12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT

Pend Oreille Basin
North Fork Flathead Subbasin

LOCATION.--Lat 48°29′44″, long 114°07′36″ referenced to North American Datum of 1927, in NE ¼ SW ¼ NW ¼ sec.35, T.32 N., R.20 W., Flathead County, MT, Hydrologic Unit 17010206, on right bank 1.5 mi downstream from Canyon Creek, 3.8 mi upstream from Middle Fork, 8.8 mi northeast of Columbia Falls, and at river mile 162.1.

DRAINAGE AREA.--1,548 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--September 1910 to September 1917 (no winter records in water years 1913, 1916, 1917), April 1929 to February 1935 (incomplete), June 1935 to current year. Monthly discharge only for some periods, published in Water Supply Paper (WSP) 1316. Published as Flathead River near Columbia Falls 1915-17, 1929-70.

REVISED RECORDS.-- WSP 1216: Drainage area. WSP 1246: 1911; 1912, maximum discharge (M); 1915-17 (M); 1929 (M); 1938-39 (M); 1946 (M).

GAGE.--Water-stage recorder. Elevation of gage is 3,145.59 ft, referenced to the National Geodetic Vertical Datum of 1929. September 1910 to September 1917 and April to August 1929, nonrecording gages, and May 1, 1930, to Sept. 30, 1962, water-stage recorder, all at site 2.7 mi downstream at different elevations.

REMARKS.--Records are good except those for estimated daily discharges, which are poor. A few small diversions from tributaries for irrigation of hay meadows occur upstream from station. Bureau of Reclamation satellite telemeter is located at the station.

12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2006 TO SEPTEMBER 2007
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	671	e500	1,740	780	e400	668	4,600	7,670	10,000	3,900	1,360	792
2	663	e400	1,670	1,040	e400	610	4,320	8,320	11,000	3,700	1,320	794
3	661	e520	1,560	1,140	e450	652	3,970	9,740	11,900	3,560	1,280	762
4	655	e560	1,600	953	e570	666	3,640	9,980	12,700	3,460	1,230	747
5	648	714	1,540	725	e700	685	3,400	8,570	13,300	3,360	1,190	736
6	642	1,310	1,450	764	e800	716	3,230	7,390	13,600	3,300	1,160	726
7	638	8,290	1,420	662	791	781	3,160	6,720	12,200	3,260	1,130	721
8	635	18,000	1,350	662	649	845	3,230	6,930	10,500	3,210	1,100	727
9	630	12,300	1,280	718	546	876	3,620	9,480	9,010	3,080	1,080	720
10	624	8,020	1,220	794	580	870	4,060	12,500	8,550	2,880	1,060	710
11	621	6,110	1,190	e330	586	963	3,980	12,400	8,850	2,700	1,030	696
12	614	4,850	1,190	e190	397	2,050	3,800	12,100	8,150	2,550	1,010	681
13	608	4,120	1,200	e200	346	3,860	3,620	13,300	7,180	2,450	979	675
14	603	3,530	1,180	e250	350	3,430	3,530	14,200	6,420	2,380	953	667
15	603	3,020	1,330	e280	540	2,890	3,730	12,400	6,010	2,330	926	657
16	642	2,910	1,280	e300	522	2,640	3,820	11,400	5,640	2,270	910	645
17	651	2,700	e1,000	e400	478	2,520	3,970	11,700	5,580	2,210	905	642
18	625	2,390	e870	e500	590	3,060	4,180	13,300	6,080	2,250	891	645
19	622	2,160	e930	e700	537	4,080	4,140	13,700	6,030	2,210	877	680
20	660	2,350	e950	e800	664	4,540	4,010	13,300	5,880	2,130	886	675
21	672	2,690	e1,000	e650	700	4,430	3,830	11,700	5,830	2,040	915	695
22	649	2,570	e1,100	e750	669	4,000	3,700	10,100	5,900	1,950	887	682
23	631	2,420	e1,150	812	663	3,630	3,720	8,740	5,870	1,860	870	671
24	619	2,290	e1,100	749	677	3,690	3,940	8,130	5,620	1,830	867	668
25	613	2,120	e1,170	767	684	6,260	4,370	7,870	5,260	1,760	846	658
26	606	e1,800	1,230	516	687	8,450	4,890	7,080	4,860	1,700	825	648
27	594	e1,300	1,170	335	644	7,540	5,240	6,780	4,360	1,650	807	637
28	584	e1,200	766	e240	666	6,330	5,500	8,050	4,020	1,580	805	628
29	587	e1,400	577	e220	---	5,470	6,330	9,420	3,970	1,520	788	640
30	599	e1,600	584	e200	---	4,980	7,270	9,000	4,000	1,460	769	638
31	e560	---	677	e300	---	4,710	---	9,170	---	1,410	755	---
Total	19,430	104,144	36,474	17,727	16,286	96,892	124,800	311,140	228,270	75,950	30,411	20,663
Mean	627	3,471	1,177	572	582	3,126	4,160	10,040	7,609	2,450	981	689
Max	672	18,000	1,740	1,140	800	8,450	7,270	14,200	13,600	3,900	1,360	794
Min	560	400	577	190	346	610	3,160	6,720	3,970	1,410	755	628
Ac-ft	38,540	206,600	72,350	35,160	32,300	192,200	247,500	617,100	452,800	150,600	60,320	40,990
Cfsm	0.40	2.24	0.76	0.37	0.38	2.02	2.69	6.48	4.92	1.58	0.63	0.44
In.	0.47	2.50	0.88	0.43	0.39	2.33	3.00	7.48	5.49	1.83	0.73	0.50

