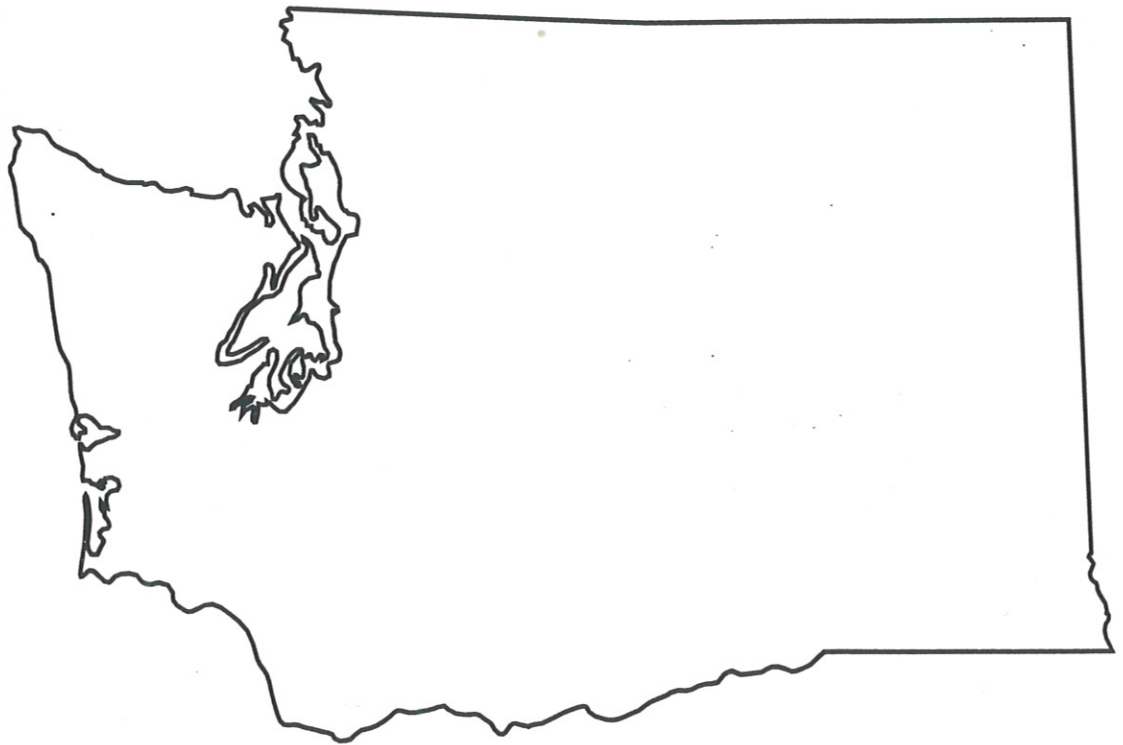




Water Resources Data Washington Water Year 1993

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U.S. GEOLOGICAL SURVEY WATER-DATA REPORT WA-93-1
Prepared in cooperation with the State of Washington
and with other agencies

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PREFACE

This volume of the annual Washington 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.

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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DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during water year 1992--Continued

