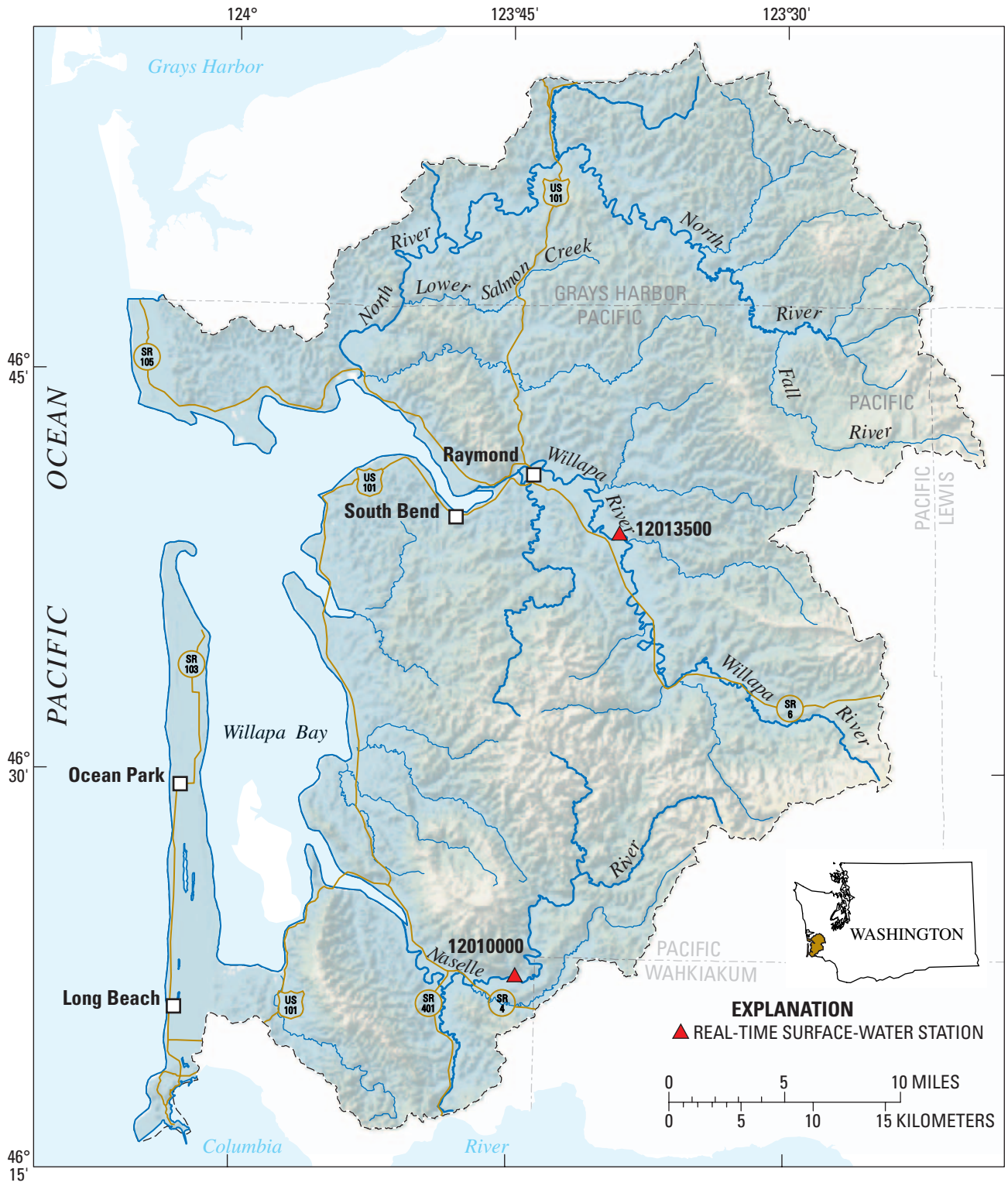

Figure 8. Location of surface-water stations in the Naselle and Willapa River Basins.