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 2007, BY WATER YEAR (WY)

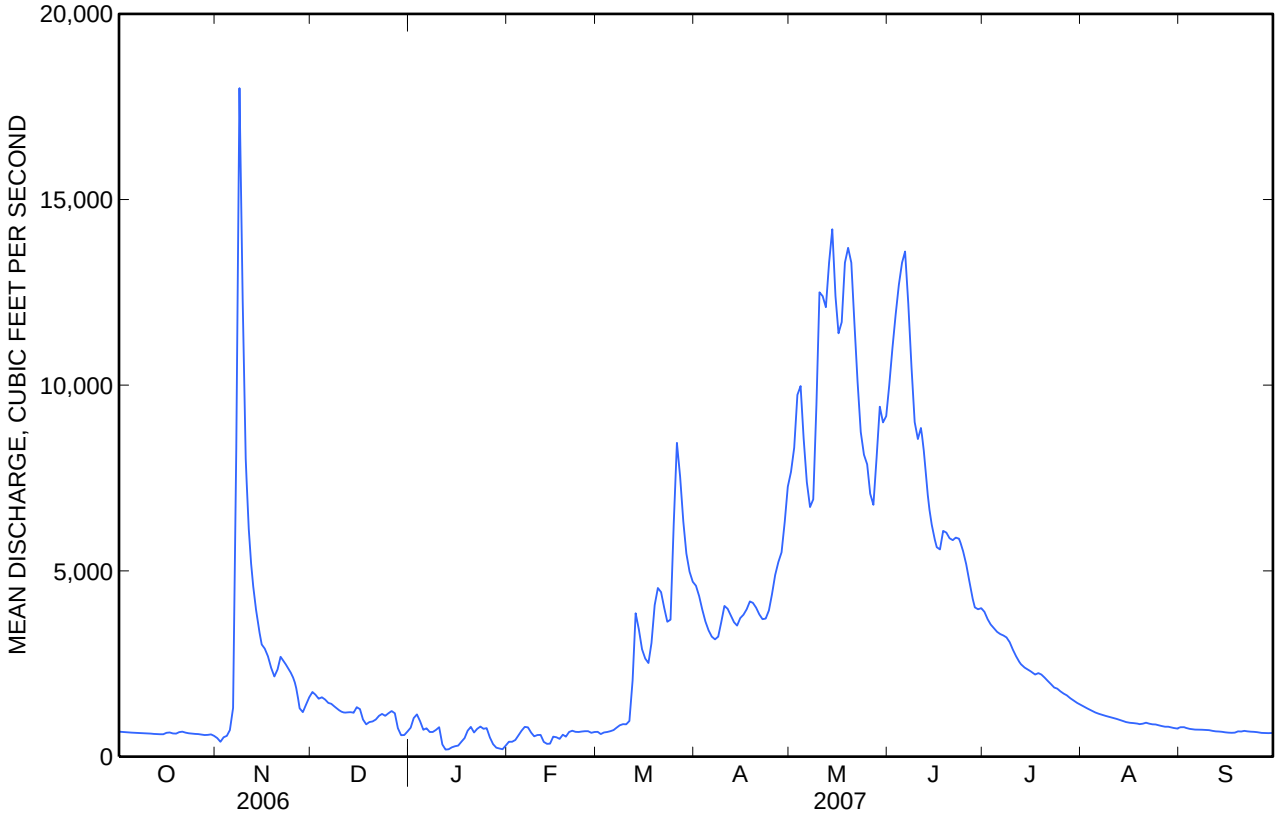
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	1,189	1,235	951	788	751	931	3,335	9,831	9,966	4,006	1,620	1,166
Max	3,650	3,733	3,388	2,242	2,017	3,126	6,877	15,160	20,780	9,262	3,232	2,653
(WY)	(1952)	(1990)	(1996)	(2005)	(1996)	(2007)	(1943)	(1954)	(1974)	(1954)	(1976)	(1959)
Min	517	486	433	398	342	406	833	4,986	3,353	1,436	747	552
(WY)	(2002)	(1988)	(2001)	(1988)	(2001)	(1944)	(1975)	(1944)	(1941)	(1977)	(1941)	(2001)

