

Figure 34. Location of surface-water and water-quality stations in the Skagit River Basin.

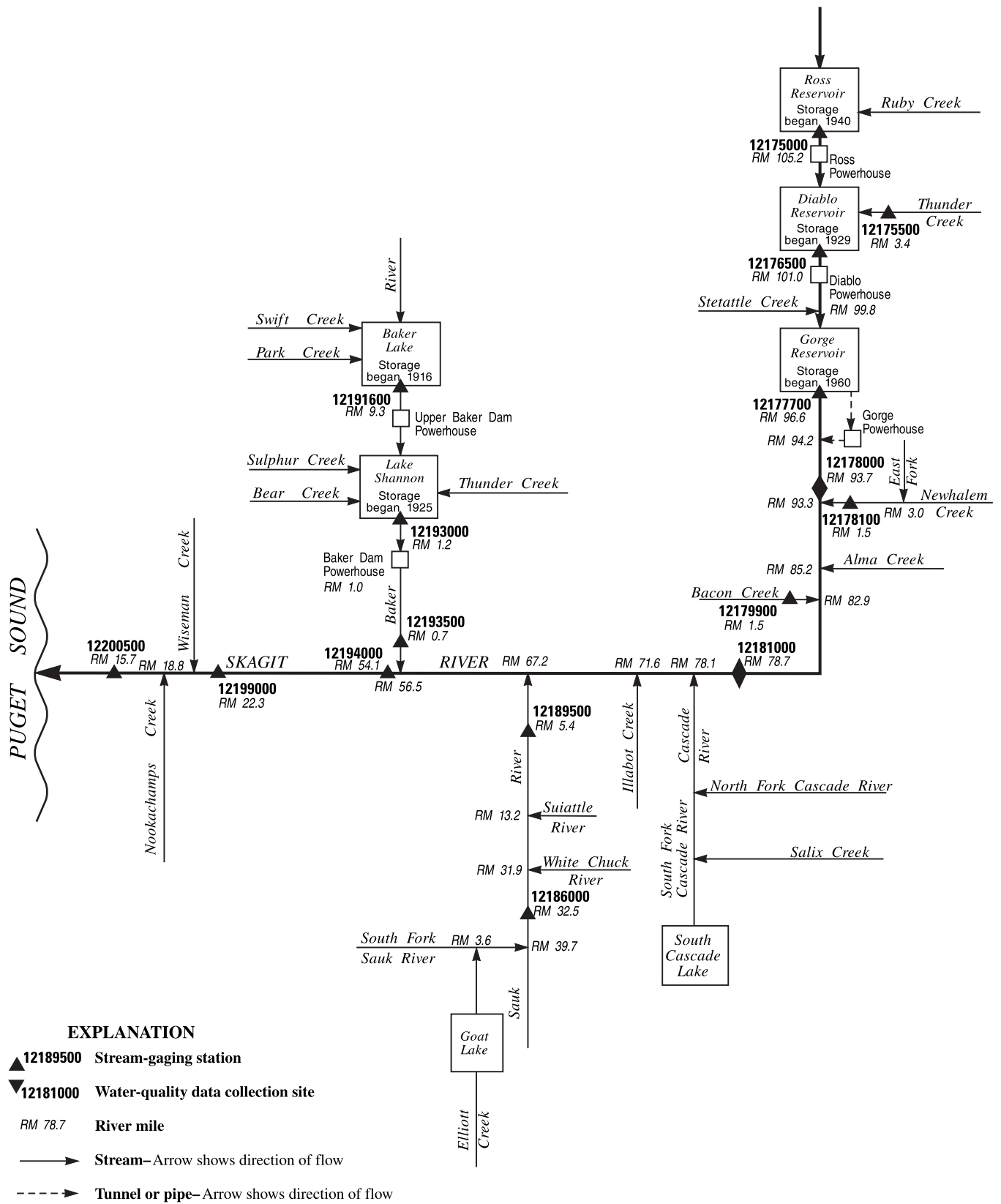


Figure 35. Schematic diagram showing surface-water and water-quality stations in the Skagit River Basin.

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, 1,433,352 acre-ft Aug. 1, elevation, 1,602.38 ft; minimum contents, 906,030 acre-ft Mar. 12, elevation, 1,551.97 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 ABOVE NGVD 1929, FEET
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,597.10	1,589.57	1,582.79	1,578.02	1,569.69	1,557.86	1,559.61	1,561.21	1,580.58	1,601.27	1,602.29	1,597.75
2	1,596.97	1,589.26	1,582.33	1,577.77	1,570.14	1,557.37	1,559.98	1,561.72	1,582.01	1,601.11	1,602.16	1,597.55
3	1,596.81	1,588.95	1,581.98	1,577.58	1,570.45	1,556.82	1,560.26	1,562.11	1,583.11	1,600.92	1,602.09	1,597.20
4	1,596.72	1,588.50	1,581.53	1,577.44	1,570.55	1,555.95	1,560.55	1,562.52	1,584.21	1,600.93	1,601.96	1,597.07
5	1,596.60	1,588.12	1,581.26	1,577.54	1,570.54	1,555.47	1,560.52	1,562.54	1,585.47	1,600.98	1,601.83	1,596.98
6	1,596.52	1,587.93	1,580.94	1,577.11	1,570.43	1,555.01	1,560.44	1,562.91	1,587.00	1,601.21	1,601.93	1,596.82
7	1,596.42	1,587.60	1,580.68	1,576.64	1,570.02	1,554.20	1,560.41	1,562.76	1,589.10	1,601.41	1,601.86	1,596.65
8	1,596.35	1,587.21	1,580.48	1,575.98	1,569.41	1,553.51	1,560.46	1,562.89	1,591.17	1,601.54	1,601.82	1,596.48
9	1,596.13	1,586.80	1,580.14	1,575.34	1,568.81	1,552.90	1,560.62	1,562.81	1,592.98	1,601.56	1,601.72	1,596.27
10	1,595.91	1,586.51	1,579.92	1,574.68	1,567.98	1,552.63	1,560.64	1,562.80	1,594.31	1,601.64	1,601.75	1,596.03
11	1,595.64	1,586.18	1,579.84	1,573.92	1,567.31	1,552.25	1,560.76	1,562.99	1,594.99	1,601.92	1,601.56	1,595.75
12	1,595.47	1,585.91	1,579.83	1,573.51	1,566.73	1,552.10	1,560.82	1,563.07	1,595.55	1,602.13	1,601.25	1,595.58
13	1,595.28	1,585.77	1,579.79	1,572.72	1,566.36	1,553.27	1,561.08	1,563.43	1,595.87	1,602.26	1,600.98	1,595.38
14	1,594.95	1,585.64	1,579.72	1,571.92	1,566.00	1,554.84	1,561.31	1,563.72	1,596.16	1,602.19	1,600.75	1,595.19
15	1,594.47	1,585.44	1,580.03	1,571.15	1,565.71	1,555.88	1,561.41	1,564.09	1,596.32	1,602.12	1,600.44	1,594.76
16	1,594.17	1,585.15	1,580.22	1,570.33	1,565.63	1,556.61	1,561.41	1,564.41	1,596.33	1,602.05	1,600.31	1,594.31
17	1,593.83	1,584.99	1,580.07	1,569.56	1,565.34	1,557.18	1,561.35	1,564.63	1,596.40	1,602.00	1,600.06	1,593.92
18	1,593.61	1,584.63	1,579.98	1,568.69	1,564.88	1,557.57	1,561.16	1,564.68	1,596.69	1,602.11	1,599.93	1,593.52
19	1,593.44	1,584.68	1,579.89	1,567.87	1,564.38	1,557.72	1,560.94	1,564.60	1,597.02	1,602.10	1,599.76	1,593.18
20	1,593.28	1,584.91	1,579.87	1,566.96	1,563.94	1,557.77	1,560.77	1,564.44	1,597.29	1,602.09	1,599.59	1,592.80
21	1,593.05	1,584.95	1,579.76	1,566.25	1,563.64	1,557.71	1,560.46	1,564.33	1,597.51	1,602.07	1,599.39	1,592.51
22	1,592.91	1,584.85	1,579.54	1,565.53	1,563.32	1,558.04	1,560.59	1,564.27	1,597.60	1,602.12	1,599.20	1,592.07
23	1,592.74	1,584.82	1,579.32	1,565.03	1,562.88	1,558.30	1,560.60	1,564.65	1,597.74	1,602.23	1,599.12	1,591.81
24	1,592.47	1,584.60	1,579.00	1,564.52	1,561.94	1,558.57	1,560.58	1,566.15	1,597.94	1,602.25	1,598.82	1,591.45
25	1,592.07	1,584.23	1,578.95	1,564.17	1,560.96	1,558.31	1,560.76	1,568.58	1,598.34	1,602.18	1,598.44	1,591.16
26	1,591.88	1,583.87	1,578.89	1,565.89	1,559.98	1,558.28	1,560.84	1,570.29	1,598.73	1,602.13	1,598.35	1,590.86
27	1,591.73	1,583.57	1,578.80	1,567.46	1,559.12	1,558.09	1,560.99	1,571.39	1,599.36	1,602.16	1,598.23	1,590.69
28	1,591.52	1,583.32	1,578.63	1,567.89	1,558.26	1,557.83	1,561.02	1,573.14	1,600.07	1,602.15	1,598.13	1,590.53
29	1,590.99	1,583.16	1,578.56	1,568.04	---	1,557.82	1,560.96	1,575.19	1,600.78	1,602.09	1,598.03	1,590.24
30	1,590.55	1,583.01	1,578.31	1,568.30	---	1,557.98	1,560.92	1,577.06	1,601.20	1,602.18	1,597.95	1,589.95
31	1,590.02	---	1,578.10	1,568.95	---	1,559.04	---	1,579.01	---	1,602.38	1,597.85	---
MAX	1,597.10	1,589.57	1,582.79	1,578.02	1,570.55	1,559.04	1,561.41	1,579.01	1,601.20	1,602.38	1,602.29	1,597.75
MIN	1,590.02	1,583.01	1,578.10	1,564.17	1,558.26	1,552.10	1,559.61	1,561.21	1,580.58	1,600.92	1,597.85	1,589.95
†	1,291,922	1,215,008	1,162,700	1,068,200	964,164	971,480	989,392	1,172,306	1,419,400	1,433,352	1,380,375	1,291,155
‡	-82,013	-76,914	-52,308	-94,500	-104,036	+7,316	+17,912	+182,914	+247,094	+13,952	-52,977	-89,220
CAL YR	2002	MAX 1,602.36	MIN 1,504.67	AC-FT‡ +35,724								
WTR YR	2003	MAX 1,602.38	MIN 1,552.10	AC-FT‡ -82,780								

