Water-Data Report 2008

12178000 SKAGIT RIVER AT NEWHALEM, WA

Puget Sound Basin
Upper Skagit Subbasin

LOCATION.--Lat 48°40′19″, long 121°14′42″ referenced to North American Datum of 1927, in SW ¼ SE ¼ sec.21, T.37 N., R.12 E., Whatcom County, WA, 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 power plant at Newhalem, 10.8 mi upstream from Bacon Creek, and at mile 93.7.

DRAINAGE AREA.--1,175 mi^2, of which 400 mi^2 are in Canada.

SURFACE-WATER 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, non-recording gages at site 0.5 mi upstream at datum 91 ft higher. Nov. 15, 1920, to June 4, 1923, non-recording 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 FOR PERIOD OF RECORD.--100 years (water years 1909-2008), 4,403 ft^3/s, 3,190,000 acre-ft/yr, adjusted. 48 years (water years 1961-2008), 4,445 ft^3/s, 3,220,000 acre-ft/yr, regulated.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 63,500 ft^3/s, Nov. 29, 1909, gage height, 22.0 ft, from floodmark, site and datum then in use; minimum discharge, 54 ft^3/s, Nov. 1, 1943, gage height, 78.15 ft; minimum daily discharge, 136 ft^3/s, Aug. 24, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1815 reached a stage of approximately 20.5 ft, discharge about 115,000 ft^3/s. Records for other floods, prior to establishment of station, are given in WSP 1527.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17,700 ft^3/s, July 2, gage height, 88.10 ft; minimum discharge, 1,760 ft^3/s, June 4, gage height, 82.00 ft.