12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT—Continued

SUMMARY STATISTICS

	Calendar Year 2006		Water Year 2007		Water Years 1940 - 2007	
Annual total	1,201,092		1,082,187			
Annual mean	3,291		2,965		2,987	
Highest annual mean					4,721	1974
Lowest annual mean					1,383	1944
Highest daily mean	21,100	May 20	18,000	Nov 8	58,000	Jun 9, 1964
Lowest daily mean	400	Nov 2	[a]190	Jan 12	190	Jan 12, 2007
Annual seven-day minimum	532	Oct 29	279	Jan 11	279	Jan 11, 2007
Maximum peak flow			19,200	Nov 8	[b]69,100	Jun 9, 1964
Maximum peak stage			9.39	Nov 8	[c]18.60	Jun 9, 1964
Instantaneous low flow					[d]187	Feb 8, 2001
Annual runoff (ac-ft)	2,382,000		2,147,000		2,164,000	
Annual runoff (cfsm)	2.13		1.92		1.93	
Annual runoff (inches)	28.86		26.01		26.22	
10 percent exceeds	9,690		8,300		8,460	
50 percent exceeds	1,300		1,220		1,220	
90 percent exceeds	661		587		560	

[a] Result of freezeup.
[b] From rating curve extended above 30,000 ft³/s, on basis of slope-area measurement of peak flow.
[c] From floodmark.
[d] Gage height, 0.87 ft, result of freezeup.



WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 1970, 1976 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: October 1975 to October 1978.
WATER TEMPERATURE: October 1975 to current year (seasonal records beginning April 2006).
SUSPENDED-SEDIMENT DISCHARGE: October 1975 to November 1978.

INSTRUMENTATION.--Temperature proble installed Oct. 1, 1975.

