

Water-Data Report 2009

## 14191000 WILLAMETTE RIVER AT SALEM, OR

Willamette Basin  
Middle Willamette Subbasin

LOCATION.--Lat 44°56'40", long 123°02'30" referenced to North American Datum of 1927, in SE ¼ SW ¼ sec.22, T.7 S., R.3 W., Marion County, OR, Hydrologic Unit 17090007, on right bank, 300 ft upstream from Center Street Bridge in Salem and at mile 84.16.

DRAINAGE AREA.--7,280 mi<sup>2</sup>, approximately.

### SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1909 to December 1916, January 1923 to current year. Monthly discharge only, January 1923 to September 1927, published in WSP 1318. Gage-height records collected at about same site since 1892 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 1318: 1915(M).

GAGE.--Water-stage recorder. Datum of gage is 106.14 ft above NGVD of 1929. Oct. 1, 1909 to Dec. 31, 1916, nonrecording gage at site 0.5 mi upstream at datum 8.00 ft higher. Jan. 1, 1923 to Nov. 26, 1934, nonrecording gage at Center Street Bridge at datum 8.00 ft higher. Nov. 27, 1934 to Sept. 30, 1962, water-stage recorder at present site at datum 8.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by 12 reservoirs upstream from station (see elsewhere in this report). Many small diversions for irrigation upstream from station; part of flow of Salem Canal, which diverts water from North Santiam River, returns to Willamette River downstream from station through Mill Creek at Salem. Periodic suspended sediment data are available for period October 1991 to September 1993.

AVERAGE DISCHARGE FOR PERIOD OF RECORD.--36 years (water years 1910-16, 1924-1952), 22,590 ft<sup>3</sup>/s, 42.17 in/yr, 16,370,000 acre-ft/yr. 93 years (water years 1910-16, 1924-2009), 23,250 ft<sup>3</sup>/s, 16,850,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 348,000 ft<sup>3</sup>/s Jan. 8, 1923, gage height, 38.3 ft, present datum; minimum discharge, 2,470 ft<sup>3</sup>/s Aug. 27, 1940, gage height, 3.55 ft, present datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 500,000 ft<sup>3</sup>/s Dec. 4, 1861, gage height, about 47 ft present datum, from rating curve extended above 250,000 ft<sup>3</sup>/s in 1916. Floods of Jan. 16, 1881 and Feb. 5, 1890, reached stages of 44.3 ft, discharge, 428,000 ft<sup>3</sup>/s and 45.1 ft, discharge, 448,000 ft<sup>3</sup>/s, respectively, from floodmarks and information by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 112,000 ft<sup>3</sup>/s Jan. 3, gage height, 23.79 ft; minimum discharge, 6,110 ft<sup>3</sup>/s July 29, 30.

