



Figure 24. Location of surface-water stations in the Skagit River Basin.

SKAGIT RIVER BASIN

12175000 ROSS RESERVOIR NEAR NEWHALEM, WA
(International gaging station)

LOCATION.--Lat 48°43'58", long 121°04'02", in SE ¼ sec.35, T.38 N., R.13 E., Whatcom County, Hydrologic Unit 17110005, Ross Lake National Recreation Area, at Ross Dam on Skagit River, 1.0 mi downstream from Ruby Creek, 9.1 mi northeast of Newhalem, and at mile 105.2.

DRAINAGE AREA.--999 mi², of which 400 mi² is in Canada.

PERIOD OF RECORD.--March 1940 to current year (monthend elevations and contents only prior to October 1946). Prior to October 1945, published as "Ruby Reservoir near Newhalem."

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is City of Seattle Ross Dam datum; 1.79 ft above NGVD of 1929, U.S. Coast and Geodetic Survey datum; and 0.88 ft above NGVD of 1929, Geodetic Survey of Canada 1959 datum (by water level transfer of elevation from the international boundary). Prior to Sept. 24, 1940, nonrecording gage on west shore at site upstream from Ross Dam at same datum. June 29, 1943, to Apr. 29, 1948, nonrecording gage on right bank at site 500 ft upstream from dam at present datum.

REMARKS.--Reservoir is formed by concrete-arch dam completed to elevation 1,615 ft in 1949, storage began Mar. 11, 1940. Starting about July 1, 1967, taintor gates were extended to elevation 1,602.50 ft. Usable storage, 1,052,300 acre-ft between elevations 1,475 ft, lower limit of operation, and 1,602.5 ft, top of taintor gates. An additional 95,000 acre-ft of storage may be obtained during major floods by surcharge of the reservoir to a maximum elevation of 1,610.5 ft. Dead storage below elevation 1,250 ft, 1,175 acre-ft. Water used by City of Seattle for power development. Figures given herein represent total contents. U.S. Geological Survey satellite telemeter at station.

COOPERATION.--Capacity table furnished by City of Seattle. This station is maintained by the United States under agreement with Canada.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,443,460 acre-ft July 20, 1981, elevation, 1,603.23 ft; minimum contents observed since dam was completed in 1949, 51,760 acre-ft Apr. 5, 1952, elevation, 1,348.50 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,432,271 acre-feet June 24, elevation, 1,602.29 ft; minimum contents 669,000 acre-feet Mar. 8, elevation 1,523.70 ft.

CAPACITY TABLE
(Based on 25-foot contour intervals furnished by City of Seattle in 1943)

Elevation (feet)	Contents (acre-feet)	Elevation (feet)	Contents (acre-feet)	Elevation (feet)	Contents (acre-feet)
1,490	454,480	1,525	678,950	1,575	1,130,200
1,500	509,240	1,550	888,320	1,603	1,440,700

ELEVATION OF RESERVOIR WATER SURFACE ABOVE DATUM, FEET
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,589.77	1,597.73	1,587.61	1,579.64	1,557.44	1,526.29	1,528.83	1,549.41	1,585.87	1,602.10	1,602.07	1,600.02
2	1,589.48	1,597.70	1,587.46	1,579.23	1,556.69	1,525.49	1,528.99	1,551.39	1,586.57	1,602.05	1,602.05	1,599.91
3	1,589.21	1,597.61	1,587.67	1,578.59	1,555.71	1,524.95	1,529.11	1,553.25	1,587.35	1,602.00	1,601.98	1,599.71
4	1,588.80	1,597.49	1,587.63	1,578.38	1,554.87	1,524.62	1,529.56	1,554.98	1,588.46	1,602.07	1,601.86	1,599.65
5	1,588.63	1,597.29	1,587.55	1,577.57	1,553.79	1,524.42	1,529.92	1,556.60	1,589.88	1,601.95	1,601.77	1,599.59
6	1,588.29	1,597.17	1,587.27	1,577.15	1,552.78	1,524.06	1,530.46	1,557.89	1,591.21	1,602.02	1,601.77	1,599.40
7	1,588.10	1,597.20	1,587.24	1,576.23	1,551.74	1,523.85	1,531.08	1,559.00	1,592.22	1,602.01	1,601.66	1,599.22
8	1,587.85	1,596.89	1,587.06	1,575.24	1,550.84	1,523.77	1,531.76	1,560.02	1,593.11	1,601.92	1,601.63	1,599.02
9	1,587.63	1,596.57	1,586.89	1,574.12	1,549.63	1,523.93	1,532.31	1,561.33	1,594.25	1,601.95	1,601.37	1,598.74
10	1,587.25	1,596.16	1,586.58	1,573.10	1,548.56	1,524.27	1,532.89	1,562.27	1,595.57	1,601.80	1,600.98	1,598.75
11	1,586.89	1,595.77	1,586.20	1,572.05	1,547.36	1,524.52	1,533.90	1,563.16	1,596.64	1,601.96	1,600.62	1,599.49
12	1,586.71	1,595.22	1,586.02	1,570.99	1,546.21	1,524.73	1,534.86	1,564.03	1,597.48	1,601.89	1,600.47	1,599.63
13	1,586.47	1,594.47	1,585.75	1,569.94	1,545.00	1,524.91	1,536.37	1,564.84	1,598.36	1,601.91	1,600.49	1,599.59
14	1,586.10	1,593.64	1,585.52	1,569.09	1,543.95	1,525.10	1,537.84	1,565.49	1,599.08	1,602.01	1,600.48	1,599.48
15	1,585.96	1,592.83	1,584.99	1,568.53	1,542.72	1,525.04	1,538.91	1,566.36	1,599.72	1,602.09	1,600.55	1,599.66
16	1,586.66	1,592.06	1,584.80	1,567.96	1,541.49	1,525.01	1,539.89	1,567.18	1,600.08	1,602.14	1,600.57	1,600.15
17	1,590.24	1,591.45	1,584.52	1,567.26	1,540.43	1,525.19	1,540.61	1,568.15	1,600.36	1,602.13	1,600.58	1,600.69
18	1,591.89	1,591.98	1,584.38	1,566.67	1,539.18	1,525.38	1,541.06	1,569.29	1,600.65	1,602.05	1,600.49	1,600.65
19	1,592.85	1,593.50	1,583.96	1,566.03	1,537.95	1,525.53	1,541.53	1,570.73	1,600.90	1,601.97	1,600.27	1,600.77
20	1,597.02	1,593.55	1,583.74	1,565.48	1,536.71	1,525.59	1,541.90	1,572.26	1,601.03	1,602.07	1,600.11	1,600.67
21	1,601.38	1,593.19	1,583.53	1,564.77	1,535.53	1,525.79	1,542.14	1,573.86	1,601.46	1,602.01	1,599.99	1,600.52
22	1,600.12	1,592.76	1,583.21	1,564.07	1,534.49	1,525.85	1,542.44	1,575.42	1,602.09	1,601.96	1,600.13	1,600.55
23	1,599.28	1,592.08	1,582.92	1,563.34	1,533.17	1,526.12	1,542.79	1,576.79	1,602.25	1,601.96	1,600.05	1,600.41
24	1,598.69	1,591.46	1,582.66	1,562.56	1,531.91	1,526.53	1,543.09	1,577.89	1,602.12	1,601.96	1,599.94	1,600.24
25	1,597.97	1,590.90	1,582.34	1,561.73	1,530.60	1,526.95	1,543.67	1,578.91	1,602.06	1,602.07	1,600.32	1,600.10
26	1,597.21	1,590.27	1,581.97	1,560.88	1,529.63	1,527.27	1,544.11	1,580.01	1,602.12	1,601.97	1,600.45	1,599.88
27	1,596.60	1,589.50	1,581.61	1,560.25	1,528.52	1,527.37	1,545.23	1,581.28	1,601.97	1,601.97	1,600.47	1,599.69
28	1,597.07	1,589.16	1,581.22	1,559.46	1,527.46	1,527.56	1,546.14	1,582.45	1,601.90	1,601.97	1,600.32	1,599.54
29	1,597.54	1,588.78	1,580.81	1,558.89	1,526.96	1,527.66	1,547.13	1,583.49	1,601.99	1,602.06	1,600.50	1,599.36
30	1,597.73	1,588.24	1,580.29	1,558.57	---	1,527.93	1,548.07	1,584.46	1,602.07	1,602.09	1,600.40	1,599.06
31	1,597.75	---	1,580.00	1,558.10	---	1,528.39	---	1,585.35	---	1,602.14	1,600.01	---
MAX	1,601.38	1,597.73	1,587.67	1,579.64	1,557.44	1,528.39	1,548.07	1,585.35	1,602.25	1,602.14	1,602.07	1,600.77
MIN	1,585.96	1,588.24	1,580.00	1,558.10	1,526.96	1,523.77	1,528.83	1,549.41	1,585.87	1,601.80	1,599.94	1,598.74
†	1,379,175	1,272,144	1,182,800	962,600	694,157	705,402	871,132	1,240,445	1,429,633	1,430,476	1,405,417	1,394,396
‡	+88,020	-107,031	-89,344	-220,200	-268,443	+11,245	+165,730	+369,313	+189,188	+843	-25,059	-11,021

CAL YR 2003 MAX 1,602.38 MIN 1552.10 AC-FT‡ +20,100
WTR YR 2004 MAX 1,602.25 MIN 1523.77 AC-FT‡ +103,241

† Contents, in acre-feet, at 2400, on last day of month.

‡ Change in contents, in acre-feet.

12175500 THUNDER CREEK NEAR NEWHALEM, WA

LOCATION.--Lat 48°40'22", long 121°04'18", in SE¼ sec.23, T.37 N., R.13 E., (unsurveyed), Whatcom County, Hydrologic Unit 17110005, Ross Lake National Recreation Area, on right bank 0.4 mi upstream from high-water line of Diablo Reservoir, 9.0 mi east of Newhalem, and at mile 3.4.

DRAINAGE AREA.--105 mi².

PERIOD OF RECORD.--October 1930 to current year. Published as "above Colonial Creek, near Marblemount" 1930-31.

REVISED RECORDS.--WSP 1012: 1943. WSP 1286: 1931(M), 1932, 1933(M), 1935(M), 1938-39(M), 1941-42(M), 1944-46(M), 1950(M), 1952 (annual runoff in acre-ft). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,220 ft above NGVD of 1929, from river-profile map.

REMARKS.--Records good, except for discharges above 8,000 ft³/s and estimated discharges, which are poor. No regulation or diversion upstream from station. Large diurnal fluctuations caused by snowmelt during summer months. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--74 years (water years 1931-2004), 619 ft³/s, 80.09 in/yr, 448,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,800 ft³/s, Oct. 20, 2003, gage height, 15.90 ft, from rating curve extended above 3,500 ft³/s and slope-area measurement at gage height of 15.90 ft; minimum discharge not determined, probably less than 50 ft³/s during period of ice effect or no gage-height record in February 1936.

EXTREMES OUTSIDE PERIOD OF RECORD.--Records for floods, prior to establishment of station, are given in WSP 1527.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct 17	1215	8,440	11.43	Aug 25	1145	2,850	7.91
Oct 20	2045	*17,800	*15.90	Sep 11	0445	3,770	8.58
Aug 22	0730	2,640	7.74				

Minimum daily discharge, 80 ft³/s, Jan. 4-7.

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	595	e400	e240	e100	e300	e100	e260	722	671	1,520	1,060	1,030
2	555	e350	e230	e90	e280	e98	e240	695	633	1,330	991	875
3	512	e300	e300	e94	e260	e98	e240	700	787	1,190	1,020	612
4	513	e250	e260	e80	e250	e100	e270	702	1,180	1,100	981	534
5	574	e200	e270	e80	e240	e98	e280	708	1,550	1,170	1,030	525
6	560	e150	e300	e80	e210	e94	e280	710	1,260	1,330	900	431
7	985	e140	e270	e80	e190	e150	e300	692	943	1,230	908	417
8	575	e130	e240	e90	e180	e250	e290	696	840	854	811	438
9	462	e120	e210	e90	e170	e350	e280	680	1,080	708	928	759
10	353	e110	e200	e90	e160	e300	e300	647	1,440	671	1,070	533
11	282	e200	e190	e140	e150	e250	e350	600	1,110	698	1,120	1,950
12	387	e200	e180	e150	e140	e230	e400	564	810	746	1,290	902
13	480	e170	e160	e170	e140	e220	e450	529	895	1,140	1,370	689
14	288	e160	e150	e280	e140	e210	e380	494	858	1,290	1,420	969
15	236	e150	e150	e700	e150	e200	e320	503	657	1,450	1,450	1,170
16	1,570	e150	e150	e500	e150	e180	e290	497	639	1,510	1,470	1,220
17	6,620	e250	e180	e400	e150	e170	e280	572	839	1,390	1,430	1,160
18	2,610	e900	e180	e300	e150	e200	e270	707	1,040	1,400	1,340	795
19	1,520	e1,300	e170	e290	e160	e190	e260	776	973	1,430	1,350	610
20	8,180	e600	e190	e270	e150	e180	e270	799	1,050	1,210	1,300	474
21	9,030	e400	e200	e250	e140	e190	e260	814	1,320	996	1,230	416
22	e3,000	e350	e190	e230	e130	e210	e250	814	1,610	1,050	1,790	461
23	e2,500	e300	e180	e200	e130	e300	e300	816	1,840	1,170	1,130	694
24	e1,500	e250	e170	e210	e130	e300	e320	778	2,000	1,290	1,320	532
25	e1,000	e250	e170	e190	e120	e280	e310	779	2,040	1,360	2,420	546
26	e700	e220	e160	e170	e110	e270	e450	1,110	1,800	1,140	1,360	484
27	e600	e200	e150	e150	e110	e260	e720	1,330	1,460	1,090	890	475
28	e800	e220	e130	e120	e120	e240	e700	1,110	1,330	1,100	937	473
29	e560	e250	e120	e180	e120	e230	655	844	1,420	1,230	1,300	431
30	e500	e240	e110	e380	---	e280	655	823	1,620	1,270	1,050	373
31	e450	---	e100	e320	---	e270	---	809	---	1,190	970	---
TOTAL	48,497	8,910	5,900	6,474	4,830	6,498	10,630	23,020	35,695	36,253	37,636	20,978
MEAN	1,564	297	190	209	167	210	354	743	1,190	1,169	1,214	699
MAX	9,030	1,300	300	700	300	350	720	1,330	2,040	1,520	2,420	1,950
MIN	236	110	100	80	110	94	240	494	633	671	811	373
AC-FT	96,190	17,670	11,700	12,840	9,580	12,890	21,080	45,660	70,800	71,910	74,650	41,610
CFSM	14.9	2.83	1.81	1.99	1.59	2.00	3.37	7.07	11.3	11.1	11.6	6.66
IN.	17.18	3.16	2.09	2.29	1.71	2.30	3.77	8.16	12.65	12.84	13.33	7.43