REMARKS.--Daily water temperature records are rated good. Several unpublished observations of specific conductance and water temperature were made during the year.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 246 microsiemens per centimeter (µS/cm) at 25.0°C, Dec. 31, 1976; minimum daily, 128 µS/cm at 25.0°C, June 30, July 1, 1976.
WATER TEMPERATURE: Maximum, 23.0°C, Aug. 12, 1997; minimum, 0.0°C on many days during winter periods.
SEDIMENT CONCENTRATION: Maximum daily mean, 931 mg/L, May 11, 1976; minimum daily mean, 1 mg/L on many days each year.
SEDIMENT LOAD: Maximum daily, 56,800 tons, May 11, 1976; minimum daily, 1.1 tons, Mar. 3, 1978.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 20.5°C, July 18, 24, and 27; minimum for season, 2.0°C, April 3, 4.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2006 TO SEPTEMBER 2007

Part 1 of 4

Date	Time	Instantaneous discharge, cfs (00061)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specific conductance, wat unf µS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)
Mar													
26...	1630	8,370	652	12.3	110	8.0	149	8.0	4.0	81	23.3	5.52	.41
Apr													
17...	1430	4,000	679	11.6	105	8.0	170	6.0	6.0	90	25.9	6.14	.39
May													
01...	1700	7,740	675	12.0	116	8.2	161	23.0	8.5	84	24.0	5.79	.31
15...	1230	12,200	684	11.0	101	8.1	143	19.5	7.0	74	21.3	4.98	.28
Jun													
05...	1430	13,400	668	10.2	107	8.1	129	25.0	11.5	66	19.1	4.43	.27
19...	1300	6,060	683	10.8	107	8.2	149	20.5	10.0	78	22.2	5.36	.26
Jul													
17...	1530	2,220	678	9.5	114	8.4	181	36.0	18.5	97	28.1	6.43	.22
Aug													
07...	1530	1,120	676	10.2	117	8.3	204	23.5	16.0	100	29.6	7.36	.33
Sep													
19...	1130	681	684	10.0	99	8.5	223	11.0	10.0	120	35.3	8.67	.33

12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2006 TO SEPTEMBER 2007
Part 2 of 4
[Remark codes: <, less than; E, estimated.]

Date	Sodium adsorption ratio (00931)	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Fluoride, water, fltrd, mg/L (00950)	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Dissolved solids, sum of constituents mg/L (70301)	Dissolved solids, tons/acre-ft (70303)	Dissolved solids, tons/d (70302)	Ammonia water, fltrd, mg/L as N (00608)	Nitrate + nitrite water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)
Mar													
26...	.1	1.04	76	.21	<.10	5.86	4.56	87	.12	1,960	<.020	.057	<.002
Apr													
17...	.1	1.14	88	.20	<.10	5.24	4.70	96	.13	1,040	<.020	E.013	<.002
May													
01...	.0	.95	82	.13	E.06	5.25	4.12	90	.12	1,880	<.020	.032	<.002
15...	.0	.76	74	<.12	<.10	4.89	3.15	E80	E.11	E2,630	<.020	.042	<.002
Jun													
05...	.0	.70	68	E.10	<.10	4.13	2.81	E72	E.10	E2,620	<.020	.025	<.002
19...	.0	.79	77	E.09	E.06	4.49	3.76	E83	E.11	E1,360	<.020	<.016	<.002
Jul													
17...	.0	.92	91	.14	<.10	4.83	5.54	101	.14	604	<.020	E.008	E.001
Aug													
07...	.0	1.00	104	E.12	E.05	5.04	7.22	E113	E.15	E342	<.020	<.016	<.002
Sep													
19...	.0	1.09	115	.18	E.07	5.86	10.0	130	.18	240	<.020	E.010	<.002

12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2006 TO SEPTEMBER 2007
Part 3 of 4
[Remark codes: <, less than; E, estimated.]

