Water-Data Report 2012

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT

Pend Oreille Basin
Flathead Lake Subbasin

LOCATION.--Lat 48°21'42", long 114°11'04" referenced to North American Datum of 1983, in NW ¼ NW ¼ SE ¼ sec.17, T.30 N., R.20 W., Flathead County, MT, Hydrologic Unit 17010208, on right bank 200 ft downstream from county road bridge at Columbia Falls, 5.7 mi downstream from South Fork Flathead River, and at river mile 143.0.

DRAINAGE AREA.--4,464 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--May 1922 to September 1923 (fragmentary), June 1928 to current year. Monthly discharge only for some periods, published in Water Supply Paper (WSP) 1316.

REVISED RECORDS.--WSP 1092: 1923. WSP 1216: Drainage area. WSP 1636: 1958, adjusted runoff.

GAGE.--Water-stage recorder. Elevation of gage is 2,977.67 ft, referenced to the National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Nov. 12, 1928, nonrecording gage on bridge 200 ft upstream at elevation 0.19 ft higher.

REMARKS.--Records are good except for estimated daily discharges, which are fair. South Fork Flathead River, which contributes about one-third of flow, is completely regulated by Hungry Horse Reservoir 10.9 mi upstream since Sept. 21, 1951 (see station number 12362000). Bureau of Reclamation satellite telemeter is located at the station.

AVERAGE DISCHARGE FOR PERIOD OF RECORD.--84 years, 9,621 ft^3/s, 29.27 in/yr, 6,970,000 acre-ft/yr, adjusted for change in contents in Hungry Horse Reservoir since Oct. 1, 1951.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 176,000 ft^3/s, June 9, 1964, gage height, 25.58 ft, from floodmarks, from rating curve extended above 95,000 ft^3/s on basis of slope-area measurement of peak flow; minimum, 798 ft^3/s, Dec. 8, 1929, gage height, -0.08 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1894 reached a stage of 22.7 ft, from floodmarks, discharge, 142,000 ft^3/s, from rating curve extended above 95,000 ft^3/s on basis of slope-area measurement of peak flow in 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 53,100 ft^3/s, June 27, gage height, 14.18 ft; minimum daily, 3,330 ft^3/s, Sept. 30.