† 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 SE 1/4 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 1,300 ft³/s, which are fair. 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.--73 years (water years 1931-2003), 618 ft³/s, 80.00 in/yr, 447,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,500 ft³/s Dec. 26, 1980, gage height, 14.5 ft, from rating curve extended above 3,500 ft³/s; 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)
Jan 26	1530	*3,890	*8.52	Jun 7	2330	2,910	7.33
May 25	0045	2,920	7.34				

Minimum discharge, 98 ft³/s, Jan. 1, gage height, 2.68 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	266	113	151	100	734	144	654	500	1,670	1,320	1,620	809
2	234	111	143	150	569	141	510	594	1,380	1,020	1,360	835
3	277	109	135	253	476	138	437	573	1,280	949	1,210	1,030
4	270	107	127	240	411	135	388	509	1,340	987	1,100	1,120
5	245	108	121	293	364	136	350	470	1,630	1,130	1,240	1,060
6	247	113	116	232	326	142	323	419	2,110	1,260	1,400	989
7	274	132	111	206	296	146	303	377	2,480	1,340	1,180	1,020
8	260	129	106	190	275	135	313	350	2,600	1,310	1,180	870
9	260	128	103	176	257	135	380	350	2,330	1,150	1,270	606
10	233	122	103	164	242	141	359	390	2,130	1,350	1,180	574
11	205	127	106	158	229	158	350	449	1,790	1,610	977	906
12	187	209	151	173	224	218	354	520	1,650	1,710	885	746
13	180	229	170	170	216	754	377	514	1,610	1,720	841	516
14	173	178	182	165	208	928	388	562	1,440	1,370	824	496
15	172	155	279	155	201	695	367	579	1,170	1,240	1,000	422
16	183	152	234	148	197	572	352	494	1,160	1,180	1,100	383
17	188	175	206	141	196	471	346	424	1,410	1,110	1,010	308
18	184	159	175	136	186	404	326	376	1,760	1,180	1,070	365
19	174	651	158	134	179	358	307	344	1,520	1,290	1,080	689
20	177	745	146	131	178	335	298	329	1,210	1,350	959	476
21	171	474	136	131	185	323	320	333	957	1,350	1,020	373
22	168	391	129	140	180	433	358	457	773	1,430	1,030	452
23	162	288	120	259	171	439	385	851	672	1,470	830	524
24	155	226	113	255	158	390	446	1,870	726	1,280	656	449
25	148	190	114	266	155	354	446	2,320	943	1,140	706	599
26	140	172	114	2,680	155	327	411	1,560	1,210	1,270	859	735
27	135	158	116	1,810	151	298	389	1,380	1,700	1,400	742	796
28	131	155	119	906	148	277	382	1,850	1,740	1,460	673	824
29	128	156	110	636	---	261	406	1,980	1,680	1,580	772	786
30	121	154	106	566	---	346	442	1,740	1,780	1,760	890	712
31	115	---	103	874	---	938	---	1,840	---	1,810	905	---
TOTAL	5,963	6,316	4,303	12,038	7,267	10,672	11,467	25,304	45,851	41,526	31,569	20,470
MEAN	192	211	139	388	260	344	382	816	1,528	1,340	1,018	682
MAX	277	745	279	2,680	734	938	654	2,320	2,600	1,810	1,620	1,120
MIN	115	107	103	100	148	135	298	329	672	949	656	308
AC-FT	11,830	12,530	8,540	23,880	14,410	21,170	22,740	50,190	90,950	82,370	62,620	40,600
CFSM	1.83	2.01	1.32	3.70	2.47	3.28	3.64	7.77	14.6	12.8	9.70	6.50
IN.	2.11	2.24	1.52	4.26	2.57	3.78	4.06	8.96	16.24	14.71	11.18	7.25

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 2003, BY WATER YEAR (WY)

MEAN	437	402	312	260	234	219	384	885	1,322	1,326	991	621
MAX	917	1,652	1,023	842	683	663	1,057	1,601	2,072	1,935	1,502	906
(WY)	(1934)	(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 2002 CALENDAR YEAR	FOR 2003 WATER YEAR	WATER YEARS 1931 - 2003
ANNUAL TOTAL	243,701	222,746	
ANNUAL MEAN	668	610	618
HIGHEST ANNUAL MEAN			863
LOWEST ANNUAL MEAN			452
HIGHEST DAILY MEAN	3,530	2,680	8,950
LOWEST DAILY MEAN	103	100	50
ANNUAL SEVEN-DAY MINIMUM	109	109	52
ANNUAL RUNOFF (AC-FT)	483,400	441,800	447,900
ANNUAL RUNOFF (CFSM)	6.36	5.81	5.89
ANNUAL RUNOFF (INCHES)	86.34	78.92	80.00
10 PERCENT EXCEEDS	1,800	1,420	1,360
50 PERCENT EXCEEDS	364	377	420
90 PERCENT EXCEEDS	131	133	135

SKAGIT RIVER BASIN

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, 89,303 acre-ft May 25, elevation, 1,205.37 ft; minimum contents, 81,575 acre-ft Nov. 17, elevation, 1,196.58 ft.

MONTH-END GAGE HEIGHT AND CONTENTS AT 2400
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)
September 30	1,201.62	85,939	--
October 31	1,201.52	85,851	-88
November 30	1,200.53	84,980	-871
December 31	1,201.82	86,115	+1,135
Calendar Year 2002	--	--	-521
January 31	1,200.79	85,209	-906
February 28	1,201.67	85,983	+774
March 31	1,201.18	85,552	-431
April 30	1,201.70	86,010	+458
May 31	1,202.73	86,920	+910
June 30	1,202.31	86,547	-373
July 31	1,201.23	85,596	-951
August 31	1,201.85	86,142	+546
September 30	1,202.86	87,036	+894
Water Year 2003	--	--	+1,097

12177700 GORGE RESERVOIR NEAR NEWHALEM, WA

LOCATION.--Lat 48°41'53", long 121°12'25", in NW $\frac{1}{4}$ 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, 8,908 acre-ft July 14, elevation, 876.72 ft; minimum recorded contents, 6,972 acre-ft Mar. 31, elevation, 868.18 ft.

MONTH-END GAGE HEIGHT AND CONTENTS AT 2400
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)
September 30	871.70	7,720	--
October 31	870.61	7,480	-240
November 30	871.28	7,627	+147
December 31	872.15	7,820	+193
Calendar Year 2002	--	--	+331
January 31	870.60	7,478	-342
February 28	873.53	8,138	+660
March 31	869.63	7,270	-868
April 30	873.12	8,042	+772
May 31	870.13	7,376	-666
June 30	872.72	7,950	+574
July 31	869.99	7,346	-579
August 31	869.99	7,346	-579
September 30	870.77	7,515	+169
Water Year 2003	--	--	-205

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.--95 years (water years 1909-2003), 4,401 ft³/s, 3,188,000 acre-ft/yr, adjusted. 43 years (water years 1961-2003), 4,447 ft³/s, 3,222,000 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, 8,080 ft³/s Jan. 26, gage height, 85.32 ft; minimum discharge, 1,770 ft³/s Oct. 24, 28, gage height, 81.68 ft, result of regulation; minimum daily discharge, 1,800 ft³/s Oct. 24.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2,120	3,200	2,350	2,450	3,260	3,800	3,810	3,840	3,250	6,190	3,780	2,890
2	2,020	2,400	3,170	2,800	2,600	3,550	3,960	3,650	3,450	5,720	3,660	2,690
3	1,950	2,290	3,260	4,460	2,680	4,760	3,570	3,780	3,440	5,580	4,220	3,150
4	1,850	3,150	3,310	3,350	2,640	4,420	3,490	3,670	4,120	4,680	3,520	3,080
5	1,850	3,180	2,590	3,500	3,550	3,940	3,280	4,070	4,130	4,190	3,140	3,200
6	1,840	2,800	2,200	4,520	3,190	3,880	3,370	4,150	4,140	3,210	3,270	3,060
7	1,850	2,510	2,320	5,120	4,960	4,440	3,650	3,570	4,320	3,870	3,200	2,940
8	1,860	2,970	2,080	5,280	5,370	4,880	3,740	4,220	4,060	3,920	3,210	3,080
9	1,830	3,200	2,060	5,590	6,020	3,680	3,370	4,060	3,970	4,420	3,310	2,980
10	1,830	2,180	2,170	4,930	6,070	3,970	3,450	3,900	6,530	3,590	2,940	3,050
11	2,000	3,220	2,130	5,850	6,180	4,080	3,740	3,900	6,390	3,620	3,690	3,450
12	2,630	3,340	2,070	4,390	5,360	4,220	3,450	4,140	6,860	3,620	3,930	3,150
13	2,550	2,830	1,980	5,880	4,020	4,110	3,600	4,070	7,040	3,710	4,040	2,530
14	2,620	1,850	2,110	5,220	3,280	3,050	3,720	4,140	7,090	5,330	3,580	2,520
15	3,530	2,090	2,540	6,030	3,320	2,760	3,700	4,130	7,120	6,390	4,000	3,520
16	2,800	2,790	2,490	6,000	2,570	2,430	4,220	4,040	7,160	4,780	3,160	3,580
17	2,210	2,340	1,970	6,030	3,090	2,610	4,360	3,990	7,120	3,370	7,120	3,810
18	2,100	2,670	2,490	5,550	3,990	2,670	4,540	3,970	7,130	3,500	3,800	3,640
19	1,830	2,850	2,050	5,740	4,410	2,680	4,480	4,010	6,830	3,050	3,650	3,540
20	1,830	2,520	2,100	5,770	4,080	3,290	4,260	4,010	4,890	3,310	2,850	3,640
21	2,030	2,250	1,950	5,490	3,450	3,820	4,450	3,990	5,060	4,260	3,000	2,990
22	2,130	2,770	2,090	5,750	3,890	3,760	4,390	4,050	4,930	3,490	3,600	3,590
23	1,870	2,070	2,430	5,430	3,350	3,180	4,460	4,340	3,770	3,390	2,940	3,330
24	1,800	2,840	2,060	5,380	5,630	3,430	4,450	4,190	3,140	3,300	2,970	3,300
25	2,900	3,250	1,960	4,550	6,540	4,400	4,350	4,150	3,180	4,080	3,930	3,320
26	2,060	3,340	1,950	6,740	6,500	4,050	4,260	3,940	2,880	4,180	3,120	3,350
27	1,900	3,240	1,950	6,640	5,780	3,920	4,390	4,150	3,570	3,060	2,600	2,480
28	2,380	2,380	1,960	4,710	5,370	4,050	4,350	4,200	3,310	3,800	2,470	2,410
29	2,920	2,070	1,950	5,060	---	2,890	4,420	3,820	2,970	3,390	2,440	3,130
30	3,400	2,070	1,950	4,600	---	2,800	4,320	3,380	4,540	3,440	2,330	3,480
31	3,380	---	2,030	3,750	---	4,260	---	3,370	---	3,480	2,360	---
TOTAL	69,870	80,660	69,720	156,560	121,150	113,780	119,600	122,890	146,390	125,920	102,520	94,880
MEAN	2,254	2,689	2,249	5,050	4,327	3,670	3,987	3,964	4,880	4,062	3,307	3,163
MAX	3,530	3,340	3,310	6,740	6,540	4,880	4,540	4,340	7,160	6,390	4,220	3,810
MIN	1,800	1,850	1,950	2,450	2,570	2,430	3,280	3,370	2,880	3,050	2,330	2,410
AC-FT	138,600	160,000	138,300	310,500	240,300	225,700	237,200	243,800	290,400	249,800	203,300	188,200
MEAN†	915	1,384	1,420	3,493	2,480	3,767	4,308	6,943	9,039	4,273	2,444	1,681
CFSM†	0.78	1.18	1.21	2.97	2.11	3.21	3.67	5.91	7.69	3.64	2.08	1.43
IN.†	0.90	1.31	1.39	2.43	2.20	3.70	4.09	6.81	8.58	4.19	2.40	1.60
AC-FT†	56,260	82,360	87,320	214,800	137,700	231,700	256,300	427,000	537,700	262,800	150,300	100,000