Date	Total nitrogen, water, unfltrd, mg/L (62855)	Orthophosphate, water, fltrd, mg/L as P (00671)	Total phosphorus, water, unfltrd mg/L (00665)	Suspnd. sediment, sieve diametr percent <.063mm (70331)	Suspended sediment concentration mg/L (80154)	Suspended sediment discharge, tons/d (80155)
Mar						
26...	.27	E.005	.089	82	136	3,070
Apr						
17...	.08	E.003	E.006	88	6	65
May						
01...	.31	<.006	.045	74	88	1,840
15...	.18	E.005	.069	70	86	2,830
Jun						
05...	.16	<.006	.081	71	106	3,840
19...	.09	E.004	.009	80	9	147
Jul						
17...	E.05	E.004	<.008	84	2	12
Aug						
07...	E.05	<.006	<.008	70	1	3.0
Sep						
19...	E.04	E.004	<.008	58	1	1.8

WATER-QUALITY DATA
WATER YEAR OCTOBER 2006 TO SEPTEMBER 2007
Part 4 of 4
[Remark codes: <, less than; E, estimated.]

Date	Time	Turbdty white light, det ang 90+/-30 corrctd NTRU (63676)	Organic carbon, water, unfltrd mg/L (00680)	Chlorophyll a phytoplankton, fluoro, µg/L (70953)	Pheophytin a, phytoplankton, µg/L (62360)	Arsenic water, unfltrd µg/L (01002)	Cadmium water, unfltrd µg/L (01027)	Chromium, water, unfltrd recoverable, µg/L (01034)	Copper, water, unfltrd recoverable, µg/L (01042)	Lead, water, unfltrd recoverable, µg/L (01051)	Nickel, water, unfltrd recoverable, µg/L (01067)	Zinc, water, unfltrd recoverable, µg/L (01092)
May												
15...	1230	35	3.1	.7	.5	.81	.02	.78	1.7	.94	1.1	4.8
Aug												
07...	1530	<2.0	.9	.1	.1	.34	E.01	<.60	<1.2	<.06	<.16	<2.0

12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
APRIL 2007 TO SEPTEMBER 2007

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		April			May			June	
1	5.0	3.5	4.0	8.5	6.0	7.5	11.5	9.0	10.5
2	4.5	3.0	3.5	8.5	6.5	7.5	12.0	9.5	11.0
3	4.0	2.0	3.0	7.5	5.0	6.0	12.5	9.5	11.0
4	4.0	2.0	3.0	5.5	4.0	4.5	12.0	10.0	11.0
5	6.0	3.5	4.5	7.0	4.5	5.5	12.0	10.5	11.0
6	6.5	4.0	5.0	8.5	5.0	6.5	10.5	8.5	9.0
7	6.5	4.0	5.5	8.5	6.5	7.5	9.0	8.0	8.5
8	7.5	4.5	6.0	10.0	6.5	8.0	9.5	8.0	8.5
9	7.0	5.0	5.5	9.5	8.0	9.0	10.5	8.0	9.0
10	5.5	4.0	4.5	9.0	6.5	7.5	10.5	9.5	10.0
11	5.0	3.0	4.0	9.0	6.5	7.5	10.5	8.5	9.5
12	6.0	3.0	4.5	9.5	7.0	8.0	10.0	8.0	9.0
13	6.0	4.0	5.0	9.0	6.5	7.5	10.0	8.0	9.0
14	7.0	4.5	6.0	8.5	5.5	6.5	11.0	8.5	9.5
15	7.0	5.5	6.0	9.0	6.0	7.5	11.0	8.5	10.0
16	7.0	4.0	5.5	10.0	7.0	8.5	11.5	9.0	10.0
17	7.0	5.5	6.5	10.0	7.5	9.0	11.0	8.5	9.0
18	6.5	5.0	5.5	9.5	7.5	8.5	10.5	8.0	9.0
19	5.0	4.0	4.5	9.0	7.5	8.0	12.5	8.5	10.5
20	6.0	4.5	5.0	7.5	6.0	7.0	14.0	10.0	12.0
21	7.0	4.0	5.5	7.5	6.5	7.0	14.0	11.0	12.5
22	8.0	5.0	6.5	8.5	6.5	7.5	14.0	11.0	12.5
23	8.5	5.5	7.0	8.5	6.5	7.5	14.5	11.5	13.0
24	8.0	6.0	7.0	8.5	6.0	7.5	14.0	11.5	12.5
25	7.5	5.5	6.5	8.0	5.0	6.5	12.5	10.0	11.0
26	8.0	5.5	6.5	10.0	6.5	8.0	13.5	9.0	10.5
27	7.0	6.0	6.5	9.5	8.0	8.5	14.5	10.5	12.5
28	8.0	5.5	6.5	8.5	6.5	7.5	16.0	12.5	14.0
29	8.0	6.0	7.0	9.5	6.0	7.5	16.0	13.5	14.5
30	7.5	5.5	6.5	10.5	7.5	9.0	14.5	12.0	13.5
31	---	---	---	11.5	8.5	10.0	---	---	---
Month	8.5	2.0	5.5	11.5	4.0	7.5	16.0	8.0	11.0

