7 MEAN 86.4 MAX 264 MIN 1.7 AC-FT 62710 MEAN† 165 AC-FT† 119700
WTR YR 1989 TOTAL 128406.4 MEAN 352 MAX 7420 MIN 1.7 AC-FT 254700 MEAN† 120 AC-FT† 86900

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

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 mi^2, 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 for estimated daily discharges, which are fair. Slight regulation by small reservoirs upstream from station. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--63 years (water years 1927-89), 192 ft^3/s, 139,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft^3/s Dec. 23, 1964, gage height, 13.50 ft, from rating curve extended above 4,500 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 12	0030	*3,560	*9.01	Apr. 12	1500	1,800	6.88
Mar. 25	1300	1,960	7.10	May 10	1900	1,960	7.11

Minimum discharge, 1.9 ft^3/s Aug. 18-21.

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	2.6	27	67	e58	e60	e290	1210	431	104	36	6.2	9.7
2	5.6	27	60	e55	e45	e625	1020	431	89	31	18	8.7
3	7.5	30	61	e54	e30	245	803	394	90	30	19	8.0
4	6.4	40	60	e52	e25	141	668	374	136	32	9.2	7.8
5	7.1	41	63	e51	e25	120	667	364	160	37	8.2	7.2
6	8.0	38	68	e50	e25	124	949	375	155	40	8.5	6.5
7	e9.0	37	75	e50	e27	902	1180	400	150	36	10	6.2
8	e10	47	82	e52	e33	1470	e1400	413	143	31	8.7	5.2
9	e11	54	89	e60	e45	2000	1440	395	136	19	6.9	9.7
10	e12	59	95	e70	e55	2750	1280	1380	138	20	6.5	12
11	e14	56	161	e66	e70	2410	1140	1630	132	24	4.9	20
12	e15	54	138	e64	e70	2630	1310	969	130	25	3.9	20
13	e16	60	113	e58	e70	1960	1190	707	121	37	3.1	20
14	e17	73	97	e56	e70	1090	1100	597	131	30	2.8	18
15	e18	63	67	e55	e71	786	1080	530	143	32	2.4	20
16	e19	62	e65	e55	e71	959	1130	451	217	33	2.2	23
17	e20	70	e64	e55	e71	827	1110	383	167	34	2.2	29
18	21	63	e63	e55	e72	746	1050	367	125	31	2.2	43
19	18	56	61	e56	e80	1360	999	349	97	31	1.9	47
20	22	58	67	e60	88	854	958	302	78	28	1.9	52
21	20	63	70	e64	106	1030	893	271	69	26	2.1	47
22	20	86	71	e68	135	1340	851	243	68	22	2.4	50
23	21	372	e64	e54	239	1070	774	223	66	19	6.3	47
24	23	133	e58	e40	246	1270	682	215	62	11	10	50
25	20	89	e54	e33	175	1860	738	213	47	14	34	53
26	20	86	e50	e35	e150	1680	793	210	48	19	43	51
27	21	67	e40	e42	e150	1320	792	190	46	11	34	52
28	22	66	e40	e42	208	1140	617	173	39	6.5	26	51
29	24	81	e40	e44	---	1320	523	169	28	6.1	24	49
30	25	70	e50	e48	---	991	455	161	24	3.1	24	52
31	26	---	e65	e68	---	1220	---	127	---	3.3	17	---
TOTAL	501.2	2128	2218	1670	2512	36530	28802	13437	3139	758.0	351.5	875.0
MEAN	16.2	70.9	71.5	53.9	89.7	1178	960	433	105	24.5	11.3	29.2
MAX	26	372	161	70	246	2750	1440	1630	217	40	43	53
MIN	2.6	27	40	33	25	120	455	127	24	3.1	1.9	5.2
AC-FT	994	4220	4400	3310	4980	72460	57130	26650	6230	1500	697	1740

CAL YR 1988 TOTAL 23031.84 MEAN 62.9 MAX 562 MIN .50 AC-FT 45680
WTR YR 1989 TOTAL 92921.7 MEAN 255 MAX 2750 MIN 1.9 AC-FT 184300

e Estimated

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 mi^2, 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, 187,100 acre-ft May 18, elevation, 3,405.15 ft; minimum contents 6 acre-ft Oct. 1, elevation, 3,327.15 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 1988 TO SEPTEMBER 1989
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3327.20	3332.94	3342.24	3345.79	3348.87	3354.92	3388.18	3402.31	3404.02	3398.19	3388.58	3380.87
2	3327.26	3333.17	3342.37	3345.79	---	3355.66	3388.80	3402.42	3403.90	3397.89	3388.23	3380.74
3	3327.30	3333.38	3342.49	3345.89	---	3355.97	3389.28	3402.52	3403.77	3397.59	3387.91	3380.63
4	3327.42	3333.60	3342.58	3346.62	---	3356.19	3389.72	3402.57	3403.67	3397.29	3387.58	3380.50
5	3327.56	3333.91	3342.64	3346.78	---	3356.44	3390.12	3402.60	3403.56	3396.98	3387.26	3380.39
6	3327.71	3334.19	3342.79	3346.83	---	3356.93	3390.64	3402.63	3403.48	3396.68	3386.94	3380.26
7	3327.86	3334.47	3343.01	3346.83	---	3357.91	3391.31	3402.67	3403.37	3396.38	3386.63	3380.10
8	3328.02	3334.75	3343.19	3346.83	---	3360.14	3392.13	3402.70	3403.25	3396.04	3386.31	3379.95
9	3328.17	3335.09	3343.48	3346.83	---	3362.74	3392.97	3402.76	3403.10	3395.71	3386.02	3379.79
10	3328.34	3335.50	3343.68	3346.86	---	3366.22	3393.70	3403.15	3402.94	3395.37	3385.73	3379.64
11	3328.48	3335.86	3343.98	3346.70	---	3368.62	3394.33	3403.95	3402.75	3395.04	3385.47	3379.49
12	3328.58	3336.19	3344.30	3347.00	3349.22	3371.34	3395.03	3404.33	3402.56	3394.72	3385.22	3379.32
13	3328.72	3336.56	3344.55	3347.13	3349.30	3373.13	3395.69	3404.59	3402.37	3394.42	3385.21	3379.16
14	3328.94	3336.93	3344.75	3347.20	3349.37	3374.00	3396.23	3404.81	3402.15	3394.12	3385.21	3378.99
15	3329.10	3337.29	3344.79	3347.27	3349.42	3374.62	3396.73	3404.99	3401.95	3393.83	3384.32	3378.84
16	3329.34	3337.62	3344.81	3347.92	3349.68	3375.29	3397.23	3405.08	3401.75	3393.53	3384.03	3378.69
17	3329.60	3337.93	3344.82	3348.22	3349.87	3375.93	3397.79	3405.11	3401.57	3393.25	3383.76	3378.59
18	3329.83	3338.23	3344.85	3348.35	3350.00	3376.46	3398.31	3405.11	3401.38	3392.97	3383.50	3378.46
19	3330.07	3338.48	3345.28	3348.37	3350.03	3377.38	3398.84	3405.09	3401.15	3392.68	3383.23	3378.34
20	3330.30	3338.70	3345.42	3348.52	3350.08	3378.03	3399.29	3405.06	3400.92	3392.41	3382.99	3378.22
21	3330.53	3338.99	3345.54	3348.63	3350.11	3378.68	3399.65	3404.99	3400.69	3392.12	3382.72	3378.12
22	3330.75	3339.28	3345.67	3348.82	3352.45	3379.64	3400.01	3404.89	3400.47	3391.82	3382.48	3378.03
23	3330.96	3340.14	3345.78	---	3352.83	3380.37	3400.35	3404.73	3400.25	3391.52	3382.27	3377.96
24	3331.15	3340.75	3345.79	---	3353.27	3381.15	3400.68	3404.62	3400.02	3391.21	3382.07	3377.87
25	3331.37	3341.06	3345.83	---	3353.58	3382.43	3400.98	3404.52	3399.82	3390.89	3381.87	3377.80
26	3331.60	3341.31	3345.84	---	3353.82	3383.63	3401.31	3404.45	3399.58	3390.58	3381.69	3377.71
27	3331.82	3341.53	3345.84	---	3354.16	3384.50	3401.66	3404.40	3399.32	3390.26	3381.54	3377.63
28	3332.03	3341.69	3345.84	---	3354.46	3385.22	3401.88	3404.32	3399.07	3389.95	3381.38	3377.55
29	3332.26	3341.89	3345.85	3348.81	---	3386.04	3402.05	3404.25	3398.78	3389.62	3381.24	3377.47
30	3332.49	3342.08	3345.81	3348.81	---	3386.69	3402.18	3404.16	3398.48	3389.28	3381.10	3377.35
31	3332.72	---	3345.81	3348.78	---	3387.40	---	3404.09	---	3388.92	3380.98	---
MAX	3332.72	3342.08	3345.85	---	---	3387.40	3402.18	3405.11	3404.02	3398.19	3388.58	3380.87
MIN	3327.20	3332.94	3342.24	---	---	3354.92	3388.18	3402.31	3398.48	3388.92	3380.98	3377.35
(†)	1030	6950	11160	15150	24350	115200	173900	182400	158000	120600	93650	82160
(‡)	+1024	+5920	+4210	+3990	+9200	+90850	+58700	+8500	-24400	-37400	-26950	-11490

CAL YR 1988 AC-FT‡ -2080
WTR YR 1989 AC-FT‡ +82154

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

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 Warmsprings Dam, 3.0 mi upstream from South Fork, 4.0 mi northwest of Riverside, and at mile 113.

DRAINAGE AREA.--1,100 mi^2, 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 Warmsprings 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.--Records good except for estimated daily discharges, which are poor. Flow completely regulated since November 1919 by Warmsprings Reservoir (station 13214500). Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--70 years (water years 1920-89), 191 ft^3/s, 138,400 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 594 ft^3/s July 8, gage height, 5.15 ft; no flow for many days.

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	.00	.00	.00	.00	.00	e.48	.00	248	308	550	545	173
2	.00	.00	.00	.00	.00	e.48	.00	248	346	549	545	168
3	.00	.00	.00	.00	.00	e.48	.00	280	373	565	535	168
4	.00	.00	.00	.00	.00	e.48	.00	316	376	574	529	170
5	.00	.00	.00	.00	.00	e.48	.00	359	376	560	516	172
6	.00	.00	.00	.00	.00	e.48	.00	376	376	554	509	207
7	.00	.00	.00	.00	.00	e.48	.00	377	390	566	501	232
8	.00	.00	.00	.00	.00	e.48	.00	418	398	583	502	235
9	.00	.00	.00	.00	.00	e.48	.00	440	422	589	480	235
10	.00	.00	.00	.00	.00	e.48	.00	441	467	588	439	235
11	.00	.00	.00	.00	.00	e.40	.00	332	483	579	411	254
12	.00	.00	.00	.00	.00	e.40	.00	259	503	565	418	263
13	.00	.00	.00	.00	.00	e.40	.00	219	537	559	424	260
14	.00	.00	.00	.00	.00	e.40	83	196	555	541	423	260
15	.00	.00	.00	.00	.00	e.40	160	200	559	527	423	260
16	.00	.00	.00	.00	.00	e.30	160	321	558	527	423	247
17	.00	.00	.00	.00	.00	e.30	62	390	527	510	401	240
18	.00	.00	.00	.00	.00	e.30	e.48	391	510	500	389	226
19	.00	.00	.00	.00	.00	e.30	e.48	411	510	499	386	218
20	.00	.00	.00	.00	.00	e.30	84	435	501	498	384	218
21	.00	.00	.00	.00	e.20	e.20	206	440	482	488	382	197
22	.00	.00	.00	.00	e.48	e.20	162	484	474	497	364	163
23	.00	.00	.00	.00	e.48	e.20	138	506	474	505	326	149
24	.00	.00	.00	.00	e.48	e.20	138	487	474	516	310	151
25	.00	.00	.00	.00	e.48	e.20	138	455	473	523	311	149
26	.00	.00	.00	.00	e.48	e.10	138	384	471	523	292	151
27	.00	.00	.00	.00	e.48	e.10	138	363	490	523	281	151
28	.00	.00	.00	.00	e.48	e.10	204	356	501	513	255	162
29	.00	.00	.00	.00	---	e.10	248	356	535	531	241	181
30	.00	.00	.00	.00	---	e.10	248	345	551	547	216	189
31	.00	---	.00	.00	---	e.10	---	320	---	545	187	---
TOTAL	0.00	0.00	0.00	0.00	3.56	9.90	2307.96	11153	14000	16694	12348	6084
MEAN	.00	.00	.00	.00	.13	.32	76.9	360	467	539	398	203
MAX	.00	.00	.00	.00	.48	.48	248	506	559	589	545	263
MIN	.00	.00	.00	.00	.00	.10	.00	196	308	488	187	149
AC-FT	.0	.0	.0	.0	7.1	20	4580	22120	27770	33110	24490	12070

CAL YR 1988 TOTAL 23868.88 MEAN 65.2 MAX 389 MIN .00 AC-FT 47340
WTR YR 1989 TOTAL 62600.42 MEAN 172 MAX 589 MIN .00 AC-FT 124200

e Estimated

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 mi^2.

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 those for March to July, which are fair, and estimated daily discharges from November to February, which are poor. No regulation. Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--53 years (water years 1937-89), 136 ft^3/s, 98,530 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,970 ft^3/s Dec. 23, 1964, gage height, 9.90 ft, present datum, from floodmark, from rating curve extended above 1,300 ft^3/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 ft^3/s Dec. 13, 1967, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 11	1800	*1,880	*4.06	Apr. 8	0100	594	2.65
Mar. 18	2330	588	2.64	Apr. 20	0500	564	2.60
Mar. 25	2200	872	3.07	May 10	0630	987	3.21

Minimum daily discharge, 16 ft^3/s Feb. 5, 6, result of freezeup.

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	36	41	e41	e35	e37	77	335	254	e155	67	44	50
2	36	42	40	e35	e33	e75	314	260	e150	67	46	49
3	36	55	e38	e35	e28	69	275	258	e145	65	47	48
4	33	53	e35	e34	e20	57	252	253	e140	63	45	47
5	33	47	41	e33	e16	68	263	257	e137	61	41	40
6	34	47	50	e32	e16	69	341	293	e134	58	41	37
7	35	48	60	e31	e17	141	439	350	e130	54	42	41
8	35	47	55	e35	e21	275	543	381	e126	51	43	44
9	36	42	55	e43	e26	567	502	388	e122	54	45	44
10	34	49	62	e40	e30	596	458	883	e118	55	42	43
11	33	47	68	e37	e30	893	422	795	e115	49	44	43
12	34	50	63	e35	e31	729	443	704	e112	45	43	45
13	32	54	61	e35	e31	554	443	606	e110	45	43	44
14	34	57	50	e35	e32	334	462	526	e115	44	40	45
15	36	43	42	e35	e32	308	490	475	e130	e48	39	45
16	38	60	38	e35	e32	326	524	412	e140	e49	41	44
17	37	54	e38	e35	e32	278	513	365	e160	e50	41	48
18	36	e48	e38	e35	e32	339	506	359	e150	e51	42	59
19	36	e41	e42	e35	e32	392	538	342	e120	e50	42	51
20	38	e41	e42	e37	e32	283	549	319	e100	e48	44	49
21	38	e52	e42	e39	e35	340	550	298	e96	e48	42	49
22	38	e70	e42	e39	e42	369	534	278	91	e47	52	47
23	39	e320	e37	e30	e48	352	458	258	88	e47	73	46
24	39	e110	e35	e21	e60	450	397	246	83	e47	70	47
25	39	e80	e35	e21	68	739	387	223	80	e45	57	46
26	39	e64	e28	e24	69	543	354	213	78	43	52	47
27	38	e52	e23	e26	72	439	314	194	75	44	53	44
28	37	e60	e23	e27	76	442	282	188	72	42	51	43
29	39	55	e24	e28	---	408	272	175	70	40	49	44
30	39	42	e30	e32	---	327	254	e170	68	42	52	44
31	40	---	e35	e38	---	382	---	e160	---	42	53	---
TOTAL	1127	1871	1313	1032	1030	11221	12414	10883	3410	1561	1459	1373
MEAN	36.4	62.4	42.4	33.3	36.8	362	414	351	114	50.4	47.1	45.8
MAX	40	320	68	43	76	893	550	883	160	67	73	59
MIN	32	41	23	21	16	57	252	160	68	40	39	37
AC-FT	2240	3710	2600	2050	2040	22260	24620	21590	6760	3100	2890	2720

CAL YR 1988 TOTAL 21194 MEAN 57.9 MAX 320 MIN 23 AC-FT 42040
WTR YR 1989 TOTAL 48694 MEAN 133 MAX 893 MIN 16 AC-FT 96580

e Estimated

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 mi^2, 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.

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, 59,880 acre-ft May 12, gage height, 3,339.98 ft; minimum contents observed, 12 acre-ft Oct. 13, gage height, 3,266.63 ft, but may have been less during period of no record Oct. 1 to Nov. 22.

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 1988 TO SEPTEMBER 1989
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	3290.21	3296.80	3302.24	3306.70	3331.32	3338.94	3338.26	3331.66	3321.56	3309.04
2	---	---	3290.39	3297.02	3302.37	3307.07	3331.77	3338.90	3338.07	3331.40	3321.28	3308.64
3	---	---	3290.61	3297.25	3302.48	3307.27	3332.14	3338.85	3337.88	3331.11	3320.95	3308.26
4	---	---	3290.82	3297.46	3302.54	3307.42	3332.52	3338.84	3337.75	3330.80	3320.62	3307.88
5	---	---	3291.05	3297.68	3302.62	3307.66	3332.89	3338.81	3337.61	3330.50	3320.29	3307.44
6	---	---	3291.34	3297.83	3302.71	3307.86	3333.34	3338.80	3337.45	3330.20	3319.90	3307.09
7	---	---	3291.65	3298.00	3302.81	3308.30	3333.90	3338.86	3337.29	3329.86	3319.57	3306.78
8	---	---	3291.93	3298.22	3302.95	3309.25	3334.57	3338.95	3337.11	3329.53	3319.17	3306.45
9	---	---	3292.21	3298.45	3303.12	3310.96	3335.18	3339.06	3336.91	3329.21	3318.78	3306.12
10	---	---	3292.53	3298.68	3303.30	3312.65	3335.73	3339.62	3336.72	3328.90	3318.35	3305.80
11	---	---	3292.86	3298.90	3303.45	3314.77	3336.25	3339.89	3336.54	3328.59	3317.94	3305.49
12	---	---	3293.16	3299.06	3303.61	3316.57	3336.77	3339.92	3336.34	3328.25	3317.48	3305.31
13	---	---	3293.45	3299.21	3303.75	3317.85	3337.25	3339.84	3336.14	3327.97	3317.06	3305.13
14	---	---	3293.66	3299.38	3303.87	3318.62	3337.65	3339.76	3335.92	3327.63	3316.59	3304.96
15	---	---	3293.78	3299.60	3303.99	3319.31	3337.98	3339.71	3335.73	3327.31	3316.12	3304.77
16	---	---	3293.87	3299.80	3304.17	3320.00	3338.35	3339.59	3335.57	3326.97	3315.68	3304.58
17	---	---	3293.98	3300.00	3304.37	3320.63	3338.68	3339.54	3335.40	3326.69	3315.24	3304.44
18	---	---	3294.13	3300.17	3304.54	3321.35	3338.98	3339.50	3335.18	3326.37	3314.79	3304.38
19	---	---	3294.34	3300.33	3304.70	3322.17	3339.24	3339.54	3334.91	3326.05	3314.30	3304.35
20	---	---	3294.61	3300.48	3304.85	3322.78	3339.46	3339.54	3334.64	3325.75	3313.83	3304.37
21	---	---	3294.83	3300.65	3305.00	3323.43	3339.59	3339.50	3334.43	3325.38	3313.34	3304.40
22	---	3287.28	3295.07	3300.82	3305.18	3324.12	3339.57	3339.44	3334.15	3325.06	3312.88	3304.43
23	---	3287.90	3295.27	3300.92	3305.39	3324.77	3339.45	3339.29	3333.91	3324.71	3312.54	3304.49
24	---	3288.26	3295.48	3301.01	3305.61	3325.58	3339.35	3339.23	3333.66	3324.36	3312.13	3304.57
25	---	3288.64	3295.66	3301.11	3305.81	3326.82	3339.27	3339.14	3333.39	3324.02	3311.76	3304.65
26	---	3288.95	3295.76	3301.23	3306.00	3327.71	3339.19	3339.07	3333.12	3323.67	3311.40	3304.75
27	---	3289.18	3295.87	3301.37	3306.22	3328.41	3339.10	3338.93	3332.85	3323.34	3311.02	3304.90
28	---	3289.52	3295.97	3301.52	3306.42	3329.08	3339.04	3338.80	3332.56	3322.99	3310.63	3305.02
29	---	3289.82	3296.16	3301.70	---	3329.68	3339.04	3338.67	3332.27	3322.64	3310.23	3305.10
30	---	3290.07	3296.34	3301.90	---	3330.19	3339.01	3338.55	3331.95	3322.29	3309.79	3305.18
31	---	---	3296.56	3302.10	---	3330.81	---	3338.41	---	3321.93	3309.44	---
MAX	---	---	3296.56	3302.10	3306.42	3330.81	3339.59	3339.92	3338.26	3331.66	3321.56	3309.04
MIN	---	---	3290.21	3296.80	3302.24	3306.70	3331.32	3338.41	3331.95	3321.93	3309.44	3304.35
(†)	e10	3780	6910	10370	13690	43820	58060	56950	45660	30780	16400	12660
(‡)	0	+3770	+3130	+3460	+3320	+30130	+14240	-1110	-11290	-14880	-14380	-3740

CAL YR 1988 AC-FT‡ -2610
WTR YR 1989 AC-FT‡ +12650

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

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 mi^2, 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.--Records good except those for March 26 to June 21, which are fair, and estimated daily discharges and discharges below 10 ft^3/s, which are poor. Flow regulated since 1935 by Beulah Reservoir (station 13217000). Diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--54 years (water years 1936-89), 147 ft^3/s, 106,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,000 ft^3/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 ft^3/s on basis of computation of peak flow over dam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum recorded discharge, 628 ft^3/s May 11, gage height, 4.01 ft; no flow Oct. 30 to Mar. 21.

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	e38	.00	.00	.00	.00	.00	1.9	310	312	305	275	241
2	e39	.00	.00	.00	.00	.00	2.2	312	312	304	275	239
3	e40	.00	.00	.00	.00	.00	3.2	312	311	302	275	238
4	e39	.00	.00	.00	.00	.00	3.2	312	312	302	272	237
5	e38	.00	.00	.00	.00	.00	3.2	312	312	299	271	235
6	36	.00	.00	.00	.00	.00	4.2	309	315	299	271	204
7	37	.00	.00	.00	.00	.00	5.1	312	314	297	271	186
8	37	.00	.00	.00	.00	.00	6.6	309	315	296	270	186
9	39	.00	.00	.00	.00	.00	6.9	309	315	297	299	183
10	37	.00	.00	.00	.00	.00	5.4	309	315	296	312	183
11	36	.00	.00	.00	.00	.00	5.9	416	315	296	311	163
12	37	.00	.00	.00	.00	.00	6.1	599	315	296	309	135
13	35	.00	.00	.00	.00	.00	44	570	315	294	309	132
14	36	.00	.00	.00	.00	.00	121	509	315	290	311	132
15	39	.00	.00	.00	.00	.00	175	449	313	290	310	132
16	41	.00	.00	.00	.00	.00	195	477	311	290	309	132
17	39	.00	.00	.00	.00	.00	200	362	311	287	309	132
18	38	.00	.00	.00	.00	.00	244	306	310	287	310	113
19	38	.00	.00	.00	.00	.00	e260	306	310	287	309	80
20	40	.00	.00	.00	.00	.00	e260	305	309	287	309	53
21	41	.00	.00	.00	.00	.00	e310	305	309	285	308	45
22	40	.00	.00	.00	.00	.08	e410	306	309	284	309	45
23	41	.00	.00	.00	.00	.10	e545	306	308	284	308	29
24	41	.00	.00	.00	.00	.12	e515	309	306	283	306	20
25	41	.00	.00	.00	.00	.18	e475	309	306	281	279	7.4
26	41	.00	.00	.00	.00	.26	e465	309	306	278	263	.14
27	41	.00	.00	.00	.00	.38	e455	310	305	278	262	.19
28	39	.00	.00	.00	.00	.80	351	311	305	278	262	.47
29	15	.00	.00	.00	---	1.4	312	312	305	277	262	.67
30	.00	.00	.00	.00	---	1.6	310	312	305	275	259	.78
31	.00	---	.00	.00	---	1.7	---	312	---	275	248	---
TOTAL	1099.00	0.00	0.00	0.00	0.00	6.62	5700.9	10806	9321	8979	8953	3484.65
MEAN	35.5	.00	.00	.00	.00	.21	190	349	311	290	289	116
MAX	41	.00	.00	.00	.00	1.7	545	599	315	305	312	241
MIN	.00	.00	.00	.00	.00	.00	1.9	305	305	275	248	.14
AC-FT	2180	.0	.0	.0	.0	13	11310	21430	18490	17810	17760	6910

CAL YR 1988 TOTAL 25445.57 MEAN 69.5 MAX 362 MIN .00 AC-FT 50470
WTR YR 1989 TOTAL 48350.17 MEAN 132 MAX 599 MIN .00 AC-FT 95900

e Estimated

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 mi^2.

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, 30,530 acre-ft Apr. 13, elevation, 2,516.56 ft; no usable contents observed Oct. 4, elevation, 2,456.22 ft.

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 1988 TO SEPTEMBER 1989
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	2466.72	2472.80	2475.54	2481.48	2513.52	2516.08	2514.29	2510.23	2501.77	2493.69
2	---	---	2467.12	2472.91	2475.62	2483.54	2513.58	2516.07	2514.23	2510.01	2501.44	2493.51
3	---	---	2467.56	2473.00	2475.69	2485.74	2513.62	2516.06	2514.17	2509.79	2501.13	2493.42
4	---	---	2467.84	2473.09	2475.73	2487.42	2513.71	2516.06	2514.15	2509.53	2500.79	2493.31
5	---	---	2468.15	2473.22	---	2488.86	2514.00	2516.05	2514.11	2509.27	2500.50	2493.17
6	---	---	2468.57	2473.24	---	2489.93	2514.34	2516.06	2514.06	2508.99	2500.20	2493.04
7	---	---	2468.94	2473.29	---	2491.05	2514.74	2515.99	2514.02	2508.69	2499.91	2492.88
8	---	---	2469.24	2473.39	2475.93	2496.46	2515.17	2515.98	2513.92	2508.37	2499.54	2492.71
9	---	---	2469.61	2473.50	2476.01	2503.03	2515.57	2515.93	2513.79	2508.07	2499.25	2492.55
10	---	---	2469.93	2473.58	2476.06	2508.31	2515.90	2515.85	2513.67	2507.79	2498.99	2492.38
11	---	---	2470.24	2473.68	2476.12	2509.41	2516.21	2515.84	2513.58	2507.52	2498.74	2492.22
12	---	---	2470.55	2473.76	2476.21	2508.06	2516.40	2515.81	2513.47	2507.21	2498.48	2492.05
13	---	---	2470.85	2473.84	2476.28	2508.15	2516.48	2515.80	2513.31	2506.95	2498.21	2491.90
14	---	---	2471.15	2473.93	2476.34	2508.26	2516.46	2515.81	2513.10	2506.68	2497.93	2491.72
15	---	2458.97	2471.46	2474.05	2476.42	2509.21	2516.39	2515.79	2512.96	2506.38	2497.62	2491.57
16	---	2459.54	2471.65	2474.16	2476.53	2509.09	2516.34	2515.72	2512.77	2506.10	2497.33	2491.42
17	---	2460.08	2471.75	2474.27	2476.66	2509.31	2516.32	2515.69	2512.61	2505.88	2497.09	2491.22
18	---	2460.65	2471.81	2474.38	2476.78	2509.75	2516.30	2515.52	2512.46	2505.65	2496.84	2491.07
19	---	2461.21	2471.86	2474.46	2476.88	2510.37	2516.23	2515.44	2512.25	2505.42	2496.56	2490.96
20	---	2461.71	2471.93	2474.57	2476.96	2510.60	2516.17	2515.37	2512.06	2505.18	2496.30	2490.83
21	---	2462.20	2471.99	2474.71	2477.07	2510.92	2516.07	2515.25	2511.91	2504.90	2496.03	2490.68
22	---	2462.67	2472.08	2474.80	2477.20	2511.17	2515.96	2515.16	2511.73	2504.67	2495.71	2490.58
23	---	2463.07	2472.13	2474.86	2477.30	2511.40	2515.88	2514.92	2511.59	2504.42	2495.44	2490.49
24	---	2463.47	2472.24	2474.91	2477.47	2511.66	2515.90	2514.80	2511.48	2504.15	2495.18	2490.42
25	---	2463.90	2472.33	2474.98	2477.73	2512.33	2515.95	2514.74	2511.36	2503.90	2494.94	2490.31
26	---	2464.36	2472.35	2475.05	2478.40	2513.08	2516.01	2514.70	2511.21	2503.63	2494.72	2490.20
27	---	2464.95	2472.39	2475.12	2479.19	2513.11	2516.06	2514.59	2511.07	2503.34	2494.50	2490.12
28	---	2465.49	2472.43	2475.20	2479.98	2513.08	2516.07	2514.53	2510.91	2503.06	2494.31	2490.04
29	---	2465.92	2472.53	2475.28	---	2513.15	2516.11	2514.47	2510.73	2502.75	2494.14	2489.95
30	---	2466.33	2472.62	2475.38	---	2513.24	2516.12	2514.41	2510.47	2502.43	2493.93	2489.84
31	---	---	2472.71	2475.46	---	2513.39	---	2514.34	---	2502.11	2493.81	---
MAX	---	---	2472.71	2475.46	---	2513.39	2516.48	2516.08	2514.29	2510.23	2501.77	2493.69
MIN	---	---	2466.72	2472.80	---	2481.48	2513.52	2514.34	2510.47	2502.11	2493.81	2489.84
(†)	e0	1580	3100	3910	5420	27460	30100	28370	24790	17860	12160	9840
(‡)	0	+1580	+1520	+810	+1510	+22040	+2640	-1730	-3580	-6930	-5700	-2320

CAL YR 1988 AC-FT‡ +1960
WTR YR 1989 AC-FT‡ +9840

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

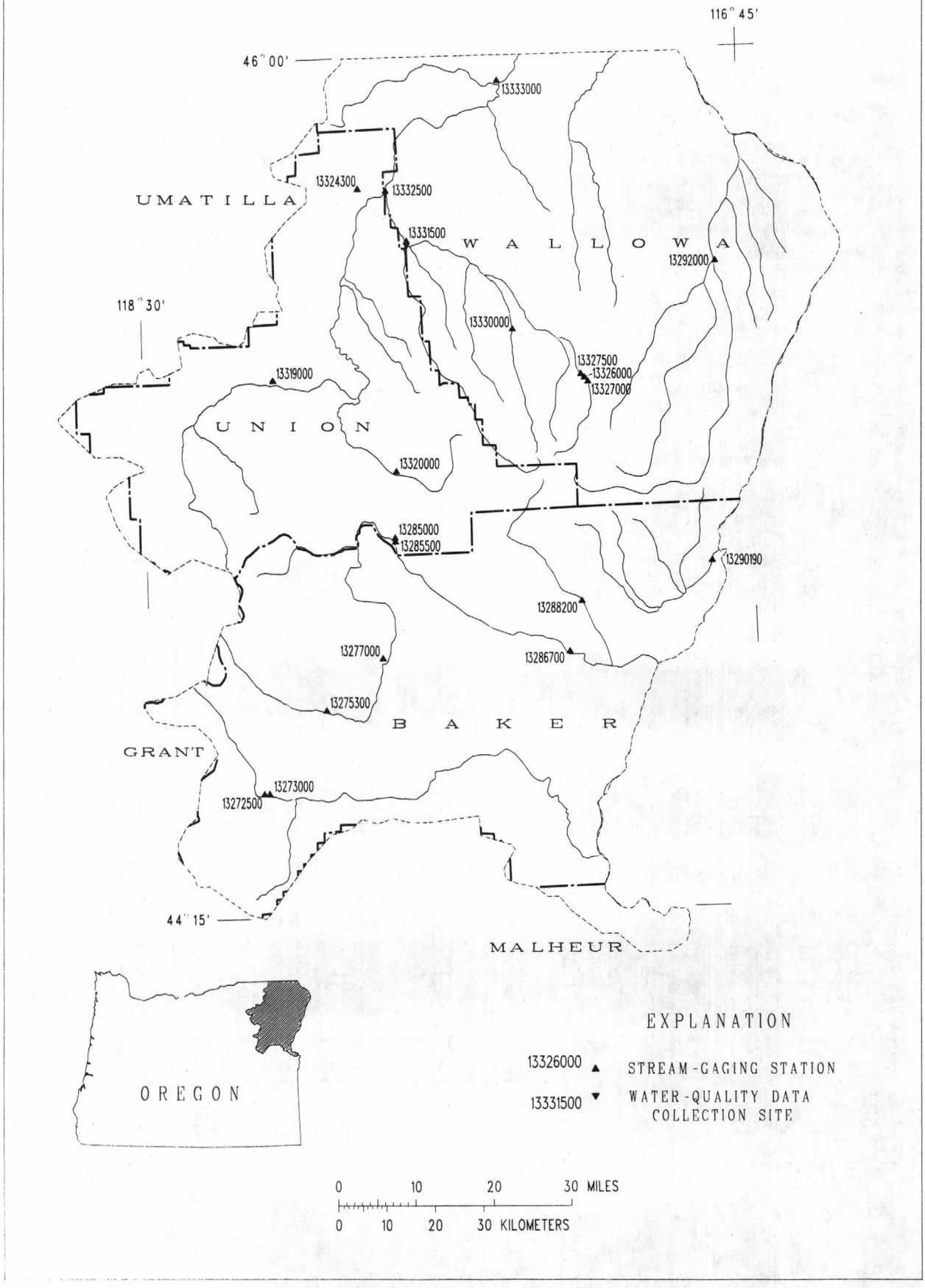

Figure 4.--Location of surface-water and water-quality stations in the Burnt River, Powder River, Imnaha River, Grande Ronde River, and Wallowa River basins.

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 mi^2.

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.--Data for computing 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, 26,230 acre-ft May 10, elevation, 3,821.08 ft; minimum contents observed, 1,400 acre-ft Oct. 19, elevation, 3,783.28, but may have been lower during period of missing record Oct. 1 to Nov. 2.

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 1988 TO SEPTEMBER 1989
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	3789.28	3793.67	3798.02	3801.73	3815.10	3819.90	3819.92	3815.01	3808.05	3801.70
2	---	---	3789.42	3793.86	---	3801.86	3815.31	3819.82	3819.84	3814.89	3807.79	3801.51
3	---	3784.47	3789.57	3794.00	---	---	3815.43	3819.88	3819.72	3814.74	3807.53	3801.34
4	---	3784.57	3789.69	3794.16	---	3802.12	3815.50	3820.03	3819.67	3814.53	3807.29	3801.16
5	---	3784.69	3789.82	3794.34	---	3802.33	3815.63	3820.09	3819.56	3814.36	3807.04	3800.97
6	---	3784.78	3790.01	3794.45	---	3802.48	3816.24	3820.19	3819.38	3814.20	3806.78	3800.83
7	---	3784.89	3790.17	3794.59	---	3802.62	3817.49	3820.45	3819.20	3813.97	3806.52	3800.69
8	---	3785.02	3790.33	3794.77	---	3802.80	3818.69	3820.59	3819.02	3813.79	3806.28	3800.56
9	---	3785.13	3790.52	3794.95	3799.01	3803.03	3819.34	3820.56	3818.79	3813.57	3806.11	3800.42
10	---	3785.26	3790.72	3795.13	3799.14	3803.40	3819.62	3821.03	3818.59	3813.39	3805.89	3800.27
11	---	3785.45	3790.90	3795.28	3799.30	3804.13	3819.75	3820.36	3818.42	3813.22	3805.69	3800.13
12	---	3785.64	3791.07	3795.41	3799.42	3805.22	3820.03	3819.96	3818.24	3813.02	3805.46	3799.97
13	---	3785.89	3791.24	3795.57	3799.56	3806.20	3820.16	3820.07	3818.06	3812.83	3805.26	3799.84
14	---	3786.08	3791.41	3795.69	3799.71	3806.81	3820.35	3820.10	3817.86	3812.59	3804.99	3799.69
15	---	3786.26	3791.51	3795.87	3799.82	3807.27	3820.50	3820.03	3817.76	3812.35	3804.77	3799.55
16	---	3786.46	3791.61	3796.03	3799.97	3807.65	3820.60	3819.95	3817.69	3812.10	3804.55	3799.41
17	---	3786.67	3791.72	3796.17	3800.12	3807.93	3820.56	3819.92	3817.56	3811.92	3804.34	3799.31
18	---	3786.83	3791.82	3796.33	3800.27	3808.21	3820.44	3819.96	3817.41	3811.72	3804.10	3799.22
19	---	3786.98	3791.97	3796.45	3800.42	3808.61	3820.33	3820.06	3817.17	3811.45	3803.87	3799.09
20	---	3787.17	3792.14	3796.61	3800.54	3808.90	3820.15	3820.08	3816.97	3811.17	3803.65	3799.01
21	---	3787.39	3792.30	3796.77	3800.68	3809.24	3819.96	3820.05	3816.86	3810.88	3803.41	3799.05
22	---	3787.63	3792.45	3796.89	3800.82	3809.57	3819.89	3820.01	3816.67	3810.66	3803.23	3799.10
23	---	3787.87	3792.58	---	3800.95	3809.97	3819.81	3819.90	3816.56	3810.42	3803.13	3799.15
24	---	3788.07	3792.75	3797.11	3801.08	3810.48	3819.81	3819.91	3816.39	3810.16	3803.02	3799.21
25	---	3788.26	3792.87	---	3801.20	3811.45	3819.86	3819.96	3816.20	3809.92	3802.87	3799.24
26	---	3788.43	3792.96	---	3801.32	3812.41	3819.82	3819.99	3815.99	3809.66	3802.70	3799.29
27	---	3788.58	3793.04	3797.41	3801.46	3813.02	3819.90	3819.95	3815.78	3809.40	3802.55	3799.36
28	---	3788.77	3793.14	3797.52	3801.60	3813.83	3820.03	3819.96	3815.58	3809.16	3802.37	3799.43
29	---	3788.95	3793.28	3797.66	---	3814.39	3820.08	3819.95	3815.37	3808.87	3802.20	3799.49
30	---	3789.11	3793.38	3797.79	---	3814.62	3820.01	3819.99	3815.18	3808.62	3802.05	3799.53
31	---	---	3793.49	3797.89	---	3814.87	---	3819.96	---	3808.33	3801.90	---
MAX	---	---	3793.49	---	---	---	3820.60	3821.03	3819.92	3815.01	3808.05	3801.70
MIN	---	---	3789.28	---	---	---	3815.10	3819.82	3815.18	3808.33	3801.90	3799.01
(†)	e1680	3610	5780	8280	10640	20660	25230	25180	20920	15390	10840	9300
(‡)	+130	+1930	+2170	+2500	+2360	+10020	+4570	-50	-4260	-5530	-4550	-1540

CAL YR 1988 AC-FT‡ -140
WTR YR 1989 AC-FT‡ +7750

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

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 mi^2.

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 ft^3/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.--61 years (water years 1929-89), 86.8 ft^3/s, 62,890 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,220 ft^3/s Apr. 17, 1943, gage height, 5.91 ft, present datum, from rating curve extended above 1,300 ft^3/s; maximum gage height, 9.07 ft Apr. 8, 1971; no flow at times; minimum discharge before construction of Unity Dam, 1.6 ft^3/s Aug. 31, 1935.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 963 ft^3/s May 10, gage height, 8.23 ft; minimum discharge, 0.01 ft^3/s Jan. 16, 18.

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	.49	.11	.18	.14	.09	.14	290	283	105	97	114	78
2	.51	.17	.18	.14	.06	.15	281	281	105	96	112	78
3	.64	.21	.18	.14	.08	.13	270	208	105	96	112	78
4	.61	.22	.18	.14	.06	.12	261	173	105	96	112	77
5	.57	.25	.18	.14	.10	.16	255	191	119	95	112	72
6	.56	.21	.18	.14	.09	.18	253	200	126	95	111	60
7	.48	.29	.18	.14	.10	.18	255	219	126	94	111	60
8	.42	.27	.18	.14	.09	.18	316	269	126	94	106	60
9	.36	.27	.18	.14	.09	6.5	422	288	125	94	96	59
10	.51	.28	.18	.18	.09	9.8	454	711	125	93	96	59
11	.56	.27	.18	.18	.03	9.7	448	949	125	93	95	59
12	.54	.30	.18	.12	.03	13	469	614	124	93	95	59
13	.78	.31	.18	.12	.10	28	560	330	124	102	95	58
14	.91	.29	.18	.10	.06	48	620	302	123	108	94	58
15	1.0	.27	.17	.10	.03	61	657	308	123	111	94	58
16	1.3	.28	.15	.03	.06	80	716	274	123	111	93	58
17	1.2	.27	.18	.03	.10	111	720	219	122	110	93	58
18	1.2	.24	.18	.03	.10	146	703	175	122	109	93	58
19	1.1	.22	.18	.03	.10	171	704	162	122	121	92	57
20	.93	.23	.18	.03	.03	175	699	162	119	127	92	39
21	.95	.22	.18	.03	.03	175	638	162	109	119	95	.93
22	.92	.23	.18	.03	.09	175	546	161	100	113	96	.92
23	.92	.22	.18	.03	.10	176	452	143	96	112	76	.92
24	.93	.21	.18	.03	.09	195	349	114	107	112	65	.92
25	.92	.22	.18	.03	.06	202	351	105	114	112	80	.92
26	.95	.22	.18	.03	.06	220	345	105	114	111	80	.94
27	1.0	.18	.18	.03	.12	245	271	104	113	111	80	.92
28	.69	.20	.18	.03	.13	253	235	102	113	110	79	.92
29	.18	.18	.16	.03	---	279	269	103	113	114	79	.93
30	.17	.18	.14	.03	---	294	284	103	104	116	79	.92
31	.13	---	.14	.03	---	294	---	103	---	115	79	---
TOTAL	22.43	7.02	5.44	2.54	2.17	3368.24	13093	7623	3477	3280	2906	1252.24
MEAN	.72	.23	.18	.082	.077	109	436	246	116	106	93.7	41.7
MAX	1.3	.31	.18	.18	.13	294	720	949	126	127	114	78
MIN	.13	.11	.14	.03	.03	.12	235	102	96	93	65	.92
AC-FT	44	14	11	5.0	4.3	6680	25970	15120	6900	6510	5760	2480

CAL YR 1988 TOTAL 14197.69 MEAN 38.8 MAX 183 MIN .11 AC-FT 28160
WTR YR 1989 TOTAL 35039.08 MEAN 96.0 MAX 949 MIN .03 AC-FT 69500

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 mi^2, approximately. Prior to Oct. 1, 1970, 170 mi^2 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.--No estimated daily discharges. Records good except for flows below 10 ft^3/s, which are fair. 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.--24 years, 111 ft^3/s, 80,420 acre-ft/yr, not adjusted for storage in Phillips Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 971 ft^3/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 ft^3/s, approximately, Mar. 20, 1910, based on comparison with records for station downstream, near Baker.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 310 ft^3/s June 15, gage height, 3.21 ft; no flow Nov. 23-29, Sept. 29.

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	13	9.1	.41	3.2	2.8	2.8	3.5	44	230	162	263	25
2	8.1	4.0	1.1	3.2	3.0	3.1	3.7	91	259	153	275	25
3	8.1	3.5	1.6	3.4	2.9	3.2	3.9	113	269	145	272	26
4	8.1	2.8	2.2	3.5	2.7	3.2	4.3	121	263	124	272	26
5	8.1	2.8	2.9	3.4	2.5	3.2	4.8	148	247	144	272	26
6	8.1	2.8	3.3	3.2	2.3	3.4	4.3	203	239	159	245	26
7	13	2.8	3.2	3.2	2.2	3.5	4.8	202	239	159	230	26
8	17	2.5	3.2	3.2	2.0	3.5	5.5	187	239	159	222	26
9	17	2.3	3.2	3.2	1.7	3.5	6.9	166	240	159	185	26
10	17	2.0	3.2	3.2	1.5	3.5	7.3	126	249	159	184	25
11	17	1.8	3.2	3.2	1.3	3.5	8.1	87	255	159	182	25
12	16	1.6	3.2	3.2	1.3	3.5	8.5	83	255	171	182	25
13	16	1.4	3.2	3.2	1.3	3.5	9.6	104	259	174	182	25
14	17	1.2	3.2	3.2	1.3	3.5	9.6	116	306	169	176	25
15	17	1.0	3.2	3.2	1.3	3.3	9.2	116	277	169	166	25
16	17	.88	3.2	3.2	1.3	3.0	8.1	120	210	169	152	24
17	17	.60	3.2	3.2	1.3	2.8	8.6	206	203	169	144	24
18	17	.45	3.2	3.2	1.3	3.0	7.3	229	203	169	148	22
19	17	.33	3.2	3.2	1.3	3.2	7.1	229	162	169	162	20
20	17	.18	3.2	3.2	1.6	3.2	6.7	230	122	169	180	20
21	17	.12	3.2	3.2	1.7	3.2	5.7	228	118	180	214	20
22	17	.07	3.2	3.2	2.0	3.2	5.9	227	119	190	232	20
23	16	.01	3.2	3.2	2.2	3.2	7.6	227	115	216	219	20
24	16	.01	3.2	3.2	2.2	3.2	8.5	250	102	217	162	20
25	16	.02	3.2	3.2	2.3	3.2	14	272	102	235	110	20
26	16	.00	3.2	3.2	2.5	3.2	13	252	102	233	91	20
27	16	.00	3.2	3.2	2.5	3.3	12	230	103	231	69	21
28	16	.00	3.2	3.0	2.5	3.5	11	215	104	230	33	21
29	16	.07	3.2	2.8	---	3.5	12	186	115	230	25	12
30	17	.21	3.2	2.8	---	3.5	21	181	143	231	26	19
31	17	---	3.2	2.8	---	3.5	---	207	---	245	26	---
TOTAL	465.5	44.55	91.51	98.5	54.8	101.9	242.5	5396	5849	5648	5301	685
MEAN	15.0	1.48	2.95	3.18	1.96	3.29	8.08	174	195	182	171	22.8
MAX	17	9.1	3.3	3.5	3.0	3.5	21	272	306	245	275	26
MIN	8.1	.00	.41	2.8	1.3	2.8	3.5	44	102	124	25	12
AC-FT	923	88	182	195	109	202	481	10700	11600	11200	10510	1360

CAL YR 1988 TOTAL 24467.36 MEAN 66.9 MAX 275 MIN .00 AC-FT 48530
WTR YR 1989 TOTAL 23978.26 MEAN 65.7 MAX 306 MIN .00 AC-FT 47560

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 mi^2.

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.--17 years, 112 ft^3/s, 81,140 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,120 ft^3/s Jan. 15, 1974, gage height, 5.55 ft; maximum gage height, 5.57 ft Jan. 5, 1984 (ice jam); minimum discharge, 0.7 ft^3/s Oct. 28, 29, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 792 ft^3/s Mar. 11, gage height, 4.75 ft; minimum discharge recorded, 3.2 ft^3/s Nov. 13, 16.

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	13	16	9.1	e9.4	e10	e28	68	21	152	80	209	21
2	9.2	9.8	10	e10	e8.0	e25	67	65	179	84	227	28
3	5.9	7.1	9.4	e11	e7.0	e23	58	92	196	78	229	27
4	4.3	6.1	10	e12	e6.6	e27	52	91	202	65	235	26
5	3.8	4.8	10	e10	e6.2	e30	51	94	181	62	238	26
6	3.9	6.7	9.4	e8.6	e5.8	30	59	152	167	73	224	25
7	4.4	6.7	9.9	e7.0	e5.6	30	73	186	164	87	197	14
8	9.4	7.0	9.4	e6.0	e5.4	34	80	184	161	98	197	12
9	12	6.5	8.5	e8.0	e7.0	74	71	141	158	90	160	12
10	12	6.5	8.6	e10	e9.0	270	63	215	161	75	158	12
11	8.5	6.2	9.2	e9.0	e10	421	56	153	170	64	156	13
12	7.5	3.5	9.9	e8.0	e12	310	54	109	171	73	155	16
13	8.1	3.3	9.9	e7.6	e14	216	54	97	170	91	155	16
14	8.8	3.4	7.8	e7.0	e16	124	53	105	211	85	156	11
15	8.8	3.4	e10	e8.0	e14	93	57	102	238	82	145	17
16	8.4	3.2	e11	e8.6	e13	98	61	98	168	83	124	18
17	8.8	3.4	12	e8.4	e17	93	59	146	141	84	98	20
18	8.9	5.1	11	e8.0	e21	115	49	205	135	85	91	21
19	9.1	7.9	12	e7.2	e26	160	48	201	140	84	103	16
20	8.8	8.5	12	e9.0	e31	98	50	195	100	81	114	15
21	8.8	5.9	e11	e10	e31	96	46	193	87	86	147	14
22	8.9	5.7	e11	e9.0	e32	95	46	175	74	98	182	15
23	8.6	8.4	e10	e8.0	e32	87	41	163	67	122	197	14
24	8.5	6.8	e9.6	e6.0	e33	83	33	172	54	127	146	14
25	8.5	7.2	e9.0	e7.0	e31	113	39	206	51	141	102	12
26	8.5	6.3	e8.4	e6.4	e29	108	38	196	51	154	86	6.6
27	9.4	6.4	e7.8	e7.0	e27	90	35	171	50	159	79	6.0
28	12	7.6	e7.4	e6.8	e30	106	26	163	44	159	51	6.1
29	12	12	e7.0	e8.0	---	102	18	134	40	163	21	6.0
30	12	e10	e7.6	e9.0	---	79	13	118	55	168	22	5.8
31	12	---	e8.4	e12	---	75	---	128	---	188	21	---
TOTAL	272.8	201.4	296.3	262.0	489.6	3333	1518	4471	3938	3169	4425	465.5
MEAN	8.80	6.71	9.56	8.45	17.5	108	50.6	144	131	102	143	15.5
MAX	13	16	12	12	33	421	80	215	238	188	238	28
MIN	3.8	3.2	7.0	6.0	5.4	23	13	21	40	62	21	5.8
AC-FT	541	399	588	520	971	6610	3010	8870	7810	6290	8780	923

CAL YR 1988 TOTAL 17745.7 MEAN 48.5 MAX 219 MIN 3.2 AC-FT 35200
WTR YR 1989 TOTAL 22841.6 MEAN 62.6 MAX 421 MIN 3.2 AC-FT 45310

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 mi^2, 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, 18,830 acre-ft Mar. 13, elevation, 3,134.89 ft; minimum contents, 1,330 acre-ft Oct. 1, elevation, 3,101.48 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 1988 TO SEPTEMBER 1989
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3101.67	3106.15	3113.33	3120.66	3126.79	3132.56	3133.63	---	3133.38	3131.79	3123.27	3118.27
2	3101.84	3106.32	3113.58	3120.83	3126.95	3132.83	3133.61	3133.72	3133.33	3131.48	3122.88	3118.42
3	3102.01	3106.51	3113.84	3121.04	3127.08	3133.05	3133.57	3133.66	3133.40	3131.16	3122.57	3118.54
4	3102.19	3106.73	3114.06	3121.24	3127.26	3133.18	3133.55	3133.64	3133.47	3130.91	3122.21	3118.67
5	3102.34	3106.95	3114.27	3121.44	3127.44	3133.24	3133.58	3133.68	3133.60	3130.72	3121.71	3118.75
6	3102.50	3107.15	3114.54	3121.64	3127.60	3133.22	3133.61	---	3133.56	3130.52	3121.32	3118.86
7	3102.63	3107.34	3114.81	---	3127.77	3133.32	3133.63	3134.16	3133.60	3130.29	3120.96	3118.88
8	3102.76	3107.54	3115.08	---	3127.92	3133.38	3133.65	3134.37	3133.44	3129.93	3120.60	3118.65
9	3102.88	3107.73	3115.34	---	3128.12	3134.07	3133.64	3134.27	3133.36	3129.64	3120.20	3118.43
10	3102.98	3107.97	3115.66	---	3128.27	---	3133.57	3134.57	3133.36	3129.33	3119.85	3118.25
11	3103.09	3108.16	3116.03	---	3128.43	3134.45	3133.56	3134.44	3133.39	3129.23	3119.55	3118.01
12	3103.17	3108.44	3116.42	3122.91	3128.61	3134.69	3133.56	3134.21	3133.38	3129.17	3119.23	3117.79
13	3103.25	3108.72	3116.80	3123.04	3128.77	3134.65	3133.58	3134.04	3133.33	3129.11	3118.91	3117.60
14	3103.32	3109.00	3117.11	3123.20	3128.94	3134.24	3133.62	3133.92	3133.37	3129.02	3118.58	3117.31
15	3103.41	3109.26	3117.22	3123.39	3129.11	3133.97	3133.63	3133.82	3133.48	3128.90	3118.21	3117.03
16	3103.54	3109.54	3117.44	3123.54	3129.31	3133.88	3133.69	3133.75	3133.74	3128.80	3117.86	3116.75
17	3103.64	3109.87	3117.64	3123.74	3129.52	3133.83	3133.71	3133.66	3133.72	3128.67	3117.53	3116.47
18	3103.80	3110.17	3117.86	3123.94	3129.70	3133.91	3133.70	3133.66	3133.65	3128.38	3117.20	3116.26
19	3103.95	3110.44	3118.10	3124.16	3129.76	3133.98	3133.72	3133.67	3133.50	3128.02	3116.84	3116.01
20	3104.12	3110.67	3118.35	3124.35	3130.06	3133.89	3133.83	3133.62	3133.43	3127.65	3116.50	3115.81
21	3104.34	3110.87	3118.58	3124.56	3130.12	3133.93	3133.90	3133.55	3133.45	3127.25	3116.14	3115.62
22	3104.44	3111.19	3118.82	3124.78	3130.53	3133.86	3133.93	3133.54	3133.35	3126.92	3115.81	3115.37
23	3104.62	3111.43	3119.05	3124.97	3130.78	3133.77	3133.93	3133.49	3133.32	3126.60	3115.65	3115.17
24	3104.80	3111.72	3119.25	3125.14	3131.07	3133.75	3133.84	3133.49	3133.33	3126.21	3115.81	3114.91
25	3104.97	3112.03	3119.43	3125.33	3131.35	3133.86	3133.83	3133.46	3133.33	3125.90	3116.10	3114.64
26	3105.11	3112.28	3119.59	3125.55	3131.65	3133.82	3133.82	3133.44	3133.26	3125.54	3116.49	3114.36
27	3105.27	3112.44	3119.74	3125.74	3131.94	3133.74	---	3133.40	3133.23	3125.18	3116.85	3114.08
28	3105.43	3112.64	3119.92	3125.94	3132.23	3133.73	---	3133.42	3133.04	3124.83	3117.20	3113.85
29	3105.59	3112.98	---	3126.15	---	3133.74	---	3133.44	3132.53	3124.41	3117.55	3113.58
30	3105.78	3113.16	3120.28	3126.40	---	3133.68	---	3133.45	3132.10	3124.03	3117.79	3113.28
31	3105.97	---	3120.45	3126.58	---	3133.63	---	3133.40	---	3123.66	3118.04	---
MAX	3105.97	3113.16	---	---	3132.23	---	---	---	3133.74	3131.79	3123.27	3118.88
MIN	3101.67	3106.15	---	---	3126.79	---	---	---	3132.10	3123.66	3115.65	3113.28
(†)	2680	5520	9200	12880	16830	17870	e17960	17700	16730	11060	7890	5570
(‡)	+1350	+2840	+3680	+3680	+3950	+1040	+90	-260	-970	-5670	-3170	-2320

CAL YR 1988 AC-FT‡ -110
WTR YR 1989 AC-FT‡ +4240

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

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 mi^2, 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 ft^3/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.--11 years (water years 1979-89), 239 ft^3/s, 173,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 2,920 ft^3/s Mar. 21, 1910, gage height, 10.0 ft, site and datum then in use, from rating curve extended above 1,000 ft^3/s; maximum gage height, 10.05 ft July 2, 1982; no flow Aug. 9 to Sept. 10, 1910.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,170 ft^3/s Mar. 13, gage height, 9.69 ft; minimum discharge, 0.01 ft^3/s several days in November, December, January.

