



**Figure 8.** Location of surface-water stations in the Naselle and Willapa River Basins.

12010000 NASELLE RIVER NEAR NASELLE, WA

LOCATION.--Lat 46°22'27", long 123°44'32", in SW<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub>, sec. 1, T.10 N., R.9 W., Pacific County, Hydrologic Unit 17100106, on right bank 0.2 mi upstream from county highway bridge, 2.2 mi upstream from Salmon Creek, 3.4 mi east of Naselle, and at mile 17.4.

DRAINAGE AREA.--54.8 mi<sup>2</sup>.

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

REVISED RECORDS.--WSP 1216: Drainage area. WSP 1316: 1930(M), 1932-40(M), 1945-46(M).

GAGE.--Water-stage recorder. Elevation of gage is 24 ft above NGVD of 1929, by barometer. Prior to Jan. 11, 1957, nonrecording gage and crest-stage gage at site 1,350 ft downstream at present datum. Jan. 11, 1957, to Dec. 31, 1961, nonrecording gage and crest-stage gage at site 1,200 ft downstream at present datum.

REMARKS.--Records good. No regulation or diversion upstream from station. Chemical analyses October 1965 to September 1970, January to September 1973, November 1975 to June 1980. Water temperatures August 1963 to September 1973. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--75 years (water years 1930-2004), 427 ft<sup>3</sup>/s, 105.89 in/yr, 309,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,600 ft<sup>3</sup>/s, Mar. 18, 1997, gage height, 19.26 ft; minimum discharge, 17 ft<sup>3</sup>/s, Sept. 3, 5, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct 21	0145	*4,130	*11.33	No other peak greater than base discharge.			

Minimum discharge, 22 ft<sup>3</sup>/s, Oct. 4, gage height, 3.67 ft.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	240	929	371	1,240	291	305	127	176	71	38	94
2	23	236	728	334	1,070	269	275	122	150	70	36	103
3	23	213	729	309	856	283	252	116	131	71	39	88
4	23	197	597	271	722	354	231	112	119	67	42	78
5	23	185	891	242	579	560	214	109	120	65	38	74
6	25	174	2,020	240	631	622	198	100	141	65	58	70
7	47	167	1,260	400	604	554	185	102	147	67	82	67
8	49	161	886	884	535	485	174	98	131	64	54	65
9	71	154	681	1,010	468	427	162	92	123	62	43	69
10	81	158	573	1,080	413	377	153	89	126	60	38	66
11	89	265	491	910	367	336	142	101	125	59	36	349
12	180	207	593	742	328	303	136	89	119	56	34	193
13	223	186	808	641	297	273	131	84	210	55	33	245
14	139	174	1,080	654	359	254	168	81	181	54	32	254
15	113	189	1,060	710	643	231	164	78	158	53	31	509
16	408	504	892	607	708	213	172	77	140	52	31	435
17	1,700	727	720	502	669	200	158	77	128	50	30	389
18	622	2,670	576	451	678	232	144	73	118	49	29	438
19	552	2,990	487	412	624	225	148	71	109	48	29	459
20	1,710	1,800	455	362	537	207	211	71	103	50	28	389
21	2,970	1,090	392	323	460	188	346	70	97	47	49	327
22	1,300	749	344	292	400	178	285	75	93	45	173	286
23	864	612	313	329	352	171	248	75	92	42	83	255
24	594	654	469	331	351	243	217	67	88	41	98	224
25	461	1,080	704	348	342	267	197	65	86	40	413	201
26	380	1,050	619	400	313	523	180	90	82	39	371	182
27	323	832	607	474	315	768	167	158	79	39	259	163
28	350	1,610	604	1,180	306	571	157	242	77	38	181	151
29	343	3,040	535	3,410	297	452	144	203	75	39	143	140
30	296	1,540	460	3,240	---	407	135	218	72	39	119	129
31	262	---	415	1,840	---	344	---	212	---	39	103	---
TOTAL	14,267	23,854	21,918	23,299	15,464	10,808	5,799	3,344	3,596	1,636	2,773	6,492
MEAN	460	795	707	752	533	349	193	108	120	52.8	89.5	216
MAX	2,970	3,040	2,020	3,410	1,240	768	346	242	210	71	413	509
MIN	23	154	313	240	297	171	131	65	72	38	28	65
AC-FT	28,300	47,310	43,470	46,210	30,670	21,440	11,500	6,630	7,130	3,250	5,500	12,880
CFSM	8.40	14.5	12.9	13.7	9.73	6.36	3.53	1.97	2.19	0.96	1.63	3.95
IN.	9.68	16.19	14.88	15.82	10.50	7.34	3.94	2.27	2.44	1.11	1.88	4.41