CAL YR	2002	TOTAL	1,765,700	MEAN	4,838	MAX	14,400	MIN	1,760	AC-FT	3,502,000	MEAN†	4,886	CFSM†	4.16	IN.†	56.46	AC-FT†	3,538,000
WTR YR	2003	TOTAL	1,323,940	MEAN	3,627	MAX	7,160	MIN	1,800	AC-FT	2,626,000	MEAN†	3,513	CFSM†	2.99	IN.†	40.60	AC-FT†	2,544,000

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

12178000 SKAGIT RIVER AT NEWHALEM, WA—Continued

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 excellent from October 29 to May 12, good from May 13 to June 14, fair from October 1 to October 18 and June 15 to July 17, and poor from October 19 to 28 and July 18 to September 30.

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, 12.0°C July 29, Aug. 1, 4; minimum recorded, 3.7°C Mar. 10, 13, 14.

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	10.0	9.6	9.8	9.1	9.0	9.1	8.2	8.2	8.2	6.5	6.5	6.5
2	9.8	9.7	9.7	9.1	8.9	9.0	8.4	8.2	8.3	6.5	6.4	6.5
3	9.9	9.5	9.7	9.0	8.9	8.9	8.4	8.2	8.3	6.5	6.3	6.4
4	9.8	9.5	9.7	9.0	8.8	8.9	8.4	8.3	8.3	6.5	6.3	6.4
5	9.8	9.7	9.8	9.2	8.8	9.0	8.3	8.3	8.3	6.5	6.4	6.5
6	9.9	9.7	9.8	9.3	9.1	9.3	---	---	---	6.4	6.3	6.4
7	10.1	9.7	9.9	9.3	9.3	9.3	---	---	---	6.5	6.4	6.4
8	10.2	9.9	10	9.3	9.3	9.3	---	---	---	6.5	6.3	6.4
9	10.1	9.9	10.0	9.4	9.3	9.3	---	---	---	6.5	6.2	6.3
10	10.1	9.9	10	9.4	9.3	9.3	---	---	---	6.3	6.0	6.2
11	10.0	9.6	9.8	9.4	9.2	9.3	---	---	---	6.3	6.0	6.2
12	9.8	9.6	9.7	9.4	9.3	9.3	---	---	---	6.3	6.2	6.3
13	9.8	9.5	9.7	9.4	9.2	9.3	---	---	---	6.4	6.2	6.3
14	9.7	9.5	9.6	9.2	9.2	9.2	---	---	---	6.5	6.3	6.3
15	9.8	9.5	9.6	9.2	9.1	9.2	---	---	---	6.4	6.2	6.3
16	9.9	9.6	9.7	9.2	9.1	9.2	---	---	---	6.3	6.1	6.2
17	9.9	9.6	9.8	9.2	9.1	9.2	---	---	---	6.3	6.0	6.1
18	9.8	9.5	9.7	9.2	9.0	9.1	---	---	---	6.2	5.9	6.1
19	9.9	9.4	9.7	9.0	8.9	8.9	---	---	---	6.2	6.0	6.1
20	9.9	9.5	9.8	9.0	8.6	8.8	---	---	---	6.2	6.0	6.1
21	9.9	9.6	9.7	8.6	8.5	8.5	---	---	---	6.2	6.0	6.1
22	9.8	9.5	9.7	8.8	8.5	8.7	---	---	---	6.1	5.9	6.0
23	9.7	9.5	9.6	8.8	8.7	8.8	---	---	---	6.1	5.9	6.0
24	9.6	9.3	9.5	8.7	8.3	8.5	---	---	---	6.0	5.8	5.9
25	9.6	9.3	9.4	8.4	8.2	8.3	---	---	---	6.1	5.9	6.0
26	9.4	9.3	9.4	8.3	8.3	8.4	---	---	---	6.1	4.9	5.7
27	9.4	9.2	9.3	8.5	8.3	8.4	---	---	---	5.7	4.9	5.3
28	9.5	9.2	9.3	8.6	8.4	8.5	---	---	---	5.8	5.7	5.7
29	9.5	9.3	9.4	8.5	8.4	8.4	---	---	---	5.8	5.6	5.7
30	9.3	9.0	9.2	8.4	8.2	8.3	---	---	---	5.7	5.6	5.6
31	9.2	9.0	9.1	---	---	---	---	---	---	5.7	5.5	5.6
MONTH	10.2	9.0	9.6	9.4	8.2	8.9	8.4	8.2	8.3	6.5	4.9	6.1

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.--42 years (water years 1961-2003), 175 ft³/s, 85.15 in/yr, 126,700 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)
Jan 26	----	*1,579	*5.20	May 24	2145	794	4.03
Mar 13	1730	799	4.04				

Minimum discharge, 21 ft³/s, Nov. 3, 4, 5, gage height, 1.08 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	23	63	46	e250	47	312	167	351	224	109	38
2	44	22	58	172	e200	46	214	193	296	181	100	37
3	53	22	54	298	e180	44	171	191	287	172	92	38
4	48	21	50	268	e160	43	151	165	331	175	86	40
5	46	21	47	281	139	47	139	159	430	193	86	39
6	45	27	44	194	126	49	125	138	538	208	94	38
7	43	34	41	181	112	45	123	120	599	216	83	43
8	41	38	39	161	101	43	149	108	549	204	79	46
9	41	41	37	139	92	44	214	113	445	176	80	39
10	42	42	42	116	84	57	171	139	401	196	79	39
11	39	57	48	101	80	120	170	162	326	214	72	59
12	37	173	155	148	75	233	167	191	315	213	66	52
13	35	141	165	135	72	722	169	187	330	236	62	41
14	33	112	223	127	68	575	164	200	290	178	60	37
15	32	88	303	107	65	370	152	192	243	160	61	34
16	32	96	207	92	66	279	145	163	254	151	66	43
17	31	122	163	84	68	206	144	143	314	141	52	42
18	30	120	126	83	62	164	133	125	338	142	51	59
19	29	489	103	82	59	148	119	114	274	146	50	86
20	29	361	88	76	64	143	117	109	217	141	49	62
21	29	244	77	72	77	149	129	118	188	137	47	52
22	28	194	69	103	71	292	140	174	162	141	47	48
23	27	139	61	293	63	218	141	308	149	136	44	46
24	27	106	56	208	57	162	156	581	160	124	41	43
25	26	86	55	e250	54	147	153	552	204	114	39	41
26	25	75	55	e1,600	52	136	139	358	270	114	40	41
27	25	67	57	e350	50	120	127	348	327	116	39	41
28	25	65	56	e300	49	107	124	475	307	114	37	43
29	25	66	51	e250	---	102	137	475	299	114	37	42
30	24	67	48	e240	---	187	154	440	300	117	38	41
31	23	---	45	e400	---	584	---	440	---	115	39	---
TOTAL	1,063	3,159	2,686	6,957	2,596	5,629	4,649	7,348	9,494	5,009	1,925	1,350
MEAN	34.3	105	86.6	224	92.7	182	155	237	316	162	62.1	45.0
MAX	53	489	303	1,600	250	722	312	581	599	236	109	86
MIN	23	21	37	46	49	43	117	108	149	114	37	34
AC-FT	2,110	6,270	5,330	13,800	5,150	11,170	9,220	14,570	18,830	9,940	3,820	2,680
CFSM	1.23	3.77	3.11	8.04	3.32	6.51	5.55	8.50	11.3	5.79	2.23	1.61
IN.	1.42	4.21	3.58	9.28	3.46	7.51	6.20	9.80	12.66	6.68	2.57	1.80

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2003, BY WATER YEAR (WY)

MEAN	123	184	162	137	123	111	150	279	363	263	121	87.3
MAX	351	589	552	340	313	290	267	448	594	476	277	192
(WY)	(1968)	(1996)	(1981)	(1984)	(1991)	(1972)	(1989)	(1972)	(1974)	(1972)	(1999)	(1978)
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)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1961 - 2003

ANNUAL TOTAL	68,303	51,865	
ANNUAL MEAN	187	142	175
HIGHEST ANNUAL MEAN			244
LOWEST ANNUAL MEAN			114
HIGHEST DAILY MEAN	1,690	Jan 7	5,300
LOWEST DAILY MEAN	21	Nov 4	20
ANNUAL SEVEN-DAY MINIMUM	22	Oct 30	22
ANNUAL RUNOFF (AC-FT)	135,500	102,900	126,700
ANNUAL RUNOFF (CFSM)	6.71	5.09	6.27
ANNUAL RUNOFF (INCHES)	91.07	69.15	85.15
10 PERCENT EXCEEDS	471	300	369
50 PERCENT EXCEEDS	103	112	118
90 PERCENT EXCEEDS	42	38	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 mile downstream from Oakes Creek, 5.5 miles 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) 1942-1950.