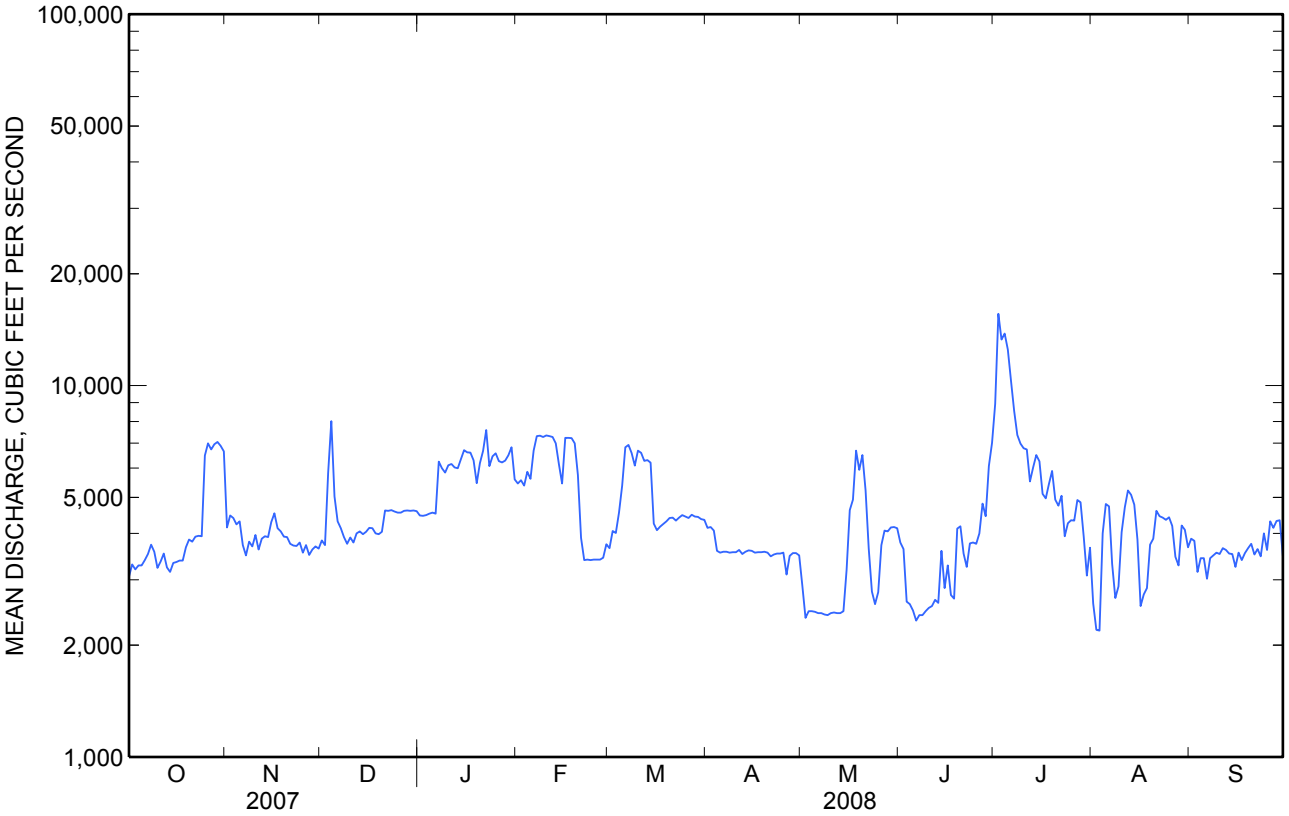
12178000 SKAGIT RIVER AT NEWHALEM, WA—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	3,060	4,150	3,830	4,470	5,450	3,650	4,140	2,890	3,780	8,930	2,590	3,870
2	3,300	4,470	3,720	4,460	5,560	4,060	4,160	2,370	3,630	15,600	2,200	3,820
3	3,200	4,400	5,820	4,480	5,380	4,010	4,070	2,470	2,620	13,300	2,190	3,150
4	3,280	4,230	8,020	4,520	5,860	4,550	3,590	2,470	2,580	13,800	4,000	3,430
5	3,280	4,310	5,030	4,550	5,610	5,380	3,550	2,460	2,480	12,500	4,800	3,430
6	3,390	3,720	4,310	4,520	6,680	6,820	3,570	2,440	2,330	10,300	4,730	3,020
7	3,520	3,490	4,130	6,240	7,310	6,920	3,570	2,440	2,410	8,550	3,310	3,430
8	3,730	3,800	3,910	5,990	7,330	6,580	3,550	2,420	2,410	7,360	2,680	3,490
9	3,570	3,690	3,750	5,830	7,270	6,090	3,560	2,410	2,470	6,980	2,880	3,550
10	3,230	3,960	3,900	6,100	7,340	6,680	3,560	2,440	2,520	6,780	4,030	3,520
11	3,360	3,620	3,780	6,150	7,310	6,590	3,610	2,450	2,550	6,730	4,700	3,650
12	3,530	3,870	4,000	6,020	7,270	6,270	3,520	2,440	2,650	5,520	5,220	3,610
13	3,240	3,930	4,050	5,990	6,990	6,300	3,570	2,440	2,600	6,020	5,080	3,530
14	3,150	3,910	3,980	6,340	6,140	6,200	3,600	2,470	3,590	6,500	4,780	3,520
15	3,330	4,290	4,040	6,700	5,450	4,250	3,590	3,190	2,850	6,250	3,850	3,250
16	3,350	4,530	4,140	6,610	7,230	4,080	3,550	4,620	3,280	5,110	2,550	3,550
17	3,380	4,130	4,130	6,600	7,230	4,170	3,560	4,930	2,730	4,970	2,740	3,390
18	3,380	4,050	4,000	6,290	7,220	4,240	3,560	6,680	2,670	5,430	2,850	3,540
19	3,670	3,920	3,980	5,460	6,990	4,310	3,570	5,930	4,120	5,890	3,730	3,650
20	3,850	3,910	4,040	6,180	5,740	4,400	3,550	6,500	4,180	4,930	3,870	3,750
21	3,800	3,750	4,610	6,670	3,890	4,410	3,470	5,220	3,530	4,750	4,600	3,510
22	3,920	3,710	4,600	7,590	3,390	4,330	3,510	3,640	3,250	5,050	4,450	3,630
23	3,940	3,700	4,620	6,070	3,400	4,410	3,530	2,790	3,760	3,930	4,410	3,470
24	3,930	3,780	4,580	6,450	3,390	4,480	3,530	2,580	3,780	4,260	4,350	4,000
25	6,480	3,550	4,550	6,570	3,400	4,440	3,550	2,780	3,750	4,340	4,420	3,610
26	6,990	3,720	4,550	6,260	3,400	4,400	3,100	3,720	4,000	4,330	4,190	4,310
27	6,730	3,500	4,600	6,210	3,400	4,490	3,480	4,070	4,810	4,920	3,460	4,140
28	6,950	3,620	4,610	6,280	3,440	4,440	3,540	4,050	4,450	4,850	3,280	4,320
29	7,050	3,690	4,600	6,490	3,740	4,430	3,540	4,150	6,070	3,920	4,200	4,340
30	6,880	3,640	4,610	6,820	---	4,370	3,490	4,160	7,010	3,080	4,090	3,480
31	6,650	---	4,590	5,590	---	4,350	---	4,130	---	3,660	3,670	---
Total	131,120	117,040	137,080	184,500	162,810	154,100	107,740	107,750	102,860	208,540	117,900	108,960
Mean	4,230	3,901	4,422	5,952	5,614	4,971	3,591	3,476	3,429	6,727	3,803	3,632
Max	7,050	4,530	8,020	7,590	7,340	6,920	4,160	6,680	7,010	15,600	5,220	4,340
Min	3,060	3,490	3,720	4,460	3,390	3,650	3,100	2,370	2,330	3,080	2,190	3,020
Ac-ft	260,100	232,100	271,900	366,000	322,900	305,700	213,700	213,700	204,000	413,600	233,900	216,100
Mean adjusted for change in contents in Ross, Diablo and Gorge Reservoirs												
	2,854	2,595	4,634	1,808	1,690	2,259	2,204	12,810	9,878	6,943	3,867	1,940
CFSM adjusted for change in contents in Ross, Diablo and Gorge Reservoirs												
	2.43	2.21	3.94	1.54	1.44	1.92	1.88	10.90	8.41	5.91	3.29	1.65
In. adjusted for change in contents in Ross, Diablo and Gorge Reservoirs												
	2.80	2.46	4.55	1.77	1.55	2.22	2.09	12.58	9.38	6.81	3.79	1.84
Ac-ft adjusted for change in contents in Ross, Diablo and Gorge Reservoirs												
	175,500	154,400	285,000	111,200	97,230	138,900	131,100	788,100	587,600	427,000	237,800	115,400