12355500 NORTH FORK FLATHEAD RIVER NEAR COLUMBIA FALLS, MT—Continued

TEMPERATURE, WATER, DEGREES CELSIUS
APRIL 2007 TO SEPTEMBER 2007

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
		July			August			September	
1	15.0	11.5	13.5	18.0	15.5	17.0	16.5	14.0	15.0
2	15.5	13.0	14.5	18.5	15.5	17.0	16.5	14.5	15.5
3	16.5	13.0	15.0	18.0	16.0	17.5	16.5	14.0	15.5
4	17.5	13.5	15.5	17.5	14.5	16.0	16.0	14.0	15.0
5	18.0	14.5	16.5	17.5	15.0	16.5	16.0	13.5	15.0
6	18.5	15.5	17.0	17.5	15.5	16.5	16.0	14.0	15.0
7	18.5	16.0	17.5	16.5	15.0	16.0	14.5	12.0	13.5
8	18.0	15.0	16.0	15.5	14.0	14.5	12.5	10.5	11.5
9	17.0	14.5	16.0	16.5	13.0	15.0	13.0	10.5	12.0
10	17.5	14.5	16.0	16.5	14.5	16.0	12.5	10.5	12.0
11	18.5	15.0	17.0	16.0	13.0	14.5	13.5	11.0	12.5
12	19.0	16.0	17.5	16.0	13.5	15.0	13.5	12.0	12.5
13	19.5	16.5	18.0	16.5	13.5	15.5	12.5	10.0	11.5
14	20.0	17.0	18.5	17.0	14.0	16.0	12.0	10.0	11.0
15	19.5	17.5	18.5	17.0	14.5	16.0	12.5	10.0	11.5
16	19.0	16.5	18.0	16.5	14.5	15.5	12.5	10.5	11.5
17	19.0	16.5	18.0	16.0	14.0	15.0	12.0	11.0	11.5
18	20.5	17.0	18.5	16.0	13.5	15.0	11.5	10.5	11.0
19	20.0	18.0	19.0	15.0	13.5	14.0	12.0	10.0	11.0
20	19.5	17.0	18.0	14.0	12.5	13.5	10.5	8.0	9.0
21	18.5	16.5	17.5	14.0	12.5	13.5	10.0	7.5	9.0
22	19.5	16.0	17.5	15.0	12.0	13.5	11.5	9.5	10.5
23	20.0	17.0	18.5	14.5	12.5	13.5	11.5	9.0	10.5
24	20.5	18.5	19.5	15.5	12.5	14.0	9.5	8.0	8.5
25	20.0	17.5	18.5	16.0	13.0	14.5	8.5	8.0	8.0
26	19.5	16.5	18.5	16.0	14.0	14.5	9.5	8.0	8.5
27	20.5	17.5	19.0	14.0	12.5	13.5	10.0	8.0	9.0
28	20.0	17.5	19.0	14.0	11.0	12.5	11.5	9.0	10.0
29	19.5	17.0	18.5	15.0	12.0	13.5	10.5	8.5	9.5
30	19.5	16.5	18.0	15.5	13.0	14.5	9.0	7.0	8.0
31	19.0	16.5	17.5	15.0	13.5	14.5	---	---	---
Month	20.5	11.5	17.5	18.5	11.0	15.0	16.5	7.0	11.5