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	4,680	4,050	3,850	3,830	3,870	3,940	12,500	30,900	21,000	35,200	8,010	4,400
2	4,660	3,970	3,870	3,870	3,890	3,940	12,600	29,400	24,200	35,100	7,780	4,310
3	4,220	3,910	3,850	3,900	3,840	3,960	11,900	26,900	32,600	33,000	7,840	4,250
4	3,860	3,990	3,910	3,980	3,820	3,990	11,600	25,000	34,100	31,600	7,630	4,220
5	3,830	4,010	3,850	3,930	3,880	4,000	11,700	23,900	36,300	28,200	7,330	4,180
6	3,900	4,010	3,890	3,920	3,910	3,980	11,900	22,900	44,100	25,000	7,120	4,230
7	3,960	4,050	3,860	3,890	3,900	3,830	11,600	21,800	44,100	22,600	7,020	4,310
8	4,060	4,110	3,830	3,900	3,860	3,840	11,300	21,500	e40,000	22,100	6,970	4,240
9	4,020	4,060	3,810	3,890	3,890	3,840	11,100	23,500	e35,000	21,900	6,920	4,160
10	3,930	4,010	3,900	3,890	3,950	3,910	13,600	27,700	e32,500	20,900	6,740	4,110
11	3,930	3,820	3,980	3,830	3,920	3,920	14,900	28,000	e30,600	20,400	6,610	4,090
12	4,070	3,850	4,030	3,860	3,910	3,930	16,700	25,900	27,800	19,500	6,480	4,020
13	4,150	3,840	3,850	3,970	3,900	3,950	18,300	25,100	28,100	18,700	6,360	3,990
14	3,950	3,800	3,900	3,930	3,860	3,970	18,100	26,600	33,500	18,500	6,280	3,930
15	3,920	3,820	3,910	3,950	3,850	3,900	18,000	30,400	38,100	18,800	6,230	3,820
16	3,930	3,800	3,920	3,900	3,860	4,420	17,500	33,200	35,800	17,900	6,160	3,620
17	3,950	3,880	3,910	3,860	3,910	4,680	17,500	36,600	36,000	16,300	6,060	3,570
18	3,960	3,930	3,910	3,840	3,920	4,390	18,500	36,700	45,900	15,500	5,910	3,570
19	3,930	3,850	3,900	3,870	3,930	4,220	19,300	32,500	49,300	14,400	5,820	3,540
20	3,950	3,870	3,900	3,890	3,920	3,980	19,400	28,500	47,900	13,800	5,690	3,510
21	3,940	3,920	3,870	3,970	3,920	e3,850	22,000	26,500	43,600	13,100	5,640	3,490
22	3,970	3,950	3,860	3,990	3,950	e3,770	23,300	31,600	41,600	12,400	5,450	3,510
23	4,120	3,980	3,810	3,910	3,930	3,710	25,900	36,700	41,500	11,600	5,330	4,160
24	4,240	3,940	3,920	3,840	3,870	3,720	33,300	33,500	44,600	11,100	5,210	4,580
25	4,090	3,890	4,010	3,940	3,880	3,690	41,800	29,400	48,200	10,400	5,180	4,580
26	3,990	3,880	3,960	3,910	3,900	5,150	44,900	26,100	51,000	9,700	5,090	4,500
27	3,960	3,900	3,910	3,840	3,900	7,190	48,200	23,700	51,500	9,220	4,990	4,060
28	3,980	3,910	3,950	3,880	3,840	8,310	44,000	21,900	44,200	8,930	4,920	3,560
29	3,950	3,910	4,260	3,930	3,830	8,630	34,800	20,700	38,100	8,710	4,560	3,360
30	3,990	3,890	4,090	4,000	---	9,250	30,300	20,600	35,500	8,490	4,480	3,330
31	4,060	---	3,860	3,910	---	11,100	---	20,500	---	8,220	4,430	---
Total	125,150	117,800	121,330	121,020	112,810	148,960	646,500	848,200	1,156,700	561,270	190,240	119,200
Mean	4,037	3,927	3,914	3,904	3,890	4,805	21,550	27,360	38,560	18,110	6,137	3,973
Max	4,680	4,110	4,260	4,000	3,950	11,100	48,200	36,700	51,500	35,200	8,010	4,580
Min	3,830	3,800	3,810	3,830	3,820	3,690	11,100	20,500	21,000	8,220	4,430	3,330
Ac-ft	248,200	233,700	240,700	240,000	223,800	295,500	1,282,000	1,682,000	2,294,000	1,113,000	377,300	236,400
Cfsm	0.90	0.88	0.88	0.87	0.87	1.08	4.83	6.13	8.64	4.06	1.37	0.89
In.	1.04	0.98	1.01	1.01	0.94	1.24	5.39	7.07	9.64	4.68	1.59	0.99