12178000 SKAGIT RIVER AT NEWHALEM, WA—Continued

	Calendar Year 2007	Water Year 2008
Total	1,883,500	1,640,400
Mean	5,160	4,482
Max	11,500	15,600
Min	2,280	2,190
Ac-ft	3,736,000	3,254,000
Mean adjusted for change in contents in Ross, Diablo and Gorge Reservoirs	5,101	4,477
CFSM adjusted for change in contents in Ross, Diablo and Gorge Reservoirs	4.34	3.81
In. adjusted for change in contents in Ross, Diablo and Gorge Reservoirs	58,95	51.85
Ac-ft adjusted for change in contents in Ross, Diablo and Gorge Reservoirs	3,694,000	3,249,000



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 with a 15-minute logging interval, interfaced with a data collection platform for satellite telemetry.

REMARKS.--Temperature record good. Interruptions in the record were due to malfunctions of the instrument.

EXTREMES FOR PERIOD OF RECORD.--
WATER TEMPERATURE: Maximum recorded, 14.0°C Aug. 8, 2008 but may have been higher during instrument malfunction Aug. 8 to Sept. 4; minimum, 2.2°C Feb. 21, 2002.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum recorded, 14.0°C Aug. 8, but may have been higher during instrument malfunction Aug. 8 to Sept. 4; minimum recorded, 3.5°C several days in February.

