

12044900 ELWHA RIVER ABOVE LAKE MILLS, NEAR PORT ANGELES, WA

Puget Sound Basin
Dungeness-Elwha Subbasin

LOCATION.--Lat 47°58'13", long 123°35'22" referenced to North American Datum of 1927, in NE ¼ NE ¼ sec.32, T.29 N., R.7 W., Clallam County, WA, Hydrologic Unit 17110020, Olympic National Park, on right bank upstream from Cat Creek, 2.5 mi above Glines Canyon Dam, 12.5 mi southwest of Port Angeles, and at mile 16.0.

DRAINAGE AREA.--198 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD.--March 1994 to May 1998, February 2004 to Sept. 2011 (discharge discontinued).

REVISED RECORDS.--WDR-US-2006: 2004-05.

GAGE.--Water-stage recorder. Elevation of gage 580 ft NGVD of 1929 from topographic map. Prior to February 2004, gage on left bank 0.2 mi upstream, at different datum, 580.00 ft above NGVD of 1929.

REMARKS.--Records fair except estimated daily discharges, and discharges above 8,000 ft³/s, which are poor. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE FOR PERIOD OF RECORD.--10 years (water years 1995-97, 2005-11), 1,367 ft³/s, 93.83 in/yr, 990,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,600 ft³/s, Dec. 3, 2007, gage height, 22.14 ft; minimum discharge, 187 ft³/s, Sept. 25, 27, 28, 2005.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 10,000 ft³/s and (or) maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Dec 12	0645	*19,200	*18.01
No other peak greater than base discharge.			

Minimum discharge, 362 ft³/s, Oct. 21.

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DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	564	3,870	943	1,380	1,460	957	1,800	930	1,690	2,320	1,740	798
2	530	2,930	734	1,330	1,410	1,050	1,680	986	1,710	2,330	1,630	775
3	491	1,730	637	1,280	1,440	1,010	1,520	994	1,720	2,680	1,620	744
4	467	1,670	576	1,230	1,790	974	1,460	993	1,860	2,640	1,630	732
5	449	1,560	535	1,230	1,660	1,030	1,430	1,070	2,250	2,580	1,630	748
6	429	1,410	514	1,440	1,560	964	1,390	1,160	2,790	2,930	1,620	746
7	417	1,990	994	1,580	1,550	928	1,320	1,200	3,130	3,230	1,550	732
8	430	1,300	2,940	1,500	1,470	910	1,260	1,180	2,740	2,810	1,480	735
9	1,120	1,110	2,690	1,400	1,410	1,210	1,210	1,180	2,800	2,340	1,430	757
10	3,110	956	1,680	1,330	1,360	1,660	1,220	1,300	2,930	2,190	1,360	739
11	833	869	1,450	1,280	1,330	1,530	1,410	1,440	2,780	2,180	1,280	726
12	632	799	13,900	1,470	1,470	1,500	1,300	1,450	2,590	2,170	1,270	737
13	549	771	6,890	2,020	1,520	1,830	1,240	1,380	2,520	2,210	1,260	699
14	501	1,070	4,630	2,900	1,910	2,520	1,220	1,400	2,550	2,060	1,210	666
15	475	1,160	3,120	2,710	1,860	2,540	1,160	2,160	2,290	2,000	1,150	641
16	447	1,310	2,370	6,110	1,640	2,480	1,130	2,070	2,120	2,170	1,100	626
17	423	1,160	1,930	6,140	1,510	1,840	1,090	1,770	2,130	2,260	1,070	597
18	401	1,030	1,780	3,720	1,430	e1,600	1,050	1,660	2,380	2,030	1,060	638
19	389	869	1,650	2,680	1,360	e1,500	1,020	1,630	2,540	1,970	1,040	623
20	376	785	1,560	2,190	1,300	e1,400	985	1,670	2,580	1,940	1,000	585
21	369	712	1,500	2,320	1,240	e1,300	957	1,780	2,640	1,990	1,040	567
22	435	654	1,470	1,990	1,200	1,290	933	1,780	3,000	1,880	1,170	816
23	443	582	1,560	1,830	1,150	1,210	923	1,750	3,040	1,780	1,260	852
24	1,480	570	2,360	1,870	1,100	1,170	935	1,710	2,510	1,840	1,100	733
25	2,770	563	3,420	1,840	1,040	1,160	955	1,730	2,270	2,000	1,090	877
26	2,180	655	2,480	1,730	1,010	1,120	953	1,750	2,150	1,890	1,040	2,070
27	1,260	601	1,940	1,660	1,020	1,080	987	1,700	2,310	1,770	1,000	1,790
28	1,030	534	1,770	1,650	1,000	1,040	1,010	1,640	2,890	1,740	993	1,080
29	951	507	1,650	1,650	---	1,030	956	1,600	3,050	1,790	989	840
30	838	1,070	1,530	1,580	---	1,230	935	1,660	2,750	1,800	936	755
31	1,170	---	1,440	1,510	---	2,000	---	1,680	---	1,850	855	---
Total	25,959	34,797	72,643	64,550	39,200	43,063	35,439	46,403	74,710	67,370	38,603	24,424
Mean	837	1,160	2,343	2,082	1,400	1,389	1,181	1,497	2,490	2,173	1,245	814
Max	3,110	3,870	13,900	6,140	1,910	2,540	1,800	2,160	3,130	3,230	1,740	2,070
Min	369	507	514	1,230	1,000	910	923	930	1,690	1,740	855	567
Ac-ft	51,490	69,020	144,100	128,000	77,750	85,420	70,290	92,040	148,200	133,600	76,570	48,440
Cfsm	4.23	5.86	11.8	10.5	7.07	7.02	5.97	7.56	12.6	11.0	6.29	4.11
In.	4.88	6.54	13.65	12.13	7.36	8.09	6.66	8.72	14.04	12.66	7.25	4.59