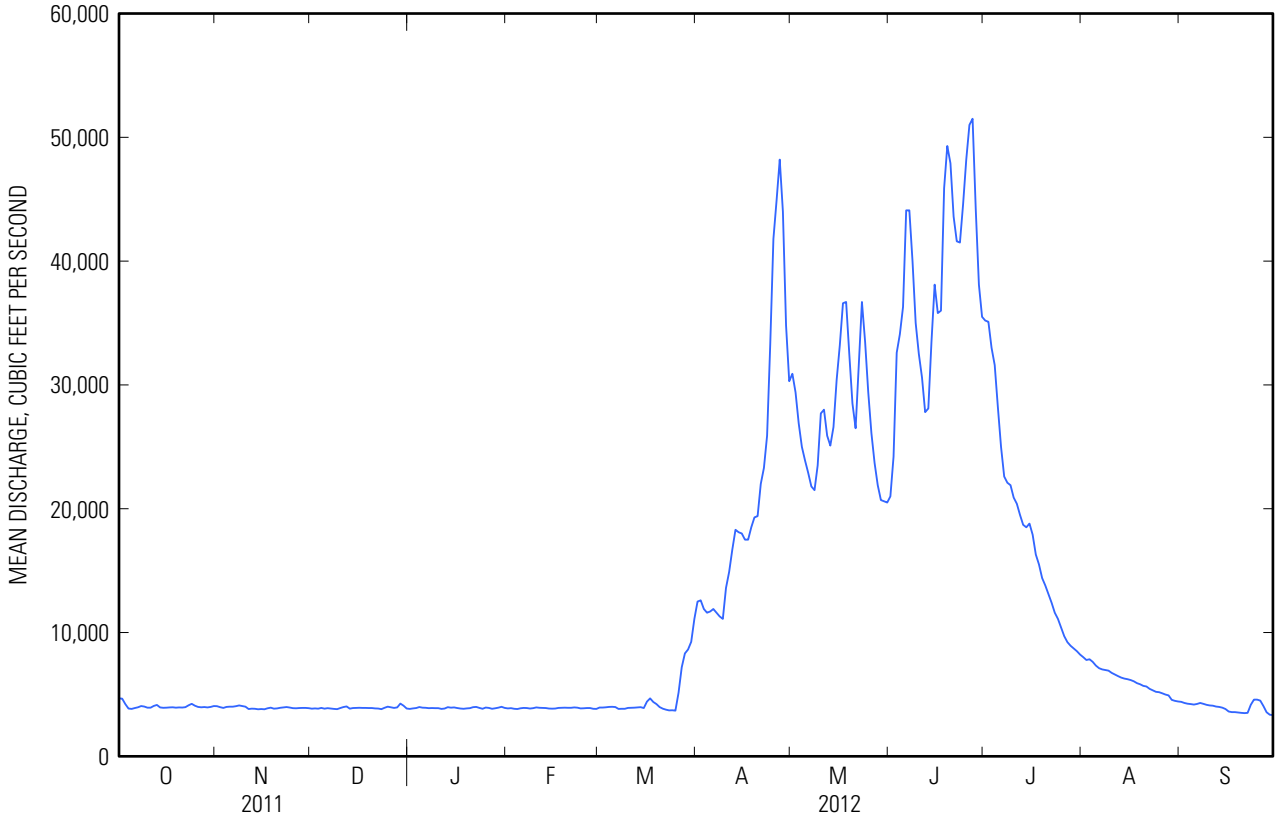
ADJUSTED FOR CHANGE IN CONTENTS IN HUNGRY HORSE RESERVOIR

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	3,435	3,003	2,191	2,130	2,048	3,879	22,790	31,660	44,420	17,390	4,477	2,309
Ac-ft	211,200	178,700	134,700	131,000	117,800	238,500	1,356,000	1,974,000	2,643,000	1,069,000	275,300	134,400
Cfsm	0.77	0.67	0.49	0.48	0.46	0.87	5.11	7.09	9.95	3.90	1.00	0.52
In.	0.89	0.75	0.57	0.55	0.49	1.00	5.70	8.18	11.10	4.49	1.16	0.58

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT—Continued

OBSERVED										
Calendar Year 2011	**Total**	4,892,500	**Mean**	13,400	**Max**	48,400	**Min**	3,750	**Ac-ft**	9,704,000
Water Year 2012	**Total**	4,269,180	**Mean**	11,660	**Max**	51,500	**Min**	3,330	**Ac-ft**	8,468,000

ADJUSTED										
Calendar Year 2011	**Total**	4,921,600	**Mean**	13,480	**Cfsm**	3.02	**In**	41.00	**Ac-ft**	9,762,000
Water Year 2012	**Total**	4,256,100	**Mean**	11,630	**Cfsm**	2.61	**In**	35.46	**Ac-ft**	8,468,000



12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949-50, 1963-67, 1970, 1979 to September 1994, March 2002 to current year. Water years 1968-69 published as Flathead River near Kalispell (station 12363500) 15 mi downstream. No appreciable inflow or outflow occurs between the two points.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1964 to September 1967, March 1979 to September 1981.
WATER TEMPERATURE: January 1949 to September 1950, August 1963 to September 1969, March 1979 to current year.
SUSPENDED-SEDIMENT DISCHARGE: July 1965 to September 1969.

INSTRUMENTATION.--Water temperature recorder was installed Mar. 27, 1979.