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	.16	.04	.10	.01	.13	.31	e390	428	120	138	115	30
2	.17	.05	.09	.02	.13	.28	e380	429	105	138	115	31
3	.17	.04	.07	.04	.13	2.4	e350	386	111	125	114	30
4	.17	.04	.06	.06	.13	54	e320	329	171	89	113	31
5	.17	.02	.05	.05	.13	88	e293	322	217	89	112	31
6	.16	.06	.04	.05	.15	73	296	381	240	89	112	31
7	.16	.04	.05	.04	.15	89	336	637	257	99	111	57
8	.15	.05	.05	.04	.15	140	373	1070	234	107	110	76
9	.15	.05	.07	.04	.15	349	365	1120	196	105	110	76
10	.13	.11	.09	.05	.15	1130	339	1320	171	104	109	76
11	.11	.07	.09	.05	.15	1250	302	1550	152	61	108	76
12	.10	.12	.10	.05	.15	1350	278	1160	139	33	108	76
13	.09	.12	.09	.04	.15	1970	269	857	126	33	107	75
14	.10	.12	.07	.04	.15	1330	287	676	136	33	107	87
15	.10	.08	.04	.05	.15	842	312	568	203	33	107	96
16	.10	.11	.02	.05	.15	641	356	461	438	33	106	95
17	.09	.14	e.01	.05	.15	562	401	399	476	58	105	94
18	.10	.09	e.01	.05	.15	558	383	379	377	114	104	94
19	.10	.07	e.02	.05	.15	653	397	370	316	114	103	94
20	.09	.07	.03	.05	.21	e620	458	325	251	113	102	93
21	.08	.05	.04	.05	1.4	e620	559	282	218	112	102	92
22	.08	.09	.03	.07	2.3	e640	656	247	182	112	101	92
23	.07	.10	.04	.08	3.2	e560	654	221	150	112	63	92
24	.07	.06	.04	.08	.32	e500	589	217	127	111	30	91
25	.07	.05	.04	.08	.32	e520	574	204	116	110	30	90
26	.06	.08	.02	.08	.33	e580	567	179	110	110	30	90
27	.06	.07	e.01	.08	.32	e540	537	165	69	108	30	90
28	.08	.10	e.01	.10	.34	e520	497	169	130	111	30	90
29	.08	.11	e.01	.10	---	e520	460	180	197	117	30	90
30	.08	.11	e.01	.10	---	e480	431	196	175	116	30	89
31	.06	---	.01	.11	---	e430	---	153	---	115	30	---
TOTAL	3.36	2.31	1.41	1.81	11.49	17611.99	12409	15380	5910	2942	2684	2255
MEAN	.11	.077	.045	.058	.41	568	414	496	197	94.9	86.6	75.2
MAX	.17	.14	.10	.11	3.2	1970	656	1550	476	138	115	96
MIN	.06	.02	.01	.01	.13	.28	269	153	69	33	30	30
AC-FT	6.7	4.6	2.8	3.6	23	34930	24610	30510	11720	5840	5320	4470

CAL YR 1988 TOTAL 18404.30 MEAN 50.3 MAX 176 MIN .01 AC-FT 36500
WTR YR 1989 TOTAL 59212.37 MEAN 162 MAX 1970 MIN .01 AC-FT 117400

e Estimated

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 mi^2, 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.--32 years, 270 ft^3/s, 195,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,090 ft^3/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 ft^3/s Aug. 11, 12, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,240 ft^3/s Mar. 12, gage height, 6.52 ft; minimum discharge, 7.0 ft^3/s Aug. 7, 8.

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	14	16	24	e35	e22	e40	734	632	89	153	47	65
2	14	16	e26	e39	e18	e37	703	638	77	114	47	61
3	14	16	e31	e41	e16	e33	656	632	65	106	29	63
4	14	17	34	e45	e14	e32	597	572	59	100	11	65
5	14	18	43	e40	e13	e60	557	495	73	80	8.2	62
6	14	18	54	e35	e13	e130	568	454	127	63	8.2	56
7	15	18	56	e27	e12	e250	697	651	159	58	7.6	51
8	16	18	41	e21	e14	572	856	1060	182	51	12	49
9	15	19	24	e34	e18	1570	839	1300	152	49	35	53
10	16	20	27	e39	e25	2420	770	1310	143	52	50	58
11	15	20	29	e35	e23	2730	699	1500	118	59	61	59
12	15	20	34	e30	e28	2810	685	1600	103	69	75	59
13	15	21	47	e28	e27	2500	690	1200	136	63	63	59
14	15	24	45	e27	e22	2560	727	873	152	50	91	54
15	15	25	e37	e30	e19	1780	798	705	130	41	89	57
16	15	23	e30	e33	e28	1290	882	583	253	39	56	58
17	17	23	e29	e27	e40	1100	893	471	473	44	53	66
18	17	24	e30	e23	e56	1040	858	410	470	41	53	93
19	16	23	e34	e25	e50	1190	879	382	381	37	34	93
20	17	22	e35	e29	e52	1140	947	357	327	44	27	86
21	17	22	e33	e29	e54	1150	998	302	261	49	40	82
22	16	22	e32	e26	e56	1180	1050	253	198	46	60	78
23	16	21	e30	e22	e56	1010	1040	190	180	43	107	79
24	16	21	e35	e18	e60	913	946	181	136	46	211	78
25	16	22	e33	e20	e50	968	880	184	113	42	174	83
26	15	23	e24	e20	e45	1100	856	160	107	40	132	94
27	15	e31	e21	e22	e40	1010	796	144	97	45	120	88
28	14	44	e19	e23	e45	965	744	137	88	44	100	84
29	15	26	e22	e25	---	958	697	133	71	43	81	82
30	15	e25	e24	e29	---	895	649	130	129	45	76	83
31	16	---	e29	e27	---	802	---	131	---	48	67	---
TOTAL	474	658	1012	904	916	34235	23691	17770	5049	1804	2025.0	2098
MEAN	15.3	21.9	32.6	29.2	32.7	1104	790	573	168	58.2	65.3	69.9
MAX	17	44	56	45	60	2810	1050	1600	473	153	211	94
MIN	14	16	19	18	12	32	557	130	59	37	7.6	49
AC-FT	940	1310	2010	1790	1820	67910	46990	35250	10010	3580	4020	4160

CAL YR 1988 TOTAL 18365.0 MEAN 50.2 MAX 296 MIN 2.7 AC-FT 36430
WTR YR 1989 TOTAL 90636.0 MEAN 248 MAX 2810 MIN 7.6 AC-FT 179800

e Estimated

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 mi^2.

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 those for Nov. 25 to Mar. 5, 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.--32 years, 320 ft^3/s, 231,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,310 ft^3/s July 12, 1975, gage height, 5.06 ft, from rating curve extended above 2,500 ft^3/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 ft^3/s Nov. 28, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 7	0530	*2,760	*3.92	June 6	2200	1,720	3.45
May 10	1200	2,560	3.84	June 15	1900	2,030	3.65

Minimum daily discharge, 45 ft^3/s Feb. 4.

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	59	54	e66	e88	e103	88	257	622	704	571	171	138
2	59	65	e75	e92	e74	83	243	631	889	512	166	133
3	58	88	e82	e91	e50	e75	226	652	1160	525	162	130
4	57	73	e94	e88	e45	e70	216	721	1250	542	158	127
5	57	69	e100	e84	e49	e78	223	880	1250	532	153	124
6	57	75	e105	e83	e60	86	297	1260	1360	502	149	119
7	56	69	e100	e72	e59	92	510	2260	1380	489	147	114
8	56	67	e100	e60	e58	106	581	1980	1290	475	146	111
9	56	67	90	e70	e60	196	499	1750	1320	427	160	108
10	55	72	82	e87	e70	266	467	2310	1230	382	160	106
11	55	72	79	e80	e78	277	441	e1700	1130	357	153	104
12	55	76	80	e72	e88	296	496	e1500	1140	344	147	102
13	55	73	83	e68	e92	273	582	e1300	1140	328	144	98
14	55	75	80	e85	e96	226	705	e1100	1240	321	141	95
15	56	68	63	e80	e80	195	886	942	1580	314	138	94
16	56	73	e52	e84	e84	181	959	976	1420	295	137	93
17	58	73	e62	e110	e90	171	869	973	1060	279	135	104
18	59	70	e72	e105	e110	167	900	1200	942	260	135	143
19	58	67	e90	e110	e130	170	1230	928	945	252	133	111
20	57	72	e108	e90	e120	170	1380	850	845	254	132	118
21	56	72	e94	e80	e110	183	1340	824	740	243	134	112
22	56	73	e88	e95	e112	179	1120	821	699	227	180	108
23	55	110	e84	e80	e120	184	884	869	681	212	232	106
24	56	86	e80	e68	e110	191	763	765	709	200	248	104
25	55	e81	e84	e63	e100	295	709	694	698	193	231	102
26	54	e74	e70	e67	e95	326	637	657	691	190	201	102
27	55	e80	e62	e75	e94	315	587	667	696	184	190	101
28	56	e88	e58	e83	e90	353	555	661	653	175	164	99
29	55	e70	e62	e93	---	333	525	615	653	169	152	96
30	54	e70	e72	e114	---	279	563	596	638	163	150	102
31	54	---	e82	e110	---	267	---	629	---	157	143	---
TOTAL	1740	2222	2499	2627	2427	6171	19650	32333	30133	10074	4992	3304
MEAN	56.1	74.1	80.6	84.7	86.7	199	655	1043	1004	325	161	110
MAX	59	110	108	114	130	353	1380	2310	1580	571	248	143
MIN	54	54	52	60	45	70	216	596	638	157	132	93
AC-FT	3450	4410	4960	5210	4810	12240	38980	64130	59770	19980	9900	6550

CAL YR 1988 TOTAL 70780 MEAN 193 MAX 1040 MIN 50 AC-FT 140400
WTR YR 1989 TOTAL 118172 MEAN 324 MAX 2310 MIN 45 AC-FT 234400

e Estimated

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 mi^2, 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.--Records good except for estimated daily discharges, which are fair. Diversions upstream from station for irrigation of about 19,000 acres (1966 determination).

AVERAGE DISCHARGE.--22 years, 367 ft^3/s, 265,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft^3/s Feb. 21, 1968, gage height, 9.82 ft; minimum discharge, 10 ft^3/s Aug. 17-24, 1977, gage height, 2.12 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,320 ft^3/s Mar. 11, gage height, 6.82 ft; minimum discharge, 21 ft^3/s Oct. 8-11, gage height, 2.33 ft.

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	22	28	113	e97	e83	250	952	697	576	307	31	89
2	22	30	110	e99	e70	252	886	718	689	282	32	89
3	22	55	127	e93	e56	226	744	705	861	257	33	91
4	23	43	116	e91	e58	207	651	734	954	235	33	91
5	23	37	122	95	e67	217	617	818	983	216	33	91
6	22	39	126	92	e76	227	733	990	1000	195	32	89
7	22	43	113	80	e81	344	1100	1560	1020	173	31	87
8	22	41	111	e76	e76	526	1230	1550	989	156	31	84
9	22	39	115	e80	e84	1060	1070	1420	968	145	31	81
10	22	47	123	e82	e98	1500	985	1770	922	139	32	79
11	22	53	134	e83	e90	1740	854	1570	809	92	37	76
12	22	61	153	e82	e95	1840	907	1230	798	77	35	72
13	22	69	173	e82	e93	1710	1020	1040	807	79	31	68
14	22	84	160	e80	e92	1440	1160	905	801	74	32	65
15	22	65	133	e81	e120	1140	1340	854	973	72	32	62
16	22	63	111	e80	138	997	1390	879	1150	79	31	60
17	23	69	111	e82	147	1020	1290	828	885	82	31	60
18	24	65	111	e82	153	1000	1200	901	739	79	33	65
19	25	59	e110	e82	173	1340	1470	742	711	63	31	74
20	25	62	112	e80	162	1250	1640	661	629	54	32	78
21	25	69	112	e83	137	1310	1600	629	539	49	35	79
22	25	120	111	e82	132	1230	1450	612	501	45	38	79
23	25	221	105	e82	178	1170	1160	652	466	43	49	79
24	26	160	101	e73	206	1100	1000	592	460	40	58	79
25	26	137	101	e78	242	1580	929	537	425	37	71	78
26	26	134	69	e72	258	1990	817	503	401	34	81	78
27	26	119	e68	e76	264	1710	744	505	394	33	85	76
28	27	127	e67	e78	257	1810	694	557	367	32	87	76
29	27	116	e66	e83	---	1550	657	592	347	32	89	75
30	28	108	e88	e84	---	1160	654	546	325	31	89	74
31	28	---	e92	e81	---	1080	---	535	---	31	89	---
TOTAL	740	2363	3464	2571	3686	33976	30944	26832	21489	3263	1415	2324
MEAN	23.9	78.8	112	82.9	132	1096	1031	866	716	105	45.6	77.5
MAX	28	221	173	99	264	1990	1640	1770	1150	307	89	91
MIN	22	28	66	72	56	207	617	503	325	31	31	60
AC-FT	1470	4690	6870	5100	7310	67390	61380	53220	42620	6470	2810	4610

CAL YR 1988 TOTAL 57434 MEAN 157 MAX 635 MIN 17 AC-FT 113900
WTR YR 1989 TOTAL 133067 MEAN 365 MAX 1990 MIN 22 AC-FT 263900

e Estimated

IMNAHA RIVER BASIN

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 mi^2.

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.--61 years, 513 ft^3/s, 371,700 acre-ft/yr.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 21	0230	1,900	4.45	June 16	0130	1,900	4.45
May 10	1530	*2,490	*4.92				

Minimum daily discharge, 56 ft^3/s Feb. 5.

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	98	96	105	145	137	174	460	857	805	609	178	198
2	97	100	115	139	107	177	449	889	881	552	176	192
3	96	118	128	142	e75	153	409	897	1030	537	174	188
4	96	135	111	141	e58	121	383	927	1100	538	169	180
5	94	118	117	137	e56	177	370	993	1140	528	165	174
6	94	124	132	131	e68	172	400	1140	1170	497	158	172
7	93	140	147	109	e68	188	648	1790	1270	474	156	169
8	93	117	144	83	e70	215	875	1820	1250	466	153	166
9	93	112	139	119	e74	574	829	1660	1240	435	165	163
10	92	108	141	144	e78	1080	770	2170	1250	402	160	160
11	91	112	137	129	e86	1130	704	1920	1120	378	157	157
12	92	114	136	125	e98	1160	752	1590	1110	359	146	156
13	92	119	138	117	e105	978	868	1360	1140	349	147	153
14	93	119	140	98	e98	749	1060	1200	1170	340	143	149
15	93	104	110	117	e94	595	1300	1080	1430	336	141	146
16	95	115	58	129	e100	518	1380	1060	1600	325	138	144
17	99	129	e60	129	e120	469	1330	1010	1250	317	135	174
18	104	127	93	130	141	446	1220	1170	1080	293	131	258
19	107	120	e130	123	139	468	1530	1020	1080	277	130	203
20	101	118	161	125	135	440	1740	911	1000	274	137	182
21	98	119	136	130	136	445	1770	879	845	265	133	171
22	96	119	133	138	150	446	1690	831	796	252	151	166
23	96	181	128	119	180	421	1390	902	734	241	260	160
24	96	167	122	73	169	396	1190	829	758	229	369	157
25	96	142	132	95	176	471	1060	755	739	220	389	153
26	96	135	110	106	180	670	951	704	705	219	294	151
27	97	109	75	108	178	675	878	688	730	221	268	150
28	98	126	62	119	181	643	845	741	675	202	246	148
29	98	124	77	147	---	611	794	737	664	195	229	145
30	97	109	e120	156	---	543	793	773	658	188	216	147
31	96	---	e140	147	---	504	---	780	---	183	214	---
TOTAL	2977	3676	3677	3850	3257	15809	28838	34083	30420	10701	5828	5032
MEAN	96.0	123	119	124	116	510	961	1099	1014	345	188	168
MAX	107	181	161	156	181	1160	1770	2170	1600	609	389	258
MIN	91	96	58	73	56	121	370	688	658	183	130	144
AC-FT	5900	7290	7290	7640	6460	31360	57200	67600	60340	21230	11560	9980

CAL YR 1988 TOTAL 102187 MEAN 279 MAX 1010 MIN 58 AC-FT 202700
WTR YR 1989 TOTAL 148148 MEAN 406 MAX 2170 MIN 56 AC-FT 293900

e Estimated

13319000 GRANDE RONDE RIVER AT LA GRANDE, OR

LOCATION.--Lat 45°20'47", long 118°07'26", in NW 1/4 SE 1/4 sec.36, T.2 S., R.37 E., Union County, Hydrologic Unit 17060104, on right bank 1.8 mi northwest of La Grande, 5.7 mi downstream from Fivepoint Creek, and at mile 164.0.

DRAINAGE AREA.--678 mi^2.

PERIOD OF RECORD.--October 1903 to September 1915, February 1918 to September 1923, October 1925 to September 1989 (discontinued). Monthly discharge only for some periods, published in WSP 1317. Published as "at Hilgard" 1903-15.

REVISED RECORDS.--WSP 768: 1933. WSP 1397: 1904-11, 1913, 1915, 1919-20, 1922-23, 1926, 1929-31, 1936-37, 1939, 1942. WSP 1737: Drainage area. WRD Oreg. 1974: 1973(M).

GAGE.--Water-stage recorder. Datum of gage is 2,826.25 ft above National Geodetic Vertical Datum of 1929. Nov. 6, 1903, to Sept. 30, 1915, nonrecording gage at site 5.5 mi upstream at various datums. Feb. 16, 1918, to June 28, 1923, and Oct. 1, 1925, to Nov. 23, 1931, nonrecording gage at site 0.7 mi downstream at various datums. Nov. 24, 1931, to Oct. 8, 1965, water-stage recorder at site 0.3 mi upstream at datum 4.61 ft higher.

REMARKS.--Records good except those for Nov. 16 to Dec. 25, which are fair, and estimated daily discharges, which are poor. Since 1915, slight regulation by city of La Grande reservoir on Beaver Creek, capacity, about 900 acre-ft. Diversions for irrigation upstream from station. Since 1909, city of La Grande has diverted about 3 ft^3/s from Beaver Creek upstream from station for domestic water supply.

AVERAGE DISCHARGE.--81 years, 389 ft^3/s, 281,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,100 ft^3/s Jan. 30, 1965, gage height, 11.44 ft, site and datum then in use, from rating curve extended above 7,200 ft^3/s; minimum discharge, 3.9 ft^3/s Aug. 26, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 11	2130	*4,590	*8.77	Apr. 16	0430	3,140	7.58
Mar. 21	2330	3,190	7.63	May 10	1530	4,270	8.53
Apr. 8	0330	3,930	8.26				

Minimum discharge, 10 ft^3/s Dec. 1.

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	27	27	24	e105	e140	e270	1470	1360	518	117	34	66
2	26	29	35	e115	e120	e230	1580	1390	526	116	35	56
3	26	31	43	e120	e100	e210	1360	1330	538	106	35	52
4	25	39	44	e125	e85	e200	1220	1310	536	98	35	49
5	25	38	46	e110	e74	e190	1240	1390	511	92	33	46
6	25	39	49	e95	e74	e220	1860	1770	479	86	32	44
7	25	47	88	e80	e75	e300	3280	2010	449	81	33	43
8	25	41	e120	e74	e78	461	3420	1900	412	75	35	42
9	24	37	e150	e90	e85	1100	2690	1710	378	72	59	41
10	24	37	e300	e110	e100	2910	2280	3530	346	70	55	40
11	24	37	270	e115	e125	3800	1950	3150	315	69	45	39
12	24	39	240	e120	e130	3400	2020	2340	289	66	41	37
13	24	39	259	e100	e125	2860	2170	1850	268	64	37	36
14	24	45	258	e88	e120	1930	2550	1550	263	61	34	36
15	24	37	161	e88	e110	1420	2860	1310	292	69	32	34
16	24	42	111	e100	e95	1330	2970	1180	436	70	32	33
17	25	45	101	e120	e140	1160	2710	1080	304	76	31	41
18	26	45	98	e140	e190	1250	2510	1090	256	75	30	79
19	28	40	e130	e170	e210	1650	2730	949	226	63	30	76
20	29	37	151	e140	e220	1380	2720	841	233	57	29	59
21	29	44	138	e120	e210	2260	2640	787	225	53	30	51
22	28	43	118	e110	e190	2600	2490	739	195	51	39	47
23	27	64	103	e94	e170	1940	1990	719	183	49	63	45
24	27	73	89	e84	e160	1790	1680	684	170	47	93	43
25	27	55	94	e72	e170	2310	1640	654	154	44	93	41
26	27	56	e82	e66	e180	2680	1590	596	144	42	102	40
27	26	38	e80	e76	e200	2430	1580	579	134	42	76	40
28	26	66	e78	e90	e220	2460	1510	581	128	39	69	39
29	27	69	e76	e110	---	2250	1400	542	121	38	57	38
30	27	45	e80	e140	---	1700	1320	560	114	36	53	39
31	27	---	e95	e170	---	1570	---	532	---	35	86	---
TOTAL	802	1324	3711	3337	3896	50261	63430	40013	9143	2059	1488	1372
MEAN	25.9	44.1	120	108	139	1621	2114	1291	305	66.4	48.0	45.7
MAX	29	73	300	170	220	3800	3420	3530	538	117	102	79
MIN	24	27	24	66	74	190	1220	532	114	35	29	33
AC-FT	1590	2630	7360	6620	7730	99690	125800	79370	18140	4080	2950	2720

CAL YR 1988 TOTAL 98182 MEAN 268 MAX 1640 MIN 18 AC-FT 194700
WTR YR 1989 TOTAL 180836 MEAN 495 MAX 3800 MIN 24 AC-FT 358700

e Estimated

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 mi^2.

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 excellent 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.--66 years (water years 1912, 1919, 1926-89), 119 ft^3/s, 86,220 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,740 ft^3/s May 27, 1948, gage height, 4.57 ft; minimum discharge, 6.5 ft^3/s Feb. 4, 1955, result of freezeup; minimum daily, 8 ft^3/s Nov. 7, 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 20	2200	842	3.32	May 7	0500	*980	*3.55

Minimum daily discharge, 16 ft^3/s Feb. 4-6.

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	20	20	e32	e32	e34	e34	131	324	245	142	41	42
2	20	24	e34	e32	e24	e32	127	339	288	131	41	40
3	20	31	e36	e34	e18	e30	116	354	357	124	41	37
4	19	28	33	e34	e16	e30	107	385	395	119	39	36
5	20	27	32	e34	e16	e34	105	459	395	114	38	35
6	20	35	30	e34	e16	e38	133	600	407	108	36	35
7	19	27	36	e30	e18	45	260	900	400	102	35	35
8	19	25	32	e28	e20	59	332	844	372	97	37	34
9	19	25	38	e30	e22	164	309	770	363	92	42	33
10	19	26	40	e34	e24	247	291	917	340	88	38	33
11	19	26	36	e34	e26	291	267	744	312	82	38	32
12	19	29	37	e34	e26	319	303	601	302	79	35	31
13	19	27	39	e32	e26	272	369	508	305	75	34	31
14	19	28	38	e30	e26	203	483	441	312	71	33	30
15	20	27	e30	e30	e24	157	578	403	381	69	32	29
16	20	29	e26	e32	e24	135	605	391	371	70	32	29
17	24	29	e26	e36	e34	120	558	388	302	71	31	36
18	22	27	e32	e36	e36	120	575	444	270	64	30	57
19	23	25	e32	e34	e36	129	699	372	258	60	30	39
20	21	27	e32	e34	e36	120	769	341	245	58	30	34
21	20	27	e32	e36	e38	148	774	322	215	55	31	32
22	20	32	e30	e36	e38	149	677	316	200	54	50	31
23	20	45	e32	e34	e38	139	532	326	190	52	66	30
24	20	31	e32	e30	e40	135	442	299	185	50	107	29
25	21	30	e30	e20	e40	159	404	272	180	48	101	29
26	20	31	e26	e22	e40	190	344	253	174	50	64	29
27	20	50	e22	e26	e38	190	311	253	168	48	58	29
28	20	43	e20	e26	e36	184	294	239	159	45	50	28
29	20	29	e22	e26	---	177	277	225	152	44	47	28
30	20	e30	e28	e34	---	156	287	221	148	43	45	30
31	20	---	e32	e34	---	144	---	228	---	42	45	---
TOTAL	622	890	977	978	810	4350	11459	13479	8391	2347	1377	1003
MEAN	20.1	29.7	31.5	31.5	28.9	140	382	435	280	75.7	44.4	33.4
MAX	24	50	40	36	40	319	774	917	407	142	107	57
MIN	19	20	20	20	16	30	105	221	148	42	30	28
AC-FT	1230	1770	1940	1940	1610	8630	22730	26740	16640	4660	2730	1990

CAL YR 1988 TOTAL 29572 MEAN 80.8 MAX 461 MIN 14 AC-FT 58660
WTR YR 1989 TOTAL 46683 MEAN 128 MAX 917 MIN 16 AC-FT 92600

e Estimated

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 mi^2.

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 good 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 ft^3/s that is returned through the fish ladder to the gage pool.

AVERAGE DISCHARGE.--7 years, 133 ft^3/s 96,360 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,100 ft^3/s May 30, 1984, gage height, 6.52 ft; minimum discharge, 25 ft^3/s Oct. 11, 1983, result of regulation at fish hatchery upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 380 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 4	1200	(a)	*6.50	May 10	0230	*941	6.24
Apr. 7	2200	524	5.66	June 16	unknown	unknown	unknown
Apr. 20	2000	925	6.22				

Minimum discharge, 32 ft^3/s Jan. 9, result of temporary blockage upstream.

(a) Ice jam.

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	50	52	60	65	68	72	183	452	284	e88	e52	56
2	51	57	60	62	e58	72	184	475	317	e86	e52	55
3	52	69	60	62	e54	72	172	491	e360	e83	e52	55
4	55	74	60	61	e50	74	161	546	e370	e80	e52	54
5	57	64	60	64	e58	72	178	634	e370	e82	e52	54
6	59	77	68	66	e64	78	240	723	e360	e80	e52	55
7	59	62	100	65	e64	87	398	789	e360	e78	e54	54
8	59	59	89	67	e62	89	445	805	e350	e76	e54	55
9	51	56	87	71	e60	112	364	815	e320	e72	e52	56
10	50	61	87	76	e60	176	326	846	e300	e70	e50	56
11	50	63	84	70	e65	242	308	638	e300	e68	e51	56
12	49	67	81	67	e69	230	334	488	e320	e66	e52	55
13	51	62	81	67	68	202	395	421	e360	e66	e54	55
14	51	60	80	67	65	166	482	418	e400	e65	e52	55
15	51	57	74	69	66	142	592	404	e440	e65	e52	55
16	51	56	73	69	63	131	608	392	e460	e64	e52	55
17	57	59	72	67	64	121	565	417	e340	e62	e52	59
18	52	58	70	69	66	128	569	439	e280	e60	e52	62
19	51	56	71	68	67	137	685	357	e220	e62	e52	58
20	51	59	70	67	66	136	783	334	e170	e62	e52	57
21	51	66	69	68	66	154	822	326	e160	e66	e55	56
22	51	86	68	69	68	167	719	315	e140	e64	e56	56
23	48	105	67	68	72	155	596	340	e130	e60	e64	56
24	48	85	65	70	73	147	528	310	e130	e58	e72	56
25	52	76	65	69	75	204	487	267	e125	e56	e80	54
26	75	70	65	68	77	251	439	264	e115	e54	e74	55
27	60	65	69	66	77	237	416	279	e110	e54	e66	54
28	50	65	65	68	76	241	407	266	e100	e53	e58	53
29	50	63	68	67	---	236	402	260	e100	e53	57	54
30	50	61	76	67	---	201	434	268	e92	e52	56	53
31	51	---	69	67	---	192	---	270	---	e52	57	---
TOTAL	1643	1970	2233	2086	1841	4724	13222	14049	7883	2057	1738	1664
MEAN	53.0	65.7	72.0	67.3	65.7	152	441	453	263	66.4	56.1	55.5
MAX	75	105	100	76	77	251	822	846	460	88	80	62
MIN	48	52	60	61	50	72	161	260	92	52	50	53
AC-FT	3260	3910	4430	4140	3650	9370	26230	27870	15640	4080	3450	3300

CAL YR 1988 TOTAL 37191 MEAN 102 MAX 449 MIN 48 AC-FT 73770
WTR YR 1989 TOTAL 55110 MEAN 151 MAX 846 MIN 48 AC-FT 109300

e Estimated

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 mi^2.

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, 33,020 acre-ft June 30, gage height, 20.90 ft (mean of surge); minimum contents, 8,750 acre-ft Oct. 16, gage height, 5.65 ft (mean of surge).

MONTHEND GAGE-HEIGHT AND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Gage Height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	5.80	8,980	--
Oct. 31	5.85	9,060	+80
Nov. 30	6.96	10,790	+1,730
Dec. 31	7.36	11,410	+620
CAL YR 1988	--	--	-450
Jan. 31	8.13	12,620	+1,210
Feb. 28	8.76	13,610	+990
Mar. 31	10.41	16,200	+2,590
Apr. 30	14.14	22,100	+5,900
May 31	18.95	29,840	+7,740
June 30	20.86	32,950	+3,110
July 31	16.24	25,460	-7,490
Aug. 31	11.33	17,640	-7,820
Sept.30	12.76	19,910	+2,270
WTR 1989	--	--	+10,930

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 mi^2.

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 ft^3/s from Wallowa Lake for municipal use.

AVERAGE DISCHARGE.--62 years (water years 1928-89), 133 ft^3/s, 35.48 in/yr, 96,360 acre-ft/yr, adjusted for storage and diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,550 ft^3/s June 10, 1969, gage height, 5.15 ft; no flow at times in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 334 ft^3/s June 10, gage height, 3.33 ft; minimum discharge, 9.2 ft^3/s Nov. 25-27.

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	32	21	39	e18	16	17	12	15	194	235	195	23
2	32	20	33	e18	16	17	11	15	218	223	200	23
3	32	20	26	e18	16	17	11	16	224	215	197	23
4	32	20	26	e18	16	17	11	16	234	205	209	23
5	32	19	25	e18	16	17	11	17	250	197	224	23
6	32	18	26	e18	16	17	11	18	261	185	227	21
7	33	18	e26	e18	16	16	11	19	275	190	232	21
8	33	18	e23	e18	16	16	11	21	295	194	228	21
9	33	17	e20	e18	17	15	14	53	314	233	202	21
10	33	17	e20	e18	17	11	15	62	325	241	200	21
11	33	17	e19	e18	17	11	15	61	321	231	208	21
12	33	17	e19	e18	17	11	14	57	307	238	208	21
13	33	17	e18	e18	17	12	14	57	303	217	207	21
14	33	17	e18	e18	17	11	14	71	305	210	196	21
15	33	17	e18	e18	17	11	15	112	300	230	198	21
16	26	17	e18	e18	17	11	15	130	294	240	203	22
17	25	17	e18	e18	17	11	15	133	263	237	212	22
18	25	17	e18	e18	17	11	15	144	243	228	213	22
19	25	17	e18	e18	17	11	15	148	240	215	209	22
20	25	17	e18	e18	17	11	16	148	233	209	205	22
21	25	17	e18	e18	17	12	16	149	210	204	197	22
22	25	17	e18	e18	17	13	16	147	196	207	185	22
23	24	16	e18	e18	17	13	16	151	194	225	160	22
24	24	12	e18	e18	17	13	16	154	216	241	62	22
25	24	9.4	e18	e18	17	13	16	154	248	254	28	22
26	24	9.2	e18	17	17	13	15	153	257	256	27	22
27	24	11	e18	16	17	13	15	156	257	254	27	22
28	24	26	e18	16	17	13	15	159	254	237	27	22
29	25	35	e18	16	---	13	15	159	252	225	27	22
30	23	37	e18	16	---	13	15	159	244	214	23	23
31	21	---	e18	16	---	13	---	172	---	201	20	---
TOTAL	878	547.6	644	547	468	413	421	3026	7727	6891	4956	656
MEAN	28.3	18.3	20.8	17.6	16.7	13.3	14.0	97.6	258	222	160	21.9
MAX	33	37	39	18	17	17	16	172	325	256	232	23
MIN	21	9.2	18	16	16	11	11	15	194	185	20	21
AC-FT	1740	1090	1280	1080	928	819	835	6000	15330	13670	9830	1300
MEAN†	36.3	51.3	32.2	38.1	35.7	58.4	116	235	370	178	80.8	65
CFSM†	0.71	1.01	0.63	0.75	0.70	1.15	2.28	4.62	7.27	3.50	1.59	1.28
IN.†	0.82	1.12	0.73	0.86	0.73	1.32	2.54	5.31	8.11	4.03	1.83	1.43
AC-FT†	2230	3050	1980	2340	1980	3590	6900	14420	22010	10930	4970	3870

CAL YR 1988 TOTAL 29264.6 MEAN 80.0 MAX 383 MIN 9.2 AC-FT 58050 MEAN† 96.5 CFSM† 1.90 IN.† 25.82 AC-FT† 70080
WTR YR 1989 TOTAL 27174.6 MEAN 74.5 MAX 325 MIN 9.2 AC-FT 53900 MEAN† 108 CFSM† 2.12 IN.† 28.84 AC-FT† 78260

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

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 mi^2.

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 except for estimated daily discharges, which are fair. 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.--65 years (water years 1913, 1926-89), 194 ft^3/s, 140,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,550 ft^3/s June 16, 1974, gage height, 8.59 ft, present datum; minimum discharge, 7.5 ft^3/s Mar. 2, 1966, result of freezeup; minimum daily, 10 ft^3/s Nov. 28-30, 1936.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 10	0930	1,140	6.15	June 15	2130	*1,770	*7.42

Minimum discharge recorded, 17 ft^3/s Jan. 24, but may have been less during period of missing record Feb. 4-19.

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	25	21	26	33	33	e23	63	213	330	450	87	92
2	24	25	27	33	23	26	64	212	475	398	82	86
3	23	35	28	34	22	23	63	211	642	428	78	82
4	22	36	25	35	e20	22	61	244	743	455	74	76
5	21	31	25	38	e19	27	62	308	825	440	71	71
6	21	45	29	37	e20	29	74	470	922	409	68	68
7	20	37	35	34	e21	29	116	804	948	411	67	64
8	21	35	34	34	e23	29	138	790	888	400	69	61
9	21	33	41	38	e24	45	125	736	908	336	77	59
10	21	31	43	42	e26	84	120	1020	874	290	68	57
11	21	31	41	40	e27	88	114	741	802	269	67	55
12	20	34	41	39	e29	93	122	560	804	262	61	53
13	20	32	44	37	e29	87	144	467	837	257	59	51
14	20	34	41	36	e27	78	194	427	975	270	54	49
15	21	30	32	35	e26	71	265	405	1280	261	54	47
16	22	33	31	36	e25	68	302	400	1240	254	52	46
17	29	32	33	36	e25	65	286	407	841	256	51	54
18	28	31	31	35	e26	67	319	518	716	235	49	67
19	31	30	34	34	e26	67	450	411	705	228	48	61
20	27	32	33	33	24	62	523	367	615	229	47	55
21	25	33	34	33	24	66	526	353	487	211	47	51
22	24	40	34	33	25	67	459	356	439	185	71	49
23	24	45	33	31	27	64	371	405	453	165	121	47
24	23	37	31	20	25	62	317	352	524	153	161	45
25	22	37	32	30	25	69	280	314	538	140	177	43
26	21	35	26	28	e24	71	246	288	558	131	159	42
27	22	31	25	28	e23	71	224	289	574	124	163	41
28	23	38	25	28	e25	71	207	287	528	115	141	41
29	22	34	27	28	---	70	191	266	541	105	124	39
30	22	27	31	29	---	65	195	250	523	98	111	40
31	22	---	33	32	---	65	---	263	---	91	102	---
TOTAL	708	1005	1005	1039	693	1824	6621	13134	21535	8056	2660	1692
MEAN	22.8	33.5	32.4	33.5	24.7	58.8	221	424	718	260	85.8	56.4
MAX	31	45	44	42	33	93	526	1020	1280	455	177	92
MIN	20	21	25	20	19	22	61	211	330	91	47	39
AC-FT	1400	1990	1990	2060	1370	3620	13130	26050	42710	15980	5280	3360

CAL YR 1988 TOTAL 48850 MEAN 133 MAX 973 MIN 15 AC-FT 96890
WTR YR 1989 TOTAL 59972 MEAN 164 MAX 1280 MIN 19 AC-FT 119000

e Estimated

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 mi^2, 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.--25 years, 462 ft^3/s, 26.14 in/yr, 334,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,260 ft^3/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 ft^3/s Dec. 6, 1972, Jan. 10, 1973, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,450 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 21	0100	1,800	3.35	June 7	0030	2,280	3.78
May 10	1100	2,900	4.28	June 15	2230	*2,930	*4.30
May 18	0530	1,510	3.07				

Minimum daily discharge, 43 ft^3/s Feb. 4.

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	67	50	97	e130	e100	180	344	715	779	762	176	181
2	65	58	92	e120	e80	172	358	722	1000	665	174	173
3	63	90	109	e120	e47	146	343	716	1370	647	170	169
4	61	109	102	e120	e43	113	328	781	1620	670	165	159
5	60	94	172	e115	e45	208	318	948	1770	664	159	153
6	59	110	184	e110	e56	234	355	1340	1940	620	153	147
7	58	103	116	e70	e55	e350	594	2030	2030	589	150	142
8	56	82	105	e76	e54	e400	690	2100	1890	583	148	138
9	54	78	115	e94	e57	e460	564	1990	1870	515	162	134
10	54	73	140	e125	e61	e780	503	2630	1800	455	150	130
11	53	75	133	e100	e65	857	452	2100	1610	413	153	126
12	52	75	128	e86	e72	822	469	1630	1580	393	143	121
13	52	77	142	e95	e78	660	539	1360	1630	380	140	118
14	52	79	146	e110	e73	507	725	1210	1760	378	134	115
15	55	66	111	e105	e76	408	951	1100	2140	372	130	113
16	61	75	69	e115	e80	376	993	1120	2260	354	127	110
17	62	78	e76	e130	e90	356	943	1090	1640	352	125	120
18	75	74	e85	e120	108	358	950	1360	1330	316	122	171
19	72	67	e94	e100	122	392	1360	1130	1320	301	119	148
20	67	71	e100	e95	122	379	1600	1010	1200	297	119	130
21	62	76	e100	e110	111	391	1660	979	987	288	120	121
22	58	97	e100	e120	120	399	1460	941	887	270	138	116
23	57	137	e92	e80	168	380	1190	1060	830	249	236	112
24	55	131	e85	e68	162	353	1010	955	889	235	343	108
25	54	114	e78	e69	159	372	904	862	904	224	373	106
26	53	108	e70	e70	201	400	794	793	883	216	289	104
27	52	94	e71	e72	228	411	722	783	933	218	252	100
28	52	112	e75	e72	221	410	675	779	853	203	231	99
29	52	108	e80	e76	---	397	628	725	835	196	212	97
30	51	100	e90	e85	---	369	638	684	841	189	200	98
31	50	---	e140	e96	---	358	---	702	---	182	191	---
TOTAL	1794	2661	3297	3054	2854	12398	23060	36345	41381	12196	5504	3859
MEAN	57.9	88.7	106	98.5	102	400	769	1172	1379	393	178	129
MAX	75	137	184	130	228	857	1660	2630	2260	762	373	181
MIN	50	50	69	68	43	113	318	684	779	182	119	97
AC-FT	3560	5280	6540	6060	5660	24590	45740	72090	82080	24190	10920	7650
CFSM	.24	.37	.44	.41	.42	1.67	3.20	4.89	5.75	1.64	.74	.54
IN.	.28	.41	.51	.47	.44	1.92	3.57	5.63	6.41	1.89	.85	.60

CAL YR 1988 TOTAL 120222 MEAN 328 MAX 1720 MIN 50 AC-FT 238500 CFSM 1.37 IN. 18.63
WTR YR 1989 TOTAL 148403 MEAN 407 MAX 2630 MIN 43 AC-FT 294400 CFSM 1.69 IN. 23.00

e Estimated

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.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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)	HARD-NESS NONCARB (MG/L AS CACO3)
NOV												
21...	1350	74	52	7.9	3.0	0.5	12.9	104	K3	K6	24	0
MAR												
21...	1210	376	56	7.8	5.5	6.9	12.8	112	K2	K6	23	2
MAY												
24...	1400	945	31	7.2	6.0	1.0	12.2	108	K1	<1	13	0
AUG												
23...	1215	232	42	7.6	12.5	0.5	9.6	99	K540	K800	18	3

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	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 WATER DIS IT FIELD (MG/L AS CACO3)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	CAR-BONATE WATER 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												
21...	6.7	1.7	2.5	18	0.2	1.1	42	52	0	1.7	0.6	<0.1
MAR												
21...	6.1	2.0	2.6	18	0.2	1.3	20	24	0	3.9	1.2	0.1
MAY												
24...	3.8	0.8	1.6	20	0.2	0.7	16	20	0	<1.0	1.6	0.1
AUG												
23...	5.2	1.1	2.0	19	0.2	1.0	14	18	0	<1.0	0.4	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 DAY)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS TOTAL (MG/L AS P)
NOV											
21...	19	50	60	9.99	0.07	<0.01	<0.10	0.2	0.01	<0.01	0.01
MAR											
21...	28	62	59	62.9	0.08	<0.01	<0.10	0.4	0.06	0.05	0.06
MAY											
24...	15	26	--	--	--	0.01	<0.10	<0.2	<0.01	0.01	0.01
AUG											
23...	15	25	--	--	--	0.02	<0.10	<0.2	<0.01	<0.01	<0.01

K - Results based on colony count outside acceptable range (non-ideal colony count).

13331500 MINAM RIVER AT MINAM, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM DISSOLVED (UG/L AS LI)
NOV 21...	<10	<1	4	1	<1	<1	<3	1	24	<5	<4
MAR 21...	230	<1	7	<0.5	<1	<1	<3	1	240	<5	<4
MAY 24...	30	<1	8	<0.5	<1	<1	<3	4	19	<1	<4
AUG 23...	<10	<1	3	<0.5	<1	<1	<3	1	11	<1	<4

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)
NOV 21...	3	0.2	<10	2	<1	1	23	<6	4	2	0.4
MAR 21...	2	<0.1	<10	5	<1	<1	20	<6	7	4	4.1
MAY 24...	1	<0.1	<10	1	<1	<1	15	<6	3	5	13
AUG 23...	<1	<0.1	<10	1	<1	<1	19	<6	7	2	1.3

DATE	GROSS ALPHA, DISSOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DISSOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DISSOLVED (PCI/L AS SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L)	URANIUM NATURAL DISSOLVED (UG/L AS U)
NOV 21...	<0.4	<0.4	1.0	<0.4	0.9	<0.4	<0.02	0.22
MAR 21...	--	--	--	--	--	--	--	--
MAY 24...	0.5	<0.4	1.3	<0.4	1.0	<0.4	<0.02	0.06
AUG 23...	--	--	--	--	--	--	--	--

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 mi^2.

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 except those for December 15 to February 15, which are fair. 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.--63 years, 2,158 ft^3/s, 1,563,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,700 ft^3/s Jan. 30, 1965, gage height, 10.93 ft; minimum discharge, 179 ft^3/s Aug. 24, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 11	2330	*10,800	*6.77	Apr. 21	0230	10,500	6.65
Mar. 28	1930	6,900	5.20	May 10	1300	10,300	6.57
Apr. 8	0030	7,070	5.19	June 16	0230	7,470	5.44

Minimum discharge, 359 ft^3/s Oct. 12.

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	387	391	581	587	701	1210	4770	5170	2830	2090	503	863
2	377	429	515	595	673	1180	4690	5130	3200	1850	497	833
3	376	507	e500	589	579	1080	4390	5070	3960	1790	498	802
4	375	576	503	588	521	970	4010	5190	4490	1810	481	762
5	377	550	518	589	560	941	3900	5580	4800	1790	467	726
6	378	581	632	586	649	1220	4340	6390	5010	1670	456	693
7	379	559	691	563	641	1810	5880	8150	5200	1550	464	672
8	374	507	724	545	603	2030	6980	8650	4910	1510	454	644
9	371	506	813	552	583	3380	6880	8370	4810	1350	527	618
10	375	506	943	734	626	7330	6610	9690	4700	1210	524	600
11	375	520	1060	703	660	8390	6100	9240	4250	1100	550	605
12	366	521	1050	715	706	9480	5900	8420	4140	1030	535	589
13	379	525	1060	701	682	8770	6050	7480	4160	1010	529	571
14	372	540	1070	685	655	7500	6660	6770	4360	998	499	557
15	377	510	932	689	609	6210	7630	6160	5280	1030	479	547
16	390	514	665	654	605	5460	8150	5790	6370	958	479	517
17	401	530	653	685	612	5000	8170	5390	4880	996	467	541
18	412	535	654	755	629	4850	8110	5750	4050	926	440	722
19	442	526	e680	831	642	5210	9020	5030	3910	869	413	672
20	448	540	722	838	648	4990	9760	4470	3590	863	425	649
21	429	550	753	838	650	5540	10100	4150	3080	831	448	628
22	428	661	728	832	667	5940	9670	3900	2790	784	524	609
23	424	860	682	798	797	5650	8600	4040	2600	717	838	582
24	413	773	600	689	908	5350	7630	3800	2680	668	1710	565
25	406	716	e560	704	1030	5910	6960	3480	2700	649	1650	553
26	425	658	531	650	1140	6230	6330	3230	2570	613	1330	542
27	406	612	472	649	1210	6340	5880	3130	2630	590	1270	544
28	398	618	447	636	1220	6630	5620	3110	2340	544	1160	542
29	396	619	447	e640	---	6300	5300	2970	2230	542	1040	543
30	395	621	435	687	---	5650	5140	2850	2210	558	959	542
31	391	---	557	713	---	5180	---	2770	---	551	891	---
TOTAL	12242	17061	21178	21020	20206	151731	199230	169320	114730	33447	21507	18833
MEAN	395	569	683	678	722	4895	6641	5462	3824	1079	694	628
MAX	448	860	1070	838	1220	9480	10100	9690	6370	2090	1710	863
MIN	366	391	435	545	521	941	3900	2770	2210	542	413	517
AC-FT	24280	33840	42010	41690	40080	301000	395200	335800	227600	66340	42660	37360

CAL YR 1988 TOTAL 520913 MEAN 1423 MAX 5110 MIN 252 AC-FT 1033000
WTR YR 1989 TOTAL 800505 MEAN 2193 MAX 10100 MIN 366 AC-FT 1588000

e Estimated

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 mi^2.

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 those for Jan. 25 to June 27, which are fair, and 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.--45 years, 3,076 ft^3/s, 2,229,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,200 ft^3/s Dec. 23, 1964, gage height, 11.25 ft; minimum discharge, 344 ft^3/s Aug. 19-21, 23, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 12	0400	*13,600	*a7.35	Apr. 20	1900	13,500	7.33
Mar. 28	2100	9,200	6.37	May 10	0600	11,900	6.99
Apr. 7	1900	11,200	6.82				

Minimum discharge, 503 ft^3/s Aug. 19, 20.

a From peak-stage indicator.

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	542	541	847	e840	985	e1550	6250	6670	3920	2430	624	1000
2	532	625	795	e840	e920	e1500	6110	6610	4670	2210	599	990
3	528	721	791	e840	e830	e1400	5700	6580	5220	2070	607	947
4	526	781	781	e820	e750	e1300	5240	6820	5530	2050	593	911
5	524	741	745	e810	e750	e1250	5490	7320	5750	2040	579	879
6	531	787	829	e800	e820	e1350	7110	8520	5900	1940	560	835
7	527	740	1050	e790	e850	e2000	9990	10400	5710	1790	557	812
8	524	685	1100	e750	e830	e2500	10400	10200	5500	1700	557	777
9	523	673	1160	e760	e800	e3500	9420	10100	5420	1560	588	755
10	522	710	1270	e1000	e870	e8000	8700	11500	5120	1410	627	725
11	524	720	1390	1080	954	e10000	8080	10800	4850	1280	619	717
12	520	752	1410	956	851	e11500	8070	9940	4770	1170	634	714
13	520	753	1440	960	782	e12000	8680	8910	4770	1150	626	707
14	529	745	1500	927	769	e11000	9890	7970	5100	1120	603	684
15	531	708	1400	944	805	e9000	11300	7220	6370	1130	573	671
16	533	705	1110	931	822	e7400	11200	6790	6290	1110	565	654
17	567	723	992	889	e780	e6700	10700	6420	5150	1110	560	657
18	571	723	e960	971	e770	e6400	11000	6660	4520	1070	545	805
19	593	721	e1000	1100	e810	e6500	12400	5830	4330	1010	523	844
20	602	e750	1070	1170	e840	e6300	13100	5270	4060	961	529	805
21	582	e840	1040	1180	e830	6630	13200	4990	3480	955	527	778
22	577	e1000	1000	1160	e880	7670	12000	4790	3190	916	595	755
23	577	e1350	960	1120	e990	7090	10500	4960	2980	860	823	731
24	571	1250	885	1040	e1170	6650	9290	4630	3050	796	1900	708
25	564	1100	e840	996	e1300	7350	8440	4190	3060	761	2040	689
26	558	1000	e720	990	e1520	8420	7700	3940	2920	742	1690	679
27	555	918	e640	1040	e1600	8440	7230	3940	e3020	716	1460	677
28	546	913	e640	974	e1610	8840	6980	3840	2750	666	1360	688
29	546	872	e640	978	---	8460	6650	3630	2570	637	1240	688
30	539	884	e720	966	---	7380	6610	3520	2540	653	1130	681
31	538	---	e820	969	---	6730	---	3590	---	650	1050	---
TOTAL	16922	24431	30545	29591	26488	194810	267430	206550	132510	38663	25483	22963
MEAN	546	814	985	955	946	6284	8914	6663	4417	1247	822	765
MAX	602	1350	1500	1180	1610	12000	13200	11500	6370	2430	2040	1000
MIN	520	541	640	750	750	1250	5240	3520	2540	637	523	654
AC-FT	33560	48460	60590	58690	52540	386400	530400	409700	262800	76690	50550	45550

CAL YR 1988 TOTAL 690723 MEAN 1887 MAX 7070 MIN 400 AC-FT 1370000
WTR YR 1989 TOTAL 1016386 MEAN 2785 MAX 13200 MIN 520 AC-FT 2016000

e Estimated

13353000 SNAKE RIVER BELOW ICE HARBOR DAM, WA

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.

DRAINAGE AREA.--108,500 mi^2, approximately.

PERIOD OF RECORD.--October 1907 to March 1917 (gage heights only October 1907 to August 1909), March 1962 to current year. Published as "at Burbank" prior to 1911 and as "near Burbank" 1912-17.

REVISED RECORDS.--WSP 1317: Drainage area.

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.--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.

COOPERATION.--Records furnished by U.S. Corps of Engineers. Records not reviewed.

AVERAGE DISCHARGE.--34 years (water years 1910-16, 1963-89), 54,620 ft^3/s, 39,572,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 312,000 ft^3/s June 19, 1974; no flow momentarily Aug. 27, 1965 (result of testing at Ice Harbor Dam).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 30, 1948, reached an elevation of 361.9 ft at a site 0.7 mi downstream, from information by U.S. Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum hourly discharge, 140,000 ft^3/s May 12; maximum forebay elevation, 440.10 ft Mar. 29; minimum hourly discharge, 300 ft^3/s Feb. 20; minimum forebay elevation, 436.48 ft June 28.

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	14400	11200	36900	25000	29800	32700	80100	92800	65700	32100	14100	32100
2	15500	16000	20800	27100	40700	28700	61800	90100	68000	38300	14900	31000
3	31700	23000	9600	22300	31700	27900	68000	84900	60900	37200	32700	21200
4	25100	18400	11000	17700	24000	27900	65400	92000	72700	35300	16100	25700
5	12300	20900	25300	23600	21800	31600	60100	101000	95500	39700	22900	32100
6	13100	18100	17800	24500	39200	36200	70700	96300	92600	34800	17600	33200
7	13600	27100	22200	24500	35400	30000	69400	103000	93200	38700	24900	17600
8	10700	25200	18400	28400	31800	39800	79300	105000	100000	25100	18500	41100
9	11700	24600	18600	38100	30900	45400	84000	114000	86000	22200	26800	35300
10	16900	21300	18200	21600	30200	57400	84200	118000	90700	30600	23200	37800
11	14600	22000	17200	17100	21200	79800	79000	118000	91200	25500	25400	26000
12	18400	19600	22900	39500	15600	74600	66900	120000	89100	29500	28800	24200
13	16600	20100	25100	29200	26000	68500	75100	101000	81800	29200	19000	34700
14	12200	23100	23500	33400	18900	82200	75200	79600	78600	23600	14200	34100
15	15300	20000	27700	32800	22200	70800	86300	69900	70800	31400	14100	28800
16	17000	29500	20200	43600	13500	57400	98700	84800	91800	35200	27900	22300
17	15800	26600	10900	27000	22100	64800	95300	82900	102000	19100	24100	29900
18	20700	23000	10300	29900	18700	59200	94000	84500	84200	33000	14200	22500
19	20300	16900	17000	34200	11600	62300	96500	76700	74600	25800	18700	27500
20	19500	10800	21700	29500	19000	69000	92200	56400	83100	26800	11800	26000
21	21300	24700	23000	36000	25000	61800	112000	73000	65900	42800	13400	30600
22	18700	21300	22600	35900	30900	65600	114000	74800	68300	37500	30000	29500
23	12600	23500	31300	40100	33700	71300	105000	62900	64400	32100	22400	26200
24	22300	27500	22500	44200	30100	65500	109000	57600	56100	27700	29800	28400
25	17700	21900	21000	25100	37800	60600	110000	60300	44700	21800	28300	29600
26	18500	31300	24300	16100	34400	63600	87200	58200	47600	22100	29300	25500
27	21400	26500	23700	30600	37800	73300	91100	64900	48700	26600	23200	27900
28	43400	27200	27500	23900	42400	72000	93100	63300	43000	21200	31100	32700
29	11700	27700	19000	12600	---	76000	57100	61000	47600	20000	29300	31900
30	9300	25700	17400	31800	---	75200	96400	60200	40500	21900	32300	29600
31	11300	---	24600	35000	---	81300	---	62400	---	18400	30300	---
TOTAL	543600	674700	652200	900300	776400	1812400	2557100	2569500	2199300	905200	709300	875000
MEAN	17540	22490	21040	29040	27730	58460	85240	82890	73310	29200	22880	29170
MAX	43400	31300	36900	44200	42400	82200	114000	120000	102000	42800	32700	41100
MIN	9300	10800	9600	12600	11600	27900	57100	56400	40500	18400	11800	17600
AC-FT	1078000	1338000	1294000	1786000	1540000	3595000	5072000	5097000	4362000	1795000	1407000	1736000

CAL YR 1988 TOTAL 10566800 MEAN 28870 MAX 90400 MIN 9300 AC-FT 20960000
WTR YR 1989 TOTAL 15175000 MEAN 41580 MAX 120000 MIN 9300 AC-FT 30100000

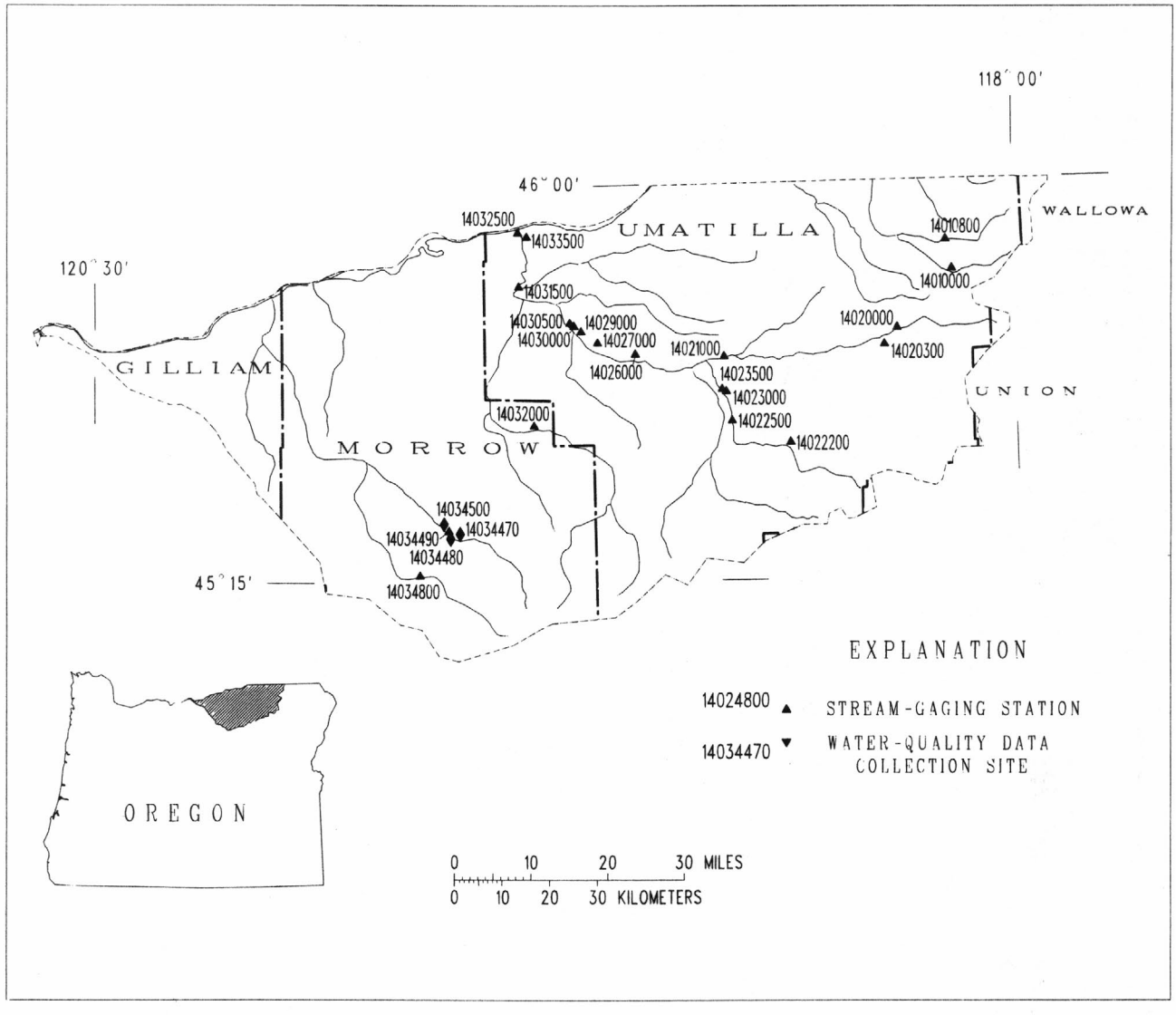

Figure 5.--Location of surface-water and water-quality stations in the Walla Walla River, Umatilla River, and Willow Creek basins.