SKAGIT RIVER BASIN

12175500 THUNDER CREEK NEAR NEWHALEM, WA—Continued

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2004, BY WATER YEAR (WY)												
MEAN	452	400	310	260	233	219	384	883	1,320	1,324	994	622
MAX	1,564	1,652	1,023	842	683	663	1,057	1,601	2,072	1,935	1,502	906
(WY)	(2004)	(1996)	(1981)	(1984)	(1991)	(1972)	(1934)	(1993)	(1948)	(1975)	(1999)	(1997)
MIN	192	110	95.2	78.4	57.3	91.1	172	432	837	784	704	367
(WY)	(2003)	(1936)	(1931)	(1979)	(1936)	(1956)	(1975)	(1977)	(1981)	(1993)	(1993)	(1985)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1931 - 2004	
ANNUAL TOTAL	269,471		245,321			
ANNUAL MEAN	738		670		619	
HIGHEST ANNUAL MEAN					863	
LOWEST ANNUAL MEAN					452	
HIGHEST DAILY MEAN	9,030	Oct 21	9,030	Oct 21	9,030	Oct 21, 2003
LOWEST DAILY MEAN	100	Jan 1	80	Jan 4	50	Feb 7, 1936
ANNUAL SEVEN-DAY MINIMUM	134	Dec 25	84	Jan 4	52	Feb 15, 1936
ANNUAL RUNOFF (AC-FT)	534,500		486,600		448,400	
ANNUAL RUNOFF (CFSM)	7.03		6.38		5.89	
ANNUAL RUNOFF (INCHES)	95.47		86.91		80.09	
10 PERCENT EXCEEDS	1,570		1,340		1,360	
50 PERCENT EXCEEDS	449		450		421	
90 PERCENT EXCEEDS	153		140		135	

e Estimated

12176500 DIABLO RESERVOIR NEAR NEHALEM, WA

LOCATION.--Lat 48°42'56", long 121°07'52", in SE $\frac{1}{4}$ sec.5, T.37 N., R.13 E. (unsurveyed), Whatcom County, Hydrologic Unit 17110005, Ross Lake National Recreation Area, at Diablo Dam on Skagit River, 1.2 mi downstream from Thunder Creek, 6.0 mi northeast of Newhalem, and at mile 101.0.

DRAINAGE AREA.--1,125 mi², includes 400 mi² in Canada.

PERIOD OF RECORD.--October 1929 to current year. October 1929 to September 1938, monthly change in reservoir contents published with records for Skagit River at Newhalem.

GAGE.--Water-stage recorder. Datum of gage is City of Seattle datum. Prior to Oct. 1, 1964, at datum 0.28 ft higher.

REMARKS.--Reservoir is formed by concrete-arch dam, completed in 1930; storage began in October 1929. Usable storage, 8,820 acre-ft between elevations 1,195 ft, normal lower limit of operation, and 1,205 ft, top of taintor gates. Dead storage, below elevation 1,040 ft, 12,900 acre-ft. Crest of spillway is at elevation 1,187 ft. Water used by City of Seattle for power development at Diablo and Gorge powerplants. Capacity table furnished by City of Seattle. Figures given herein represent total contents. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 90,600 acre-ft July 14, 1933, elevation, 1,206.5 ft; minimum contents not determined.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 89,330 acre-ft Oct 17, elevation, 1,205.40 ft; minimum contents, 83,494 acre-ft Jan. 5, elevation, 1,198.82 ft.

MONTH-END GAGE HEIGHT AND CONTENTS AT 2400
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
September 30	1,202.86	87,036	--
October 31	1,201.80	86,098	-938
November 30	1,203.17	87,312	+1,214
December 31	1,202.70	86,894	-418
Calender Year 2003	--	--	+779
January 31	1,202.73	86,920	+26
February 29	1,200.82	85,235	-1,685
March 31	1,203.12	87,268	+2,033
April 30	1,201.33	85,684	-1,584
May 31	1,199.60	84,168	-1,516
June 30	1,204.28	88,310	+4,142
July 31	1,202.13	86,388	-1,922
August 31	1,204.74	88,729	+2,341
September 30	1,201.90	86,186	-2,543
Water Year 2004	--	--	-850

12177700 GORGE RESERVOIR NEAR NEWHALEM, WA

LOCATION.--Lat 48°41'53", long 121°12'25", in NW ¼ sec.14, T.37 N., R.12 E., Whatcom County, Hydrologic Unit 17110005, Ross Lake National Recreation Area, at Gorge Dam on Skagit River, 2.4 mi upstream from Gorge powerplant at Newhalem, and at mile 96.6.

DRAINAGE AREA.--1,159 mi², includes 400 mi² in Canada.

PERIOD OF RECORD.--June 1960 to current year.

GAGE.--Water-stage recorder; prior to Apr. 1, 1962, reference point on Gorge Dam or water-stage indicator in powerhouse. Datum of gage is 0.00 ft City of Seattle Gorge High Dam datum, and 1.792 ft below NGVD of 1929 (Corps of Engineers' benchmark).

REMARKS.--Reservoir is formed by concrete-arch and gravity dam, completed Dec. 27, 1960; storage began June 27, 1960. Usable storage, 2,115 acre-ft between elevations 865 ft, normal lower limit of operation, and 875 ft, top of gates. Lowest outlet at elevation 760 ft. No dead storage. Crest of spillway is at elevation 825 ft. Water used by City of Seattle for power development at Gorge powerplant. Capacity table furnished by City of Seattle. Figures given herein represent total contents.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 9,761 acre-ft June 1, 1982, elevation, 880.01 ft; minimum observed contents since normal low operating level was reached in December 1960, 172 acre-ft Aug. 13, 1997, elevation, 781.75 ft (City of Seattle).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 8,710 acre-ft Oct. 17, elevation, 875.92 ft; minimum recorded contents, 1,554 acre-ft Nov. 3, elevation, 819.50 ft.

MONTH-END GAGE HEIGHT AND CONTENTS AT 2400
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Gage height (feet)	Contents (acre-feet)	Change in contents (acre-feet)
September 30	870.77	7,515	--
October 31	872.39	7,875	+360
November 30	856.95	5,151	-2,724
December 31	870.51	7,459	+2,308
Calender Year 2003	--	--	-361
January 31	873.21	8,063	+604
February 29	873.81	8,203	+140
March 31	873.51	8,133	-70
April 30	871.51	7,678	-455
May 31	872.51	7,902	+224
June 30	874.05	8,259	+357
July 31	871.50	7,676	-583
August 31	874.84	8,447	+771
September 30	871.24	7,618	-829
Water Year 2004	--	--	+103

12178000 SKAGIT RIVER AT NEWHALEM, WA

LOCATION.--Lat 48°40'19", long 121°14'48", in SW ¼ SE ¼ sec.21, T.37 N., R.12 E., Whatcom County, Hydrologic Unit 17110005, Ross Lake National Recreation Area, on right bank 0.4 mi upstream from Newhalem Creek, 0.5 mi downstream from City of Seattle powerplant at Newhalem, 10.8 mi upstream from Bacon Creek, and at mile 93.7.

DRAINAGE AREA.--1,175 mi², of which 400 mi² is in Canada.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1908 to May 1914, October 1920 to current year. June 1914 to September 1920 (monthly discharge only), in State Water-Supply Bulletin 6. Published as "near Marblemount" 1908-14, 1920-31.

REVISED RECORDS.--WSP 512: 1909-14. WSP 1012: 1929. WSP 1316: 1914(M). WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 401.5 ft above NGVD of 1929 (river-profile survey). Prior to May 24, 1914, nonrecording gages at site 0.5 mi upstream at datum 91 ft higher. Nov. 15, 1920, to June 4, 1923, nonrecording gage at site about 500 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Water is diverted 2.9 mi upstream from station and is returned to river at City of Seattle powerplant 0.5 mi upstream from station. Flow regulated by Gorge powerplant since August 1924 and by Ross Reservoir (station 12175000) since March 1940, Diablo Reservoir (station 12176500) since October 1929, and Gorge Reservoir (station 12177700) since June 1960, having a combined total capacity of 1,533,000 acre-ft. U.S. Geological Survey satellite telemeter at station. Chemical analyses October 1973 to September 1974.

AVERAGE DISCHARGE.--96 years (water years 1909-2004), 4,404 ft³/s, 3,191,000 acre-ft/yr, adjusted. 44 years (water years 1961-2004), 4,449 ft³/s, 3,223,000 acre-ft/yr, regulated.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 63,500 ft³/s Nov. 29, 1909, gage height, 22.0 ft from floodmark, site and datum then in use; minimum discharge, 54 ft³/s Nov. 1, 1943, gage height, 78.15 ft; minimum daily discharge, 136 ft³/s Aug. 24, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1815 reached a stage of approximately 20.5 ft, discharge about 115,000 ft³/s. Records for other floods, prior to establishment of station, are given in WSP 1527.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 36,800 ft³/s, Oct. 22, gage height, 91.40 ft; minimum discharge, 2,090 ft³/s, June 8; minimum gage height, 82.16 ft Oct. 14, 15, result of regulation; minimum daily discharge, 2,120 ft³/s, June 9.

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	3,350	5,260	7,670	3,670	6,380	3,550	2,780	2,700	2,300	6,230	2,470	3,920
2	2,730	4,940	4,910	3,950	6,740	4,760	2,780	2,520	2,200	6,620	3,280	3,640
3	3,110	3,430	3,820	4,010	7,250	3,220	3,010	2,490	2,270	5,140	3,210	3,830
4	2,850	2,740	4,020	3,970	6,910	3,010	2,780	2,520	2,340	4,530	3,280	3,340
5	2,580	2,540	3,680	3,960	7,080	2,880	2,800	2,580	3,830	4,530	3,260	2,320
6	3,060	2,460	4,550	3,860	7,140	2,890	3,080	2,480	2,200	4,620	3,090	2,940
7	3,560	3,090	4,090	6,740	7,060	2,800	3,080	2,460	3,010	5,010	3,260	3,210
8	3,390	3,330	4,320	7,040	6,830	2,950	3,080	2,310	2,130	4,610	2,290	3,180
9	3,450	3,350	3,960	7,160	6,860	2,950	3,080	2,160	2,120	4,380	3,300	3,130
10	3,440	4,550	4,360	7,380	7,110	2,900	3,070	2,150	2,130	3,100	4,770	3,050
11	3,400	4,770	4,130	7,120	7,170	2,890	2,870	2,270	2,160	2,760	4,930	4,160
12	3,510	5,710	4,230	7,140	7,080	2,780	3,030	2,210	2,210	3,390	3,710	3,450
13	3,600	7,080	4,100	7,250	6,880	2,770	2,910	2,240	2,240	3,030	3,600	3,500
14	3,140	7,130	4,310	7,080	6,900	2,780	2,890	2,240	2,260	2,900	3,590	3,890
15	3,240	7,310	4,300	7,270	7,020	2,770	3,110	2,260	2,260	3,670	2,640	4,010
16	5,540	7,790	4,210	7,270	7,200	2,760	3,060	2,220	2,870	3,350	3,280	3,230
17	13,400	7,540	3,930	7,080	7,290	2,880	3,140	2,360	3,940	4,420	3,340	4,090
18	5,820	7,930	3,800	6,490	6,800	2,810	3,130	2,410	5,900	4,590	3,790	4,140
19	3,800	8,600	3,980	6,390	6,910	2,820	3,120	2,430	5,700	4,290	4,290	4,170
20	14,100	7,960	3,450	4,850	6,910	2,850	3,080	2,440	5,650	3,730	3,910	4,100
21	25,200	7,810	3,490	6,390	7,150	2,830	2,920	2,590	5,210	3,840	3,970	3,820
22	32,700	7,750	3,740	5,850	6,290	2,810	2,940	2,370	3,670	3,520	3,390	3,640
23	22,800	7,720	3,920	6,300	6,830	2,790	2,950	2,450	8,670	3,740	3,860	3,600
24	14,600	7,420	3,790	6,090	6,760	2,760	2,850	2,440	10,700	3,430	3,960	3,650
25	12,700	7,220	3,920	6,150	6,700	2,870	2,810	2,440	10,700	3,050	3,800	3,530
26	11,900	7,260	3,920	6,220	6,360	2,880	2,820	2,450	8,820	3,460	3,830	3,520
27	9,190	6,870	3,900	5,700	6,350	2,880	2,830	2,510	7,650	3,070	3,700	3,420
28	4,870	7,230	3,930	5,890	5,740	2,870	2,840	2,460	6,740	3,190	3,450	3,460
29	3,950	7,880	3,930	6,070	4,010	2,910	2,830	2,430	5,660	3,140	2,530	3,470
30	3,220	7,810	3,950	6,840	---	2,950	2,820	2,400	5,330	2,960	3,540	3,650
31	3,680	---	4,010	6,390	---	2,880	---	2,390	---	2,970	3,820	---
TOTAL	235,880	182,480	128,320	187,570	195,710	91,450	88,490	74,380	132,870	121,270	109,140	107,060
MEAN	7,609	6,083	4,139	6,051	6,749	2,950	2,950	2,399	4,429	3,912	3,521	3,569
MAX	32,700	8,600	7,670	7,380	7,290	4,760	3,140	2,700	10,700	6,620	4,930	4,170
MIN	2,580	2,460	3,450	3,670	4,010	2,760	2,780	2,150	2,120	2,760	2,290	2,320
AC-FT	467,900	361,900	254,500	372,000	388,200	181,400	175,500	147,500	263,500	240,500	216,500	212,400
MEAN†	9,029	4,260	2,715	2,478	2,054	3,164	5,702	8,382	7,686	3,883	3,164	3,328
CFSM†	7.58	3.63	2.31	2.11	1.75	2.69	4.85	7.13	6.54	3.30	2.69	2.83
IN.†	8.86	4.04	2.66	2.43	1.89	3.11	5.41	8.23	7.30	3.81	3.11	3.16
AC-FT†	555,300	253,400	167,000	152,400	118,200	194,600	339,200	515,500	457,200	238,800	194,600	198,000
CAL YR 2003	TOTAL 1,650,370	MEAN 4,522	MAX 32,700	MIN 2,330	AC-FT 3,274,000	MEAN† 4,550	CFSM† 3.87	IN.† 52.58	AC-FT† 3,295,000			
WTR YR 2004	TOTAL 1,654,620	MEAN 4,521	MAX 32,700	MIN 2,120	AC-FT 3,282,000	MEAN† 4,663	CFSM† 3.97	IN.† 54.00	AC-FT† 3,384,000			