REMARKS.--Annual temperature records are complete and rated excellent, except for Nov. 9 to Mar. 15 which is rated good and for missing data on Mar. 21-23 and Aug. 4. Several unpublished observations of specific conductance and water temperature were made during the year.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 290 microsiemens per centimeter (µS/cm) at 25.0°C, April 6, 1980; minimum daily, 121 µS/cm at 25.0°C, May 28, 1979.
WATER TEMPERATURE: Maximum, 21.0°C, Aug. 23, 1963, Aug. 8, 1968; minimum, 0.0°C on several days during winter periods most years.
SEDIMENT CONCENTRATION: Maximum daily, 980 mg/L, May 21, 1967; Minimum daily, 1 mg/L on several days most years.
SEDIMENT LOAD: Maximum daily, 140,000 tons, May 23, 1967; minimum daily, 4 tons, Mar. 4-6, 1967.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 18.0°C, Aug. 7; minimum, 0.9°C, Jan. 16.

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		October			November			December			January	
1	12.6	11.2	11.8	5.8	4.3	5.0	3.4	2.8	3.0	2.6	1.8	2.2
2	13.3	11.4	12.1	4.8	3.5	4.1	3.5	2.7	2.9	2.7	1.9	2.3
3	12.8	8.1	11.1	4.2	2.9	3.6	2.7	2.2	2.5	3.5	2.2	2.8
4	8.3	7.5	7.8	4.4	3.2	3.8	3.0	2.3	2.6	3.4	2.5	2.9
5	8.1	7.3	7.6	4.4	3.7	4.0	2.9	2.1	2.5	3.4	2.9	3.1
6	8.4	7.2	7.7	3.8	3.2	3.4	3.1	2.5	2.7	3.4	2.7	2.9
7	7.7	7.3	7.4	3.5	3.1	3.3	3.0	2.1	2.5	2.9	2.4	2.6
8	9.1	7.2	7.9	3.8	3.4	3.6	2.8	2.0	2.4	2.8	2.3	2.6
9	8.1	6.8	7.4	4.7	3.6	4.0	2.9	1.9	2.3	3.3	2.6	2.9
10	8.1	6.8	7.4	4.4	3.4	3.8	2.7	2.1	2.3	3.3	2.2	2.9
11	7.8	7.1	7.4	3.9	3.2	3.6	3.0	2.4	2.7	2.5	1.5	2.0
12	8.1	7.1	7.5	3.8	3.3	3.6	2.9	2.2	2.5	2.6	1.5	2.1
13	8.1	6.9	7.4	3.9	3.2	3.4	2.6	1.9	2.3	2.9	2.2	2.4
14	6.9	5.9	6.4	3.9	2.9	3.3	2.7	2.3	2.5	2.5	2.2	2.3
15	7.2	6.0	6.4	2.9	2.2	2.5	2.6	2.3	2.5	2.7	1.2	1.9
16	7.3	5.4	6.2	2.7	1.8	2.3	2.7	2.4	2.6	1.8	0.9	1.3
17	6.5	5.4	5.9	3.5	2.0	2.6	3.4	2.6	2.9	2.6	1.5	1.9
18	7.0	4.9	5.8	2.6	1.4	2.0	3.0	2.5	2.8	2.0	1.4	1.7
19	6.5	4.8	5.6	2.3	1.3	1.9	3.3	2.7	2.9	2.1	1.7	1.8
20	6.7	5.4	5.8	2.9	2.2	2.5	2.9	2.5	2.7	2.5	1.8	2.2
21	7.0	5.5	6.1	2.6	2.4	2.5	3.4	2.5	2.9	2.7	2.1	2.3
22	6.9	6.2	6.5	3.2	2.5	2.9	2.9	2.2	2.4	2.8	2.0	2.3
23	7.4	6.1	6.6	3.6	3.2	3.4	2.7	1.9	2.3	3.1	1.9	2.3
24	6.6	5.9	6.2	4.3	3.6	3.9	2.9	2.4	2.7	2.4	1.6	2.0
25	6.4	4.9	5.6	3.8	2.9	3.5	3.2	2.6	2.8	3.0	1.8	2.4
26	5.4	4.2	4.8	3.0	2.5	2.7	3.0	2.5	2.7	3.2	1.9	2.4
27	5.7	4.3	4.8	3.2	2.4	2.7	2.9	2.5	2.7	2.7	1.5	1.9
28	5.0	3.7	4.4	4.1	3.2	3.5	3.5	2.9	3.2	2.4	1.8	2.0
29	5.6	4.2	4.7	3.6	3.2	3.4	3.5	2.9	3.2	2.9	2.1	2.6
30	5.3	4.2	4.8	4.1	3.1	3.6	3.1	2.5	2.8	2.9	2.5	2.7
31	5.7	5.1	5.3	---	---	---	2.6	2.2	2.4	2.7	2.1	2.4
Month	13.3	3.7	6.9	5.8	1.3	3.3	3.5	1.9	2.7	3.5	0.9	2.3