MIDDLE COLUMBIA RIVER BASIN

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 mi^2, 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.--Records good except those for Feb. 3 to Mar. 5, which are poor, and Mar. 6 to July 14, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--68 years (water years 1908-17, 1932-89), 177 ft^3/s, 38.15 in/yr, 128,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,530 ft^3/s Jan. 29, 1965, gage height, 5.60 ft; minimum discharge, 72 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 7	1500	(a)	*3.33	Apr. 21	0300	*585	2.39

Minimum discharge, 76 ft^3/s Oct. 1, 2, Sept. 27-30.

(a) Backwater from ice.

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	76	82	107	101	180	123	205	307	240	120	94	91
2	76	85	105	101	168	118	206	303	254	119	95	91
3	78	94	103	101	e120	110	193	310	263	115	95	89
4	78	102	101	101	e96	105	180	351	248	111	94	88
5	78	93	102	102	e98	105	185	386	225	112	93	88
6	78	116	115	102	e100	120	254	443	218	110	93	87
7	78	92	237	101	e100	149	395	478	202	110	92	87
8	78	88	193	102	99	158	401	458	190	109	93	87
9	78	88	186	126	93	288	312	446	185	110	92	86
10	78	92	185	210	92	425	271	480	176	110	90	85
11	79	95	169	169	91	432	248	357	168	108	90	84
12	80	97	166	146	90	400	266	294	165	108	89	83
13	80	94	175	136	89	341	314	266	163	109	89	83
14	80	97	163	127	89	275	401	257	162	108	88	83
15	82	93	143	122	87	232	462	260	170	108	88	82
16	81	101	130	129	86	213	447	262	165	107	88	81
17	92	109	123	143	87	194	391	270	153	108	90	86
18	83	108	120	167	87	204	390	279	146	105	91	89
19	84	103	121	196	87	217	482	234	142	103	91	84
20	84	107	116	192	87	200	520	220	148	103	93	82
21	84	132	115	182	87	215	549	216	138	102	94	81
22	82	184	111	169	108	242	479	222	135	101	103	79
23	82	238	108	153	136	217	385	232	131	99	102	79
24	82	173	106	139	148	194	332	214	130	98	119	78
25	82	145	105	130	149	247	311	200	128	97	118	78
26	82	128	102	125	146	295	286	188	126	97	101	78
27	82	118	101	122	138	273	271	214	124	97	98	78
28	82	116	101	119	128	270	264	206	123	96	94	76
29	82	112	103	117	---	261	261	232	121	95	93	76
30	82	109	101	133	---	228	286	239	120	95	93	77
31	82	---	101	171	---	215	---	234	---	94	91	---
TOTAL	2505	3391	4014	4234	3066.0	7066	9947	9058	5059	3264	2934	2496
MEAN	80.8	113	129	137	109	228	332	292	169	105	94.6	83.2
MAX	92	238	237	210	180	432	549	480	263	120	119	91
MIN	76	82	101	101	86	105	180	188	120	94	88	76
AC-FT	4970	6730	7960	8400	6080	14020	19730	17970	10030	6470	5820	4950
CFSM	1.28	1.79	2.06	2.17	1.74	3.62	5.26	4.64	2.68	1.67	1.50	1.32
IN.	1.48	2.00	2.37	2.50	1.81	4.17	5.87	5.35	2.99	1.93	1.73	1.47

CAL YR 1988 TOTAL 44578 MEAN 122 MAX 327 MIN 75 AC-FT 88420 CFSM 1.93 IN. 26.32
WTR YR 1989 TOTAL 57034 MEAN 156 MAX 549 MIN 76 AC-FT 113100 CFSM 2.48 IN. 33.68

e Estimated

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 mi^2.

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,940 ft, from topographic map.

REMARKS.--Records good except those for March to June, which are fair. No regulation; one diversion upstream from station.

AVERAGE DISCHARGE.--20 years, 51.2 ft^3/s, 20.17 in/yr, 37,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,240 ft^3/s Feb. 23, 1986, gage height, 7.02 ft; minimum discharge, 3.3 ft^3/s Aug. 26-28, 1986.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 10	0200	*263	*4.98				

Minimum discharge, 4.2 ft^3/s Oct. 5-11, 13.

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	4.5	4.4	16	13	96	37	113	141	81	13	6.4	5.3
2	4.5	4.5	15	13	65	34	110	139	73	13	6.4	5.2
3	4.5	5.1	14	18	e47	30	98	136	67	12	6.5	5.3
4	4.5	8.3	14	33	e31	28	86	138	61	12	6.4	5.0
5	4.3	8.5	13	33	e30	28	89	143	55	11	6.3	4.8
6	4.3	13	15	28	30	39	127	153	49	11	6.2	4.8
7	4.3	8.8	66	25	27	71	203	162	43	9.3	6.1	4.7
8	4.3	7.6	51	22	24	75	231	153	39	7.5	6.1	4.7
9	4.3	7.7	43	34	22	140	184	141	36	7.5	6.5	4.7
10	4.3	8.1	45	133	20	240	155	164	34	7.5	6.3	4.7
11	4.3	9.1	39	81	19	244	140	127	31	7.3	6.2	4.6
12	4.4	9.0	37	52	19	237	145	102	29	7.2	6.0	4.5
13	4.3	8.9	41	41	18	222	168	85	28	7.0	6.0	4.5
14	4.4	9.7	36	35	17	171	202	75	29	6.8	6.0	4.5
15	4.6	9.1	29	30	16	130	227	68	33	6.8	6.0	4.5
16	4.7	15	25	33	16	113	223	66	32	6.8	5.8	4.6
17	5.2	19	21	54	17	106	194	68	25	7.6	5.4	5.1
18	4.9	18	19	84	17	115	183	76	22	7.6	5.4	5.9
19	4.8	16	19	115	17	117	205	61	21	7.2	5.5	5.2
20	4.7	19	17	105	17	103	225	54	25	7.0	6.1	5.0
21	4.5	24	17	89	18	111	235	50	20	6.9	5.9	4.9
22	4.4	37	17	72	45	134	200	47	19	6.8	7.9	4.9
23	4.4	79	16	55	71	116	164	51	18	6.7	7.2	4.9
24	4.4	44	15	44	69	101	145	50	17	6.6	10	4.7
25	4.4	30	14	36	61	125	135	43	16	6.5	11	4.7
26	4.3	24	12	33	56	158	129	38	15	6.6	7.3	5.1
27	4.4	19	12	32	49	150	130	52	15	6.5	6.2	5.3
28	4.4	19	11	30	42	157	135	50	14	6.4	5.7	5.3
29	4.4	18	12	29	---	156	135	80	14	6.4	5.6	5.3
30	4.4	17	13	51	---	128	139	99	13	6.4	5.5	5.4
31	4.4	---	14	105	---	118	---	91	---	6.4	5.4	---
TOTAL	138.5	519.8	728	1558	976	3734	4855	2903	974	247.3	199.3	148.1
MEAN	4.47	17.3	23.5	50.3	34.9	120	162	93.6	32.5	7.98	6.43	4.94
MAX	5.2	79	66	133	96	244	235	164	81	13	11	5.9
MIN	4.3	4.4	11	13	16	28	86	38	13	6.4	5.4	4.5
AC-FT	275	1030	1440	3090	1940	7410	9630	5760	1930	491	395	294
CFSM	.13	.50	.68	1.46	1.01	3.50	4.70	2.72	.94	.23	.19	.14
IN.	.15	.56	.79	1.68	1.06	4.04	5.25	3.14	1.05	.27	.22	.16

CAL YR 1988 TOTAL 10279.7 MEAN 28.1 MAX 190 MIN 4.0 AC-FT 20390 CFSM .82 IN. 11.12
WTR YR 1989 TOTAL 16981.0 MEAN 46.5 MAX 244 MIN 4.3 AC-FT 33680 CFSM 1.35 IN. 18.36

e Estimated

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 mi^2.

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 except for estimated daily discharges, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--56 years, 226 ft^3/s, 23.43 in/yr, 163,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,930 ft^3/s Jan. 25, 1975, gage height, 9.18 ft, from rating curve extended above 3,500 ft^3/s; maximum gage height, 9.50 ft Jan. 29, 1965; minimum discharge, 16 ft^3/s Nov. 9, 1965, momentary regulation from unknown source.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 11	1830	*1,970	*5.76	Apr. 20	2330	1,580	5.36
Apr. 7	2200	1,810	5.59				

Minimum discharge, 40 ft^3/s Oct. 1-4, 6-14.

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	41	43	131	82	249	213	518	683	305	73	47	46
2	40	47	123	83	e210	197	514	665	303	70	47	45
3	40	55	113	98	e115	178	468	666	295	67	47	45
4	41	70	105	124	e82	165	410	706	280	64	47	44
5	41	59	103	122	e85	164	409	758	262	63	46	44
6	41	79	121	117	e92	234	691	854	245	61	45	44
7	41	62	536	110	e100	366	1460	908	221	59	45	45
8	41	55	421	110	e110	402	1360	836	203	57	45	44
9	41	52	349	223	e117	1010	900	769	187	57	48	44
10	41	58	380	870	e117	1580	740	1030	173	57	46	44
11	40	62	300	390	e115	1790	632	751	158	56	46	44
12	41	66	265	257	e110	1600	694	587	147	55	45	43
13	41	66	297	212	e105	1400	859	500	140	54	45	42
14	41	74	273	181	e102	953	1180	459	137	53	44	42
15	42	70	217	164	e103	636	1390	436	148	55	44	41
16	42	82	179	159	e110	536	1260	417	151	54	44	42
17	45	117	154	197	e120	483	1020	412	124	58	44	47
18	44	183	138	296	e115	525	1090	416	115	54	44	54
19	45	191	135	407	e110	569	1310	338	108	52	44	47
20	44	257	123	395	e105	498	1360	308	115	51	44	45
21	43	317	119	334	e105	568	1360	293	102	49	45	44
22	42	481	112	276	218	699	1100	281	96	49	54	44
23	41	591	107	227	311	561	820	286	93	48	59	43
24	41	307	101	192	346	484	697	269	87	47	68	43
25	41	214	98	170	344	694	647	248	84	47	67	43
26	42	164	93	157	334	964	592	232	80	47	54	44
27	42	141	89	148	279	840	580	260	77	47	50	44
28	43	161	96	139	239	836	588	260	75	46	48	44
29	43	154	101	137	---	794	566	281	73	46	47	44
30	42	141	94	189	---	616	626	316	71	46	47	46
31	42	---	86	246	---	552	---	312	---	47	46	---
TOTAL	1295	4419	5559	6812	4548	21107	25841	15537	4655	1689	1492	1331
MEAN	41.8	147	179	220	162	681	861	501	155	54.5	48.1	44.4
MAX	45	591	536	870	346	1790	1460	1030	305	73	68	54
MIN	40	43	86	82	82	164	409	232	71	46	44	41
AC-FT	2570	8770	11030	13510	9020	41870	51260	30820	9230	3350	2960	2640
CFSM	.32	1.12	1.37	1.68	1.24	5.20	6.58	3.83	1.18	.42	.37	.34
IN.	.37	1.25	1.58	1.93	1.29	5.99	7.34	4.41	1.32	.48	.42	.38

CAL YR 1988 TOTAL 62883 MEAN 172 MAX 937 MIN 39 AC-FT 124700 CFSM 1.31 IN. 17.86
WTR YR 1989 TOTAL 94285 MEAN 258 MAX 1790 MIN 40 AC-FT 187000 CFSM 1.97 IN. 26.77

e Estimated

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 mi^2.

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.--Records fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--14 years, 198 ft^3/s, 15.28 in/yr, 143,500 acre-ft.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,750 ft^3/s Feb. 20, 1982, gage height, 6.60 ft, from floodmark, from rating curve extended above 2,600 ft^3/s; minimum discharge, 6.6 ft^3/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 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 9	2300	*2,120	*5.32	No other peak greater than base discharge.			

Minimum daily discharge, 11 ft^3/s many days in October, August, and September.

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	11	13	121	74	240	216	485	323	79	e27	e14	e12
2	11	14	118	73	e165	193	477	293	78	e25	e13	e11
3	11	16	113	94	e110	167	423	248	77	e24	e13	e11
4	11	21	105	123	e84	147	371	236	76	e23	e13	e11
5	11	18	106	125	e84	145	345	251	74	e22	e12	e11
6	11	22	115	125	e88	184	590	305	72	e21	e12	e11
7	11	20	303	121	e94	370	1110	305	69	e21	e12	e12
8	11	20	434	119	e100	488	1140	238	65	e20	e12	e11
9	11	23	374	192	e108	1040	844	185	63	e20	e12	e11
10	11	22	469	677	e110	1770	780	439	60	e20	e11	e11
11	11	23	382	484	e108	1550	700	331	57	e19	e11	e11
12	11	25	324	356	e104	1280	784	213	55	e19	e11	e11
13	11	25	364	285	e100	1020	943	159	54	e19	e11	e11
14	11	31	369	234	e98	801	1190	140	53	e18	e11	11
15	11	31	278	201	e98	590	1370	128	55	e18	e11	11
16	11	38	208	185	e102	476	1400	120	59	e19	e11	11
17	11	61	161	212	e108	422	1340	114	55	e20	e11	12
18	11	74	141	262	e105	433	1340	113	52	e19	e11	14
19	12	70	135	302	e94	503	1480	102	49	e18	e11	12
20	12	80	126	318	e90	482	1430	95	49	e18	e11	12
21	12	123	122	311	91	525	1360	91	46	e17	e12	12
22	12	262	117	287	165	748	1130	87	43	e17	e13	13
23	12	341	111	245	286	647	740	87	40	e16	e15	12
24	12	241	99	202	326	534	488	85	36	e16	e17	12
25	12	171	93	183	337	619	420	82	33	e16	e17	12
26	12	136	87	160	348	825	406	78	31	e16	e15	12
27	12	122	78	153	303	756	390	79	e29	e15	e13	12
28	12	132	76	146	255	736	371	80	e28	e15	e12	12
29	13	131	77	144	---	734	311	80	e27	e15	e12	12
30	13	125	78	163	---	592	292	80	e26	e14	e12	12
31	13	---	77	214	---	511	---	79	---	e14	e12	---
TOTAL	357	2431	5761	6770	4301	19504	24450	5246	1590	581	384	349
MEAN	11.5	81.0	186	218	154	629	815	169	53.0	18.7	12.4	11.6
MAX	13	341	469	677	348	1770	1480	439	79	27	17	14
MIN	11	13	76	73	84	145	292	78	26	14	11	11
AC-FT	708	4820	11430	13430	8530	38690	48500	10410	3150	1150	762	692
CFSM	.07	.46	1.06	1.24	.87	3.57	4.63	.96	.30	.11	.07	.07
IN.	.08	.51	1.22	1.43	.91	4.12	5.17	1.11	.34	.12	.08	.07

CAL YR 1988 TOTAL 51607.0 MEAN 141 MAX 1060 MIN 8.7 AC-FT 102400 CFSM .80 IN. 10.91
WTR YR 1989 TOTAL 71724 MEAN 197 MAX 1770 MIN 11 AC-FT 142300 CFSM 1.12 IN. 15.16

e Estimated

14021000 UMATILLA RIVER AT PENDLETON, OR

LOCATION.--Lat 45°40'20", long 118°47'30", in NW 1/4 NE 1/4 sec.10, T.2 N., R.32 E., Umatilla County, Hydrologic Unit 17070103, on wingwall 0.3 mi downstream from Main Street bridge at Pendleton, 1.5 mi downstream from Wildhorse Creek, 2.8 mi upstream from McKay Creek, and at mile 55.2.

DRAINAGE AREA.--637 mi^2.

PERIOD OF RECORD.--February 1891 to July 1892, May 1903 to June 1905 (gage heights and discharge measurements only June to December 1904), October 1934 to September 1989 (discontinued). Monthly discharge only February 1891 to July 1892, published in WSP 1318.

REVISED RECORDS.--WSP 1398: 1904, 1937.

GAGE.--Water-stage recorder. Datum of gage is 1,054.3 ft above National Geodetic Vertical Datum of 1929 (levels by Oregon Department of Transportation). Apr. 24 to Aug. 26, 1959, nonrecording gage and Aug. 27, 1959, to Feb. 4, 1965, water-stage recorder at 8th Street Bridge 0.7 mi upstream at datum of 1,067.01 ft above National Geodetic Vertical Datum of 1929. Feb. 5 to Nov. 18, 1965, nonrecording gage at Main Street Bridge 1,600 ft upstream at different datum. Nov. 19, 1965, to Sept. 30, 1969, water-stage recorder at 8th Street Bridge 0.7 mi upstream at datum of 1,067.60 ft above National Geodetic Vertical Datum of 1929 Nov. 19, 1965, to Mar. 28, 1967, and at datum of 1,064.02 ft above National Geodetic Vertical Datum of 1929 Mar. 29, 1967, to Sept. 30, 1969. See WSP 1738 for history of changes prior to Apr. 24, 1959.

REMARKS.--Records good except those for October and November, and estimated daily discharges, which are fair. No regulation. Many diversions for irrigation upstream from station. Records for this station will be available after September 1989 in the files of the Oregon Water Resources Department.

AVERAGE DISCHARGE.--55 years (water years 1935-89), 503 ft^3/s, 364,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,200 ft^3/s Feb. 23, 1986, gage height, 10.16 ft, datum then in use; minimum discharge, 10 ft^3/s July 13-16, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 17,000 ft^3/s Dec. 14, 1882 (date and discharge from data furnished by Corps of Engineers). Flood of May 30, 31, 1906, reached a stage of 11.0 ft, 1934-58 site and datum, but before channel was improved, discharge, 15,500 ft^3/s, estimated by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 12	1030	*(a)	*(a)	Apr. 8	0430	4,530	9.65

Minimum discharge, 29 ft^3/s Aug. 16.

a Not determined.

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	42	57	406	213	730	709	1530	1300	444	98	39	51
2	42	60	375	208	627	659	1510	1250	428	98	40	50
3	42	69	345	216	e300	594	1380	1200	413	94	41	49
4	e42	87	330	345	e180	548	1230	1200	401	89	42	45
5	e42	91	325	372	e180	601	1150	1250	381	84	41	43
6	e41	93	333	362	e190	714	1510	1330	358	83	39	43
7	41	99	727	338	e190	1010	3150	1390	328	79	34	43
8	42	91	1020	322	e200	1160	3840	1320	301	75	34	43
9	41	86	848	e590	e210	e1700	2610	1170	279	74	48	43
10	41	89	962	e2600	e220	e3700	2120	1560	255	73	42	44
11	41	89	859	e1500	e240	e4100	1790	1390	234	69	39	43
12	40	93	749	e1000	e250	e3500	1820	1110	219	68	40	43
13	43	99	767	e750	e250	e2700	2030	940	208	67	39	42
14	51	e105	792	e650	e240	1880	2590	822	203	63	35	41
15	51	e100	660	e550	e235	1740	3060	750	208	60	36	41
16	44	e120	e500	e500	e230	1700	2980	709	230	56	31	40
17	45	e160	e400	e600	e350	1580	2490	658	205	67	33	43
18	50	265	e360	881	e600	1600	2240	680	185	65	35	58
19	56	251	e320	1090	e600	1740	2630	590	166	57	37	59
20	59	265	e300	1060	e600	1610	2600	515	156	56	35	54
21	58	397	317	968	e800	1620	2620	489	156	55	35	51
22	55	960	299	894	e1000	2170	2270	454	142	54	54	50
23	53	1160	287	751	e1650	1870	1800	456	135	51	66	49
24	54	799	272	626	1170	1580	1500	434	126	50	72	49
25	55	591	254	556	1060	1750	1370	405	119	46	77	47
26	54	475	237	497	1010	2490	1340	367	110	44	75	47
27	51	400	222	464	912	2290	1280	374	106	43	66	46
28	54	444	211	442	792	2240	1280	406	108	42	60	47
29	55	483	199	420	---	2250	1210	401	104	41	58	47
30	56	445	220	532	---	1850	1200	465	99	39	55	48
31	57	---	224	693	---	1640	---	457	---	39	55	---
TOTAL	1498	8523	14120	20990	15016	55295	60130	25842	6807	1979	1433	1399
MEAN	48.3	284	455	677	536	1784	2004	834	227	63.8	46.2	46.6
MAX	59	1160	1020	2600	1650	4100	3840	1560	444	98	77	59
MIN	40	57	199	208	180	548	1150	367	99	39	31	40
AC-FT	2970	16910	28010	41630	29780	109700	119300	51260	13500	3930	2840	2770

CAL YR 1988 TOTAL 126874 MEAN 347 MAX 2100 MIN 23 AC-FT 251700
WTR YR 1989 TOTAL 213032 MEAN 584 MAX 4100 MIN 31 AC-FT 422500

e Estimated

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 mi^2.

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.--16 years, 43.8 ft^3/s, 31,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,980 ft^3/s Jan. 25, 1975, gage height, 8.48 ft, from floodmark, from rating curve extended above 150 ft^3/s on basis of slope-area measurement of peak flow; minimum discharge, 0.22 ft^3/s June 26, 1985 (result of temporary construction upstream).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 290 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 10	0030	*801	*4.92	Mar. 21	1730	357	3.19
Mar. 11	1630	576	4.06				

Minimum discharge, 0.91 ft^3/s several days in October and August.

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	.98	1.2	51	31	e76	73	170	63	16	2.5	.91	1.3
2	.97	1.4	40	37	e54	65	157	56	14	2.3	.94	1.4
3	.99	1.6	33	79	e35	56	133	47	13	2.1	1.0	1.4
4	1.0	1.9	29	96	e27	53	119	40	12	2.0	1.0	1.4
5	1.0	1.8	27	78	e29	55	129	34	10	1.8	.97	1.5
6	.98	2.2	28	62	e32	114	181	29	9.5	1.7	.95	1.5
7	1.0	1.9	153	52	e33	162	238	25	8.5	1.6	.91	1.5
8	.99	2.4	110	48	e34	155	210	21	7.7	1.6	.91	1.5
9	.96	2.4	101	178	e36	289	166	22	7.2	1.5	1.2	1.4
10	.98	3.0	94	459	e38	403	138	90	6.8	1.5	1.1	1.5
11	.95	3.1	73	205	e42	487	122	72	6.3	1.5	1.1	1.5
12	.95	3.1	62	142	e44	374	120	60	5.6	1.5	1.0	1.4
13	.95	3.0	61	115	43	357	125	51	5.3	1.5	1.0	1.4
14	.94	3.7	52	92	40	282	129	43	5.4	1.5	1.0	1.4
15	1.0	4.0	41	77	36	228	131	37	6.6	1.6	1.1	1.3
16	1.0	7.5	33	79	36	223	118	32	8.2	1.5	1.1	1.4
17	1.2	24	27	115	61	220	100	28	5.7	1.6	1.1	1.7
18	1.2	25	24	158	67	252	90	28	5.0	1.4	1.1	2.0
19	1.2	16	24	175	63	255	83	23	4.6	1.4	1.1	1.8
20	1.2	23	23	151	67	213	73	20	5.2	1.3	1.1	1.6
21	1.2	79	24	128	83	296	69	17	4.5	1.2	1.2	1.5
22	1.1	203	23	114	180	281	73	15	4.1	1.2	1.7	1.4
23	1.1	150	22	96	188	216	60	20	3.9	1.2	1.9	1.4
24	1.1	75	21	81	168	184	49	19	3.6	1.2	1.8	1.4
25	1.1	57	20	71	139	239	48	16	3.2	1.1	1.7	1.5
26	1.1	46	e18	65	122	248	83	14	2.8	1.1	1.5	1.8
27	1.1	42	e16	59	101	225	93	16	2.6	1.1	1.4	1.7
28	1.2	95	e18	53	84	246	96	16	2.6	1.1	1.4	1.7
29	1.2	82	e20	54	---	227	85	18	2.5	1.0	1.3	1.7
30	1.2	63	29	91	---	183	72	20	2.4	1.0	1.3	1.9
31	1.2	---	33	e110	---	187	---	18	---	.97	1.3	---
TOTAL	33.04	1024.2	1330	3351	1958	6848	3460	1010	194.8	45.57	37.09	45.9
MEAN	1.07	34.1	42.9	108	69.9	221	115	32.6	6.49	1.47	1.20	1.53
MAX	1.2	203	153	459	188	487	238	90	16	2.5	1.9	2.0
MIN	.94	1.2	16	31	27	53	48	14	2.4	.97	.91	1.3
AC-FT	66	2030	2640	6650	3880	13580	6860	2000	386	90	74	91

CAL YR 1988 TOTAL 9781.81 MEAN 26.7 MAX 226 MIN .60 AC-FT 19400
WTR YR 1989 TOTAL 19337.60 MEAN 53.0 MAX 487 MIN .91 AC-FT 38360

e Estimated

14022500 MCKAY CREEK NEAR PILOT ROCK, OR

LOCATION.--Lat 45°32'57", long 118°46'24", in NW 1/4 SE 1/4 sec.23, T.1 N., R.32 E., Umatilla County, Hydrologic Unit 17070103, on left bank 500 ft upstream from county road bridge, 5.5 mi northeast of Pilot Rock, and at mile 8.2.

DRAINAGE AREA.--180 mi^2.

PERIOD OF RECORD.--May to August 1921, October 1926 to June 1928, December 1928 to July 1929, October 1929 to September 1989 (discontinued). Monthly discharge only for some periods, published in WSP 1318.

REVISED RECORDS.--WSP 1398: 1928-29, 1933, 1940.

GAGE.--Water-stage recorder. Datum of gage is 1,343.60 ft above National Geodetic Vertical Datum of 1929. See WSP 1318 or 1738 for history of changes prior to Apr. 9, 1941. Apr. 9, 1941, to July 24, 1963, at site 1,000 ft downstream at datum 7.92 ft lower.

REMARKS.--Records fair. No regulation. Many small diversions for irrigation upstream from station. Records for this station will be available after September 1989 in the files of the Oregon Water Resources Department.

AVERAGE DISCHARGE.--61 years (water years 1927, 1930-89), 103 ft^3/s, 74,620 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,400 ft^3/s Jan. 30, 1965, gage height, 8.40 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 840 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 10	0430	*1,630	*5.60	Mar. 26	0115	940	4.86
Mar. 12	0215	1,410	5.36	Apr. 7	2400	1,090	5.03
Mar. 22	0230	1,300	5.25				

Minimum discharge, 0.72 ft^3/s Oct. 1-3.

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	.72	1.7	102	54	e230	239	514	284	49	2.4	1.6	2.0
2	.72	1.8	81	61	e150	218	470	255	44	2.5	1.5	2.2
3	.78	1.8	62	123	e100	189	396	218	40	2.4	1.3	2.1
4	.78	2.1	50	226	e85	178	333	190	37	1.8	1.3	1.8
5	.79	2.3	43	185	e85	183	323	168	32	1.8	1.5	1.8
6	.86	2.4	40	155	e90	305	486	159	29	2.1	1.6	1.8
7	.90	2.8	283	128	e100	441	850	141	25	2.1	1.4	1.8
8	.92	3.2	306	112	e100	425	870	123	22	2.3	1.3	1.8
9	.97	3.4	262	270	e105	569	669	114	18	2.4	1.2	1.7
10	.97	3.6	261	1040	e110	995	559	426	3.9	2.3	1.1	1.5
11	1.0	4.0	205	550	e120	1250	477	451	5.8	2.5	1.0	1.5
12	1.0	4.4	168	386	e125	1170	478	348	8.0	2.6	1.0	1.5
13	1.1	4.7	157	313	e130	1110	495	275	8.7	2.8	1.0	1.6
14	1.2	7.9	138	253	e130	953	565	222	9.7	2.8	1.0	1.6
15	1.2	7.3	110	210	e120	752	595	184	15	1.9	1.0	1.5
16	1.2	8.9	87	192	e110	693	576	155	26	1.7	1.0	1.7
17	1.3	44	68	240	e132	656	487	132	19	2.1	.96	1.7
18	1.4	113	55	322	139	736	429	123	15	2.0	.90	1.8
19	1.5	93	52	379	133	765	430	106	12	2.0	.87	1.8
20	1.5	93	48	349	147	639	398	93	12	2.0	.81	2.1
21	1.5	141	52	302	190	900	380	83	11	1.9	.86	2.3
22	1.5	312	50	276	442	1110	379	76	10	1.8	1.2	2.3
23	1.5	278	46	238	580	833	311	74	9.4	1.8	1.1	2.4
24	1.6	150	43	205	521	640	263	72	8.5	1.8	1.2	2.3
25	1.6	108	41	183	430	696	252	65	5.7	1.8	1.2	2.4
26	1.6	90	35	169	375	847	309	56	3.8	1.8	1.3	2.5
27	1.6	72	29	159	318	759	374	57	3.5	1.8	1.7	2.7
28	1.6	139	25	147	270	766	376	59	3.1	1.8	1.8	2.8
29	1.8	165	24	136	---	750	351	62	3.2	1.8	1.8	2.5
30	1.6	129	37	187	---	581	312	66	2.9	1.7	1.8	2.3
31	1.6	---	53	e306	---	557	---	56	---	1.5	2.0	---
TOTAL	38.31	1989.3	3013	7856	5567	20905	13707	4893	492.2	64.0	39.30	59.8
MEAN	1.24	66.3	97.2	253	199	674	457	158	16.4	2.06	1.27	1.99
MAX	1.8	312	306	1040	580	1250	870	451	49	2.8	2.0	2.8
MIN	.72	1.7	24	54	85	178	252	56	2.9	1.5	.81	1.5
AC-FT	76	3950	5980	15580	11040	41470	27190	9710	976	127	78	119

CAL YR 1988 TOTAL 23029.24 MEAN 62.9 MAX 374 MIN .17 AC-FT 45680
WTR YR 1989 TOTAL 58623.91 MEAN 161 MAX 1250 MIN .72 AC-FT 116300

e Estimated

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 mi^2.

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.

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, 72,520 acre-ft June 5, 6, gage height, 1,320.96 ft; minimum contents, 2,200 acre-ft Oct. 27, gage height, 1,213.65 ft, but may have been lower during period of missing record Oct. 27 to Nov. 3.

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 1988 TO SEPTEMBER 1989
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1214.17	---	---	1246.66	1276.69	1292.17	1316.42	1319.36	1320.92	1311.20	1289.86	1268.99
2	1214.17	---	1229.55	1247.07	1277.46	1292.67	1316.38	1319.59	1320.90	1310.70	1289.13	1268.48
3	1214.10	1213.80	1229.87	---	1278.10	1293.07	1316.46	1319.75	1320.90	1310.17	1288.35	1267.97
4	1214.00	1213.82	1230.40	1248.83	1278.63	1293.32	1316.72	1319.90	1320.91	1309.59	1287.60	1267.47
5	1213.98	1213.83	1230.67	1249.64	1279.10	1293.88	1316.98	1320.02	1320.95	1309.10	1286.85	1266.93
6	1213.94	1213.81	1231.01	---	1279.50	1294.59	1317.24	1320.17	1320.92	1308.54	1286.11	1266.39
7	1213.94	1213.79	1232.42	---	1279.87	1295.63	1317.39	1320.26	1320.82	1307.98	1285.32	1265.84
8	1213.92	1213.87	1234.22	1251.66	1280.15	1296.64	1317.44	1320.39	1320.52	1307.37	1284.42	1265.23
9	1213.90	1213.95	1234.75	1252.94	1280.49	1297.98	1317.25	1320.37	1320.21	1306.79	1283.62	1264.62
10	1213.89	1214.11	---	---	1280.77	1300.17	1317.03	1320.53	1319.89	1306.20	1282.82	1264.00
11	1213.86	1214.17	1236.90	---	1281.03	1302.60	1317.06	1320.56	1319.56	1305.59	1281.94	1263.38
12	1213.85	1214.34	---	1260.83	1281.28	1304.68	1317.22	1320.56	1319.13	1305.01	1281.10	1262.67
13	1213.84	1214.45	1239.24	1261.97	1281.47	1306.42	1317.31	1320.66	1318.68	1304.31	1280.25	1261.96
14	1213.81	1214.65	---	1262.80	1281.66	1307.83	1317.40	1320.72	1318.36	1303.58	1279.34	1261.23
15	1213.78	1214.85	---	---	1281.85	1308.98	1317.38	1320.78	1318.06	1302.84	1278.49	1260.46
16	1213.78	1214.98	1241.69	1263.15	1282.04	1310.00	1317.31	1320.79	1317.76	1302.04	1277.69	1259.68
17	1213.75	1215.22	1242.18	1264.60	1282.32	1310.96	1317.12	1320.79	1317.45	1301.39	1276.84	1258.99
18	1213.73	1215.75	1242.61	1265.71	1282.66	1311.93	1317.05	1320.72	1317.13	1300.65	1276.05	1258.32
19	1213.73	1216.31	1243.00	1266.98	1282.99	1312.91	1317.03	1320.69	1316.76	1299.96	1275.21	1257.79
20	1213.73	1217.24	1243.28	1268.11	1283.36	1313.88	1317.02	1320.67	1316.38	1299.29	1274.33	1257.32
21	1213.72	1218.19	1243.64	1269.15	1283.82	1315.17	1317.06	1320.76	1316.01	1298.56	1273.50	1256.70
22	1213.72	1220.29	1243.91	1270.07	1285.14	1316.35	1317.13	1320.81	1315.56	1297.80	1272.86	1256.03
23	1213.70	---	1244.31	1270.84	1286.75	1317.17	1317.06	1320.86	1315.11	1297.07	1272.41	1255.46
24	1213.70	---	1244.56	---	1288.14	1317.23	1317.05	1320.87	1314.64	1296.42	1272.08	1254.92
25	1213.70	---	1244.88	1272.10	1289.24	1317.28	1317.27	1320.88	1314.19	1295.48	1271.73	1254.26
26	1213.69	---	1245.09	1272.66	1290.16	1317.37	1317.62	1320.86	1313.64	1294.73	1271.61	1253.48
27	---	---	1245.34	1273.16	1290.96	1317.27	1318.03	1320.88	1313.24	1294.01	1271.27	---
28	---	---	1245.57	1273.65	1291.58	1317.18	1318.42	1320.89	1312.88	1293.09	1270.85	1252.07
29	---	---	1245.69	1274.12	---	1317.02	1318.79	1320.92	1312.31	1292.28	1270.42	1251.43
30	---	---	1245.98	1274.74	---	1316.77	1319.12	1320.92	1311.74	1291.47	1269.94	1250.90
31	---	---	1246.34	1275.70	---	---	---	1320.93	---	1290.72	1269.48	---
MAX	---	---	---	---	1291.58	---	1319.12	1320.93	1320.95	1311.20	1289.86	---
MIN	---	---	---	---	1276.69	---	1316.38	1319.36	1311.74	1290.72	1269.48	---
(†)	e2210	e6650	13840	30580	42410	e67200	70240	72480	61760	41710	26510	16050
(‡)	-90	+4440	+7190	+16740	+11830	+24790	+3040	+2240	-10720	-20050	-15200	-10460

CAL YR 1988 AC-FT‡ +6840
WTR YR 1989 AC-FT‡ +13750

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

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 mi^2.

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 ft^3/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 ft^3/s; since 1982, diversion has been less than 1.0 ft^3/s.

AVERAGE DISCHARGE.--52 years (water years 1933-43, 1949-89), 98.1 ft^3/s, 71,070 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 3,250 ft^3/s Feb. 10, 1921, gage height, 4.4 ft, site and datum then in use, from rating curve extended above 1,200 ft^3/s; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum recorded discharge, 746 ft^3/s Mar. 28, gage height, 2.21 ft, but may have been greater during missing record on Mar. 30; no flow at times.

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	.00	.00	.10	.90	2.2	2.7	400	90	55	289	292	129
2	.00	.00	.10	.90	2.2	2.8	280	91	35	277	277	134
3	.00	.00	.10	.95	2.2	2.8	155	91	16	275	271	145
4	.00	.00	.15	1.0	2.2	2.9	155	91	11	275	270	146
5	.00	.00	.15	1.0	2.2	2.6	180	74	11	275	270	145
6	.00	.00	.15	1.1	2.2	2.4	314	57	11	273	270	152
7	.00	.00	.15	1.1	2.2	2.9	613	57	122	274	270	160
8	.00	.00	.20	1.2	2.2	3.6	698	37	196	284	270	164
9	.00	.00	.20	1.2	2.2	3.6	710	27	199	290	270	168
10	.00	.00	.20	1.2	2.2	3.9	625	365	201	298	270	167
11	.00	.00	.20	1.3	2.2	4.6	475	404	224	296	270	167
12	.00	.00	.20	1.3	2.3	5.7	430	318	278	313	270	189
13	.00	.00	.25	1.4	2.3	6.4	415	189	267	325	270	198
14	.00	.00	.25	1.4	2.3	6.4	448	157	195	332	270	196
15	.00	.00	.25	1.5	2.3	7.0	521	157	192	344	270	196
16	.00	.00	.30	1.5	2.4	8.1	555	148	207	343	270	195
17	.00	.00	.30	1.6	2.4	8.1	553	149	205	335	270	178
18	.00	.00	.35	1.6	2.4	6.8	466	148	205	315	270	168
19	.00	.01	.35	1.7	2.4	7.4	406	104	205	305	270	136
20	.00	.01	.40	1.7	2.4	8.1	369	23	227	302	270	136
21	.00	.02	.40	1.7	2.5	8.9	317	11	236	311	270	143
22	.00	.02	.45	1.8	2.5	54	316	11	263	321	245	151
23	.00	.02	.50	1.8	2.5	276	338	21	285	318	141	129
24	.00	.03	.55	1.9	2.6	545	245	52	269	317	98	127
25	.00	.04	.60	1.9	2.6	606	137	48	259	316	67	167
26	.00	.04	.60	1.9	2.6	675	89	41	276	315	58	179
27	.00	.05	.65	2.0	2.7	707	89	41	214	314	74	166
28	.00	.06	.70	2.0	2.7	711	89	41	205	313	105	164
29	.00	.07	.75	2.1	---	716	89	53	309	312	125	174
30	.00	.09	.80	2.1	---	690	90	63	308	311	123	178
31	.00	---	.85	2.2	---	680	---	55	---	304	127	---
TOTAL	0.00	0.46	11.20	46.95	66.1	5767.7	10567	3214	5686	9472	6863	4847
MEAN	.00	.015	.36	1.51	2.36	186	352	104	190	306	221	162
MAX	.00	.09	.85	2.2	2.7	716	710	404	309	344	292	198
MIN	.00	.00	.10	.90	2.2	2.4	89	11	11	273	58	127
AC-FT	.0	.9	22	93	131	11440	20960	6370	11280	18790	13610	9610

CAL YR 1988 TOTAL 19412.57 MEAN 53.0 MAX 333 MIN .00 AC-FT 38500
WTR YR 1989 TOTAL 46541.41 MEAN 128 MAX 716 MIN .00 AC-FT 92310

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 mi^2, 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.--Records good except for estimated daily discharges during December and February, which are fair. 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.--86 years, 679 ft^3/s, 491,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft^3/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 ft^3/s; minimum discharge, 12 ft^3/s Aug. 10-12, 1908, Aug. 4, 1910.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 10	1000	4,200	5.94	Mar. 26	1330	3,830	5.67
Feb. 22	2230	4,160	5.91	Apr. 8	0930	5,820	7.00
Mar. 12	0730	*5,910	*7.05	Apr. 16	0930	4,410	6.09

Minimum discharge, 41 ft^3/s Oct. 2-10, 13.

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	43	55	413	242	993	881	2420	1820	591	386	328	185
2	42	58	378	236	e780	804	2260	1760	564	376	318	183
3	41	64	348	244	e550	731	2010	1660	484	362	311	193
4	42	82	314	349	e370	652	1720	1600	477	360	308	189
5	42	88	299	414	e250	662	1550	1620	462	354	305	188
6	42	86	297	407	e240	873	1910	1670	421	347	302	189
7	41	93	651	389	e240	1210	3810	1750	431	342	307	197
8	41	90	1170	375	e250	1430	5190	1660	512	346	317	199
9	41	84	955	556	e270	1770	3940	1430	494	345	324	203
10	42	87	1110	2990	e280	4330	3240	2300	470	355	308	203
11	43	87	1000	1970	e300	4760	2660	2360	457	356	318	203
12	43	91	845	1340	e320	5210	2540	1890	483	359	320	224
13	42	93	858	1070	e330	4410	2790	1530	491	375	321	235
14	45	120	911	893	e330	3630	3510	1300	421	377	312	233
15	48	119	755	760	e320	2580	4070	1180	394	390	306	231
16	44	113	618	702	e310	2150	4130	1080	455	391	298	232
17	43	151	512	773	e370	2000	3700	1000	434	398	297	223
18	46	e250	440	974	e800	1980	3280	1020	408	389	293	229
19	52	266	411	1230	e800	2130	3580	885	381	363	289	198
20	56	e270	384	1240	e800	2030	3480	704	372	354	292	191
21	56	e500	379	1130	e960	1970	3480	e630	400	349	289	191
22	54	e900	361	1090	1400	2620	3100	e620	390	357	294	196
23	51	1280	347	946	2060	2520	2580	e600	409	357	238	179
24	50	930	e310	797	1630	2430	2150	e590	399	357	192	173
25	50	668	e280	730	1410	2600	1900	560	378	355	169	207
26	52	533	e270	667	1320	3590	1900	491	368	347	145	221
27	50	427	e250	630	1170	3470	1830	479	344	347	137	209
28	52	453	e250	598	1000	3320	1860	530	276	343	158	205
29	54	520	e260	553	---	3340	1800	513	385	339	188	213
30	55	462	e260	677	---	2910	1750	622	392	341	186	221
31	55	---	255	893	---	2620	---	589	---	338	184	---
TOTAL	1458	9020	15891	25865	19853	75613	84140	36443	12943	11155	8354	6143
MEAN	47.0	301	513	834	709	2439	2805	1176	431	360	269	205
MAX	56	1280	1170	2990	2060	5210	5190	2360	591	398	328	235
MIN	41	55	250	236	240	652	1550	479	276	338	137	173
AC-FT	2890	17890	31520	51300	39380	150000	166900	72280	25670	22130	16570	12180

CAL YR 1988 TOTAL 160716 MEAN 439 MAX 2320 MIN 41 AC-FT 318800
WTR YR 1989 TOTAL 306878 MEAN 841 MAX 5210 MIN 41 AC-FT 608700

e Estimated

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 mi^2, 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 satellite telemeter at station.

AVERAGE DISCHARGE.--62 years (water years 1928-89), 463 ft^3/s, 335,400 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 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 10	1730	4,080	5.57	Mar. 27	0430	3,750	5.43
Feb. 23	0630	4,650	5.79	Apr. 9	0300	4,820	5.85
Mar. 12	1800	*6,300	*6.34				

Minimum discharge, 1.1 ft^3/s July 20, Aug. 7.

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	55	92	290	188	880	823	2800	1430	240	8.9	1.8	1.7
2	52	114	246	122	1010	716	2560	1410	170	5.0	1.6	1.7
3	53	126	195	96	833	628	2300	1330	131	2.2	1.6	2.2
4	51	134	161	110	809	573	1990	1320	113	1.8	1.7	3.6
5	51	155	132	221	e700	551	1570	1100	82	1.8	2.4	2.1
6	51	158	107	220	e620	816	1550	1100	50	1.9	3.0	2.4
7	50	163	93	199	e500	1000	2800	1240	21	2.0	1.9	2.1
8	48	186	712	174	e530	1270	4500	1230	17	2.9	1.9	1.9
9	50	180	855	188	e560	1410	4650	956	45	3.0	2.1	2.1
10	52	178	801	1950	e570	3490	3730	1280	62	2.0	2.9	1.9
11	53	173	919	2390	e580	4670	3200	1980	62	1.9	1.9	1.9
12	50	172	719	1450	e570	5460	2380	1550	46	2.6	2.1	1.9
13	51	175	590	982	e540	4800	2390	1140	53	1.7	1.7	1.7
14	50	182	657	779	e520	4260	2860	856	73	1.7	1.6	1.6
15	48	213	626	624	500	3140	3390	691	55	1.8	1.6	1.7
16	52	211	515	532	473	2320	3710	550	40	1.9	2.2	1.5
17	49	211	423	504	765	2120	3630	485	55	2.1	2.6	1.4
18	58	268	367	711	719	2030	3300	386	51	1.8	2.8	11
19	60	387	321	939	560	2170	3090	349	36	1.9	2.1	22
20	63	355	235	1040	560	2210	3140	218	14	1.4	1.8	25
21	72	345	191	981	1460	1970	3060	144	2.1	2.2	2.0	29
22	75	510	169	971	774	2480	2930	74	2.6	1.8	2.6	26
23	79	1110	178	848	2820	2910	2450	92	1.9	1.5	5.6	23
24	80	1150	135	699	2160	2660	1890	266	2.0	1.4	5.2	19
25	77	773	147	643	1710	2580	1500	245	2.1	1.4	2.0	33
26	80	590	184	577	1510	3340	1530	193	2.0	1.8	2.0	32
27	83	429	312	523	1360	3710	1490	158	1.9	5.9	2.5	43
28	85	345	287	486	1020	3570	1530	294	17	3.8	2.2	47
29	86	392	273	450	---	3520	1580	301	2.4	1.9	2.1	48
30	87	341	240	454	---	3440	1450	329	67	1.4	2.2	44
31	93	---	245	645	---	3120	---	329	---	2.3	2.8	---
TOTAL	1944	9818	11325	20696	25613	77757	78950	23026	1517.0	75.7	72.5	435.4
MEAN	62.7	327	365	668	915	2508	2632	743	50.6	2.44	2.34	14.5
MAX	93	1150	919	2390	2820	5460	4650	1980	240	8.9	5.6	48
MIN	48	92	93	96	473	551	1450	74	1.9	1.4	1.6	1.4
AC-FT	3860	19470	22460	41050	50800	154200	156600	45670	3010	150	144	864

CAL YR 1988 TOTAL 96943.47 MEAN 265 MAX 2600 MIN .79 AC-FT 192300
WTR YR 1989 TOTAL 251229.6 MEAN 688 MAX 5460 MIN 1.4 AC-FT 498300

e Estimated

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 mi^2.

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

CORRECTIONS.--The average discharge published in the report for 1988 should have been 27.2 ft^3/s, 19,710 acre-ft/yr.

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 fair except for estimated daily discharges, which are 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.--7 years, 24.4 ft^3/s, 16,950 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 445 ft^3/s Mar. 4, 1983, gage height, 6.93 ft; minimum discharge, 0.01 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 23	unknown	141	5.52	Apr. 2	1145	150	5.58
Mar. 10	0245	*180	*5.77				

Minimum daily discharge, 0.10 ft^3/s Oct. 9-11.

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	e.12	.87	6.5	5.9	28	34	e70	86	19	7.1	.38	.90
2	e.16	.85	6.5	6.0	e14	33	e60	71	19	7.1	.40	.85
3	e.14	1.3	6.1	6.5	e8.0	23	e50	66	18	6.2	.42	.85
4	e.14	1.2	5.8	7.3	e6.0	22	47	59	17	5.5	.40	.90
5	e.14	1.6	5.7	7.6	e6.5	26	44	58	17	4.9	.36	.85
6	e.14	2.2	6.2	7.8	e7.2	77	50	67	14	3.4	.35	.85
7	e.12	2.2	12	7.2	e8.0	98	86	70	12	3.8	.39	.85
8	e.12	1.9	12	7.7	e8.6	77	102	68	10	3.7	.46	.85
9	e.10	2.5	e11	11	e9.6	102	84	49	10	2.7	.58	.90
10	e.10	4.8	e11	45	e11	164	73	62	8.7	2.4	.70	.94
11	e.10	3.6	e11	34	e12	157	68	58	7.0	3.4	.69	1.0
12	e.12	3.7	e10	25	13	136	67	46	8.2	3.7	.63	1.0
13	e.14	5.3	e10	21	13	126	76	41	8.5	3.4	.63	1.1
14	e.14	5.6	e10	18	11	102	89	36	9.6	1.4	.67	1.1
15	e.14	6.4	8.4	16	10	83	97	34	12	1.6	.69	1.1
16	e.12	6.7	6.5	14	12	80	98	30	14	1.4	.68	1.1
17	e.12	8.6	6.4	14	15	74	86	29	12	1.6	.69	1.1
18	e.14	7.6	7.0	14	16	80	77	28	12	1.3	.63	1.3
19	e.16	6.9	8.6	17	e25	86	86	27	11	1.4	.66	1.4
20	e.20	6.8	8.0	18	e40	76	83	23	11	.84	.64	1.4
21	.26	6.3	7.7	20	e60	81	82	19	10	.44	.63	1.5
22	.45	7.9	7.5	21	e100	88	84	18	7.9	.38	.73	1.5
23	.56	10	6.7	18	e115	84	68	24	7.7	.31	2.9	1.5
24	.48	7.7	6.5	18	e100	78	57	21	4.6	.28	4.7	1.4
25	.25	6.9	5.8	17	e82	102	70	20	3.7	.27	2.0	1.4
26	.20	6.6	3.5	14	e75	107	83	16	3.0	.26	1.3	1.5
27	.18	5.9	4.4	14	e55	100	92	18	1.5	.29	1.4	1.5
28	.28	7.8	5.7	13	38	96	102	20	3.4	.27	1.3	1.5
29	.32	7.5	6.0	13	---	92	102	19	2.7	.28	.98	1.5
30	.32	6.3	6.9	17	---	87	96	21	4.3	.28	.93	1.5
31	.38	---	6.2	27	---	83	---	20	---	.30	.85	---
TOTAL	6.34	153.52	235.6	495.0	898.9	2654	2329	1224	298.8	70.20	28.77	35.14
MEAN	.20	5.12	7.60	16.0	32.1	85.6	77.6	39.5	9.96	2.26	.93	1.17
MAX	.56	10	12	45	115	164	102	86	19	7.1	4.7	1.5
MIN	.10	.85	3.5	5.9	6.0	22	44	16	1.5	.26	.35	.85
AC-FT	13	305	467	982	1780	5260	4620	2430	593	139	57	70

CAL YR 1988 TOTAL 3433.84 MEAN 9.38 MAX 63 MIN .01 AC-FT 6810
WTR YR 1989 TOTAL 8429.27 MEAN 23.1 MAX 164 MIN .10 AC-FT 16720

e Estimated

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 mi^2.

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 good except those for Jan. 8-13, which are fair. Diversion for irrigation of about 170 acres upstream from station.

AVERAGE DISCHARGE.--7 years, 3.30 ft^3/s, 2,390 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 190 ft^3/s Mar. 4, 1983, gage height, 4.90 ft, from rating curve extended above 82 ft^3/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 ft^3/s June 14, 1903, result of slope-area measurement (see WSP 96).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 60 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 22	1830	*27	*3.87				

Minimum discharge, 0.01 ft^3/s on Sept. 26.

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	.07	.09	.46	.59	4.4	6.1	5.9	4.9	1.6	.19	.08	.05
2	.07	.11	.45	.68	e2.7	6.0	5.7	5.5	1.8	.17	.18	.04
3	.05	.14	.45	.66	e2.4	5.4	4.4	5.2	1.5	.15	.22	.06
4	.04	.15	.46	.67	e2.2	5.4	4.7	4.7	1.3	.14	.08	.06
5	.04	.13	.48	.76	e2.4	6.6	5.0	3.9	1.3	.14	.07	.06
6	.04	.18	.49	.73	e2.6	11	4.7	4.1	1.1	.13	.06	.07
7	.04	.15	.51	.76	e2.9	11	4.5	3.8	.98	.13	.05	.08
8	.13	.18	.50	.82	e3.1	10	4.0	3.7	.93	.12	.05	.06
9	.13	.18	.53	.94	e3.3	10	4.0	3.6	.84	.13	.05	.06
10	.06	.27	.52	e3.0	e3.5	11	4.0	3.8	.81	.11	.04	.08
11	.05	.21	.52	e2.6	e3.3	9.9	3.8	3.4	.77	.10	.04	.07
12	.05	.23	.52	e2.0	e3.0	9.2	3.2	3.9	.96	.10	.04	.07
13	.05	.24	.52	e1.8	e2.8	9.6	2.9	4.3	.78	.09	.04	.07
14	.06	.33	.53	e1.6	e2.6	10	2.6	3.9	.72	.09	.03	.06
15	.05	.32	.53	1.5	e2.4	10	1.5	3.8	.71	.09	.03	.06
16	.04	.31	.52	1.5	e2.6	11	1.2	3.9	.82	.11	.03	.07
17	.04	.43	.49	1.7	2.9	11	1.6	3.7	.89	.13	.04	.08
18	.03	.36	.50	1.8	3.2	14	1.8	3.6	.84	.14	.03	.08
19	.02	.38	.54	2.1	3.3	15	1.8	3.5	.58	.13	.02	.07
20	.02	.38	.53	2.3	4.1	12	1.8	3.3	.57	.10	.02	.08
21	.02	.38	.54	2.6	5.5	11	1.8	3.0	.55	.09	.02	.07
22	.02	.40	.55	2.8	13	11	2.0	2.9	.53	.09	.08	.06
23	.02	.40	.54	2.6	13	9.8	1.9	3.2	.50	.09	.17	.06
24	.02	.41	.55	2.4	12	9.0	1.7	2.7	.39	.08	.07	.06
25	.02	.43	.55	2.7	9.4	8.5	2.3	2.1	.38	.07	.06	.06
26	.03	.41	.53	e2.4	7.9	7.7	3.0	1.6	.31	.08	.06	.06
27	.05	.44	.57	e2.3	6.9	6.6	3.2	.81	.22	.08	.06	.05
28	.06	.45	.55	e2.2	6.4	5.7	4.6	1.4	.20	.07	.05	.06
29	.07	.45	.58	e2.4	---	6.4	5.4	1.6	.24	.07	.05	.06
30	.08	.46	.61	3.5	---	6.2	5.3	1.4	.21	.07	.05	.06
31	.09	---	.58	4.8	---	6.0	---	1.4	---	.23	.04	---
TOTAL	1.56	9.00	16.20	59.21	133.8	282.1	100.3	102.61	23.33	3.51	1.91	1.93
MEAN	.050	.30	.52	1.91	4.78	9.10	3.34	3.31	.78	.11	.062	.064
MAX	.13	.46	.61	4.8	13	15	5.9	5.5	1.8	.23	.22	.08
MIN	.02	.09	.45	.59	2.2	5.4	1.2	.81	.20	.07	.02	.04
AC-FT	3.1	18	32	117	265	560	199	204	46	7.0	3.8	3.8

CAL YR 1988 TOTAL 378.59 MEAN 1.03 MAX 12 MIN .01 AC-FT 751
WTR YR 1989 TOTAL 735.46 MEAN 2.01 MAX 15 MIN .02 AC-FT 1460

e Estimated

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 mi^2.