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Date	Discharge (ft ³ /s)
ICICLE CREEK BASIN--Continued						
Ice Creek	Wenatchee River	Lat 47°32'59", long 120°40'46", in SE 1/4 NW 1/4 sec.26, T.24 N., R.17 E., Chelan County, 3.4 mi south of Leavenworth, 1.3 mi upstream from Leavenworth National Fish Hatchery, and at mile 3.9.	211	1991	10- 2-91 10-10-91	83 73
CRAB CREEK BASIN						
12470500 Rocky Ford Creek near Ephrata	Moses Lake	Lat 47°18'46", long 119°26'40", in SW 1/4 SW 1/4 sec.16, T.21 N., R.27 E., Grant County, Hydrologic Unit 17020015, on right bank, 1.4 mi downstream from source at Rocky Ford Springs, 5.0 mi east of Ephrata, and 6.3 mi upstream from mouth.	12	1909-11, 1942-91	10-10-91 11-21-91 12-19-91 2- 7-92 4-16-92 6-11-92 8- 6-92	58 50 52 44 34 36 43
TUCANNON RIVER BASIN						
13344500 Tucannon River near Starbuck	Snake River	Lat 46°30'17", long 118°03'55", in NE 1/4 SW 1/4 sec.21, T.12 N., R.38 E., Columbia County, 180 ft downstream from county road bridge, 0.5 mi downstream from Smith Hollow, 3.0 mi east of Starbuck, 3.3 mi downstream from Pataha Creek, and at mile 7.9	431	1915-17‡, 1928-31‡, 1958-90‡	11- 7-90 4- 3-91 5-29-91 7- 2-91 9- 3-91 10-22-91 1- 2-92 2-25-92 4-20-92 6-16-92 8-18-92	b90 b124 b212 b107 b50 56 88 179 204 62 31
PALOUSE RIVER BASIN						
13348000 South Fork Palouse River	Palouse River	Lat 46°43'57", long 117°10'48", in NE 1/4 NW 1/4 sec.6, T.14 N., R.45 E., Whitman County, on right bank at State Street crossing in Pullman, 600 ft upstream from Missouri Flat Creek, and at mile 22.2.	132	1934-42‡, 1948, 1954, 1958-59, 1959-82‡, 1983-91	10-11-91 3-16-92 5-28-92	4.7 20 5.4
WALLA WALLA RIVER BASIN						
Yellowhawk-Garrison Diversion	Walla Walla River	Lat 46°04'34", long 118°16'18", in NE 1/4 NW 1/4 sec.23, T.7 N., R. 36 E., Walla Walla County, 50 ft downstream from headgate diversion, from Mill Creek, and 1.5 mi east of Walla Walla.	---	---	7-15-91 9- 4-91 1- 3-92 2-24-92 6-17-92 8-20-92	b24 b17 27 23 34 11
Touchet River	.....do.....	Lat 46°19'07", long 117°58'06", in SE 1/4 NW 1/4 sec.30, T.10 N., R.39 E., Columbia County, at U.S. Highway 12 crossing in Dayton, and at mile 53.3	---	1991	10-22-91 1- 2-92 2-25-92 4-20-92 6-16-92 8-18-92	39 98 272 262 50 29
14017600 Touchet River	.....do.....	Lat 46°02'29", long 118°40'59", in NE 1/4 NE 1/4 sec.33, T.7 N., R.33 E., Walla Walla County, at U.S. Highway 12 crossing, 0.5 mi west of Touchet, and 0.6 mi upstream from mouth.	747	1962-65, 1972-75, 1977-91	8-25-92	20

‡ Operated as a continuous-record gaging station.

b Not previously published.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at miscellaneous sites during water year 1993--Continued

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements Date	Discharge (ft ³ /s)
OKANOGAN RIVER BASIN						
12443600 Similkameen River	Okanogan River	Lat 48°56'05", long 119°26'27", in NE 1/4 SW 1/4 sec.28, T.40 N., R.27 E., Okanogan County, at Twelfth Avenue bridge in Oroville.	3,590	1929-30, 1935, 1937, 1939-40, 1943-44, 1975-92	3-23-93 5-20-93 8-11-93	474 11,900 1,970
ICICLE CREEK BASIN						
12458000 Icicle Creek	Wenatchee River	Lat 47°32'28", long 120°43'08", in SE 1/4 SE 1/4 sec.28, T.24 N., R.17 E., Chelan County, on right bank 1,000 ft upstream from Icicle Canal diversion dam, 0.4 mi upstream from Snow Creek, 4.8 mi southwest of Leavenworth, and at mile 5.8.	193	1926, 1936-72, 1975-77, 1991-92	9-30-93	71
12458500 Icicle Creek	.....do.....	Lat 47°33'49", long 120°40'00", in SW 1/4 NW 1/4 sec.24, T.24 N., R.17 E., Chelan County, downstream side county road bridge, near center of span, 1.8 mi south of Leavenworth, and at mile 2.5.	211	---	10-15-92 12- 9-92 2-12-93 4-16-93 5-15-93 6- 9-93	93 144 154 381 3,170 1,210
CRAB CREEK BASIN						
12470500 Rocky Ford Creek	Moses Lake	Lat 47°18'46", long 119°26'40", in SW 1/4 SW 1/4 sec.16, T.21 N., R.27 E., Grant County, Hydrologic Unit 17020015, on right bank, 1.4 mi downstream from source at Rocky Ford Springs, 5.0 mi east of Ephrata, and 6.3 mi upstream from mouth.	12	1909-11, 1942-92	10- 8-92 10- 8-92 2- 4-93 4- 9-93 5-28-93 6-24-93 7-20-93 8-19-93	57 55 37 30 25 37 35 39
YAKIMA RIVER BASIN						
Wilson Creek	Yakima River	Lat 46°55'01", long 120°30'25", in NE 1/4 SW 1/4 sec.31, T.17 N., R.19 E., Kittitas County, 200 ft upstream from mouth, 0.7 mi downstream from Cherry Creek, 0.8 mi south of Thrall.	382	1914, 1915, 1971, 1973-75, 1977	12- 8-92 2- 9-93 4- 7-93 8- 3-93	89 106 174 314
GRANDE RONDE RIVER BASIN						
Grande Ronde River	Snake River	Lat 46°04'13", long 117°00'16", in SW 1/4 NE 1/4 sec.23, T.7 N., R.46 E., Asotin County, Hydrologic Unit 17060106, at county road bridge, 2.8 mi upstream from mouth, 1.5 mi downstream from Joseph Creek, and 8 mi southeast of Anatone.	---	1976-77, 1981	12- 3-92 1-27-93 9-15-93	828 1,090 706