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		February			March			April			May	
1	3.0	2.0	2.5	3.3	2.1	2.6	4.4	3.7	4.1	5.2	4.6	4.9
2	3.4	2.4	2.8	3.1	2.2	2.5	4.1	3.3	3.7	5.2	4.5	4.9
3	3.4	2.0	2.6	3.0	2.4	2.7	4.7	3.3	3.9	5.2	4.5	4.7
4	2.6	1.5	2.0	4.7	3.0	3.6	4.2	3.6	3.9	5.7	4.5	5.0
5	2.5	1.8	2.2	4.3	3.5	3.7	4.4	3.5	3.9	5.7	4.8	5.2
6	3.4	1.7	2.3	4.3	2.7	3.3	4.2	3.5	3.8	5.9	4.3	5.1
7	3.1	1.4	2.0	4.3	2.2	3.1	4.3	3.7	3.9	6.4	5.0	5.8
8	2.5	1.2	1.8	4.6	2.6	3.4	5.1	3.4	4.1	7.3	5.9	6.6
9	2.8	2.0	2.4	5.6	2.9	4.0	5.5	4.0	4.6	7.6	6.5	7.1
10	3.1	2.1	2.5	5.8	3.4	4.3	5.7	4.2	4.8	7.1	5.5	6.2
11	2.7	1.8	2.2	4.3	3.4	3.8	5.5	4.6	5.0	5.9	4.4	5.2
12	2.7	2.4	2.6	4.6	2.6	3.6	5.0	4.2	4.8	6.6	5.2	5.9
13	3.2	2.6	2.8	4.0	2.9	3.6	4.8	3.6	4.2	7.3	5.8	6.6
14	4.2	2.5	3.1	4.1	2.3	3.1	4.9	4.0	4.4	7.7	6.4	7.1
15	2.9	1.9	2.5	4.0	3.2	3.6	4.7	3.9	4.3	7.9	6.7	7.4
16	3.4	2.4	2.7	4.6	3.5	3.9	4.6	4.1	4.4	8.1	6.9	7.6
17	3.6	2.6	3.0	3.6	2.0	2.5	4.9	4.3	4.5	8.0	6.6	7.0
18	4.1	2.6	3.1	3.3	2.1	2.7	4.7	4.4	4.6	6.9	6.0	6.5
19	3.4	2.5	2.9	3.8	2.7	3.1	4.9	4.3	4.6	6.6	5.6	6.1
20	3.6	2.4	2.9	3.2	2.4	2.8	5.1	4.3	4.6	7.1	5.8	6.3
21	3.0	2.3	2.8	---	---	---	5.0	4.4	4.7	7.1	6.7	6.8
22	3.9	2.8	3.2	---	---	---	6.1	4.5	5.3	7.0	6.6	6.8
23	3.7	2.7	3.0	---	---	---	6.4	5.4	5.9	6.6	5.6	6.0
24	3.4	2.6	2.9	4.9	2.8	3.7	6.4	5.4	5.8	6.6	5.8	6.1
25	3.0	2.3	2.7	6.5	3.3	4.8	5.9	4.6	5.3	6.7	5.8	6.4
26	3.4	2.1	2.6	5.2	4.0	4.6	5.8	4.8	5.3	6.7	6.0	6.3
27	4.4	2.3	3.0	5.8	3.6	4.5	5.4	4.1	4.5	6.5	5.9	6.1
28	4.0	1.3	2.5	5.0	3.9	4.2	5.0	3.9	4.3	6.7	5.6	6.1
29	3.0	1.6	2.2	4.2	3.6	3.9	5.9	4.6	5.0	7.1	6.2	6.6
30	---	---	---	4.3	3.8	4.1	5.3	4.9	5.1	7.2	6.4	6.8
31	---	---	---	4.7	3.4	4.0	---	---	---	7.1	6.1	6.4
Month	4.4	1.2	2.6	---	---	---	6.4	3.3	4.6	8.1	4.3	6.2