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, 4,580 acre-ft Feb. 25, elevation, 2,064.95 ft; minimum contents, 3,580 acre-ft Nov. 12, 13, elevation, 2,056.84 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 1988 TO SEPTEMBER 1989
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2059.37	2057.14	2058.03	2060.53	2064.06	2063.76	2062.63	2063.10	2063.17	2062.04	2060.86	2059.24
2	2059.16	2057.09	2058.07	2060.59	2063.98	2063.41	2062.24	2062.94	2063.22	2062.06	2060.81	2059.19
3	2059.04	2057.05	2058.11	2060.65	2063.88	2063.09	2062.11	2062.88	2063.24	2062.09	2060.75	2059.13
4	2058.98	2057.02	2058.14	2060.74	2063.83	2062.97	2062.18	2062.90	2063.28	2062.10	2060.69	2059.06
5	2058.92	2056.97	2058.21	2060.85	2063.79	2063.17	2062.30	2062.93	2063.30	2062.10	2060.63	2059.02
6	2058.85	2056.95	2058.25	2060.95	2063.84	2063.61	2062.53	2063.02	2063.27	2062.11	2060.57	2058.95
7	2058.80	2056.92	2058.41	2061.05	2063.86	2063.92	2063.03	2063.03	2063.21	2062.09	2060.51	2058.90
8	2058.73	2056.88	2058.58	2061.17	2063.86	2063.94	2063.38	2062.97	2063.13	2062.08	2060.45	2058.84
9	2058.66	2056.87	2058.73	2061.37	2063.86	2064.06	2063.49	2062.95	2063.02	2062.05	2060.38	2058.78
10	2058.60	2056.86	2058.90	2061.94	2063.85	2064.42	2063.42	2063.17	2062.90	2062.04	2060.32	2058.73
11	2058.53	2056.85	2059.05	2062.32	2063.82	2064.38	2063.25	2063.21	2062.76	2062.02	2060.24	2058.66
12	2058.46	2056.84	2059.18	2062.48	2063.77	2063.94	2063.11	2063.09	2062.71	2062.01	2060.15	2058.60
13	2058.41	2056.86	2059.29	2062.44	2063.75	2063.48	2063.01	2062.87	2062.69	2061.98	2060.10	2058.56
14	2058.33	2056.93	2059.43	2062.37	2063.69	2063.16	2063.10	2062.60	2062.72	2061.94	2060.01	2058.52
15	2058.25	2056.95	2059.52	2062.28	2063.61	2062.93	2063.27	2062.55	2062.81	2061.88	2059.94	2058.45
16	2058.20	2057.03	2059.58	2062.15	2063.59	2062.89	2063.53	2062.66	2062.89	2061.85	2059.86	2058.40
17	2058.12	2057.13	2059.63	2062.16	2063.61	2063.00	2063.69	2062.81	2062.92	2061.83	2059.80	2058.35
18	2058.05	2057.19	2059.68	2062.24	2063.70	2063.12	2063.64	2062.91	2062.94	2061.81	2059.75	2058.32
19	2057.99	2057.27	2059.78	2062.39	2063.77	2063.32	2063.58	2063.03	2062.91	2061.76	2059.66	2058.26
20	2057.92	2057.30	2059.88	2062.60	2064.03	2063.40	2063.50	2063.09	2062.84	2061.69	2059.60	2058.23
21	2057.84	2057.39	2059.95	2062.84	2064.19	2063.41	2063.44	2063.08	2062.71	2061.64	2059.54	2058.19
22	2057.78	2057.45	2060.05	2063.10	2064.56	2063.59	2063.38	2063.05	2062.60	2061.57	2059.53	2058.13
23	2057.71	2057.53	2060.13	2063.25	2064.86	2063.64	2063.14	2063.15	2062.51	2061.52	2059.55	2058.10
24	2057.65	2057.67	2060.17	2063.36	2064.93	2063.54	2062.72	2063.15	2062.38	2061.45	2059.58	2058.05
25	2057.59	2057.68	2060.22	2063.44	2064.93	2063.55	2062.82	2063.14	2062.23	2061.38	2059.57	2058.01
26	2057.52	2057.72	2060.22	2063.49	2064.92	2063.61	2062.94	2063.04	2062.13	2061.31	2059.55	2057.97
27	2057.44	2057.79	2060.23	2063.52	2064.76	2063.63	2063.01	2062.99	2062.04	2061.24	2059.52	2057.93
28	2057.37	2057.84	2060.29	2063.53	2064.29	2063.58	2063.13	2062.98	2062.03	2061.17	2059.47	2057.87
29	2057.32	2057.91	2060.39	2063.55	---	2063.45	2063.20	2062.95	2062.02	2061.08	2059.42	2057.85
30	2057.25	2057.98	2060.44	2063.61	---	2063.23	2063.18	2063.00	2062.03	2061.03	2059.37	2057.79
31	2057.20	---	2060.46	2063.78	---	2062.95	---	2063.10	---	2060.94	2059.31	---
MAX	2059.37	2057.98	2060.46	2063.78	2064.93	2064.42	2063.69	2063.21	2063.30	2062.11	2060.86	2059.24
MIN	2057.20	2056.84	2058.03	2060.53	2063.59	2062.89	2062.11	2062.55	2062.02	2060.94	2059.31	2057.79
(†)	3620	3710	4010	4430	4490	4320	4350	4340	4200	4070	3870	3690
(‡)	-280	+90	+300	+420	+60	-170	+30	-10	-140	-130	-200	-180

CAL YR 1988 MAX -- MIN -- AC-FT‡ +220
WTR YR 1989 MAX 2064.93 MIN 2056.84 AC-FT‡ -210

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

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 mi^2.

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.--Records good. 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 ft^3/s, 13,840 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 812 ft^3/s May 10, 1957, gage height, 6.15 ft, from rating curve extended above 230 ft^3/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 ft^3/s June 14, 1903, result of slope-area measurement (see WSP 96). Discharge for flood of Feb. 22, 1949, was 1,700 ft^3/s, result of slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 129 ft^3/s Mar. 12, gage-height, 4.39 ft; minimum discharge, 2.6 ft^3/s Jan. 6.

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	12	3.6	3.0	3.0	20	60	85	88	16	3.0	3.0	3.0
2	12	3.6	3.0	3.0	20	50	85	88	16	3.0	3.0	3.0
3	6.9	3.6	3.0	3.0	20	44	63	80	16	3.3	3.0	3.0
4	3.9	3.5	3.0	2.8	20	31	46	69	16	3.0	3.0	3.1
5	3.9	3.2	3.0	2.9	20	25	43	65	16	3.0	3.0	3.1
6	3.6	3.2	3.0	2.8	20	44	43	65	16	2.9	3.0	3.1
7	3.6	3.1	3.0	2.7	19	66	49	65	16	3.0	3.0	3.2
8	3.7	3.1	3.0	2.8	18	72	68	65	16	3.0	3.0	3.1
9	3.7	3.1	3.0	2.8	17	73	76	57	16	3.0	3.1	3.1
10	3.7	3.0	3.0	2.8	17	94	76	52	16	3.0	3.1	3.1
11	3.7	3.0	3.0	7.9	17	114	76	58	16	3.0	3.1	3.1
12	3.7	3.0	3.0	18	17	125	76	63	12	3.0	3.1	3.1
13	3.7	3.0	3.0	23	17	120	75	63	8.2	3.0	3.1	3.1
14	3.7	3.0	3.0	23	17	110	75	63	7.1	3.0	3.1	3.5
15	3.7	3.0	3.0	23	17	98	76	42	6.8	3.0	3.1	3.1
16	3.7	3.0	3.0	23	17	87	76	27	8.2	3.0	3.1	3.1
17	3.7	3.1	3.0	15	17	81	76	25	8.8	3.0	3.1	3.1
18	3.7	3.0	3.0	10	17	79	82	25	8.8	3.0	3.1	3.1
19	3.7	3.0	3.0	10	17	79	85	25	12	3.0	3.1	3.1
20	3.7	3.0	3.0	10	17	81	85	25	14	3.0	3.1	3.1
21	3.7	3.0	3.0	9.8	28	85	85	25	18	3.0	3.1	3.1
22	3.7	3.0	3.0	9.1	42	85	85	25	15	3.0	3.0	3.1
23	3.7	3.0	3.0	9.4	48	85	85	25	12	2.9	3.1	3.1
24	3.7	3.0	3.0	12	55	85	85	25	12	3.2	3.0	3.1
25	3.7	3.0	3.0	15	60	85	65	25	12	3.0	3.0	3.0
26	3.6	3.0	3.0	15	61	85	75	25	8.0	3.0	3.0	2.9
27	3.6	3.0	3.0	16	60	85	85	25	5.6	2.9	3.0	2.9
28	3.6	3.0	3.0	16	60	85	87	25	4.6	3.0	3.0	2.9
29	3.6	3.0	3.0	16	---	85	88	25	3.0	3.0	3.0	2.9
30	3.6	3.0	3.0	18	---	85	88	19	3.0	3.0	3.0	2.9
31	3.6	---	3.0	18	---	85	---	16	---	3.0	3.0	---
TOTAL	134.1	93.1	93.0	345.8	775	2468	2244	1370	355.1	93.2	94.4	92.1
MEAN	4.33	3.10	3.00	11.2	27.7	79.6	74.8	44.2	11.8	3.01	3.05	3.07
MAX	12	3.6	3.0	23	61	125	88	88	18	3.3	3.1	3.5
MIN	3.6	3.0	3.0	2.7	17	25	43	16	3.0	2.9	3.0	2.9
AC-FT	266	185	184	686	1540	4900	4450	2720	704	185	187	183

CAL YR 1988 TOTAL 3468.3 MEAN 9.48 MAX 27 MIN 2.9 AC-FT 6880
WTR YR 1989 TOTAL 8157.8 MEAN 22.4 MAX 125 MIN 2.7 AC-FT 16180

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 mi^2, 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 ft^3/s, which are fair. No regulation. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--29 years, 23.0 ft^3/s, 16,660 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,280 ft^3/s June 10, 1969, gage height, 7.05 ft, site and datum then in use, from rating curve extended above 130 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 9	2030	*225	*3.74				

Minimum discharge, 0.85 ft^3/s Aug. 7.

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	3.1	3.7	5.6	7.6	e23	21	67	87	19	8.4	3.4	3.6
2	3.9	4.7	5.9	8.3	e15	20	67	79	17	8.0	3.9	4.0
3	3.9	5.6	5.8	9.7	e13	17	62	73	17	7.6	4.3	3.2
4	3.7	5.3	4.9	10	e11	16	59	66	16	7.2	4.4	3.2
5	3.7	5.4	5.3	10	e12	28	56	58	15	7.0	3.8	2.7
6	3.4	6.8	6.5	9.8	e14	113	57	56	14	7.0	e1.4	2.7
7	3.7	6.5	12	9.1	e15	117	61	50	12	6.8	1.9	2.9
8	2.7	6.4	12	9.5	e16	94	65	46	11	6.5	2.1	3.0
9	2.7	5.9	12	12	e18	158	62	41	11	6.5	3.7	2.7
10	2.3	6.2	12	23	19	186	60	52	10	6.5	2.4	2.6
11	2.5	6.6	9.0	21	13	172	57	41	9.0	6.3	2.2	2.5
12	3.0	6.1	8.5	19	12	148	56	35	8.4	6.0	2.4	2.5
13	3.1	6.2	9.1	18	11	147	55	32	8.5	5.8	2.6	2.5
14	3.3	6.4	8.8	16	9.6	127	58	30	8.6	5.3	2.2	2.5
15	3.3	7.8	6.9	15	9.0	108	61	28	9.5	3.9	2.6	2.0
16	3.1	7.7	7.8	15	9.3	106	62	27	12	3.8	2.7	2.4
17	3.1	8.7	7.2	14	12	101	59	26	9.8	6.4	3.6	2.8
18	3.4	7.2	6.4	16	13	137	54	25	9.3	5.9	3.8	4.8
19	3.9	6.4	8.0	21	15	132	53	23	8.9	5.1	3.6	4.2
20	4.1	6.3	7.7	23	22	108	52	22	9.1	5.3	3.9	3.7
21	3.5	6.6	7.3	24	33	113	55	21	8.5	4.8	4.0	3.5
22	3.1	8.6	7.0	24	90	106	61	20	8.3	4.7	8.9	3.4
23	3.1	12	6.7	21	98	93	55	22	8.2	4.5	13	3.3
24	3.1	7.5	e6.2	e20	85	86	49	22	8.0	4.2	12	3.0
25	3.3	6.7	e5.9	19	58	97	61	21	7.8	3.8	7.0	2.8
26	3.4	6.5	e5.8	18	43	91	91	20	7.4	3.8	5.4	3.8
27	3.4	5.1	e5.9	18	32	85	122	22	6.8	3.8	5.2	4.2
28	3.4	7.7	6.0	17	24	83	122	23	7.0	3.2	4.5	3.7
29	3.6	6.5	6.5	17	---	78	108	23	7.7	2.0	4.4	3.6
30	3.9	5.0	8.8	e21	---	72	94	23	8.0	1.9	4.7	3.2
31	3.7	---	8.1	e26	---	73	---	20	---	2.9	4.7	---
TOTAL	103.4	198.1	235.6	512.0	744.9	3033	2001	1134	312.8	164.9	134.7	95.0
MEAN	3.34	6.60	7.60	16.5	26.6	97.8	66.7	36.6	10.4	5.32	4.35	3.17
MAX	4.1	12	12	26	98	186	122	87	19	8.4	13	4.8
MIN	2.3	3.7	4.9	7.6	9.0	16	49	20	6.8	1.9	1.4	2.0
AC-FT	205	393	467	1020	1480	6020	3970	2250	620	327	267	188

CAL YR 1988 TOTAL 3883.74 MEAN 10.6 MAX 159 MIN .92 AC-FT 7700
WTR YR 1989 TOTAL 8669.4 MEAN 23.8 MAX 186 MIN 1.4 AC-FT 17200

e Estimated

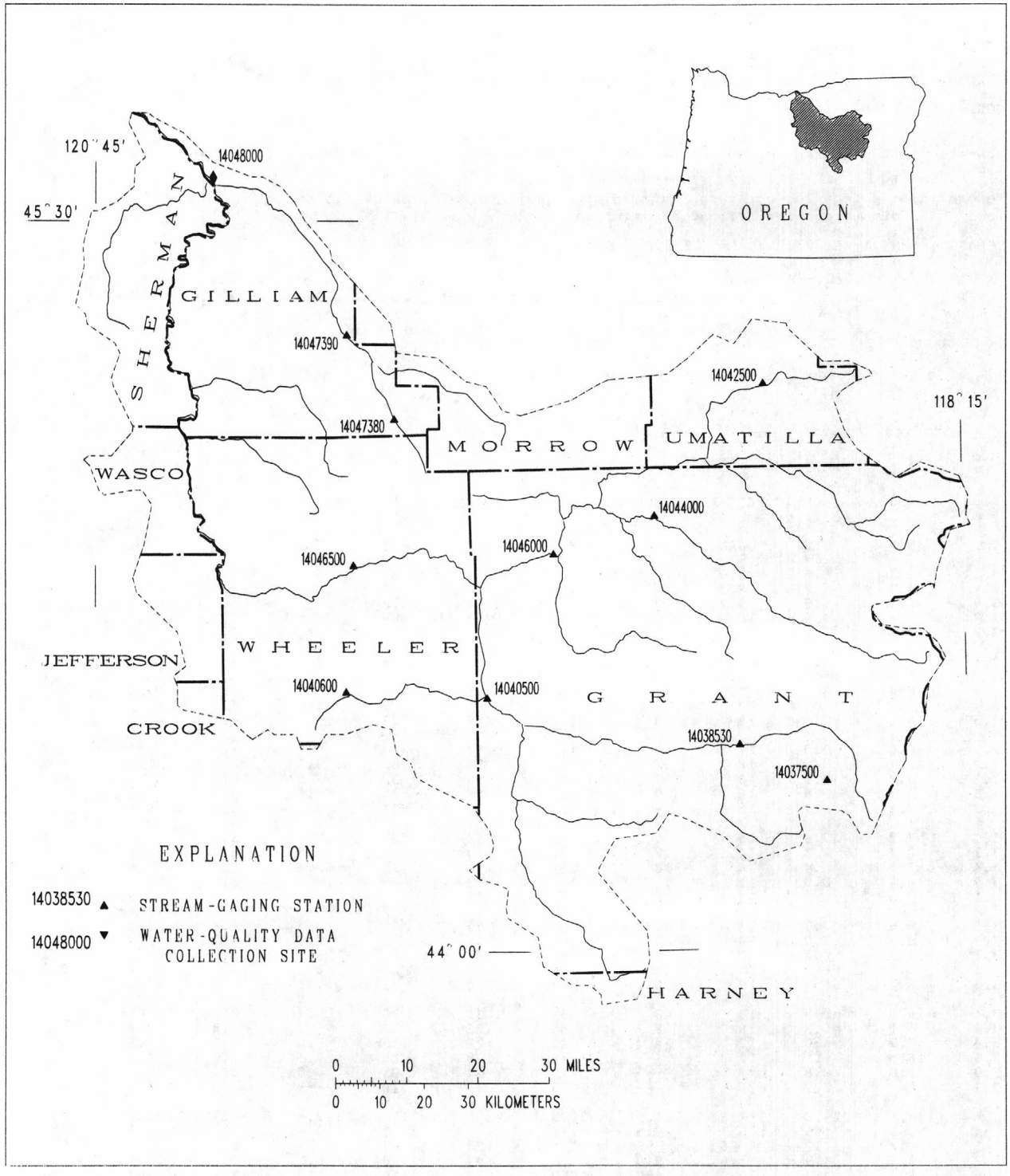

Figure 6.--Location of surface-water and water-quality stations in the John Day River basin.

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 mi^2.

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.--59 years, 12.9 ft^3/s, 25.03 in/yr, 9,350 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 354 ft^3/s May 31, 1983, gage height, 2.45 ft, from rating curve extended above 190 ft^3/s; maximum gage height, 3.23 ft May 24, 1956 (backwater from logs); minimum discharge, 1.0 ft^3/s Mar. 20, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 104 ft^3/s May 11, gage height, 1.73 ft; minimum discharge, 1.4 ft^3/s Oct. 21 to Nov. 2.

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	2.1	1.4	2.4	2.4	1.9	1.7	3.9	16	21	20	7.9	4.6
2	2.1	1.9	2.4	2.4	e1.8	1.7	3.9	16	23	19	7.9	4.6
3	2.1	2.1	2.4	2.4	e1.7	1.7	3.7	16	27	18	7.7	4.4
4	2.1	1.8	2.4	2.4	e1.6	1.7	3.5	16	28	17	7.3	4.2
5	2.1	1.8	2.4	2.4	e1.5	1.8	3.6	18	36	16	7.0	4.2
6	2.1	2.2	2.4	2.4	e1.5	1.9	4.1	23	51	16	6.8	4.2
7	2.1	2.0	2.4	2.3	e1.6	1.9	5.4	34	60	16	6.8	4.2
8	2.1	2.1	2.4	2.1	e1.7	2.0	7.1	38	63	16	6.7	4.0
9	2.1	2.1	2.8	2.2	e1.8	3.6	7.3	41	64	16	6.3	3.9
10	2.1	2.1	2.9	2.2	e2.0	4.3	7.3	57	63	15	6.1	3.9
11	2.1	2.1	2.9	2.1	e2.3	4.7	7.3	82	60	14	5.9	3.9
12	2.1	2.2	2.9	2.1	e2.2	5.0	7.5	65	56	14	5.9	3.9
13	2.0	2.1	2.9	2.1	e2.1	4.9	8.1	56	55	14	5.9	3.9
14	1.9	2.1	2.9	2.1	e2.0	4.6	9.3	45	58	14	5.9	3.9
15	1.9	2.2	e2.4	2.1	e2.0	4.4	11	37	63	14	5.6	3.9
16	1.9	2.2	e2.4	2.1	e2.0	4.2	14	32	70	13	5.4	3.9
17	1.9	2.2	2.7	2.1	e2.1	3.9	14	30	66	13	5.1	4.1
18	1.7	2.1	2.7	2.1	2.2	3.9	16	30	52	13	4.6	3.9
19	1.7	2.1	2.5	2.1	2.3	3.8	19	28	45	12	4.5	3.9
20	1.7	2.1	2.4	2.1	2.0	3.6	22	28	40	12	4.2	3.9
21	1.6	2.2	2.4	2.1	1.9	3.8	23	28	35	11	4.2	3.9
22	1.4	2.7	2.4	2.1	2.3	3.9	22	28	31	11	5.0	3.7
23	1.4	2.7	2.4	e1.8	2.0	3.9	21	28	30	10	5.7	3.5
24	1.4	2.6	2.4	e1.7	1.9	3.9	19	28	29	10	4.9	3.5
25	1.4	2.7	2.4	e1.7	1.8	4.3	18	27	27	10	4.6	3.5
26	1.4	2.7	e2.0	e1.8	1.7	4.6	17	26	26	9.8	4.6	3.5
27	1.6	2.6	e1.9	e1.8	1.7	4.5	16	25	25	9.4	4.6	3.2
28	1.7	2.7	e2.0	e1.8	1.7	4.5	16	24	24	9.1	4.6	3.2
29	1.6	2.7	e2.2	e1.8	---	4.2	15	23	22	9.1	4.6	3.2
30	1.4	2.5	2.4	1.9	---	4.2	16	22	21	8.8	4.7	3.2
31	1.4	---	2.4	1.9	---	3.9	---	21	---	8.4	4.6	---
TOTAL	56.2	67.0	76.5	64.6	53.3	111.0	361.0	988	1271	408.6	175.6	115.8
MEAN	1.81	2.23	2.47	2.08	1.90	3.58	12.0	31.9	42.4	13.2	5.66	3.86
MAX	2.1	2.7	2.9	2.4	2.3	5.0	23	82	70	20	7.9	4.6
MIN	1.4	1.4	1.9	1.7	1.5	1.7	3.5	16	21	8.4	4.2	3.2
AC-FT	111	133	152	128	106	220	716	1960	2520	810	348	230
CFSM	.26	.32	.35	.30	.27	.51	1.72	4.55	6.05	1.88	.81	.55
IN.	.30	.36	.41	.34	.28	.59	1.92	5.25	6.75	2.17	.93	.62

CAL YR 1988 TOTAL 2834.4 MEAN 7.74 MAX 58 MIN 1.4 AC-FT 5620 CFSM 1.11 IN. 15.06
WTR YR 1989 TOTAL 3748.6 MEAN 10.3 MAX 82 MIN 1.4 AC-FT 7440 CFSM 1.47 IN. 19.92

e Estimated

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 mi^2.

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 those for Dec. 15 to Mar. 14 and Apr. 7-17, which are fair. No regulation upstream. Many diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--21 years, 214 ft^3/s, 155,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,830 ft^3/s June 9, 1969, gage height, 10.80 ft, from floodmark; minimum discharge, 3.5 ft^3/s Aug. 26-28, 1969.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 22	1800	1,150	6.00	Apr. 20	0530	809	5.61
Mar. 6	1730	*2,530	*7.96	May 10	1400	2,130	7.50
Mar. 9	1900	2,020	7.40				

Minimum discharge, 24 ft^3/s Aug. 2, 3, 5, 6.

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	70	66	91	101	128	372	380	385	191	e100	26	92
2	70	69	90	92	95	418	398	383	203	e99	26	90
3	69	82	89	89	64	235	355	381	276	e96	25	85
4	68	82	86	86	e54	190	323	379	344	e93	26	83
5	69	78	86	87	e46	259	299	396	315	e90	26	77
6	66	82	91	84	e46	e1650	328	507	300	e88	25	73
7	61	79	101	84	e50	987	e450	797	280	86	27	68
8	60	80	97	e86	e58	674	e600	828	269	83	29	66
9	59	77	115	e90	e65	1470	e530	858	254	85	35	65
10	59	79	122	144	e80	1040	e450	1850	236	81	35	69
11	59	78	108	130	e100	782	e430	1290	217	73	33	68
12	61	82	105	e122	e130	663	e430	1010	204	71	32	64
13	62	85	106	114	e115	583	e450	834	206	65	32	66
14	61	87	103	106	e110	455	e500	704	224	61	32	62
15	64	87	85	104	e105	385	e550	602	379	64	35	61
16	66	87	e80	101	e108	371	e620	513	452	79	35	61
17	68	89	e78	99	e110	390	e700	463	295	73	34	80
18	72	86	e78	99	101	415	686	504	249	69	31	130
19	72	82	e84	e98	158	548	767	444	217	67	32	100
20	71	85	90	e98	169	400	785	388	212	63	34	93
21	69	85	92	103	159	470	778	337	195	61	33	99
22	68	94	91	111	571	446	712	334	175	60	41	98
23	66	136	88	101	962	393	583	330	164	57	152	94
24	64	103	84	74	740	378	505	316	146	51	164	94
25	65	98	85	e62	579	468	487	300	127	48	111	90
26	65	95	79	e64	476	480	450	264	123	45	90	88
27	65	86	57	e76	349	429	419	269	111	44	82	89
28	68	112	e60	e76	326	543	408	265	113	39	77	89
29	68	104	e60	e78	---	512	387	253	109	28	75	90
30	67	94	e80	e86	---	445	378	241	e105	26	96	95
31	67	---	e129	e100	---	432	---	205	---	28	105	---
TOTAL	2039	2629	2790	2945	6054	17283	15138	16630	6691	2073	1636	2479
MEAN	65.8	87.6	90.0	95.0	216	558	505	536	223	66.9	52.8	82.6
MAX	72	136	129	144	962	1650	785	1850	452	100	164	130
MIN	59	66	57	62	46	190	299	205	105	26	25	61
AC-FT	4040	5210	5530	5840	12010	34280	30030	32990	13270	4110	3250	4920

CAL YR 1988 TOTAL 35898 MEAN 98.1 MAX 302 MIN 10 AC-FT 71200
WTR YR 1989 TOTAL 78387 MEAN 215 MAX 1850 MIN 25 AC-FT 155500

e Estimated

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 mi^2, 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.--Records good except for estimated daily discharges, which are poor. No regulation. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--63 years, 501 ft^3/s, 363,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,170 ft^3/s Dec. 22, 1964, gage height, 14.97 ft; minimum discharge, 1.0 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 23	0500	2,040	7.97	Apr. 8	1530	2,550	8.66
Mar. 10	0230	*5,000	*11.21	May 11	0330	4,410	10.68
Mar. 28	2130	2,420	8.50				

Minimum discharge, 15 ft^3/s Aug. 11, result of momentary blockage upstream.

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	e80	115	209	221	321	751	1800	1800	612	225	51	153
2	e80	114	207	216	e250	863	1770	1760	571	230	49	144
3	e80	135	207	212	e190	656	1610	1680	569	220	47	136
4	e80	153	201	215	e170	554	1500	1610	652	202	42	138
5	e80	151	195	218	e170	594	1420	1560	645	193	38	133
6	e78	147	199	209	e190	1880	1540	1630	619	182	35	131
7	e76	152	207	199	e220	2580	1960	1930	600	169	33	128
8	e72	155	235	202	e250	1750	2440	2180	560	154	33	122
9	e70	156	240	215	e280	2960	2390	2110	516	149	33	115
10	e70	160	310	314	e350	4260	2160	3530	493	152	34	111
11	e70	161	294	338	e350	3390	1960	3770	472	143	32	111
12	e70	159	270	302	e320	3130	1920	2800	442	132	29	112
13	e70	169	259	275	289	2680	1920	2350	411	126	22	114
14	73	180	255	265	279	2130	2040	2030	410	120	19	110
15	92	178	230	267	252	1770	2210	1820	444	116	19	107
16	92	177	199	258	246	1640	2380	1610	736	121	20	105
17	96	184	209	255	271	1520	2350	1450	592	128	18	118
18	97	183	231	256	338	1520	2210	1410	511	137	18	162
19	97	176	222	260	461	1670	2260	1350	454	131	20	179
20	102	174	222	259	516	1530	2250	1220	414	126	21	164
21	106	176	220	276	502	1580	2160	1080	404	119	22	156
22	107	196	219	291	738	1870	2090	1020	376	116	26	158
23	114	317	211	269	1630	1700	1820	972	359	108	65	155
24	117	278	207	227	1440	1650	1610	953	336	102	210	153
25	117	238	203	242	1200	2000	1620	914	310	99	214	152
26	118	227	e170	263	1030	2180	1790	864	289	90	180	152
27	120	217	e150	254	868	1970	1910	817	262	83	152	151
28	123	216	e160	253	716	2090	1900	848	248	75	142	151
29	125	245	e170	258	---	2180	1830	772	234	66	127	150
30	117	228	191	264	---	1940	1810	752	223	61	135	153
31	116	---	231	279	---	1890	---	668	---	56	158	---
TOTAL	2905	5517	6733	7832	13837	58878	58630	49260	13764	4131	2044	4124
MEAN	93.7	184	217	253	494	1899	1954	1589	459	133	65.9	137
MAX	125	317	310	338	1630	4260	2440	3770	736	230	214	179
MIN	70	114	150	199	170	554	1420	668	223	56	18	105
AC-FT	5760	10940	13350	15530	27450	116800	116300	97710	27300	8190	4050	8180

CAL YR 1988 TOTAL 80349.9 MEAN 220 MAX 876 MIN 9.3 AC-FT 159400
WTR YR 1989 TOTAL 227655 MEAN 624 MAX 4260 MIN 18 AC-FT 451600

e Estimated

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 mi^2.

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 for estimated daily discharges and those below 1.0 ft^3/s, which are poor. Several diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--23 years (1966-89), 11.5 ft^3/s, 8,330 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 538 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 26	1200	(a)	*2.44	Apr. 26	1630	*164	2.23
Mar. 6	1700	89	1.88	May 6	0030	87	1.87
Mar. 11	2030	91	1.89	May 10	0130	96	1.92

Minimum discharge, 0.06 ft^3/s Oct. 11.
(a) Backwater from ice.

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	.16	.14	e8.5	2.9	e2.5	e8.6	30	83	14	3.8	.92	1.3
2	.15	.20	6.5	2.7	e1.7	e6.9	28	72	13	3.5	1.0	1.3
3	.14	.36	5.3	3.0	e1.6	e7.0	25	64	12	3.1	1.0	1.2
4	.15	.27	8.5	3.5	e1.4	18	21	62	12	2.7	1.0	1.2
5	.14	.27	11	3.2	e1.4	28	25	59	11	2.7	.97	1.1
6	.14	.36	22	3.0	e1.5	53	42	71	10	2.6	.96	1.1
7	.14	.36	4.9	2.9	e1.6	28	59	63	9.4	2.0	1.0	1.1
8	.14	.36	4.3	2.8	e1.6	26	62	57	8.8	2.1	1.1	1.1
9	.14	.40	7.0	3.3	e1.8	57	51	60	8.4	2.2	1.2	1.1
10	.14	.83	5.7	e3.5	e2.1	69	43	75	7.8	2.2	1.1	1.0
11	.10	.57	4.3	e3.4	e2.4	84	40	54	6.0	2.0	1.0	.98
12	.14	.63	3.8	e3.3	e2.7	67	42	47	4.4	1.9	.97	.97
13	.14	.85	4.0	e3.3	e3.0	61	44	43	5.6	1.8	.93	.93
14	.14	1.5	e3.5	e3.3	e3.0	39	52	40	6.8	1.8	.89	.93
15	.14	1.0	e3.0	e3.3	3.0	31	59	37	9.9	1.8	.79	.93
16	.14	1.5	e2.7	e3.4	2.9	31	58	33	9.8	2.0	.82	.95
17	.14	2.0	e2.5	e3.4	3.3	28	50	31	7.4	2.2	.81	1.5
18	.14	1.3	e2.5	3.4	e5.0	29	49	29	6.5	1.8	.79	1.8
19	.14	3.1	e2.6	3.4	e7.0	27	52	27	5.8	1.7	.79	1.4
20	.14	2.1	e3.0	3.4	e10	19	49	24	5.7	1.6	.77	1.3
21	.14	3.4	e3.3	3.4	e17	28	59	22	5.4	1.3	.79	1.2
22	.14	13	e3.3	3.4	e34	34	57	22	5.1	1.3	1.5	1.1
23	.14	7.2	e3.3	e2.5	e30	29	44	24	4.2	1.2	2.4	1.0
24	.14	4.2	e3.3	e2.3	e25	30	53	22	3.8	1.1	1.9	.99
25	.14	3.4	e3.0	e2.3	e20	67	99	22	3.7	1.1	1.6	1.1
26	.14	e2.6	e2.5	e2.6	e16	54	118	20	3.6	.89	1.5	1.2
27	.14	e3.5	e2.3	e2.7	e13	37	113	22	3.6	.75	1.3	1.2
28	.14	e5.0	e2.3	e2.8	e10	46	112	21	3.8	.68	1.2	1.1
29	.14	e7.0	e2.5	e3.0	---	37	95	20	3.6	.79	1.2	1.1
30	.14	9.6	e2.8	e3.2	---	32	88	18	3.5	.76	1.8	1.1
31	.14	---	3.1	e3.0	---	32	---	16	---	.81	1.5	---
TOTAL	4.34	77.00	147.3	95.6	224.5	1143.5	1719	1260	214.6	56.18	35.50	34.28
MEAN	.14	2.57	4.75	3.08	8.02	36.9	57.3	40.6	7.15	1.81	1.15	1.14
MAX	.16	13	22	3.5	34	84	118	83	14	3.8	2.4	1.8
MIN	.10	.14	2.3	2.3	1.4	6.9	21	16	3.5	.68	.77	.93
AC-FT	8.6	153	292	190	445	2270	3410	2500	426	111	70	68

CAL YR 1988 TOTAL 1490.85 MEAN 4.07 MAX 37 MIN .01 AC-FT 2960
WTR YR 1989 TOTAL 5011.80 MEAN 13.7 MAX 118 MIN .10 AC-FT 9940

e Estimated

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 mi^2.

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.--53 years (water years 1915-17, 1922-23, 1942-89), 96.3 ft^3/s, 69,770 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,840 ft^3/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 ft^3/s Aug. 9, 1932, June 24 to July 2, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 550 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 11	1830	*1,640	*3.66	Apr. 7	2230	1,020	3.05
Mar. 21	2100	659	2.61	Apr. 15	2200	666	2.62
Mar. 25	2100	681	2.64	May 10	1200	904	2.92

Minimum discharge, 2.9 ft^3/s Aug. 6, 7.

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	4.6	3.9	e15	e32	e27	89	283	309	77	14	3.7	6.8
2	4.4	4.8	e21	e31	e22	72	305	299	76	13	3.6	6.6
3	4.3	5.0	e24	e29	e18	67	270	272	79	11	3.8	6.1
4	4.3	5.0	e22	e28	e15	121	251	251	80	10	3.4	5.8
5	4.1	5.3	e21	e27	e15	98	275	252	70	9.7	3.3	5.6
6	4.1	7.8	e24	e26	e16	144	473	403	63	9.1	3.2	5.3
7	4.0	7.4	e30	e22	e18	221	809	379	57	8.4	3.3	5.2
8	4.1	6.3	e40	e24	e21	209	800	313	51	8.0	4.2	5.2
9	4.1	5.9	e47	e28	e24	532	611	274	45	7.8	5.4	5.1
10	4.2	6.1	e52	e35	e33	1150	506	774	41	7.1	5.1	5.1
11	3.7	6.3	e45	e37	e28	1360	429	613	36	7.0	5.3	4.9
12	3.5	6.2	e40	e30	e25	960	458	422	32	6.8	5.4	5.1
13	3.6	6.1	e37	e29	e24	730	509	314	30	6.5	4.5	4.6
14	3.7	8.8	e36	e28	e22	465	576	250	29	6.2	4.4	4.7
15	3.4	6.7	e27	e29	e20	349	608	207	36	8.5	4.1	4.9
16	3.4	6.6	e25	e36	e19	327	612	175	52	8.3	4.1	4.4
17	3.6	7.6	e25	e29	e20	279	566	153	33	9.6	4.2	7.1
18	3.7	6.7	e25	e35	e24	284	552	152	28	7.9	4.1	11
19	4.2	6.8	e26	e34	e30	304	581	136	24	6.7	4.0	8.7
20	4.3	6.5	e34	e27	e45	252	549	117	25	6.0	4.0	7.5
21	4.1	6.3	e28	e25	e70	421	516	102	23	5.4	4.3	6.9
22	4.0	8.5	e31	e29	e100	531	463	92	20	5.2	8.1	6.5
23	3.8	20	e28	e27	e120	405	354	92	19	5.3	11	6.2
24	3.8	13	e27	e20	e110	388	307	94	17	4.7	11	6.2
25	3.8	12	e26	e16	e110	556	333	92	16	4.5	10	5.9
26	3.8	10	e19	e20	e100	570	400	80	15	4.4	8.9	6.4
27	3.8	18	e17	e18	e96	495	483	87	14	4.4	8.4	6.0
28	3.8	14	e16	e19	e94	463	427	88	14	4.2	7.5	5.8
29	3.8	11	e18	e21	---	407	362	88	14	4.0	6.5	5.9
30	3.8	e14	e23	e25	---	322	316	88	13	3.7	6.8	6.2
31	3.8	---	e31	e29	---	302	---	81	---	3.7	7.5	---
TOTAL	121.6	252.6	880	845	1266	12873	13984	7049	1129	221.1	173.1	181.7
MEAN	3.92	8.42	28.4	27.3	45.2	415	466	227	37.6	7.13	5.58	6.06
MAX	4.6	20	52	37	120	1360	809	774	80	14	11	11
MIN	3.4	3.9	15	16	15	67	251	80	13	3.7	3.2	4.4
AC-FT	241	501	1750	1680	2510	25530	27740	13980	2240	439	343	360

CAL YR 1988 TOTAL 20834.8 MEAN 56.9 MAX 494 MIN 2.8 AC-FT 41330
WTR YR 1989 TOTAL 38976.1 MEAN 107 MAX 1360 MIN 3.2 AC-FT 77310

e Estimated

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 mi^2.

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.--60 years, 255 ft^3/s, 184,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,730 ft^3/s Jan. 30, 1965, gage height, 8.39 ft, from rating curve extended above 2,200 ft^3/s; maximum gage height, 9.13 ft Feb. 1, 1963, ice jam; minimum discharge, 0.90 ft^3/s Aug. 19, 20, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 9	1930	2,810	6.70	Apr. 16	0730	1,770	5.79
Mar. 26	0200	1,690	5.71	May 10	1230	*3,360	*7.14
Apr. 8	1030	1,920	5.95				

Minimum daily discharge, 24 ft^3/s Oct. 3-7, 10-12.

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	26	28	30	87	e110	215	871	850	440	117	36	71
2	26	29	45	82	e90	e215	833	864	487	114	35	59
3	24	32	56	78	e80	e200	741	841	549	107	36	55
4	24	41	49	e70	e70	e170	673	832	587	96	37	52
5	24	41	45	e68	e76	160	655	887	561	90	36	49
6	24	39	58	e66	e84	371	942	1160	564	86	34	47
7	24	43	90	e64	e90	485	1480	1360	547	81	35	47
8	25	39	110	e70	e100	493	1790	1560	513	74	38	46
9	25	37	115	e100	e110	1450	1540	1410	488	70	38	45
10	24	39	153	e140	e120	1960	1340	2880	453	69	39	44
11	24	42	108	182	e120	1800	1190	2410	419	68	35	43
12	24	42	92	173	e110	1670	1250	1800	390	66	34	42
13	25	44	89	159	e100	1520	1310	1460	366	65	33	42
14	25	50	84	147	e90	1030	1500	1240	353	62	32	40
15	25	46	56	129	e82	793	1660	1110	373	74	31	39
16	25	42	e50	115	e80	768	1720	997	505	71	31	39
17	26	48	e46	111	e84	730	1660	921	375	78	31	46
18	26	46	e44	113	e86	730	1530	943	317	77	31	72
19	27	44	e52	116	e90	969	1630	823	287	67	30	64
20	27	40	67	124	e96	763	1650	745	263	60	30	53
21	27	44	66	125	e100	1020	1610	714	242	55	31	50
22	26	48	63	e110	183	1140	1530	674	212	53	37	48
23	26	90	64	e100	310	956	1250	669	196	51	66	46
24	26	84	62	e96	307	934	1050	621	179	49	104	45
25	27	60	e50	e90	279	1340	1010	595	165	46	81	44
26	28	56	e44	e90	267	1470	1030	545	152	43	68	45
27	27	41	e40	e90	249	1200	980	521	139	42	64	46
28	27	41	e36	e96	222	1280	940	507	133	40	59	45
29	28	58	e60	e100	---	1270	886	475	128	39	51	44
30	29	41	78	e110	---	973	833	449	121	38	53	43
31	29	---	86	e120	---	920	---	433	---	37	101	---
TOTAL	800	1375	2088	3321	3785	28995	37084	31296	10504	2085	1397	1451
MEAN	25.8	45.8	67.4	107	135	935	1236	1010	350	67.3	45.1	48.4
MAX	29	90	153	182	310	1960	1790	2880	587	117	104	72
MIN	24	28	30	64	70	160	655	433	121	37	30	39
AC-FT	1590	2730	4140	6590	7510	57510	73560	62080	20830	4140	2770	2880

CAL YR 1988 TOTAL 46733 MEAN 128 MAX 600 MIN 14 AC-FT 92690
WTR YR 1989 TOTAL 124181 MEAN 340 MAX 2880 MIN 24 AC-FT 246300

e Estimated

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 mi^2, 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 except for estimated daily discharges, which are poor. 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.--64 years, 1,290 ft^3/s, 934,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,400 ft^3/s Jan. 30, 1965, gage height, 18.45 ft, from rating curve extended above 17,000 ft^3/s; minimum discharge, 6 ft^3/s sometime during period Nov. 2-13, 1936 (result of freezeup); minimum daily, 17 ft^3/s Dec. 12, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 11	2300	16,300	12.28	Apr. 20	0600	9,950	9.77
Mar. 26	0600	7,720	8.80	May 10	1700	*18,500	*13.10
Apr. 8	0730	8,790	9.28				

Minimum discharge, 80 ft^3/s part or all of each day Oct. 10-15.

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	106	98	172	e400	718	1330	3850	5070	1860	530	142	353
2	99	102	125	e420	e500	1320	3930	5170	1860	519	140	260
3	94	112	221	e420	e400	1070	3520	4950	1980	483	140	225
4	91	128	199	e400	e340	957	3150	4740	2170	446	145	202
5	86	165	176	e380	e340	1210	3050	4960	2220	409	142	191
6	85	167	227	e360	e380	3160	3900	6790	2160	384	138	181
7	83	157	407	e340	e440	4200	6450	7850	2110	360	133	171
8	83	182	598	e340	e500	3380	8180	7980	2030	337	138	163
9	83	158	580	e380	e580	6430	7130	7000	1920	314	152	159
10	81	153	887	e600	e640	12500	6280	14500	1790	303	164	154
11	80	154	764	e680	e620	13300	5550	12800	1660	296	158	151
12	80	153	627	e740	e580	11300	5880	9230	1550	290	140	146
13	80	156	587	e700	e540	9710	6320	7030	1450	278	132	144
14	80	206	583	e660	e480	6860	7410	5830	1390	265	126	143
15	80	190	440	e640	e440	4920	8230	5080	1400	250	120	141
16	81	175	275	e620	e420	4520	9000	4440	1950	300	118	138
17	82	169	184	e600	e440	4010	8870	4030	1560	293	116	149
18	85	187	163	e600	e500	4050	8080	3900	1290	314	116	187
19	89	175	250	e600	e600	4910	9020	3710	1150	286	116	289
20	94	165	e400	e620	e800	3900	9240	3240	1070	251	115	242
21	98	154	e500	e640	1560	5020	9120	2970	1030	230	113	205
22	99	194	e460	e640	e2500	6380	8670	2820	921	213	134	188
23	97	286	e420	e540	2150	4940	6700	2720	858	203	174	176
24	95	398	e400	e480	1880	4430	5580	2650	794	199	306	166
25	95	321	e380	e460	1690	6240	5330	2540	723	190	337	162
26	95	274	e300	e460	1640	6960	5830	2380	671	180	292	161
27	96	230	e180	e460	1500	5760	6230	2180	623	169	279	160
28	95	217	e140	e480	1390	5370	5900	2210	594	163	259	159
29	95	291	e180	e500	---	5410	5350	2090	571	159	234	155
30	96	281	e260	e560	---	4290	4950	2040	538	155	211	152
31	97	---	e320	625	---	4220	---	1960	---	149	274	---
TOTAL	2780	5798	11405	16345	24568	162057	190700	154860	41893	8918	5304	5473
MEAN	89.7	193	368	527	877	5228	6357	4995	1396	288	171	182
MAX	106	398	887	740	2500	13300	9240	14500	2220	530	337	353
MIN	80	98	125	340	340	957	3050	1960	538	149	113	138
AC-FT	5510	11500	22620	32420	48730	321400	378300	307200	83090	17690	10520	10860

CAL YR 1988 TOTAL 251417 MEAN 687 MAX 3960 MIN 57 AC-FT 498700
WTR YR 1989 TOTAL 630101 MEAN 1726 MAX 14500 MIN 80 AC-FT 1250000

e Estimated

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 mi^2, 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.--Records good except for estimated daily discharges, which are fair. 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.--61 years, 1,933 ft^3/s, 1,400,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,200 ft^3/s Dec. 23, 1964, gage height, 17.85 ft, from rating curve extended above 14,000 ft^3/s on basis of slope-area measurement of peak flow; minimum discharge, 6.0 ft^3/s Aug. 23, 24, 1973.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 11	0730	19,100	11.97	Apr. 20	1300	12,400	9.76
Mar. 26	1230	10,100	8.96	May 10	2300	*20,900	*12.50
Apr. 8	1630	11,600	9.48				

Minimum discharge, 108 ft^3/s Aug. 16, 17, 19, 20.

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	152	224	552	602	1080	2440	6280	7300	2610	790	189	496
2	138	233	447	621	e900	2470	6130	7410	2570	783	168	515
3	146	241	412	622	e750	2300	5760	7150	2720	767	166	436
4	155	269	497	595	e600	1820	5190	6830	2970	710	169	394
5	154	308	454	604	e600	1870	4890	6820	3060	660	168	372
6	152	356	454	582	e700	4120	5330	8220	2930	617	157	352
7	151	344	520	557	e800	8150	7790	9660	2860	581	158	340
8	154	350	752	551	e900	6080	10500	10400	2710	545	151	329
9	151	373	880	590	e920	7250	10400	9550	2540	511	153	309
10	152	355	1010	960	e940	17100	9190	14200	2380	487	167	291
11	148	356	1240	1020	e920	16900	8240	17800	2210	473	164	277
12	152	352	1040	1100	e900	16300	8060	12400	2040	456	170	270
13	158	361	931	1050	e850	12900	8510	9750	1920	450	153	272
14	157	438	906	994	e800	10600	9400	8130	1840	428	137	272
15	154	450	855	952	e750	7680	10400	7120	1850	404	123	262
16	170	427	654	940	e700	6700	11500	6300	2360	402	110	255
17	173	423	488	919	764	6170	11700	5680	2610	471	111	252
18	178	423	440	941	865	5910	10800	5400	2030	463	115	311
19	184	430	483	969	1060	6630	11300	5240	1750	476	112	401
20	187	404	579	998	1520	6230	11800	4640	1580	430	111	506
21	194	398	725	1050	1550	6170	11500	4210	1500	389	114	443
22	202	403	681	1100	1810	8740	11300	3970	1400	360	123	398
23	204	477	616	1030	4590	7410	9420	3790	1270	340	157	378
24	210	713	593	851	4000	6580	7870	3730	1190	319	250	362
25	212	718	578	805	3410	7690	7340	3590	1100	298	569	344
26	213	605	452	893	3120	9700	8280	3390	1010	281	561	333
27	213	563	368	842	2860	8470	9000	3150	935	273	513	334
28	216	532	321	830	2510	7630	8720	3210	882	246	466	342
29	223	534	394	844	---	8300	8060	3040	849	232	434	336
30	225	618	414	886	---	7060	7490	2930	811	214	400	327
31	224	---	525	966	---	6520	---	2800	---	206	388	---
TOTAL	5502	12678	19261	26264	41169	233890	262150	207810	58487	14062	6927	10509
MEAN	177	423	621	847	1470	7545	8738	6704	1950	454	223	350
MAX	225	718	1240	1100	4590	17100	11800	17800	3060	790	569	515
MIN	138	224	321	551	600	1820	4890	2800	811	206	110	252
AC-FT	10910	25150	38200	52090	81660	463900	520000	412200	116000	27890	13740	20840

CAL YR 1988 TOTAL 347813 MEAN 950 MAX 5430 MIN 46 AC-FT 689900
WTR YR 1989 TOTAL 898709 MEAN 2462 MAX 17800 MIN 110 AC-FT 1783000

e Estimated

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 mi^2, 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 fair except those below 0.6 ft^3/s, which are poor.

AVERAGE DISCHARGE.--22 years (1966-74, 1975-89), 19.2 ft^3/s, 3.78 in/yr, 13,910 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded discharge, 1,210 ft^3/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 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 9	1900	*382	*3.53	Mar. 25	0830	232	3.06

Minimum discharge, 0.02 ft^3/s on Aug. 12-22.

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	.04	.20	4.5	8.9	19	25	87	70	7.1	.75	.04	.06
2	.04	.23	4.4	10	e7.0	23	88	54	7.0	.95	.04	.07
3	.04	.36	5.6	12	e3.1	20	72	45	6.4	.82	.04	.08
4	.04	.52	5.4	14	e2.7	20	64	40	5.2	.82	.04	.06
5	.05	.29	5.8	15	e3.0	53	74	33	4.5	.67	.04	.06
6	.05	.39	6.1	14	e3.3	242	103	33	3.8	.29	.03	.06
7	.06	.62	8.9	15	e3.5	138	115	25	3.1	.09	.03	.07
8	.05	.85	9.5	15	e3.6	110	96	21	2.8	.06	.03	.06
9	.05	1.3	14	20	e3.9	230	75	20	2.5	.07	.04	.06
10	.05	2.0	15	26	e4.3	258	64	26	2.5	.10	.03	.06
11	.05	2.7	10	16	e4.7	280	54	15	2.3	.11	.03	.06
12	.05	3.1	9.2	13	e5.3	209	50	11	2.1	.05	.03	.06
13	.06	3.2	11	12	6.6	203	45	11	2.1	.05	.02	.05
14	.05	3.7	7.9	11	6.1	133	42	10	2.7	.05	.02	.05
15	.06	4.3	6.1	10	5.6	108	38	9.3	3.2	.05	.02	.04
16	.07	4.5	3.8	9.8	5.6	106	34	8.6	4.0	.05	.02	.05
17	.08	5.0	4.2	9.6	7.6	93	29	8.0	3.1	.05	.02	.08
18	.11	5.7	4.4	10	8.4	124	25	7.5	2.5	.05	.02	.09
19	.20	5.5	4.9	12	11	108	22	7.2	2.3	.05	.02	.08
20	.25	5.4	4.6	12	13	85	20	6.9	1.9	.06	.02	.08
21	.26	5.4	5.1	13	16	151	25	6.9	1.5	.11	.02	.07
22	.28	4.4	6.2	12	31	137	35	6.9	1.3	.11	.07	.08
23	.28	7.6	6.3	9.8	24	102	28	8.5	1.1	.09	.12	.07
24	.29	3.7	6.4	9.9	32	103	26	8.8	1.1	.07	.07	.07
25	.30	2.6	6.4	10	40	196	40	7.7	.86	.06	.05	.08
26	.30	1.9	5.4	9.9	45	138	97	7.1	.74	.06	.05	.13
27	.30	2.0	7.0	9.2	38	108	177	8.2	.42	.05	.06	.14
28	.25	4.1	6.3	8.8	27	104	146	9.0	.41	.05	.05	.13
29	.33	3.9	7.0	9.6	---	97	110	7.8	.43	.05	.05	.11
30	.21	3.1	8.3	16	---	85	80	7.6	.43	.05	.10	.12
31	.14	---	8.0	23	---	96	---	7.3	---	.05	.06	---
TOTAL	4.39	88.56	217.7	396.5	380.3	3885	1961	547.3	79.39	5.94	1.28	2.28
MEAN	.14	2.95	7.02	12.8	13.6	125	65.4	17.7	2.65	.19	.041	.076
MAX	.33	7.6	15	26	45	280	177	70	7.1	.95	.12	.14
MIN	.04	.20	3.8	8.8	2.7	20	20	6.9	.41	.05	.02	.04
AC-FT	8.7	176	432	786	754	7710	3890	1090	157	12	2.5	4.5
CFSM	.00	.04	.10	.19	.20	1.82	.95	.26	.04	.00	.00	.00
IN.	.00	.05	.12	.21	.21	2.09	1.06	.30	.04	.00	.00	.00

CAL YR 1988 TOTAL 2697.30 MEAN 7.37 MAX 145 MIN .00 AC-FT 5350 CFSM .11 IN. 1.45
WTR YR 1989 TOTAL 7569.64 MEAN 20.7 MAX 280 MIN .02 AC-FT 15010 CFSM .30 IN. 4.08

e Estimated

14047390 ROCK CREEK ABOVE WHYTE PARK, NEAR CONDON, OR

LOCATION.--Lat 45°15'53", long 120°01'15", in NE 1/4 SW 1/4 sec.36, T.3 S., R.22 E., Gilliam County, Hydrologic Unit 17070204, on left bank 0.2 mi upstream from Whyte Park, 8.0 mi northeast of Condon, and at mile 40.8.

DRAINAGE AREA.--297 mi^2.

PERIOD OF RECORD.--October 1975 to September 1989 (discontinued).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,714.50 ft above National Geodetic Vertical Datum of 1929 (Soil Conservation Service temporary bench mark).

REMARKS.--Records good except for estimated daily discharges in November and December, which are fair, and January and February, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--14 years, 59.8 ft^3/s, 43,330 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,360 ft^3/s May 5, 1983, gage height, 9.17 ft; maximum gage height, 9.4 ft Feb. 6, 1979; minimum discharge, 0.08 ft^3/s Aug. 17, 19, 20, 22, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 22	2130	378	6.63	Mar. 18	2330	399	6.67
Mar. 7	0030	678	7.15	Mar. 21	2400	408	6.69
Mar. 7	0030	(a)	7.28	Mar. 25	1330	421	6.72
Mar. 10	0300	*1,330	7.00	Apr. 27	0600	399	6.67
Mar. 10	0300	(a)	*8.05				

Minimum discharge, 0.55 ft^3/s Aug 8, 11-15.

(a) From crest-stage gage.

REVISIONS.--Revised daily discharges, in cubic feet per second, for December 1978 and January 1979, are given below. These figures supercede those published in the report for 1979.

Dec. 13	65	Dec. 26	e14	Jan. 8	e6.5	Jan. 21	334
14	44	27	e13	9	e7.5	22	168
15	39	28	e11	10	e8.5	23	107
16	e35	29	e9.0	11	e9.0	24	83
17	e30	30	e7.5	12	e9.0	25	45
18	e30	31	e6.5	13	e11	26	32
19	e17	Jan. 1	e6.5	14	e12	27	31
20	e20	2	e6.5	15	e12	28	15
21	e24	3	e6.5	16	e10	29	8.2
22	e22	4	e6.5	17	8.7	30	8.5
23	e20	5	e6.5	18	7.8	31	e11
24	e18	6	e6.5	19	7.4		
25	e16	7	e6.5	20	225		

	TOTAL	MEAN	MAX	MIN	AC-FT
December 1978	950	30.6	83	6.5	1880
January 1979	1223	39.4	334	6.5	2430
Wtr Yr 1979	25749	70.5	716	.68	51070

e Estimated

The peak discharges and annual maximum (*) reported for water year 1979 have been revised as shown in the following table. They supersede figures published in the report for 1979.

EXTREMES FOR 1979 WATER YEAR.--Peak discharges greater than base discharge of 220 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 20	2030	970	7.10	Apr. 7	0030	272	5.85
Feb. 6	1730	*1,800	8.51	Apr. 24	2400	560	6.70
Feb. 6	1730	(a)	*9.4	May 5	2230	284	5.90
Feb. 12	2400	974	7.47	Aug. 15	1930	1,490	8.16
Mar. 6	2100	753	6.76	Aug. 21	0330	295	5.95
Mar. 29	0530	292	5.93				

(a) From outside gage.

14047390 ROCK CREEK ABOVE WHYTE PARK, NEAR CONDON, OR--Continued

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	1.4	2.8	10	12	73	96	186	174	19	2.4	.75	1.0
2	1.5	3.4	10	12	41	87	198	143	16	2.4	.75	1.0
3	1.5	4.3	10	12	e20	71	167	120	15	2.2	.75	1.0
4	1.6	4.2	10	12	e17	62	151	106	14	2.2	.75	1.0
5	1.6	4.3	10	13	e17	81	145	93	12	2.2	.75	1.0
6	1.8	5.3	10	13	e13	289	164	89	11	2.0	.73	.95
7	2.0	5.4	12	13	e15	442	177	80	9.7	1.7	.67	.90
8	2.0	5.5	19	13	e18	312	167	69	8.8	1.5	.67	.90
9	2.0	5.7	22	16	e20	521	139	63	7.3	1.5	.67	.90
10	2.1	6.1	43	57	e22	853	121	71	6.8	1.5	.67	.90
11	2.0	6.3	37	55	e25	814	107	64	6.2	1.5	.61	.90
12	2.1	6.9	29	47	28	633	97	51	5.8	1.4	.55	.82
13	2.1	7.4	27	46	28	549	88	46	5.4	1.2	.55	.94
14	2.1	9.5	27	37	25	416	82	41	5.6	1.1	.55	1.0
15	2.1	8.6	20	37	23	318	77	38	5.8	1.0	.56	1.0
16	2.1	8.6	15	33	23	305	72	35	6.4	.99	.60	1.0
17	2.1	9.5	12	30	26	268	66	31	6.8	1.1	.60	1.0
18	2.2	e9.5	12	30	28	351	60	29	6.9	1.1	.60	1.0
19	2.3	e8.5	15	35	32	350	54	28	6.2	1.1	.60	1.1
20	2.4	e8.0	14	42	45	271	49	26	5.7	.99	.60	1.1
21	2.3	7.7	14	48	57	324	49	22	4.9	.90	.60	1.0
22	2.2	8.5	13	50	180	350	67	21	4.5	.90	.67	1.0
23	2.3	12	12	38	252	271	70	26	4.3	.90	.87	1.0
24	2.5	15	12	29	225	236	64	26	3.9	.89	.98	1.0
25	2.6	13	12	e27	179	362	72	25	3.5	.83	1.0	.98
26	2.6	11	7.5	e30	154	333	190	22	3.1	.75	.99	1.1
27	2.7	10	e7.0	e30	130	261	374	22	2.9	.75	.96	1.3
28	2.8	9.7	e7.5	31	114	233	356	25	2.9	.75	1.0	1.4
29	2.7	11	e9.5	31	---	226	287	25	2.9	.75	.92	1.4
30	2.7	11	11	38	---	200	210	26	2.9	.75	1.0	1.4
31	2.7	---	12	61	---	208	---	23	---	.75	1.1	---
TOTAL	67.1	238.7	481.5	978	1830	10093	4106	1660	216.2	40.00	23.07	30.99
MEAN	2.16	7.96	15.5	31.5	65.4	326	137	53.5	7.21	1.29	.74	1.03
MAX	2.8	15	43	61	252	853	374	174	19	2.4	1.1	1.4
MIN	1.4	2.8	7.0	12	13	62	49	21	2.9	.75	.55	.82
AC-FT	133	473	955	1940	3630	20020	8140	3290	429	79	46	61

CAL YR 1988 TOTAL 7860.41 MEAN 21.5 MAX 615 MIN .57 AC-FT 15590
WTR YR 1989 TOTAL 19764.56 MEAN 54.1 MAX 853 MIN .55 AC-FT 39200

e Estimated

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 mi^2, 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.--Water-discharge records good. No regulation. Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--84 years (water years 1906-89), 2,097 ft^3/s, 1,519,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,800 ft^3/s Dec. 24, 1964, gage height, 13.59 ft, from floodmark, from rating curve extended above 11,000 ft^3/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 ft^3/s, from rating curve extended above 22,000 ft^3/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 13	0130	20,200	10.66	Apr. 21	0830	12,600	8.34
Mar. 27	0830	11,000	7.74	Apr. 28	0730	10,600	7.60
Apr. 9	1230	11,800	8.03	May 11	2000	*21,600	*11.04

Minimum discharge, 119 ft^3/s Oct. 1.