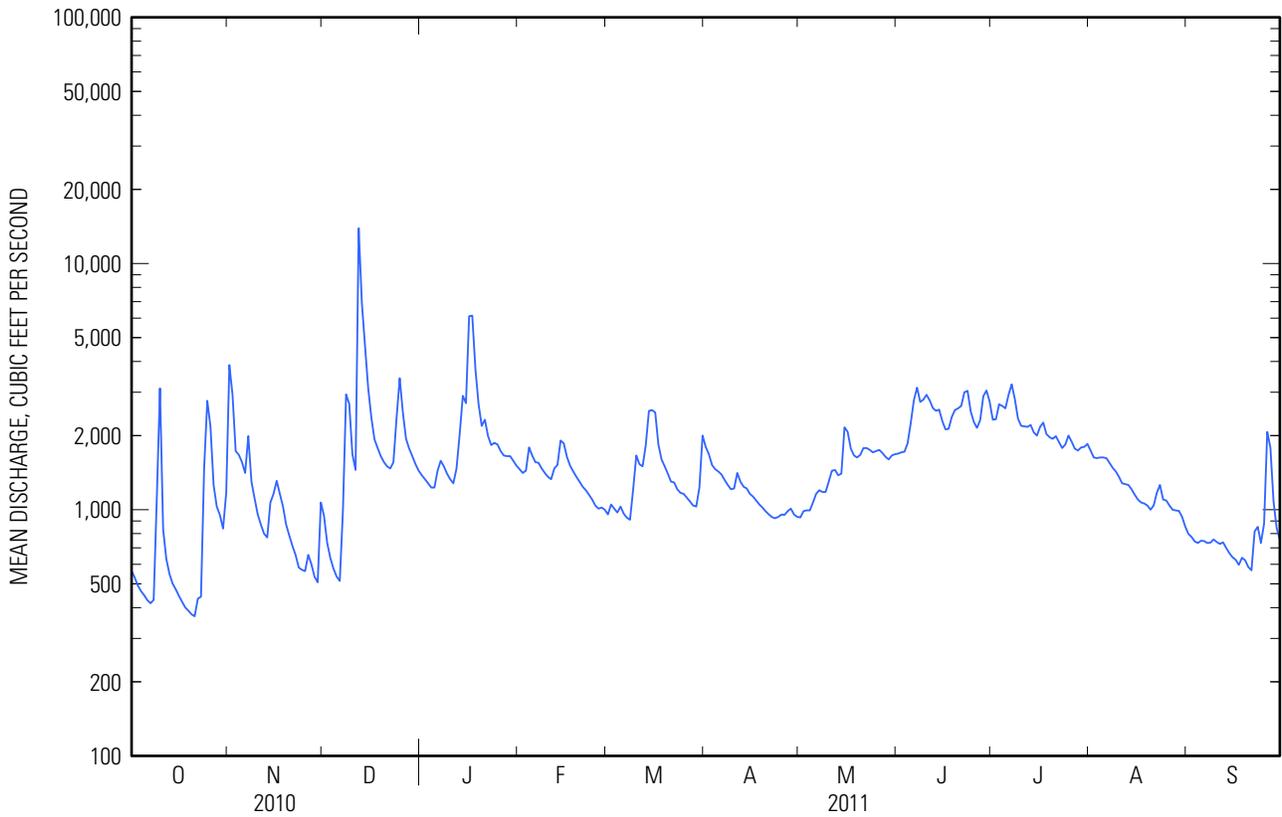
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1994 - 2011, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	749	1,725	1,951	2,157	1,400	1,208	1,081	1,711	1,791	1,238	599	458
Max	2,179	3,636	3,039	3,682	2,843	2,286	1,597	2,572	2,490	2,173	1,245	915
(WY)	(1998)	(1996)	(1996)	(2010)	(1995)	(1997)	(1997)	(1997)	(2011)	(2011)	(2011)	(1997)
Min	243	684	705	887	544	646	533	1,171	844	529	318	276
(WY)	(2007)	(1995)	(2009)	(2008)	(2008)	(2008)	(2008)	(1996)	(2005)	(2005)	(2005)	(2005)