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

REMARKS.--Records good, except those above 500 ft³/s, which are fair. No regulation or diversion upstream from station. Summer flows augmented by glacial melt. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--12 years (water years 1944-50, 1999-2003), 421 ft³/s, 115.11 in/yr, 305,000 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)
Nov 19	1615	1,820	6.53	Mar 13	1730	2,230	6.99
Jan 26	0830	*4,840	*9.07				

Minimum discharge, 64 ft³/s, Nov. 4, 5, gage height, 2.86 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	130	68	199	199	843	159	660	468	688	516	247	114
2	117	67	177	600	620	156	492	525	597	392	224	112
3	123	66	160	771	513	151	418	499	577	343	204	114
4	117	65	149	780	434	147	365	418	669	329	188	120
5	119	65	142	759	377	165	330	411	833	345	181	119
6	118	75	134	547	335	177	308	341	1,020	372	183	117
7	114	90	127	494	305	172	324	296	1,090	400	173	131
8	109	133	121	434	280	161	418	268	1,020	398	166	137
9	109	169	116	387	260	167	579	300	862	349	168	125
10	111	183	133	325	242	218	456	410	772	381	176	125
11	109	230	154	286	229	370	483	463	651	419	169	199
12	103	659	693	418	217	756	459	513	615	421	153	171
13	99	553	566	355	210	1,980	452	466	705	427	142	135
14	95	383	850	354	202	1,630	429	494	652	367	134	125
15	92	287	996	295	195	1,080	386	467	510	336	134	117
16	89	293	705	260	202	801	368	389	510	313	144	131
17	87	335	534	238	206	617	380	342	606	291	141	137
18	86	370	416	240	194	500	349	303	636	283	142	171
19	85	1,280	338	237	188	423	314	280	531	293	144	251
20	83	1,130	288	220	216	414	312	272	453	286	138	176
21	82	783	251	212	251	467	360	297	427	280	133	142
22	80	579	225	315	242	739	381	427	379	289	134	125
23	79	413	203	853	217	596	378	696	338	287	130	116
24	78	311	189	560	199	475	420	1,130	333	270	121	110
25	76	250	197	604	188	413	397	1,060	392	251	113	106
26	74	214	223	3,120	180	380	351	757	497	243	114	104
27	73	198	234	1,330	171	345	323	719	604	244	113	104
28	74	200	240	816	166	315	322	914	598	245	110	108
29	73	214	214	652	---	300	380	883	588	247	110	109
30	70	222	200	622	---	506	448	861	668	253	112	109
31	69	---	186	1,090	---	1,070	---	839	---	256	115	---
TOTAL	2,923	9,885	9,360	18,373	7,882	15,850	12,042	16,508	18,821	10,126	4,656	3,960
MEAN	94.3	330	302	593	282	511	401	533	627	326	150	132
MAX	130	1,280	996	3,120	843	1,980	660	1,130	1,090	516	247	251
MIN	69	65	116	199	166	147	308	268	333	243	110	104
AC-FT	5,800	19,610	18,570	36,440	15,630	31,440	23,890	32,740	37,330	20,080	9,240	7,850
CFSM	1.90	6.63	6.08	11.9	5.66	10.3	8.08	10.7	12.6	6.57	3.02	2.66
IN.	2.19	7.40	7.01	13.75	5.90	11.86	9.01	12.36	14.09	7.58	3.48	2.96

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2003, BY WATER YEAR (WY)

	MEAN	MAX	(WY)	MIN	(WY)	MEAN	MAX	(WY)	MIN	(WY)	MEAN	MAX	(WY)	MIN	(WY)
	318	574	(1948)	94.3	(2003)	422	954	(1950)	166	(2001)	359	511	(1950)	172	(1949)
	343	619	(2002)	113	(1949)	343	619	(2002)	113	(1949)	302	511	(2003)	160	(2001)
	398	604	(2002)	177	(1948)	398	604	(2002)	260	(1945)	697	1,030	(1949)	518	(1944)
	808	1,267	(1950)	233	(2001)	808	1,267	(1950)	233	(1944)	558	917	(1950)	150	(1944)
	310	644	(1999)	150	(2003)	310	644	(1999)	150	(1944)	233	644	(1999)	150	(2003)

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR	FOR 2003 WATER YEAR	WATER YEARS 1943 - 2003
ANNUAL TOTAL	167,175	130,386	
ANNUAL MEAN	458	357	421
HIGHEST ANNUAL MEAN			578
LOWEST ANNUAL MEAN			290
HIGHEST DAILY MEAN	4,590	3,120	6,200
LOWEST DAILY MEAN	65	65	65
ANNUAL SEVEN-DAY MINIMUM	67	67	67
ANNUAL RUNOFF (AC-FT)	331,600	258,600	305,000
ANNUAL RUNOFF (CFSM)	9.22	7.19	8.47
ANNUAL RUNOFF (INCHES)	125.13	97.59	115.11
10 PERCENT EXCEEDS	985	705	810
50 PERCENT EXCEEDS	286	286	312
90 PERCENT EXCEEDS	117	110	138

12181000 SKAGIT RIVER AT MARBLEMOUNT, WA

LOCATION.--Lat 48°32'02", long 121°25'43", in NE 1/4 SW 1/4 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.--32 years (water years 1947-51, 1977-2003), 6,036 ft³/s, 4,373,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 62,300 ft³/s Nov. 29, 1995, gage height, 13.73 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, 23,200 ft³/s Jan. 26, gage height, 7.86 ft; minimum discharge, 1,950 ft³/s Oct. 24.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2,520	3,710	3,030	3,230	6,890	4,580	6,700	5,560	5,870	7,980	4,640	3,160
2	2,450	2,700	3,950	5,010	5,350	4,290	6,030	5,560	5,700	7,220	4,540	3,130
3	2,430	2,570	3,950	7,610	4,850	5,330	5,510	5,640	5,610	6,900	5,090	3,510
4	2,240	3,370	3,990	6,380	4,530	5,140	5,130	5,260	6,430	6,020	4,230	3,500
5	2,250	3,570	3,300	6,770	5,140	4,680	4,710	5,600	7,310	5,490	3,930	3,600
6	2,220	3,220	2,730	6,690	4,590	4,670	4,660	5,460	7,920	4,720	3,990	3,500
7	2,200	2,890	2,810	7,210	6,020	5,130	4,920	4,760	8,310	5,360	3,890	3,400
8	2,200	3,550	2,520	7,150	6,530	5,470	5,470	5,260	7,900	5,410	3,860	3,550
9	2,160	3,820	2,520	7,300	7,090	4,600	5,740	5,240	7,170	5,600	3,980	3,400
10	2,180	3,030	2,630	6,310	7,160	4,970	5,350	5,260	9,030	5,130	3,620	3,450
11	2,340	4,060	2,760	7,090	7,260	5,670	5,640	5,470	8,720	5,210	4,270	4,140
12	3,000	5,480	4,280	6,310	6,480	7,080	5,280	5,900	8,950	5,200	4,560	3,770
13	3,000	5,030	4,190	7,370	4,960	12,500	5,440	5,760	9,380	5,390	4,590	2,950
14	3,020	3,380	4,960	6,980	4,310	9,690	5,500	5,940	9,320	6,350	4,160	2,890
15	4,000	3,130	6,380	7,000	4,100	7,120	5,290	5,880	8,890	7,790	4,510	3,800
16	3,340	4,000	5,270	7,360	3,500	5,700	5,630	5,580	8,920	6,060	3,750	4,140
17	2,590	3,810	4,130	7,110	3,870	5,110	5,940	5,260	9,230	4,580	4,270	4,260
18	2,470	4,210	4,060	6,800	4,770	4,760	5,900	5,190	9,400	4,640	4,470	4,210
19	2,110	8,040	3,550	6,750	5,050	4,470	5,790	5,100	8,790	4,170	4,230	4,460
20	2,070	6,950	3,290	6,800	5,030	4,840	5,520	5,080	6,770	4,380	3,400	4,340
21	2,240	5,110	2,960	6,570	4,620	5,630	5,880	e5,200	6,620	5,280	3,480	3,530
22	2,470	4,900	3,000	6,960	4,820	6,810	5,870	e5,800	6,350	4,640	4,070	4,040
23	2,130	3,730	3,240	8,770	4,360	5,700	5,900	e7,600	5,300	4,510	3,460	3,810
24	2,000	4,080	2,840	7,630	6,150	5,290	6,010	8,190	4,420	4,320	3,370	3,740
25	3,050	4,250	2,750	7,060	7,310	6,120	5,970	8,170	4,640	5,000	4,280	3,710
26	2,460	4,290	2,770	17,800	7,270	5,790	5,650	6,760	4,750	5,150	3,690	3,760
27	2,150	4,110	2,820	12,500	6,650	5,400	5,620	6,700	5,730	4,070	3,010	2,930
28	2,540	3,330	2,860	8,150	6,270	5,410	5,640	7,540	5,560	4,710	2,820	2,790
29	3,230	2,880	2,740	7,550	---	4,240	5,820	7,240	5,140	4,360	2,780	3,520
30	3,850	2,910	2,670	7,330	---	4,700	5,990	6,590	6,640	4,360	2,650	3,920
31	3,730	---	2,650	8,240	---	8,880	---	6,580	---	4,520	2,680	---
TOTAL	80,640	120,110	105,600	231,790	154,930	179,770	168,500	185,130	214,770	164,520	120,270	108,910
MEAN	2,601	4,004	3,406	7,477	5,533	5,799	5,617	5,972	7,159	5,307	3,880	3,630
MAX	4,000	8,040	6,380	17,800	7,310	12,500	6,700	8,190	9,400	7,980	5,090	4,460
MIN	2,000	2,570	2,520	3,230	3,500	4,240	4,660	4,760	4,420	4,070	2,650	2,790
AC-FT	159,900	238,200	209,500	459,800	307,300	356,600	334,200	367,200	426,000	326,300	238,600	216,000

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2003, BY WATER YEAR (WY)

	4,150	6,510	6,131	6,644	6,735	5,905	5,642	6,502	7,507	7,694	4,905	3,879
MEAN	4,150	6,510	6,131	6,644	6,735	5,905	5,642	6,502	7,507	7,694	4,905	3,879
MAX	7,258	22,270	12,120	8,719	13,830	9,415	9,534	10,690	13,590	14,730	9,214	5,240
(WY)	(1948)	(1991)	(1996)	(1980)	(1991)	(1997)	(1951)	(1997)	(1997)	(1950)	(1999)	(1978)
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)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1943 - 2003

ANNUAL TOTAL	2,450,270	1,834,940	6,036
ANNUAL MEAN	6,713	5,027	9,617
HIGHEST ANNUAL MEAN			3,710
LOWEST ANNUAL MEAN			1,991
HIGHEST DAILY MEAN	22,800	Jan 8	17,800
LOWEST DAILY MEAN	2,000	Oct 24	2,000
ANNUAL SEVEN-DAY MINIMUM	2,210	Oct 4	2,210
ANNUAL RUNOFF (AC-FT)	4,860,000	3,640,000	4,373,000
10 PERCENT EXCEEDS	10,600	7,300	9,160
50 PERCENT EXCEEDS	6,730	4,840	5,430
90 PERCENT EXCEEDS	2,640	2,780	3,200

e Estimated

SKAGIT RIVER BASIN
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 except for the period of May 20 to May 23, which are fair.