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	125	236	564	436	1120	2940	7260	8290	3120	881	257	416
2	132	246	650	522	e900	2750	6960	8050	2880	839	239	386
3	142	253	600	626	719	2740	6760	8070	2770	811	221	395
4	145	265	505	665	e640	2720	6360	7720	2800	795	212	501
5	149	265	447	667	540	2290	5800	7360	3010	763	202	433
6	140	277	493	654	e500	2780	5470	7390	3170	716	183	392
7	140	292	493	650	572	4600	5860	9060	3020	660	182	369
8	145	329	466	629	735	8410	8510	10400	2950	612	187	356
9	147	353	512	624	823	6580	11100	10900	2820	574	187	340
10	146	356	795	820	976	9330	10600	10100	2650	539	182	340
11	141	371	928	1200	e920	18600	9500	17100	2490	518	182	328
12	149	374	1170	1200	e900	18500	8550	17300	2320	488	174	317
13	147	355	1230	1260	e860	16700	8510	12500	2150	465	164	301
14	148	375	1070	1250	e820	14000	8940	10300	2010	451	170	287
15	145	391	1000	1190	e780	11200	9940	8790	1930	425	175	281
16	153	422	983	1120	e740	8680	10900	7740	1890	419	178	277
17	161	451	910	1090	e760	7730	11900	6900	2060	420	169	275
18	164	446	725	1090	e800	7170	11900	6240	2790	410	155	272
19	171	443	515	1070	e900	6990	11000	5920	2210	447	145	268
20	185	434	484	1110	e1000	7600	11800	5740	1890	449	138	277
21	190	438	520	1170	e1300	7100	12100	5130	1690	444	134	320
22	198	433	610	1210	2080	7200	11900	4690	1550	427	150	424
23	200	425	774	1260	2910	9650	11600	4530	1500	396	148	437
24	207	420	732	1250	5010	8180	9690	4260	1380	375	146	403
25	211	481	671	1140	4470	7390	8320	4170	1280	361	162	382
26	212	730	633	1000	3870	8890	8400	4000	1190	348	174	376
27	212	750	556	950	3530	10500	9670	3810	1090	321	333	368
28	214	646	498	1030	3280	9210	10300	3570	1020	302	538	359
29	217	625	393	993	---	8500	9790	3550	965	291	488	346
30	220	589	399	979	---	9070	8920	3420	921	280	456	348
31	227	---	372	1040	---	7780	---	3220	---	264	414	---
TOTAL	5283	12471	20698	29895	42455	255780	278310	230220	63516	15491	6845	10574
MEAN	170	416	668	964	1516	8251	9277	7426	2117	500	221	352
MAX	227	750	1230	1260	5010	18600	12100	17300	3170	881	538	501
MIN	125	236	372	436	500	2290	5470	3220	921	264	134	268
AC-FT	10480	24740	41050	59300	84210	507300	552000	456600	126000	30730	13580	20970

CAL YR 1988 TOTAL 383608 MEAN 1048 MAX 6030 MIN 26 AC-FT 760900
WTR YR 1989 TOTAL 971538 MEAN 2662 MAX 18600 MIN 125 AC-FT 1927000

e Estimated

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.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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)	HARD-NESS NONCARB (MG/L AS CACO3)
NOV												
22...	1240	427	251	8.5	8.0	2.6	12.6	110	K9	85	110	0
FEB												
15...	1235	E780	214	8.3	0.5	3.8	14.8	101	K5	60	96	0
MAY												
16...	1120	7810	124	8.0	14.0	33	9.8	97	130	K300	55	0
AUG												
24...	1020	144	300	8.5	19.0	0.6	10.1	110	K9	180	120	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 PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WATER DIS IT FIELD (MG/L AS CACO3)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	CAR-BONATE WATER 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												
22...	25	11	16	24	0.7	2.1	130	158	0	10	3.0	0.2
FEB												
15...	22	9.9	12	21	0.5	1.7	112	127	5	9.4	2.8	0.1
MAY												
16...	13	5.4	6.1	19	0.4	1.4	57	69	0	4.0	1.6	0.1
AUG												
24...	26	13	23	29	0.9	3.1	146	174	2	13	4.4	0.2

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 DAY)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS TOTAL (MG/L AS P)
NOV											
22...	24	159	170	183	0.22	<0.01	<0.10	0.4	<0.01	<0.01	0.02
FEB											
15...	30	116	156	244	0.16	<0.01	<0.10	0.3	0.01	0.02	0.04
MAY											
16...	32	83	100	1750	0.11	0.03	<0.10	<0.2	0.04	0.04	0.17
AUG											
24...	21	188	193	73.1	0.26	0.01	<0.10	0.3	<0.01	<0.01	<0.01

E - Estimated value.
K - Results based on colony count outside acceptable range (non-ideal colony count).

14048000 JOHN DAY RIVER AT MCDONALD FERRY, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)
NOV 22...	<10	1	17	<0.5	1	<1	<3	1	15	<5	<4	5
FEB 15...	50	<1	18	<0.5	<1	<1	<3	2	53	<5	5	5
MAY 16...	120	1	14	<0.5	<1	<1	<3	<1	110	<1	<4	5
AUG 24...	<10	1	12	<0.5	<1	<1	<3	2	5	<1	<4	1

DATE	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 22...	0.1	<10	<1	<1	1	100	7	4	8	9.2	--
FEB 15...	<0.1	<10	<1	<1	<1	89	<6	10	22	46	--
MAY 16...	<0.1	<10	2	<1	<1	53	<6	3	172	3630	73
AUG 24...	<0.1	10	<1	<1	<1	120	9	6	2	0.78	--

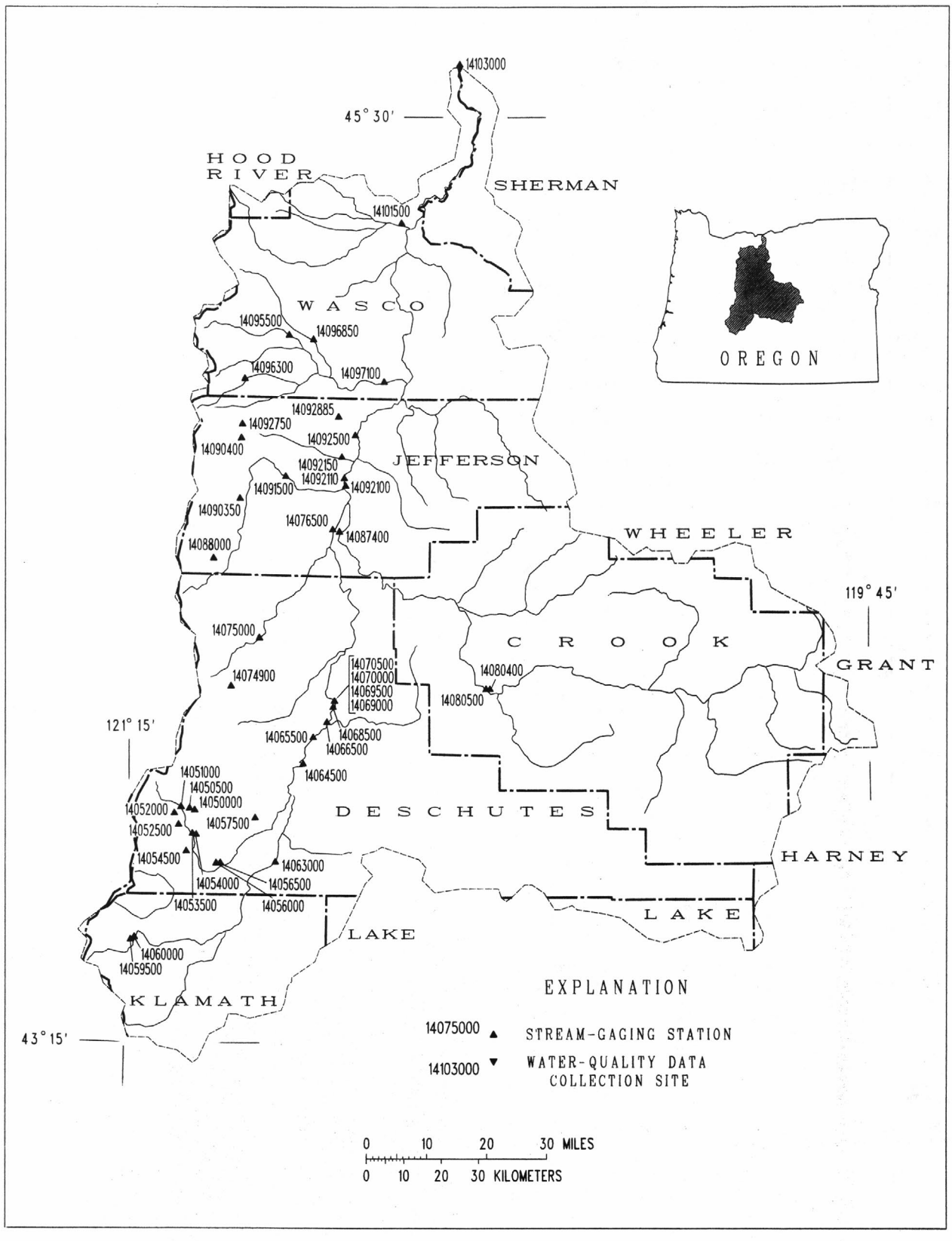

Figure 7.--Location of surface-water and water-quality stations in the Deschutes River and Crooked River basins.

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 mi^2, 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. 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.--52 years, 149 ft^3/s, 108,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 480 ft^3/s Aug. 19, 1974, gage height, 3.17 ft; maximum gage height, 4.12 ft Jan. 21, 1943 (ice jam); minimum discharge, 40 ft^3/s sometime during period Dec. 22, 1959, to Mar. 2, 1960, result of freezeup; minimum daily, 55 ft^3/s for many days April to June 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 291 ft^3/s Aug. 8, gage height, 1.73 ft; maximum gage height, 1.74 ft Feb. 6-10, backwater from ice; minimum discharge, 64 ft^3/s Feb. 6-8, but may have been less during period of ice effect Feb. 3-11.

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	95	84	82	80	74	67	68	85	90	135	177	213
2	95	87	82	81	72	68	69	85	91	137	182	211
3	95	93	81	80	71	67	68	85	91	137	184	210
4	95	90	81	80	e66	67	68	87	91	138	183	210
5	95	87	80	80	e65	71	69	88	91	139	183	210
6	95	89	82	81	e64	69	70	89	91	140	183	207
7	94	86	81	80	e64	68	72	90	91	142	186	207
8	93	86	80	81	e64	68	73	91	91	142	206	204
9	92	85	80	85	e66	71	73	98	92	143	222	204
10	92	86	80	83	e68	70	73	98	93	145	207	204
11	92	84	80	79	e70	71	73	95	95	145	207	202
12	91	86	83	78	72	70	74	93	96	148	207	201
13	91	85	84	79	71	71	75	92	100	149	207	199
14	91	84	84	79	70	69	76	92	101	151	207	198
15	90	84	84	79	69	69	76	92	106	152	207	198
16	90	84	84	78	70	69	78	92	106	157	207	198
17	89	84	84	78	69	69	79	93	109	160	208	198
18	89	82	83	77	70	70	80	94	111	160	210	196
19	88	82	83	76	68	69	82	92	114	160	210	194
20	88	82	83	76	68	70	85	92	117	161	210	193
21	88	85	84	77	68	73	87	92	117	163	210	191
22	87	88	84	76	67	71	85	92	120	163	222	190
23	86	85	83	77	66	70	83	93	120	166	221	188
24	86	84	84	79	66	71	85	95	121	168	214	188
25	86	84	82	72	67	73	86	92	124	170	213	188
26	86	82	81	72	67	71	84	92	126	174	216	188
27	84	82	81	72	66	70	83	94	127	176	217	187
28	84	83	81	73	66	72	83	92	129	178	216	184
29	84	82	82	73	---	69	83	92	132	180	217	182
30	84	82	81	72	---	69	85	92	134	181	222	182
31	84	---	80	72	---	68	---	90	---	178	217	---
TOTAL	2779	2547	2544	2405	1904	2160	2325	2839	3217	4838	6378	5925
MEAN	89.6	84.9	82.1	77.6	68.0	69.7	77.5	91.6	107	156	206	197
MAX	95	93	84	85	74	73	87	98	134	181	222	213
MIN	84	82	80	72	64	67	68	85	90	135	177	182
AC-FT	5510	5050	5050	4770	3780	4280	4610	5630	6380	9600	12650	11750

CAL YR 1988 TOTAL 29059 MEAN 79.4 MAX 100 MIN 69 AC-FT 57640
WTR YR 1989 TOTAL 39861 MEAN 109 MAX 222 MIN 64 AC-FT 79060

e Estimated

14050500 CULTUS RIVER ABOVE CULTUS CREEK, NEAR LA PINE, OR

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.

DRAINAGE AREA.--16.5 mi^2, hydrologic drainage boundry uncertain owing to ground-water exchange.

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."

REVISED RECORDS.--WSP 1448: 1923-25, 1947.

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.

REMARKS.--Records good. No regulation or diversions upstream from station.

AVERAGE DISCHARGE.--55 years, 62.7 ft^3/s, 45,430 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 178 ft^3/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 ft^3/s May 26-31, Nov. 23 to Dec. 4, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 96 ft^3/s Aug. 8, gage height, 0.85 ft; maximum gage height, 1.40 ft Apr. 7, 8, backwater from debris; minimum daily discharge, 34 ft^3/s Feb. 6, 7, but may have been less during period of ice effect Feb. 2-11.

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	48	52	39	37	36	39	41	56	68	72	77	72
2	48	53	39	37	e36	39	41	56	69	72	77	72
3	48	54	39	37	e36	39	41	58	70	72	77	72
4	50	54	39	37	e35	39	41	60	70	72	77	72
5	50	54	39	37	e35	39	41	62	70	72	77	72
6	50	54	39	37	e34	39	41	66	70	72	77	72
7	50	54	38	37	e34	39	41	68	70	72	77	72
8	50	52	37	37	e35	39	41	72	70	73	79	72
9	50	47	37	38	e36	39	41	77	70	75	77	71
10	50	46	37	38	e37	39	43	76	70	75	77	70
11	50	47	38	37	e38	39	43	73	70	75	77	70
12	52	47	39	37	39	39	44	71	70	75	76	70
13	52	47	39	37	39	39	45	69	70	75	75	70
14	52	46	39	37	37	39	46	69	70	75	75	70
15	52	46	39	39	37	39	46	68	70	75	75	70
16	52	46	39	39	37	39	48	68	70	77	75	70
17	52	46	37	39	37	39	48	70	70	77	75	70
18	52	46	37	39	37	39	49	70	70	77	75	70
19	52	45	37	37	37	39	50	69	70	75	73	70
20	52	44	37	37	38	39	52	68	70	75	72	70
21	52	45	37	38	38	40	54	68	70	75	73	70
22	52	38	37	37	37	41	54	68	71	75	75	70
23	52	37	37	37	39	41	54	68	72	75	75	70
24	52	39	37	37	39	41	56	68	72	75	73	70
25	52	39	37	37	39	41	56	68	72	75	72	69
26	52	39	36	37	39	41	56	68	72	75	71	68
27	53	39	36	36	39	41	56	68	72	75	72	68
28	54	38	36	36	39	41	56	68	72	76	72	68
29	52	39	37	36	---	41	56	68	72	77	73	68
30	52	39	37	36	---	41	56	68	71	77	73	68
31	52	---	37	36	---	41	---	68	---	77	72	---
TOTAL	1587	1372	1168	1153	1039	1230	1437	2094	2113	2315	2321	2106
MEAN	51.2	45.7	37.7	37.2	37.1	39.7	47.9	67.5	70.4	74.7	74.9	70.2
MAX	54	54	39	39	39	41	56	77	72	77	79	72
MIN	48	37	36	36	34	39	41	56	68	72	71	68
AC-FT	3150	2720	2320	2290	2060	2440	2850	4150	4190	4590	4600	4180

CAL YR 1988 TOTAL 16660 MEAN 45.5 MAX 58 MIN 34 AC-FT 33050
WTR YR 1989 TOTAL 19935 MEAN 54.6 MAX 79 MIN 34 AC-FT 39540

e Estimated

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 mi^2, 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 May 11 to Sept. 30; fair Dec. 26 to May 10; poor Oct. 1 to Dec. 25. Some regulation by fish screens at Cultus Lake since 1962. No diversion upstream from station.

AVERAGE DISCHARGE.--52 years (water years 1938-89), 22.4 ft^3/s, 16,230 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 336 ft^3/s Dec. 25, 1964, gage height, 4.15 ft, from floodmark, from rating curve extended above 90 ft^3/s; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 136 ft^3/s May 10, gage height, 2.88 ft; maximum gage height, 3.46 ft Jan. 10, backwater from ice; no flow at times.

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	.06	.00	e.05	3.2	8.3	7.1	24	55	63	36	6.3	3.7
2	.02	.0	e.04	3.4	e6.6	7.8	26	55	64	34	6.3	3.5
3	.0	.32	e.04	4.2	e5.5	7.8	25	55	65	33	6.3	3.5
4	.00	.14	e.04	4.2	e4.5	7.7	25	56	67	31	6.3	3.5
5	.00	.04	e.04	3.9	e3.5	9.4	24	57	70	29	6.3	3.2
6	.00	.18	e.04	3.4	e2.9	11	24	59	72	28	6.3	3.2
7	.00	.0	e.05	3.6	e2.7	11	24	67	73	26	6.3	3.2
8	.00	.00	e.05	3.7	e2.7	11	24	77	73	24	6.1	3.2
9	.00	.00	e.06	e10	e2.7	12	24	104	73	21	6.3	3.2
10	.00	.05	.06	e45	e3.0	12	26	130	73	18	6.2	3.2
11	.00	.04	.08	e22	e4.0	12	27	135	73	18	6.0	3.2
12	.00	.13	.10	11	e4.7	13	28	130	72	17	5.9	3.0
13	.00	.04	.14	12	e5.4	14	29	122	72	16	5.6	2.9
14	.00	.0	.05	12	e5.4	15	32	117	71	16	5.6	2.9
15	.00	.0	.03	13	e5.4	16	35	112	70	14	5.6	2.5
16	.00	.0	.0	13	e6.0	16	40	103	67	14	5.6	2.2
17	.00	.04	.0	13	e7.0	17	44	97	66	14	5.6	2.1
18	.00	.0	.03	12	8.2	18	46	94	65	14	5.6	1.8
19	.00	.0	e.10	11	8.7	19	46	90	60	14	5.1	1.8
20	.00	.08	.21	11	8.7	18	53	87	58	13	4.5	1.8
21	.00	.21	.36	11	8.7	20	58	83	55	13	4.5	1.8
22	.00	1.0	4.2	11	8.9	20	66	81	53	12	4.7	1.8
23	.00	.16	e7.0	11	8.9	20	74	79	50	12	4.8	1.8
24	.00	.07	e10	11	8.6	20	77	79	49	11	4.3	1.8
25	.00	.05	e10	10	8.3	21	75	77	48	10	4.2	1.7
26	.00	.06	e5.0	9.7	7.9	21	70	74	45	9.9	4.5	1.4
27	.00	.06	e2.0	9.3	7.6	21	66	72	43	9.0	4.2	1.4
28	.00	.10	e1.5	8.9	7.4	24	62	70	42	8.4	4.2	1.4
29	.00	.06	e1.6	8.6	---	25	59	68	41	7.8	4.2	1.4
30	.00	e.05	2.1	8.1	---	25	57	65	39	7.1	3.6	.98
31	.00	---	2.7	7.9	---	25	---	64	---	6.8	3.5	---
TOTAL	0.08	2.88	47.67	321.1	172.2	496.8	1290	2614	1832	537.0	164.5	73.08
MEAN	.003	.096	1.54	10.4	6.15	16.0	43.0	84.3	61.1	17.3	5.31	2.44
MAX	.06	1.0	10	45	8.9	25	77	135	73	36	6.3	3.7
MIN	.00	.00	.00	3.2	2.7	7.1	24	55	39	6.8	3.5	.98
AC-FT	.2	5.7	95	637	342	985	2560	5180	3630	1070	326	145

CAL YR 1988 TOTAL 4994.75 MEAN 13.6 MAX 61 MIN .00 AC-FT 9910
WTR YR 1989 TOTAL 7551.31 MEAN 20.7 MAX 135 MIN .00 AC-FT 14980

e Estimated

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 mi^2, 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 for discharges below 1.0 ft^3/s and estimated daily discharges, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--52 years (water years 1938-89), 7.40 ft^3/s, 5,360 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 200 ft^3/s, estimated, Dec. 25, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 64 ft^3/s May 10, gage height, 2.94 ft; minimum discharge, 0.01 ft^3/s Nov. 16.

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	.07	.06	e.52	e1.0	e1.1	e.98	9.7	24	20	2.2	.13	.12
2	.07	.14	e.52	e1.2	e.95	e1.2	10	24	19	2.0	.13	.08
3	.07	.36	e.52	e1.3	e.75	e1.3	9.3	26	20	1.9	.12	.07
4	.07	.18	e.56	1.3	e.62	e1.3	8.7	28	20	1.7	.11	.06
5	.08	.13	e.56	1.3	e.47	2.9	8.5	32	20	1.5	.11	.06
6	.07	.23	e.60	e1.1	e.39	3.8	8.9	37	20	1.4	.12	.06
7	.04	.08	e.63	e1.1	e.39	3.5	9.8	43	19	1.4	.11	.06
8	.04	.06	e.63	e1.8	e.39	3.2	11	47	18	1.2	.14	.06
9	.03	.06	e.63	e3.2	e.39	4.1	13	55	17	1.1	.15	.06
10	.03	.11	e.63	e9.0	e.45	4.5	14	63	16	.89	.11	.06
11	.03	.09	.70	6.5	e.58	4.5	16	60	14	.84	.10	.06
12	.05	.15	.70	5.2	e.70	4.7	17	52	13	.75	.09	.06
13	.03	.09	.69	4.8	e.84	5.6	18	45	12	.70	.10	.06
14	.06	.06	.61	4.7	e.84	5.8	20	39	11	.70	.10	.06
15	.06	.06	e.48	4.8	e.84	6.0	22	35	9.7	.61	.13	.06
16	.06	.06	e.47	4.3	e.89	5.6	25	32	8.4	.53	.13	.09
17	.06	.06	e.47	3.6	e1.0	5.4	29	31	7.4	.62	.13	.09
18	.06	.05	e.47	3.0	e1.2	5.9	32	31	6.2	.57	.13	.09
19	.06	.07	e.47	2.6	e1.3	5.6	36	31	4.8	.54	.13	.08
20	.06	.03	e.50	2.4	e1.3	5.1	41	29	4.7	.50	.13	.08
21	.05	.06	e.65	2.3	e1.2	6.6	44	27	4.5	.41	.13	.07
22	.03	.44	e.90	2.3	e1.2	6.8	43	26	4.2	.33	.26	.07
23	.03	.25	e1.2	e2.6	e1.2	6.5	40	26	3.9	.30	.29	.07
24	.03	.15	2.2	2.5	e1.2	6.6	36	27	3.6	.27	.19	.07
25	.03	.21	2.2	1.8	e1.2	7.5	34	26	3.3	.24	.16	.07
26	.03	.37	e1.0	e1.6	e1.1	7.8	30	25	2.9	.21	.15	.11
27	.04	.48	e.46	1.5	e.98	8.1	27	24	2.5	.20	.13	.09
28	.05	.97	e.42	1.4	e.98	10	25	23	2.2	.17	.12	.09
29	.04	.82	e.42	1.3	---	11	23	22	2.1	.17	.14	.09
30	.06	e.58	e.58	1.2	---	10	23	21	2.1	.17	.24	.09
31	.06	---	e.80	1.2	---	10	---	20	---	.16	.14	---
TOTAL	1.55	6.46	22.19	83.9	24.45	171.88	683.9	1031	311.5	24.28	4.35	2.24
MEAN	.050	.22	.72	2.71	.87	5.54	22.8	33.3	10.4	.78	.14	.075
MAX	.08	.97	2.2	9.0	1.3	11	44	63	20	2.2	.29	.12
MIN	.03	.03	.42	1.0	.39	.98	8.5	20	2.1	.16	.09	.06
AC-FT	3.1	13	44	166	48	341	1360	2040	618	48	8.6	4.4

CAL YR 1988 TOTAL 1603.97 MEAN 4.38 MAX 29 MIN .01 AC-FT 3180
WTR YR 1989 TOTAL 2367.70 MEAN 6.49 MAX 63 MIN .03 AC-FT 4700

e Estimated

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.--55 years, 24.0 ft^3/s, 17,390 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 59 ft^3/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, 33 ft^3/s June 10, 17, 20, 21, July 25, gage height, 1.82 ft; maximum gage height, 1.82 ft June 10, 17, 20, 21; minimum discharge, 7.1 ft^3/s Jan. 24, 25, 27-30, Feb. 1-17.

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	17	12	10	8.0	7.4	9.2	11	19	28	31	29	26
2	16	12	9.9	8.0	7.1	9.2	11	19	28	31	29	26
3	16	12	9.9	8.0	7.1	8.4	11	19	29	31	29	26
4	16	12	9.9	8.4	7.1	9.1	11	20	29	31	29	26
5	16	12	9.9	7.8	7.1	9.2	11	20	29	31	29	26
6	15	12	9.9	7.7	7.1	9.1	10	20	29	31	29	26
7	15	12	9.9	7.7	e7.1	9.1	11	20	29	31	29	26
8	15	12	9.9	8.0	e7.2	9.1	12	21	30	31	29	26
9	15	12	9.9	8.0	e7.3	9.2	13	21	31	31	29	26
10	15	12	9.6	7.8	e7.5	8.9	13	21	32	31	29	26
11	14	12	9.1	7.7	7.7	9.3	14	21	31	32	28	24
12	14	12	9.4	8.0	7.7	9.7	15	22	31	32	28	24
13	13	12	9.9	8.2	7.7	9.7	15	22	32	32	28	24
14	13	11	9.9	7.7	7.7	9.7	15	23	32	32	28	24
15	13	11	9.1	7.7	7.7	9.9	15	23	32	32	28	24
16	13	12	9.1	7.7	7.7	9.8	16	23	32	32	28	24
17	13	11	9.1	7.7	7.9	9.5	16	23	32	29	28	24
18	13	11	9.1	7.7	8.2	9.4	17	23	32	30	28	24
19	13	11	9.1	7.7	8.0	9.3	18	24	32	30	28	23
20	13	11	9.1	7.7	8.4	9.9	18	25	32	30	28	23
21	13	11	8.9	7.7	8.6	9.9	18	26	33	29	28	23
22	12	11	8.7	7.7	9.1	9.9	18	26	32	29	28	23
23	12	11	8.6	7.7	9.1	9.9	19	26	32	29	28	23
24	12	11	9.0	7.7	9.1	9.9	19	26	32	e29	28	23
25	12	11	8.4	7.6	9.1	10	19	25	32	e29	28	23
26	12	10	8.4	7.7	9.0	10	19	26	32	29	28	22
27	12	10	8.6	7.4	9.1	11	19	26	32	29	27	22
28	12	10	8.4	7.1	9.1	11	19	27	32	29	27	22
29	12	9.9	8.4	7.2	---	11	19	27	31	29	27	22
30	12	9.9	8.5	7.4	---	11	19	27	31	29	27	22
31	12	---	8.1	7.7	---	11	---	27	---	29	26	---
TOTAL	421	338.8	285.7	240.1	222.9	301.3	461	718	931	940	872	723
MEAN	13.6	11.3	9.22	7.75	7.96	9.72	15.4	23.2	31.0	30.3	28.1	24.1
MAX	17	12	10	8.4	9.1	11	19	27	33	32	29	26
MIN	12	9.9	8.1	7.1	7.1	8.4	10	19	28	29	26	22
AC-FT	835	672	567	476	442	598	914	1420	1850	1860	1730	1430

CAL YR 1988 TOTAL 5282.5 MEAN 14.4 MAX 24 MIN 7.1 AC-FT 10480
WTR YR 1989 TOTAL 6454.8 MEAN 17.7 MAX 33 MIN 7.1 AC-FT 12800

e Estimated

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 mi^2, 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, 38,440 acre-ft May 31, elevation, 4,441.36 ft; minimum observed contents, 19,710 acre-ft Oct. 31, elevation, 4,436.63 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	4,437.07	21,280	-
Oct. 31	a4,436.63	19,710	-1,570
Nov. 30	--	b20,930	+1,220
Dec. 31	4,437.16	21,610	+680
CAL YR 1988	-	-	-4,870
Jan. 31	4,438.67	27,330	+5,720
Feb. 28	4,439.36	30,070	+2,740
Mar. 31	4,439.73	31,560	+1,490
Apr. 30	4,440.52	34,840	+3,280
May 31	4,441.35	38,390	+3,550
June 30	4,440.88	36,360	-2,030
July 31	4,439.18	29,340	-7,020
Aug. 31	4,438.63	27,180	-2,160
Sept.30	4,437.97	24,620	-2,560
WTR YR 1989	-	-	+3,340

a Gage reading at 1500 hours furnished by watermaster.
b Interpolated.

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 mi^2, 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 excellent Oct. 1 to Jan. 5, Feb. 1 to June 28; good Jan. 6-31; fair June 29 to Sept. 30.

AVERAGE DISCHARGE.--71 years, 213 ft^3/s, 154,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft^3/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, 369 ft^3/s July 2-5, gage height, 1.70 ft; minimum discharge, 6.3 ft^3/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	364	336	331
2	169	143	143	143	40	126	126	192	250	365	336	331
3	169	145	143	143	40	126	126	192	250	369	336	327
4	169	145	143	143	40	126	126	192	250	369	336	326
5	169	145	143	143	40	126	126	192	250	363	336	326
6	169	145	143	e92	40	126	126	192	250	360	336	326
7	169	145	143	e27	40	126	126	192	250	359	334	326
8	169	145	143	e27	40	126	126	192	250	355	333	326
9	169	145	143	e28	40	126	126	192	250	355	336	326
10	169	145	143	e29	40	126	126	192	250	355	336	326
11	169	145	143	e30	40	126	126	192	250	355	336	326
12	169	145	143	e31	40	126	126	192	250	355	334	326
13	169	145	143	e32	40	126	126	192	250	355	331	326
14	169	145	143	e32	40	126	129	192	250	355	331	326
15	169	145	143	e33	40	126	129	192	250	355	331	326
16	169	145	143	e33	40	126	129	192	250	355	331	322
17	169	145	143	e34	40	126	129	192	250	355	331	322
18	169	145	143	e34	40	126	129	192	250	355	331	322
19	169	145	143	e35	40	126	129	195	250	353	331	322
20	169	145	143	e35	40	126	157	196	250	350	331	322
21	166	145	143	e36	40	126	192	199	250	348	331	322
22	166	145	143	e36	76	126	192	199	251	345	331	322
23	166	145	143	e37	126	126	192	199	254	344	331	322
24	166	144	143	e37	126	126	192	199	254	340	331	319
25	166	143	143	e38	126	126	192	199	253	340	331	317
26	166	143	143	e39	126	126	192	199	250	340	331	317
27	156	143	143	e39	126	126	192	199	250	340	331	317
28	148	143	143	e40	126	126	192	199	250	340	331	317
29	148	143	143	e41	---	126	192	199	250	339	331	317
30	148	143	143	e41	---	126	192	199	313	336	331	317
31	148	---	143	e42	---	126	---	229	---	336	331	---
TOTAL	5124	4326	4433	1673	1672	3906	4489	6066	7575	10905	10314	9698
MEAN	165	144	143	54.0	59.7	126	150	196	252	352	333	323
MAX	169	145	143	143	126	126	192	229	313	369	336	331
MIN	148	136	143	27	40	126	126	192	250	336	331	317
AC-FT	10160	8580	8790	3320	3320	7750	8900	12030	15030	21630	20460	19240

CAL YR 1988 TOTAL 55838 MEAN 153 MAX 182 MIN 86 AC-FT 110800
WTR YR 1989 TOTAL 70181 MEAN 192 MAX 369 MIN 27 AC-FT 139200

e Estimated

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 mi^2, 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. WDR 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.--54 years, 38.4 ft^3/s, 27,820 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 104 ft^3/s Aug. 4, 1956, gage height, 1.64 ft; maximum gage height, 3.50 ft Jan. 30, 1980, backwater from ice; minimum discharge, 16 ft^3/s July 22-25, 1941, and at times December 1941 to March 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 45 ft^3/s Aug. 8, gage height, 0.66 ft; maximum gage height, 2.43 ft Feb. 8, backwater from ice; minimum discharge, 23 ft^3/s Feb. 10-24, Feb. 27 to Mar. 5.

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	30	29	27	27	25	24	29	29	29	31	35	38
2	30	30	27	27	25	24	28	29	29	32	35	38
3	29	31	27	27	e25	23	28	29	29	32	35	38
4	29	30	27	27	e25	23	28	28	29	32	35	38
5	29	29	27	27	e25	25	31	28	29	32	35	38
6	28	30	27	27	e25	24	32	28	29	32	35	38
7	28	29	e27	26	e25	24	33	28	30	32	35	38
8	28	29	e27	27	e25	25	33	28	30	32	36	38
9	28	29	e27	28	e25	26	32	29	30	32	36	38
10	28	30	e27	28	24	26	32	29	30	32	36	38
11	28	29	e27	27	23	27	32	29	30	32	36	38
12	28	29	e27	27	23	28	32	28	30	32	36	38
13	28	29	e27	27	23	27	32	28	30	32	36	37
14	28	28	e27	27	23	26	32	28	30	33	36	37
15	28	29	27	27	23	26	31	28	30	33	36	37
16	28	29	27	26	23	26	31	28	30	33	36	37
17	28	28	27	26	23	25	31	28	30	33	36	37
18	28	28	27	26	24	26	31	28	30	33	36	37
19	28	28	27	26	24	26	31	28	31	33	36	37
20	28	28	27	26	24	25	31	28	31	33	36	37
21	28	29	27	26	24	28	31	28	31	34	36	37
22	28	32	27	26	24	27	31	28	31	34	37	37
23	28	31	27	e26	24	27	30	29	31	34	37	37
24	28	29	27	26	24	27	31	29	31	34	37	37
25	28	28	27	25	24	29	34	29	31	34	36	37
26	28	28	e27	25	24	28	32	29	31	34	36	37
27	28	28	27	25	24	27	30	29	31	34	36	37
28	28	28	27	25	24	29	30	29	31	34	36	37
29	28	28	27	25	---	28	30	29	31	34	37	36
30	28	27	27	25	---	28	30	29	31	35	38	36
31	28	---	27	25	---	29	---	29	---	35	38	---
TOTAL	875	869	837	815	674	813	929	883	906	1022	1117	1120
MEAN	28.2	29.0	27.0	26.3	24.1	26.2	31.0	28.5	30.2	33.0	36.0	37.3
MAX	30	32	27	28	25	29	34	29	31	35	38	38
MIN	28	27	27	25	23	23	28	28	29	31	35	36
AC-FT	1740	1720	1660	1620	1340	1610	1840	1750	1800	2030	2220	2220

CAL YR 1988 TOTAL 9765 MEAN 26.7 MAX 32 MIN 23 AC-FT 19370
WTR YR 1989 TOTAL 10860 MEAN 29.8 MAX 38 MIN 23 AC-FT 21540

e Estimated

14056000 WICKIUP RESERVOIR NEAR LA PINE, OR

LOCATION.--Lat 43°41'02", long 121°41'20", in SW 1/4 NE 1/4 sec. 7, T.22 S., R.9 E., Deschutes County, Hydrologic Unit 17070301, in Deschutes National Forest, in gate-chamber structure at Wickiup Dam on Deschutes River, 9.0 mi west of La Pine, and at mile 226.8.

DRAINAGE AREA.--482 mi^2, hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--December 1942 to September 1989 (discontinued). Prior to Oct. 1, 1964, published as "near Lapine."

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to Jan. 15, 1945, nonrecording gage at nearby sites at same datum.

REMARKS.--Reservoir is formed by rock-faced, earthfill dam completed in 1949. Some storage began in December 1942, capacity, 182,100 acre-ft between elevations 4,265.0 ft, no storage, and 4,336.0 ft crest of spillway, with earth plug to elevation 4,339.0 ft. Crater Creek Canal diverts water upstream from station to Tumalo Creek basin. Released water is diverted from Deschutes River at Bend for irrigation near Madras. Records for this station will be available after September 1989 in the files of the Oregon Water Resources Department.

COOPERATION.--Daily elevations furnished by North Unit Irrigation District, and capacity table furnished by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 204,000 acre-ft Apr. 8,1974, elevation, 4,338.01 ft; minimum contents observed since reservoir first filled in March 1949, 534 acre-ft, revised on basis of computer expanded capacity table dated June 1970, Oct. 18, 1952, elevation, 4,270.86 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents observed, 193,400 acre-ft May 4, elevation, 4,337.06 ft; minimum contents observed, 22,720 acre-ft Oct. 1, elevation, 4,296.38 ft.

MONTHEND ELEVATION AND CONTENTS AT 0800, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	4,296.13	22,340	-
Oct. 31	4,312.43	54,530	+32,190
Nov. 30	4,323.43	89,050	+34,520
Dec. 31	4,328.64	118,300	+29,250
CAL YR 1988	-	-	+3,800
Jan. 31	4,331.52	140,100	+21,800
Feb. 28	4,333.46	157,200	+17,100
Mar. 31	4,335.98	181,900	+24,700
Apr. 30	4,336.91	191,800	+9,900
May 31	4,334.67	168,700	-23,100
June 30	4,328.43	116,900	-51,800
July 31	4,320.62	78,270	-38,630
Aug. 31	4,311.99	53,430	-24,840
Sept.30	4,303.81	35,590	-17,840
WTR YR 1989	-	-	+13,250

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 mi^2, 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.--Records good except those for April 11-28, which are fair. 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.

AVERAGE DISCHARGE.--51 years, 738 ft^3/s, 534,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,280 ft^3/s July 28 to Aug. 1, 1956, July 31, Aug. 1, 2, 1962; minimum, 1.9 ft^3/s Nov. 10, 1973; minimum daily, 10 ft^3/s Jan. 17, 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,760 ft^3/s July 14-17, gage height, 6.17 ft; minimum recorded discharge, 17 ft^3/s Oct. 30, but may have been less during the period Oct. 31 to Nov. 30.

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	497	e20	e34	24	24	25	30	154	1310	1450	1580	1350
2	408	e20	e40	23	24	25	30	273	1490	1430	1550	1350
3	410	e19	e50	23	24	25	30	359	1580	1420	1550	1350
4	453	e19	e31	23	23	25	31	461	1580	1420	1540	1340
5	496	e19	e22	23	23	25	31	535	1570	1420	1550	1380
6	509	e19	e22	23	23	25	32	610	1570	1450	1550	1430
7	511	e19	e22	23	23	25	31	617	1590	1460	1530	1440
8	239	e19	e22	23	22	26	32	710	1600	1460	1520	1470
9	155	e19	e22	23	22	26	32	854	1600	1460	1520	1550
10	203	e24	e22	23	22	25	32	908	1580	1500	1510	1550
11	270	e44	e22	23	23	25	73	889	1550	1580	1490	1550
12	287	e24	e24	23	24	25	146	818	1550	1660	1470	1530
13	287	e20	e24	22	25	26	209	767	1560	1670	1460	1510
14	85	e25	e24	22	25	26	405	814	1560	1720	1460	1500
15	28	e28	23	22	25	27	413	933	1560	1760	1500	1460
16	27	e19	23	22	25	26	415	1010	1510	1760	1520	1380
17	26	e19	23	22	26	27	467	1010	1430	1740	1510	1380
18	25	e19	23	22	26	27	519	1020	1400	1670	1510	1380
19	27	e20	23	23	27	27	523	1040	1370	1630	1510	1320
20	26	e19	24	23	27	28	527	1060	1320	1590	1510	1240
21	26	e20	23	23	27	29	532	1060	1340	1530	1520	1220
22	26	e20	21	23	25	29	536	1070	1410	1500	1490	1220
23	25	e20	22	23	24	30	510	1140	1430	1500	1400	1210
24	21	e20	23	22	25	31	288	1140	1430	1530	1330	1210
25	21	e19	23	22	25	30	179	1100	1430	1560	1310	1230
26	21	e19	23	23	25	32	114	1080	1540	1570	1290	1250
27	21	e19	23	24	26	32	117	1080	1600	1590	1290	1260
28	21	e20	23	24	26	32	119	1080	1610	1600	1290	1230
29	21	e21	23	25	---	29	119	1080	1620	1600	1330	1200
30	18	e21	23	25	---	29	119	1090	1550	1590	1350	1120
31	e18	---	24	25	---	29	---	1140	---	1590	1350	---
TOTAL	5208	633	771	714	686	848	6641	26902	45240	48410	45290	40610
MEAN	168	21.1	24.9	23.0	24.5	27.4	221	868	1508	1562	1461	1354
MAX	511	44	50	25	27	32	536	1140	1620	1760	1580	1550
MIN	18	19	21	22	22	25	30	154	1310	1420	1290	1120
AC-FT	10330	1260	1530	1420	1360	1680	13170	53360	89730	96020	89830	80550

CAL YR 1988 TOTAL 212563 MEAN 581 MAX 1670 MIN 18 AC-FT 421600
WTR YR 1989 TOTAL 221953 MEAN 608 MAX 1760 MIN 18 AC-FT 440200

e Estimated

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 mi^2, 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.--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.--51 years, 148 ft^3/s, 107,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 254 ft^3/s June 5, 1965, gage height, 2.02 ft; minimum discharge, 67 ft^3/s sometime during period Sept. 20-30, 1969.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 148 ft^3/s May 16, gage height, 1.40 ft, result of regulation; minimum discharge, 87 ft^3/s Mar. 7, 14, result of regulation.

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	104	102	e102	99	100	99	106	107	110	113	114	110
2	104	105	e102	100	100	100	106	107	110	113	114	110
3	104	105	e102	101	99	99	105	108	110	113	114	110
4	103	104	e102	101	98	100	105	109	110	113	114	110
5	104	104	e102	100	98	102	104	108	110	113	114	110
6	103	104	100	101	e98	101	106	107	111	113	114	110
7	104	103	100	100	e98	100	106	107	110	113	114	110
8	103	102	100	101	e98	100	107	107	110	113	116	110
9	103	103	100	103	e98	102	108	108	110	113	113	110
10	103	104	100	102	e98	101	108	107	110	114	113	109
11	103	103	100	100	e100	102	109	107	111	114	112	109
12	103	103	100	100	102	101	109	107	111	114	112	109
13	102	103	99	101	100	100	110	107	113	113	112	109
14	102	104	99	102	100	99	110	107	114	113	112	109
15	102	104	98	101	100	99	110	107	114	112	112	108
16	102	103	98	100	100	100	109	107	113	113	112	109
17	102	102	99	100	99	100	109	107	113	113	112	110
18	102	e104	99	100	100	100	108	107	113	113	112	109
19	102	e104	100	100	99	99	109	107	113	113	112	110
20	102	e104	100	100	99	99	109	107	112	113	112	110
21	102	e104	101	101	99	102	110	107	112	113	112	109
22	102	e104	101	100	99	101	110	109	112	113	113	109
23	102	e104	100	99	98	101	110	111	112	113	112	109
24	102	e103	101	99	99	100	111	110	112	113	111	109
25	102	e103	100	99	100	102	112	110	112	113	110	108
26	102	e103	100	99	100	102	110	110	112	113	110	110
27	102	e103	100	99	98	103	110	110	112	113	110	108
28	102	e103	100	99	99	104	108	110	112	114	110	109
29	102	e103	100	100	---	103	107	110	113	114	110	110
30	102	e102	100	100	---	104	107	110	113	114	111	109
31	102	---	99	100	---	104	---	110	---	114	110	---
TOTAL	3179	3102	3104	3107	2776	3129	3248	3352	3350	3509	3479	3281
MEAN	103	103	100	100	99.1	101	108	108	112	113	112	109
MAX	104	105	102	103	102	104	112	111	114	114	116	110
MIN	102	102	98	99	98	99	104	107	110	112	110	108
AC-FT	6310	6150	6160	6160	5510	6210	6440	6650	6640	6960	6900	6510

CAL YR 1988 TOTAL 40145 MEAN 110 MAX 119 MIN 98 AC-FT 79630
WTR YR 1989 TOTAL 38616 MEAN 106 MAX 116 MIN 98 AC-FT 76590

e Estimated

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 mi^2, 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, 55,280 acre-ft June 27 to July 1, elevation, 4,837.33 ft; minimum contents, 31,590 acre-ft Oct. 1, elevation, 4,830.92 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	4,830.92	31,590	-
Oct. 31	4,831.16	32,460	+870
Nov. 30	4,832.16	36,080	+3,620
Dec. 31	4,832.49	37,290	+1,210
CAL YR 1988	-	-	-17,160
Jan. 31	4,832.92	38,870	+1,580
Feb. 28	--	a39,780	+910
Mar. 31	4,833.80	42,100	+2,320
Apr. 30	4,834.87	46,070	+3,970
May 31	4,836.43	51,890	+5,820
June 30	4,837.33	55,280	+3,390
July 31	4,835.83	49,650	-5,630
Aug. 31	4,833.97	42,730	-6,920
Sept.30	4,832.81	38,470	-4,260
WTR YR 1989	-	-	+6,880

a Interpolated.

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 mi^2, 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.--Records good above 10 ft^3/s, fair below. Flow regulated since 1922 by Crescent Lake (station 14059500). No diversion upstream from station.

AVERAGE DISCHARGE.--63 years (water years 1913-14, 1929-89), 57.7 ft^3/s, 41,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 313 ft^3/s July 9, 1929, Aug. 9, 1936; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 148 ft^3/s July 14-17, gage height, 1.90 ft; minimum discharge, 1.0 ft^3/s Oct. 20, result of regulation.

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	5.8	5.4	5.8	5.8	5.8	7.3	6.9	4.7	30	29	140	130
2	5.8	5.5	5.8	5.8	5.8	7.3	6.9	4.7	30	29	140	130
3	5.8	5.8	5.8	5.8	e5.8	7.3	6.9	4.7	30	29	139	129
4	5.8	5.8	5.8	5.8	e5.8	7.3	6.9	4.7	30	29	139	129
5	5.7	5.8	5.8	5.8	e5.8	7.3	6.9	4.7	30	53	139	129
6	5.7	5.8	5.8	5.8	e5.8	7.3	6.9	4.7	30	70	138	128
7	5.7	5.8	5.8	5.8	e5.8	7.3	6.9	4.9	30	70	138	128
8	5.7	5.8	5.8	5.8	e5.8	7.1	6.9	5.0	30	70	138	127
9	5.7	5.8	5.8	5.8	e5.8	7.3	6.9	5.0	31	70	137	127
10	5.8	5.8	5.8	5.8	e5.8	7.3	6.9	5.0	31	69	137	126
11	5.8	5.8	5.8	5.8	e6.2	7.2	6.9	5.0	31	69	136	126
12	5.8	5.8	5.8	5.8	e6.2	6.9	7.0	5.4	31	69	136	125
13	5.8	5.8	5.8	5.8	e6.2	6.9	7.1	5.4	31	69	135	125
14	5.8	5.8	5.8	5.8	e6.2	6.9	7.3	5.4	31	102	135	125
15	5.8	5.8	5.8	5.8	e6.2	6.9	7.3	5.4	31	147	135	125
16	5.8	5.8	5.8	5.8	e7.0	6.9	7.3	5.4	31	146	134	124
17	5.8	5.8	5.8	5.8	e7.3	6.9	7.3	5.4	31	146	134	124
18	5.8	5.8	5.8	5.8	e7.3	6.9	7.3	5.4	30	146	133	90
19	5.8	5.8	5.8	e5.8	e7.3	6.9	7.3	5.4	30	145	133	66
20	7.2	5.8	5.8	e5.8	e7.3	6.9	7.3	5.4	30	145	133	66
21	11	5.8	5.8	e5.8	e7.3	6.9	7.3	5.4	30	144	133	66
22	11	5.8	5.8	e5.8	e7.3	6.9	7.3	5.4	30	144	133	66
23	11	5.8	5.8	e5.8	e7.3	6.8	5.7	5.4	30	144	133	62
24	11	5.8	5.8	e5.8	e7.3	6.5	4.7	5.4	29	144	132	60
25	11	5.8	5.8	e5.8	7.3	6.6	4.7	5.4	30	144	132	60
26	11	5.8	5.8	e5.8	7.3	6.7	4.7	5.4	29	143	132	61
27	11	5.8	5.8	e5.8	7.3	6.6	4.7	5.4	29	143	132	34
28	9.0	5.8	5.8	e5.8	7.3	6.9	4.7	5.4	29	142	131	5.6
29	5.7	5.8	5.8	e5.8	---	6.9	4.7	5.4	29	141	131	5.3
30	5.8	5.8	5.8	e5.8	---	6.9	4.7	5.4	29	141	131	4.3
31	5.6	---	5.8	e5.8	---	6.8	---	21	---	140	131	---
TOTAL	220.0	173.3	179.8	179.8	183.6	216.6	194.3	176.7	903	3272	4180	2803.2
MEAN	7.10	5.78	5.80	5.80	6.56	6.99	6.48	5.70	30.1	106	135	93.4
MAX	11	5.8	5.8	5.8	7.3	7.3	7.3	21	31	147	140	130
MIN	5.6	5.4	5.8	5.8	5.8	6.5	4.7	4.7	29	29	131	4.3
AC-FT	436	344	357	357	364	430	385	350	1790	6490	8290	5560

CAL YR 1988 TOTAL 18589.2 MEAN 50.8 MAX 243 MIN 5.4 AC-FT 36870
WTR YR 1989 TOTAL 12682.3 MEAN 34.7 MAX 147 MIN 4.3 AC-FT 25160

e Estimated

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 mi^2, 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 for estimated daily discharges, which are poor. Flow regulated since 1922 by Crescent Lake (station 14059500). Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--65 years (water years 1925-89), 207 ft^3/s, 150,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,660 ft^3/s Dec. 25, 1964, gage height, 8.18 ft; minimum discharge, 8 ft^3/s Sept. 2, 3, 1931.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 664 ft^3/s Apr. 25, gage height, 6.30 ft; minimum daily discharge, 41 ft^3/s Feb. 5, 6, result of freezeup.

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	76	42	95	e67	e70	e110	267	434	e250	135	176	159
2	64	44	97	e67	e55	e100	274	398	244	135	176	157
3	59	60	91	e67	e45	e80	261	369	229	130	176	154
4	56	81	97	e67	e42	e80	237	358	221	125	175	152
5	53	101	90	e67	e41	124	226	356	223	122	171	148
6	52	94	88	e67	e41	183	250	353	226	120	167	145
7	50	88	91	e67	e42	236	285	354	228	135	164	143
8	49	83	91	e80	e43	236	321	365	231	130	166	142
9	48	75	90	e90	e47	206	354	392	231	131	187	141
10	47	73	84	e110	e55	230	378	430	228	133	205	140
11	46	73	80	e120	e60	233	396	481	226	133	192	138
12	46	75	79	e115	e60	242	412	565	221	132	183	136
13	45	78	77	e95	e60	245	421	595	214	131	177	135
14	45	93	76	e95	e60	218	427	584	210	130	169	134
15	45	95	63	e95	e60	188	433	541	205	130	164	133
16	45	92	e61	e95	e65	167	443	471	203	164	161	133
17	45	90	e61	e88	e80	160	453	417	202	181	159	139
18	45	80	58	e85	e95	155	473	375	196	192	153	147
19	44	70	64	e85	e90	157	495	356	191	195	151	142
20	44	71	68	e85	e85	160	528	347	181	192	151	114
21	43	78	76	e85	e86	159	556	340	174	190	150	108
22	44	97	81	e75	e88	198	579	334	169	188	155	104
23	45	176	76	e72	e88	244	607	330	162	185	170	96
24	45	212	73	e72	e90	242	628	334	153	184	188	94
25	45	168	73	e72	e95	242	660	340	148	183	187	90
26	45	138	e67	e70	e100	272	658	345	144	183	180	90
27	45	117	e67	e70	e110	279	648	e310	138	182	169	93
28	45	116	e67	e70	e110	249	622	e290	135	180	162	97
29	45	119	e67	e70	---	249	577	e280	136	179	158	74
30	44	104	e67	e72	---	286	500	e270	137	178	157	64
31	43	---	e67	e72	---	274	---	e260	---	177	162	---
TOTAL	1493	2883	2382	2507	1963	6204	13369	11974	5856	4885	5261	3742
MEAN	48.2	96.1	76.8	80.9	70.1	200	446	386	195	158	170	125
MAX	76	212	97	120	110	286	660	595	250	195	205	159
MIN	43	42	58	67	41	80	226	260	135	120	150	64
AC-FT	2960	5720	4720	4970	3890	12310	26520	23750	11620	9690	10440	7420

CAL YR 1988 TOTAL 53581 MEAN 146 MAX 341 MIN 42 AC-FT 106300
WTR YR 1989 TOTAL 62519 MEAN 171 MAX 660 MIN 41 AC-FT 124000

e Estimated

14063300 PAULINA CREEK NEAR LA PINE, OR

LOCATION.--Lat 43°42'47", long 121°16'39", in SW 1/4 NE 1/4 sec.34, T.21 S., R.12 E., Deschutes County, Hydrologic Unit 17070302, on right bank 180 ft downstream from dam at outlet of Paulina Lake and 12 mi east of La Pine.

DRAINAGE AREA.--10.1 mi^2, of which 2.2 mi^2 is lake surface at elevation 6,331 ft, hydrologic drainage boundary uncertain because of interbasin ground-water exchange.

PERIOD OF RECORD.--October 1982 to September 1989 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 6,315.41 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for estimated daily discharges, which are fair. Flow regulated by dam at outlet of Paulina Lake 180 ft upstream.

AVERAGE DISCHARGE.--7 years, 20.0 ft^3/s, 14,490 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 66 ft^3/s Apr. 29, 1983, gage height, 2.35 ft; minimum discharge, 0.19 ft^3/s Oct. 19, 1982, Nov. 22, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 40 ft^3/s Oct. 13, gage height, 1.83 ft, result of regulation; minimum discharge, 0.80 ft^3/s Oct. 13, 19, result of regulation.

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	7.6	13	6.6	16	e16	20	25	28	23	19	19	17
2	7.6	4.9	6.6	17	e15	24	27	26	23	19	19	17
3	7.6	4.7	6.7	17	e15	23	26	26	23	19	19	17
4	7.6	4.8	6.8	16	e15	23	26	26	23	19	19	17
5	7.6	4.9	7.2	18	e15	26	25	26	22	19	19	17
6	7.6	4.8	9.1	18	e15	29	24	25	21	18	19	17
7	7.6	4.7	11	18	e15	28	23	25	21	18	19	17
8	7.5	4.6	11	18	e15	27	22	24	21	18	19	17
9	7.5	4.6	11	24	e16	31	22	25	20	17	19	16
10	12	4.6	11	33	17	33	21	25	20	17	19	16
11	23	4.6	11	31	17	31	20	24	23	17	18	16
12	21	4.6	11	29	17	29	20	24	29	17	18	16
13	18	4.7	11	29	17	31	19	24	28	17	18	16
14	18	4.7	11	29	17	30	19	23	27	17	18	16
15	18	4.6	11	29	17	29	19	22	28	17	18	16
16	18	4.6	11	28	17	29	19	22	29	17	18	16
17	18	4.6	9.2	26	19	28	19	21	28	18	18	16
18	18	4.6	9.3	23	21	29	18	21	27	18	18	16
19	17	4.6	10	21	22	29	18	20	25	18	17	16
20	19	4.7	11	21	22	28	18	20	25	18	17	16
21	19	4.8	13	21	22	30	19	20	24	19	17	16
22	18	4.8	15	23	24	29	20	20	23	20	17	16
23	16	4.8	15	22	25	27	21	24	24	20	18	16
24	15	4.8	17	21	24	26	23	25	22	20	18	16
25	14	4.8	17	20	23	27	33	26	21	20	18	16
26	17	4.8	17	20	22	26	36	25	21	20	18	16
27	16	5.2	17	20	21	25	34	26	20	20	18	16
28	16	6.0	17	19	21	26	32	25	20	20	18	16
29	16	6.3	16	19	---	26	30	25	20	20	18	16
30	19	6.6	17	18	---	25	29	25	20	20	17	16
31	20	---	17	17	---	26	---	24	---	19	17	---
TOTAL	454.2	154.8	370.5	681	522	850	707	742	701	575	562	488
MEAN	14.7	5.16	12.0	22.0	18.6	27.4	23.6	23.9	23.4	18.5	18.1	16.3
MAX	23	13	17	33	25	33	36	28	29	20	19	17
MIN	7.5	4.6	6.6	16	15	20	18	20	20	17	17	16
AC-FT	901	307	735	1350	1040	1690	1400	1470	1390	1140	1110	968

CAL YR 1988 TOTAL 6039.6 MEAN 16.5 MAX 29 MIN 4.6 AC-FT 11980
WTR YR 1989 TOTAL 6807.5 MEAN 18.7 MAX 36 MIN 4.6 AC-FT 13500

e Estimated

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 mi^2.