† Adjusted for change in contents in Ross, Diablo and Gorge Reservoirs.

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: January 1999 to current year.

INSTRUMENTATION.--Water-temperature sensor interfaced with a data collection platform for satellite telemetry.

REMARKS.--Records good Apr. 13 to Sept. 30; records fair Oct. 8 to 23; records poor Oct. 1 to 7, Oct. 24 to Jan. 12.

EXTREMES FOR PERIOD OF RECORD.--

WATER TEMPERATURE: Maximum, 12.0°C, July 29, Aug. 1, 4, 2003; minimum, 2.2°C, Feb. 21, 2002.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum recorded, 11.4°C, Oct. 24; minimum recorded, 3.8°C, Jan. 5-7.

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	10.5	10.0	10.2	9.2	8.6	8.9	7.7	6.8	7.2	5.8	5.3	5.5
2	10.5	10.0	10.2	9.3	8.7	9.0	7.6	7.0	7.3	5.7	5.1	5.4
3	10.5	10.0	10.2	9.1	8.7	8.9	7.3	6.5	7.0	5.5	4.7	5.2
4	10.3	9.9	10.1	8.9	8.3	8.6	6.9	6.4	6.7	4.9	4.0	4.4
5	10.4	9.9	10.1	8.5	8.0	8.2	7.2	6.7	6.9	4.2	3.8	4.0
6	10.4	10.1	10.2	8.2	7.8	8.0	7.1	6.6	6.9	4.3	3.8	4.1
7	10.4	10.1	10.3	8.2	7.8	8.0	6.9	6.4	6.7	5.1	3.8	4.5
8	10.4	10.0	10.2	8.3	7.9	8.1	6.9	6.4	6.6	5.2	4.3	4.8
9	10.2	9.9	10.0	8.4	8.0	8.2	6.8	6.3	6.5	5.3	4.4	4.9
10	10.1	9.8	9.9	8.7	8.1	8.3	6.8	6.3	6.5	5.4	4.6	5.0
11	10.1	9.8	9.9	8.7	8.0	8.3	6.9	6.4	6.6	5.6	4.7	5.1
12	10.0	9.5	9.8	8.9	8.3	8.6	6.9	6.3	6.6	5.6	4.8	5.2
13	9.8	9.4	9.6	9.0	8.4	8.7	6.7	6.2	6.5	---	---	---
14	9.8	9.4	9.6	9.1	8.5	8.8	6.7	6.2	6.5	---	---	---
15	9.9	9.6	9.7	9.4	8.7	9.1	6.6	6.0	6.3	---	---	---
16	9.8	8.9	9.5	9.3	8.5	8.9	6.6	6.1	6.3	---	---	---
17	10.0	8.5	9.3	9.0	8.2	8.6	6.5	6.0	6.2	---	---	---
18	9.9	9.1	9.4	8.7	7.2	7.9	6.5	6.0	6.2	---	---	---
19	9.3	8.8	9.1	7.6	5.2	6.6	6.4	5.9	6.2	---	---	---
20	10.3	8.7	9.2	8.0	7.1	7.5	6.5	6.0	6.2	---	---	---
21	10.3	9.2	9.6	8.0	7.2	7.6	6.5	6.1	6.3	---	---	---
22	10.9	9.2	10.3	7.6	7.0	7.3	6.6	6.0	6.3	---	---	---
23	11.3	10.4	10.8	7.9	7.1	7.5	6.5	6.0	6.3	---	---	---
24	11.4	10.4	11.0	7.9	7.2	7.5	6.6	6.1	6.3	---	---	---
25	10.9	10.2	10.5	7.7	6.9	7.3	6.6	6.1	6.3	---	---	---
26	10.8	10.2	10.5	7.6	7.0	7.3	6.6	5.9	6.3	---	---	---
27	10.8	10.2	10.4	7.8	7.0	7.4	6.3	5.6	6.0	---	---	---
28	10.6	10.1	10.4	7.8	6.9	7.4	6.0	5.4	5.7	---	---	---
29	10.3	9.6	9.9	7.5	6.8	7.2	5.8	5.3	5.5	---	---	---
30	9.7	9.2	9.5	7.5	6.8	7.2	5.8	5.3	5.5	---	---	---
31	9.4	8.8	9.0	---	---	---	5.8	5.3	5.5	---	---	---
MONTH	11.4	8.5	9.9	9.4	5.2	8.0	7.7	5.3	6.4	---	---	---

12178000 SKAGIT RIVER AT NEWHALEM, WA—Continued

TEMPERATURE, WATER, DEGREES CELSIUS—CONTINUED
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	---	---	---	---	---	---	7.2	6.5	6.8
2	---	---	---	---	---	---	---	---	---	7.0	6.6	6.8
3	---	---	---	---	---	---	---	---	---	7.0	6.6	6.8
4	---	---	---	---	---	---	---	---	---	6.8	6.6	6.7
5	---	---	---	---	---	---	---	---	---	7.1	6.7	6.8
6	---	---	---	---	---	---	---	---	---	7.3	6.7	6.9
7	---	---	---	---	---	---	---	---	---	7.2	6.7	6.9
8	---	---	---	---	---	---	---	---	---	7.2	6.8	6.9
9	---	---	---	---	---	---	---	---	---	7.3	6.9	7.1
10	---	---	---	---	---	---	---	---	---	7.3	7.1	7.2
11	---	---	---	---	---	---	---	---	---	7.4	6.9	7.1
12	---	---	---	---	---	---	---	---	---	7.6	6.9	7.1
13	---	---	---	---	---	---	5.9	5.6	5.7	7.9	6.9	7.3
14	---	---	---	---	---	---	5.8	5.6	5.7	7.9	7.1	7.4
15	---	---	---	---	---	---	5.9	5.6	5.7	8.0	7.3	7.6
16	---	---	---	---	---	---	6.0	5.7	5.8	7.9	7.4	7.6
17	---	---	---	---	---	---	6.1	5.8	5.9	8.4	7.6	7.8
18	---	---	---	---	---	---	6.3	5.8	6.0	8.2	7.5	7.8
19	---	---	---	---	---	---	6.4	5.9	6.1	8.2	7.5	7.8
20	---	---	---	---	---	---	6.3	5.9	6.1	8.4	7.8	8.0
21	---	---	---	---	---	---	6.4	5.9	6.0	8.1	7.9	8.1
22	---	---	---	---	---	---	6.6	6.0	6.2	8.1	7.6	7.8
23	---	---	---	---	---	---	6.4	6.0	6.2	8.3	7.6	7.9
24	---	---	---	---	---	---	6.2	6.0	6.1	8.3	7.6	7.9
25	---	---	---	---	---	---	6.7	6.1	6.4	8.2	7.8	8.0
26	---	---	---	---	---	---	7.0	6.3	6.6	8.1	7.8	8.0
27	---	---	---	---	---	---	6.7	6.4	6.5	8.0	7.8	7.9
28	---	---	---	---	---	---	6.6	6.1	6.4	8.1	7.7	7.8
29	---	---	---	---	---	---	7.0	6.3	6.6	8.2	7.7	7.9
30	---	---	---	---	---	---	7.1	6.4	6.7	8.1	7.8	7.9
31	---	---	---	---	---	---	---	---	---	8.2	7.8	8.0
MONTH	---	---	---	---	---	---	---	---	---	8.4	6.5	7.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	8.4	7.8	8.1	9.2	8.7	8.9	11.3	10.6	10.9	10.6	10.2	10.5
2	8.7	7.9	8.3	9.2	8.7	8.9	11.1	10.7	10.9	10.2	9.9	10.1
3	9.1	8.1	8.6	9.2	8.8	9.0	11.1	10.8	11.0	10.2	9.9	10.0
4	9.1	8.2	8.6	9.3	8.8	9.0	11.2	10.8	11.0	10.1	9.8	10
5	8.9	8.5	8.7	9.4	8.9	9.2	11.1	10.8	10.9	10.2	9.9	9.9
6	8.6	8.2	8.4	9.4	9.0	9.2	11.0	10.4	10.8	10.3	9.8	10.1
7	8.6	8.2	8.4	9.3	8.8	9.0	10.6	10.4	10.5	10.3	9.8	10.0
8	9.0	8.3	8.6	9.1	8.8	9.0	11.2	10.5	10.8	10.2	9.8	10.0
9	8.9	8.4	8.6	9.3	8.9	9.1	10.9	10.4	10.7	10.2	9.8	10
10	9.0	8.7	8.9	9.3	9.0	9.2	10.8	10.2	10.6	10.2	9.8	10.0
11	8.8	8.4	8.6	9.4	9.0	9.2	10.8	10.2	10.5	10.3	9.8	10.1
12	8.6	8.4	8.4	9.6	9.1	9.3	10.6	10.1	10.4	10.3	10.0	10.2
13	8.8	8.4	8.5	9.5	9.0	9.3	10.6	10.0	10.3	10.2	9.8	10.0
14	8.9	8.4	8.6	9.7	9.0	9.2	10.8	10.2	10.5	10.0	9.8	9.8
15	9.1	8.4	8.6	9.6	9.0	9.3	10.7	10.3	10.5	9.9	9.6	9.7
16	9.4	8.5	9.0	9.8	9.5	9.6	11.0	10.4	10.7	9.6	9.5	9.6
17	9.6	8.8	9.2	10.0	9.4	9.7	11.0	10.7	10.9	9.6	9.3	9.5
18	9.3	8.7	9.0	9.9	9.5	9.7	11.2	10.7	10.9	9.5	9.3	9.4
19	8.9	8.4	8.7	9.9	9.5	9.7	11.3	10.9	11.1	9.6	9.3	9.4
20	8.8	8.3	8.6	9.9	9.6	9.7	11.3	11.0	11.2	9.6	9.3	9.4
21	8.8	8.3	8.6	10.0	9.4	9.7	11.2	10.8	11.0	9.6	9.3	9.4
22	9.3	8.5	8.7	10.2	9.8	10	11.0	10.7	10.9	9.6	9.3	9.5
23	9.3	8.8	9.0	10.2	9.7	10.0	11.0	10.7	10.8	9.7	9.4	9.5
24	9.7	8.7	9.2	10.3	9.7	10	10.9	10.6	10.8	9.8	9.4	9.6
25	9.6	8.7	9.1	10.2	9.9	10.0	10.8	10.5	10.7	9.7	9.4	9.5
26	9.5	8.4	8.9	10.5	10.0	10.2	10.7	10.4	10.5	9.8	9.3	9.6
27	9.4	8.7	9.1	10.7	10.0	10.3	10.6	10.4	10.5	9.8	9.5	9.6
28	9.3	8.5	8.9	10.6	10.0	10.3	10.6	10.5	10.5	9.8	9.4	9.6
29	9.0	8.4	8.7	10.6	10.3	10.4	10.8	10.5	10.6	9.9	9.4	9.6
30	9.0	8.6	8.8	10.8	10.4	10.6	10.9	10.5	10.7	9.9	9.5	9.7
31	---	---	---	11.0	10.5	10.8	10.8	10.4	10.6	---	---	---
MONTH	9.7	7.8	8.7	11.0	8.7	9.6	11.3	10.0	10.7	10.6	9.3	9.8

12178100 NEWHALEM CREEK NEAR NEWHALEM, WA

LOCATION.--Lat 48°39'22", long 121°14'14", in SE ¼ SE ¼ sec.28, T.37 N., R.12 E., Whatcom County, Hydrologic Unit 17110005, North Cascades National Park, on left bank 1.2 mi south of Newhalem, 1.5 mi downstream from East Fork, and at mile 1.5.