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, 13.9°C July 29; minimum, 3.2°C Mar. 12, 13.

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	10.4	8.6	9.6	8.9	7.8	8.3	7.6	7.0	7.4	6.0	5.7	5.9
2	10.2	8.8	9.5	8.5	7.4	8.0	8.1	7.5	7.8	5.7	5.1	5.4
3	10.8	9.5	10.0	8.4	7.1	7.9	7.8	7.1	7.5	5.9	5.0	5.5
4	10.6	9.7	10.1	8.6	7.1	7.9	8.1	7.2	7.7	6.0	5.2	5.7
5	10.3	9.7	10	9.0	7.9	8.5	8.0	7.3	7.7	6.0	5.3	5.7
6	11.1	9.7	10.3	9.2	8.7	8.9	7.6	7.1	7.4	6.1	5.5	5.8
7	11.1	9.8	10.4	9.2	8.8	9.0	7.4	6.8	7.1	6.1	5.4	5.8
8	10.8	9.7	10.3	9.1	8.7	8.9	7.3	6.7	7.0	6.2	5.5	5.9
9	10.9	10.0	10.4	9.1	8.5	8.8	7.3	6.7	7.0	6.0	5.4	5.8
10	10.3	9.3	9.9	8.8	8.4	8.7	7.4	7.1	7.3	5.8	5.2	5.5
11	10.1	8.8	9.3	8.8	8.3	8.6	7.3	7.0	7.1	6.1	5.3	5.7
12	10.1	8.4	9.2	8.7	7.8	8.2	7.0	6.1	6.5	6.0	5.8	5.9
13	10.1	8.3	9.2	8.6	7.6	8.2	6.8	6.2	6.5	6.2	5.5	5.9
14	10.2	8.4	9.3	8.4	8.0	8.1	6.7	6.0	6.4	6.3	5.9	6.1
15	10.4	8.8	9.6	8.5	7.7	8.1	6.5	6.0	6.3	6.2	5.6	5.9
16	10.6	9.2	9.8	8.4	7.7	8.2	6.5	6.2	6.4	6.2	5.7	5.9
17	10.4	9.0	9.7	8.3	7.7	8.0	6.4	6.0	6.2	6.2	5.6	5.9
18	10.1	8.8	9.6	8.1	7.3	7.9	6.5	6.2	6.3	6.1	5.6	5.8
19	10.2	9.4	9.8	7.4	6.8	7.0	6.4	6.0	6.2	6.1	5.4	5.8
20	10.6	9.5	10.0	7.9	7.3	7.6	6.4	6.0	6.2	6.3	5.8	6.0
21	10.7	9.6	10.1	8.1	7.5	7.8	6.4	5.9	6.2	6.0	5.8	5.9
22	10.4	9.1	9.7	8.4	8.0	8.2	6.7	6.2	6.4	5.9	5.6	5.8
23	10.2	8.7	9.4	8.4	7.2	7.9	6.3	5.7	6.0	5.7	5.2	5.5
24	9.9	8.0	8.9	7.8	6.9	7.3	6.0	5.5	5.8	5.9	5.5	5.7
25	9.5	7.6	8.6	7.6	6.6	7.1	6.1	6.0	6.0	6.0	5.6	5.8
26	9.1	8.1	8.6	7.8	6.8	7.4	6.5	5.9	6.1	5.9	5.1	5.3
27	9.0	8.1	8.6	8.1	7.1	7.6	6.0	5.8	5.9	5.6	5.0	5.3
28	9.5	8.7	9.1	8.2	7.3	7.7	6.1	5.5	5.9	5.9	5.3	5.6
29	9.2	8.4	8.8	8.1	7.4	7.7	6.0	5.7	5.9	5.6	5.2	5.3
30	8.9	7.9	8.4	8.0	7.4	7.7	5.8	5.2	5.6	5.8	5.3	5.6
31	8.8	7.5	8.1	---	---	---	6.2	5.6	5.9	5.7	5.3	5.5
MONTH	11.1	7.5	9.5	9.2	6.6	8.0	8.1	5.2	6.6	6.3	5.0	5.7
	FEBRUARY			MARCH			APRIL			MAY		
1	5.9	5.4	5.6	5.8	4.6	5.1	5.7	4.6	5.1	8.3	6.6	7.2
2	6.0	5.6	5.8	5.2	4.6	4.9	6.0	4.5	5.1	8.9	6.6	7.5
3	6.0	5.5	5.7	5.8	4.8	5.2	5.5	4.6	5.0	7.7	6.3	7.0
4	5.7	5.3	5.4	5.6	4.8	5.1	6.1	4.9	5.4	7.9	6.4	7.0
5	5.6	5.1	5.2	5.3	4.9	5.2	5.9	5.0	5.4	7.9	6.2	6.9
6	5.6	4.8	5.1	4.9	4.6	4.8	6.5	5.0	5.6	7.5	5.9	6.7
7	5.5	4.7	5.0	5.1	4.4	4.7	5.9	5.2	5.5	8.2	6.0	7.0
8	5.5	4.7	5.0	5.2	4.3	4.7	6.2	5.2	5.6	8.4	6.2	7.2
9	5.3	4.7	5.0	4.4	3.8	4.2	6.8	5.2	5.9	8.6	6.6	7.4
10	5.4	4.7	5.0	5.0	4.2	4.5	5.9	5.1	5.5	9.0	6.7	7.6
11	5.4	4.6	4.9	4.6	4.3	4.5	6.7	5.4	5.9	9.4	7.0	7.9
12	5.5	4.7	5.0	4.8	3.2	4.4	6.2	5.3	5.7	8.2	7.1	7.5
13	5.6	4.8	5.1	4.3	3.2	3.9	6.3	5.4	5.7	8.7	6.5	7.4
14	5.7	5.1	5.3	5.0	4.2	4.6	7.1	5.5	6.0	7.7	6.9	7.3
15	5.6	5.1	5.3	5.7	4.6	5.1	7.0	5.4	6.0	7.2	6.1	6.7
16	6.0	5.3	5.6	6.0	4.9	5.4	7.1	5.6	6.2	7.6	5.6	6.6
17	6.0	5.0	5.5	6.4	5.1	5.6	6.6	5.7	6.0	7.8	6.1	6.8
18	5.7	5.0	5.3	5.9	5.0	5.3	7.0	5.6	6.1	8.4	6.4	7.1
19	5.7	5.1	5.4	5.9	4.7	5.3	6.6	5.5	6.0	8.5	6.3	7.3
20	5.5	5.0	5.3	5.9	5.2	5.5	7.6	5.8	6.6	7.8	6.9	7.3
21	5.1	4.7	5.0	5.9	5.1	5.4	7.1	6.0	6.5	8.1	7.0	7.5
22	5.3	4.8	5.0	5.4	4.8	5.1	6.4	6.0	6.3	---	---	7.3
23	5.2	4.3	4.7	5.2	4.6	4.8	6.7	5.8	6.2	---	---	8.2
24	5.1	4.0	4.5	5.7	4.4	5.0	6.3	5.8	6.1	9.2	7.1	8.0
25	5.3	4.3	4.7	6.0	4.7	5.1	7.5	5.5	6.3	8.3	6.9	7.5
26	5.4	4.6	4.9	5.4	4.8	5.1	7.3	5.5	6.3	9.0	6.7	7.7
27	5.5	4.6	5.0	6.1	4.9	5.3	7.8	6.1	6.7	9.3	7.3	8.2
28	5.6	4.7	5.0	6.2	4.6	5.3	8.1	5.9	6.9	8.9	7.5	8.1
29	---	---	---	5.9	5.2	5.5	8.2	6.4	7.2	9.9	7.2	8.4
30	---	---	---	---	---	5.6	7.6	6.5	7.0	9.5	7.3	8.3
31	---	---	---	5.8	4.8	5.2	---	---	---	8.7	7.6	8.0
MONTH	6.0	4.0	5.2	6.4	3.2	5.0	8.2	4.5	6.0	9.9	5.6	7.4

SKAGIT RIVER BASIN

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

LOCATION.--Lat 48°10'08", long 121°28'10", on north line NE 1/4 NE 1/4 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 discharges, which are fair. No regulation or diversion upstream from station. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--79 years (water years 1918-20, 1922, 1929-2003), 1,125 ft³/s, 100.57 in/yr, 815,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,100 ft³/s Dec. 26, 1980, gage height, 16.03 ft, from rating curve extended above 15,000 ft³/s; 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)
Jan 26	1230	*10,800	*8.30	Mar 13	0300	6,970	6.98
Jan 31	0600	4,890	6.09				