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		October			November			December			January	
1	10.3	10.2	10.2	9.9	9.6	9.8	7.7	7.6	7.6	5.1	5.0	5.1
2	10.2	9.8	10	9.6	9.6	9.6	7.6	7.5	7.6	5.1	5.1	5.1
3	9.9	9.5	9.7	9.7	9.6	9.6	7.5	5.9	7.0	5.2	5.0	5.1
4	9.8	9.5	9.7	9.8	9.5	9.6	6.7	5.9	6.1	5.2	5.2	5.2
5	9.9	9.7	9.8	9.5	9.4	9.5	6.6	6.2	6.4	5.2	5.1	5.2
6	10.0	9.8	9.9	9.6	9.4	9.5	6.7	6.6	6.7	5.1	5.0	5.1
7	9.9	9.6	9.8	9.6	9.5	9.6	6.7	6.6	6.6	5.1	5.0	5.1
8	9.8	9.5	9.6	9.7	9.6	9.7	6.6	6.4	6.5	5.1	4.9	5.0
9	9.8	9.5	9.7	9.7	9.6	9.7	6.4	6.3	6.3	5.0	4.9	5.0
10	10.0	9.8	9.9	9.6	9.4	9.5	6.3	6.2	6.2	5.0	4.8	4.9
11	10.0	9.8	9.9	9.4	9.2	9.3	6.2	6.1	6.2	4.8	4.8	4.8
12	10.0	9.8	9.9	9.2	9.1	9.2	6.3	6.2	6.3	4.9	4.8	4.9
13	10.1	9.9	9.9	9.1	8.9	9.0	6.2	6.1	6.2	4.9	4.8	4.9
14	10.0	9.8	9.9	8.9	8.8	8.9	6.2	6.2	6.2	4.9	4.8	4.8
15	10.0	9.9	10	8.9	8.8	8.9	6.2	6.2	6.2	4.8	4.7	4.7
16	10.0	10.0	10.0	8.8	8.5	8.7	6.2	6.1	6.1	4.7	4.7	4.7
17	10.0	9.9	9.9	8.6	8.5	8.6	6.2	6.1	6.1	4.7	4.7	4.7
18	9.9	9.8	9.8	8.7	8.6	8.6	6.1	5.9	6.0	4.7	4.6	4.7
19	9.8	9.7	9.8	8.6	8.5	8.5	5.9	5.8	5.9	4.6	4.6	4.6
20	9.7	9.6	9.7	8.6	8.5	8.6	5.8	5.8	5.8	4.7	4.6	4.6
21	9.7	9.6	9.7	8.5	8.2	8.4	5.8	5.7	5.7	4.6	4.3	4.4
22	9.7	9.6	9.6	8.2	8.1	8.2	5.7	5.6	5.7	4.3	4.2	4.3
23	9.7	9.4	9.6	8.1	8.0	8.0	5.6	5.5	5.6	4.3	4.2	4.2
24	9.7	9.4	9.5	8.1	8.0	8.1	5.6	5.5	5.5	4.2	4.1	4.2
25	9.6	9.4	9.5	8.2	8.0	8.1	5.5	5.5	5.5	4.2	4.0	4.1
26	9.6	9.6	9.6	8.0	7.9	8.0	5.5	5.4	5.5	4.1	4.0	4.0
27	9.8	9.6	9.7	8.0	7.9	7.9	5.4	5.4	5.4	4.1	4.0	4.1
28	10.0	9.8	10	7.9	7.8	7.9	5.4	5.2	5.3	4.1	4.0	4.1
29	10.0	10.0	10.0	7.9	7.8	7.9	5.2	5.2	5.2	4.0	3.7	3.9
30	10.0	9.9	9.9	7.8	7.7	7.7	5.2	5.0	5.1	4.0	3.8	3.9
31	9.9	9.8	9.9	---	---	---	5.1	5.0	5.1	4.0	3.8	3.9
Month	10.3	9.4	9.8	9.9	7.7	8.8	7.7	5.0	6.1	5.2	3.7	4.6