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SUMMARY STATISTICS

	Calendar Year 2010		Water Year 2011		Water Years 1994 - 2011	
Annual total	534,035		567,161			
Annual mean	1,463		1,554		1,367	
Highest annual mean					1,610	1997
Lowest annual mean					947	2005
Highest daily mean	13,900	Dec 12	13,900	Dec 12	16,000	Dec 4, 2007
Lowest daily mean	369	Oct 21	369	Oct 21	204	Sep 28, 2005
Annual seven-day minimum	405	Oct 17	405	Oct 17	207	Sep 22, 2005
Annual runoff (ac-ft)	1,059,000		1,125,000		990,600	
Annual runoff (cfsm)	7.39		7.85		6.91	
Annual runoff (inches)	100.33		106.56		93.83	
10 percent exceeds	2,450		2,580		2,560	
50 percent exceeds	1,070		1,400		1,030	
90 percent exceeds	497		640		386	



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WATER-QUALITY RECORDS

PERIOD OF RECORD.--

CHEMICAL DATA: March and April 1994.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: April 1994 to May 1998, February 2004 to September 2005.

TURBIDITY: December 2003 to September 2005, June to September 2011.

SUSPENDED SEDIMENT DISCHARGE: March 1994 to December 1997.

INSTRUMENTATION.--Turbidity sensor since June 2011 with 15-minute logging interval.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE (April 1994 to May 1998, February 2004 to September 2005): Maximum 16.1 °C, Aug. 19, 2004; minimum, 0.0 °C, Jan. 30, 31, Dec. 26, 27, 29, 30, 1996, Jan. 11, 12, 1998.

TURBIDITY: Maximum, 1,040 FNU, Nov. 2, Dec. 10, and Sept. 29, 2004; minimum 0.0 FNU, July 21, 2004, Aug. 19-27, 30-31, and Sept. 6-29, 2005.

SUSPENDED SEDIMENT CONCENTRATION (March 1994 to December 1997): Maximum daily, 4,130 mg/L, Nov. 8, 1995; minimum, 1 mg/L on many days during each year.

SUSPENDED SEDIMENT DISCHARGE (April 1994 to September 1995): Maximum daily, 158,000 tons, Nov. 8, 1995; minimum daily, 0.56 tons, Oct. 13, 16, 1994 (estimated).

EXTREMES FOR CURRENT YEAR.--

TURBIDITY: Maximum, 700 FNU, Sept. 26, minimum, 0.9 FNU, Sept. 19-21.