Minimum daily discharge, 90 ft³/s, Nov. 6.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	251	e100	444	457	2,920	370	2,020	959	2,260	1,150	370	215
2	214	e100	415	1,290	2,080	356	1,550	1,090	1,970	901	332	215
3	276	e95	372	2,050	1,700	339	1,330	1,180	1,820	823	301	217
4	349	e95	342	1,800	1,410	325	1,140	1,100	1,890	812	270	219
5	280	e95	320	2,000	1,190	378	1,020	1,070	2,220	832	263	219
6	263	e90	300	1,360	1,030	413	944	958	2,690	832	277	219
7	243	e100	283	1,140	917	374	886	862	3,010	849	250	223
8	226	164	266	1,000	825	347	968	800	2,990	800	235	223
9	212	290	253	908	752	549	1,170	801	2,670	681	239	223
10	207	333	298	803	685	860	1,100	861	2,280	706	232	223
11	199	403	444	714	634	1,810	1,130	1,020	1,890	800	227	228
12	180	930	1,150	882	595	3,100	1,160	1,220	1,840	797	226	277
13	167	1,530	1,210	966	565	6,220	1,230	1,190	1,840	805	222	297
14	157	971	1,450	857	529	4,600	1,220	1,300	1,690	665	219	288
15	148	664	2,330	752	505	3,100	1,100	1,460	1,430	605	219	274
16	142	631	1,780	667	519	2,350	1,040	1,330	1,410	572	224	262
17	137	1,160	1,350	607	598	1,810	1,030	1,160	1,580	529	220	253
18	133	958	1,040	583	519	1,470	978	1,010	1,800	500	220	245
19	129	3,890	833	577	481	1,250	889	916	1,520	517	220	252
20	127	2,700	706	553	580	1,180	838	881	1,260	495	217	294
21	125	1,860	613	554	823	1,350	883	926	1,110	479	214	295
22	121	1,350	546	837	854	2,500	929	1,110	989	493	214	287
23	119	1,050	492	2,310	687	1,980	929	1,570	870	491	210	275
24	117	822	450	1,650	572	1,490	1,090	2,740	805	459	205	263
25	e110	676	433	1,610	509	1,280	1,040	2,990	908	399	204	254
26	e105	579	458	7,600	477	1,190	952	2,250	1,170	380	208	245
27	e105	511	513	4,210	433	1,090	873	2,020	1,420	385	211	238
28	e110	473	546	2,490	399	975	844	2,650	1,380	381	211	236
29	e110	459	462	1,990	---	876	887	2,680	1,340	380	214	237
30	e105	451	429	2,370	---	943	935	2,550	1,410	384	215	236
31	e105	---	413	4,250	---	2,580	---	2,540	---	382	215	---
TOTAL	5,272	23,530	20,941	49,837	23,788	47,455	32,105	45,194	51,462	19,284	7,304	7,432
MEAN	170	784	676	1,608	850	1,531	1,070	1,458	1,715	622	236	248
MAX	349	3,890	2,330	7,600	2,920	6,220	2,020	2,990	3,010	1,150	370	297
MIN	105	90	253	457	399	325	838	800	805	380	204	215
AC-FT	10,460	46,670	41,540	98,850	47,180	94,130	63,680	89,640	102,100	38,250	14,490	14,740
CFSM	1.12	5.16	4.44	10.6	5.59	10.1	7.04	9.59	11.3	4.09	1.55	1.63
IN.	1.29	5.76	5.13	12.20	5.82	11.61	7.86	11.06	12.59	4.72	1.79	1.82

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1918 - 2003, BY WATER YEAR (WY)

MEAN	797	1,199	1,228	1,022	902	780	1,080	1,877	2,180	1,399	593	479
MAX	2,174	4,117	3,512	2,584	2,369	2,442	1,991	2,965	3,648	2,875	1,393	1,504
(WY)	(1968)	(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 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1918 - 2003

ANNUAL TOTAL	432,825	333,604	
ANNUAL MEAN	1,186	914	1,125
HIGHEST ANNUAL MEAN			1,557
LOWEST ANNUAL MEAN			631
HIGHEST DAILY MEAN	9,600	Jan 8	27,000
LOWEST DAILY MEAN	90	Nov 6	90
ANNUAL SEVEN-DAY MINIMUM	96	Nov 1	96
ANNUAL RUNOFF (AC-FT)	858,500	661,700	815,100
ANNUAL RUNOFF (CFSM)	7.80	6.01	7.40
ANNUAL RUNOFF (INCHES)	105.93	81.65	100.57
10 PERCENT EXCEEDS	2,800	1,990	2,340
50 PERCENT EXCEEDS	648	681	811
90 PERCENT EXCEEDS	207	212	292

e Estimated

12189500 SAUK RIVER NEAR SAUK, WA

LOCATION.--Lat 48°25'29", long 121°34'02", in NW $\frac{1}{4}$ NW $\frac{1}{4}$ 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 good. No regulation. Small diversion for millpond at Darrington and for domestic use.

AVERAGE DISCHARGE.--75 years (water years 1929-2003), 4,338 ft³/s, 82.54 in/yr, 3,142,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 98,600 ft³/s Dec. 26, 1980, gage height, 18.24 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)
Jan 26	1430	*34,200	*11.45	Mar 13	0630	26,100	10.23

Minimum discharge, 633 ft³/s, Nov. 5, gage height, 2.69 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1,210	683	1,440	1,780	8,840	1,680	6,560	3,350	7,310	4,500	2,200	1,240
2	1,080	673	1,360	5,280	6,570	1,630	5,150	3,650	6,350	3,560	2,030	1,210
3	1,230	663	1,290	7,400	5,520	1,580	4,540	3,950	5,750	3,280	1,890	1,280
4	1,590	654	1,240	5,770	4,740	1,530	4,060	3,690	5,920	3,240	1,730	1,380
5	1,300	645	1,210	7,140	4,200	1,610	3,710	3,600	6,910	3,330	1,740	1,340
6	1,310	667	1,150	4,640	3,750	1,910	3,490	3,250	8,630	3,440	1,830	1,280
7	1,230	780	1,110	3,940	3,390	1,810	3,390	2,960	9,990	3,500	1,730	1,290
8	1,180	892	1,060	3,500	3,110	1,690	e4,100	2,770	10,200	3,400	1,600	1,220
9	1,130	1,300	1,030	3,180	2,860	2,160	e4,200	2,730	9,030	2,960	1,670	1,120
10	1,090	1,390	1,160	2,840	2,660	3,590	e4,100	2,860	7,970	3,020	1,700	991
11	1,070	1,910	1,540	2,580	2,510	5,910	e2,300	3,230	6,500	3,400	1,550	1,330
12	998	2,580	3,650	3,520	2,380	9,330	4,200	3,800	6,090	3,540	1,460	1,740
13	969	4,120	4,070	3,550	2,280	22,900	4,230	3,690	6,110	3,510	1,400	1,230
14	935	2,850	4,250	3,210	2,170	15,700	4,230	3,990	5,740	3,010	1,390	1,070
15	902	2,050	7,750	2,800	2,080	10,100	3,890	4,320	4,740	2,800	1,420	1,020
16	893	1,800	5,460	2,520	2,100	7,750	3,650	4,210	4,680	2,670	1,540	997
17	878	3,210	4,390	2,320	2,410	6,150	3,610	3,870	5,020	2,550	1,520	1,050
18	860	2,590	3,310	2,230	2,190	5,090	3,450	3,420	6,170	2,440	1,490	956
19	842	9,590	2,710	2,200	2,010	4,440	3,170	3,170	5,280	2,540	1,510	1,260
20	828	7,750	2,370	2,100	2,380	4,230	3,000	3,120	4,410	2,490	1,430	1,340
21	822	4,880	2,120	2,140	2,930	4,570	3,100	3,240	3,940	2,530	1,400	1,090
22	811	3,680	1,930	3,290	3,100	8,510	3,200	3,640	3,520	2,550	1,440	1,020
23	794	2,810	1,780	8,000	2,580	6,960	3,210	4,630	3,150	2,510	1,330	1,070
24	782	2,310	1,650	5,460	2,220	5,340	3,660	7,780	2,940	2,400	1,210	1,040
25	762	1,970	1,640	5,370	2,040	4,630	3,720	9,600	3,240	2,150	1,170	1,020
26	745	1,770	1,910	22,700	1,950	4,430	3,380	7,020	3,980	2,070	1,290	1,120
27	734	1,620	2,080	13,600	1,840	4,190	3,130	6,080	5,160	2,150	1,290	1,160
28	779	1,540	2,460	8,020	1,760	3,840	3,000	7,990	5,420	2,150	1,190	1,160
29	766	1,490	1,990	6,350	---	3,510	3,100	8,630	5,070	2,160	1,210	1,140
30	717	1,470	1,810	7,550	---	3,780	3,350	8,000	5,300	2,220	1,260	1,090
31	690	---	1,730	12,700	---	7,670	---	8,230	---	2,200	1,270	---
TOTAL	29,927	70,337	72,650	167,680	86,570	168,220	113,810	144,470	174,520	88,270	46,890	35,254
MEAN	965	2,345	2,344	5,409	3,092	5,426	3,794	4,660	5,817	2,847	1,513	1,175
MAX	1,590	9,590	7,750	22,700	8,840	22,900	6,560	9,600	10,200	4,500	2,200	1,740
MIN	690	645	1,030	1,780	1,760	1,530	3,000	2,730	2,940	2,070	1,170	956
AC-FT	59,360	139,500	144,100	332,600	171,700	333,700	225,700	286,600	346,200	175,100	93,010	69,930
CFSM	1.35	3.28	3.28	7.58	4.33	7.60	5.31	6.53	8.15	3.99	2.12	1.65
IN.	1.56	3.66	3.79	8.74	4.51	8.76	5.93	7.53	9.09	4.60	2.44	1.84

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2003, BY WATER YEAR (WY)

	2,832	4,428	4,634	4,164	3,792	3,281	3,995	6,479	7,897	5,653	2,807	2,075
MEAN	2,832	4,428	4,634	4,164	3,792	3,281	3,995	6,479	7,897	5,653	2,807	2,075
MAX	6,770	14,690	11,580	8,615	9,062	9,443	7,375	10,570	13,520	10,610	5,529	4,941
(WY)	(1968)	(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)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1929 - 2003

ANNUAL TOTAL	1,606,304	1,198,598	
ANNUAL MEAN	4,401	3,284	4,338
HIGHEST ANNUAL MEAN			6,048
LOWEST ANNUAL MEAN			2,662
HIGHEST DAILY MEAN	36,600	Jan 8	22,900
LOWEST DAILY MEAN	645	Nov 5	645
ANNUAL SEVEN-DAY MINIMUM	668	Oct 31	668
ANNUAL RUNOFF (AC-FT)	3,186,000		2,377,000
ANNUAL RUNOFF (CFSM)	6.16		4.60
ANNUAL RUNOFF (INCHES)	83.69		62.45
10 PERCENT EXCEEDS	9,870		6,520
50 PERCENT EXCEEDS	2,810		2,580
90 PERCENT EXCEEDS	1,120		1,050
			69,900
			578
			604
			3,142,000
			6.08
			82.54
			8,320
			3,330
			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 $\frac{1}{4}$ 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, 283,934 acre-ft July 14, elevation, 723.69 ft; minimum contents, 137,037 acre-ft Mar. 9, elevation, 687.36 ft.