12471000 MOSES LAKE AT MOSES LAKE, WA

LOCATION.--Lat 47°06'11", long 119°19'02", in SW 1/4 SW 1/4 sec.28, T.19 N., R.28 E., Grant County, Hydrologic Unit 17020015, on east shore 35 ft north of Interstate 90, 1.7 mi upstream from outlet, at town of Moses Lake, and at mile 55.9.

DRAINAGE AREA.--3,080 mi², of which 665 mi² is noncontributing.

PERIOD OF RECORD.--June 1909 to September 1914 and November 1936 to September 1945 (fragmentary), October 1945 to current year. Published as "at Neppel" 1912-14.

REVISED RECORDS.--WSP 1933: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is U.S. Bureau of Reclamation datum. Prior to Apr. 3, 1910, nonrecording gage at site 0.6 mi northeast at different datum. Apr. 3, 1910, to Sept. 30, 1914, and Nov. 19, 1936, to Nov. 24, 1944, nonrecording gages at site 2.8 mi northeast at Parker Horn at various datums. Oct. 30, 1945, to Mar. 12, 1955, water-stage recorder at site near west shore on downstream side of bridge on U.S. Highway 10 at present datum.

REMARKS.--Elevation controlled between 1,041 ft and 1,047 ft by two outlet structures at south end of lake. Many small diversions for irrigation.

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 1,048.29 ft Mar. 10, 1950; minimum observed, 1,038.17 ft Aug. 27, 1910.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,046.97 ft Oct. 2; minimum, 1,043.49 ft Dec. 4.