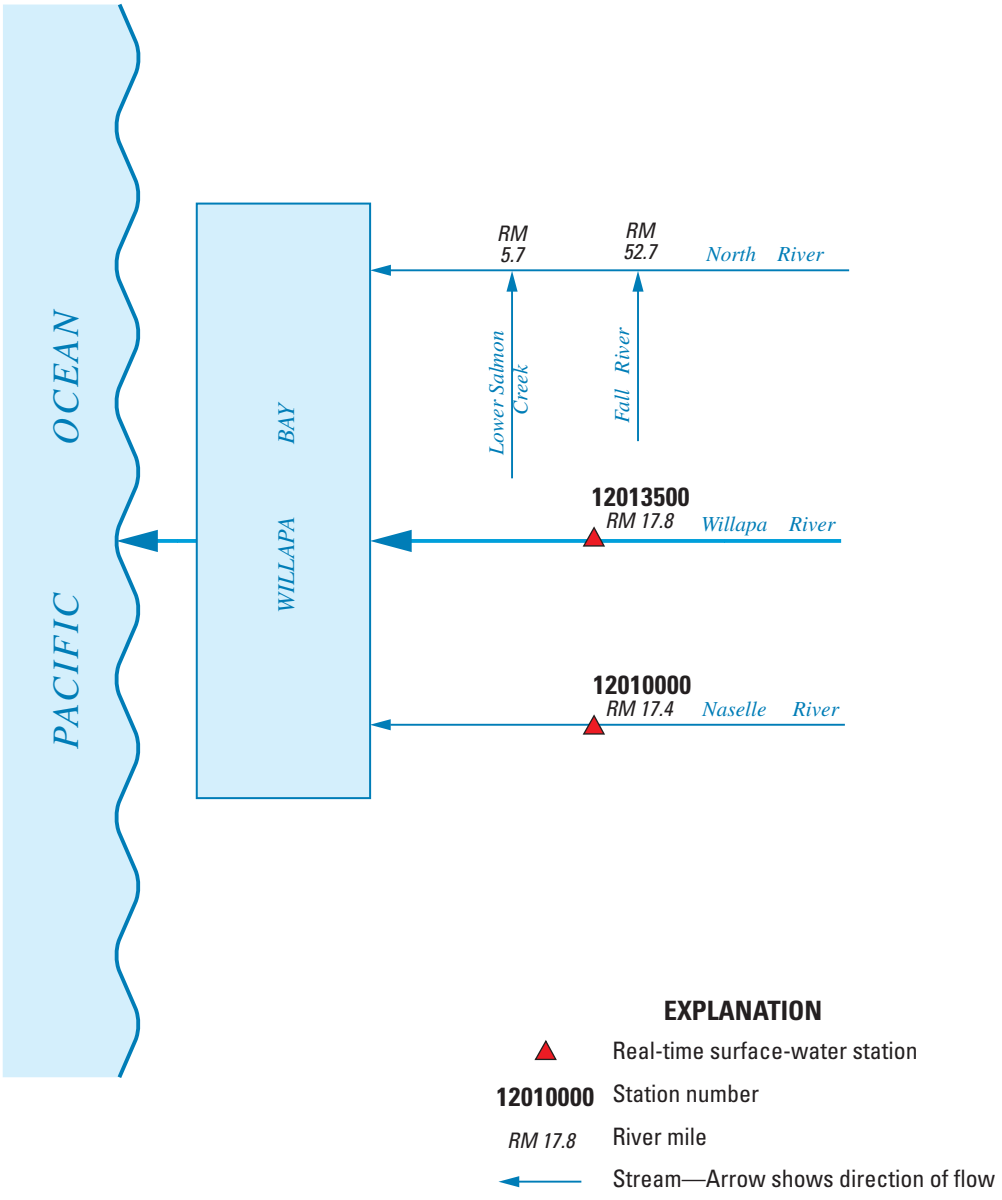

Figure 9. Schematic diagram showing surface-water stations in the Naselle and Willapa River Basins.

12010000 NASELLE RIVER NEAR NASELLE, WA

LOCATION.--Lat 46°22'27", long 123°44'32", in SW¼SW¼ 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^2.

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.-- No estimated daily discharges. 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.--76 years (water years 1930-2005), 425 ft^3/s, 105.42 in/yr, 308,000 acre-ft/yr.

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec 11	0130	4,090	11.28	Jan 18	0830	*5,490	*12.93