DRAINAGE AREA.--27.9 mi².

PERIOD OF RECORD.--January 1961 to current year.

REVISED RECORDS.--WDR WA-84-1: 1983.

GAGE.--Water-stage recorder. Elevation of gage is 1,080 ft above NGVD of 1929, by barometer. Prior to October 1981, at datum 0.96 ft lower.

REMARKS.--Records good, except for estimated daily discharges, which are fair. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--43 years (water years 1961-2004), 175 ft³/s, 85.34 in/yr, 126,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,430 ft³/s Dec. 26, 1980, gage height, 9.14 ft present datum, from floodmarks, from rating curve extended above 5,570 ft³/s on basis of slope-area measurement of peak flow; minimum discharge, 20 ft³/s Feb. 1, 1963, gage height, 1.07 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 750 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct 17	0645	2,610	6.26	Nov 19	0215	1,980	5.65
Oct 20	1715	*4,100	*7.39	Sep 11	0330	958	4.28
Oct 28	1430	805	4.00				

Minimum discharge, 34 ft³/s, Oct. 5, 6, gage height, 1.20 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	39	130	e160	61	158	53	138	359	238	250	e80	186
2	38	114	157	57	136	50	123	399	231	232	e80	287
3	37	102	216	e60	125	49	123	326	297	205	e80	176
4	36	90	169	e50	118	50	150	357	413	192	e70	133
5	35	80	174	e50	110	49	156	322	447	197	e70	119
6	35	71	213	e50	98	46	155	233	415	217	78	98
7	175	64	175	e50	90	77	174	215	287	206	86	86
8	111	59	148	e60	84	201	169	246	290	154	68	79
9	165	56	133	e60	78	315	164	240	371	130	62	136
10	122	54	125	e60	72	246	174	212	403	131	61	101
11	96	112	117	102	68	184	216	195	293	144	60	379
12	233	112	108	104	66	162	268	180	217	132	59	204
13	284	89	101	125	65	141	322	183	298	146	58	216
14	148	82	94	213	66	129	259	192	282	161	57	330
15	112	77	87	505	68	119	208	210	215	180	57	429
16	1,010	78	86	325	69	108	175	228	224	168	56	450
17	1,940	176	110	216	69	106	154	256	291	155	55	546
18	559	845	109	183	70	134	138	326	313	149	52	378
19	433	1,030	103	174	71	129	125	354	284	149	51	274
20	2,060	361	118	154	68	112	127	373	308	130	50	211
21	1,630	239	131	135	64	117	118	380	368	108	63	170
22	567	187	125	124	60	150	113	382	413	106	168	149
23	503	167	117	120	59	208	131	306	430	108	80	186
24	311	146	108	124	59	204	136	281	426	107	161	137
25	237	e130	109	113	58	179	129	264	385	105	494	115
26	207	e130	103	104	55	162	205	410	326	93	289	103
27	176	e130	92	92	54	154	289	432	264	e85	168	92
28	393	e150	85	88	55	141	219	380	251	e85	180	84
29	242	e200	77	137	55	139	189	286	260	e85	e200	79
30	177	e180	70	311	---	169	235	333	265	e85	e150	74
31	147	---	65	200	---	164	---	302	---	e85	e130	---
TOTAL	12,258	5,441	3,785	4,207	2,268	4,247	5,282	9,162	9,505	4,480	3,373	6,007
MEAN	395	181	122	136	78.2	137	176	296	317	145	109	200
MAX	2,060	1,030	216	505	158	315	322	432	447	250	494	546
MIN	35	54	65	50	54	46	113	180	215	85	50	74
AC-FT	24,310	10,790	7,510	8,340	4,500	8,420	10,480	18,170	18,850	8,890	6,690	11,910
CFSM	14.2	6.50	4.38	4.86	2.80	4.91	6.31	10.6	11.4	5.18	3.90	7.18
IN.	16.34	7.25	5.05	5.61	3.02	5.66	7.04	12.22	12.67	5.97	4.50	8.01

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2004, BY WATER YEAR (WY)

MEAN	129	184	161	137	122	111	151	280	362	260	121	89.8
MAX	395	589	552	340	313	290	267	448	594	476	277	200
(WY)	(2004)	(1996)	(1981)	(1984)	(1991)	(1972)	(1989)	(1972)	(1974)	(1972)	(1999)	(2004)
MIN	28.2	43.4	44.7	29.2	39.9	48.7	68.7	145	211	110	53.6	32.2
(WY)	(1988)	(1980)	(1979)	(1979)	(1969)	(1962)	(1975)	(1977)	(1992)	(1977)	(1998)	(1998)

12178100 NEWHALEM CREEK NEAR NEWHALEM, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1961 - 2004	
ANNUAL TOTAL	66,441		70,015			
ANNUAL MEAN	182		191		175	
HIGHEST ANNUAL MEAN					244	
LOWEST ANNUAL MEAN					114	
HIGHEST DAILY MEAN	2,060	Oct 20	2,060	Oct 20	5,300	Dec 26, 1980
LOWEST DAILY MEAN	34	Sep 15	35	Oct 5	20	Feb 1, 1963
ANNUAL SEVEN-DAY MINIMUM	37	Sep 30	50	Feb 29	22	Jan 13, 1993
ANNUAL RUNOFF (AC-FT)	131,800		138,900		126,900	
ANNUAL RUNOFF (CFSM)	6.52		6.86		6.28	
ANNUAL RUNOFF (INCHES)	88.59		93.35		85.34	
10 PERCENT EXCEEDS	330		360		369	
50 PERCENT EXCEEDS	131		142		119	
90 PERCENT EXCEEDS	43		60		50	

e Estimated

12179900 BACON CREEK BELOW OAKES CREEK, NEAR MARBLEMOUNT, WA

LOCATION.--Lat 48°36'17", long 121°23'54", in SE ¼ sec.17, T.36 N., R.11 E., Skagit County, Hydrologic Unit 17110005, Mt. Baker Snoqualmie National Forest, on left bank 1.25 mi downstream from Oakes Creek, 5.5 mi northeast of Marblemount, and at mile 1.5.

DRAINAGE AREA.--49.7 mi².

PERIOD OF RECORD.--August 1943 to September 1950, October 1998 to current year. Published as Bacon Creek near Marblemount (station 12180000) 1942-50. Prior to Oct. 1, 1950, at site 1.4 mi downstream at different datum.

GAGE.--Water-stage recorder. Elevation of gage is 410 ft above NGVD of 1929, from topographic map.

REMARKS.--Records fair, except those above 1,000 ft³/s, which are poor. No regulation or diversion upstream from station. Summer flows augmented by glacial melt. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--13 years (water years 1944-50, 1999-2004), 430 ft³/s, 117.43 in/yr, 311,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,100 ft³/s Nov. 26, 1949, gage height, 7.13 ft at site and datum then in use, on basis of outside high-water mark on pier and by a slope-area determination; minimum discharge, 64 ft³/s Nov. 4, 5, 2002.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct 16	1945	unknown	16.32	Nov 19	0200	2,680	7.57
Oct 20	----	unknown	(a)19.97				

Minimum discharge, 90 ft³/s, Oct. 6.

(a) From outside highwater mark probably caused by debris torrent.

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	106	323	404	214	495	231	365	660	513	430	213	347
2	102	294	430	205	423	231	335	663	507	413	206	498
3	98	268	590	234	378	231	350	575	573	378	199	367
4	94	248	473	221	358	221	421	596	669	358	191	297
5	93	232	509	213	324	212	423	579	732	354	186	293
6	92	219	597	212	312	208	411	479	816	379	187	258
7	187	209	491	241	304	285	455	451	590	391	205	231
8	177	202	421	299	287	502	429	472	558	330	188	215
9	275	194	368	308	271	667	426	469	618	285	181	405
10	258	209	334	381	259	547	452	437	660	276	182	343
11	220	269	307	385	255	450	527	410	584	308	183	e800
12	681	242	303	381	253	414	596	422	481	284	186	e500
13	700	226	298	473	250	369	639	430	702	292	193	e450
14	360	218	299	909	253	351	537	436	654	305	196	e500
15	286	225	288	e1,500	257	329	460	456	515	332	200	e550
16	e5,000	270	344	e800	263	310	404	458	500	323	201	e550
17	e12,000	432	375	e600	e260	316	367	482	558	315	201	e700
18	e4,600	1,080	329	e500	e260	391	338	571	576	315	194	e600
19	e4,000	1,580	317	e450	e270	377	317	601	542	330	191	e500
20	e12,500	791	353	e400	e260	338	334	604	545	300	189	e400
21	e11,000	586	373	394	e250	342	318	616	581	265	226	e300
22	e2,000	480	338	355	e240	428	316	667	618	256	363	e250
23	e1,400	422	311	341	e240	504	381	564	634	261	255	e280
24	e1,000	389	319	347	266	499	388	532	629	264	370	e250
25	e900	358	325	315	259	457	357	522	590	263	869	e240
26	e600	335	297	300	249	427	500	661	536	248	564	e230
27	e400	313	279	291	244	417	587	681	466	232	387	e220
28	e1,000	482	266	338	242	394	462	686	442	226	406	e210
29	e600	612	244	458	238	396	424	565	443	227	478	e200
30	415	478	231	890	---	452	510	671	448	227	339	e190
31	363	---	225	615	---	422	---	614	---	222	283	---
TOTAL	61,507	12,186	11,038	13,570	8,220	11,718	12,829	17,030	17,280	9,389	8,412	11,174
MEAN	1,984	406	356	438	283	378	428	549	576	303	271	372
MAX	12,500	1,580	597	1,500	495	667	639	686	816	430	869	800
MIN	92	194	225	205	238	208	316	410	442	222	181	190
AC-FT	122,000	24,170	21,890	26,920	16,300	23,240	25,450	33,780	34,270	18,620	16,690	22,160
CFSM	39.9	8.17	7.16	8.81	5.70	7.61	8.60	11.1	11.6	6.09	5.46	7.49
IN.	46.04	9.12	8.26	10.16	6.15	8.77	9.60	12.75	12.93	7.03	6.30	8.36

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2004, BY WATER YEAR (WY)

MEAN	446	421	359	350	286	308	401	685	790	538	307	243
MAX	1,984	954	511	619	432	511	604	1,030	1,267	917	644	372
(WY)	(2004)	(1950)	(1950)	(2002)	(1947)	(2003)	(2002)	(1949)	(1950)	(1950)	(1999)	(2004)
MIN	94.3	166	172	113	160	177	260	527	518	233	150	132
(WY)	(2003)	(2001)	(1949)	(1949)	(2001)	(1948)	(1945)	(1944)	(2001)	(1944)	(1944)	(2003)

12179900 BACON CREEK BELOW OAKES CREEK, NEAR MARBLEMOUNT, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1943 - 2004	
ANNUAL TOTAL	192,949		194,353			
ANNUAL MEAN	529		531		430	
HIGHEST ANNUAL MEAN					578	
LOWEST ANNUAL MEAN					290	
HIGHEST DAILY MEAN	12,500	Oct 20	12,500	Oct 20	12,500	Oct 20, 2003
LOWEST DAILY MEAN	92	Oct 6	92	Oct 6	65	Nov 4, 2002
ANNUAL SEVEN-DAY MINIMUM	99	Sep 30	110	Oct 1	67	Oct 30, 2002
ANNUAL RUNOFF (AC-FT)	382,700		385,500		311,200	
ANNUAL RUNOFF (CFSM)	10.6		10.7		8.64	
ANNUAL RUNOFF (INCHES)	144.42		145.47		117.43	
10 PERCENT EXCEEDS	784		656		803	
50 PERCENT EXCEEDS	333		363		320	
90 PERCENT EXCEEDS	132		211		140	

e Estimated

12181000 SKAGIT RIVER AT MARBLEMOUNT, WA

LOCATION.--Lat 48°32'02", long 121°25'43", in NE ¼ SW ¼ sec.7, T.35 N., R.11 E., Skagit County, Hydrologic Unit 17110005, on right bank 0.5 mi north of Marblemount, 0.6 mi upstream from Cascade River, and at mile 78.7.

DRAINAGE AREA.--1,381 mi², of which 400 mi² is in Canada.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1943 to July 1944, October 1946 to September 1951, May 1976 to current year.

REVISED RECORDS.--WDR WA-76-1: Drainage area. WDR WA-90-1: 1983, 1976-87 (M).

GAGE.--Water-stage recorder. Datum of gage is 305.1 ft above NGVD of 1929 (river-profile survey).