12178000 SKAGIT RIVER AT NEWHALEM, WA—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		February			March			April			May	
1	3.9	3.7	3.8	3.7	3.6	3.7	4.1	3.9	4.0	5.7	5.3	5.4
2	3.9	3.7	3.8	3.8	3.6	3.7	4.3	4.0	4.1	5.9	5.4	5.6
3	3.8	3.7	3.8	3.7	3.6	3.7	4.4	4.1	4.2	6.0	5.5	5.7
4	3.8	3.8	3.8	3.8	3.6	3.6	4.3	4.2	4.2	6.4	5.7	6.0
5	3.8	3.7	3.8	3.7	3.6	3.7	4.3	4.2	4.2	6.5	5.7	6.0
6	3.8	3.7	3.8	3.7	3.6	3.7	4.4	4.2	4.2	6.3	5.8	6.0
7	3.8	3.7	3.7	3.8	3.7	3.7	4.4	4.2	4.3	6.4	5.9	6.0
8	3.8	3.7	3.7	3.8	3.7	3.8	4.6	4.3	4.4	6.2	5.9	6.0
9	3.8	3.7	3.7	3.8	3.7	3.7	4.6	4.4	4.4	6.4	5.8	6.0
10	3.8	3.8	3.8	3.8	3.8	3.8	4.7	4.4	4.5	6.5	6.0	6.3
11	3.8	3.7	3.8	3.8	3.8	3.8	4.7	4.5	4.6	6.4	6.2	6.3
12	3.8	3.8	3.8	3.8	3.7	3.8	5.0	4.5	4.7	6.5	6.1	6.2
13	3.8	3.7	3.8	3.8	3.8	3.8	5.0	4.7	4.9	6.5	6.2	6.4
14	3.8	3.7	3.7	3.9	3.8	3.8	5.1	4.7	4.9	6.7	6.3	6.5
15	3.7	3.7	3.7	4.0	3.9	3.9	4.8	4.6	4.6	7.3	6.4	6.7
16	3.8	3.7	3.7	4.0	3.9	3.9	4.8	4.6	4.7	7.0	6.3	6.7
17	3.8	3.6	3.7	3.9	3.8	3.9	5.2	4.8	5.0	6.9	6.0	6.5
18	3.7	3.6	3.6	4.0	3.9	3.9	5.1	4.8	5.0	6.9	6.3	6.5
19	3.6	3.6	3.6	4.1	3.9	4.0	4.9	4.7	4.8	7.0	6.5	6.8
20	3.7	3.6	3.6	4.1	4.0	4.0	5.3	4.8	5.0	6.7	6.2	6.5
21	3.7	3.5	3.6	4.1	3.9	4.0	5.5	5.1	5.2	6.3	6.1	6.2
22	3.6	3.5	3.6	4.0	3.9	3.9	5.5	5.1	5.2	6.5	6.3	6.4
23	3.7	3.5	3.6	4.0	3.9	4.0	5.5	5.1	5.4	6.8	6.4	6.7
24	3.6	3.5	3.5	4.0	3.8	3.9	5.6	5.2	5.4	7.2	6.7	6.8
25	3.6	3.5	3.5	4.0	3.9	3.9	5.3	5.1	5.1	7.4	6.7	7.0
26	3.8	3.5	3.6	4.1	3.9	4.0	5.7	5.1	5.3	7.0	6.6	6.9
27	3.6	3.5	3.6	4.0	3.8	3.9	5.7	5.4	5.6	7.0	6.5	6.8
28	3.8	3.6	3.6	3.9	3.8	3.8	5.8	5.5	5.7	7.3	6.8	7.0
29	3.8	3.6	3.7	4.1	3.9	3.9	5.7	5.3	5.5	7.2	7.0	7.1
30	---	---	---	4.2	4.0	4.0	5.4	5.2	5.3	7.1	6.9	7.0
31	---	---	---	4.2	4.0	4.1	---	---	---	7.6	7.1	7.3
Month	3.9	3.5	3.7	4.2	3.6	3.8	5.8	3.9	4.8	7.6	5.3	6.4