Minimum discharge, 31 ft^3/s, Sept. 25-29, gage height, 3.70 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	120	351	285	246	198	184	750	161	175	80	62	42
2	113	945	260	230	185	168	642	158	161	79	60	40
3	108	772	242	216	175	157	648	147	151	76	58	40
4	103	562	233	204	197	146	590	146	141	72	56	40
5	104	444	227	195	211	137	502	135	142	71	54	39
6	157	372	268	196	298	132	429	129	141	102	54	37
7	111	324	464	281	332	127	405	123	133	82	53	37
8	189	288	1,600	325	282	122	368	119	130	140	52	36
9	253	260	1,050	308	254	117	320	130	119	195	52	36
10	234	236	1,940	292	234	115	294	228	118	144	52	52
11	196	216	2,980	272	218	110	354	202	122	140	51	47
12	172	199	1,450	297	216	105	361	170	117	132	50	40
13	156	187	927	300	208	100	450	152	123	124	49	37
14	144	174	834	279	202	96	450	145	111	115	48	36
15	136	185	701	268	187	95	429	166	104	108	46	38
16	167	177	569	277	176	111	1,310	183	105	106	46	38
17	679	173	472	1,450	168	114	1,130	186	121	99	52	44
18	632	240	401	4,460	159	97	826	311	104	93	53	38
19	788	231	357	2,120	153	116	622	451	111	88	47	36
20	631	205	314	1,210	146	693	492	415	98	82	45	35
21	474	189	293	842	139	608	403	341	95	79	44	34
22	441	185	272	628	133	392	340	353	96	81	43	33
23	382	180	248	498	129	323	299	313	92	77	43	32
24	345	260	232	415	124	278	266	280	86	72	41	32
25	327	1,210	302	357	120	248	247	253	86	70	40	32
26	319	630	398	318	116	1,130	223	230	85	69	39	32
27	287	465	320	291	114	1,940	205	211	103	66	40	31
28	266	377	290	263	135	1,240	192	196	99	65	40	31
29	252	328	274	246	---	1,390	181	183	89	64	51	39
30	379	318	255	226	---	1,100	173	172	84	62	60	160
31	334	---	246	216	---	786	---	166	---	61	45	---
TOTAL	8,999	10,683	18,704	17,726	5,209	12,477	13,901	6,555	3,442	2,894	1,526	1,244
MEAN	290	356	603	572	186	402	463	211	115	93.4	49.2	41.5
MAX	788	1,210	2,980	4,460	332	1,940	1,310	451	175	195	62	160
MIN	103	173	227	195	114	95	173	119	84	61	39	31
AC-FT	17,850	21,190	37,100	35,160	10,330	24,750	27,570	13,000	6,830	5,740	3,030	2,470
CFSM	5.30	6.50	11.0	10.4	3.39	7.34	8.46	3.86	2.09	1.70	0.90	0.76
IN.	6.11	7.25	12.70	12.03	3.54	8.47	9.44	4.45	2.34	1.96	1.04	0.84

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 2005, BY WATER YEAR (WY)

MEAN	275	713	925	857	783	615	396	207	137	76.2	52.5	84.2
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	186	153	120	82.0	54.9	33.8	22.3	26.4
(WY)	(1988)	(1937)	(1977)	(1985)	(2005)	(1992)	(1939)	(1956)	(1982)	(1970)	(1970)	(1999)

12010000 NASELLE RIVER NEAR NASELLE, WA—Continued

SUMMARY STATISTICS	FOR 2004 CALENDAR YEAR		FOR 2005 WATER YEAR		WATER YEARS 1930 - 2005	
ANNUAL TOTAL	111,597		103,360			
ANNUAL MEAN	305		283		425	
HIGHEST ANNUAL MEAN					611	1974
LOWEST ANNUAL MEAN					226	1977
HIGHEST DAILY MEAN	3,410	Jan 29	4,460	Jan 18	10,400	Jan 22, 1935
LOWEST DAILY MEAN	28	Aug 20	31	Sep 27	18	Aug 31, 1970
ANNUAL SEVEN-DAY MINIMUM	30	Aug 14	32	Sep 22	19	Aug 31, 2003
ANNUAL RUNOFF (AC-FT)	221,400		205,000		308,000	
ANNUAL RUNOFF (CFSM)	5.56		5.17		7.76	
ANNUAL RUNOFF (INCHES)	75.76		70.16		105.42	
10 PERCENT EXCEEDS	631		614		1,050	
50 PERCENT EXCEEDS	210		176		216	
90 PERCENT EXCEEDS	54		45		39	

12013500 WILLAPA RIVER NEAR WILLAPA, WA

LOCATION.--Lat 46°39'04", long 123°39'05", in SW¼SW¼ 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^2.

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.--Records good except estimated daily discharges, which are fair. 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.--50 years (water years 1949-1954, 1962-2005), 636 ft^3/s, 66.45 in/yr, 460,600 acre-ft/yr.