REMARKS.--Records good. All diversions returned to river upstream from gage. Flow regulated by Ross Reservoir (station 12175000), Diablo Reservoir (station 12176500), and Gorge Reservoir (station 12177700) since 1960. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--33 years (water years 1947-51, 1977-2004), 6,058 ft³/s, 4,389,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 64,800 ft³/s Oct. 20, 2003, gage height, 14.11 ft, from rating curve extended above 30,000 ft³/s; minimum discharge, 620 ft³/s Mar. 6, 1944, gage height, 0.55 ft; minimum daily discharge, 1,190 ft³/s Feb. 25, 1944.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 64,800 ft³/s, Oct. 20, gage height, 14.11 ft; minimum discharge, 2,830 ft³/s, Oct. 4, 6, gage height, 2.82 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	3,830	7,180	10,100	4,790	9,170	4,650	4,510	6,020	4,700	8,490	3,500	5,520
2	3,180	6,800	7,240	5,030	8,890	5,780	4,340	6,170	4,440	8,970	4,340	6,050
3	3,510	4,970	6,850	5,060	9,360	4,270	4,630	5,560	4,950	7,380	4,240	5,620
4	3,240	4,010	6,400	5,000	8,900	3,990	4,650	5,640	5,660	6,530	4,310	4,880
5	2,980	3,670	6,100	4,970	8,940	3,800	4,700	5,650	7,680	6,420	4,310	3,630
6	3,440	3,510	7,430	4,840	8,930	3,820	4,970	4,810	6,470	6,580	4,090	4,070
7	4,460	4,160	6,560	7,760	8,850	4,070	5,190	4,590	5,950	7,090	4,410	4,260
8	4,200	4,460	6,390	8,490	8,510	5,340	5,080	4,570	4,850	6,410	3,190	4,250
9	4,650	4,420	5,840	8,620	8,330	6,190	5,050	4,380	5,250	5,970	4,090	4,840
10	4,470	5,730	6,020	9,080	8,640	5,600	5,150	4,180	5,500	4,630	5,610	4,430
11	4,260	6,710	5,800	8,850	8,710	5,030	5,320	4,170	5,070	4,320	5,950	10,300
12	5,780	7,150	5,820	8,850	8,580	4,700	5,880	4,110	4,370	4,800	4,760	6,420
13	6,540	8,690	5,660	9,250	8,410	4,490	6,120	4,140	5,400	4,520	4,550	5,890
14	4,600	8,640	5,860	10,400	8,310	4,400	5,540	4,200	5,360	4,400	4,540	7,240
15	4,310	8,860	5,790	13,300	8,500	4,300	5,350	4,320	4,560	5,290	3,550	7,880
16	16,800	9,530	5,870	11,400	8,610	4,190	4,990	4,290	5,110	4,940	4,120	7,270
17	39,600	10,100	5,720	10,200	8,780	4,340	4,930	4,560	6,530	5,980	4,260	10,100
18	12,600	15,000	5,410	9,120	8,380	4,610	4,790	5,200	8,930	6,220	4,540	8,230
19	9,620	19,300	5,510	8,830	8,420	4,610	4,670	5,430	8,540	6,130	5,350	7,180
20	32,100	12,600	5,080	7,080	8,360	4,470	4,710	5,530	8,500	5,260	4,900	6,410
21	42,700	11,200	5,290	8,350	8,620	4,420	4,400	5,790	8,260	5,190	5,000	5,870
22	35,800	10,400	5,330	7,760	7,780	4,720	4,400	5,800	7,010	4,890	5,210	5,410
23	27,200	10,100	5,400	8,160	8,020	5,140	4,640	5,250	11,800	5,100	5,090	5,450
24	17,700	9,670	5,340	8,010	8,270	5,100	4,580	4,990	14,000	4,830	5,450	5,230
25	15,200	9,290	5,480	7,890	7,860	4,980	4,390	4,870	14,000	4,370	8,310	4,980
26	14,100	9,240	5,400	7,970	7,820	4,880	5,010	5,830	12,100	4,610	6,490	4,860
27	11,500	8,670	4,910	7,420	7,580	4,840	5,770	6,020	10,500	4,390	5,560	4,690
28	9,100	9,820	5,470	7,770	7,110	4,730	5,100	5,990	9,250	4,350	5,330	4,660
29	7,010	11,400	5,190	8,510	5,260	4,730	4,830	5,230	8,120	4,300	4,850	4,580
30	5,470	10,500	5,140	11,800	---	5,100	5,220	5,610	7,800	4,130	5,060	4,640
31	5,600	---	5,200	9,550	---	4,890	---	5,430	---	4,080	5,140	---
TOTAL	365,550	255,780	183,600	254,110	241,900	146,180	148,910	158,330	220,660	170,570	150,100	174,840
MEAN	11,790	8,526	5,923	8,197	8,341	4,715	4,964	5,107	7,355	5,502	4,842	5,828
MAX	42,700	19,300	10,100	13,300	9,360	6,190	6,120	6,170	14,000	8,970	8,310	10,300
MIN	2,980	3,510	4,910	4,790	5,260	3,800	4,340	4,110	4,370	4,080	3,190	3,630
AC-FT	725,100	507,300	364,200	504,000	479,800	289,900	295,400	314,000	437,700	338,300	297,700	346,800

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2004, BY WATER YEAR (WY)

MEAN	4,375	6,569	6,125	6,690	6,784	5,870	5,622	6,461	7,503	7,629	4,903	3,934
MAX	11,790	22,270	12,120	8,719	13,830	9,415	9,534	10,690	13,590	14,730	9,214	5,828
(WY)	(2004)	(1991)	(1996)	(1980)	(1991)	(1997)	(1951)	(1997)	(1997)	(1950)	(1999)	(2004)
MIN	2,071	1,864	2,609	2,450	2,115	2,222	3,035	3,680	3,492	2,891	2,884	2,144
(WY)	(1978)	(1944)	(1944)	(1944)	(1944)	(1948)	(2001)	(1977)	(2001)	(1977)	(1977)	(1977)

12181000 SKAGIT RIVER AT MARBLEMOUNT, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1943 - 2004	
ANNUAL TOTAL	2,333,520		2,470,530			
ANNUAL MEAN	6,393		6,750		6,058	
HIGHEST ANNUAL MEAN					9,617	
LOWEST ANNUAL MEAN					3,710	
HIGHEST DAILY MEAN	42,700	Oct 21	42,700	Oct 21	50,000	Nov 10, 1990
LOWEST DAILY MEAN	2,650	Aug 30	2,980	Oct 5	1,190	Feb 25, 1944
ANNUAL SEVEN-DAY MINIMUM	2,890	Aug 27	3,520	Oct 1	1,520	Feb 20, 1944
ANNUAL RUNOFF (AC-FT)	4,629,000		4,900,000		4,389,000	
10 PERCENT EXCEEDS	9,060		9,570		9,170	
50 PERCENT EXCEEDS	5,510		5,460		5,430	
90 PERCENT EXCEEDS	3,700		4,270		3,220	

12181000 SKAGIT RIVER AT MARBLEMOUNT, WA—Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: March 1986 to current year.

INSTRUMENTATION.--Water-temperature sensor interfaced directly with a data collection platform for satellite telemetry.

REMARKS.--Records good Oct. 1 to Dec. 26 and Dec. 29 to Sept. 30; records fair Dec. 27 to 28.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 15.0°C (rounded), Aug. 13, 1998; minimum, 0.5°C (rounded), Dec. 27, 1996.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 14.7°C, Aug. 1; minimum, 2.6°C, Jan. 4, 5.

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	11.4	10.0	10.6	8.7	7.5	8.1	7.1	6.7	6.9	5.3	4.8	5.0
2	11.5	9.8	10.6	8.7	7.8	8.2	7.1	6.6	7.0	5.2	4.8	5.0
3	11.4	9.7	10.5	8.1	7.5	7.8	6.6	6.0	6.3	4.9	3.4	4.0
4	11.2	9.8	10.4	7.7	7.0	7.4	6.4	5.8	6.1	3.4	2.6	3.1
5	11.2	10.1	10.5	7.5	6.7	7.0	6.6	6.3	6.4	3.3	2.6	3.0
6	10.9	10.1	10.5	7.4	6.5	6.9	6.6	6.0	6.4	3.9	3.1	3.5
7	10.8	10.3	10.6	7.7	6.6	7.1	6.4	5.9	6.2	4.4	3.5	4.0
8	10.6	10.0	10.3	8.2	7.5	7.8	6.7	6.2	6.4	4.7	4.3	4.5
9	10.5	9.6	10	8.2	7.4	7.8	6.3	5.8	6.1	4.9	4.5	4.7
10	10.5	9.5	9.9	8.1	7.8	8.0	6.5	6.0	6.2	4.9	4.6	4.7
11	10.1	9.4	9.7	8.0	7.2	7.7	6.5	6.3	6.4	5.0	4.6	4.8
12	9.8	8.8	9.4	8.5	7.7	8.0	6.4	6.2	6.3	5.1	4.8	4.9
13	9.8	8.7	9.2	8.5	8.0	8.2	6.3	6.0	6.1	5.1	4.9	5.0
14	10.1	9.0	9.5	8.6	8.0	8.4	6.4	6.0	6.1	5.0	4.6	4.9
15	9.6	9.1	9.4	8.7	8.4	8.6	6.3	5.9	6.1	4.7	4.6	4.7
16	9.4	8.0	8.8	8.6	7.9	8.4	6.1	5.9	6.0	5.1	4.7	4.9
17	9.8	8.9	9.5	7.9	7.5	7.7	6.1	5.8	6.0	5.3	4.9	5.1
18	9.6	9.3	9.5	7.5	6.2	6.6	6.2	5.7	5.9	5.3	5.1	5.2
19	9.5	9.2	9.4	6.4	5.0	5.7	6.3	5.6	6.0	5.4	5.0	5.2
20	10.4	9.1	9.7	7.0	6.4	6.7	6.3	6.0	6.2	5.2	4.7	4.9
21	10.4	9.9	10.2	7.0	6.6	6.8	6.4	6.0	6.2	5.0	4.6	4.8
22	10.7	9.8	10.3	6.9	6.6	6.7	6.1	5.6	5.8	5.3	4.8	5.0
23	10.5	10.0	10.3	7.1	6.8	7.0	6.2	5.6	5.9	5.2	5.0	5.1
24	10.5	10.0	10.2	7.3	7.0	7.1	6.3	6.1	6.2	5.1	4.8	5.0
25	10.2	9.8	10.0	7.0	6.3	6.7	6.3	5.9	6.1	4.9	4.7	4.8
26	10.4	9.9	10.1	7.1	6.8	7.0	6.0	5.5	5.8	4.8	4.4	4.5
27	10.3	10.1	10.2	7.3	6.9	7.1	5.6	4.6	5.4	4.9	4.4	4.6
28	10.2	9.1	9.8	7.1	6.3	6.8	5.6	4.6	4.9	4.8	4.4	4.6
29	9.3	8.5	8.9	6.9	6.3	6.6	5.1	4.5	4.8	4.8	4.6	4.7
30	8.5	8.0	8.3	6.9	6.6	6.7	5.1	4.5	4.8	4.7	4.3	4.4
31	8.1	7.5	7.9	---	---	---	5.2	4.6	4.9	4.7	4.3	4.5
MONTH	11.5	7.5	9.8	8.7	5.0	7.4	7.1	4.5	6.0	5.4	2.6	4.6

12186000 SAUK RIVER ABOVE WHITE CHUCK RIVER, NEAR DARRINGTON, WA

LOCATION.--Lat 48°10'08", long 121°28'10", on north line, NE¼NE¼, sec.23, T.31 N., R.10 E., Snohomish County, Hydrologic Unit 17110006, Mount Baker National Forest, on right bank 0.6 mi upstream from White Chuck River, 8.4 mi southeast of Darrington, and at mile 32.5.

DRAINAGE AREA.--152 mi².

PERIOD OF RECORD.--August to November 1910 (fragmentary gage heights only), October 1917 to September 1922, August 1928 to current year. Monthly discharge only for April and May 1921, published in WSP 1316.

REVISED RECORDS.--WSP 752: 1932. WSP 1286: 1918(M), 1920(M), 1921, 1922(M), 1932(M), 1934(M), 1946-47(M), 1949.

GAGE.--Water-stage recorder. Elevation of gage is 930 ft above NGVD of 1929, from river-profile map. Prior to Nov. 18, 1910, nonrecording gage 0.5 mi downstream at different datum.

REMARKS.--Records good, except estimated daily discharges, which are fair. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--80 years (water years 1918-20, 1922, 1929-2004), 1,126 ft³/s, 100.66 in/yr, 815,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,000 ft³/s, Oct. 20, 2003, gage height, 15.39 ft, from rating curve extended above 15,000 ft³/s, on basis of slope-area measurement; maximum gage height, 16.03 ft, Dec. 26, 1980; minimum daily discharge, 90 ft³/s, Nov. 6, 2002, but may have been lower during period of missing record.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct 17	1330	11,900	8.75	Oct 28	1845	5,000	6.23
Oct 20	2100	(a) *44,000	*15.39	Nov 19	0430	16,700	10.05

Minimum discharge, 219 ft³/s, Oct. 8.

(a) From rating curve extended above 15,000 ft³/s, on basis of slope-area measurement.