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**DISCHARGE, CUBIC FEET PER SECOND**  
**WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009**  
**DAILY MEAN VALUES**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	9,690	12,200	10,700	81,100	18,000	26,300	26,500	15,700	16,200	7,960	6,300	7,580
2	9,750	12,400	10,600	95,500	17,400	25,300	25,000	16,000	15,800	7,530	6,520	7,640
3	10,500	12,900	12,000	109,000	16,900	27,400	28,700	17,600	15,900	7,420	6,580	8,040
4	11,900	14,300	13,000	101,000	16,000	26,100	29,500	18,600	16,300	7,500	6,540	7,990
5	14,100	18,200	13,100	90,900	14,400	23,700	26,800	24,600	17,800	7,430	6,730	8,310
6	14,700	21,000	11,700	89,000	13,300	23,300	25,200	41,300	17,500	7,420	6,800	8,720
7	14,100	25,900	9,690	89,500	13,200	22,900	24,100	50,600	15,700	7,370	6,910	9,220
8	14,900	26,100	9,080	92,100	12,300	21,400	23,600	50,000	14,000	7,360	7,170	9,390
9	14,600	25,200	8,920	90,900	11,700	20,200	23,500	43,100	12,800	7,020	7,340	9,250
10	14,400	25,500	8,680	86,800	11,400	18,600	24,100	35,600	13,800	7,100	7,310	8,990
11	13,900	25,800	8,470	82,700	11,300	16,900	24,100	30,100	13,800	7,190	7,210	8,750
12	12,500	33,200	8,360	79,200	11,400	15,500	22,500	26,200	13,800	7,080	7,150	8,790
13	11,400	48,400	8,880	71,900	11,800	14,800	23,600	26,400	13,900	7,570	7,070	8,760
14	11,100	51,800	9,880	63,400	11,600	14,300	26,200	29,000	13,400	7,520	7,030	9,070
15	11,600	41,400	10,300	56,400	11,200	16,900	24,500	32,200	12,100	7,390	6,850	8,860
16	12,600	35,200	11,000	51,900	11,000	28,900	22,200	30,200	10,500	7,190	6,840	9,000
17	13,100	30,700	11,100	47,500	10,800	37,200	20,700	27,500	10,000	6,870	6,930	8,930
18	13,500	27,900	11,400	42,400	10,900	34,000	20,400	26,200	9,730	6,680	6,880	8,520
19	13,300	25,200	12,300	38,000	10,700	30,200	20,400	26,300	9,590	6,650	6,740	8,180
20	12,900	23,000	12,300	35,000	10,500	27,200	20,200	26,800	9,530	6,660	6,600	7,980
21	13,200	22,300	13,800	32,400	10,200	25,600	20,400	25,500	9,560	6,590	6,660	7,700
22	13,500	22,300	21,400	30,200	10,100	24,500	20,700	22,500	9,610	6,430	6,700	7,690
23	13,200	21,700	26,100	27,400	10,800	25,200	20,500	21,600	9,470	6,410	6,690	7,910
24	12,700	20,400	23,700	23,900	16,700	24,200	19,400	19,800	9,080	6,510	6,730	7,800
25	11,900	19,300	24,100	22,800	31,000	23,500	19,300	18,600	9,080	6,450	6,720	8,050
26	11,700	17,800	24,700	22,100	42,900	25,500	19,200	18,800	9,050	6,470	7,260	8,280
27	11,900	15,600	23,400	21,300	43,900	27,000	18,500	18,100	8,750	6,490	7,660	8,430
28	11,700	13,800	38,900	20,800	33,000	25,500	17,900	17,700	8,460	6,270	7,430	8,430
29	11,200	12,400	67,000	20,500	---	28,500	18,100	16,200	8,330	6,200	7,460	8,540
30	11,100	11,200	82,800	19,800	---	29,800	17,400	15,400	8,140	6,230	7,520	9,020
31	11,600	---	83,900	18,700	---	28,300	---	16,100	---	6,210	7,530	---
<b>Total</b>	388,240	713,100	641,260	1,754,100	454,400	758,700	673,200	804,300	361,680	215,170	215,860	253,820
<b>Mean</b>	12,520	23,770	20,690	56,580	16,230	24,470	22,440	25,950	12,060	6,941	6,963	8,461
<b>Max</b>	14,900	51,800	83,900	109,000	43,900	37,200	29,500	50,600	17,800	7,960	7,660	9,390
<b>Min</b>	9,690	11,200	8,360	18,700	10,100	14,300	17,400	15,400	8,140	6,200	6,300	7,580
<b>Ac-ft</b>	770,100	1,414,000	1,272,000	3,479,000	901,300	1,505,000	1,335,000	1,595,000	717,400	426,800	428,200	503,500

**STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 2009, BY WATER YEAR (WY)**

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	10,960	27,810	42,710	46,930	39,410	31,430	26,090	20,580	13,940	7,314	5,865	7,206
<b>Max</b>	33,440	72,040	116,700	107,800	91,350	73,670	63,410	38,610	37,360	19,870	9,540	13,340
<b>(WY)</b>	(1948)	(1951)	(1965)	(2006)	(1961)	(1972)	(1937)	(1963)	(1933)	(1916)	(1971)	(1978)
<b>Min</b>	3,214	3,140	6,780	6,377	5,313	11,110	10,260	7,701	5,065	3,286	2,653	2,682
<b>(WY)</b>	(1937)	(1937)	(1977)	(1977)	(1977)	(1941)	(1977)	(1973)	(1940)	(1940)	(1940)	(1931)

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SUMMARY STATISTICS

	Calendar Year 2008		Water Year 2009		Water Years 1910 - 2009	
<b>Annual total</b>	8,114,840		7,233,830			
<b>Annual mean</b>	22,170		19,820		23,250	
<b>Highest annual mean</b>					37,960	1974
<b>Lowest annual mean</b>					9,792	1977
<b>Highest daily mean</b>	83,900	Dec 31	109,000	Jan 3	342,000	Jan 8, 1923
<b>Lowest daily mean</b>	6,450	Aug 16	6,200	Jul 29	2,480	Aug 27, 1940
<b>Annual seven-day minimum</b>	6,570	Aug 12	6,310	Jul 26	2,520	Aug 27, 1940
<b>Annual runoff (ac-ft)</b>	16,100,000		14,350,000		16,850,000	
<b>10 percent exceeds</b>	43,000		34,400		52,800	
<b>50 percent exceeds</b>	19,000		13,900		15,100	
<b>90 percent exceeds</b>	7,420		7,080		5,380	