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TURBIDITY, WATER, UNFILT, NEAR IR LED LIGHT, 780-900 NM, DETECT ANG. 90 DEG, FORMAZIN NEPHELOMETRIC UNITS
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Day	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median
	October			November			December			January		
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TURBIDITY, WATER, UNFILT, NEAR IR LED LIGHT, 780-900 NM, DETECT ANG. 90 DEG, FORMAZIN NEPHELOMETRIC UNITS
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Day	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median
	February			March			April			May		
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12044900 ELWHA RIVER ABOVE LAKE MILLS, NEAR PORT ANGELES, WA—Continued

TURBIDITY, WATER, UNFILT, NEAR IR LED LIGHT, 780-900 NM, DETECT ANG. 90 DEG, FORMAZIN NEPHELOMETRIC UNITS
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011

Day	Max	Min	Median	Max	Min	Median	Max	Min	Median	Max	Min	Median
	June			July			August			September		
1	---	---	---	18	13	15	6.6	4.7	5.2	2.4	1.5	1.7
2	---	---	---	18	12	13	5.3	4.2	4.6	3.3	1.4	1.5
3	---	---	---	21	16	18	4.8	3.9	4.3	2.2	1.3	1.4
4	---	---	---	21	15	17	5.1	3.8	4.3	1.9	1.2	1.3
5	---	---	---	23	14	17	5.2	3.8	4.4	2.5	1.1	1.3
6	---	---	---	37	19	22	5.9	3.8	4.5	2.2	1.1	1.2
7	---	---	---	41	28	32	5.0	3.8	4.2	4.6	1.1	1.2
8	---	---	---	31	18	23	4.8	3.5	3.9	1.8	1.1	1.2
9	---	---	---	20	13	15	4.1	3.4	3.6	3.0	1.1	1.3
10	---	---	---	13	11	12	3.8	3.2	3.4	1.6	1.1	1.2
11	---	---	---	12	9.3	10	3.7	3.2	3.4	1.9	1.0	1.2
12	---	---	---	15	8.8	9.8	3.9	2.9	3.2	2.2	1.1	1.2
13	---	---	---	16	8.5	9.8	3.6	2.7	2.9	2.2	1.1	1.2
14	---	---	---	10	7.4	8.4	3.1	2.5	2.7	3.4	1.1	1.2
15	17	13	14	8.9	7.1	7.7	3.2	2.4	2.5	3.3	1.0	1.2
16	14	11	12	13	7.6	8.5	2.7	2.2	2.4	1.5	1.0	1.1
17	13	10	11	14	8.2	9.9	3.0	2.1	2.2	2.2	1.0	1.2
18	17	12	14	8.9	7.0	7.8	2.5	1.8	2.0	9.5	1.1	1.5
19	20	14	17	9.0	6.5	7.2	4.2	1.7	1.9	3.3	0.9	1.1
20	20	15	17	8.2	6.2	6.7	2.9	1.7	1.9	2.5	0.9	1.0
21	25	16	18	7.7	6.2	6.8	2.6	1.6	1.9	1.2	0.9	1.0
22	45	23	25	7.2	5.7	6.3	7.3	2.0	2.6	19	1.0	4.1
23	45	23	32	6.5	5.4	5.7	9.3	2.7	4.2	6.2	2.5	2.9
24	26	16	19	8.0	4.9	5.8	3.1	2.0	2.4	3.0	1.7	2.2
25	18	13	15	9.1	6.1	7.1	2.7	1.9	2.1	15	1.6	3.5
26	14	12	13	7.4	5.3	6.1	3.0	1.8	1.9	700	4.3	15
27	18	12	13	5.9	5.0	5.3	2.2	1.6	1.8	330	21	51
28	31	18	23	6.2	4.6	5.0	2.2	1.6	1.8	22	6.6	11
29	33	24	27	6.2	4.6	5.3	2.1	1.6	1.8	7.7	4.0	5.1
30	28	17	21	6.3	4.6	5.5	2.9	1.5	1.8	4.2	2.9	3.4
31	---	---	---	12	5.0	6.0	2.2	1.6	1.8	---	---	---
Max	---	---	---	41	28	32	9.3	4.7	5.2	700	21	51
Min	---	---	---	5.9	4.6	5.0	2.1	1.5	1.8	1.2	0.9	1.0