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	236	1,080	1,310	413	1,400	359	841	1,680	1,910	1,000	367	478
2	232	958	1,270	397	1,120	347	772	2,070	1,640	958	347	633
3	232	849	1,770	384	947	343	768	2,030	1,720	893	338	545
4	231	758	1,330	341	857	395	875	1,920	2,130	833	320	455
5	230	689	1,390	331	759	443	924	1,910	2,290	771	313	438
6	228	634	1,610	324	705	417	900	1,520	2,260	815	313	396
7	229	597	1,290	360	666	620	994	1,410	1,800	1,040	543	359
8	242	570	1,080	554	611	1,200	1,020	1,570	1,550	792	390	337
9	427	542	934	582	566	1,560	1,050	1,510	1,720	667	343	367
10	392	634	834	698	529	1,410	1,090	1,400	1,780	623	329	362
11	324	1,500	754	684	504	1,100	1,250	1,260	1,600	605	319	1,510
12	1,000	1,090	744	647	484	974	e1,500	1,360	1,330	572	318	929
13	1,760	850	790	705	466	873	e1,600	1,270	1,660	601	317	850
14	780	738	779	e900	484	813	e1,500	1,260	1,790	620	317	2,270
15	538	685	712	e1,400	499	774	1,350	1,270	1,480	650	314	2,590
16	3,350	816	787	e1,300	503	721	1,170	1,310	1,340	632	312	2,600
17	8,390	1,440	967	e1,200	510	698	1,050	1,300	1,450	596	310	3,190
18	2,740	7,230	766	1,090	531	802	961	1,650	1,610	598	294	2,000
19	1,780	10,300	701	1,000	558	824	890	2,140	1,540	594	287	1,510
20	e40,000	3,540	730	909	513	716	900	1,960	1,440	547	283	1,180
21	e9,000	2,110	773	801	474	671	850	1,930	1,530	480	274	981
22	4,020	1,550	698	721	444	729	806	1,940	1,660	464	604	843
23	3,410	1,310	642	712	423	970	898	1,800	1,760	469	453	774
24	2,290	1,250	646	835	416	1,080	916	1,610	1,740	473	993	693
25	1,730	1,110	667	746	413	1,020	868	1,520	1,600	478	2,420	629
26	1,440	1,000	602	691	398	977	1,050	2,020	1,400	450	2,130	568
27	1,220	884	547	685	387	953	1,550	3,190	1,170	412	1,000	521
28	2,560	1,350	521	889	378	879	1,440	2,660	1,070	397	729	493
29	2,330	2,790	474	e1,600	370	846	1,250	1,980	1,070	400	615	463
30	1,580	1,700	440	e3,500	---	961	1,300	2,290	1,080	400	527	428
31	1,250	---	432	2,000	---	949	---	2,620	---	387	463	---
TOTAL	94,171	50,554	26,990	27,399	16,915	25,424	32,333	55,360	48,120	19,217	16,882	29,392
MEAN	3,038	1,685	871	884	583	820	1,078	1,786	1,604	620	545	980
MAX	40,000	10,300	1,770	3,500	1,400	1,560	1,600	3,190	2,290	1,040	2,420	3,190
MIN	228	542	432	324	370	343	768	1,260	1,070	387	274	337
AC-FT	186,800	100,300	53,530	54,350	33,550	50,430	64,130	109,800	95,450	38,120	33,490	58,300
CFSM	20.0	11.1	5.73	5.81	3.84	5.40	7.09	11.7	10.6	4.08	3.58	6.45
IN.	23.05	12.37	6.61	6.71	4.14	6.22	7.91	13.55	11.78	4.70	4.13	7.19

12186000 SAUK RIVER ABOVE WHITE CHUCK RIVER, NEAR DARRINGTON, WA—Continued

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1918 - 2004, BY WATER YEAR (WY)												
MEAN	824	1,205	1,224	1,020	898	781	1,079	1,876	2,173	1,390	593	485
MAX	3,038	4,117	3,512	2,584	2,369	2,442	1,991	2,965	3,648	2,875	1,393	1,504
(WY)	(2004)	(1991)	(1918)	(1953)	(1951)	(1972)	(1934)	(1949)	(1974)	(1954)	(1954)	(1920)
MIN	119	137	347	224	167	293	458	1,119	895	396	215	177
(WY)	(1988)	(1937)	(1986)	(1979)	(1929)	(1955)	(1975)	(1977)	(1941)	(1941)	(1941)	(1942)
SUMMARY STATISTICS				FOR 2003 CALENDAR YEAR			FOR 2004 WATER YEAR			WATER YEARS 1918 - 2004		
ANNUAL TOTAL				455,576			442,757					
ANNUAL MEAN				1,248			1,210			1,126		
HIGHEST ANNUAL MEAN										1,557		
LOWEST ANNUAL MEAN										631		
HIGHEST DAILY MEAN				40,000			Oct 20			40,000		
LOWEST DAILY MEAN				204			Aug 25			228		
ANNUAL SEVEN-DAY MINIMUM				209			Aug 22			231		
ANNUAL RUNOFF (AC-FT)				903,600						878,200		
ANNUAL RUNOFF (CFSM)				8.21						7.96		
ANNUAL RUNOFF (INCHES)				111.50						108.36		
10 PERCENT EXCEEDS				2,320						1,970		
50 PERCENT EXCEEDS				857						848		
90 PERCENT EXCEEDS				232						361		

e Estimated

12189500 SAUK RIVER NEAR SAUK, WA

LOCATION.--Lat 48°25'29", long 121°34'02", in NW¼NW¼, sec.19, T.34 N., R.10 E., Skagit County, Hydrologic Unit 17110006, on left bank, 4.4 mi southeast of Rockport, 7.6 mi southeast of Sauk, 7.8 mi downstream from Suiattle River, and at mile 5.4.

DRAINAGE AREA.--714 mi².

PERIOD OF RECORD.--August to October 1910 (fragmentary gage heights), March 1911 to August 1912, July 1928 to current year. Published as "near Suiattle Crossing, near Sauk" 1910-12.

REVISED RECORDS.--WSP 1286: 1929, 1937, 1939.

GAGE.--Water-stage recorder. Datum of gage is 266 ft above NGVD of 1929 (from river-profile survey). Prior to Aug. 4, 1912, nonrecording gages at several sites 1.0 mi downstream to 5.0 mi upstream from present site at various datums. July 24, 1928, to Sept. 16, 1929, nonrecording gage at present site and datum. U.S. Geological Survey satellite telemeter at station.

REMARKS.--Records fair. No regulation. Small diversion for millpond at Darrington and for domestic use.

AVERAGE DISCHARGE.--76 years (water years 1929-2004), 4,341 ft³/s, 82.62 in/yr, 3,145,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 106,000 ft³/s, Oct. 21, 2003, gage height, 18.96 ft, from rating extended above 50,000 ft³/s; minimum discharge, 572 ft³/s, Dec. 5, 1929, but may have been less during period of ice effect Jan. 10-27, 1930.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 16,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct 17	1415	33,100	11.20	Oct 28	2115	16,100	7.56
Oct 21	0100	*106,000	*18.96	Nov 19	0830	45,300	12.45

Minimum discharge, 848 ft³/s, Oct. 4, 5, gage height, 2.96 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	1,020	5,510	8,160	3,010	7,170	1,930	3,120	6,120	6,390	4,190	e2,200	2,560
2	958	4,930	7,290	2,900	5,710	1,880	2,890	7,370	5,450	3,900	e2,100	3,810
3	949	4,510	8,560	2,800	4,750	1,840	2,860	6,990	5,510	3,570	e2,000	3,310
4	901	4,310	7,250	2,660	4,160	1,850	3,190	6,400	6,660	3,370	e1,900	2,740
5	923	4,150	7,020	2,440	3,790	1,980	3,330	6,700	7,360	3,160	e1,900	2,660
6	918	4,000	7,340	2,430	3,520	2,070	3,250	5,420	6,790	3,330	e1,900	2,390
7	1,070	3,980	6,960	2,690	3,370	2,150	3,570	4,930	5,460	3,880	e2,800	2,180
8	1,130	3,970	6,640	3,900	3,200	3,410	3,520	5,600	4,740	3,250	e2,100	2,080
9	1,420	3,960	6,120	3,790	3,020	4,430	3,590	5,520	5,820	2,700	e2,000	2,270
10	1,390	4,080	5,590	4,110	2,840	4,910	3,970	5,270	6,360	2,490	2,040	2,160
11	1,190	6,060	5,150	4,240	2,710	4,380	4,620	4,800	5,560	2,530	2,030	5,000
12	2,150	4,800	4,870	3,860	2,610	3,800	5,450	4,900	4,430	2,470	2,100	3,890
13	5,110	4,620	4,940	3,820	2,520	3,440	6,000	4,720	4,940	2,580	2,150	3,190
14	2,400	4,720	5,180	4,310	2,470	3,180	5,420	4,760	5,350	2,710	2,180	6,230
15	1,710	4,570	4,930	7,310	2,460	3,000	4,670	4,890	4,510	2,840	2,160	6,850
16	7,740	4,990	4,760	6,790	2,480	2,890	4,030	5,130	4,030	2,920	2,180	7,880
17	23,600	6,490	5,880	5,310	2,530	2,820	3,620	5,010	4,400	2,810	2,200	8,970
18	8,790	16,400	5,460	4,770	2,550	2,830	3,360	6,030	5,100	2,870	2,090	7,120
19	5,060	33,100	5,010	4,430	2,670	3,130	3,190	7,370	4,990	2,880	2,070	5,560
20	30,200	13,100	4,800	4,120	2,640	3,040	3,230	7,070	4,630	2,870	2,040	4,470
21	52,100	9,750	4,820	3,720	2,510	2,880	3,110	7,250	5,050	2,570	1,960	3,650
22	11,900	8,500	4,630	3,400	2,370	2,820	2,980	7,210	5,760	2,460	2,940	3,300
23	9,290	7,660	4,390	3,230	2,270	3,380	3,140	6,770	6,110	2,480	2,430	3,120
24	7,160	7,490	4,250	3,330	2,200	3,890	3,450	6,140	6,330	2,560	3,050	2,840
25	5,740	6,910	4,320	3,350	2,160	4,040	3,410	5,850	6,270	2,630	8,030	2,640
26	5,290	6,430	4,090	3,170	2,110	3,840	4,010	7,310	5,830	e2,600	9,840	2,560
27	5,080	5,780	3,770	3,090	2,060	3,710	5,920	10,100	4,730	e2,500	4,560	2,350
28	8,760	7,080	3,590	3,290	2,010	3,610	5,540	9,030	4,350	e2,400	3,410	2,260
29	9,240	12,200	3,400	4,790	1,980	3,450	4,730	6,800	4,340	e2,400	3,340	2,200
30	7,160	9,210	3,200	10,700	---	3,540	4,810	6,820	4,500	e2,400	2,800	2,130
31	6,260	---	3,080	9,260	---	3,530	---	7,830	---	e2,300	2,480	---
TOTAL	226,609	223,260	165,450	131,020	86,840	97,650	117,980	196,110	161,750	88,620	86,980	112,370
MEAN	7,310	7,442	5,337	4,226	2,994	3,150	3,933	6,326	5,392	2,859	2,806	3,746
MAX	52,100	33,100	8,560	10,700	7,170	4,910	6,000	10,100	7,360	4,190	9,840	8,970
MIN	901	3,960	3,080	2,430	1,980	1,840	2,860	4,720	4,030	2,300	1,900	2,080
AC-FT	449,500	442,800	328,200	259,900	172,200	193,700	234,000	389,000	320,800	175,800	172,500	222,900
CFSM	10.2	10.4	7.47	5.92	4.19	4.41	5.51	8.86	7.55	4.00	3.93	5.25
IN.	11.81	11.63	8.62	6.83	4.52	5.09	6.15	10.22	8.43	4.62	4.53	5.85

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2004, BY WATER YEAR (WY)

MEAN	2,891	4,468	4,644	4,165	3,781	3,279	3,994	6,477	7,864	5,616	2,807	2,097
MAX	7,310	14,690	11,580	8,615	9,062	9,443	7,375	10,570	13,520	10,610	5,529	4,941
(WY)	(2004)	(1996)	(1934)	(1974)	(1951)	(1972)	(1934)	(1949)	(1974)	(1972)	(1974)	(1959)
MIN	751	724	1,457	1,199	793	1,523	2,039	4,061	3,715	2,515	1,513	1,089
(WY)	(1988)	(1930)	(1953)	(1979)	(1929)	(1955)	(1975)	(1977)	(1941)	(1941)	(2003)	(1942)

12189500 SAUK RIVER NEAR SAUK, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1929 - 2004	
ANNUAL TOTAL	1,641,003		1,694,639			
ANNUAL MEAN	4,496		4,630		4,341	
HIGHEST ANNUAL MEAN					6,048	
LOWEST ANNUAL MEAN					2,662	
HIGHEST DAILY MEAN	52,100	Oct 21	52,100	Oct 21	69,900	Nov 24, 1990
LOWEST DAILY MEAN	901	Oct 4	901	Oct 4	578	Dec 4, 1929
ANNUAL SEVEN-DAY MINIMUM	963	Oct 1	963	Oct 1	604	Nov 29, 1929
ANNUAL RUNOFF (AC-FT)	3,255,000		3,361,000		3,145,000	
ANNUAL RUNOFF (CFSM)	6.30		6.48		6.08	
ANNUAL RUNOFF (INCHES)	85.50		88.29		82.62	
10 PERCENT EXCEEDS	7,990		7,260		8,300	
50 PERCENT EXCEEDS	3,550		3,870		3,340	
90 PERCENT EXCEEDS	1,270		2,110		1,520	

e Estimated

12191600 BAKER LAKE AT UPPER BAKER DAM NEAR CONCRETE, WA

LOCATION.--Lat 48°38'58", long 121°41'22", in SW ¼ sec.31, T.37 N., R.9 E., Whatcom County, Hydrologic Unit 17110005, at upper Baker Dam on Baker River near center of dam, 0.3 mi upstream from Sulphur Creek, 8.0 mi north of Concrete, and at mile 9.3.

DRAINAGE AREA.--215 mi².

PERIOD OF RECORD.--July 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929.

REMARKS.--Reservoir is formed by concrete gravity dam, completed in June 1959; storage began July 9, 1959. Usable storage, 220,630 acre-ft between elevations 655 ft, minimum operating pool, and 724 ft, normal full pool. Dead storage below elevation 655 ft, 64,840 acre-ft. Crest of spillway is at elevation 694 ft. Water used by Puget Sound Energy for power generation. Capacity table furnished by Puget Sound Energy. Figures given herein represent total contents. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 287,930 acre-ft July 12, 1972, elevation, 724.49 ft; minimum contents since normal operating level was reached in August 1960, 102,621 acre-ft May 8, 1977, elevation, 674.81 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 285,873 acre-ft Oct. 21, elevation, 724.08 ft; minimum contents, 128,076 acre-ft Mar. 6, elevation, 684.36 ft.