ELEVATION (FEET USBR), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1046.94	1046.87	1043.53	1043.72	1043.94	1043.79	1044.38	1046.66	1046.64	1046.70	1046.60	1046.82
2	1046.95	1046.80	1043.53	1043.72	1043.92	1043.78	1044.62	1046.68	1046.61	1046.73	1046.62	1046.83
3	1046.92	1046.74	1043.53	1043.71	1043.91	1043.79	1044.89	1046.71	1046.58	1046.76	1046.63	1046.83
4	1046.87	1046.73	1043.54	1043.72	1043.91	1043.81	1045.28	1046.74	1046.57	1046.79	1046.65	1046.76
5	1046.84	1046.73	1043.56	1043.73	1043.91	1043.80	1045.73	1046.76	1046.59	1046.79	1046.67	1046.77
6	1046.78	1046.72	1043.58	1043.73	1043.90	1043.79	1046.12	1046.77	1046.64	1046.80	1046.68	1046.88
7	1046.74	1046.72	1043.60	1043.75	1043.88	1043.79	1046.31	1046.77	1046.66	1046.73	1046.68	1046.90
8	1046.70	1046.70	1043.62	1043.76	1043.86	1043.77	1046.26	1046.79	1046.69	1046.81	1046.66	1046.86
9	1046.68	1046.66	1043.66	1043.77	1043.85	1043.77	1046.23	1046.78	1046.72	1046.80	1046.65	1046.83
10	1046.68	1046.51	1043.70	1043.78	1043.84	1043.75	1046.18	1046.76	1046.74	1046.74	1046.63	1046.79
11	1046.67	1046.24	1043.73	1043.80	1043.83	1043.74	1046.17	1046.75	1046.71	1046.68	1046.62	1046.75
12	1046.66	1045.95	1043.76	1043.82	1043.82	1043.75	1046.17	1046.78	1046.66	1046.63	1046.61	1046.73
13	1046.65	1045.67	1043.76	1043.83	1043.82	1043.74	1046.25	1046.81	1046.64	1046.62	1046.61	1046.75
14	1046.65	1045.41	1043.76	1043.84	1043.83	1043.74	1046.37	1046.80	1046.62	1046.57	1046.63	1046.73
15	1046.68	1045.19	1043.77	1043.86	1043.83	1043.73	1046.44	1046.78	1046.61	1046.55	1046.67	1046.75
16	1046.70	1044.99	1043.77	1043.88	1043.83	1043.73	1046.48	1046.78	1046.60	1046.60	1046.70	1046.77
17	1046.70	1044.81	1043.76	1043.89	1043.83	1043.72	1046.46	1046.83	1046.61	1046.66	1046.74	1046.77
18	1046.72	1044.64	1043.79	1043.91	1043.83	1043.71	1046.41	1046.71	1046.61	1046.67	1046.78	1046.73
19	1046.74	1044.50	1043.82	1043.92	1043.83	1043.70	1046.41	1046.61	1046.62	1046.64	1046.81	1046.68
20	1046.75	1044.36	1043.78	1043.93	1043.82	1043.69	1046.40	1046.54	1046.61	1046.61	1046.84	1046.68
21	1046.77	1044.23	1043.76	1043.94	1043.82	1043.69	1046.33	1046.49	1046.62	1046.63	1046.86	1046.71
22	1046.78	1044.11	1043.76	1043.95	1043.82	1043.68	1046.30	1046.41	1046.63	1046.67	1046.85	1046.78
23	1046.81	1043.99	1043.75	1043.96	1043.82	1043.68	1046.27	1046.37	1046.64	1046.71	1046.83	1046.83
24	1046.84	1043.92	1043.75	1043.97	1043.81	1043.70	1046.30	1046.47	1046.66	1046.78	1046.78	1046.83
25	1046.89	1043.87	1043.75	1043.98	1043.81	1043.74	1046.38	1046.61	1046.67	1046.84	1046.73	1046.84
26	1046.89	1043.80	1043.74	1043.99	1043.80	1043.72	1046.43	1046.69	1046.67	1046.80	1046.70	1046.83
27	1046.91	1043.73	1043.74	1044.00	1043.80	1043.70	1046.50	1046.75	1046.68	1046.66	1046.70	1046.80
28	1046.92	1043.66	1043.73	1044.00	1043.80	1043.71	1046.54	1046.74	1046.69	1046.63	1046.69	1046.79
29	1046.93	1043.59	1043.72	1043.99	---	1043.80	1046.58	1046.58	1046.71	1046.69	1046.62	1046.79
30	1046.94	1043.54	1043.72	1043.98	---	1043.94	1046.62	1046.69	1046.69	1046.59	1046.74	1046.79
31	1046.94	---	1043.72	1043.96	---	1044.16	---	1046.66	---	1046.58	1046.80	---
MEAN	1046.79	1045.25	1043.70	1043.86	1043.85	1043.76	1046.13	1046.69	1046.65	1046.69	1046.71	1046.79
MAX	1046.95	1046.87	1043.82	1044.00	1043.94	1044.16	1046.62	1046.83	1046.74	1046.84	1046.86	1046.90
MIN	1046.65	1043.54	1043.53	1043.71	1043.80	1043.68	1044.38	1046.37	1046.57	1046.55	1046.60	1046.68

WTR YR 1991 MEAN 1045.58 MAX 1046.95 MIN 1043.53