12178000 SKAGIT RIVER AT NEWHALEM, WA—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		June			July			August			September	
1	7.6	7.3	7.5	10.1	8.8	9.1	11.7	10.6	11.2	---	---	---
2	7.4	7.3	7.3	9.5	9.2	9.3	13.0	11.7	12.3	---	---	---
3	7.5	7.3	7.4	9.3	8.7	8.9	13.2	10.6	11.9	---	---	---
4	7.4	7.2	7.3	8.9	8.1	8.6	12.0	11.0	11.5	---	---	---
5	7.3	7.3	7.3	8.6	8.0	8.3	12.5	11.5	12.0	10.1	9.9	10.0
6	7.5	7.2	7.3	8.3	8.0	8.1	13.2	12.4	12.8	10.1	9.8	10
7	7.6	7.3	7.4	8.7	7.9	8.2	13.9	12.4	13.6	10.3	9.9	10.1
8	7.6	7.4	7.5	8.9	8.2	8.5	---	---	---	10.1	9.8	10
9	7.8	7.4	7.6	8.9	8.5	8.7	---	---	---	10.0	9.8	9.9
10	7.9	7.5	7.6	8.9	8.4	8.6	---	---	---	10.0	9.7	9.9
11	7.7	7.5	7.6	8.9	8.1	8.5	---	---	---	10.0	9.7	9.8
12	7.8	7.5	7.6	8.9	8.6	8.8	---	---	---	10.0	9.7	9.9
13	8.1	7.6	7.9	9.0	8.7	8.9	---	---	---	10.0	9.8	9.9
14	8.3	7.9	8.1	9.1	8.7	8.8	---	---	---	10.0	9.8	9.9
15	8.2	7.8	8.1	9.0	8.7	8.8	---	---	---	10.0	9.7	9.9
16	8.5	7.9	8.2	9.2	8.8	8.9	---	---	---	10.0	9.8	9.9
17	8.3	8.0	8.2	9.2	8.9	9.0	---	---	---	10.0	9.8	9.9
18	8.2	8.0	8.0	9.3	9.0	9.1	---	---	---	9.9	9.8	9.8
19	8.3	8.0	8.1	9.5	9.1	9.3	---	---	---	10.0	9.8	9.9
20	8.6	8.1	8.3	9.6	9.2	9.4	---	---	---	10.0	9.9	10.0
21	8.5	8.1	8.3	9.7	9.4	9.5	---	---	---	10.0	9.9	10
22	8.1	7.9	7.9	9.7	9.6	9.6	---	---	---	10.0	9.9	10
23	8.2	7.8	8.0	9.6	9.2	9.4	---	---	---	9.9	9.8	9.9
24	8.3	8.0	8.1	9.8	9.4	9.5	---	---	---	10.0	9.9	9.9
25	8.5	8.1	8.2	9.9	9.7	9.8	---	---	---	10.0	9.9	9.9
26	8.4	8.2	8.3	10.0	9.8	9.9	---	---	---	9.9	9.8	9.9
27	8.7	8.1	8.3	10.0	9.7	9.8	---	---	---	10.0	9.9	9.9
28	8.9	8.5	8.7	10.3	9.8	9.9	---	---	---	10.0	9.8	10
29	8.8	8.6	8.7	10.3	10.1	10.2	---	---	---	10.0	9.8	9.9
30	9.0	8.7	8.8	10.4	10.1	10.2	---	---	---	10.1	9.9	10
31	---	---	---	10.6	10.2	10.4	---	---	---	---	---	---
Month	9.0	7.2	7.9	10.6	7.9	9.2	---	---	---	---	---	---