MONTH-END ELEVATION AND CONTENTS AT 2400
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
September 30	710.71	223,431	--
October 31	715.96	246,913	+23,482
November 30	704.12	195,961	-50,952
December 31	698.86	175,797	-20,164
Calendar Year 2003	--	--	-25,270
January 31	692.34	152,933	-22,864
February 29	691.00	148,520	-4,413
March 31	693.36	156,353	+7,833
April 30	693.99	158,489	+2,136
May 31	719.86	265,234	+106,745
June 30	722.02	275,692	+10,458
July 31	715.93	246,776	-28,916
August 31	722.08	275,987	+29,211
September 30	714.36	239,617	-36,370
Water Year 2004	--	--	+16,186

12193000 LAKE SHANNON AT CONCRETE, WA

LOCATION.--Lat 48°32'53", long 121°44'22", in SW $\frac{1}{4}$ sec.2, T.35 N., R.8 E., Skagit County, Hydrologic Unit 17110005, at Baker Dam on Baker River near left bank, 0.7 mi north of Concrete, and at mile 1.2.

DRAINAGE AREA.--297 mi².

PERIOD OF RECORD.--November 1925 to current year.

GAGE.--Water-stage recorder; prior to Nov. 11, 1959, water-stage indicator in powerplant. Datum of gage is NGVD of 1929. Prior to March 1959, at datum 1.72 ft lower. Period August 31, 1961, to September 30, 1991, at datum 0.15 ft higher.

REMARKS.--Reservoir is formed by concrete-arch and gravity dam, completed in June 1927; storage began in November 1925. Usable storage, 142,400 acre-ft between elevations 355 ft, minimum operating pool, and 438.6 ft, normal full pool. Dead storage unknown. Spillway crest is at elevation 424.9 ft. Water used by Puget Sound Energy for power generation. Capacity table furnished by Puget Sound Energy. Prior to Nov. 11, 1959, gage-height record furnished by Puget Sound Energy from powerplant log. Figures given herein represent contents above elevation 341.7 ft, center line of outlet tunnel. U.S. Geological Survey satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 161,470 acre-ft Sept. 17, 1968, elevation, 439.50 ft; minimum contents since October 1953, 28,260 acre-ft Mar. 6, 1969, elevation, 363.7 ft, not determined prior to October 1953 because of incomplete records.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 159,290 acre-ft June 8, elevation, 438.52 ft; minimum contents, 51,714 acre-ft Feb. 16, elevation, 380.10 ft.

MONTH-END ELEVATION AND CONTENTS AT 2400
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
September 30	411.83	105,900	--
October 31	424.19	129,316	+23,416
November 30	420.11	121,384	-7,932
December 31	417.87	117,171	-4,213
Calendar Year 2003	--	--	-16,675
January 31	406.99	96,906	-20,265
February 29	388.84	65,482	-31,424
March 31	406.89	96,722	+31,240
April 30	392.24	71,051	-25,671
May 31	423.49	127,940	+56,889
June 30	435.67	153,046	+25,106
July 31	426.75	134,408	-18,638
August 31	411.27	104,858	-29,550
September 30	405.72	94,563	-10,295
Water Year 2004	--	--	-11,337

12193500 BAKER RIVER AT CONCRETE, WA

LOCATION.--Lat 48°32'24", long 121°44'31", in NW ¼ NW ¼ sec.11, T.35 N., R.8 E., Skagit County, Hydrologic Unit 17110005, on left bank at upstream side of fish barrier, 0.2 mi northeast of Concrete, 0.3 mi downstream from Baker River powerplant, and at mile 0.7.

DRAINAGE AREA.--297 mi².

PERIOD OF RECORD.--September 1910 to March 1915, September 1943 to current year.

REVISED RECORDS.--WSP 1286: 1911-13(M), 1945-46, drainage area.

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929. Prior to Mar. 5, 1915, nonrecording gage at site 0.2 mi downstream at different datum. Sept. 1, 1943, to Jan. 22, 1958, water-stage recorder at site 700 ft upstream at datum 172.6 ft above NGVD of 1929 (from river-profile survey). Jan. 23 to June 11, 1958, powerplant record. Supplementary water-stage recorder on left bank about 40 ft downstream from fish barrier and on tailrace of powerhouse at same datum.

REMARKS.--Records good, except estimated discharges, which are fair, and flows below 200 ft³/s, which are poor. Flows were affected by backwater from Skagit River during part of days on October 20 and 21. All diversions returned to river upstream from gage; at times, power generation is shut down for maintenance at Baker River or the fish-barrier dam causing the stage to drop below the control. Water is released through a valve-controlled pipe to the fish ladder located on the left bank just downstream from the gage and control. Flow regulated by Baker Lake (station 12191600) since July 1959 and Shannon Lake (station 12193000) since November 1925. U.S. Geological Survey satellite telemeter at station.

COOPERATION.--Puget Sound Energy provided streamflow data from dam upstream during period of backwater.

AVERAGE DISCHARGE.--65 years (water years 1911-14, 1944-2004), 2,655 ft³/s, 121.40 in/yr, 1,924,000 acre-ft/yr, adjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,600 ft³/s Nov. 19, 1962, elevation, 186.6 ft, computation of peak flow over dam; minimum daily discharge, 30 ft³/s Mar. 21-26, 1973, Apr. 26-28, May 7-9, 11, 1983, Apr. 20, 24-28, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 30,800 ft³/s, Oct. 21, elevation, 184.96 ft; minimum discharge, 80 ft³/s, on parts of each day Feb. 11, 15-19.

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	592	3,980	3,020	2,310	4,000	3,830	3,290	102	102	2,750	1,700	2,550
2	601	4,230	2,480	927	4,010	3,780	4,040	851	102	2,680	2,100	3,240
3	618	3,970	2,360	2,190	4,040	1,740	3,740	104	107	1,370	2,480	4,030
4	645	3,930	2,360	3,980	4,040	753	2,610	89	109	1,430	2,600	4,120
5	839	3,940	3,100	3,960	3,950	3,350	2,630	88	114	1,970	2,690	4,130
6	659	3,940	2,830	3,860	1,350	2,900	675	88	121	2,320	2,040	4,120
7	636	4,050	2,720	3,990	765	82	88	190	2,130	1,540	2,760	4,110
8	626	4,040	1,570	3,980	2,490	82	2,930	108	2,440	2,790	1,660	3,280
9	625	4,020	3,050	3,860	2,730	647	3,030	1,310	3,920	2,630	2,770	3,730
10	642	4,000	1,990	2,600	1,900	82	2,240	802	3,950	2,860	2,770	4,400
11	652	4,020	2,340	1,240	1,120	1,140	2,400	2,110	4,010	2,480	2,720	4,410
12	2,620	4,020	3,230	3,330	3,130	205	2,340	1,830	4,020	3,410	2,570	4,200
13	2,900	4,010	3,230	2,800	2,350	82	2,860	517	4,020	3,910	2,470	4,170
14	4,150	3,780	3,200	2,870	2,430	84	3,240	806	4,020	2,620	99	4,200
15	4,340	2,600	3,890	3,190	2,560	1,420	3,340	1,040	4,010	2,930	782	4,270
16	4,420	3,040	2,990	3,230	1,280	2,820	3,430	1,800	3,960	3,990	2,150	4,280
17	8,070	4,000	975	4,070	714	86	1,260	1,630	2,960	3,840	3,480	4,300
18	9,260	4,260	2,670	3,730	80	87	102	2,530	2,390	2,890	2,170	4,320
19	13,900	4,440	2,780	2,800	624	2,640	2,850	2,660	4,060	2,810	1,840	4,290
20	e17,300	4,030	734	3,000	1,080	2,370	2,950	121	2,220	2,860	2,250	4,260
21	e11,000	4,110	1,270	4,090	703	1,560	2,990	95	3,940	2,820	1,900	4,270
22	21,700	3,220	2,880	4,070	2,360	1,220	3,140	95	3,940	2,420	1,560	4,260
23	8,730	3,010	2,850	3,310	1,590	694	3,260	96	3,970	2,570	95	4,260
24	4,310	3,380	1,660	3,970	1,260	89	3,210	98	3,960	2,780	2,680	4,260
25	4,180	3,090	1,190	4,020	2,780	2,810	3,010	98	3,960	2,580	4,080	4,230
26	4,170	3,260	118	4,050	1,830	181	3,000	100	3,910	3,180	4,050	4,250
27	4,160	3,180	88	4,040	82	1,920	3,010	100	3,890	2,850	597	4,290
28	4,170	3,120	2,450	3,210	718	2,920	3,020	102	3,880	2,930	95	4,320
29	4,190	2,880	2,920	4,020	2,060	2,300	2,900	102	3,870	3,090	96	4,390
30	4,080	2,870	3,440	4,020	---	2,200	143	102	3,830	2,930	2,100	4,200
31	3,990	---	4,040	4,010	---	3,040	---	102	---	1,760	2,660	---
TOTAL	148,775	110,420	74,425	104,727	58,026	47,114	77,728	19,866	87,915	83,990	64,014	123,140
MEAN	4,799	3,681	2,401	3,378	2,001	1,520	2,591	641	2,930	2,709	2,065	4,105
MAX	21,700	4,440	4,040	4,090	4,040	3,830	4,040	2,660	4,060	3,990	4,080	4,410
MIN	592	2,600	88	927	80	82	88	88	102	1,370	95	2,550
AC-FT	295,100	219,000	147,600	207,700	115,100	93,450	154,200	39,400	174,400	166,600	127,000	244,200
MEAN†	5,561	2,691	2,003	2,676	1,378	2,154	2,197	3,301	3,530	1,935	2,060	3,320
CFSM†	18.72	9.06	6.74	9.01	4.64	7.25	7.40	11.11	11.89	6.52	6.94	11.18
IN.†	21.59	10.11	7.78	10.39	5.00	8.36	8.25	12.82	13.26	7.51	8.00	12.47
AC-FT†	342,000	160,100	123,200	164,600	79,260	135,200	130,700	203,000	210,000	119,000	126,700	197,500

CAL YR 2003 TOTAL 1,000,208 MEAN 2,740 MAX 21,700 MIN 77 AC-FT 1,984,000 MEAN† 2,682 CFSM† 9.03 IN.† 122.60 AC-FT† 1,942,000

WTR YR 2004 TOTAL 1,000,140 MEAN 2,733 MAX 21,700 MIN 80 AC-FT 1,984,000 MEAN† 2,741 CFSM† 9.23 IN.† 125.57 AC-FT† 1,989,000

† Adjusted for change in contents in Baker Lake and Lake Shannon.

e Estimated

12194000 SKAGIT RIVER NEAR CONCRETE, WA

LOCATION.--Lat 48°31'28", long 121°46'11", in SE¼NE¼ sec.16, T.35 N., R.8 E., Skagit County, Hydrologic Unit 17110007, on right bank at Dalles Bridge, 1.3 mi southwest of Concrete, 2.4 mi downstream from Baker River, and at mile 54.1.

DRAINAGE AREA.--2,737 mi², of which 400 mi² is in Canada.

PERIOD OF RECORD.--September 1924 to current year.

REVISED RECORDS.--WSP 1566: 1957. WSP 1736: 1948. WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 130.0 ft above NGVD of 1929. Prior to Dec. 10, 1924, nonrecording gage 200 ft upstream and Dec. 10, 1924, to Sept. 30, 1937, water-stage recorder at present site; both gages at datum 12.7 ft higher.