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.--72 years (water years 1907-13, 1925-89), 1,411 ft^3/s, 1,022,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,000 ft^3/s, estimated, Nov. 27, 1909 (gage height not determined); minimum discharge, 363 ft^3/s Jan. 20, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,310 ft^3/s June 9, 10, gage height, 5.75 ft; minimum discharge, 428 ft^3/s Dec. 15.

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	1270	483	532	503	511	554	775	1150	1870	2170	2110	1840
2	1060	491	533	505	479	559	765	1120	2000	2080	2100	1840
3	934	517	552	505	477	541	765	1180	2140	2040	2080	1840
4	903	528	532	506	e460	536	760	1240	2260	2030	2070	1830
5	921	529	531	509	e460	552	740	1310	2280	2020	2070	1830
6	966	549	549	506	e460	595	721	1370	2280	2020	2060	1840
7	981	547	546	506	e470	634	731	1430	2280	2020	2060	1870
8	981	536	548	506	481	677	756	1440	2290	2040	2060	1890
9	808	530	547	518	481	734	781	1540	2310	2050	2070	1900
10	652	531	545	537	484	751	809	1700	2310	2040	2050	1950
11	648	523	543	526	492	754	832	1760	2300	2060	2050	1960
12	716	520	536	518	495	746	862	1760	2270	2100	2040	1960
13	753	522	532	515	496	749	1010	1720	2260	2160	2000	1960
14	754	527	527	508	496	743	1090	1700	2250	2190	1990	1940
15	664	535	471	533	496	729	1310	1760	2260	2210	1980	1930
16	524	550	482	529	500	704	1340	1880	2250	2250	1980	1910
17	501	552	505	524	506	678	1350	1940	2210	2280	2000	1860
18	497	539	511	522	520	674	1410	1910	2140	2290	2000	1840
19	496	527	510	523	527	671	1470	1860	2090	2270	1990	1830
20	494	521	509	524	524	659	1480	1850	2060	2220	1990	1800
21	495	522	509	528	522	665	1500	1850	2010	2180	1980	1720
22	491	548	511	528	531	664	1530	1840	2000	2130	1990	1680
23	492	575	511	508	540	680	1550	1860	2040	2090	1990	1670
24	494	612	512	505	546	722	1540	1920	2060	2080	1950	1660
25	494	666	505	516	549	746	1430	1910	2050	2080	1870	1660
26	488	648	474	511	552	744	1350	1880	2040	2090	1850	1670
27	486	609	489	509	550	754	1260	1870	2090	2100	1830	1700
28	486	590	503	509	552	781	1230	1860	2170	2110	1820	1690
29	486	577	505	505	---	763	1210	1850	2180	2120	1810	1680
30	485	559	508	505	---	747	1180	1840	2200	2120	1820	1650
31	484	---	506	508	---	773	---	1830	---	2110	1840	---
TOTAL	20904	16463	16074	15955	14157	21279	33537	52130	64950	65750	61500	54400
MEAN	674	549	519	515	506	686	1118	1682	2165	2121	1984	1813
MAX	1270	666	552	537	552	781	1550	1940	2310	2290	2110	1960
MIN	484	483	471	503	460	536	721	1120	1870	2020	1810	1650
AC-FT	41460	32650	31880	31650	28080	42210	66520	103400	128800	130400	122000	107900

CAL YR 1988 TOTAL 416204 MEAN 1137 MAX 2160 MIN 471 AC-FT 825500
WTR YR 1989 TOTAL 437099 MEAN 1198 MAX 2310 MIN 460 AC-FT 867000

e Estimated

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.

14066500 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 1988 to SEPTEMBER 1989

MONTH	ARNOLD CANAL	CENTRAL OREGON CANAL	DESCHUTES COUNTY MUNICIPAL IMPROVEMENT DISTRICT CANAL	NORTH UNIT MAIN CANAL	NORTH CANAL	SWALLEY CANAL	TOTAL
OCTOBER	403	395	0	13,340	6,530	3,700	24,370
NOVEMBER	547	3,660	0	0	1,650	450	6,310
DECEMBER	123	1,750	0	0	1,450	254	3,580
JANUARY	9.9	1,590	0	0	1,520	343	3,460
FEBRUARY	387	1,740	0	0	2,040	321	4,490
MARCH	387	0	0	0	0	0	387
APRIL	1,690	16,820	118	13,120	16,000	3,570	51,320
MAY	5,410	24,220	1,650	30,010	25,780	5,900	92,970
JUNE	6,560	29,620	2,400	42,680	30,780	6,850	118,900
JULY	6,910	33,030	6,010	35,670	32,350	7,360	121,300
AUGUST	6,470	31,880	7,840	29,640	31,870	7,190	114,900
SEPTEMBER	5,480	26,740	5,900	31,030	26,770	5,630	101,600
WTR YR 1989	34,380	171,400	23,920	195,500	176,700	41,570	643,600

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 mi^2.

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 estimated daily discharges, 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.--75 years, 494 ft^3/s, 357,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,820 ft^3/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 ft^3/s Aug. 25, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge near this site since 1905, 4,820 ft^3/s Nov. 27, 1909.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 804 ft^3/s Nov. 25, Mar. 29, gage height, 3.29 ft; maximum gage height, 3.53 ft, Feb. 5, backwater from ice; minimum discharge, 22 ft^3/s May 23.

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	122	395	436	449	451	481	664	45	33	30	36	39
2	165	401	446	449	e430	496	625	33	33	28	34	38
3	73	426	506	448	e425	478	396	33	34	28	34	37
4	30	437	498	450	e410	472	165	32	35	27	32	37
5	30	449	484	462	e410	484	163	31	35	29	36	36
6	30	503	504	446	e410	519	152	30	37	29	35	37
7	30	515	502	448	e420	557	98	30	36	29	37	37
8	30	502	504	450	e430	589	150	30	34	30	35	37
9	36	494	503	470	e430	663	170	33	33	30	34	37
10	34	497	501	512	e435	670	93	36	32	29	33	37
11	33	490	501	516	e440	678	43	37	33	30	33	37
12	35	488	324	450	e440	670	47	37	32	29	33	37
13	36	488	250	450	e445	673	e60	36	30	29	33	38
14	34	345	244	457	e445	667	e64	35	30	29	33	38
15	289	257	278	474	e445	661	e56	34	30	29	32	37
16	444	258	417	476	e450	627	e51	34	31	28	33	37
17	399	258	443	397	462	607	47	34	30	29	33	37
18	389	413	459	242	463	600	35	33	29	30	33	36
19	380	496	339	164	445	597	33	33	28	30	33	36
20	380	486	127	102	383	565	33	32	29	29	33	36
21	381	388	131	149	206	543	33	31	29	28	33	36
22	384	192	212	205	211	545	32	99	29	30	33	36
23	380	175	458	214	116	549	32	213	30	29	33	36
24	377	190	462	440	90	583	205	34	29	29	49	37
25	378	320	456	451	262	631	279	35	30	29	34	38
26	376	627	433	449	234	659	277	35	30	30	36	38
27	366	580	420	446	242	664	157	34	30	32	36	39
28	379	549	442	445	340	703	130	34	28	35	42	39
29	365	508	451	445	---	692	111	34	29	34	40	40
30	338	482	455	442	---	666	86	34	31	36	38	39
31	362	---	450	444	---	685	---	33	---	36	38	---
TOTAL	7085	12609	12636	12442	10370	18674	4487	1294	939	929	1087	1119
MEAN	229	420	408	401	370	602	150	41.7	31.3	30.0	35.1	37.3
MAX	444	627	506	516	463	703	664	213	37	36	49	40
MIN	30	175	127	102	90	472	32	30	28	27	32	36
AC-FT	14050	25010	25060	24680	20570	37040	8900	2570	1860	1840	2160	2220

CAL YR 1988 TOTAL 87008 MEAN 238 MAX 627 MIN 26 AC-FT 172600
WTR YR 1989 TOTAL 83671 MEAN 229 MAX 703 MIN 27 AC-FT 166000

e Estimated

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 mi^2.

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 good except for discharges greater than 50 ft^3/s, which are fair, and those greater than 100 ft^3/s and estimated daily discharges, which are poor. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--18 years (1971-89), 6.78 ft^3/s, 55.80 in/yr, 4,910 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 341 ft^3/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 ft^3/s Mar. 24, 25, 31, 1988.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 25 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 3	1930	53	1.58	Apr. 15	2100	69	1.68
Nov. 11	1230	50	1.53	Apr. 19	1800	*127	*2.01
Mar. 5	1600	79	1.75	May 1	2130	27	1.26
Apr. 7	2300	35	1.38	May 4	2300	48	1.50

Minimum daily discharge, 1.4 ft^3/s Feb. 5, 6, 8-11.

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	5.0	4.2	e4.5	e2.3	e1.8	1.5	1.6	19	8.8	12	9.5	6.7
2	4.5	5.5	e3.0	e2.3	e1.7	1.5	1.5	22	9.9	12	9.5	6.7
3	4.4	12	e2.5	e2.5	e1.6	1.5	1.5	18	11	12	9.2	6.7
4	4.4	23	e2.4	e2.7	e1.5	1.5	1.8	28	14	12	9.1	6.6
5	4.4	7.5	e2.4	e2.5	e1.4	35	4.3	e17	14	12	8.9	6.6
6	4.4	4.9	e2.4	e2.3	e1.4	37	11	11	14	12	9.1	6.4
7	4.4	4.8	e2.4	e2.2	e1.5	7.6	24	12	14	12	8.9	6.3
8	4.4	5.0	e2.4	e2.2	e1.4	3.6	28	11	14	12	10	6.3
9	4.4	3.8	e2.4	e2.4	e1.4	6.3	23	12	14	11	9.5	6.3
10	4.4	14	e2.4	e2.6	e1.4	8.1	15	10	13	11	8.5	6.3
11	4.4	36	e2.4	e2.4	e1.4	5.6	18	8.4	14	11	8.3	6.2
12	4.4	27	e2.4	e2.3	e1.5	3.8	23	7.4	15	11	8.3	6.0
13	4.4	7.6	e2.4	e2.3	e1.5	2.5	29	6.8	16	11	8.1	6.0
14	4.4	4.0	e2.4	e2.2	e1.5	2.1	34	6.7	21	11	7.9	6.0
15	4.3	3.8	e2.4	e2.3	e1.5	2.0	45	7.0	20	11	7.9	6.0
16	4.2	3.6	e2.3	e2.4	e1.5	2.4	45	7.6	15	12	7.9	6.0
17	4.2	3.5	e2.2	e2.4	e1.5	1.7	49	8.2	14	11	7.9	6.0
18	4.2	e3.5	e2.2	e2.4	1.7	1.6	69	7.1	15	10	7.7	6.0
19	4.2	e3.5	e2.2	e2.4	1.6	1.6	87	6.5	14	10	7.6	5.7
20	4.2	e3.7	e2.4	e2.3	1.6	1.7	71	7.1	12	10	7.5	5.6
21	4.2	e15	e2.8	e2.2	1.7	12	39	7.6	12	10	7.5	5.6
22	4.2	e56	e2.8	e2.0	1.7	11	17	7.3	13	9.9	8.6	5.6
23	4.1	e15	e2.8	e1.9	1.5	4.4	9.5	6.7	14	9.9	7.7	5.6
24	4.0	e8.6	e2.8	e1.8	1.5	3.0	6.5	6.1	14	9.9	7.4	5.6
25	3.9	e8.2	e2.5	e1.8	1.5	2.5	5.3	5.7	14	9.9	7.2	5.6
26	3.9	e9.0	e2.2	e1.8	1.5	2.2	5.2	5.9	14	9.8	7.1	5.4
27	e3.9	e17	e2.0	e1.8	1.5	1.9	5.5	6.2	13	9.6	7.1	5.1
28	3.9	e27	e2.0	e1.8	1.5	1.7	4.8	5.7	13	9.5	7.1	5.0
29	3.9	e10	e2.0	e1.8	---	1.6	5.1	5.3	13	9.5	7.1	5.0
30	3.9	e8.0	e2.5	e1.9	---	1.6	8.7	5.8	12	9.5	7.1	5.0
31	3.9	---	e2.3	e1.9	---	1.6	---	7.0	---	9.3	6.8	---
TOTAL	131.4	354.7	76.8	68.1	42.8	172.1	688.3	302.1	414.7	332.8	252.0	177.9
MEAN	4.24	11.8	2.48	2.20	1.53	5.55	22.9	9.75	13.8	10.7	8.13	5.93
MAX	5.0	56	4.5	2.7	1.8	37	87	28	21	12	10	6.7
MIN	3.9	3.5	2.0	1.8	1.4	1.5	1.5	5.3	8.8	9.3	6.8	5.0
AC-FT	261	704	152	135	85	341	1370	599	823	660	500	353
CFSM	2.57	7.17	1.50	1.33	.93	3.36	13.9	5.91	8.38	6.51	4.93	3.59
IN.	2.96	8.00	1.73	1.54	.96	3.88	15.52	6.81	9.35	7.50	5.68	4.01

CAL YR 1988 TOTAL 1866.33 MEAN 5.10 MAX 56 MIN .90 AC-FT 3700 CFSM 3.09 IN. 42.08
WTR YR 1989 TOTAL 3013.7 MEAN 8.26 MAX 87 MIN 1.4 AC-FT 5980 CFSM 5.00 IN. 67.95

e Estimated

UPPER 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 mi^2, not including 12.6 mi^2 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 poor. 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 mi^2 included that of Pole Creek. Water is diverted from Snow Creek, a tributary upstream from station, for irrigation in Three Creek basin.

AVERAGE DISCHARGE.--77 years (water years 1907-18, 1920, 1926-89), 105 ft^3/s, 76,070 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge since 1909, 2,000 ft^3/s Dec. 25, 1980, from rating curve extended above 690 ft^3/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 ft^3/s Mar. 2, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 470 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 10	0200	(a)	*3.61	June 15	0130	*369	2.69

Minimum daily discharge, 22 ft^3/s Feb. 5.

(a) Backwater from ice.

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	61	49	e60	e58	e39	39	60	99	137	183	120	85
2	61	90	56	e58	e30	39	59	101	163	178	131	82
3	60	109	54	54	e24	43	57	103	189	193	121	81
4	59	89	55	45	e23	48	58	119	223	193	116	82
5	60	81	52	44	e22	78	66	139	245	186	115	81
6	59	104	61	44	e26	82	74	168	262	190	119	79
7	59	64	56	45	e31	63	85	199	241	204	119	78
8	58	60	54	57	e37	56	92	211	237	197	128	78
9	57	56	54	56	e34	60	91	219	234	185	144	78
10	57	56	54	56	e38	65	87	205	225	178	123	76
11	56	54	52	52	e42	65	87	170	227	176	117	75
12	55	64	53	54	e44	63	90	152	246	186	114	74
13	54	57	57	e50	e44	62	96	140	266	199	111	73
14	53	53	54	47	e39	59	106	136	315	197	108	74
15	62	52	e50	47	e39	59	119	133	339	192	105	75
16	64	52	e45	46	e42	58	130	144	272	197	101	76
17	64	50	e45	45	e44	57	136	158	237	225	101	75
18	59	48	e50	44	e40	58	153	148	239	199	99	70
19	57	e47	e60	44	e38	56	168	130	240	192	99	69
20	54	50	e70	43	e40	55	176	132	207	182	100	69
21	53	60	79	44	e41	84	163	142	187	166	100	69
22	52	88	76	42	e41	78	139	141	201	156	145	70
23	51	78	73	e29	e40	70	123	133	226	154	114	70
24	51	63	75	e27	40	67	117	120	236	156	96	71
25	51	60	70	e33	40	69	116	113	240	152	92	71
26	49	58	56	e34	39	66	105	110	251	147	90	71
27	47	68	e35	e36	40	64	99	117	222	141	90	68
28	47	79	e35	e38	39	65	95	111	200	133	88	69
29	46	66	e40	e40	---	62	92	104	199	134	89	70
30	47	74	e52	e41	---	60	93	104	195	137	93	70
31	47	---	e66	e44	---	60	---	115	---	132	88	---
TOTAL	1710	1979	1749	1397	1036	1910	3132	4316	6901	5440	3376	2229
MEAN	55.2	66.0	56.4	45.1	37.0	61.6	104	139	230	175	109	74.3
MAX	64	109	79	58	44	84	176	219	339	225	145	85
MIN	46	47	35	27	22	39	57	99	137	132	88	68
AC-FT	3390	3930	3470	2770	2050	3790	6210	8560	13690	10790	6700	4420

CAL YR 1988 TOTAL 29654 MEAN 81.0 MAX 269 MIN 35 AC-FT 58820
WTR YR 1989 TOTAL 35175 MEAN 96.4 MAX 339 MIN 22 AC-FT 69770

e Estimated

14076500 DESCHUTES RIVER NEAR CULVER, OR

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.

DRAINAGE AREA.--2,705 mi^2.

PERIOD OF RECORD.--July 1952 to current year.

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.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Crescent Lake and Crane Prairie and Wickiup Reservoirs (see elsewhere in this report). Many diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--37 years, 921 ft^3/s, 667,300 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,680 ft^3/s Dec. 24, 1964, gage height, 10.00 ft, from rating curve extended above 2,200 ft^3/s on basis of slope-area measurement of peak flow; minimum discharge, 418 ft^3/s July 7, 8, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,350 ft^3/s Mar. 10, gage height, 4.15 ft; minimum discharge, 510 ft^3/s July 21, 27.

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	536	970	1090	1030	1020	917	1240	602	520	528	519	524
2	622	994	1050	1030	1010	993	1190	558	525	526	524	524
3	692	1090	1070	1040	998	993	1160	533	539	521	525	526
4	633	1100	1110	1030	998	1010	843	533	561	523	523	525
5	581	1020	1090	1030	998	1070	716	543	641	532	521	525
6	580	1080	1070	1030	995	1160	715	542	669	525	520	524
7	579	1080	1080	1020	986	1160	713	566	674	527	524	524
8	578	1060	1080	1010	963	1170	693	612	647	537	525	525
9	578	1050	1100	1040	942	1220	768	688	633	534	533	524
10	581	1040	1060	1090	992	1310	763	707	622	525	534	524
11	585	1040	1050	1080	1030	1290	660	671	602	518	527	525
12	584	1040	1040	1080	1050	1300	566	622	607	516	523	524
13	585	1060	852	1030	1020	1290	566	575	634	518	522	525
14	584	1060	828	1030	1010	1280	568	557	672	517	522	543
15	588	879	812	1030	1000	1270	592	549	802	515	524	531
16	886	888	860	1050	1020	1230	654	548	786	515	522	529
17	1020	915	977	1010	1040	1180	645	548	670	531	521	530
18	994	892	1030	902	1050	1190	662	559	636	535	524	529
19	991	1080	1080	771	1050	1190	670	559	622	524	525	536
20	984	1100	903	714	1010	1190	719	541	594	518	525	544
21	982	1090	749	672	895	1170	730	538	552	515	523	528
22	987	1000	761	761	801	1200	719	537	528	515	530	525
23	982	891	886	774	804	1170	655	592	539	517	532	523
24	983	850	1060	815	692	1180	660	687	584	517	538	524
25	982	860	1060	1020	702	1170	846	542	604	517	539	525
26	983	1050	1000	1030	819	1200	835	531	601	515	535	526
27	977	1220	966	1030	784	1210	789	532	598	515	527	526
28	971	1210	1010	1020	786	1240	681	533	569	518	527	525
29	973	1160	1030	1020	---	1250	645	531	540	520	525	525
30	954	1110	1060	1020	---	1230	623	530	533	520	532	536
31	931	---	1040	1020	---	1220	---	522	---	517	528	---
TOTAL	24466	30879	30854	30229	26465	36653	22286	17688	18304	16171	16319	15824
MEAN	789	1029	995	975	945	1182	743	571	610	522	526	527
MAX	1020	1220	1110	1090	1050	1310	1240	707	802	537	539	544
MIN	536	850	749	672	692	917	566	522	520	515	519	523
AC-FT	48530	61250	61200	59960	52490	72700	44200	35080	36310	32080	32370	31390

CAL YR 1988 TOTAL 284437 MEAN 777 MAX 1240 MIN 511 AC-FT 564200
WTR YR 1989 TOTAL 286138 MEAN 784 MAX 1310 MIN 515 AC-FT 567600

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 mi^2, approximately, of which 500 mi^2 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, 160,200 acre-ft Apr. 30, May 1, elevation, 3,237.20 ft; minimum contents, 75,640 acre-ft Oct. 28 to Nov. 4, elevation, 3,202.45 ft.

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 1988 TO SEPTEMBER 1989
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3203.95	3202.45	3205.23	3209.14	3212.75	3223.38	3231.54	3237.20	3234.10	3229.54	3223.27	3216.66
2	3203.80	3202.45	3205.36	3209.24	3212.84	3223.81	3231.16	3237.11	3234.02	3229.37	3223.05	3216.53
3	3203.68	3202.46	3205.44	3209.34	3212.90	3224.01	3230.69	3236.95	3233.99	3229.19	3222.84	3216.30
4	3203.54	3202.51	3205.56	3209.46	3212.94	3224.20	3230.23	3236.88	3233.89	3229.00	3222.63	3216.13
5	3203.41	3202.58	3205.63	3209.58	3212.99	3224.42	3229.82	3236.78	3233.80	3228.81	3222.44	3215.93
6	3203.27	3202.58	3205.71	3209.71	3213.08	3225.62	3229.72	3236.78	3233.70	3228.66	3222.25	3215.74
7	3203.17	3202.58	3205.79	3209.75	3213.16	3227.61	3230.18	3236.78	3233.70	3228.45	3222.07	3215.56
8	3203.05	3202.58	3205.93	3209.82	3213.24	3228.52	3231.09	3236.73	3233.70	3228.22	3221.82	3215.42
9	3202.96	3202.64	3206.06	3210.00	3213.32	3230.06	3231.82	3236.58	3233.25	3228.08	3221.61	3215.20
10	3202.83	3202.68	3206.34	3210.14	3213.38	3232.31	3232.13	3236.43	3233.15	3227.88	3221.40	3215.03
11	3202.73	3202.76	3206.70	3210.32	3213.44	3233.36	3232.21	3236.47	3233.06	3227.69	3221.09	3214.85
12	3202.69	3202.80	3207.02	3210.47	3213.52	3234.31	3232.33	3236.49	3232.94	3227.56	3220.93	3214.67
13	3202.63	3202.88	3207.25	3210.55	3213.61	3234.92	3232.48	3236.41	3232.77	3227.33	3220.72	3214.52
14	3202.59	3202.96	3207.45	3210.69	3213.67	3234.73	3232.79	3236.24	3232.62	3227.11	3220.46	3214.36
15	3202.59	3203.03	3207.60	3210.81	3213.79	3234.12	3233.08	3236.05	3232.44	3226.90	3220.26	3214.17
16	3202.59	3203.14	3207.68	3210.94	3213.86	3233.55	3233.43	3235.91	3232.24	3226.68	3220.02	3214.03
17	3202.59	3203.23	3207.76	3211.06	3213.96	3232.79	3233.67	3235.70	3232.09	3226.49	3219.80	3213.85
18	3202.58	3203.36	3207.83	3211.20	3214.16	3232.08	3234.03	3235.41	3231.94	3226.31	3219.59	3213.66
19	3202.58	3203.42	3207.96	3211.32	3215.14	3231.44	3234.24	3235.22	3231.74	3226.13	3219.36	3213.53
20	3202.55	3203.49	3208.05	3211.47	3216.15	3230.90	3234.38	3235.07	3231.57	3225.91	3219.16	3213.37
21	3202.53	3203.57	3208.20	3211.61	3216.86	3230.60	3234.58	3234.88	3231.39	3225.65	3218.92	3213.21
22	3202.53	3203.66	3208.25	3211.74	3217.70	3230.83	3234.83	3234.69	3231.21	3225.47	3218.70	3213.09
23	3202.53	3203.99	3208.40	3211.85	3219.81	3231.03	3234.93	3234.50	3231.03	3225.29	3218.48	3212.93
24	3202.51	3204.34	3208.49	3211.91	3221.19	3231.03	3234.97	3234.33	3230.88	3225.11	3218.24	3212.82
25	3202.51	3204.53	3208.56	3211.98	3222.00	3231.45	3235.18	3234.33	3230.70	3224.86	3218.04	3212.69
26	3202.49	3204.68	3208.64	3212.09	3222.52	3232.03	3235.69	3234.27	3230.49	3224.67	3217.80	3212.54
27	3202.48	3204.79	3208.69	3212.20	3223.00	3232.12	3236.13	3234.27	3230.28	3224.50	3217.58	3212.42
28	3202.46	3204.88	3208.76	3212.30	3223.13	3232.12	3236.54	3234.23	3230.07	3224.23	3217.38	3212.29
29	3202.46	3205.03	3208.81	3212.42	---	3232.26	3236.93	3234.23	3229.90	3224.04	3217.14	3212.19
30	3202.46	3205.15	3208.92	3212.52	---	3232.14	3237.19	3234.21	3229.72	3223.75	3217.00	3212.05
31	3202.45	---	3209.06	3212.64	---	3231.89	---	3234.12	---	3223.47	3216.83	---
MAX	3203.95	3205.15	3209.06	3212.64	3223.13	3234.92	3237.19	3237.20	3234.10	3229.54	3223.27	3216.66
MIN	3202.45	3202.45	3205.23	3209.14	3212.75	3223.38	3229.72	3234.12	3229.72	3223.47	3216.83	3212.05
(†)	75640	80720	88450	95920	120300	144200	160200	150800	138000	121200	105200	94660
(‡)	-3120	+5080	+7730	+7470	+24380	+23900	+16000	-9400	-12800	-16800	-16000	-10540

CAL YR 1988 MAX 3232.99 MIN 3202.45 AC-FT‡ +5380
WTR YR 1989 MAX 3237.20 MIN 3202.45 AC-FT‡ +15900

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

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 mi^2, approximately, of which 500 mi^2 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 ft^3/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 ft^3/s, 273,900 acre-ft/yr; 29 years (water years 1961-89), 369 ft^3/s, 267,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,410 ft^3/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, 3,110 ft^3/s Mar. 14, gage height, 7.62 ft; minimum discharge, 2.7 ft^3/s Jan. 6.

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	154	31	20	7.6	19	199	1980	1450	268	268	263	211
2	154	31	20	7.6	19	199	1990	1440	239	268	263	211
3	154	31	20	7.6	19	199	1980	1310	221	268	261	211
4	154	31	20	7.8	19	199	1780	1250	221	268	261	211
5	154	31	20	7.9	19	199	1660	1160	221	268	261	211
6	154	31	19	12	19	199	1660	1130	221	268	261	211
7	135	31	19	19	19	324	1470	1130	223	268	261	211
8	123	31	19	19	19	401	1370	1120	223	268	261	202
9	123	31	19	19	19	728	1380	1110	223	267	261	196
10	112	31	19	19	19	1870	1620	1100	223	266	261	195
11	84	31	19	19	19	3070	1760	1110	224	266	261	196
12	67	31	12	19	19	3070	1760	1040	225	265	260	196
13	63	31	7.1	19	19	3080	1570	972	225	268	259	196
14	44	31	7.2	19	19	3010	1470	949	241	273	259	196
15	30	31	7.3	19	19	2900	1480	857	263	273	259	196
16	30	31	7.4	19	19	2660	1480	781	263	273	258	197
17	30	31	7.5	19	19	2520	1290	761	264	273	258	197
18	30	31	7.4	19	19	2460	1180	739	265	272	258	197
19	30	31	7.4	19	19	2450	1180	639	265	271	258	197
20	30	31	7.5	19	19	2260	1190	567	265	270	258	197
21	30	27	7.5	19	19	2040	1030	557	265	270	258	197
22	30	20	7.6	19	19	1980	943	553	265	270	257	181
23	30	19	7.6	19	19	1980	947	553	265	268	256	173
24	28	20	7.6	19	47	1980	948	404	266	268	256	173
25	31	20	7.6	19	139	1980	954	325	267	268	256	173
26	31	20	7.6	19	199	1990	996	287	268	268	256	173
27	31	20	7.6	19	199	1990	1050	267	268	265	256	173
28	31	20	7.6	19	199	1990	1110	268	268	264	254	173
29	31	20	7.6	19	---	1990	1170	268	268	263	226	173
30	31	20	7.6	19	---	1990	1310	268	268	263	211	154
31	31	---	7.6	19	---	1990	---	268	---	263	211	---
TOTAL	2190	826	368.3	525.5	1220	53897	41708	24633	7451	8311	7899	5778
MEAN	70.6	27.5	11.9	17.0	43.6	1739	1390	795	248	268	255	193
MAX	154	31	20	19	199	3080	1990	1450	268	273	263	211
MIN	28	19	7.1	7.6	19	199	943	267	221	263	211	154
AC-FT	4340	1640	731	1040	2420	106900	82730	48860	14780	16480	15670	11460

CAL YR 1988 TOTAL 53122.3 MEAN 145 MAX 342 MIN 7.1 AC-FT 105400
WTR YR 1989 TOTAL 154806.8 MEAN 424 MAX 3080 MIN 7.1 AC-FT 307100

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 mi^2, approximately, of which 500 mi^2 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.--28 years, 1,595 ft^3/s, 1,156,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,660 ft^3/s Dec. 24, 1964, gage height, 9.36 ft; minimum daily discharge, 1,090 ft^3/s May 11, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,190 ft^3/s Mar. 12, gage height, 7.95 ft, due to powerplant operation; maximum daily discharge, 4,310 ft^3/s Mar. 14; minimum discharge not determined, occurred when stage briefly dropped below intakes on many days, due to powerplant operation; minimum daily, 1,140 ft^3/s June 14.

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	1270	1250	1240	1200	1240	1430	3210	2800	1340	1210	1200	1340
2	1270	1250	1230	1200	1230	1420	3180	2830	1320	1250	1200	1350
3	1270	1260	1240	1200	1200	1410	3170	2750	1270	1260	1200	1360
4	1270	1270	1230	1200	1190	1400	3160	2590	1240	1220	1200	1360
5	1260	1270	1230	1200	1190	1420	2920	2530	1250	1210	1200	1350
6	1230	1260	1230	1200	1200	1580	2890	2460	1220	1210	1230	1330
7	1210	1250	1230	1200	1200	1620	2900	2510	1210	1190	1250	1330
8	1170	1250	1230	1200	1200	1650	2690	2440	1180	1180	1250	1340
9	1170	1250	1230	1200	1200	1770	2640	2380	1150	1180	1260	1340
10	1170	1250	1230	1250	1200	2330	2630	2320	1150	1190	1250	1330
11	1170	1250	1230	1280	1210	3290	2910	2310	1150	1190	1290	1330
12	1200	1250	1230	1250	1210	4190	2950	2270	1150	1170	1280	1330
13	1190	1250	1230	1240	1210	4280	2920	2140	1150	1170	1270	1340
14	1190	1250	1230	1230	1210	4310	2690	2070	1140	1160	1280	1320
15	1240	1250	1220	1230	1210	4210	2670	2010	1150	1180	1290	1310
16	1310	1260	1230	1230	1210	4080	2640	1870	1190	1180	1300	1310
17	1270	1260	1210	1220	1210	3850	2650	1810	1220	1210	1300	1340
18	1260	1260	1210	1220	1210	3690	2420	1760	1220	1240	1300	1350
19	1270	1260	1210	1240	1230	3640	2400	1720	1230	1240	1300	1360
20	1260	1250	1210	1250	1230	3630	2370	1640	1220	1220	1310	1360
21	1260	1250	1210	1260	1230	3400	2350	1600	1200	1220	1320	1360
22	1260	1250	1220	1250	1240	3270	2160	1590	1200	1210	1330	1370
23	1260	1260	1240	1250	1330	3220	2130	1600	1190	1220	1390	1370
24	1250	1240	1230	1240	1320	3200	2200	1580	1180	1230	1440	1350
25	1250	1240	1210	1240	1320	3220	2190	1470	1180	1220	1490	1360
26	1250	1240	1200	1230	1360	3260	2390	1420	1180	1220	1460	1350
27	1250	1250	1200	1220	1440	3230	2530	1390	1180	1210	1440	1350
28	1250	1230	1200	1220	1440	3230	2560	1380	1170	1220	1390	1360
29	1250	1230	1200	1220	---	3260	2590	1390	1170	1210	1370	1370
30	1250	1240	1200	1220	---	3230	2630	1390	1180	1210	1350	1390
31	1250	---	1200	1220	---	3220	---	1370	---	1220	1350	---
TOTAL	38430	37530	37840	38010	34870	90940	79740	61390	35980	37450	40490	40410
MEAN	1240	1251	1221	1226	1245	2934	2658	1980	1199	1208	1306	1347
MAX	1310	1270	1240	1280	1440	4310	3210	2830	1340	1260	1490	1390
MIN	1170	1230	1200	1200	1190	1400	2130	1370	1140	1160	1200	1310
AC-FT	76230	74440	75060	75390	69160	180400	158200	121800	71370	74280	80310	80150

CAL YR 1988 TOTAL 450770 MEAN 1232 MAX 1430 MIN 1140 AC-FT 894100
WTR YR 1989 TOTAL 573080 MEAN 1570 MAX 4310 MIN 1140 AC-FT 1137000

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 mi^2.

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 except for estimated daily discharges, which are fair. Flow occasionally regulated by Suttle Lake 150 ft upstream from station.

AVERAGE DISCHARGE.--74 years (water years 1916-89), 52.3 ft^3/s, 37,890 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum recorded discharge, 446 ft^3/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 ft^3/s Nov. 4, 5, 1940; minimum daily, 8 ft^3/s Nov. 5, 1940, Oct. 6, 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 144 ft^3/s Apr. 24, gage height, 3.23 ft; minimum discharge, 16 ft^3/s Oct. 31, Nov. 1, July 9.

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	25	20	57	43	41	33	65	82	51	33	27	24
2	23	33	54	44	e38	35	68	78	50	31	29	25
3	26	53	52	40	e36	35	63	80	48	23	29	26
4	27	51	49	40	e35	35	62	82	48	26	27	29
5	26	39	46	41	e35	42	61	84	48	28	27	29
6	26	37	48	42	e34	49	61	86	48	33	28	26
7	26	31	46	42	e34	44	63	88	46	31	30	25
8	27	30	45	45	e34	42	70	91	46	31	31	26
9	27	30	45	49	e34	49	77	100	45	27	33	27
10	27	34	45	66	e35	53	81	97	44	20	31	26
11	27	33	45	56	38	52	84	94	45	24	31	29
12	26	35	45	51	40	54	86	90	44	52	29	25
13	25	33	44	e50	39	61	88	83	42	53	28	26
14	25	33	38	e49	39	63	94	78	41	41	28	26
15	25	33	e37	e48	39	61	97	74	42	26	27	23
16	25	32	e36	e48	40	61	97	65	40	29	31	27
17	25	33	e36	e48	42	62	101	58	40	37	30	28
18	26	31	e36	47	42	65	106	60	40	40	25	22
19	26	31	e39	46	42	59	112	60	40	36	31	22
20	24	28	44	45	39	57	116	60	41	32	29	25
21	27	33	48	47	37	60	118	59	38	29	27	29
22	24	47	50	48	38	57	120	56	38	31	35	29
23	24	50	52	45	38	58	118	57	36	32	30	23
24	25	50	51	43	37	62	129	59	36	31	29	22
25	26	58	50	42	36	67	118	56	36	31	27	26
26	28	56	45	41	36	65	108	54	35	33	27	26
27	33	61	e42	41	36	65	96	58	33	30	27	27
28	31	71	43	40	34	71	93	56	33	29	27	29
29	29	61	42	40	---	67	89	54	34	30	28	29
30	26	59	46	41	---	65	86	53	35	29	34	25
31	18	---	44	45	---	64	---	52	---	27	30	---
TOTAL	805	1226	1400	1413	1048	1713	2727	2204	1243	985	902	781
MEAN	26.0	40.9	45.2	45.6	37.4	55.3	90.9	71.1	41.4	31.8	29.1	26.0
MAX	33	71	57	66	42	71	129	100	51	53	35	29
MIN	18	20	36	40	34	33	61	52	33	20	25	22
AC-FT	1600	2430	2780	2800	2080	3400	5410	4370	2470	1950	1790	1550

CAL YR 1988 TOTAL 16223 MEAN 44.3 MAX 90 MIN 18 AC-FT 32180
WTR YR 1989 TOTAL 16447 MEAN 45.1 MAX 129 MIN 18 AC-FT 32620

e Estimated

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 mi^2.

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.--6 years, 92.4 ft^3/s, 45.14 in/yr, 66,940 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 428 ft^3/s Feb. 23, 1986, gage height, 3.21 ft; minimum daily discharge, 37 ft^3/s Feb. 8-10, 1989.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 2	2300	*210	*2.39				

Minimum daily discharge, 37 ft^3/s Feb. 8-10.

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	77	69	72	61	60	53	64	105	131	130	108	87
2	77	96	71	63	e50	53	64	106	147	129	111	86
3	77	114	69	66	e43	52	62	105	155	133	107	85
4	76	113	68	65	e41	52	64	116	163	132	104	85
5	77	91	68	63	e40	64	71	131	163	129	104	84
6	76	94	77	61	e38	88	76	146	166	129	104	83
7	76	72	76	61	e38	70	85	154	155	132	105	82
8	75	68	72	61	e37	64	91	150	153	128	105	82
9	74	66	72	71	e37	65	89	148	151	126	106	82
10	74	70	73	74	e37	71	83	141	145	124	103	82
11	74	67	72	68	e43	69	84	124	146	123	101	81
12	73	82	72	65	e53	69	87	117	155	126	100	80
13	73	71	80	65	55	68	91	112	157	129	100	79
14	73	68	74	64	57	65	97	112	165	128	98	79
15	78	66	71	64	58	64	106	115	166	127	97	80
16	79	67	69	64	59	63	111	119	145	127	96	80
17	78	65	67	64	59	62	107	125	139	131	97	79
18	74	64	67	65	59	63	117	119	143	128	96	78
19	73	65	68	64	58	62	139	109	142	125	95	78
20	72	65	67	64	57	61	144	109	136	121	94	77
21	72	79	67	63	56	76	130	113	131	117	96	77
22	71	121	66	62	57	72	111	113	137	115	107	77
23	70	106	65	59	56	68	104	111	144	115	96	78
24	70	83	66	60	55	67	107	107	146	114	92	77
25	70	77	64	60	54	68	107	103	145	113	91	77
26	69	73	55	60	53	66	103	102	148	113	90	77
27	69	84	57	59	53	65	98	109	136	112	90	76
28	69	91	59	59	53	65	96	105	130	110	89	75
29	68	77	62	59	---	64	95	103	130	110	88	76
30	68	74	65	59	---	63	98	102	135	111	88	76
31	68	---	63	61	---	63	---	114	---	110	88	---
TOTAL	2270	2398	2114	1954	1416	2015	2881	3645	4405	3797	3046	2395
MEAN	73.2	79.9	68.2	63.0	50.6	65.0	96.0	118	147	122	98.3	79.8
MAX	79	121	80	74	60	88	144	154	166	133	111	87
MIN	68	64	55	59	37	52	62	102	130	110	88	75
AC-FT	4500	4760	4190	3880	2810	4000	5710	7230	8740	7530	6040	4750
CFSM	2.63	2.88	2.45	2.27	1.82	2.34	3.45	4.23	5.28	4.41	3.53	2.87
IN.	3.04	3.21	2.83	2.61	1.89	2.70	3.86	4.88	5.89	5.08	4.08	3.20

CAL YR 1988 TOTAL 30945 MEAN 84.5 MAX 162 MIN 48 AC-FT 61380 CFSM 3.04 IN. 41.41
WTR YR 1989 TOTAL 32336 MEAN 88.6 MAX 166 MIN 37 AC-FT 64140 CFSM 3.19 IN. 43.27

e Estimated

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 mi^2.

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. 30 to Feb. 9 and Mar. 12 to Sept. 30, which are fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--7 years, 83.8 ft^3/s, 49.69 in/yr, 60,710 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 613 ft^3/s Dec. 10, 1987, from rating curve extended above 170 ft^3/s, gage height, 3.24 ft; minimum discharge, 34 ft^3/s Nov. 25 to Dec. 1, 1987, Oct. 31, Nov. 1, 1988.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 220 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 5	1700	(a)	*2.95	Apr. 20	unknown	*unknown	unknown

Minimum discharge, 34 ft^3/s Oct. 31, Nov. 1, Feb. 5-7.

(a) Backwater from ice.

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	51	36	69	50	e41	37	86	136	88	136	71	50
2	53	66	67	50	e40	37	84	136	104	132	82	48
3	51	91	65	50	e38	37	81	141	116	145	75	49
4	50	88	63	50	e36	37	84	153	131	153	74	52
5	52	84	63	49	e34	55	91	181	142	121	76	50
6	52	114	74	48	e34	83	104	181	156	132	82	47
7	52	56	74	45	e34	63	115	181	140	113	84	48
8	50	51	70	45	e36	58	134	181	138	124	86	51
9	48	47	75	72	e40	66	126	179	138	117	91	51
10	49	55	77	73	41	71	126	176	142	102	79	48
11	47	50	75	59	41	70	126	132	135	106	73	47
12	47	63	74	54	41	79	123	111	148	106	75	46
13	46	53	88	55	40	83	123	103	157	106	72	47
14	46	48	79	54	40	85	141	101	175	110	68	49
15	68	46	73	54	39	77	149	99	185	110	72	52
16	81	45	66	54	41	80	158	102	158	107	72	57
17	69	44	64	55	42	76	167	108	163	115	78	48
18	54	41	63	55	41	73	172	104	149	109	65	44
19	49	44	62	53	40	69	186	95	152	106	68	43
20	44	44	61	52	39	67	201	90	143	98	70	44
21	44	75	60	51	39	90	201	91	113	90	75	45
22	44	143	58	51	40	97	176	92	117	85	134	49
23	41	124	56	49	41	89	141	91	141	86	87	53
24	41	95	54	48	39	85	141	87	153	85	67	53
25	41	72	53	47	39	95	136	82	153	82	54	54
26	38	65	54	47	38	87	132	79	153	84	53	51
27	35	84	51	46	38	90	132	84	141	81	53	49
28	35	107	51	46	38	88	132	80	141	77	53	51
29	35	86	54	47	---	92	132	76	141	82	52	56
30	35	70	56	e44	---	92	132	74	141	89	55	56
31	34	---	52	e42	---	89	---	77	---	80	53	---
TOTAL	1482	2087	2001	1595	1090	2297	4032	3603	4254	3269	2249	1488
MEAN	47.8	69.6	64.5	51.5	38.9	74.1	134	116	142	105	72.5	49.6
MAX	81	143	88	73	42	97	201	181	185	153	134	57
MIN	34	36	51	42	34	37	81	74	88	77	52	43
AC-FT	2940	4140	3970	3160	2160	4560	8000	7150	8440	6480	4460	2950
CFSM	2.09	3.04	2.82	2.25	1.70	3.24	5.87	5.08	6.19	4.60	3.17	2.17
IN.	2.41	3.39	3.25	2.59	1.77	3.73	6.55	5.85	6.91	5.31	3.65	2.42

CAL YR 1988 TOTAL 28270 MEAN 77.2 MAX 177 MIN 34 AC-FT 56070 CFSM 3.37 IN. 45.92
WTR YR 1989 TOTAL 29447 MEAN 80.7 MAX 201 MIN 34 AC-FT 58410 CFSM 3.52 IN. 47.84

e Estimated

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 mi^2, 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.--69 years (water years 1913, 1922-89), 1,493 ft^3/s, 1,082,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,530 ft^3/s Dec. 24, 1964, gage height, 6.81 ft; minimum discharge, 1,080 ft^3/s Feb. 17, 1932, Oct. 2-31, Nov. 6, 7, 10-14, 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,750 ft^3/s Apr. 20, gage height, 1.94 ft; minimum discharge, 1,210 ft^3/s Oct. 31, Nov. 1.

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	1250	1220	1370	1280	1330	1270	1460	1560	1470	1450	1350	1300
2	1250	1290	1350	1280	1270	1270	1470	1550	1510	1430	1360	1290
3	1250	1450	1340	1290	1250	1260	1450	1550	1550	1430	1350	1290
4	1250	1420	1330	1290	1250	1260	1440	1560	1580	1440	1350	1290
5	1250	1340	1320	1280	1250	1350	1460	1610	1590	1430	1350	1290
6	1250	1380	1350	1280	1250	1480	1480	1650	1600	1430	1350	1290
7	1250	1280	1360	1270	1250	1450	1510	1690	1580	1440	1360	1280
8	1250	1270	1340	1270	1250	1420	1540	1700	1560	1430	1360	1290
9	1240	1260	1340	1390	1250	1460	1550	1700	1560	1420	1380	1290
10	1240	1290	1350	1590	1260	1510	1540	1690	1540	1400	1360	1280
11	1240	1280	1340	1450	1280	1510	1530	1630	1520	1400	1340	1280
12	1240	1310	1340	1400	1300	1510	1540	1590	1540	1420	1340	1280
13	1240	1290	1360	1390	1290	1520	1550	1560	1560	1450	1330	1280
14	1240	1280	1340	1380	1290	1500	1560	1540	1580	1450	1330	1280
15	1260	1270	1320	1370	1280	1490	1600	1530	1620	1430	1320	1280
16	1270	1270	1310	1370	1290	1480	1630	1530	1550	1430	1320	1290
17	1270	1270	1310	1380	1300	1480	1620	1530	1500	1450	1330	1280
18	1250	1250	1310	1380	1300	1510	1640	1530	1500	1440	1320	1280
19	1240	1250	1310	1370	1290	1490	1700	1490	1500	1430	1320	1270
20	1230	1260	1310	1360	1290	1470	1740	1480	1480	1410	1330	1270
21	1230	1320	1310	1380	1280	1520	1730	1480	1460	1390	1330	1270
22	1230	1520	1310	1370	1290	1510	1670	1490	1470	1380	1400	1280
23	1230	1550	1310	1340	1290	1490	1640	1480	1500	1380	1350	1280
24	1230	1410	1310	1340	1280	1490	1690	1480	1510	1380	1320	1270
25	1230	1390	1300	1330	1270	1500	1670	1460	1500	1370	1310	1280
26	1230	1360	1270	1320	1270	1490	1630	1450	1510	1370	1310	1280
27	1220	1380	1280	1320	1270	1480	1590	1470	1480	1370	1300	1280
28	1230	1500	1280	1310	1270	1490	1570	1470	1450	1360	1300	1280
29	1220	1410	1290	1310	---	1480	1550	1450	1450	1360	1300	1280
30	1220	1380	1310	1310	---	1460	1550	1440	1460	1370	1310	1290
31	1220	---	1290	1330	---	1460	---	1440	---	1360	1310	---
TOTAL	38450	40150	40960	41730	35740	45060	47300	47780	45680	43700	41390	38470
MEAN	1240	1338	1321	1346	1276	1454	1577	1541	1523	1410	1335	1282
MAX	1270	1550	1370	1590	1330	1520	1740	1700	1620	1450	1400	1300
MIN	1220	1220	1270	1270	1250	1260	1440	1440	1450	1360	1300	1270
AC-FT	76270	79640	81240	82770	70890	89380	93820	94770	90610	86680	82100	76310

CAL YR 1988 TOTAL 497230 MEAN 1359 MAX 1620 MIN 1220 AC-FT 986300
WTR YR 1989 TOTAL 506410 MEAN 1387 MAX 1740 MIN 1220 AC-FT 1004000

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 mi^2, 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, 535,500 acre-ft Aug. 20, elevation, 1,945.20 ft; minimum contents observed, 471,700 acre-ft Feb. 15, elevation, 1,928.52 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept.30	1,944.27	531,800	--
Oct. 31	1,941.85	522,400	-9,400
Nov. 30	1,936.93	503,600	-18,800
Dec. 31	1,939.65	513,900	+10,300
CAL YR 1988	--	--	+23,400
Jan. 31	1,934.12	492,900	-21,000
Feb. 28	1,933.87	491,900	-1,000
Mar. 31	1,944.40	532,400	+40,500
Apr. 30	1,942.65	525,500	-6,900
May 31	1,943.45	528,600	+3,100
June 30	1,944.22	531,600	+3,000
July 31	1,944.06	531,000	-600
Aug. 31	1,944.23	531,700	+700
Sept.30	1,941.47	520,900	-10,800
WTR YR 1989	--	--	-10,900

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 mi^2, aprroximately.

PERIOD OF RECORD.--October 1988 to September 1989.

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.--No estimated daily discharges. Records poor. Flow regulated by Round Butte Dam.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,200 ft^3/s Jan. 7, 8; maximum gage height, 10.47 ft Jan. 7; minimum discharge, unknown, occurred during period of missing record.

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	3580	4530	3790	4260	4260	---	6110	---	---	---	---	4100
2	3700	4280	4490	4000	3950	4160	5380	---	---	---	---	3700
3	3640	4320	4110	4510	---	3950	6020	---	---	---	---	3930
4	3670	4120	4310	3910	---	4160	5740	---	---	---	---	3860
5	4000	4190	3090	4140	---	4540	6220	---	---	---	---	3790
6	3340	4360	3480	3840	---	4480	6230	---	---	---	---	4050
7	3910	4380	4040	3190	---	4400	6120	---	---	---	---	3260
8	3420	4440	4160	3130	---	4490	5800	---	---	---	---	3970
9	3530	4340	3790	3030	---	4860	5870	---	---	---	---	3820
10	3940	4460	3900	3960	---	4680	5880	---	---	---	---	---
11	3420	4640	5300	3250	---	5690	5990	---	---	---	---	---
12	3340	4600	4310	5000	---	5180	5750	---	---	---	---	---
13	3520	4960	3780	4340	---	---	6070	---	---	---	---	---
14	3560	4550	3760	4640	---	6000	6340	---	---	---	---	---
15	4140	4330	4250	4410	---	5360	5530	---	---	---	---	---
16	4550	4400	4050	4640	---	5500	5740	---	---	---	---	---
17	3280	4860	3760	4980	---	5620	5760	---	---	---	---	---
18	3500	4470	2800	4860	---	5820	5910	---	---	---	---	---
19	4140	4560	3730	4910	---	5450	5100	---	---	---	---	---
20	4260	4610	3800	4820	---	6180	5270	---	---	---	---	---
21	4070	4800	3970	5500	---	5080	4900	---	---	---	4070	---
22	4390	4800	3900	5380	---	---	4720	---	---	---	3730	---
23	4520	4500	3730	5550	---	5600	4090	---	---	---	3850	---
24	4470	5170	4230	5150	---	6590	4200	---	---	---	3970	---
25	4400	4660	4410	5550	---	6380	3880	---	---	---	4010	---
26	4730	4870	3800	5410	---	6140	4450	---	---	---	---	---
27	4470	4930	3950	---	---	5830	4440	---	---	---	---	---
28	4440	5050	4430	---	---	6080	4490	---	---	---	---	---
29	4660	4560	4350	---	---	5940	5650	---	---	---	---	---
30	4340	4640	4250	---	---	6090	5200	---	---	---	---	---
31	4070	---	3930	---	---	5650	---	---	---	---	4440	---
TOTAL	123000	137380	123650	---	---	---	162850	---	---	---	---	---
MEAN	3968	4579	3989	---	---	---	5428	---	---	---	---	---
MAX	4730	5170	5300	---	---	---	6340	---	---	---	---	---
MIN	3280	4120	2800	---	---	---	3880	---	---	---	---	---
AC-FT	244000	272500	245300	---	---	---	323000	---	---	---	---	---

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 mi^2.

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. No regulation or diversion upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 100 ft^3/s Mar. 10, 1989, gage height, 5.57 ft; minimum discharge, 0.63 ft^3/s June 24-26, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 100 ft^3/s Mar. 10, gage height, 5.57 ft; minimum discharge, 0.63 ft^3/s June 24-26.

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	1.7	2.0	3.3	3.0	e3.8	e3.3	28	11	2.6	1.2	e2.1	e1.5
2	1.6	2.1	3.3	3.0	e3.3	e3.4	23	9.5	2.6	1.2	e2.4	e1.4
3	1.7	3.4	3.4	3.1	e3.2	e3.5	20	8.8	2.6	.86	e2.2	e1.5
4	1.9	3.6	3.4	3.2	e3.0	e3.5	17	8.1	2.5	.92	e2.2	e1.6
5	1.9	2.9	3.7	3.3	e3.0	7.9	17	7.6	2.6	.82	e2.2	e1.5
6	2.0	3.0	3.5	3.2	e2.9	42	15	7.6	2.3	.95	e2.4	e1.4
7	2.0	3.0	3.5	3.2	e2.9	48	14	6.5	1.6	.92	e2.5	e1.4
8	2.0	2.8	3.4	3.2	e3.0	40	13	5.7	1.9	1.3	e2.5	e1.5
9	2.0	2.5	3.4	5.7	e3.2	49	12	4.7	2.2	1.1	e2.6	e1.5
10	2.0	3.1	3.4	39	e3.4	81	11	5.0	1.3	1.1	e2.4	e1.4
11	2.0	3.2	3.5	21	e3.6	78	12	4.9	1.6	1.2	e2.1	e1.4
12	2.0	3.1	3.5	18	e3.8	77	11	4.2	.95	1.3	e2.2	e1.3
13	1.9	3.1	3.5	15	e3.8	81	12	4.2	.87	1.3	e2.1	e1.4
14	2.0	3.8	3.4	14	e3.7	62	12	4.2	1.1	1.2	e2.0	1.4
15	2.0	3.4	3.1	14	e3.6	56	12	3.8	1.1	1.0	e2.1	1.4
16	2.0	3.8	2.5	15	e3.5	55	11	3.7	1.2	1.6	e2.1	1.7
17	2.0	3.2	2.6	16	e3.4	50	10	4.1	.96	2.8	e2.3	2.3
18	2.3	3.0	2.5	16	e3.4	65	9.5	4.8	.87	3.1	e1.9	2.8
19	2.1	3.0	2.7	16	e3.3	59	9.2	4.4	1.0	2.7	e2.0	2.4
20	2.1	3.0	3.0	16	e3.3	53	9.2	4.2	1.1	2.5	e2.1	2.3
21	2.1	3.1	3.0	17	e3.3	52	9.2	4.0	1.0	2.6	e2.2	2.3
22	2.1	4.0	3.0	19	e3.4	48	9.2	4.1	.89	2.6	e3.9	2.2
23	2.1	5.1	3.2	20	e3.4	44	9.1	4.3	.74	2.5	e2.6	2.2
24	2.1	4.0	3.4	21	e3.5	39	14	3.6	.70	e2.5	e2.0	2.3
25	2.1	3.9	3.3	19	e3.4	38	16	3.2	.73	e2.4	e1.6	2.1
26	2.1	3.9	2.6	18	e3.4	35	16	3.2	.90	e2.4	e1.6	2.1
27	2.1	3.4	2.6	17	e3.4	33	14	3.2	1.0	e2.3	e1.6	2.3
28	2.1	3.4	2.6	18	e3.5	33	12	3.3	1.0	e2.2	e1.6	2.3
29	2.1	3.4	2.6	13	---	32	11	3.3	1.0	e2.4	e1.5	2.2
30	2.1	3.4	2.9	9.2	---	30	9.9	3.3	1.1	e2.6	e1.7	2.2
31	2.1	---	3.0	e5.3	---	29	---	2.9	---	e2.4	e1.6	---
TOTAL	62.3	98.6	96.8	407.4	94.4	1330.6	398.3	155.4	42.01	55.97	66.3	55.3
MEAN	2.01	3.29	3.12	13.1	3.37	42.9	13.3	5.01	1.40	1.81	2.14	1.84
MAX	2.3	5.1	3.7	39	3.8	81	28	11	2.6	3.1	3.9	2.8
MIN	1.6	2.0	2.5	3.0	2.9	3.3	9.1	2.9	.70	.82	1.5	1.3
AC-FT	124	196	192	808	187	2640	790	308	83	111	132	110
CFSM	.02	.04	.03	.14	.04	.46	.14	.05	.02	.02	.02	.02
IN.	.02	.04	.04	.16	.04	.53	.16	.06	.02	.02	.03	.02

CAL YR 1988 TOTAL 2261.31 MEAN 6.18 MAX 53 MIN .92 AC-FT 4490 CFSM .07 IN. .90
WTR YR 1989 TOTAL 2863.38 MEAN 7.84 MAX 81 MIN .70 AC-FT 5680 CFSM .08 IN. 1.14

e Estimated

14092500 DESCHUTES RIVER NEAR MADRAS, OR

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.