12363000 FLATHEAD RIVER AT COLUMBIA FALLS, MT—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		June			July			August			September	
1	6.9	6.1	6.5	10.8	10.1	10.4	17.1	15.2	16.0	16.5	14.3	15.2
2	7.2	6.7	6.9	11.4	9.5	10.3	15.9	14.8	15.3	15.8	13.6	14.6
3	7.1	6.4	6.8	11.4	9.6	10.5	15.2	13.2	14.3	15.8	13.3	14.4
4	8.6	6.9	7.5	10.4	8.6	9.5	---	---	---	16.0	13.7	14.6
5	8.6	7.2	8.0	11.6	9.8	10.6	17.1	14.6	15.8	15.9	13.6	14.6
6	7.2	5.3	6.1	12.2	11.0	11.6	17.5	15.6	16.5	14.8	13.7	14.2
7	7.6	4.9	5.9	12.9	11.7	12.3	18.0	15.8	16.8	15.9	12.6	14.1
8	7.6	7.1	7.4	13.6	12.1	12.9	16.9	15.8	16.3	15.8	13.1	14.4
9	7.3	6.2	6.7	14.0	12.9	13.5	17.1	15.1	16.1	15.3	13.6	14.3
10	6.2	5.8	5.9	14.6	13.2	13.9	17.2	15.3	16.2	14.2	12.6	13.4
11	8.3	6.0	7.0	14.2	13.0	13.7	17.3	15.2	16.3	14.0	11.9	12.8
12	8.6	7.6	8.2	15.0	13.8	14.4	17.8	14.9	16.6	13.6	10.9	12.1
13	8.3	7.6	8.0	15.4	14.3	14.9	17.9	15.6	16.8	14.2	11.1	12.4
14	8.5	6.9	7.6	15.4	14.0	14.9	17.7	15.8	16.7	14.5	11.9	13.0
15	8.7	7.5	8.1	14.0	12.7	13.3	16.6	14.6	15.8	14.0	12.3	13.0
16	8.8	7.6	8.2	14.9	13.0	13.8	17.0	14.8	15.9	14.7	11.9	13.2
17	8.8	8.3	8.5	14.9	14.3	14.7	16.9	14.2	15.6	14.6	12.0	13.2
18	8.4	7.4	7.7	15.5	13.6	14.5	17.2	14.9	16.0	14.9	12.1	13.4
19	8.0	7.3	7.6	15.6	14.4	15.0	17.3	15.2	16.2	14.9	12.2	13.4
20	8.8	7.6	8.1	15.6	14.8	15.2	17.4	15.4	16.4	15.0	12.4	13.5
21	9.8	8.2	8.9	15.5	14.4	14.9	16.4	14.6	15.8	15.1	12.4	13.6
22	9.8	9.0	9.4	15.5	13.7	14.6	16.7	14.3	15.4	13.9	12.4	13.2
23	10.2	9.1	9.6	16.3	14.9	15.4	16.3	14.7	15.5	13.9	12.0	12.9
24	10.7	9.0	9.8	14.9	13.0	13.8	15.2	13.7	14.5	14.2	12.0	12.9
25	10.6	9.6	10.0	15.3	12.9	14.0	15.1	12.4	13.8	13.5	12.1	12.8
26	10.0	8.0	9.0	16.3	14.4	15.3	15.5	13.1	14.4	14.1	12.1	12.8
27	8.1	7.2	7.6	16.6	15.3	15.9	16.4	14.2	15.2	13.6	11.3	12.4
28	10.0	7.5	8.4	17.8	15.6	16.6	16.9	14.6	15.7	13.9	11.5	12.6
29	10.0	9.5	9.7	16.7	15.3	16.1	17.0	14.7	15.8	13.8	11.8	12.7
30	10.8	9.0	9.8	16.8	14.9	15.7	16.6	13.6	15.0	14.3	12.0	12.9
31	---	---	---	16.9	14.8	15.8	16.2	14.0	15.1	---	---	---
Month	10.8	4.9	8.0	17.8	8.6	13.8	---	---	---	16.5	10.9	13.4