REMARKS.--Records good, except for estimated daily discharges, which are fair. Flow regulated by Ross Reservoir (station 12175000), Diablo Reservoir (station 12176500), Gorge Reservoir (station 12177700), Baker Lake (station 12191600), and Lake Shannon (station 12193000). Chemical analyses November 1970 to September 1971, October 1973 to September 1974. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--80 years (water years 1925-2004), 15,040 ft³/s, 10,890,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 166,000 ft³/s, Oct. 21, 2003, gage height, 42.21 ft; minimum discharge, probably less than 2,160 ft³/s during period Oct. 1-24, 1925, when recorder was not operating and gates in Baker River Dam were first closed; minimum daily recorded, 2,360 ft³/s, Dec. 12, 1929.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of about 1815 reached a stage of 69.3 ft present datum, from floodmarks at site 200 ft upstream, estimated discharge about 500,000 ft³/s. Records of other floods, prior to establishment of station, are given in WSP 1527.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 166,000 ft³/s, Oct. 21, gage height, 42.21 ft; minimum discharge, 4,120 ft³/s, Oct. 4, 5, gage height, 13.89 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	5,620	16,400	20,900	9,410	21,400	10,400	11,900	12,800	e14,000	18,200	8,700	12,500
2	5,130	16,600	16,800	7,820	19,000	10,800	12,200	16,000	e12,000	18,600	9,410	16,400
3	5,080	13,900	18,600	9,020	18,600	8,180	11,900	14,500	12,300	15,300	9,810	15,900
4	4,990	12,200	15,700	10,600	17,600	6,640	11,200	13,700	14,600	14,100	9,920	14,300
5	5,060	11,500	16,400	10,300	16,900	9,190	11,600	14,300	18,300	14,000	10,200	13,100
6	4,910	11,000	19,000	10,200	13,800	8,980	9,480	11,700	17,900	14,800	9,030	12,600
7	6,480	11,200	16,700	e13,000	12,900	6,290	9,480	10,600	17,000	e16,000	10,900	12,300
8	6,520	11,500	13,700	15,900	14,000	9,450	12,400	11,200	14,900	e15,000	8,450	11,300
9	6,990	11,400	14,000	15,700	13,700	12,800	12,600	12,200	18,200	13,700	9,490	12,600
10	6,940	11,900	12,200	15,600	13,000	12,200	11,900	11,100	19,400	12,600	10,900	13,100
11	6,380	17,100	12,200	13,900	12,100	11,100	12,900	11,800	18,900	11,700	11,900	22,500
12	9,880	15,800	12,800	15,500	13,800	9,330	14,500	11,500	16,100	12,700	10,900	18,300
13	17,400	16,400	13,000	15,800	12,900	8,450	16,600	9,890	17,300	13,600	10,400	15,900
14	12,600	15,700	13,000	18,000	12,700	8,040	15,900	10,200	18,600	12,000	7,740	22,700
15	11,000	14,100	13,500	28,000	13,200	9,150	14,700	10,700	16,300	13,100	7,850	23,100
16	21,000	16,200	12,500	26,400	12,000	10,400	13,800	11,700	15,500	14,500	9,330	24,800
17	78,800	22,000	11,700	22,100	11,800	7,380	10,800	11,700	15,800	14,600	11,400	28,800
18	42,500	38,300	12,000	18,900	10,900	7,990	8,950	14,400	19,100	14,000	9,640	25,100
19	32,400	63,300	11,800	17,000	11,600	11,300	11,400	16,900	21,000	14,100	10,300	22,000
20	67,900	35,700	9,650	14,800	11,800	10,200	11,500	14,200	18,100	13,200	10,400	19,200
21	131,000	27,700	10,600	16,200	11,300	9,040	11,200	14,600	20,600	12,300	9,640	17,500
22	80,100	22,500	11,700	15,300	12,400	9,190	10,900	14,700	20,700	11,500	11,500	16,000
23	54,500	20,300	11,500	14,800	11,200	10,200	11,500	13,700	24,600	11,700	8,890	16,000
24	35,500	20,200	10,300	16,000	11,300	10,100	11,800	12,600	27,600	12,000	11,700	15,100
25	29,700	18,700	9,970	15,400	12,300	12,700	11,100	11,900	27,600	11,400	24,600	14,400
26	27,000	18,400	8,640	15,100	11,300	9,550	11,900	13,900	25,800	11,800	26,700	13,900
27	23,400	16,800	8,060	15,000	9,150	11,200	15,200	18,900	22,900	11,200	14,700	13,500
28	26,200	19,700	10,400	14,900	9,620	12,000	14,400	18,200	20,800	10,800	11,600	13,100
29	26,800	30,500	10,500	19,600	9,240	11,000	13,000	15,500	19,800	11,200	12,100	12,900
30	18,600	24,100	10,800	31,800	---	11,600	10,400	15,900	19,400	10,900	12,400	12,500
31	16,300	---	11,400	24,800	---	12,700	---	e15,000	---	9,430	12,600	---
TOTAL	826,680	601,100	400,020	506,850	381,510	307,550	367,110	415,990	565,100	410,030	353,100	501,400
MEAN	26,670	20,040	12,900	16,350	13,160	9,921	12,240	13,420	18,840	13,230	11,390	16,710
MAX	131,000	63,300	20,900	31,800	21,400	12,800	16,600	18,900	27,600	18,600	26,700	28,800
MIN	4,910	11,000	8,060	7,820	9,150	6,290	8,950	9,890	12,000	9,430	7,740	11,300
AC-FT	1,640,000	1,192,000	793,400	1,005,000	756,700	610,000	728,200	825,100	1,121,000	813,300	700,400	994,500

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 2004, BY WATER YEAR (WY)

MEAN	11,240	15,550	15,850	14,850	13,780	12,150	13,800	20,230	24,430	19,120	10,830	8,563
MAX	26,670	49,160	34,660	25,240	28,840	23,380	29,270	36,310	43,320	37,430	20,930	16,710
(WY)	(2004)	(1991)	(1976)	(1935)	(1991)	(1972)	(1934)	(1925)	(1972)	(1972)	(1976)	(2004)
MIN	3,808	2,876	5,289	4,485	3,195	6,224	7,716	11,440	12,300	8,856	6,403	4,852
(WY)	(1926)	(1937)	(1930)	(1930)	(1929)	(1929)	(2001)	(1977)	(1926)	(1977)	(1941)	(1942)

SKAGIT RIVER BASIN

12194000 SKAGIT RIVER NEAR CONCRETE, WA—Continued

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1925 - 2004	
ANNUAL TOTAL	5,451,440		5,636,440		15,040	
ANNUAL MEAN	14,940		15,400		21,270	1991
HIGHEST ANNUAL MEAN					9,512	2001
LOWEST ANNUAL MEAN					135,000	Nov 10, 1990
HIGHEST DAILY MEAN	131,000	Oct 21	131,000	Oct 21	2,400	Oct 17, 1925
LOWEST DAILY MEAN	4,500	Aug 30	4,910	Oct 6	2,360	Dec 12, 1929
ANNUAL SEVEN-DAY MINIMUM	5,320	Oct 1	5,320	Oct 1	2,400	
ANNUAL RUNOFF (AC-FT)	10,810,000		11,180,000		10,890,000	
10 PERCENT EXCEEDS	22,500		22,500		26,100	
50 PERCENT EXCEEDS	12,600		12,900		12,800	
90 PERCENT EXCEEDS	7,160		9,300		6,700	

e Estimated

12200500 SKAGIT RIVER NEAR MOUNT VERNON, WA

LOCATION.--Lat 48°26'42", long 122°20'03", in SE¹/₄SE¹/₄, sec.7, T.34 N., R.4 E., Skagit County, Hydrologic Unit 17110007, on right bank 220 ft downstream of bridge on U.S. Highway 99, 1.5 mi north of Skagit Valley Junior College in Mount Vernon, and at mile 15.7.

DRAINAGE AREA.--3,093 mi², of which 400 mi² is in Canada.

PERIOD OF RECORD.--October 1940 to current year. Monthly discharge only October 1940, published in WSP 1316.

REVISED RECORDS.--WSP 1932: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is NGVD of 1929. Supplementary water-stage recorder in bridge pier 0.2 mi downstream from base gage from Dec. 3, 1957, to Oct. 15, 1964. Water-stage recorder located on downstream pier of the Highway 99 bridge from Oct. 15, 1964, to Jan. 6, 1993.

REMARKS.--Records good, except estimated daily discharges, which are fair. Flow regulated by Ross Reservoir (station 12175000), Diablo Reservoir (station 12176500), Gorge Reservoir (station 12177700), Baker Lake (station 12191600), and Lake Shannon (station 12193000). Small diversions for domestic and municipal use. Chemical analyses July 1959 to September 1971, October 1973 to September 1994. Prior to November 1962, published as "at Lawrence." U.S. Geological Survey satellite telemeter at station. Specific conductance February 1974 to November 1981. Water temperature July 1962 to August 1970, February 1974 to November 1981.

AVERAGE DISCHARGE.--64 years (water years 1941-2004), 16,590 ft³/s, 12,020,000 acre-ft, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 152,000 ft³/s, Nov. 25, 1990, elevation, 37.37 ft, from floodmarks; minimum discharge, 2,740 ft³/s, Oct. 26, 1942, elevation, 7.37 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1906 reached a stage of 37 ft, from Great Northern Railway high-water profile, discharge 180,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct 18	0815	77,200	29.06	Nov 19	2045	73,700	28.49
Oct 21	2315	*135,000	*36.19				

Minimum discharge, 5,310 ft³/s, Oct. 6, gage height, 8.92 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	7,040	17,300	23,700	11,900	25,000	12,500	14,200	13,200	16,200	17,700	9,220	12,300
2	6,390	17,900	20,700	10,800	22,000	12,400	14,300	15,800	14,100	18,300	9,510	15,400
3	5,930	16,800	22,300	10,400	21,300	12,100	13,800	16,600	13,600	16,300	9,550	16,000
4	6,120	14,200	19,400	12,300	20,600	10,300	13,200	14,900	15,100	14,900	9,970	14,600
5	6,040	13,300	19,900	12,000	19,900	10,700	13,500	15,700	17,700	13,700	10,300	13,500
6	5,790	12,700	23,100	11,900	18,100	12,600	12,700	14,000	21,100	14,600	9,340	12,600
7	6,670	12,300	21,600	13,500	16,400	10,400	11,400	12,300	18,900	15,200	10,200	12,300
8	8,290	12,700	17,900	17,800	16,100	12,800	12,700	12,300	17,300	15,400	9,860	11,400
9	7,930	12,600	17,200	18,600	16,600	15,800	14,400	13,200	18,200	13,900	8,870	e12,100
10	8,190	12,700	15,600	18,800	16,200	16,500	13,500	13,100	19,200	13,300	10,000	e13,500
11	7,660	18,700	15,200	18,000	15,600	13,700	14,400	12,100	20,300	11,800	11,600	e21,000
12	8,510	17,800	15,500	17,800	15,100	13,400	15,400	12,900	17,800	12,400	11,000	e21,000
13	18,400	17,500	16,100	18,600	16,700	11,500	17,300	12,200	17,700	13,400	10,400	e17,000
14	15,000	17,000	16,500	19,900	14,100	10,900	17,500	11,100	19,700	12,000	9,440	21,000
15	12,100	15,300	16,600	27,900	15,900	11,100	16,600	12,100	18,300	12,500	7,970	e24,000
16	13,700	16,800	15,400	30,200	15,700	12,200	15,900	11,600	16,800	14,300	8,230	e27,500
17	53,300	24,300	16,100	24,600	15,700	11,300	14,100	13,100	16,200	13,900	10,700	e28,500
18	67,900	35,400	14,500	21,300	14,600	10,700	11,400	14,000	18,700	13,700	9,650	28,700
19	34,800	64,500	14,500	19,600	14,700	13,000	11,800	16,600	20,500	13,700	9,760	24,200
20	47,300	54,200	13,700	18,300	15,600	12,900	13,000	16,100	18,600	13,200	10,400	20,800
21	e98,000	32,900	13,900	17,800	14,300	12,000	13,000	15,000	20,300	12,400	9,750	18,800
22	115,000	26,000	14,100	17,900	14,200	12,000	12,600	15,500	20,800	11,600	11,000	17,100
23	78,800	23,000	14,300	17,100	14,100	12,100	12,700	15,300	21,800	11,400	10,900	16,600
24	47,100	22,800	13,700	18,100	14,500	13,600	13,300	13,900	25,700	11,900	9,680	16,100
25	32,700	21,500	13,200	18,000	13,600	14,400	12,800	13,100	26,600	11,500	21,500	15,300
26	27,800	20,800	13,200	17,500	14,500	13,900	12,800	13,700	25,600	11,600	29,200	14,700
27	24,800	19,600	11,300	18,200	12,200	13,100	15,300	18,400	22,700	11,400	18,200	14,200
28	24,100	20,800	12,000	18,200	12,200	14,700	16,100	21,300	20,400	10,800	12,600	13,800
29	31,100	33,400	12,900	23,000	11,600	13,800	14,500	17,700	19,600	11,100	12,900	13,500
30	21,900	28,200	13,100	34,400	---	13,800	13,100	16,200	18,800	11,000	11,500	13,300
31	18,600	---	13,500	30,300	---	15,400	---	18,900	---	10,100	12,600	---
TOTAL	866,960	673,000	500,700	584,700	467,100	395,600	417,300	451,900	578,300	409,000	355,800	520,800
MEAN	27,970	22,430	16,150	18,860	16,110	12,760	13,910	14,580	19,280	13,190	11,480	17,360
MAX	115,000	64,500	23,700	34,400	25,000	16,500	17,500	21,300	26,600	18,300	29,200	28,700
MIN	5,790	12,300	11,300	10,400	11,600	10,300	11,400	11,100	13,600	10,100	7,970	11,400
AC-FT	1,720,000	1,335,000	993,100	1,160,000	926,500	784,700	827,700	896,300	1,147,000	811,300	705,700	1,033,000

12200500 SKAGIT RIVER NEAR MOUNT VERNON, WA—Continued

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2004, BY WATER YEAR (WY)												
MEAN	12,420	18,100	18,610	17,650	16,720	14,320	15,070	20,360	24,570	20,130	11,730	9,468
MAX	27,970	52,550	37,930	27,220	31,140	27,010	23,360	36,530	43,460	37,650	21,890	17,540
(WY)	(2004)	(1991)	(1976)	(1974)	(1951)	(1972)	(1943)	(1946)	(1972)	(1972)	(1999)	(1959)
MIN	4,323	6,592	8,358	7,636	7,626	6,856	8,857	12,460	13,430	9,310	6,441	5,023
(WY)	(1943)	(1944)	(2001)	(1942)	(1942)	(1942)	(1973)	(1970)	(1992)	(1977)	(1941)	(1942)

SUMMARY STATISTICS	FOR 2003 CALENDAR YEAR		FOR 2004 WATER YEAR		WATER YEARS 1941 - 2004	
ANNUAL TOTAL	6,082,540		6,221,160			
ANNUAL MEAN	16,660		17,000		16,590	
HIGHEST ANNUAL MEAN					23,140	
LOWEST ANNUAL MEAN					10,500	
HIGHEST DAILY MEAN	115,000	Oct 22	115,000	Oct 22	142,000	Nov 25, 1990
LOWEST DAILY MEAN	5,790	Oct 6	5,790	Oct 6	3,050	Oct 26, 1942
ANNUAL SEVEN-DAY MINIMUM	6,280	Oct 1	6,280	Oct 1	3,530	Oct 22, 1942
ANNUAL RUNOFF (AC-FT)	12,060,000		12,340,000		12,020,000	
10 PERCENT EXCEEDS	24,800		23,800		27,300	
50 PERCENT EXCEEDS	14,400		14,500		14,500	
90 PERCENT EXCEEDS	8,000		10,700		7,900	

e Estimated