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2004, BY WATER YEAR (WY)

MEAN	275	718	930	861	791	618	395	207	138	75.9	52.6	84.7
MAX	862	1,539	2,530	1,969	1,587	1,424	858	448	400	250	196	455
(WY)	(1998)	(1984)	(1934)	(1953)	(1961)	(1997)	(1937)	(1948)	(2000)	(1983)	(2001)	(1978)
MIN	20.9	37.3	245	215	191	153	120	82.0	54.9	33.8	22.3	26.4
(WY)	(1988)	(1937)	(1977)	(1985)	(1993)	(1992)	(1939)	(1956)	(1982)	(1970)	(1970)	(1999)

## NASELLE RIVER BASIN

12010000 NASELLE RIVER NEAR NASELLE, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1930 - 2004	
ANNUAL TOTAL	164,253		133,250			
ANNUAL MEAN	450		364		427	
HIGHEST ANNUAL MEAN					611	
LOWEST ANNUAL MEAN					226	
HIGHEST DAILY MEAN	4,350	Mar 22	3,410	Jan 29	10,400	Jan 22, 1935
LOWEST DAILY MEAN	18	Sep 3	23	Oct 1	18	Aug 31, 1970
ANNUAL SEVEN-DAY MINIMUM	19	Aug 31	27	Oct 1	19	Aug 31, 2003
ANNUAL RUNOFF (AC-FT)	325,800		264,300		309,400	
ANNUAL RUNOFF (CFSM)	8.21		6.64		7.79	
ANNUAL RUNOFF (INCHES)	111.50		90.45		105.89	
10 PERCENT EXCEEDS	1,110		755		1,050	
50 PERCENT EXCEEDS	213		208		217	
90 PERCENT EXCEEDS	25		49		39	

## 12013500 WILLAPA RIVER NEAR WILLAPA, WA

LOCATION.--Lat 46°39'04", long 123°39'05", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ , sec.35, T.14 N., R.8 W., Pacific County, Hydrologic Unit 17100106, on right bank 2,150 ft downstream from Mill Creek, 1.8 mi southeast of Willapa, and at mile 17.8.

DRAINAGE AREA.--130 mi<sup>2</sup>.

PERIOD OF RECORD.--August to October 1947, July 1948 to December 1954, water years 1955-56, 1958-59 (annual maximum), April 1961 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 3.57 ft above NGVD of 1929. Aug. 26 to Oct. 16, 1947, water-stage recorder at site 2,060 ft upstream at different datum. July 28, 1948, to Dec. 2, 1954, water-stage recorder, water years 1955-56, 1958-59, nonrecording gage, and Apr. 1, 1961, to Apr. 14, 1974, water-stage recorder at site 2,000 ft upstream at datum 2.12 ft higher.

REMARKS.--No estimated daily discharges. Records good. Some diversion for domestic use and irrigation upstream from station. No regulation. U.S. Geological Survey satellite telemeter at station. Chemical analyses October 1965 to September 1986.

AVERAGE DISCHARGE.--49 years (water years 1949-54, 1962-2004), 639 ft<sup>3</sup>/s, 66.80 in/yr, 463,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,800 ft<sup>3</sup>/s, Dec. 20, 1994, from rating curve extended above 8,000 ft<sup>3</sup>/s, gage height, 27.28 ft; minimum discharge, 13 ft<sup>3</sup>/s, Aug. 20, 1967 and Sept. 6, 2003.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct 17	1100	5,410	14.68	Nov 29	0200	5,690	15.15
Oct 21	0400	*7,390	*17.49	Jan 30	0800	6,260	15.93
Nov 19	1100	7,050	17.05				

Minimum discharge, 22 ft<sup>3</sup>/s, Aug. 21, gage height, 2.64 ft.