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec 11	0600	6,650	16.47	Jan 18	1100	*7,650	*17.85

Minimum discharge, 25 ft^3/s, Sept. 27, gage height, 2.68 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2004 TO SEPTEMBER 2005
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	99	491	454	394	370	333	1,730	315	299	106	52	37
2	94	1,490	407	364	345	291	1,550	354	276	103	52	35
3	91	1,340	374	338	324	280	1,460	307	260	101	49	33
4	89	948	354	318	351	247	1,350	285	236	93	47	31
5	91	744	352	302	401	230	1,160	266	227	88	45	31
6	138	611	385	302	466	215	1,010	246	224	107	44	30
7	118	517	656	477	542	206	967	232	209	104	43	29
8	142	447	2,240	661	446	197	913	223	205	114	44	28
9	284	394	1,770	620	407	189	780	248	182	250	43	29
10	290	352	2,680	561	377	179	693	574	173	161	43	31
11	215	320	5,230	511	356	172	809	540	181	140	44	35
12	177	296	2,560	531	350	164	804	444	176	138	43	35
13	151	281	1,700	545	350	157	947	379	168	128	42	33
14	137	262	1,520	493	341	150	995	338	160	116	40	32
15	127	263	1,270	466	314	146	912	369	149	106	38	31
16	134	265	1,050	476	296	178	1,880	392	148	102	38	34
17	676	275	885	1,310	280	230	1,910	370	217	99	39	39
18	718	390	763	6,410	269	177	1,520	540	173	90	42	36
19	950	407	677	3,490	256	181	1,210	968	161	82	e40	34
20	791	351	597	2,120	245	1,240	1,000	946	143	79	e37	32
21	592	320	536	1,550	231	1,360	838	796	132	76	35	30
22	494	309	493	1,200	220	941	716	805	e133	e79	34	29
23	443	288	445	977	210	741	632	692	e128	e77	34	28
24	419	327	409	821	203	614	563	597	118	70	33	28
25	385	1,420	432	710	197	523	533	522	115	67	32	27
26	461	989	666	630	190	1,460	474	456	116	64	30	27
27	385	766	508	573	182	3,440	426	402	134	61	29	26
28	351	625	454	509	203	2,340	390	361	138	59	29	27
29	332	538	425	465	---	2,780	361	330	122	58	40	30
30	483	512	401	427	---	2,470	339	309	113	55	57	126
31	515	---	384	402	---	1,770	---	286	---	52	44	---
TOTAL	10,372	16,538	31,077	28,953	8,722	23,601	28,872	13,892	5,216	3,025	1,262	1,033
MEAN	335	551	1,002	934	312	761	962	448	174	97.6	40.7	34.4
MAX	950	1,490	5,230	6,410	542	3,440	1,910	968	299	250	57	126
MIN	89	262	352	302	182	146	339	223	113	52	29	26
AC-FT	20,570	32,800	61,640	57,430	17,300	46,810	57,270	27,550	10,350	6,000	2,500	2,050
CFSM	2.57	4.24	7.71	7.18	2.40	5.86	7.40	3.45	1.34	0.75	0.31	0.26
IN.	2.97	4.73	8.89	8.29	2.50	6.75	8.26	3.98	1.49	0.87	0.36	0.30

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 2005, BY WATER YEAR (WY)

MEAN	279	984	1,488	1,405	1,249	986	609	299	164	75.6	48.8	76.4
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)

12013500 WILLAPA RIVER NEAR WILLAPA, WA—Continued

SUMMARY STATISTICS	FOR 2004 CALENDAR YEAR		FOR 2005 WATER YEAR		WATER YEARS 1949 - 2005	
ANNUAL TOTAL	177,021		172,563			
ANNUAL MEAN	484		473		636	
HIGHEST ANNUAL MEAN					1,048	1999
LOWEST ANNUAL MEAN					294	1977
HIGHEST DAILY MEAN	5,330	Jan 30	6,410	Jan 18	12,800	Dec 20, 1994
LOWEST DAILY MEAN	24	Aug 18	26	Sep 27	14	Aug 20, 1967
ANNUAL SEVEN-DAY MINIMUM	26	Aug 14	27	Sep 22	16	Aug 24, 1967
ANNUAL RUNOFF (AC-FT)	351,100		342,300		460,600	
ANNUAL RUNOFF (CFSM)	3.72		3.64		4.89	
ANNUAL RUNOFF (INCHES)	50.66		49.38		66.45	
10 PERCENT EXCEEDS	1,070		1,000		1,620	
50 PERCENT EXCEEDS	324		299		298	
90 PERCENT EXCEEDS	50		37		36	

e Estimated