DRAINAGE AREA.--7,820 mi^2, approximately.

PERIOD OF RECORD.--October 1923 to current year.

REVISED RECORDS.--WSP 1398: Drainage area.

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.

REMARKS.--No estimated daily discharges. Water-discharge records excellent. Diurnal fluctuation caused by Lake Simtustus and reregulating reservoir since 1957, combined capacity for normal operation, 6,500 acre-ft. Some winter and spring runoff stored in Ochoco Reservoir, capacity, 47,500 acre-ft, in Crescent Lake, Crane Prairie and Wickiup Reservoirs, combined capacity, 354,600 acre-ft, and since 1960, in Prineville Reservoir, capacity, 152,800 acre-ft, and since 1964, in Lake Billy Chinook, capacity, 534,700 acre-ft. Large diversions in upper basin for irrigation.

AVERAGE DISCHARGE.--66 years, 4,548 ft^3/s, 3,295,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,500 ft^3/s July 16, 1983, accidental release from Pelton Dam, gage height, 7.70 ft, from floodmarks; minimum discharge, 916 ft^3/s July 4, 1982, caused by power company testing control gates on dam.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,270 ft^3/s Apr. 13, gage height, 3.95 ft; minimum daily discharge, 3,010 ft^3/s Feb. 27.

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	3940	4310	4480	4280	4180	3890	6490	5710	4270	3930	3770	4240
2	3940	4310	4480	4210	4550	4350	6370	5960	4260	3930	3410	4010
3	3910	4300	4330	4210	5520	4580	6390	5920	4070	3890	3800	3830
4	3910	4330	3840	4210	5360	4600	6390	5670	4040	3710	3800	3820
5	3920	4620	3830	3830	5350	4600	6390	5580	4030	3730	3810	3860
6	3900	4620	3860	3830	5330	4570	6470	4920	4030	3920	3790	4030
7	3890	4620	4080	3820	5330	4670	6560	4850	4040	3950	3790	3820
8	3900	4560	4260	3830	5330	5210	6650	4890	4050	4150	3840	3830
9	3870	4560	4250	3830	5320	5240	6600	5700	3980	4150	4040	3830
10	3860	4560	4250	3890	5320	5500	6700	5160	3710	4150	4140	3830
11	3650	4560	4250	4220	5320	5700	6470	5150	3710	3980	4110	3940
12	3650	4580	4260	4480	5330	5690	6490	5130	3740	3700	3860	3940
13	3690	4580	4270	4860	4780	6010	6440	5410	4050	3900	3700	3910
14	3930	4630	4190	4870	4470	6230	6570	5420	4060	3780	3740	3700
15	4310	4740	4020	4860	4020	6240	6250	5360	3990	3590	3890	3750
16	4230	4730	4050	4880	3830	6310	6260	5000	4170	3640	3710	3940
17	3850	4730	3830	4950	3840	6420	6170	5000	4170	3630	3660	3970
18	3870	4730	3820	5360	3830	6390	5550	4990	4160	3920	3530	4060
19	4280	4740	3820	5420	3830	6290	5570	4960	4170	3890	3870	4120
20	4320	4740	3810	5740	3830	6350	5570	4580	4190	3920	4050	4460
21	4600	4720	3860	5730	3800	6250	5500	4550	4270	3930	4150	4460
22	4600	4770	4190	5730	3250	6340	5130	4460	4220	3910	4280	4480
23	4580	5000	4170	5730	3150	6400	5060	3890	3690	3900	4280	4460
24	4580	5000	4060	5730	3160	6430	4390	3800	3590	3920	4250	4490
25	4580	4990	4060	5570	3130	6430	4230	3810	3590	3890	3830	4470
26	4580	5000	4050	5100	3060	6430	4300	3820	3630	3470	3870	4460
27	4580	4960	4080	4600	3010	6440	5020	3820	4040	3770	4050	4510
28	4340	5000	4300	4580	3080	6440	5670	3810	4150	3610	4080	4380
29	4300	4960	4350	4590	---	6720	5670	3810	4150	3920	4290	4460
30	4300	4500	4540	4580	---	6410	5680	3810	4130	4180	4290	4350
31	4310	---	4370	4460	---	6510	---	4230	---	4150	4280	---
TOTAL	128170	140450	128010	145980	120310	179640	177000	149170	120350	120110	121960	123410
MEAN	4135	4682	4129	4709	4297	5795	5900	4812	4012	3875	3934	4114
MAX	4600	5000	4540	5740	5520	6720	6700	5960	4270	4180	4290	4510
MIN	3650	4300	3810	3820	3010	3890	4230	3800	3590	3470	3410	3700
AC-FT	254200	278600	253900	289600	238600	356300	351100	295900	238700	238200	241900	244800

CAL YR 1988 TOTAL 1520360 MEAN 4154 MAX 5000 MIN 3600 AC-FT 3016000
WTR YR 1989 TOTAL 1654560 MEAN 4533 MAX 6720 MIN 3010 AC-FT 3282000

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 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 3,580 ft, from topographic map.

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

AVERAGE DISCHARGE.--7 years, 77.1 ft^3/s, 45.72 in/yr, 55,860 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft^3/s Feb. 23, 1986, gage height, 3.65 ft, from rating curve extended above 170 ft^3/s; minimum discharge, 19 ft^3/s several days in October 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft^3/s and maximum (*) from rating curve extended above 170 ft^3/s:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 22	2130	*295	2.17	Feb. 5	1300	(a)	*2.18

Minimum discharge, 23 ft^3/s Oct. 30 to Nov. 1.

(a) Backwater from ice.

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	27	24	71	38	e36	32	58	117	95	77	48	36
2	27	38	64	37	e34	32	59	119	127	73	56	36
3	26	94	60	37	e30	32	56	117	145	80	50	36
4	26	90	56	38	e30	31	55	132	154	81	48	35
5	26	71	53	38	e31	40	62	164	150	75	46	34
6	26	100	59	37	e32	74	79	201	155	73	46	34
7	26	56	68	36	e32	74	110	e220	138	78	45	33
8	26	48	64	36	e33	66	137	e210	131	72	46	33
9	25	43	65	57	e36	69	136	e190	131	69	46	32
10	25	52	69	73	e37	80	124	e200	117	67	44	32
11	25	48	67	58	e37	86	116	e160	111	66	42	31
12	25	55	66	54	e38	90	120	119	121	68	42	31
13	24	51	84	52	37	89	130	106	128	72	42	31
14	25	46	77	49	36	81	144	98	140	70	41	31
15	25	43	67	47	36	74	174	95	150	72	41	31
16	25	42	61	48	36	70	191	101	114	67	40	31
17	25	40	56	47	35	65	169	115	98	73	40	30
18	25	37	54	46	34	65	177	115	99	65	40	30
19	25	37	52	46	34	62	225	97	99	63	39	30
20	24	38	50	45	33	59	251	88	88	62	38	30
21	24	55	48	45	33	68	221	87	81	59	38	29
22	24	158	47	43	34	76	163	90	90	56	49	29
23	24	194	45	41	34	74	135	89	102	55	47	29
24	24	120	44	41	34	71	144	85	105	54	43	29
25	24	91	42	41	33	71	145	80	100	53	41	28
26	24	74	e39	40	32	68	137	74	102	52	40	28
27	24	90	37	39	32	65	121	79	86	51	39	28
28	24	130	38	38	32	64	111	79	75	49	38	28
29	24	96	39	38	---	63	104	74	72	49	37	28
30	24	80	42	e40	---	60	105	70	87	49	37	29
31	23	---	39	e40	---	58	---	75	---	48	36	---
TOTAL	771	2141	1723	1365	951	2009	3959	3646	3391	1998	1325	932
MEAN	24.9	71.4	55.6	44.0	34.0	64.8	132	118	113	64.5	42.7	31.1
MAX	27	194	84	73	38	90	251	220	155	81	56	36
MIN	23	24	37	36	30	31	55	70	72	48	36	28
AC-FT	1530	4250	3420	2710	1890	3980	7850	7230	6730	3960	2630	1850
CFSM	1.09	3.12	2.43	1.92	1.48	2.83	5.76	5.14	4.94	2.81	1.87	1.36
IN.	1.25	3.48	2.80	2.22	1.54	3.26	6.43	5.92	5.51	3.25	2.15	1.51

CAL YR 1988 TOTAL 25801 MEAN 70.5 MAX 194 MIN 23 AC-FT 51180 CFSM 3.08 IN. 41.91
WTR YR 1989 TOTAL 24211 MEAN 66.3 MAX 251 MIN 23 AC-FT 48020 CFSM 2.90 IN. 39.33

e Estimated

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 mi^2.

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.--Records good except for estimated daily discharges, and those above 1,000 ft^3/s, which are poor. No regulation. Some diversion for irrigation and Warm Springs water supply.

AVERAGE DISCHARGE.--15 years, 96.9 ft^3/s, 17.36 in/yr, 70,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,980 ft^3/s Feb. 23, 1986, gage height, 6.40 ft, from rating curve extended above 860 ft^3/s; maximum gage height, 7.35 ft Dec. 13, 1977; minimum daily discharge, 17 ft^3/s Oct. 12-15, 17-22, 24-27, Nov. 12, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 23	0200	*308	4.54	Feb. 10	1630	(a)	*4.83

Minimum discharge, 33 ft^3/s Oct. 26, 27, 30, Nov. 1, but may have been less during periods of ice effect Dec. 18, 26, 28, 29, Jan. 31 to Feb. 15.

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	42	35	102	58	e62	40	95	153	111	99	e68	e52
2	41	44	94	57	e60	41	98	157	142	87	e74	e52
3	40	123	86	57	e43	40	93	154	161	92	e66	e51
4	40	130	81	57	e36	39	89	156	170	99	e64	e50
5	40	99	77	57	e35	45	92	188	174	94	e63	e49
6	40	135	78	56	e39	108	106	214	173	86	e62	e49
7	40	87	93	55	e42	121	133	231	167	89	e61	e48
8	40	71	90	55	e50	103	166	234	152	89	e62	e48
9	38	65	89	69	e56	121	174	215	157	82	e62	e47
10	38	74	94	143	e59	154	162	217	147	81	e60	e47
11	38	74	94	101	e60	157	150	182	137	82	e59	e46
12	38	73	92	90	e59	166	149	154	142	e88	e58	e46
13	38	78	103	84	e53	169	156	140	153	e90	e57	e46
14	39	70	108	80	e49	150	172	130	157	e88	e56	e46
15	40	65	95	76	e48	138	191	124	176	e87	e56	e46
16	40	64	86	74	53	134	218	128	147	e90	e56	e45
17	39	62	80	75	50	125	201	141	125	e90	e55	e45
18	38	58	e76	74	46	148	203	147	119	e82	e55	e44
19	38	56	e72	73	44	127	231	129	126	e80	e54	e44
20	38	58	71	73	42	116	259	117	113	e78	e53	e44
21	37	64	68	76	41	125	251	112	102	e76	e56	e44
22	37	156	68	75	41	138	204	116	103	e74	e68	e44
23	35	258	66	69	42	134	174	117	119	e72	e62	e43
24	35	176	66	67	42	128	195	113	126	e71	e60	e43
25	35	137	64	67	41	129	209	107	121	e70	e58	e43
26	35	109	e50	65	41	122	204	100	121	e68	e56	e44
27	34	100	e46	63	40	113	172	101	112	e66	e55	e44
28	35	181	e52	62	40	111	159	107	95	e65	e54	e43
29	35	141	e62	61	---	106	148	101	91	e64	e53	e43
30	35	116	e70	63	---	101	144	95	101	e64	e52	e44
31	35	---	61	e63	---	99	---	96	---	e64	e52	---
TOTAL	1173	2959	2434	2195	1314	3548	4998	4476	4040	2507	1827	1380
MEAN	37.8	98.6	78.5	70.8	46.9	114	167	144	135	80.9	58.9	46.0
MAX	42	258	108	143	62	169	259	234	176	99	74	52
MIN	34	35	46	55	35	39	89	95	91	64	52	43
AC-FT	2330	5870	4830	4350	2610	7040	9910	8880	8010	4970	3620	2740
CFSM	.50	1.30	1.04	.93	.62	1.51	2.20	1.90	1.78	1.07	.78	.61
IN.	.58	1.45	1.19	1.08	.64	1.74	2.45	2.20	1.98	1.23	.90	.68

CAL YR 1988 TOTAL 33505 MEAN 91.5 MAX 258 MIN 34 AC-FT 66460 CFSM 1.21 IN. 16.44
WTR YR 1989 TOTAL 32851 MEAN 90.0 MAX 259 MIN 34 AC-FT 65160 CFSM 1.19 IN. 16.12

e Estimated

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 mi^2.

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.--Records excellent except for estimated daily discharges, which are good. No regulation or diversions.

AVERAGE DISCHARGE.--11 years (water years 1950-54, 1984-89) 168 ft^3/s, 21.32 in/yr, 121,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,700 ft^3/s Feb. 23, 1986, gage height, 5.70 ft, from floodmark; minimum discharge observed, 97 ft^3/s July 30, Sept. 5, 30, 1915.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 350 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 25	2400	*327	*3.52				

Minimum daily discharge, 100 ft^3/s Feb. 5-8, but may have have been less during period of no gage height record, Feb. 4-10.

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	109	106	128	119	150	121	194	238	142	121	116	113
2	108	110	124	120	e130	122	203	232	140	121	116	114
3	108	123	121	120	e115	120	195	223	140	120	115	113
4	107	123	118	121	e105	119	190	218	139	120	115	112
5	107	111	117	120	e100	130	191	218	136	119	115	112
6	107	117	121	119	e100	174	201	217	134	119	113	112
7	107	110	125	118	e100	180	217	214	132	119	113	113
8	108	110	125	119	e100	174	235	211	131	118	113	114
9	108	111	127	172	e105	192	237	212	130	119	115	114
10	108	119	129	280	e105	208	236	211	129	119	113	114
11	107	115	130	211	e105	209	234	203	128	119	113	114
12	107	118	130	186	e110	215	238	193	127	119	113	114
13	107	115	134	177	e110	232	246	186	127	118	113	114
14	107	113	135	168	e115	220	252	181	127	118	113	114
15	107	112	131	161	e115	216	264	177	127	118	112	114
16	107	111	128	165	e120	216	277	173	126	120	113	114
17	106	113	126	174	e120	209	280	170	125	119	112	114
18	105	110	125	173	e120	226	277	171	125	118	112	114
19	105	109	125	171	123	213	301	167	124	118	112	114
20	105	109	124	167	122	205	311	163	125	117	112	114
21	107	119	123	174	121	223	304	160	123	117	112	114
22	107	148	123	170	123	222	286	158	123	117	118	113
23	107	167	120	160	123	218	266	157	123	117	115	114
24	106	143	121	154	123	215	266	160	122	116	115	113
25	105	133	119	151	123	219	274	159	122	116	114	113
26	105	124	118	147	121	211	302	155	121	117	114	114
27	105	128	118	145	121	207	260	154	121	117	114	114
28	105	166	118	142	121	209	245	153	122	117	114	114
29	105	147	119	139	---	206	233	150	123	116	114	113
30	105	135	128	139	---	200	231	147	122	116	114	116
31	105	---	122	150	---	197	---	144	---	115	113	---
TOTAL	3302	3675	3852	4832	3246	6028	7446	5675	3836	3660	3526	3409
MEAN	107	122	124	156	116	194	248	183	128	118	114	114
MAX	109	167	135	280	150	232	311	238	142	121	118	116
MIN	105	106	117	118	100	119	190	144	121	115	112	112
AC-FT	6550	7290	7640	9580	6440	11960	14770	11260	7610	7260	6990	6760
CFSM	1.00	1.14	1.16	1.46	1.08	1.82	2.32	1.71	1.20	1.10	1.06	1.06
IN.	1.15	1.28	1.34	1.68	1.13	2.10	2.59	1.97	1.33	1.27	1.23	1.19

CAL YR 1988 TOTAL 54147 MEAN 148 MAX 358 MIN 105 AC-FT 107400 CFSM 1.38 IN. 18.82
WTR YR 1989 TOTAL 52487 MEAN 144 MAX 311 MIN 100 AC-FT 104100 CFSM 1.34 IN. 18.25

e Estimated

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 mi^2.

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.--Records fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--6 years, 64.0 ft^3/s, 32.43 in/yr, 46,370 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 406 ft^3/s Dec. 10, 1987, gage height, 6.42 ft; maximum gage height, 7.30 ft Feb. 23, 1986, from high-water mark on crest-stage gage; minimum discharge, 34 ft^3/s several days August to September, Oct. 5-7, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 130 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 22	2230	182	5.67	Apr. 20	unknown	unknown	unknown
Nov. 27	2200	193	5.71	Apr. 24	2230	145	5.61
Jan. 9	2130	*201	5.82	May 8	0730	135	5.57
Jan. 9	2130	(a)	*6.07				

Minimum discharge, 35 ft^3/s Oct. 2, 3, 23, Sept. 22.

(a) From crest-stage gage.

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	39	40	85	56	51	45	68	98	78	52	43	40
2	37	55	79	55	e41	46	73	102	84	50	45	40
3	36	93	74	56	e36	45	68	102	88	48	44	42
4	37	87	70	55	e36	44	e65	101	91	48	43	42
5	38	57	67	52	e37	61	e70	109	93	48	43	40
6	38	74	74	51	e38	103	e80	117	93	48	43	40
7	38	56	77	50	e38	86	e90	123	92	47	43	39
8	38	51	74	51	e39	82	e110	124	88	47	45	37
9	37	49	75	97	e41	88	e115	122	86	47	45	39
10	38	70	74	118	e42	95	e110	120	84	46	44	38
11	38	63	73	82	e42	93	e105	111	81	47	43	39
12	37	70	72	71	e42	94	e105	100	79	47	44	40
13	36	63	74	67	46	96	e110	91	77	46	42	40
14	38	63	73	66	45	89	e120	87	76	45	42	40
15	39	60	71	67	45	85	e125	85	78	46	42	40
16	40	58	67	66	47	82	e125	83	77	46	42	37
17	39	57	62	67	49	78	e120	86	75	46	43	38
18	39	52	59	65	48	81	e120	89	70	46	43	38
19	39	52	59	62	47	75	e125	86	68	45	42	38
20	38	56	57	57	47	70	e130	81	70	45	41	38
21	37	74	58	57	47	80	e125	78	66	43	42	38
22	38	137	58	56	48	79	122	78	64	42	49	38
23	37	153	58	53	49	74	110	80	61	43	47	39
24	38	109	59	50	48	72	128	84	58	43	44	38
25	38	98	60	49	47	76	123	81	56	43	43	38
26	37	94	e49	48	46	73	115	77	54	42	42	40
27	38	114	e51	48	45	72	105	79	53	42	42	42
28	37	153	52	47	45	74	98	80	50	41	42	40
29	38	108	55	47	---	71	92	79	52	42	42	39
30	39	95	63	48	---	68	89	77	52	42	42	41
31	38	---	59	54	---	67	---	74	---	42	40	---
TOTAL	1174	2361	2038	1868	1232	2344	3141	2884	2194	1405	1337	1178
MEAN	37.9	78.7	65.7	60.3	44.0	75.6	105	93.0	73.1	45.3	43.1	39.3
MAX	40	153	85	118	51	103	130	124	93	52	49	42
MIN	36	40	49	47	36	44	65	74	50	41	40	37
AC-FT	2330	4680	4040	3710	2440	4650	6230	5720	4350	2790	2650	2340
CFSM	1.41	2.94	2.45	2.25	1.64	2.82	3.91	3.47	2.73	1.69	1.61	1.47
IN.	1.63	3.28	2.83	2.59	1.71	3.25	4.36	4.00	3.05	1.95	1.86	1.64

CAL YR 1988 TOTAL 24081 MEAN 65.8 MAX 178 MIN 35 AC-FT 47760 CFSM 2.46 IN. 33.43
WTR YR 1989 TOTAL 23156 MEAN 63.4 MAX 153 MIN 36 AC-FT 45930 CFSM 2.37 IN. 32.14

e Estimated

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 mi^2.

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.--Records good except for estimated daily discharges, which are fair. No regulation or diversions upstream from station.

AVERAGE DISCHARGE.--6 years, 85.9 ft^3/s, 8.04 in/yr, 62,230 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,340 ft^3/s, Feb. 23, 1986, gage height, 7.96 ft; minimum discharge, 31 ft^3/s Sept. 7, 1988.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 10	unknown	*626	*4.18	Mar. 6	1600	539	3.99

Minimum discharge, 35 ft^3/s many days in October, November, and September.

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	35	35	e60	e43	106	76	138	130	61	44	37	37
2	35	36	e54	e42	e80	71	147	126	60	44	37	37
3	35	45	e50	e43	e58	70	139	122	59	43	37	36
4	35	49	e46	e45	e46	67	130	119	58	42	37	36
5	35	40	e44	e44	e41	77	130	118	57	41	37	36
6	35	43	e44	e43	e37	342	140	121	55	41	37	36
7	35	41	e47	e41	e36	265	154	118	54	41	36	35
8	35	37	e48	e41	e36	184	164	114	53	41	37	35
9	35	37	e48	e44	e37	259	162	113	52	41	39	35
10	35	42	e50	e500	e38	319	156	112	50	41	37	35
11	35	46	e50	e280	e41	267	149	104	50	41	36	35
12	35	44	e49	e230	e44	256	148	98	50	39	36	35
13	35	45	e50	e190	e47	261	149	93	49	39	36	35
14	35	42	e52	e170	e49	228	151	90	51	39	36	35
15	35	41	e50	e160	e49	207	156	86	50	39	36	35
16	36	42	e46	e170	48	203	162	84	49	41	36	35
17	37	44	e44	e170	54	195	157	83	48	41	36	35
18	36	41	e44	178	57	323	150	82	48	39	36	36
19	35	39	e46	165	63	235	162	79	47	39	36	36
20	35	39	e45	146	63	198	171	77	46	38	36	35
21	35	46	e44	161	65	226	168	75	46	38	36	35
22	35	82	e43	171	73	213	155	73	46	37	40	35
23	35	111	e42	125	82	198	144	73	45	37	39	35
24	35	77	e43	111	94	186	138	73	45	38	37	35
25	35	64	e42	104	90	193	160	72	44	37	37	35
26	35	58	e35	97	86	181	258	69	44	37	36	36
27	35	e52	e36	94	81	169	176	68	44	37	36	36
28	35	e92	e40	90	78	165	152	67	44	37	36	35
29	35	e84	e40	87	---	159	139	65	44	37	37	35
30	35	e70	e48	88	---	150	131	64	45	37	38	36
31	35	---	e48	104	---	143	---	63	---	37	37	---
TOTAL	1089	1564	1428	3977	1679	6086	4636	2831	1494	1223	1140	1063
MEAN	35.1	52.1	46.1	128	60.0	196	155	91.3	49.8	39.5	36.8	35.4
MAX	37	111	60	500	106	342	258	130	61	44	40	37
MIN	35	35	35	41	36	67	130	63	44	37	36	35
AC-FT	2160	3100	2830	7890	3330	12070	9200	5620	2960	2430	2260	2110
CFSM	.24	.36	.32	.88	.41	1.35	1.07	.63	.34	.27	.25	.24
IN.	.28	.40	.37	1.02	.43	1.56	1.19	.73	.38	.31	.29	.27

CAL YR 1988 TOTAL 29745 MEAN 81.3 MAX 636 MIN 34 AC-FT 59000 CFSM .56 IN. 7.63
WTR YR 1989 TOTAL 28210 MEAN 77.3 MAX 500 MIN 35 AC-FT 55950 CFSM .53 IN. 7.24

e Estimated

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 mi^2.

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,400 ft, from topographic map.

REMARKS.--Records excellent except for estimated daily discharges, which are good. No regulation. Small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--17 years, 446 ft^3/s, 11.51 in/yr, 323,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,240 ft^3/s Feb. 23, 1986, gage height, 10.54 ft; minimum daily discharge, 160 ft^3/s Jan. 1, 2, 1979.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 10	0600	*1,880	*4.36	No other peak greater than base discharge.			

Minimum discharge, 214 ft^3/s Oct. 7, Dec. 26.

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	227	227	375	314	422	326	568	681	395	303	257	246
2	226	238	355	303	e340	323	587	681	394	299	261	246
3	224	299	340	308	e300	309	581	660	396	292	256	241
4	224	350	321	324	e280	306	553	644	403	286	254	241
5	224	296	307	318	e270	334	557	646	395	282	252	239
6	224	282	312	307	e270	787	585	665	391	280	251	238
7	224	286	347	295	e260	937	622	671	387	277	251	238
8	224	259	349	298	e260	663	678	668	380	274	253	237
9	222	255	344	348	e260	731	703	659	372	274	258	236
10	224	280	350	1400	e260	991	697	666	368	275	253	235
11	224	303	350	834	e270	842	680	633	362	276	248	235
12	224	288	347	650	e280	825	676	594	354	273	248	234
13	224	309	352	559	e290	855	687	563	349	270	247	235
14	224	296	365	516	e300	812	704	536	355	268	246	235
15	224	279	355	482	e310	759	733	522	354	264	246	234
16	225	276	328	509	318	740	785	506	352	273	247	233
17	227	280	312	564	328	714	792	497	344	276	247	235
18	228	267	304	569	324	913	779	503	338	272	246	237
19	226	257	335	548	315	809	811	493	329	268	245	237
20	224	259	327	513	311	701	880	471	330	263	245	235
21	224	269	316	522	314	749	889	456	329	262	247	234
22	223	401	315	594	322	761	826	449	321	261	263	234
23	221	584	308	471	340	720	771	447	315	260	269	234
24	223	488	314	427	e350	693	786	452	311	257	258	233
25	223	416	308	429	e350	707	844	453	307	256	254	235
26	224	381	253	401	e340	686	1080	438	300	256	251	238
27	222	351	324	400	335	652	845	429	300	257	251	240
28	223	524	314	385	328	641	751	431	301	256	246	238
29	226	490	287	375	---	627	704	427	306	255	246	236
30	226	415	337	377	---	603	674	415	308	256	250	240
31	232	---	335	400	---	585	---	403	---	257	247	---
TOTAL	6960	9905	10186	14740	8647	21101	21828	16759	10446	8378	7793	7109
MEAN	225	330	329	475	309	681	728	541	348	270	251	237
MAX	232	584	375	1400	422	991	1080	681	403	303	269	246
MIN	221	227	253	295	260	306	553	403	300	255	245	233
AC-FT	13810	19650	20200	29240	17150	41850	43300	33240	20720	16620	15460	14100
CFSM	.43	.63	.62	.90	.59	1.29	1.38	1.03	.66	.51	.48	.45
IN.	.49	.70	.72	1.04	.61	1.49	1.54	1.19	.74	.59	.55	.50

CAL YR 1988 TOTAL 146775 MEAN 401 MAX 1640 MIN 220 AC-FT 291100 CFSM .76 IN. 10.38
WTR YR 1989 TOTAL 143852 MEAN 394 MAX 1400 MIN 221 AC-FT 285300 CFSM .75 IN. 10.17

e Estimated

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 mi^2.

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

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.--No estimated daily discharges. Records fair. No regulation. Diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--72 years, 424 ft^3/s, 307,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,300 ft^3/s Jan. 6, 1923, gage height, about 13.3 ft, site and datum then in use, from rating curve extended above 5,000 ft^3/s; minimum discharge, 7.5 ft^3/s Aug. 31, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 10	0730	*1,670	*4.43	No other peak greater than base discharge.			

Minimum discharge, 94 ft^3/s Oct. 3-5, 8-12, 24-31, Nov. 1, 2.

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	98	95	288	321	509	301	636	855	384	207	130	108
2	97	103	271	306	399	300	646	852	420	203	142	110
3	95	152	253	334	353	286	604	836	446	199	140	112
4	95	188	238	367	e335	280	570	821	480	195	135	108
5	96	152	228	362	e320	297	622	872	486	188	132	107
6	97	175	250	349	e310	642	735	953	473	182	133	107
7	98	167	360	335	e305	784	886	999	449	178	134	106
8	96	149	345	324	e300	648	1010	967	422	175	134	105
9	96	152	360	509	e300	780	980	906	406	171	149	105
10	95	172	404	1380	e305	988	944	846	386	169	143	106
11	95	204	391	920	e315	936	911	745	377	169	132	106
12	96	189	389	723	339	977	969	682	366	164	129	111
13	96	210	469	639	316	1020	1040	618	356	165	128	108
14	98	191	451	575	305	924	1120	579	350	164	125	107
15	108	172	394	538	295	851	1230	549	350	161	122	100
16	110	183	350	590	295	843	1250	538	325	162	122	100
17	103	196	319	617	336	804	1150	534	306	172	116	100
18	101	178	294	630	308	948	1090	517	294	163	115	100
19	102	165	310	663	290	843	1270	487	279	152	112	100
20	103	176	302	664	282	778	1370	468	287	144	114	99
21	101	204	291	650	293	849	1340	448	258	142	114	99
22	99	361	281	625	301	881	1180	434	252	138	140	98
23	97	580	270	556	340	828	1050	448	249	136	133	99
24	96	387	267	515	380	784	960	439	244	134	119	100
25	96	322	252	486	348	789	932	440	247	131	114	101
26	96	274	209	456	325	776	1120	409	241	129	111	103
27	94	248	225	438	311	751	958	407	231	129	111	105
28	95	447	211	415	304	742	876	409	218	126	110	101
29	97	372	235	398	---	720	806	396	215	127	108	101
30	95	319	409	407	---	680	802	386	217	134	108	104
31	96	---	371	490	---	658	---	382	---	132	109	---
TOTAL	3037	6883	9687	16582	9119	22688	29057	19222	10014	4941	3864	3116
MEAN	98.0	229	312	535	326	732	969	620	334	159	125	104
MAX	110	580	469	1380	509	1020	1370	999	486	207	149	112
MIN	94	95	209	306	282	280	570	382	215	126	108	98
AC-FT	6020	13650	19210	32890	18090	45000	57630	38130	19860	9800	7660	6180

CAL YR 1988 TOTAL 129284 MEAN 353 MAX 1360 MIN 94 AC-FT 256400
WTR YR 1989 TOTAL 138210 MEAN 379 MAX 1380 MIN 94 AC-FT 274100

e Estimated

14103000 DESCHUTES RIVER AT MOODY, NEAR BIGGS, OR
(National stream quality accounting network station)

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 mi^2, approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1897 to December 1899 (published as "near Moro"), July 1906 to current year. Monthly discharge only for some periods, published in WSP 1318.

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.--85 years, 5,857 ft^3/s, 4,243,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 75,500 ft^3/s Dec. 22, 1964, gage height, 11.80 ft, from rating curve extended above 47,000 ft^3/s; minimum discharge, 2,400 ft^3/s Dec. 5, 1957.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,340 ft^3/s Jan. 10, gage height, 4.07 ft; minimum discharge, 3,960 ft^3/s Aug. 19.

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	4480	4970	5510	5280	5590	4270	8070	7560	5300	4970	4710	4650
2	4480	5000	5430	5150	5320	5020	7920	7700	5330	4790	4360	4580
3	4470	5050	5380	5100	5710	5350	7880	7810	5320	4760	4060	4380
4	4480	5210	5060	5150	6300	5460	7760	7580	5210	4710	4320	4240
5	4480	5290	4710	5080	6020	5530	7780	7430	5240	4530	4390	4230
6	4470	5370	4700	4780	6090	6720	7910	7300	5210	4520	4390	4280
7	4470	5420	4870	4760	6090	7880	8160	6900	5180	4650	4360	4370
8	4480	5340	5140	4720	6070	7060	8550	6900	5160	4690	4360	4230
9	4490	5270	5240	4820	6060	7160	8640	7100	5120	4860	4380	4220
10	4460	5310	5300	7440	6080	8140	8570	7370	5010	4900	4520	4210
11	4420	5360	5300	6880	6170	8330	8550	6900	4760	4900	4610	4220
12	4270	5340	5270	6250	6190	8280	8330	6800	4740	4710	4590	4280
13	4270	5370	5320	6220	6120	8230	8450	6630	4760	4500	4400	4310
14	4370	5430	5380	6270	5490	8730	8510	6740	5030	4620	4220	4270
15	4680	5410	5190	6150	5250	8510	8670	6750	5070	4470	4230	4100
16	4980	5460	5050	6150	4880	8370	8560	6550	5020	4350	4340	4100
17	4780	5470	4940	6260	4810	8470	8530	6240	5120	4400	4240	4130
18	4500	5440	4720	6530	4830	8750	8090	6210	5110	4460	4180	4170
19	4610	5430	4730	6750	4780	8940	7800	6200	5090	4640	3990	4220
20	4930	5420	4760	6900	4750	8370	8120	6030	5090	4580	4230	4270
21	5040	5440	4720	7060	4820	8320	8170	5740	5100	4600	4430	4400
22	5210	5590	4850	7160	4760	8410	7740	5690	5130	4600	4570	4510
23	5200	6210	5060	7070	4420	8450	7280	5520	5070	4590	4740	4580
24	5200	6340	5020	6850	4490	8330	6910	5040	4570	4550	4760	4630
25	5210	6100	4940	6770	4440	8360	6480	5010	4480	4560	4660	4670
26	5210	5950	4860	6460	4300	8380	7010	4980	4460	4460	4320	4710
27	5200	5830	4750	5970	4170	8290	7290	4950	4500	4140	4330	4740
28	5170	5990	4910	5650	4110	8210	7540	4950	4830	4380	4430	4760
29	4970	6250	5070	5600	---	8330	7700	4950	4960	4250	4460	4760
30	4960	5900	5340	5610	---	8210	7550	4930	5000	4540	4600	4760
31	4960	---	5490	5660	---	8030	---	4960	---	4740	4650	---
TOTAL	146900	165960	157010	186500	148110	238890	238520	195420	149970	142420	136830	131980
MEAN	4739	5532	5065	6016	5290	7706	7951	6304	4999	4594	4414	4399
MAX	5210	6340	5510	7440	6300	8940	8670	7810	5330	4970	4760	4760
MIN	4270	4970	4700	4720	4110	4270	6480	4930	4460	4140	3990	4100
AC-FT	291400	329200	311400	369900	293800	473800	473100	387600	297500	282500	271400	261800

CAL YR 1988 TOTAL 1873240 MEAN 5118 MAX 12500 MIN 4070 AC-FT 3716000
WTR YR 1989 TOTAL 2038510 MEAN 5585 MAX 8940 MIN 3990 AC-FT 4043000

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 1988 TO SEPTEMBER 1989

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)	HARD NESS NONCARB (MG/L AS CACO3)
NOV												
18...	1130	5460	130	8.1	9.5	2.5	12.2	106	K4	14	44	0
JAN												
20...	1130	6850	137	7.4	6.5	3.3	12.0	98	K2	K4	43	0
MAR												
23...	1320	8480	144	8.3	9.0	6.5	12.5	109	K1	27	49	0
MAY												
18...	1115	6220	112	8.2	10.0	1.7	11.4	102	K11	K2	38	0
JUL												
12...	1200	4680	127	7.7	18.0	3.2	10.2	108	K4	460	42	0
AUG												
31...	1005	4660	118	8.3	18.0	1.6	11.0	117	K2	20	38	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 PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WATER DIS IT FIELD (MG/L AS CACO3)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	CAR-BONATE WATER 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												
18...	7.9	5.9	11	34	0.7	2.1	63	77	0	2.8	2.2	0.2
JAN												
20...	8.1	5.6	11	34	0.7	2.1	--	--	--	3.4	2.3	0.1
MAR												
23...	9.8	6.0	13	35	0.8	2.1	64	77	2	4.8	2.7	0.2
MAY												
18...	7.8	4.6	9.7	34	0.7	1.8	54	66	0	3.0	2.0	0.1
JUL												
12...	8.3	5.1	11	35	0.8	1.9	57	70	0	2.0	2.2	0.1
AUG												
31...	7.4	4.8	10	35	0.7	1.9	57	69	0	2.0	1.9	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 DAY)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS TOTAL (MG/L AS P)
NOV											
18...	30	83	103	1220	0.11	0.04	0.40	0.3	0.05	0.05	0.07
JAN											
20...	30	95	102	1760	0.13	0.06	0.20	<0.2	0.09	0.06	0.06
MAR											
23...	32	120	112	2750	0.16	<0.01	0.17	0.3	0.10	0.06	0.07
MAY											
18...	28	64	90	1070	0.09	0.03	<0.10	0.6	0.03	0.05	0.06
JUL											
12...	26	96	92	1210	0.13	0.01	<0.10	0.3	0.02	0.03	0.05
AUG											
31...	27	82	90	1030	0.11	0.04	<0.10	0.2	0.05	0.07	0.05

K - Results based on colony count outside acceptable range (non-ideal colony count).

14103000 DESCHUTES RIVER AT MOODY, NEAR BIGGS, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)
NOV 18...	<10	2	4	<0.5	3	2	<3	2	19	<5	<4	<1
JAN 20...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 23...	140	2	7	<0.5	<1	1	<3	4	110	<5	<4	9
MAY 18...	40	1	5	<0.5	<1	2	<3	3	48	<1	<4	1
JUL 12...	40	2	5	<0.5	<1	1	<3	4	35	<1	5	4
AUG 31...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 18...	<0.1	<10	<1	<1	<1	41	11	6	9	133	47
JAN 20...	--	--	--	--	--	--	--	--	25	462	53
MAR 23...	<0.1	<10	2	<1	<1	53	12	3	39	893	41
MAY 18...	<0.1	<10	8	<1	<1	43	11	<3	14	235	69
JUL 12...	<0.1	<10	<1	<1	<1	46	10	7	15	190	85
AUG 31...	--	--	--	--	--	--	--	--	11	138	74

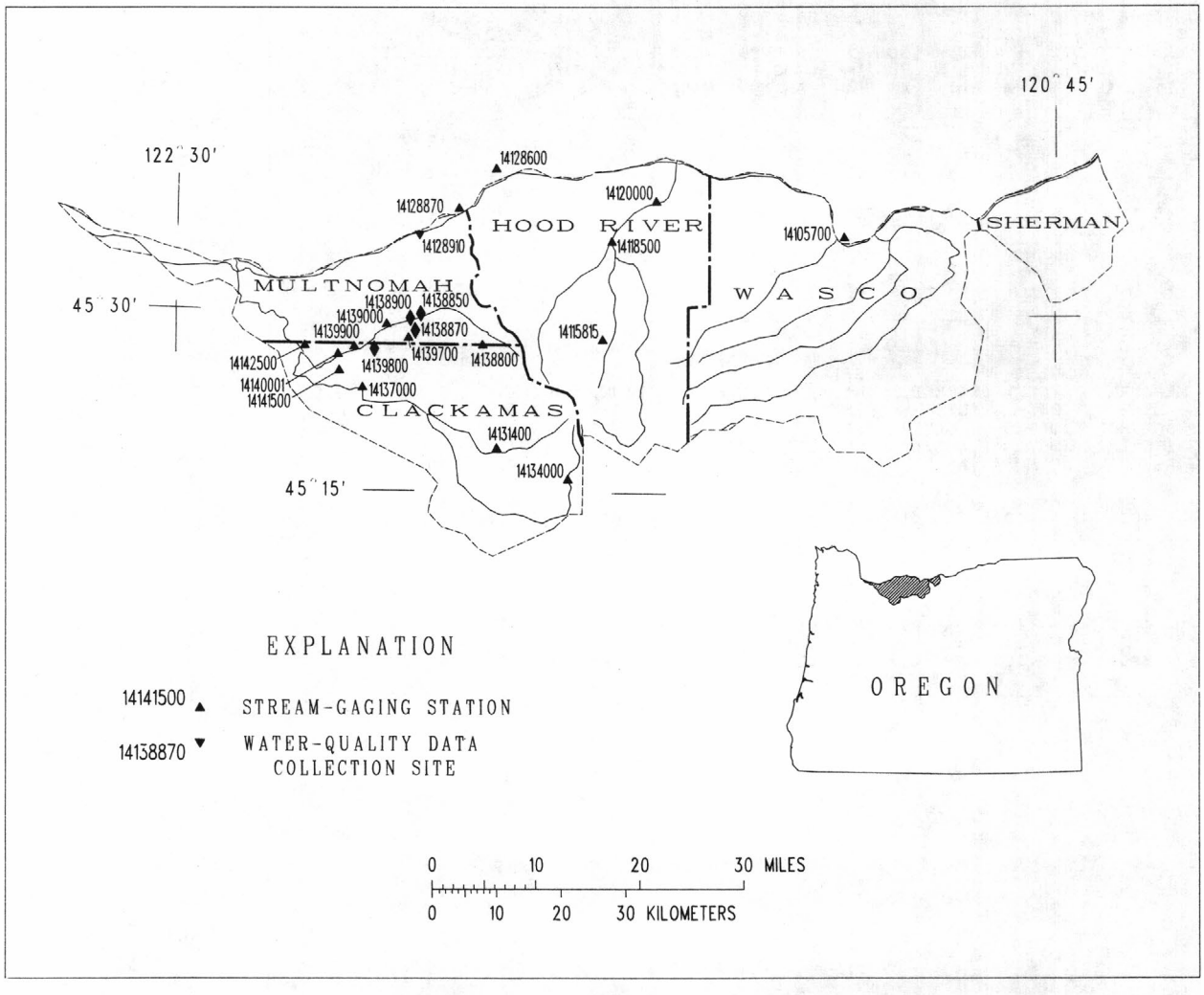

Figure 8.--Location of surface-water and water-quality stations in the Middle and Lower Columbia River, and Sandy River basins.

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 mi^2, 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 Oct. 1 to Sept. 13 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.--111 years, 192,200 ft^3/s, 139,200,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge (since 1858), 1,240,000 ft^3/s June 6, 1894, elevation, 106.5 ft; minimum discharge (since 1878), 12,100 ft^3/s Apr. 16, 1968 (due to closure of John Day dam, recorded by AVM).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 328,000 ft^3/s May 4; maximum elevation, not determined; minimum daily discharge, 71,400 ft^3/s Aug. 20.

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	111000	126000	202000	116000	233000	161000	162000	266000	264000	125000	109000	125000
2	91300	122000	144000	143000	245000	179000	150000	278000	261000	118000	107000	102000
3	92500	102000	137000	147000	195000	174000	164000	287000	194000	102000	81400	101000
4	105000	91500	142000	159000	126000	141000	174000	328000	223000	99700	88400	85500
5	93100	111000	166000	169000	127000	131000	149000	273000	252000	147000	85600	106000
6	101000	98800	157000	187000	224000	136000	147000	255000	236000	153000	85400	115000
7	107000	139000	161000	199000	168000	123000	166000	244000	241000	123000	118000	122000
8	91900	121000	171000	195000	163000	122000	166000	278000	267000	131000	96600	123000
9	85900	139000	147000	215000	176000	116000	201000	286000	275000	110000	86500	110000
10	99500	135000	129000	210000	155000	142000	201000	295000	204000	116000	88500	104000
11	112000	121000	173000	194000	117000	203000	185000	325000	222000	105000	107000	89400
12	114000	118000	145000	221000	112000	197000	167000	322000	272000	127000	104000	88700
13	115000	129000	139000	173000	152000	176000	156000	296000	241000	129000	87500	96600
14	116000	145000	172000	115000	170000	195000	205000	223000	211000	137000	118000	118000
15	113000	139000	199000	191000	171000	184000	167000	273000	208000	118000	116000	118000
16	93500	145000	139000	171000	175000	166000	204000	275000	209000	83000	85500	106000
17	104000	153000	155000	154000	154000	163000	226000	294000	181000	90700	84000	99600
18	130000	154000	160000	158000	112000	141000	232000	249000	147000	97000	91600	101000
19	124000	123000	174000	161000	89800	146000	238000	276000	163000	105000	87200	98900
20	131000	127000	167000	162000	133000	171000	247000	261000	176000	117000	71400	92300
21	115000	147000	176000	150000	150000	169000	233000	254000	175000	117000	91700	115000
22	113000	157000	180000	135000	163000	176000	233000	275000	169000	102000	117000	114000
23	97800	148000	167000	156000	129000	182000	213000	260000	146000	72800	90800	117000
24	129000	136000	157000	174000	139000	176000	259000	231000	155000	89800	87100	113000
25	105000	138000	134000	177000	124000	159000	252000	241000	120000	110000	99700	104000
26	117000	144000	132000	177000	102000	134000	241000	261000	123000	115000	94300	104000
27	152000	129000	180000	140000	140000	193000	254000	215000	137000	109000	75200	111000
28	159000	170000	180000	109000	137000	177000	284000	233000	150000	82800	99100	139000
29	104000	134000	166000	130000	---	176000	269000	222000	146000	89000	104000	139000
30	101000	167000	211000	154000	---	197000	191000	218000	138000	73100	81500	106000
31	143000	---	156000	186000	---	191000	---	246000	---	118000	116000	---
TOTAL	3466500	4009300	5018000	5128000	4281800	5097000	6136000	8240000	5906000	3411900	2955000	3264000
MEAN	111800	133600	161900	165400	152900	164400	204500	265800	196900	110100	95320	108800
MAX	159000	170000	211000	221000	245000	203000	284000	328000	275000	153000	118000	139000
MIN	85900	91500	129000	109000	89800	116000	147000	215000	120000	72800	71400	85500
AC-FT	6876000	7952000	9953000	10170000	8493000	10110000	12170000	16340000	11710000	6768000	5861000	6474000

CAL YR 1988 TOTAL 50355700 MEAN 137600 MAX 245000 MIN 78500 AC-FT 99880000
WTR YR 1989 TOTAL 56913500 MEAN 155900 MAX 328000 MIN 71400 AC-FT 112900000

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 mi^2.

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. Flow regulated by Laurance Lake 0.3 mi upstream. Water is diverted from Laurance Lake for irrigation.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 125 ft^3/s Jan. 14, 1988, gage height, 6.70 ft; minimum discharge, 0.65 ft^3/s Oct. 9, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 97 ft^3/s Apr. 20, gage height, 6.51 ft; minimum discharge, 5.6 ft^3/s Aug. 29 to Sept. 1, gage height, 5.56 ft.

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	15	19	34	31	32	31	32	46	26	9.0	8.4	10
2	15	20	34	30	32	31	34	47	34	9.0	8.2	14
3	15	20	34	30	32	31	33	46	40	9.0	8.2	14
4	15	26	34	30	32	31	33	46	47	9.0	8.2	14
5	15	30	34	30	32	31	33	52	44	9.0	8.2	14
6	15	30	34	30	32	31	33	58	41	9.0	8.2	14
7	16	30	34	30	32	31	34	60	36	9.1	8.0	14
8	17	30	35	30	32	31	34	59	33	9.0	7.8	14
9	17	30	33	32	32	31	34	56	31	9.0	7.8	14
10	17	30	31	32	32	32	34	53	26	9.0	7.6	14
11	17	30	31	e32	31	32	34	45	25	9.0	7.4	14
12	18	30	31	e32	31	32	35	38	26	9.0	7.4	14
13	19	30	31	e32	31	32	35	34	27	9.0	7.4	14
14	19	30	31	32	31	32	35	33	26	9.0	7.4	14
15	19	30	31	32	32	32	35	33	22	9.0	7.4	26
16	19	30	31	32	32	32	36	33	14	9.0	7.4	32
17	19	30	31	33	32	32	45	33	9.9	9.0	7.4	31
18	19	30	31	33	32	32	52	33	8.9	8.9	7.4	31
19	19	30	31	33	32	32	69	33	8.7	8.6	7.2	21
20	19	30	31	33	32	32	89	33	13	8.6	7.0	14
21	19	30	31	33	32	32	87	33	18	8.6	7.0	14
22	19	32	31	33	32	32	67	33	18	8.6	6.7	14
23	19	33	31	33	31	32	54	33	17	8.6	6.6	14
24	19	33	31	33	31	32	46	22	18	8.6	6.3	14
25	19	33	31	33	31	32	45	8.6	18	8.6	6.3	14
26	19	33	31	33	31	32	52	9.0	17	8.6	6.3	14
27	19	33	31	33	31	32	48	20	11	8.6	6.3	14
28	19	34	31	33	31	32	44	27	9.0	8.6	6.3	16
29	19	34	30	33	---	32	40	25	9.0	8.6	6.0	17
30	19	34	31	32	---	32	40	22	9.0	8.6	5.6	17
31	19	---	31	32	---	32	---	22	---	8.6	5.6	---
TOTAL	553	894	987	990	886	983	1322	1125.6	682.5	273.8	223.0	495
MEAN	17.8	29.8	31.8	31.9	31.6	31.7	44.1	36.3	22.7	8.83	7.19	16.5
MAX	19	34	35	33	32	32	89	60	47	9.1	8.4	32
MIN	15	19	30	30	31	31	32	8.6	8.7	8.6	5.6	10
AC-FT	1100	1770	1960	1960	1760	1950	2620	2230	1350	543	442	982

CAL YR 1988 TOTAL 8949.2 MEAN 24.5 MAX 93 MIN 6.9 AC-FT 17750
WTR YR 1989 TOTAL 9414.9 MEAN 25.8 MAX 89 MIN 5.6 AC-FT 18670

e Estimated

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 mi^2.

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.--58 years (water years 1914, 1933-89), 551 ft^3/s, 399,200 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 ft^3/s Dec. 23, 1964; minimum, 90 ft^3/s Oct. 25, 29, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 4,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 22	1930	4,390	8.32	Jan. 9	2100	*4,790	*8.63

Minimum discharge, 110 ft^3/s Sept. 22.

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	124	121	702	612	691	348	723	732	453	242	158	137
2	127	234	600	560	e610	344	803	673	466	230	207	159
3	124	384	524	695	e510	320	712	639	473	232	184	144
4	120	598	465	822	e450	306	703	661	486	230	171	138
5	119	399	448	741	e400	340	1020	725	463	222	165	135
6	119	1010	864	638	e360	960	1170	760	431	218	166	131
7	119	513	1190	559	e330	809	1450	748	393	220	169	128
8	118	492	875	575	e320	663	1210	716	369	218	175	126
9	117	471	883	2290	e340	682	1000	673	353	212	168	126
10	116	732	792	2310	332	846	896	632	334	211	157	123
11	117	772	715	1270	319	969	862	580	330	206	148	120
12	115	1220	710	933	309	1040	910	504	335	212	147	118
13	115	871	889	825	297	1070	964	458	328	223	147	118
14	131	619	687	704	286	865	1060	437	347	216	144	120
15	185	567	573	757	275	757	1110	430	351	215	141	120
16	156	808	503	1140	296	720	955	435	305	222	139	120
17	149	743	453	1410	422	671	835	450	283	255	140	118
18	136	607	420	1370	338	713	805	465	277	222	140	116
19	141	539	489	1200	322	674	1010	458	284	219	141	115
20	129	866	444	949	350	628	1140	418	389	212	145	116
21	124	1430	413	854	360	852	1000	390	304	195	166	115
22	131	2670	404	750	375	863	841	377	280	187	288	113
23	121	2240	387	644	409	742	740	410	285	185	194	115
24	119	1270	372	575	390	688	666	520	305	180	167	116
25	117	925	344	522	376	790	713	505	290	175	155	119
26	117	772	320	480	365	797	861	455	279	174	152	127
27	116	966	306	464	358	882	758	583	253	179	148	125
28	115	1530	290	429	351	946	674	560	245	167	144	118
29	115	1100	451	416	---	863	641	507	245	166	141	125
30	116	855	1010	483	---	751	664	467	257	170	139	172
31	116	---	766	872	---	760	---	445	---	165	138	---
TOTAL	3884	26324	18289	26849	10541	22659	26896	16813	10193	6380	4984	3773
MEAN	125	877	590	866	376	731	897	542	340	206	161	126
MAX	185	2670	1190	2310	691	1070	1450	760	486	255	288	172
MIN	115	121	290	416	275	306	641	377	245	165	138	113
AC-FT	7700	52210	36280	53250	20910	44940	53350	33350	20220	12650	9890	7480

CAL YR 1988 TOTAL 175841 MEAN 480 MAX 2670 MIN 110 AC-FT 348800
WTR YR 1989 TOTAL 177585 MEAN 487 MAX 2670 MIN 113 AC-FT 352200

e Estimated

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 mi^2.

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.--29 years (water years 1898-99, 1914, 1916-17, 1966-89), 1,045 ft^3/s, 757,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,300 ft^3/s Dec. 13, 1977, gage height, 15.59 ft; minimum discharge recorded, 136 ft^3/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 ft^3/s, from rating curve extended above 1,500 ft^3/s on basis of slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 22	2100	6,880	9.00	Jan. 9	2130	*7,580	*9.32

Minimum discharge, 225 ft^3/s Sept. 21.

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	302	292	1130	941	1180	668	1250	1350	815	489	334	287
2	329	462	951	859	908	662	1420	1270	851	455	416	318
3	308	740	835	1020	841	618	1250	1220	879	464	382	294
4	287	947	762	1190	e790	603	1220	1240	948	470	356	287
5	288	630	736	1090	e750	672	1670	1360	934	451	348	283
6	293	1480	1290	944	e720	1650	1920	1480	894	438	366	268
7	293	794	1840	842	e690	1370	2370	1520	833	458	412	270
8	289	733	1410	858	e680	1160	2100	1500	774	451	427	265
9	284	693	1400	3310	715	1220	1790	1400	749	437	415	273
10	284	1030	1260	3800	695	1480	1610	1300	707	431	377	273
11	328	1060	1140	2140	680	1660	1530	1170	698	415	334	258
12	332	1660	1120	1650	657	1790	1610	1020	714	435	298	245
13	339	1210	1430	1470	633	1840	1710	920	720	499	310	250
14	371	857	1110	1250	601	1560	1880	871	763	495	300	258
15	487	783	907	1300	580	1420	2000	860	785	496	286	275
16	474	1050	813	1820	611	1360	1820	865	685	501	278	298
17	462	992	756	2210	775	1260	1620	896	637	583	289	290
18	398	816	715	2140	654	1320	1570	904	612	495	291	256
19	382	757	789	1900	625	1220	1960	860	607	502	303	255
20	313	1140	745	1550	658	1140	2230	807	703	495	341	245
21	297	2050	703	1420	667	1480	2050	781	577	444	379	236
22	308	3940	693	1260	722	1470	1730	759	541	410	624	239
23	275	3930	672	1100	783	1300	1500	790	564	391	453	251
24	272	2330	653	977	749	1230	1340	890	615	379	353	267
25	273	1660	613	883	707	1350	1350	848	607	366	317	276
26	268	1280	570	829	680	1380	1570	787	606	367	314	290
27	253	1460	563	805	672	1490	1370	923	548	389	313	300
28	249	2330	534	767	671	1570	1240	907	517	357	312	305
29	247	1750	694	750	---	1460	1160	847	491	353	311	341
30	250	1370	1550	829	---	1300	1210	799	509	420	300	415
31	262	---	1190	1390	---	1300	---	782	---	397	305	---
TOTAL	9797	40226	29574	43294	20094	40003	49050	31926	20883	13733	10844	8368
MEAN	316	1341	954	1397	718	1290	1635	1030	696	443	350	279
MAX	487	3940	1840	3800	1180	1840	2370	1520	948	583	624	415
MIN	247	292	534	750	580	603	1160	759	491	353	278	236
AC-FT	19430	79790	58660	85870	39860	79350	97290	63330	41420	27240	21510	16600

CAL YR 1988 TOTAL 298798 MEAN 816 MAX 3940 MIN 198 AC-FT 592700
WTR YR 1989 TOTAL 317792 MEAN 871 MAX 3940 MIN 236 AC-FT 630300

e Estimated

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 mi^2, 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. Gage heights for Mar. 23-27, 1989 furnished by the Corps of Engineers.