DISCHARGE, CUBIC FEET PER SECOND  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	272	1,700	786	2,390	632	629	214	238	68	32	83
2	28	271	1,330	690	2,100	578	558	202	199	66	30	80
3	28	243	1,410	657	1,720	577	504	191	169	68	31	76
4	29	216	1,130	594	1,440	661	459	183	145	66	33	69
5	30	198	1,580	523	1,190	909	425	188	140	63	34	64
6	32	181	3,540	520	1,170	1,080	391	171	173	61	38	60
7	45	171	2,330	900	1,100	934	365	168	211	63	81	57
8	54	163	1,660	2,010	971	822	346	173	194	64	59	55
9	103	150	1,280	2,130	867	728	318	151	166	62	43	57
10	102	146	1,090	1,900	780	641	296	148	161	59	36	57
11	92	288	907	1,530	703	576	278	158	162	57	32	419
12	238	236	999	1,250	636	521	263	146	155	55	31	243
13	408	198	1,240	1,080	579	474	257	132	245	54	30	214
14	201	177	1,680	981	653	435	308	124	238	51	29	277
15	126	182	1,790	978	1,150	403	338	120	198	49	28	485
16	531	537	1,600	863	1,250	376	339	121	167	48	27	444
17	3,020	1,030	1,440	746	1,230	357	326	119	143	48	26	420
18	1,100	3,560	1,180	687	1,250	391	291	109	126	46	24	425
19	748	5,630	987	643	1,200	417	293	105	114	46	25	422
20	2,780	3,420	874	581	1,060	371	409	103	106	45	25	354
21	5,370	2,120	741	530	934	339	624	102	99	45	29	278
22	2,010	1,480	641	493	818	317	525	106	95	42	201	235
23	1,370	1,160	574	527	716	304	448	107	97	39	120	210
24	931	1,190	887	571	727	447	396	97	96	35	86	178
25	706	1,870	1,400	655	756	588	356	92	94	34	421	157
26	560	1,970	1,230	691	697	1,030	321	102	85	34	461	140
27	461	1,570	1,170	791	671	1,510	294	152	82	33	303	129
28	421	2,410	1,250	1,350	679	1,180	274	328	79	32	181	118
29	432	4,590	1,120	3,740	645	952	251	330	74	32	130	111
30	362	2,530	958	5,330	---	847	233	292	71	35	105	105
31	304	---	870	3,270	---	720	---	291	---	33	90	---
TOTAL	22,650	38,159	40,588	37,997	30,082	20,117	11,115	5,025	4,322	1,533	2,821	6,022
MEAN	731	1,272	1,309	1,226	1,037	649	370	162	144	49.5	91.0	201
MAX	5,370	5,630	3,540	5,330	2,390	1,510	629	330	245	68	461	485
MIN	28	146	574	493	579	304	233	92	71	32	24	55
AC-FT	44,930	75,690	80,510	75,370	59,670	39,900	22,050	9,970	8,570	3,040	5,600	11,940
CFSM	5.62	9.78	10.1	9.43	7.98	4.99	2.85	1.25	1.11	0.38	0.70	1.54
IN.	6.48	10.92	11.61	10.87	8.61	5.76	3.18	1.44	1.24	0.44	0.81	1.72

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 2004, BY WATER YEAR (WY)

	278	992	1,498	1,415	1,268	991	602	297	163	75.2	48.9	77.3
MEAN	278	992	1,498	1,415	1,268	991	602	297	163	75.2	48.9	77.3
MAX	1,187	2,270	2,844	3,115	3,445	2,127	1,312	600	486	203	161	378
(WY)	(1998)	(1984)	(1995)	(1953)	(1999)	(2003)	(1991)	(1984)	(1968)	(1983)	(2001)	(1978)
MIN	25.6	65.1	240	213	284	253	284	139	59.8	34.5	20.4	22.6
(WY)	(1988)	(1994)	(1977)	(1977)	(1993)	(1992)	(1949)	(1994)	(1992)	(1992)	(1992)	(1998)

## WILLAPA RIVER BASIN

12013500 WILLAPA RIVER NEAR WILLAPA, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1949 - 2004	
ANNUAL TOTAL	275,323		220,431			
ANNUAL MEAN	754		602		639	
HIGHEST ANNUAL MEAN					1,048	1999
LOWEST ANNUAL MEAN					294	1977
HIGHEST DAILY MEAN	7,340	Mar 22	5,630	Nov 19	12,800	Dec 20, 1994
LOWEST DAILY MEAN	14	Sep 6	24	Aug 18	14	Aug 20, 1967
ANNUAL SEVEN-DAY MINIMUM	16	Aug 31	26	Aug 14	16	Aug 24, 1967
ANNUAL RUNOFF (AC-FT)	546,100		437,200		463,000	
ANNUAL RUNOFF (CFSM)	5.80		4.63		4.92	
ANNUAL RUNOFF (INCHES)	78.78		63.08		66.80	
10 PERCENT EXCEEDS	1,860		1,420		1,630	
50 PERCENT EXCEEDS	324		306		298	
90 PERCENT EXCEEDS	26		45		36	