MONTH-END ELEVATION AND CONTENTS AT 2400
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Elevation (feet)	Contents (acre- feet)	Change in contents (acre- feet)
September 30	709.23	217,055	--
October 31	702.93	191,264	-25,791
November 30	704.66	198,123	+6,859
December 31	705.39	201,067	+2,944
Calendar Year 2002	--	--	+34,991
January 31	705.40	201,108	+41
February 28	690.56	147,101	-54,007
March 31	712.60	231,732	+84,631
April 30	701.61	186,152	-45,580
May 31	719.15	261,844	+75,692
June 30	721.68	274,036	+12,192
July 31	721.42	272,769	-1,267
August 31	715.38	244,257	-28,512
September 30	710.71	223,431	-20,826
Water Year 2003	--	--	+6,376

12193000 LAKE SHANNON AT CONCRETE, WA

LOCATION.--Lat 48°32'53", long 121°44'22", in SW ¼ 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, 157,105 acre-ft Jan. 29, elevation, 437.53 ft; minimum contents, 56,010 acre-ft Oct. 1, elevation, 382.89 ft.

MONTH-END ELEVATION AND CONTENTS AT 2400
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

Date	Elevation (feet)	Contents (acre- feet)	Change in contents (acre- feet)
October 31	408.26	99,263	+43,253
November 30	420.32	121,786	+22,523
December 31	426.47	133,846	+12,060
Calendar Year 2002	--	--	-2,985
January 31	437.35	156,709	+22,863
February 28	425.33	131,572	-25,137
March 31	422.43	125,866	-5,706
April 30	402.13	88,050	-37,816
May 31	407.16	97,222	+9,172
June 30	419.81	120,814	+23,592
July 31	433.17	147,682	+26,868
August 31	423.79	128,529	-19,153
September 30	411.83	105,900	-22,629
Water Year 2003	--	--	+49,890

12194000 SKAGIT RIVER NEAR CONCRETE, WA

LOCATION.--Lat 48°31'28", long 121°46'11", in SE ¼ NE ¼ 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.--79 years (water years 1925-2003), 15,030 ft³/s, 10,890,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 160,000 ft³/s Nov. 29, 1995, gage height, 41.57 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, 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, 65,500 ft³/s Jan. 26, gage height, 28.60 ft; minimum discharge, 3,280 ft³/s Oct. 24.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4,180	5,000	5,410	8,500	26,700	7,250	19,900	13,200	19,700	16,400	10,400	6,760
2	4,120	4,360	8,420	14,300	19,800	9,020	16,800	11,400	19,400	14,000	8,200	7,140
3	4,130	4,020	7,160	22,100	17,400	8,540	15,200	11,000	18,200	13,300	9,870	7,590
4	4,570	4,240	6,500	18,900	15,700	10,300	15,000	10,300	18,900	11,900	9,380	7,050
5	4,180	4,790	5,240	22,200	15,100	8,660	14,100	12,200	20,900	11,400	9,330	7,770
6	4,160	4,510	4,950	17,900	14,600	9,340	13,500	11,800	23,000	11,700	9,070	6,740
7	4,070	4,480	6,410	13,200	14,400	10,100	12,300	10,800	26,000	10,300	9,020	7,590
8	3,980	4,760	7,030	12,700	15,100	10,300	14,100	11,500	26,300	11,500	8,620	7,280
9	3,980	5,570	7,090	14,700	15,100	10,600	15,500	8,880	23,900	11,000	8,620	7,490
10	4,470	5,690	6,130	14,900	e15,000	10,200	15,700	8,960	23,700	11,700	8,660	4,750
11	4,150	6,190	6,490	14,700	15,000	14,800	15,700	9,550	22,100	11,800	8,700	7,490
12	4,160	9,450	9,380	14,600	e15,000	20,300	15,500	10,800	20,500	10,400	7,170	6,370
13	4,320	11,600	13,600	15,200	e13,000	42,700	15,400	13,300	21,100	10,500	6,970	5,600
14	4,510	8,220	14,500	15,200	11,300	33,200	15,500	11,100	21,000	10,700	6,620	6,560
15	5,630	8,250	22,400	14,200	7,050	23,000	13,600	11,600	18,900	14,300	6,870	6,240
16	5,450	7,640	18,200	14,000	8,980	20,900	14,700	14,200	18,500	12,800	7,100	7,030
17	4,850	10,700	15,700	11,900	9,470	17,300	15,100	10,600	19,100	11,400	8,190	7,950
18	4,240	10,900	13,300	11,900	10,100	15,200	14,800	9,760	20,900	10,400	7,170	6,470
19	4,020	23,600	12,200	12,400	10,400	14,100	14,300	9,250	19,500	9,730	8,530	8,890
20	3,860	24,300	9,260	11,100	10,600	13,500	12,700	9,110	16,800	9,760	8,050	8,430
21	3,930	17,300	7,170	12,600	11,500	15,900	13,100	9,120	14,900	10,600	7,550	7,540
22	4,090	14,700	8,340	15,000	8,970	21,300	14,400	10,200	14,100	10,400	8,270	6,470
23	3,860	12,800	6,690	22,200	9,160	20,400	14,400	15,000	11,800	10,100	7,290	7,260
24	3,740	11,500	5,510	19,800	11,500	16,300	15,000	20,200	9,930	10,000	7,310	6,980
25	4,070	11,100	5,380	18,900	13,000	12,800	15,400	24,800	9,210	10,200	8,110	6,150
26	4,350	10,900	5,690	43,200	13,000	14,800	14,400	19,700	10,600	9,750	8,300	7,180
27	3,780	10,600	5,770	40,300	12,200	14,100	14,000	18,200	13,800	9,090	7,300	6,250
28	3,880	9,790	6,750	27,600	8,970	12,100	13,700	20,400	13,500	8,730	6,960	6,080
29	4,510	6,520	5,890	23,300	---	9,610	14,000	22,600	12,600	9,660	6,880	7,280
30	5,520	5,500	6,780	24,800	---	9,450	13,700	21,000	15,000	8,910	4,500	7,210
31	5,020	---	7,970	31,400	---	21,400	---	21,200	---	9,680	6,590	---
TOTAL	133,780	278,980	271,310	573,700	368,100	477,470	441,500	421,730	543,840	342,110	245,600	209,590
MEAN	4,315	9,299	8,752	18,510	13,150	15,400	14,720	13,600	18,130	11,040	7,923	6,986
MAX	5,630	24,300	22,400	43,200	26,700	42,700	19,900	24,800	26,300	16,400	10,400	8,890
MIN	3,740	4,020	4,950	8,500	7,050	7,250	12,300	8,880	9,210	8,730	4,500	4,750
AC-FT	265,400	553,400	538,100	1,138,000	730,100	947,100	875,700	836,500	1,079,000	678,600	487,100	415,700

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 2003, BY WATER YEAR (WY)

MEAN	11,050	15,490	15,880	14,830	13,790	12,180	13,820	20,310	24,510	19,190	10,820	8,459
MAX	22,550	49,160	34,660	25,240	28,840	23,380	29,270	36,310	43,320	37,430	20,930	16,400
(WY)	(1968)	(1991)	(1976)	(1935)	(1991)	(1972)	(1934)	(1925)	(1972)	(1972)	(1976)	(1959)
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)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1925 - 2003

ANNUAL TOTAL	5,823,840	4,307,710		
ANNUAL MEAN	15,960	11,800	15,030	
HIGHEST ANNUAL MEAN			21,270	1991
LOWEST ANNUAL MEAN			9,512	2001
HIGHEST DAILY MEAN	79,700	Jan 8	43,200	Jan 26
LOWEST DAILY MEAN	3,740	Oct 24	3,740	Oct 24
ANNUAL SEVEN-DAY MINIMUM	3,940	Oct 19	3,940	Oct 19
ANNUAL RUNOFF (AC-FT)	11,550,000		8,544,000	10,890,000
10 PERCENT EXCEEDS	29,200		20,300	26,100
50 PERCENT EXCEEDS	14,000		10,600	12,800
90 PERCENT EXCEEDS	4,910		4,910	6,690