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, 77.79 ft Mar. 11; minimum, 71.55 Oct. 13.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	75.79	74.50	75.07	75.28	73.69	74.63	76.61	73.91	75.23	75.19	74.24	74.79
2	75.96	75.29	75.63	75.56	73.44	74.44	76.21	73.06	74.29	75.51	73.41	74.21
3	75.90	74.77	75.33	75.59	74.12	74.85	75.13	73.87	74.49	75.37	74.35	74.90
4	75.65	74.13	74.97	74.92	73.95	74.33	75.04	73.50	74.07	76.15	73.11	74.53
5	75.76	74.68	75.18	75.35	73.87	74.58	75.99	72.51	74.19	76.74	74.56	75.65
6	75.99	75.48	75.72	75.14	73.80	74.55	75.62	73.86	74.68	76.91	73.62	75.52
7	75.74	75.06	75.36	75.18	73.65	74.58	75.79	73.71	74.69	77.12	73.76	75.18
8	75.40	74.78	75.13	75.36	74.07	74.45	75.79	74.82	75.31	76.97	73.89	75.38
9	75.09	74.70	74.90	75.19	72.99	74.23	75.57	74.03	74.91	77.48	73.13	75.07
10	75.28	74.48	75.01	75.68	74.03	74.86	75.49	73.41	74.37	77.64	74.08	75.78
11	74.76	73.87	74.29	75.65	73.84	74.68	76.40	75.40	75.95	77.11	73.80	75.20
12	74.01	72.30	73.40	75.50	73.47	74.51	75.44	73.53	74.70	76.43	73.99	75.41
13	74.00	71.55	72.34	75.57	74.14	74.87	75.64	73.50	74.55	76.35	73.61	75.04
14	75.69	73.70	74.71	75.50	73.34	74.61	76.32	73.57	75.09	76.31	74.51	75.27
15	75.92	75.05	75.57	74.89	73.02	73.77	76.56	74.14	75.32	76.31	74.23	75.03
16	75.77	75.21	75.44	75.03	72.56	73.58	76.48	73.23	74.48	75.47	73.46	74.63
17	75.82	74.84	75.39	75.63	72.65	74.13	75.92	72.91	74.03	75.93	73.31	74.64
18	75.15	73.76	74.61	76.47	73.35	74.98	76.13	74.34	75.02	76.27	73.99	75.17
19	74.51	72.62	73.51	76.35	73.82	74.65	75.71	74.02	74.77	76.18	74.04	75.02
20	75.64	73.48	74.60	75.27	73.15	74.21	75.61	74.08	74.98	76.16	73.73	75.01
21	75.61	74.43	75.07	76.33	73.57	75.24	75.75	74.11	75.04	76.09	74.08	75.06
22	76.30	74.55	75.45	76.99	75.03	76.01	76.12	74.21	75.21	76.19	74.20	75.23
23	75.74	74.57	75.11	76.71	74.87	75.99	76.10	74.10	75.00	76.47	74.44	75.71
24	75.56	73.53	74.73	76.19	74.08	75.25	75.55	74.42	74.95	75.86	74.09	75.14
25	75.22	73.78	74.61	76.03	74.06	75.02	75.46	74.64	74.91	75.85	73.28	74.72
26	74.43	73.50	73.92	77.04	74.78	75.89	75.72	74.69	75.14	76.30	73.74	75.44
27	74.61	73.48	74.22	76.65	74.23	75.08	76.33	74.06	75.33	75.80	73.95	74.82
28	76.56	73.07	75.23	77.39	73.87	75.47	76.20	73.84	75.16	75.36	74.58	74.86
29	76.58	75.43	75.97	76.25	73.75	74.70	76.09	73.73	74.97	75.33	74.85	75.10
30	76.19	75.00	75.36	76.62	73.27	75.09	76.73	74.08	75.05	75.52	73.50	74.71
31	75.30	73.62	74.67	---	---	---	76.80	74.26	75.08	76.74	73.20	74.97
MONTH	76.58	71.55	74.85	77.39	72.56	74.77	76.80	72.51	74.87	77.64	73.11	75.07

14128600 COLUMBIA RIVER AT STEVENSON, WA--Continued

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	76.37	74.95	75.77	76.77	73.92	75.52	76.90	74.83	75.60	77.08	73.97	75.27
2	76.40	73.85	75.05	76.60	74.00	75.37	76.83	74.82	75.51	76.95	75.37	76.16
3	76.21	73.36	74.33	75.78	74.13	75.00	76.87	75.40	76.02	76.73	75.52	75.94
4	74.72	72.86	73.72	75.90	74.12	75.03	76.51	74.22	75.44	77.04	75.38	76.12
5	74.59	73.17	73.92	75.99	74.46	75.11	76.30	73.80	74.50	76.91	75.31	75.97
6	76.22	73.33	74.49	76.58	74.56	75.70	75.34	73.28	74.10	76.16	74.37	75.47
7	76.31	73.22	74.51	76.67	74.98	75.92	75.71	73.11	74.47	76.28	73.83	75.25
8	76.18	74.27	74.95	76.58	74.56	75.53	75.35	73.38	73.83	77.15	75.00	76.16
9	75.51	73.90	74.82	76.57	74.21	75.04	76.43	72.87	74.19	76.57	74.48	75.43
10	75.64	74.00	74.81	77.35	74.66	76.29	76.04	73.34	74.86	76.32	74.32	75.38
11	74.65	73.38	73.98	77.79	75.92	76.95	75.75	73.27	74.59	76.85	76.03	76.39
12	75.21	74.24	74.80	77.61	74.93	76.39	75.88	73.58	74.80	76.97	75.58	76.25
13	76.11	73.84	75.13	77.05	75.12	76.12	74.94	72.98	73.36	76.58	74.93	75.92
14	76.42	74.28	75.27	77.14	75.02	76.27	76.18	72.45	74.31	76.63	74.67	75.78
15	76.19	73.35	74.98	77.20	74.41	75.65	76.42	73.74	74.93	76.43	74.57	75.48
16	76.78	73.08	75.26	76.99	74.48	75.64	77.19	73.88	75.36	75.93	75.00	75.52
17	75.87	73.85	74.72	77.27	74.04	75.43	77.01	75.73	76.33	77.27	74.61	75.50
18	74.82	73.49	74.40	76.04	74.51	75.29	76.96	76.14	76.54	76.81	74.27	75.36
19	73.29	71.71	72.64	76.13	74.96	75.45	76.74	75.27	76.17	76.63	73.79	75.32
20	74.19	72.07	73.31	75.88	74.76	75.30	77.10	75.83	76.28	75.60	74.43	74.74
21	75.34	73.21	74.43	75.66	74.44	75.02	77.07	75.14	75.80	75.74	74.20	74.98
22	77.10	74.76	76.18	75.72	74.03	74.68	76.40	74.66	75.56	76.33	73.66	75.19
23	76.66	74.02	75.58	75.30	73.00	73.81	76.72	73.80	74.99	76.77	74.54	75.83
24	75.81	73.55	74.73	77.20	74.50	75.55	76.51	75.46	75.95	76.80	74.28	75.76
25	75.92	73.52	74.65	76.50	73.90	74.72	76.83	75.07	75.89	77.16	74.22	75.92
26	75.02	73.07	74.27	74.80	74.30	74.59	76.67	74.18	75.15	77.07	74.31	75.90
27	76.41	73.21	74.81	76.30	74.70	75.19	76.82	73.79	75.03	76.77	75.13	75.80
28	75.49	73.37	74.38	76.74	74.69	75.48	76.65	75.35	76.12	76.84	75.84	76.39
29	---	---	---	76.68	74.84	75.57	77.45	75.59	76.26	76.39	74.71	75.48
30	---	---	---	76.99	73.91	75.62	76.76	74.22	75.57	75.03	73.07	74.19
31	---	---	---	77.17	74.48	75.77	---	---	---	75.91	73.10	74.39
MONTH	77.10	71.71	74.64	77.79	73.00	75.45	77.45	72.45	75.25	77.27	73.07	75.59

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	77.62	74.25	75.70	76.09	74.95	75.46	76.38	73.86	74.49	76.46	75.60	75.94
2	77.42	74.32	75.87	76.00	75.12	75.48	74.99	72.62	73.73	76.37	75.53	75.83
3	76.77	74.04	74.89	75.80	74.21	74.78	75.19	74.48	74.82	76.50	75.58	75.93
4	76.84	73.37	74.39	74.19	72.56	73.16	75.71	74.69	75.13	76.14	74.66	75.47
5	76.66	74.72	75.41	76.23	72.45	74.04	75.63	75.01	75.36	75.87	74.56	75.22
6	76.04	73.17	74.63	76.84	73.83	75.44	75.69	74.95	75.33	76.07	74.53	75.32
7	77.19	73.18	75.23	76.10	74.06	74.45	76.34	74.14	75.19	76.15	75.25	75.63
8	76.77	73.31	75.21	74.94	73.49	74.14	76.26	74.13	75.07	75.88	74.51	75.29
9	76.25	74.60	75.49	75.63	74.20	74.76	75.76	74.71	75.31	75.90	74.36	75.07
10	76.38	74.75	75.57	75.82	73.54	74.53	76.18	74.85	75.51	75.50	74.66	75.08
11	77.13	74.68	75.72	76.21	75.41	75.86	75.99	74.88	75.47	74.87	74.04	74.44
12	77.59	76.21	76.93	76.60	75.26	75.81	75.94	74.46	75.20	75.01	74.30	74.59
13	77.15	74.66	75.81	76.65	74.75	75.47	75.49	74.50	74.72	75.17	74.37	74.79
14	76.11	74.51	75.37	76.96	73.46	75.22	74.92	73.42	74.13	75.50	73.64	74.44
15	75.34	73.05	74.03	76.80	73.68	74.65	75.86	72.98	74.28	75.39	74.08	74.56
16	77.07	74.55	75.64	76.00	74.63	75.04	75.59	74.71	75.24	75.61	74.35	74.80
17	76.98	74.36	75.14	74.93	73.71	74.24	75.53	73.98	74.71	75.66	74.87	75.18
18	75.79	73.61	74.28	75.55	73.79	74.72	75.33	73.99	74.46	75.41	74.53	74.82
19	76.15	73.71	74.76	76.77	74.13	75.31	76.07	74.54	75.20	74.90	73.77	74.17
20	76.17	74.58	74.99	76.76	74.73	75.92	76.09	75.30	75.64	74.46	73.57	74.03
21	75.19	72.73	73.98	76.63	74.71	75.50	76.19	74.78	75.39	74.40	73.57	73.95
22	75.91	73.26	74.45	76.19	74.59	75.39	76.40	75.27	75.82	74.48	73.74	74.06
23	75.88	74.64	75.42	76.17	74.72	75.37	76.26	75.16	75.42	75.66	73.82	74.76
24	75.60	73.36	74.46	75.46	74.75	75.01	75.24	74.47	74.98	75.76	74.94	75.38
25	75.64	74.88	75.36	76.65	74.61	75.47	75.99	74.75	75.38	75.48	74.40	75.04
26	75.39	74.05	74.89	76.66	75.09	75.92	76.16	75.26	75.73	75.35	74.56	75.04
27	76.59	73.64	74.97	76.48	74.68	75.40	76.19	75.48	75.67	75.40	74.27	74.81
28	76.92	73.86	75.38	76.16	74.87	75.20	76.32	75.14	75.83	75.83	74.62	75.25
29	76.43	74.02	75.27	76.47	74.61	75.25	76.27	74.84	75.42	75.80	74.66	75.13
30	76.32	75.09	75.68	76.53	75.34	75.75	75.49	74.64	75.09	75.78	74.28	74.89
31	---	---	---	76.36	74.78	75.51	76.74	74.11	75.27	---	---	---
MONTH	77.62	72.73	75.16	76.96	72.45	75.10	76.74	72.62	75.13	76.50	73.57	74.96
YEAR	77.79	71.55	75.08									

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 mi^2, 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, 24.31 ft May 12; minimum, 6.69 ft Oct. 10.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	11.62	10.14	10.67	13.51	10.21	12.36	18.56	15.91	17.09	14.24	11.72	13.28
2	10.75	8.25	9.33	12.81	9.76	11.26	17.94	14.29	15.61	15.08	11.12	12.62
3	10.59	9.13	9.66	11.70	10.25	10.92	14.36	12.73	13.27	15.94	13.60	15.11
4	9.79	9.18	9.47	10.72	9.12	10.02	14.48	12.13	13.12	15.78	12.22	14.02
5	9.62	8.35	8.99	11.23	9.10	10.15	15.80	13.87	14.53	16.07	14.48	15.37
6	11.10	7.17	9.50	11.61	9.68	10.76	15.93	14.83	15.21	18.29	15.66	16.58
7	11.31	7.84	10.45	13.25	11.41	12.52	15.31	13.94	14.79	18.52	17.15	17.74
8	11.23	8.07	9.54	13.34	12.37	12.92	17.05	14.88	15.88	18.41	17.68	18.13
9	9.67	7.77	8.77	13.19	11.47	12.46	15.53	13.85	14.61	20.25	16.82	18.48
10	11.59	6.69	9.50	13.91	11.65	12.85	13.95	12.18	13.07	21.18	19.62	20.14
11	13.00	7.68	11.10	12.90	12.07	12.58	17.29	12.85	15.36	20.64	18.82	19.40
12	14.45	7.85	11.96	12.92	11.94	12.46	15.96	13.75	14.55	20.21	18.93	19.70
13	12.44	9.50	11.06	13.48	11.99	12.55	14.75	12.29	13.53	20.94	14.89	18.57
14	11.02	8.30	9.87	15.19	13.35	14.17	15.89	13.18	14.84	15.71	12.45	13.52
15	11.98	8.54	10.82	15.16	12.41	13.61	17.33	15.76	16.66	18.28	16.59	17.78
16	11.01	7.75	9.78	14.21	12.67	13.49	17.12	11.61	14.76	18.36	16.38	17.54
17	10.92	8.50	10.08	14.33	14.02	14.16	13.08	11.23	12.40	16.37	15.93	16.10
18	14.61	9.66	12.48	14.25	13.93	14.08	15.52	12.86	14.65	16.85	15.64	15.95
19	12.06	10.25	11.38	14.04	12.78	13.37	16.08	15.29	15.64	16.91	16.41	16.68
20	12.66	8.61	11.18	13.10	12.43	12.78	15.99	14.76	15.20	16.04	15.36	15.56
21	12.24	8.14	10.72	14.91	12.53	13.71	16.30	15.48	15.86	15.64	15.27	15.44
22	11.89	8.34	10.78	17.05	14.49	15.87	16.58	15.76	16.07	15.54	13.97	14.35
23	11.46	9.72	10.65	17.20	16.58	16.93	16.54	15.90	16.15	16.59	13.73	15.38
24	13.43	10.84	11.66	17.26	14.85	15.43	16.14	14.87	15.33	18.55	15.14	16.71
25	13.08	9.94	11.61	15.44	14.83	15.06	15.25	13.16	13.66	17.34	15.46	16.43
26	12.93	8.71	11.22	16.29	14.01	15.03	13.40	12.72	12.97	16.96	14.72	15.95
27	14.58	10.11	13.05	16.36	14.35	14.73	15.79	13.45	15.24	15.70	12.65	14.45
28	14.56	12.29	13.08	19.35	14.97	16.56	16.18	15.61	15.83	12.67	10.88	11.68
29	13.93	8.62	10.39	18.31	14.55	15.70	16.69	15.55	15.86	13.02	10.77	12.05
30	12.48	9.17	10.91	16.03	14.10	14.86	18.42	16.65	17.17	14.85	12.98	14.08
31	13.54	9.59	12.61	---	---	---	18.74	13.83	16.57	17.19	14.74	15.54
MONTH	14.61	6.69	10.72	19.35	9.10	13.44	18.74	11.23	15.02	21.18	10.77	15.95

LOWER COLUMBIA RIVER BASIN

14128870 COLUMBIA RIVER BELOW BONNEVILLE DAM, OR--Continued

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	20.97	17.13	19.02	---	---	---	17.73	15.90	16.44	21.30	18.54	19.67
2	19.87	18.41	19.26	---	---	---	16.04	14.60	15.23	22.78	20.37	21.58
3	18.84	16.93	17.60	---	---	---	16.64	15.35	16.26	23.90	20.72	22.45
4	17.02	10.46	13.72	---	---	---	17.39	15.62	16.49	24.20	22.38	23.46
5	14.47	9.11	11.82	---	---	---	17.39	15.84	16.58	24.07	21.65	22.34
6	18.13	13.84	16.15	---	---	---	16.16	14.93	15.41	21.96	19.21	20.88
7	19.34	14.36	16.39	---	---	---	18.00	14.58	15.78	21.98	19.04	20.32
8	15.49	12.55	14.50	---	---	---	18.03	15.79	17.18	23.62	19.81	21.19
9	15.73	14.33	14.93	---	---	---	19.01	15.39	17.05	23.67	21.57	22.41
10	14.70	13.87	14.42	---	---	---	18.71	17.10	17.90	23.20	21.71	22.68
11	13.92	10.60	12.47	---	---	---	18.26	16.77	17.66	24.20	23.15	23.63
12	---	---	---	---	---	---	16.78	15.27	16.24	24.31	23.51	23.77
13	---	---	---	---	---	---	17.25	15.13	16.29	24.01	21.05	22.61
14	---	---	---	---	---	---	16.87	14.77	16.08	21.60	17.85	20.12
15	---	---	---	---	---	---	16.96	15.14	15.89	21.79	17.81	20.09
16	---	---	---	18.34	15.56	17.74	18.61	15.17	17.27	22.21	20.35	21.49
17	---	---	---	18.50	13.84	16.17	19.96	17.77	19.41	23.02	20.01	21.68
18	---	---	---	17.82	14.61	15.25	19.61	19.08	19.26	22.20	20.39	21.40
19	---	---	---	15.52	14.38	14.97	20.35	19.10	19.88	22.24	19.88	20.88
20	---	---	---	16.67	14.29	16.03	20.95	19.45	20.34	22.37	20.56	21.50
21	---	---	---	16.72	16.27	16.47	20.87	19.41	20.20	20.55	19.21	19.82
22	---	---	---	17.42	16.27	16.80	21.00	18.60	20.15	21.82	20.01	20.84
23	---	---	---	17.69	16.80	16.96	19.34	17.75	18.14	21.55	19.70	20.64
24	---	---	---	16.98	16.06	16.27	21.70	18.91	20.43	20.47	18.75	19.53
25	---	---	---	16.40	15.37	16.19	20.57	19.93	20.40	20.56	17.55	18.97
26	---	---	---	16.30	14.18	14.97	21.45	20.31	20.79	21.02	19.97	20.56
27	---	---	---	18.72	14.28	16.09	20.50	18.86	19.94	21.16	17.03	19.15
28	---	---	---	19.14	15.29	17.14	23.00	20.11	21.70	19.07	18.33	18.59
29	---	---	---	17.90	16.29	17.23	22.90	20.71	21.27	20.73	17.54	19.00
30	---	---	---	18.80	15.08	17.07	21.66	17.81	19.22	20.58	17.59	18.99
31	---	---	---	18.23	16.87	17.58	---	---	---	20.73	17.53	19.12
MONTH	---	---	---	---	---	---	23.00	14.58	18.16	24.31	17.03	20.95

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	20.70	18.77	19.80	13.74	11.69	12.43	12.94	11.23	12.17	12.59	10.70	11.86
2	21.92	18.93	20.62	12.23	11.45	11.83	11.41	9.19	10.28	12.05	9.70	10.31
3	21.95	17.88	18.81	12.40	10.58	11.65	9.36	7.67	8.57	10.32	9.39	9.81
4	18.33	17.36	17.85	11.81	10.14	10.78	9.61	7.41	8.62	9.84	8.03	8.83
5	21.39	18.34	20.36	14.95	11.04	11.92	9.31	7.24	8.54	10.67	9.60	10.16
6	21.33	18.64	19.29	15.80	11.94	13.36	10.35	7.09	8.45	11.09	9.45	10.43
7	19.70	18.47	19.28	16.08	12.07	12.96	11.79	9.82	10.44	12.06	11.06	11.43
8	21.84	19.45	20.69	16.11	11.21	12.17	11.96	8.67	10.07	11.93	10.87	11.20
9	22.60	19.20	21.60	12.44	9.31	10.12	9.53	8.08	8.53	11.34	9.38	10.48
10	19.71	16.70	18.56	12.52	8.29	10.73	8.65	7.25	8.14	10.99	8.89	10.13
11	18.89	16.14	17.08	10.77	8.49	9.61	11.18	7.52	9.71	9.35	7.18	8.69
12	21.68	18.10	20.25	13.84	10.72	11.20	10.43	9.77	10.17	9.05	6.99	8.48
13	22.04	17.76	20.30	15.90	10.91	12.16	10.25	8.80	9.41	9.75	6.93	9.07
14	19.21	17.75	18.37	16.41	11.08	12.41	12.09	8.25	10.99	11.56	9.20	10.45
15	18.36	16.46	17.64	16.45	10.91	12.07	11.32	8.86	10.52	12.61	9.74	11.08
16	17.81	15.96	16.46	11.18	8.98	9.76	9.52	7.67	8.75	10.85	9.78	10.35
17	18.02	15.97	16.92	10.19	8.49	9.50	11.23	7.15	9.51	10.92	9.75	10.22
18	16.01	13.24	14.66	10.06	7.64	9.33	9.71	7.29	8.52	11.41	9.88	10.62
19	14.54	12.71	13.73	14.08	8.11	9.48	9.20	7.87	8.43	11.30	9.32	10.41
20	17.19	14.36	16.12	15.88	9.38	11.41	9.14	7.22	8.27	10.83	8.35	9.43
21	16.33	14.56	15.56	16.05	9.21	11.31	10.01	7.52	8.57	11.11	8.24	9.95
22	16.85	13.70	14.76	15.86	8.19	10.31	12.63	8.26	11.09	11.41	9.38	10.24
23	15.85	12.67	14.27	9.08	7.65	8.37	11.45	8.72	10.09	10.99	8.32	10.02
24	16.27	12.24	13.45	9.67	8.18	9.18	9.85	7.75	9.07	11.26	8.32	10.14
25	12.70	10.51	11.54	10.17	8.50	9.32	10.25	7.40	8.93	10.45	9.63	10.03
26	13.13	11.47	12.03	11.84	10.24	10.96	9.99	7.81	9.31	10.67	9.50	9.98
27	12.95	11.56	12.31	11.87	9.17	10.84	8.80	7.40	8.17	11.13	8.49	10.19
28	13.48	10.19	13.15	9.91	8.11	9.14	10.72	7.09	9.11	12.26	9.78	11.38
29	14.09	12.86	13.32	9.24	7.65	8.30	11.23	9.21	10.59	13.32	11.24	12.28
30	13.86	11.95	13.03	9.26	7.65	8.28	10.02	8.00	9.01	12.36	9.88	10.59
31	---	---	---	11.84	7.80	10.64	10.97	7.18	9.83	---	---	---
MONTH	22.60	10.19	16.73	16.45	7.64	10.69	12.94	7.09	9.41	13.32	6.93	10.27

UPPER 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, Hdyrologic 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.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	TOTAL PRECIP-ITATION FOR DEFINED PERIOD (IN)	COL-LECTOR EFFI-CIENCY WET DEPOS. PERCENT	SPEC. CONDUC-TANCE CK.SOL.* ATM DEP WET TOT (US/CM)	SPEC. CONDUC-TANCE FIELD ATM DEP WET TOT (US/CM)	SPEC. CONDUC-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)
NOV 01-08	1630	0.85	85	20.8	4.8	3.1	4.34	5.13	5.44
NOV 08-15	1545	1.00	86	20.8	3.8	2.3	4.32	5.09	5.30
NOV 15-22	1530	0.62	54	20.5	6.0	3.5	4.29	4.92	5.32
NOV 22-29	1455	1.54	83	21.1	2.0	1.7	4.35	5.39	5.40
DEC 06-13	1545	0.72	82	20.5	4.2	2.1	4.21	4.96	5.37
DEC 13-20	1545	0.42	65	20.6	2.5	1.8	4.31	5.28	5.67
DEC 20-27	1530	0.59	61	21.0	2.4	1.6	4.31	5.24	5.81
DEC 27 1988-JAN 03 1989	1642	0.79	82	20.4	2.7	2.2	4.29	5.25	5.41
JAN 03-10	1545	2.78	76	19.8	2.1	1.6	4.28	5.23	5.48
JAN 10-17	1558	0.68	39	20.2	4.3	2.6	4.29	4.96	5.49
JAN 17-24	1540	0.44	79	20.7	2.9	1.7	4.34	5.20	5.70
FEB 14-21	1555	0.94	70	20.8	4.0	3.1	4.36	5.12	5.20
FEB 21-28	1831	0.34	98	20.5	7.4	3.1	4.31	4.76	5.23
FEB 28-MAR 07	1600	0.72	83	21.9	4.8	2.5	4.33	4.96	5.37
MAR 07-14	1635	0.46	86	19.4	6.3	5.6	4.30	4.73	4.91
MAR 14-21	1500	0.87	85	19.3	4.8	1.9	4.33	4.93	5.62
MAR 21-28	1530	0.38	81	19.3	9.8	4.7	4.31	4.58	5.03
MAR 28-APR 04	1535	1.00	82	19.4	7.3	3.1	4.31	4.77	5.39
APR 04-11	1515	0.10	55	19.9	56.3	62.3	4.30	3.76	3.86
APR 11-18	1530	0.08	88	20.3	50.2	51.3	4.31	3.88	3.97
APR 18-25	1600	1.00	97	20.8	6.3	3.9	4.34	5.07	5.78
APR 25-MAY 02	1537	0.37	62	19.5	15.6	5.2	4.28	4.40	5.03
MAY 02-09	1705	0.87	100	19.7	4.6	3.6	4.30	5.09	5.26
MAY 09-16	1415	1.88	94	20.9	6.5	3.2	4.30	4.82	5.21
JUN 13-20	1440	1.06	100	20.0	4.2	2.6	4.34	5.02	5.48
JUN 20-27	1328	0.06	92	20.1	8.5	8.0	4.33	4.80	6.61
JUL 11-18	1455	1.15	91	20.2	15.3	8.3	4.32	4.61	5.24
AUG 08-15	1520	0.21	99	19.7	20.3	16.7	4.34	4.48	4.65
AUG 15-22	1355	0.44	91	20.8	6.9	2.4	4.34	4.82	5.44
AUG 22-29	1400	0.71	92	20.8	6.9	5.8	4.33	4.88	4.98
AUG 29-SEP 05	1415	0.09	92	20.7	16.4	16.8	4.32	4.42	4.58
SEP 12-19	1545	1.00	93	19.9	7.0	3.8	4.34	4.84	5.29

* 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

UPPER GRANDE RONDE RIVER BASIN

451328118304100 STARKEY EXPERIMENTAL STATION, OR--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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-PHOROUS ORTHO ATM DEP WET DIS AS PO4 (MG/L)
NOV 01-08	0.03	0.012	0.142	<0.003	0.20	0.18	<0.02	0.23	<0.02
NOV 08-15	0.01	<0.003	0.038	0.003	0.07	0.05	<0.02	0.15	<0.02
NOV 15-22	0.02	0.006	0.061	<0.003	0.19	0.06	<0.02	0.44	<0.02
NOV 22-29	<0.01	<0.003	0.018	<0.003	0.04	<0.03	<0.02	<0.03	<0.02
DEC 06-13	<0.01	0.005	0.058	<0.003	0.10	0.12	<0.02	0.08	<0.02
DEC 13-20	0.01	<0.003	0.030	<0.003	0.09	0.03	<0.02	0.07	<0.02
DEC 20-27	0.02	0.004	0.020	<0.003	0.06	0.04	<0.02	0.12	<0.02
DEC 27 1988-JAN 03 1989	<0.01	<0.003	0.027	<0.003	0.07	0.03	<0.02	0.10	<0.02
JAN 03-10	0.01	<0.003	0.036	0.064	0.05	<0.03	<0.02	0.09	<0.02
JAN 10-17	0.03	0.007	0.038	<0.003	0.17	0.07	<0.02	0.20	<0.02
JAN 17-24	<0.01	<0.003	0.023	<0.003	0.07	<0.03	<0.02	0.14	<0.02
FEB 14-21	0.01	0.003	0.013	<0.003	0.10	0.03	<0.02	0.26	<0.02
FEB 21-28	0.01	<0.003	0.031	<0.003	0.06	0.04	<0.02	<0.03	<0.02
FEB 28-MAR 07	0.02	0.003	0.035	<0.003	0.08	0.04	<0.02	0.16	<0.02
MAR 07-14	0.03	0.005	0.014	<0.003	0.06	<0.03	<0.02	0.06	<0.02
MAR 14-21	0.01	0.003	0.026	<0.003	0.10	0.04	<0.02	0.16	<0.02
MAR 21-28	0.04	0.006	0.012	<0.003	0.12	<0.03	<0.02	0.13	<0.02
MAR 28-APR 04	0.04	0.010	0.052	<0.003	0.36	0.08	<0.02	0.18	<0.02
APR 04-11	0.14	0.022	0.314	0.003	0.29	0.09	<0.02	<0.03	<0.02
APR 11-18	0.29	0.048	0.233	0.016	1.34	0.12	<0.02	0.83	0.02
APR 18-25	0.21	0.023	0.082	0.016	0.39	0.10	0.15	0.55	<0.02
APR 25-MAY 02	0.05	0.008	0.076	<0.003	0.34	0.05	<0.02	0.58	<0.02
MAY 02-09	0.05	0.009	0.038	0.018	0.23	0.04	0.04	0.39	<0.02
MAY 09-16	0.03	<0.003	0.026	0.006	0.18	0.04	0.12	0.31	<0.02
JUN 13-20	0.02	0.003	0.021	0.007	0.13	0.06	0.02	0.26	<0.02
JUN 20-27	0.14	0.029	0.063	0.197	0.45	0.12	<0.02	0.03	0.13
JUL 11-18	0.18	0.030	0.084	0.058	0.75	0.13	0.42	1.27	<0.02
AUG 08-15	0.31	0.056	0.097	0.114	1.26	0.14	0.25	2.17	0.12
AUG 15-22	<0.01	0.004	0.030	0.037	0.15	0.09	0.51	0.20	<0.02
AUG 22-29	0.02	0.005	0.067	0.018	0.45	0.06	0.40	0.58	<0.02
AUG 29-SEP 05	0.19	0.031	0.122	0.034	0.99	0.20	0.35	2.35	<0.02
SEP 12-19	<0.01	0.003	0.033	0.011	0.26	0.08	0.07	0.29	<0.02

CHEMICAL QUALITY OF PRECIPITATION

SUMMER 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.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	TOTAL PRECIP-ITATION FOR DEFINED PERIOD (IN)	COL-LECTOR EFFI-CIENCY WET DEPOS. PERCENT	SPEC. CONDUC-TANCE CK.SOL.* ATM DEP WET TOT (US/CM)	SPEC. CONDUC-TANCE FIELD ATM DEP WET TOT (US/CM)	SPEC. CONDUC-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)
NOV 01-08	1645	0.73	93	21.5	3.5	2.3	4.40	5.18	5.37
NOV 08-15	1610	0.38	95	20.9	3.8	2.6	4.37	5.07	5.42
NOV 15-22	1630	0.46	71	21.4	3.5	2.4	4.33	5.03	6.04
NOV 22-29	1558	0.73	89	21.8	4.2	2.0	4.30	5.02	5.35
MAR 14-21	1640	0.29	64	21.9	4.3	2.4	4.30	4.95	5.75
MAR 21-28	1545	0.12	127	21.6	4.6	2.6	4.29	4.99	5.82
MAR 28-APR 04	1600	0.29	85	21.5	3.4	2.1	4.30	5.07	5.93
JUL 11-18	1549	0.06	92	21.6	9.1	9.5	4.33	4.75	6.66
AUG 08-15	1516	0.23	110	23.0	14.2	10.7	4.34	4.51	4.76
AUG 15-22	1521	0.06	105	22.2	11.2	6.6	4.30	4.61	6.65
AUG 22-29	1520	0.63	104	20.7	3.1	2.1	4.30	5.13	5.48
SEP 12-19	1615	1.10	99	21.6	5.9	4.5	4.34	4.97	5.20

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)
NOV 01-08	0.02	0.008	0.029	0.010	0.07	0.05	<0.02	0.07	<0.02
NOV 08-15	0.03	0.008	0.044	0.014	0.08	0.06	<0.02	0.17	<0.02
NOV 15-22	0.04	0.009	0.064	0.006	0.13	0.07	<0.02	0.14	0.02
NOV 22-29	0.02	0.004	0.030	<0.003	0.05	0.04	<0.02	<0.03	<0.02
MAR 14-21	0.03	0.006	0.094	0.003	0.10	0.07	<0.02	0.20	<0.02
MAR 21-28	0.04	0.009	0.089	0.009	0.10	0.05	<0.02	0.18	<0.02
MAR 28-APR 04	0.03	0.006	0.080	<0.003	0.14	0.04	0.04	0.14	<0.02
JUL 11-18	0.06	0.022	0.063	0.027	0.18	0.16	0.22	0.25	0.02
AUG 08-15	0.07	0.017	0.034	0.020	0.62	0.11	0.12	1.32	0.03
AUG 15-22	0.06	0.017	0.119	0.069	0.30	0.22	0.10	0.54	<0.02
AUG 22-29	0.01	0.003	0.027	<0.003	0.14	0.03	<0.02	0.11	<0.02
SEP 12-19	<0.01	0.004	0.025	0.017	0.22	0.11	0.08	0.34	<0.02

* 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.

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 1989

Stream	Tributary to	Location	Drainage area (mi^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		WALLA WALLA RIVER BASIN				
Mill Creek	Walla Walla River	Lat 45°59'24", long 118°02'58", unsurveyed, T.6 N., R.38 E., Umatilla County, Hydrologic Unit 17070102, 600 ft downstream from city of Walla Walla intake, and at mile 25.3.	---	1988	8-21-89 8-22-89 8-29-89	17 22 10
		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‡a, 1950, 1952-57, 1960-88	10- 4-88 1-11-89 3-20-89 5-10-89 6-22-89 8- 6-89	b536 b197 b274 b390 b586 b721

‡ Operated as a continuous-record gaging station.
a Published by State of Oregon Water Resources Department.
b 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 or stage 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
	WARNER LAKES BASIN		
10366500	Deep Creek above Dismal Creek, near Warner Lake, OR	13	1917-19
10367000	Dismal Creek above Big Valley, near Warner Lake, OR	12.5	1913
10367500	Dismal Creek near Warner Lake, OR	14	1919
10368000	Deep Creek below Dismal Creek, near Warner Lake, OR	27	1913
			1917-19
10368500	Deep Creek at Big Valley, near Lakeview, OR	76	1911-15
10369000	Camas Creek near Plush, OR	32	1911-12
10369500	Mud Creek near Plush, OR	18	1911-12
			1915
			1927-30
10370000	Camas Creek near Lakeview, OR	63	1912-15
			1949-73
10370500	Crane Creek near Lakeview, OR	7	1914
10371000	Drake Creek near Adel, OR	67	1915
			1923
			1951
			1966-73
10374500	Deep Creek at Adel, OR	274	1909-16
			1918-19
			1921-22
10376500	Fish Creek near Plush, OR	38	1914
10377000	Honey Creek at Charlestrand's Ranch, near Plush, OR	56	1910-11
10377500	Snyder Creek near Plush, OR	--	1911
10378000	Twelvemile Creek near Plush, OR	37	1911
	ABERT LAKE BASIN		
10382500	Chewaucan River at damsite, near Paisley, OR	158	1912-16
10382550	Chewaucan River near Buck Mountain, near Paisley, OR	157	1983-86
10382600	Chewaucan River below coffeepot Creek, near Paisley, OR	216	1983-86
10384100	Chewaucan River at Paisley, OR	278	1905-7
			1909-13
10386000	Chewaucan River at Narrows, near Paisley, OR	380	1914-21
10386500	Chewaucan River at Hotchkiss Ford, near Paisley, OR	430	1914-20
			1921
10387000	Crooked Creek near Valley Falls, OR	--	1912-13
	SUMMER LAKE BASIN		
10389000	West Fork Silver Creek near Silver Lake, OR	27	1919-23
			1925-32

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	SUMMER LAKE BASIN--Continued		
10390500	Bridge Creek near Silver Lake, OR	30	1922-23
10390800	Buck Creek above Timothy Creek, near Silver Lake, OR	250	1922-23
10391000	Buck Creek near Silver Lake, OR	290	
			1905-6
			1909-10
			1911
			1919-21
10392000	Duncan Creek near Silver Lake, OR	58	1922
	MALHEUR AND HARNEY LAKES BASIN		
10392500	Silvies River near Silvies, OR	510	1903-4
			1909-12
			1916
			1921-23
10393000	Emigrant Creek near Burns, OR	240	1921
10394000	Poison Creek near Burns, OR	81	1921-22
10394500	Prater Creek near Burns, OR	20	1921-23
10395000	East Fork Silvies River near Lawen, OR	--	1916
			1973-76
10395500	West Fork Silvies River near Lawen, OR	--	1916-17
			1919
			1922
			1972-76
10395600	Rock Creek near Burns, OR	--	1976
10396500	Mud Creek near Diamond, OR	30	1911-16
			1930
10397000	Bridge Creek near Frenchglen, OR	30	1911-16
			1930
			1937-70
10397500	Krumbo Creek near Diamond, OR	37	1911
			1930
10398500	Donner und Blitzen River near Narrows, OR	420	1915-20
10399000	Kiger Creek near Diamond, OR	75	1911-13
			1916-21
			1930
			1941
10399500	Cucamonga Creek near Diamond, OR	15	1916
			1930
10400000	McCoy Creek near Diamond, OR	45	1910
			1911
			1914
			1916-21
			1930
			1941

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	MALHEUR AND HARNEY LAKES BASIN--Continued		
10400500	Riddle Creek near Smith, OR	60	1911
10401000	Riddle Creek near Diamond, OR	120	1917-21
10401500	Donner und Blitzen River near Voltage	760	1938-46
			1973-77
10402000	Malheur Lake Outlet (Malheur Lake) at Narrows, OR	2,150	1903-6
			1909
			1911-14
			1916
			1973-76
10402500	Mud Lake Outlet near Narrows, OR	2,160	1916-18
			1921-22
10403000	Silver Creek near Riley, OR	228	1951-80
10403500	Silver Creek above Suntex, Oregon	260	1904-6
			1909-12
			1914-23
			1925-26
10404000	Chickahominy Creek near Suntex, OR	90	1917
			1921
			1922-23
10404500	Rock Quarry Creek near Suntex, OR	--	1921
			1922
10405000	Silver Creek below Suntex, OR	550	1912-13
			1921-23
10406000	Silver Creek near Narrows, OR	630	1917
			1919-23
	CATLOW VALLEY		
10406300	Home Creek near Beckley (Narrows), OR	38	1911-12
			1915-17
			1930
	ALVORD LAKE BASIN		
10407000	Little Cottonwood Creek near Denio, OR	8	1911-12
	GOOSE LAKE (CLOSED BASIN)		
11338000	Dog Creek near Lakeview, OR	27	1912-13
11339500	Drews Creek near Lakeview, OR	212	1909-81
11340500	Cottonwood Creek near Lakeview, OR	32.9	1908-19
			1923-81
11341000	Thomas Creek near Lakeview, OR	30	1912-17
			1919
			1927-31

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi2)	Period of record
	LOST RIVER BASIN		
11483500	Miller Creek at Gerber Reservoir, near Lorella, OR	220	1904-8
			1925-50
11484000	Miller Creek near Lorella, OR	270	1909-20
11484500	Lost River above Olene, OR	1,410	1915-17
11485000	Lost River at Olene, OR	1,590	1904
			1907-12
11487000	Lost River at Wilson Bridge, near Olene, OR	1,620	1912-20
11487500	Lost River near Merrill, OR	1,670	1904-7
			1908-9
11488000	Lost River at Merrill, OR	1,680	1916
	KLAMATH RIVER BASIN		
11491500	Williamson River near Silver Lake, OR	220	1917-18
			1920-21
11492000	Miller Creek near Crescent, OR	23.7	1912-14
11492500	Sand Creek near Fort Klamath, OR	35	1917-22
11493000	Scott Creek near Fort Klamath, OR	10	1917-20
11494000	Williamson River above Spring Creek, near Klamath Agency, OR	1,330	1912-13
			1917-25
11494500	Williamson River at Chiloquin, OR	1,400	1911-16
			1917
11495500	South Fork Sprague River near Bly, OR	110	1925-26
11496500	North Fork Sprague River near Bly, OR	45	1917-18
			1925-26
11497000	Fivemile Creek near Bly, OR	40	1917-20
11498000	Sycan River near Silver Lake, OR	100	1918-20
11498100	Sycan River at Sycan Marsh, near Silver Lake, OR	220	1905
11498500	Long Creek near Silver Lake, OR	40	1918-23
			1926-29
11499000	Sycan River near Beatty, OR	540	1917-25
11500000	Sprague River near Yainax, OR	1,270	1904
11502000	Sprague River at Chiloquin, OR	1,600	1911-19
			1923
			1925
11503000	Annie Creek at Crater Lake, OR	--	1913
11503500	Annie Creek near Fort Klamath, OR	40	1922-27
11504000	Wood River at Fort Klamath, OR	90	1911
			1913-36
11504100	Wood River near Fort Klamath, OR	87.7	1964-67
11504200	Crooked Creek near Fort Klamath, OR	5.68	1964-67
11505500	Fourmile Creek near Odessa, OR	10.6	1912-17
11505600	Fourmile Creek near Rocky Point, OR	105	1964-67

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	KLAMATH RIVER BASIN--Continued		
11505700	Varney Creek near Rocky Point, OR	7.43	1964-67
11508500	Diversion from Klamath River to Lost River near Olene, OR	--	1931-68
11510000	Spencer Creek near Keno, OR	90	1929-32
11510500	Klamath River at Spencer Bridge, near Keno, OR	4,050	1913-31
11514500	Keene Creek near Ashland, OR	12.1	1917-22
			1948-65
	OWYHEE RIVER BASIN		
13181500	Crooked Creek near Rome, OR	1,700	1949-52
13182000	Owyhee River above Owyhee Reservoir, OR	10,400	1929-51
13184000	Owyhee River near Owyhee, OR	11,300	1890-96
			1903-16
			1920-29
			1979-86
	MALHEUR RIVER BASIN		
13213500	Malheur River at Jones' Ranch, near Drewsey, OR	530	1914
13215500	South Fork Malheur River at Riverside, OR	630	1910-14
			1919-20
			1927-29
			1938
13216000	Malheur River at Riverside, OR	1,750	1909-15
13218000	North Fork Malheur River at Foley's Ranch, near Beulah, OR	470	1909-14
13218500	North Fork Malheur River at Juntura, OR	530	1919-22
			1926-32
			1935-40
13219000	Malheur River near Namorf, OR	2,590	1913-23
			1926-31
13219500	Malheur River near Westfall, OR	2,970	1903-5
13220000	Malheur River at Little Valley, near Hope, OR	3,010	1949-79
13220500	Malheur River near Hope, OR	3,030	1919-1949
13221500	Malheur River near Little Valley, OR	3,030	1914
13223500	Malheur River at McLaughlin Bridge, near Vale, OR	3,060	1905-6
13225500	Bully Creek near Westfall, OR	160	1912-13
			1923
13226000	Cottonwood Creek near Westfall, OR	82	1922-23
13226500	Bully Creek at Warmsprings, near Vale, OR	539	1903-7
			1910-17
			1922-23
			1963-86
13227000	Bully Creek near Vale, OR	570	1933-62
13227500	Bully Creek at Vale, OR	620	1904-5

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	MALHEUR RIVER BASIN--Continued		
13228000	Malheur River at Vale, OR	3,880	1890-91
			1895-97
			1903-14
			1919
13229000	Malheur River below Nevada Dam, near Vale, OR	3,880	1926-34
			1936-42
			1944-50
13229500	Willow Creek near Malheur, OR	250	1912-15
			1921-29
13230500	Willow Creek below reservoir, near Malheur, OR	290	1904-6
			1911
			1920-29
13231000	Cow Creek near Brogan, OR	75	1912-14
13231500	Willow Creek near Brogan, OR	420	1912-14
13232000	Willow Creek at Cole's Ranch, near Brogan, OR	455	1904-6
13232500	Pole Creek near Brogan, OR	14	1912
13233000	Pole Creek below Black Creek feed canal, near Brogan, OR	14	1913
13233500	Malheur River at Halliday Bridge, near Ontario, OR	4,620	1904-5
13234000	Malheur River near Ontario, OR	4,680	1903-4
	BURNT RIVER BASIN		
13269300	North Fork Burnt River near Whitney, OR	110	1964-80
13269500	North Fork Burnt River at Audrey, OR	139	1915-16
13270000	Middle Fork Burnt River near Audrey, OR	9.54	1915-16
13270500	South Fork Burnt River near Unity, OR	30.9	1915-16
13270800	South Fork Burnt River above Barney Creek, near Unity, OR	38.5	1963-81
13271000	South Fork Burnt River at Hardman Ranch, near Unity, OR	44.4	1916-20
			1938-40
13271500	Fleetwood ditch near Unity, OR	--	1918-20
13272000	Sawmill Creek near Unity, OR	--	1915
13274000	Burnt River at Bridgeport, OR	600	1915-16
			1931-35
13274200	Burnt River near Bridgeport, OR	650	1956-80
13274500	Burnt River near Durkee, OR	700	1931-38
13275000	Burnt River at Huntington, OR	1,093	1928-32
			1956-59
			1962-80
	POWDER RIVER BASIN		
13275500	Powder River near Baker, OR	219	1903-14
			1926-68
13276000	Old Settlers Slough at Baker, OR	--	1913-14
13276500	Baldock Slough at Baker, OR	--	1913-14

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	POWDER RIVER BASIN--Continued		
13277500	Pine Creek near Baker, OR	8.8	1913-14
			1928-30
13278000	Goodrich Creek near Baker, OR	3.1	1913
13279000	Mill Creek near Baker, OR	3.9	1913-14
			1928-30
13279500	Marble Creek near Baker, OR	3.9	1913-14
			1928-30
13280000	Salmon Creek near Baker, OR	4.4	1913-14
			1928-29
13280500	Willow Creek near Haines, OR	2.4	1913
13281000	Powder River at Haines, OR	539	1914
13281500	Powder River near Haines, OR	572	1946-53
13282000	North Powder River near North Powder, OR	47.7	1912
13282500	Anthony Fork near North Powder, OR	37	1912
13283000	North Powder River at North Powder, OR	129	1912-14
13283500	Wolf Creek at Bauer's Ranch, near North Powder, OR	30	1913-14
13284000	Wolf Creek near North Powder, OR	32.9	1946-53
13284500	Powder River near North Powder, OR	860	1913-16
			1920-25
13286000	Big Creek near Medical Springs, OR	35.5	1913-14
13286500	Goose Creek near Keating, OR	41.9	1913-14
13287000	Eagle Creek above West Fork, near Baker, OR	18	1911
13287500	West Fork Eagle Creek near Baker, OR	15	1911
13288000	Eagle Creek near Baker, OR	42	1909-10
13288500	Eagle Creek near New Bridge, OR	170	1910-11
			1914
13289000	Daly Creek near Richland, OR	40.5	1913
13289500	Powder River near Robinette, OR	1,660	1928-57
	IMNAHA RIVER BASIN		
13291000	Imnaha River above Gumboat Creek, OR	99.6	1944-53
13291500	Big Sheep Creek near Joseph, OR	12.5	1920
	GRANDE RONDE RIVER BASIN		
13318000	Meadow Creek near Starkey, OR	140	1931-35
13318050	Meadow Creek below Smith Creek, near Starkey, OR	33.2	1977-79
13318060	Meadow Creek above Bear Creek, near Starkey, OR	48.2	1977-79
13318500	Grande Ronde River near Hilgard, OR	505	1938-56
13319000	Grande Ronde River at Hilgard, OR	555	1966-81
13320400	Little Creek at High Valley, near Union, OR	15.8	1918
13320500	Little Creek at Southerland Ranch, near Union, OR	23.8	1915
13321000	Little Creek near Union, OR	30.4	1918
13321500	Ladd Creek near Hot Lake, OR	40	1918
13322000	Mill Creek near Cove, OR	11.6	1918
			1920-21
13322500	Mill Creek near Summerville, OR	--	1914-15

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	GRANDE RONDE RIVER BASIN--Continued		
13323500	Grande Ronde River near Elgin, OR	1,250	1955-81
13323600	Indian Creek near Imbler, OR	22	1938-50
13324000	Grande Ronde River at Elgin, OR	1,400	1903-12
			1918-19
13324500	Wallowa Falls powerplant tailrace near Joseph, OR	--	1924-52
			1966-83
13325500	Wallowa River above Wallowa Lake, near Joseph, OR	43	1924-33
			1936-38
			1940-41
13326500	Joseph powerplant tailrace at Joseph, OR	--	1929-41
			1950-52
13329500	Hurricane Creek near Joseph, OR	29.6	1915
			1924-78
13330500	Bear Creek near Wallowa, OR	68	1915
			1924-85
13331000	Wallowa River near Wallowa, OR	520	1903-7
13332000	Wallowa River at Minam, OR	880	1903-14
13333500	Joseph Creek at Chico, OR	280	1931-33
13334000	Grande Ronde River at Zindel, WA	3,950	1904-12
	WALLA WALLA RIVER BASIN		
14010500	South Fork Walla Walla River below Pacific Power and Light Co.'s plant, near Milton, OR	80	1903-6
			1930-45
14011000	North Fork Walla Walla River near Milton, OR	43.8	1930-69
14011500	Walla Walla River near Milton, OR	130	1905-6
			1918-29
14012000	Walla Walla River at Milton, OR	155	1903-5
14012500	Walla River below Freewater, OR	160	1941-48
	UMATILLA RIVER BASIN		
14019500	North Fork Umatilla River near Gibbon, OR	31	1912-15
			1940-43
14020500	Umatilla River at Gibbon, OR	310	1896-99
			1900-01
			1902-12
14020700	Umatilla River near Cayuse, OR	384	1968-75
			1960-79
14022000	Umatilla River above McKay Creek, near Pendleton, OR	700	1921-34
14024000	McKay Creek at mouth, near Pendleton, OR	190	1903-4
			1922-24

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	UMATILLA RIVER BASIN--Continued		
14024200	East Birch Creek near Pilot Rock, OR	70	1968-73
14024500	Birch Creek near Pilot Rock, OR	240	1919-26
14025000	Birch Creek at Rieth, OR	291	1921-23
			1927-76
14025500	Umatilla River near Yoakum, OR	1,260	1915-36
14032000	Butter Creek near Pine City, OR	291	1928-88
	WILLOW CREEK BASIN		
14035000	Willow Creek near Morgan, OR	630	1921
			1928-31
14035500	Willow Creek above Eightmile Canyon, near Arlington, OR	680	1905
14036000	Willow Creek near Arlington, OR	850	1906
			1961-79
	JOHN DAY RIVER BASIN		
14038000	Strawberry Creek near Prairie City, OR	15	1916-17
			1925-30
14038500	John Day River at Prairie City, OR	231	1916-17
			1925-68
14039000	John Day River near Dayville, OR	960	1908-14
			1920-21
			1925-26
14039500	South Fork John Day River near Dayville, OR	590	1951-56
14040000	South Fork John Day at Dayville, OR	600	1908-14
			1920-21
			1925-26
14041000	Desolation Creek near Dale, OR	108	1915-17
			1949-58
14041500	North Fork John Day River near Dale, OR	525	1929-58
14042000	Camas Creek near Lehman, OR	60.7	1950-70
14043000	Cable Creek near Ukiah, OR	39	1914-17
			1919-24
			1932-37
			1939
14043500	Camas Creek below Cable Creek, near Ukiah, OR	--	1914
14043560	Snipe Creek near Ukiah, OR	37	1968-73
14044500	Fox Creek at gorge, near Fox, OR	90.2	1930-58
14045000	Cottonwood Creek near Monument, OR	210	1926-31
14045500	Cottonwood Creek at Monument, OR	232	1925
14047000	John Day River at Clarno, OR	5,940	1914-15
			1920-21
14047500	Rock Creek at Rock Creek, OR	500	1905
			1911

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	DESCHUTES RIVER BASIN		
14049000	Deschutes River above Snow Creek, near Lapine, OR	109	1922-25
14049500	Snow Creek above Crane Prairie, near Lapine, OR	23.0	1922-25
14051500	Cultus River below Cultus Creek near Lapine, OR	52.8	1922
14053000	Charlton Creek above Crane Prairie Reservoir near La Pine, OR	16	1938-79
14055000	Deschutes River above Davis Creek, near Lapine, OR	290	1925-32
14055500	Odell Creek near Crescent, OR	39.0	1911
			1912-14
			1923-24
			1933-76
14057000	Deschutes River at Pringle Falls, near Lapine, OR	507	1915-17
			1922-52
14058000	Deschutes River near Lapine, OR	600	1910-17
			1920
			1922
14058500	Deschutes River near Lava, OR	659	1905-7
			1909-12
14059000	Little Deschutes River at Crescent, OR	109	1905-8
			1910-14
14060500	Crescent Creek below Cold Creek near Crescent, OR	77	1922-26
			1931-32
14061000	Big Marsh Creek at Hoey Ranch, near Crescent, OR	51.5	1912-14
			1924
			1928-58
14061500	Crescent Creek near Crescent, OR	137	1912-14
14062000	Little Deschutes River above Walker Basin intake, near Lapine, OR	307	1914-17
			1919-26
			1931-32
14063500	Little Deschutes River at Allen's Ranch, near Lapine, OR	1,020	1905-12
			1913-15
			1931-32
			1943-44
14065000	Deschutes River above Lava Island, near Bend, OR	1,790	1914-16
			1943-50
14066000	Deschutes River below Lava Island, near Bend, OR	1,829	1926-65
14070700	Bridge Creek near Bend, OR	7	1980-86
14071500	Tumalo Creek near Tumalo, OR	30.9	1906-14
14073000	Tumalo Creek near Bend, OR	47	1974-87
14074000	Deschutes River at Tumalo, OR	1,983	1910-12
			1914-15
14074500	Deschutes River at Cline Falls, near Redmond, OR	2,080	1910-13
			1928-46
14077000	South Fork Beaver Creek near Paulina, OR	95	1944-53
14077500	North Fork Beaver Creek near Paulina, OR	64.4	1942-54
14078000	Beaver Creek near Paulina, OR	450	1942-75
			1924-33

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	DESCHUTES RIVER BASIN--Continued		
14078500	North Fork Crooked River above Deep Creek, OR	159	1941-54
14079000	North Fork Crooked River below Deep Creek, OR	264	1946-53
14079500	Crooked River near Post, OR	2,160	1908-11
			1939-60
			1968-73
			1976-77
14079800	Crooked River above Prineville Reservoir, near Post, OR	2,400	1960-68
14080000	Bear Creek at Rickman Ranch, near Roberts, OR	44	1920-23
14080250	Bear Creek near Prineville, OR	205	1976-81
14081500	Crooked River at Prineville, OR	2,820	1914
14082500	Marks Creek near Prineville, OR	61.0	1916
14083000	Ochoco Creek above Mill Creek near Prineville, OR	200	1917-22
			1924-28
14083500	Mill Creek near Prineville, OR	78.8	1916
			1917-18
			1920-22
			1924-33
14085000	Ochoco Creek at Elliott Ranch, near Prineville, OR	300	1909-10
			1914-17
14085500	Ochoco Creek at Prineville, OR	358	1912
			1913-15
14086000	McKay Creek near Prineville, OR	76.6	1924-32
14086500	McKay Creek above Old Dry Creek, near Prineville, OR	86.2	1918-19
			1920
14087000	McKay Creek below Old Dry Creek, near Prineville, OR	103	1915
14087300	Crooked River near Terrebonne, OR	4,240	1961-67
			1967-73
14087500	Crooked River near Culver, OR	4,330	1917-63
14088500	Metolius River at Allingham ranger station, near Sisters, OR	81.5	1910-13
			1915-17
14089000	First Creek near Sisters, OR	12.2	1915-17
			1924-28
14089500	Jack Creek near Sisters, OR	16.0	1915-16
14090000	Canyon Creek near Sisters, OR	32.5	1915-16
14090500	Whitewater River near Grandview, OR	30.6	1911-13
14092000	Metolius River at Riggs Ranch, near Sisters, OR	347	1908-12
14093000	Shitike Creek at Warm Springs, OR	104	1911-16
			1923-28
			1972-74
14093500	Deschutes River at Mecca, OR	7,940	1911-27
14094000	Trout Creek near Antelope, OR	220	1915-17
14094500	Trout Creek near Gateway, OR	--	1915-16
14095000	Hay Creek near Hay Creek, OR	78	1915-16
14096000	Mill Creek at outlet of Olallie Lake, OR	5.6	1915-16
14096500	Mill Creek near Warm Springs, OR	28.8	1915
14097000	Warm Springs River near Warm Springs, OR	517	1911-19

DISCONTINUED GAGING STATIONS

Station number	Station name	Drainage area (mi^2)	Period of record
	DESCHUTES RIVER BASIN--Continued		
14097200	White River near Government Camp, OR	40.7	1969-79
			1980-81
14097400	Clear Creek below Clear Lake, near Government Camp, OR	8.32	1968-73
14097500	Clear Creek near Government Camp, OR	9.94	1940-41
			1946-53
14098000	Clear Creek above intake, near Wapinitia, OR	17.7	1918-21
			1934-35
14098600	Clear Creek near Pine Grove, OR	38.3	1967-73
14099500	Gate Creek at Purcell Ranch, near Wamic, OR	23.9	1920-23
14100000	Gate Creek near Wamic, OR	28.3	1917-18
14100500	White River near Tygh Valley, OR	221	1911-18
14102000	Deschutes River at Sherars Bridge, OR	10,200	1923-32
	FIFTEENMILE CREEK BASIN		
14104000	Fifteenmile Creek near Dufur, OR	19.6	1918-19
14104500	Fifteenmile Creek near Wrentham, OR	171	1946-53
14105000	Eightmile Creek near Boyd, OR	56	1946-53
14105500	Fivemile Creek near The Dalles, OR	32.4	1925-26
			1927-28
			1930-31
	MILL CREEK BASIN		
14105850	South Fork Mill Creek near The Dalles, OR	28	1959-75
	MOSIER CREEK BASIN		
14113200	Mosier Creek near Mosier, OR	41.5	1963-81
	HOOD RIVER BASIN		
14113400	Dog River near Parkdale, OR	4.50	1959-71
14113500	East Fork Hood River above intake, near Mount Hood, OR	77.2	1915-22
14115000	East Fork Hood River near Mount Hood, OR	78.8	1913-14
14115500	East Fork Hood River near Dee, OR	108	1917
14116000	Hood River at Dee, OR	155	1913-16
			1917
14116500	Green Point Creek near Dee, OR	10.0	1919-21
14117500	North Fork Green Point Creek near Dee, OR	7.6	1919
			1921
14118000	Green Point Creek below North Fork, near Dee, OR	20.0	1949-54
14119000	Hood River at Winans, OR	259	1905-7
			1910-12
			1913
14121000	Hood River near Hood River, OR	329	1913-64

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October 1, 1978

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
	Length	
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)
	Area	
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)
	Volume	
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)
	Flow	
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)
	Mass	
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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