e Estimated

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 on occasion may be affected by backwater from Skagit River during high flows. 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 12196000) since July 1959 and Shannon Lake (station 12193000) since November 1925. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--64 years (water years 1911-14, 1944-2003), 2,650 ft³/s, 121.25 in/yr, 1,920,000 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, 6,480 ft³/s Jan. 30, 31, Feb. 1, elevation, 176.25 ft; minimum discharge, 56 ft³/s, Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	589	547	2,920	5,790	85	3,020	3,020	3,250	1,970	2,660	2,300
2	61	679	2,900	3,030	3,970	2,440	3,090	911	4,430	1,560	754	2,420
3	61	528	1,700	3,740	3,960	1,520	2,980	82	4,320	1,720	2,410	2,590
4	70	559	991	4,060	3,890	2,940	4,030	83	4,420	1,140	2,760	1,790
5	90	556	102	4,080	3,950	1,710	4,050	1,930	4,130	1,480	2,960	2,510
6	92	513	557	3,890	3,990	2,040	3,740	1,910	3,440	1,780	2,580	1,610
7	106	581	2,140	86	4,020	2,730	2,790	1,820	4,190	122	2,790	2,550
8	88	503	3,030	83	4,050	2,650	2,900	2,760	4,190	1,290	2,590	2,160
9	169	525	3,130	2,630	4,100	2,740	e2,900	78	4,060	1,360	2,560	2,500
10	745	635	2,070	3,920	4,090	1,170	4,100	77	3,990	2,030	2,700	99
11	389	548	1,670	3,880	4,050	2,730	4,110	77	3,900	1,730	2,520	1,910
12	128	1,680	1,320	2,920	4,040	2,810	4,110	105	3,140	98	654	99
13	128	664	2,900	2,620	4,030	2,220	4,100	2,720	3,400	98	672	814
14	400	534	4,000	2,800	3,460	90	3,950	122	3,230	716	696	2,250
15	971	2,190	4,240	3,300	86	88	2,910	118	3,110	2,400	766	1,670
16	847	1,590	4,170	2,840	2,190	3,120	4,080	3,120	2,960	2,830	1,180	1,720
17	921	2,540	4,140	1,330	2,370	2,790	4,130	243	3,010	2,790	2,320	2,540
18	591	3,510	4,050	1,660	2,510	2,810	4,040	118	2,770	2,360	742	1,320
19	579	4,280	3,910	2,420	2,700	3,130	4,000	114	2,990	1,850	2,410	2,820
20	569	4,190	2,270	1,390	2,460	2,940	2,910	105	3,130	1,930	2,530	2,430
21	633	4,140	849	2,870	2,730	4,070	3,070	105	2,510	2,130	2,380	2,450
22	512	4,130	2,510	3,940	107	3,420	4,020	123	2,510	2,040	2,550	1,470
23	526	4,130	844	3,000	928	4,040	4,060	2,650	1,380	2,070	1,830	2,140
24	562	4,130	88	3,990	2,950	2,870	4,070	2,020	1,310	2,340	2,540	2,070
25	546	4,120	89	3,420	2,970	88	4,060	2,400	91	2,490	2,670	1,240
26	553	4,120	92	3,050	3,060	2,660	4,010	2,360	349	1,800	2,790	2,220
27	514	4,110	94	4,090	2,820	2,880	3,990	2,730	1,320	1,790	2,520	1,540
28	524	3,920	95	6,070	438	1,360	3,930	1,980	92	1,380	2,530	1,750
29	569	1,400	108	6,070	---	88	4,040	3,120	92	2,200	2,460	2,650
30	1,160	537	1,320	6,400	---	89	3,130	3,060	1,430	1,460	97	2,070
31	651	---	2,680	6,430	---	2,530	---	2,860	---	2,220	2,220	---
TOTAL	13,814	62,131	58,606	102,929	85,709	66,848	110,320	42,921	83,144	53,174	63,841	57,702
MEAN	446	2,071	1,891	3,320	3,061	2,156	3,677	1,385	2,771	1,715	2,059	1,923
MAX	1,160	4,280	4,240	6,430	5,790	4,070	4,130	3,120	4,430	2,830	2,960	2,820
MIN	59	503	88	83	86	85	2,790	77	91	98	97	99
AC-FT	27,400	123,200	116,200	204,200	170,000	132,600	218,800	85,130	164,900	105,500	126,600	114,500
CFSM	1.50	6.97	6.37	11.2	10.3	7.26	12.4	4.66	9.33	5.78	6.93	6.48
IN.	1.73	7.78	7.34	12.89	10.74	8.37	13.82	5.38	10.41	6.66	8.00	7.23
MEAN†	729	2,565	2,133	3,693	1,636	3,439	2,276	2,764	3,374	2,132	1,284	1,194
CFSM†	2.45	8.64	7.18	12.43	5.51	11.58	7.66	9.31	11.36	7.18	4.32	4.02
IN.†	2.83	9.63	8.28	14.34	5.74	13.35	8.55	10.73	12.67	8.28	4.98	4.48
AC-FT†	44,860	152,600	131,200	227,100	90,860	211,500	135,400	170,000	200,700	131,100	78,940	71,040

CAL YR 2002 TOTAL 974,489 MEAN 2,670 MAX 13,500 MIN 59 AC-FT 1,933,000 MEAN† 2,714 CFSM† 9.14 IN.† 124.05 AC-FT† 1,965,000
WTR YR 2003 TOTAL 801,139 MEAN 2,195 MAX 6,430 MIN 59 AC-FT 1,589,000 MEAN† 2,272 CFSM† 7.65 IN.† 103.85 AC-FT† 1,645,000

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

12200500 SKAGIT RIVER NEAR MOUNT VERNON, WA

LOCATION.--Lat 48°26'42", long 122°20'03", in SE 1/4 SE 1/4 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.--63 years (water years 1941-2003), 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)
Jan 27	0645	*59,400	*26.17	Mar 13	2214	51,800	24.61

Minimum discharge, 4,030 ft³/s, Oct. 25, gage height, 8.51 ft.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5,120	5,430	6,820	10,100	33,600	9,770	23,600	15,000	20,800	16,900	11,000	7,320
2	4,950	5,270	7,660	14,400	24,800	9,420	20,000	14,100	20,500	15,200	10,300	7,730
3	4,990	4,660	8,760	23,600	20,800	10,400	17,800	12,600	19,100	14,300	9,040	8,050
4	5,310	4,600	7,870	22,400	18,800	10,900	17,700	12,300	19,100	12,800	10,500	7,790
5	5,050	5,120	7,670	26,100	17,200	10,400	16,600	13,100	20,700	12,200	10,100	8,260
6	4,900	5,230	6,280	21,100	16,800	11,300	16,200	13,600	22,100	12,600	9,730	7,740
7	4,860	5,290	6,860	17,100	15,700	11,300	14,600	12,800	25,200	12,000	9,730	8,060
8	4,750	5,440	7,770	15,100	16,800	11,600	17,200	12,200	26,300	11,500	9,480	8,040
9	4,690	6,820	8,070	15,100	16,500	12,600	19,900	11,700	24,900	12,000	9,150	8,330
10	4,690	7,390	7,680	16,900	16,500	13,600	19,800	10,600	23,500	12,000	9,400	7,240
11	5,260	7,560	8,190	15,900	16,100	16,100	18,500	10,800	23,300	12,600	9,230	7,240
12	4,660	9,200	10,800	16,900	15,700	23,100	18,500	11,600	21,000	12,000	8,990	7,790
13	4,940	12,700	16,000	17,700	14,700	41,000	18,000	13,100	21,200	11,200	7,830	6,720
14	5,000	10,700	15,700	18,400	13,500	45,200	18,100	13,300	21,600	11,400	7,610	6,810
15	5,410	8,650	25,700	17,100	10,200	30,300	16,200	12,800	20,000	13,100	7,270	7,300
16	6,120	8,730	22,700	16,100	10,000	25,100	16,700	14,100	19,200	13,500	7,800	7,500
17	5,620	10,800	19,700	15,100	11,500	20,900	16,900	14,000	19,100	12,700	8,140	8,130
18	5,050	12,000	16,300	13,300	11,500	18,600	17,100	11,800	20,700	11,200	8,620	7,690
19	4,770	21,100	14,700	13,500	12,100	17,100	16,500	11,100	20,500	11,200	8,220	8,430
20	4,540	28,800	12,000	13,000	13,100	16,200	15,100	10,800	18,400	10,200	9,050	9,140
21	4,520	19,900	10,100	13,700	14,600	18,900	14,700	10,900	15,900	10,800	8,200	8,690
22	4,570	16,400	9,590	16,000	13,700	25,000	16,000	11,300	15,400	11,300	8,440	7,330
23	4,590	14,700	9,780	22,200	11,500	26,700	16,000	13,800	14,600	10,900	8,530	7,920
24	4,420	12,600	7,770	23,600	12,200	21,900	16,500	18,500	10,700	10,600	7,850	7,540
25	4,330	12,200	7,450	21,600	14,400	16,800	17,500	24,700	11,200	10,700	8,230	8,140
26	5,020	11,900	8,290	32,200	14,400	16,800	16,400	21,700	11,100	10,900	9,050	6,950
27	4,470	11,600	8,320	53,000	14,000	17,100	15,700	19,300	12,800	9,870	8,300	7,850
28	4,360	11,200	9,940	33,600	12,000	16,200	15,300	20,100	14,900	9,590	e8,610	6,560
29	4,790	9,370	8,560	26,500	---	13,200	15,300	22,800	13,500	10,300	e7,670	7,510
30	5,470	7,140	7,960	27,200	---	12,100	15,300	22,000	13,500	9,970	6,790	8,530
31	5,510	---	9,640	32,500	---	19,300	---	21,500	---	9,830	6,240	---
TOTAL	152,730	312,500	334,630	641,000	432,700	568,890	513,700	458,000	560,800	365,360	269,100	232,330
MEAN	4,927	10,420	10,790	20,680	15,450	18,350	17,120	14,770	18,690	11,790	8,681	7,744
MAX	6,120	28,800	25,700	53,000	33,600	45,200	23,600	24,700	26,300	16,900	11,000	9,140
MIN	4,330	4,600	6,280	10,100	10,000	9,420	14,600	10,600	10,700	9,590	6,240	6,560
AC-FT	302,900	619,800	663,700	1,271,000	858,300	1,128,000	1,019,000	908,400	1,112,000	724,700	533,800	460,800

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

	MEAN	12,170	18,030	18,650	17,630	16,730	14,340	15,090	20,450	24,660	20,240	11,730	9,343
MAX (WY)	23,710	52,550	37,930	27,220	31,140	27,010	23,360	36,530	43,460	37,650	21,890	17,540	
MIN (WY)	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)	(1968)	(1991)	(1976)	(1974)	(1951)	(1972)	(1943)	(1946)	(1972)	(1972)	(1999)	(1959)	
(WY)	(1943)	(1944)	(2001)	(1942)	(1942)	(1942)	(1973)	(1970)	(1992)	(1977)	(1941)	(1942)	

SUMMARY STATISTICS

	FOR 2002 CALENDAR YEAR		FOR 2003 WATER YEAR		WATER YEARS 1941 - 2003	
ANNUAL TOTAL	6,358,190		4,841,740			
ANNUAL MEAN	17,420		13,270		16,590	
HIGHEST ANNUAL MEAN					23,140	
LOWEST ANNUAL MEAN					10,500	
HIGHEST DAILY MEAN	73,700		53,000		142,000	
LOWEST DAILY MEAN	4,330		4,330		3,050	
ANNUAL SEVEN-DAY MINIMUM					3,530	
ANNUAL RUNOFF (AC-FT)	12,610,000		9,604,000		12,020,000	
10 PERCENT EXCEEDS	30,800		21,600		27,300	
50 PERCENT EXCEEDS	15,500		12,000		14,500	
90 PERCENT EXCEEDS	5,460		5,490		7,860	

e Estimated