

Water-Data Report 2013

**06054500 MISSOURI RIVER AT TOSTON, MT**

Missouri River Main Stem  
Upper Missouri Subbasin

LOCATION.--Lat 46°08'48", long 111°25'13" referenced to North American Datum of 1983, in NW ¼ SE ¼ NW ¼ sec.36, T.5 N., R.2 E., Broadwater County, MT, Hydrologic Unit 10030101, on left bank 2.2 mi southeast of Toston, 4.8 mi upstream from Crow Creek, 7.8 mi downstream from Sixteenmile Creek, and at river mile 2,296.1.

DRAINAGE AREA.--14,669 mi<sup>2</sup>.

**SURFACE-WATER RECORDS**

PERIOD OF RECORD.--April 1890 to February 1891, April 1910 to December 1916, April 1941 to current year. Monthly discharge only for some periods, published in Water Supply Paper 1309.

GAGE.--Water-stage recorder. Elevation of gage is 3,905.68 ft, referenced to the National Geodetic Vertical Datum of 1929. Prior to Dec. 20, 1916, nonrecording gages at site 2.5 mi downstream at different elevations.

REMARKS.--Records are good. Some regulation occurs from six reservoirs on tributaries and Clark Canyon Reservoir (station 06015300). Diversions for irrigation include about 555,400 acres of which 12,000 acres lies downstream from station. U.S. Army Corps of Engineers satellite telemeter is located at the station.

## 06054500 MISSOURI RIVER AT TOSTON, MT—Continued

**DISCHARGE, CUBIC FEET PER SECOND**  
**WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013**  
**DAILY MEAN VALUES**

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2,060	3,550	3,650	3,150	3,620	3,280	3,690	2,640	6,880	3,700	1,320	1,430
2	2,080	3,540	3,730	3,120	3,650	3,320	4,040	2,670	6,250	3,480	1,290	1,450
3	2,200	3,550	3,820	2,960	3,630	3,400	4,450	2,530	6,080	3,290	1,280	1,480
4	2,120	3,510	3,850	2,850	3,630	3,480	4,950	2,410	6,130	3,300	1,290	1,520
5	2,430	3,510	3,910	2,860	3,680	3,420	4,890	2,360	6,110	3,250	1,370	1,560
6	2,670	3,550	3,950	2,870	3,730	3,350	4,730	2,320	5,890	3,140	1,380	1,590
7	2,720	3,670	3,970	3,080	3,680	3,430	4,660	2,240	5,600	3,010	1,340	1,620
8	2,730	3,860	3,930	3,170	3,660	3,440	4,560	2,160	5,630	2,940	1,230	1,690
9	2,760	4,070	3,530	3,300	3,630	3,360	4,350	2,250	6,010	2,670	1,180	1,700
10	2,750	4,000	3,430	3,570	3,590	3,300	4,030	2,380	6,400	2,410	1,190	1,690
11	2,750	3,710	3,650	3,060	3,390	3,270	3,880	2,470	6,990	2,330	1,190	1,640
12	2,750	3,430	3,780	2,670	3,340	3,260	3,800	2,880	7,560	2,070	1,240	1,610
13	2,670	3,970	3,700	2,600	3,410	3,320	3,790	3,590	7,560	1,820	1,230	1,580
14	2,630	4,070	3,370	2,620	3,460	3,390	3,710	4,360	7,820	1,700	1,210	1,590
15	2,710	4,050	3,660	2,350	3,510	3,490	3,610	5,560	8,060	1,670	1,200	1,640
16	2,810	3,990	3,540	2,630	3,660	3,590	3,530	6,160	7,190	2,170	1,170	1,640
17	2,980	4,000	3,670	2,780	3,680	3,640	3,390	6,430	6,260	2,310	1,150	1,710
18	3,110	4,020	3,600	3,010	3,650	3,550	3,300	6,820	5,600	2,300	1,140	2,070
19	3,200	4,070	3,140	3,300	3,570	3,490	3,260	7,280	5,070	1,780	1,150	2,120
20	3,210	4,080	2,710	3,360	3,480	3,440	3,220	8,170	4,710	1,530	1,230	2,110
21	3,220	4,090	2,570	3,360	3,460	3,480	3,130	8,590	4,320	1,680	1,160	2,090
22	3,240	4,160	2,780	3,440	3,420	3,430	3,150	7,670	4,150	1,830	1,190	2,070
23	3,360	4,070	3,050	3,500	3,400	3,330	3,170	6,940	4,210	1,740	1,180	2,060
24	3,420	4,000	3,010	3,540	3,380	3,200	3,090	7,400	4,190	1,520	1,230	2,110
25	3,440	3,870	2,440	3,560	3,300	3,160	2,960	7,600	4,330	1,430	1,250	2,350
26	3,460	3,710	2,410	3,730	3,300	3,150	2,840	7,260	4,330	1,450	1,240	2,570
27	3,470	3,580	2,950	4,010	3,320	3,150	2,690	6,990	4,180	1,400	1,250	2,890
28	3,490	3,570	3,130	4,030	3,280	3,180	2,510	7,000	3,870	1,430	1,250	2,930
29	3,510	3,550	3,240	4,060	---	3,200	2,520	7,100	3,620	1,450	1,360	2,830
30	3,560	3,590	3,150	3,730	---	3,300	2,600	7,230	3,690	1,360	1,330	2,920
31	3,600	---	3,000	3,680	---	3,500	---	7,260	---	1,310	1,380	---
<b>Total</b>	91,110	114,390	104,320	99,950	98,510	104,300	108,500	158,720	168,690	67,470	38,600	58,260
<b>Mean</b>	2,939	3,813	3,365	3,224	3,518	3,365	3,617	5,120	5,623	2,176	1,245	1,942
<b>Max</b>	3,600	4,160	3,970	4,060	3,730	3,640	4,950	8,590	8,060	3,700	1,380	2,930
<b>Min</b>	2,060	3,430	2,410	2,350	3,280	3,150	2,510	2,160	3,620	1,310	1,140	1,430
<b>Ac-ft</b>	180,700	226,900	206,900	198,300	195,400	206,900	215,200	314,800	334,600	133,800	76,560	115,600

**STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1890 - 2013, BY WATER YEAR (WY)\***

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
<b>Mean</b>	4,264	4,576	3,682	3,353	3,648	4,048	5,469	8,610	12,220	5,100	2,638	3,275
<b>Max</b>	6,778	7,028	5,968	4,893	5,217	6,900	10,090	18,400	24,520	14,240	5,729	5,813
<b>(WY)</b>	(1977)	(1984)	(1960)	(1984)	(1915)	(1916)	(1969)	(1976)	(1997)	(1975)	(1975)	(1984)
<b>Min</b>	2,242	2,815	2,569	2,165	2,268	2,835	2,388	2,850	3,175	1,243	896	1,448
<b>(WY)</b>	(2004)	(1891)	(1891)	(1891)	(1989)	(1955)	(1961)	(2004)	(1987)	(1988)	(1988)	(1994)

\*During periods of operation (April 1890 to February 1891, April 1910 to December 1916, April 1941 to current year).

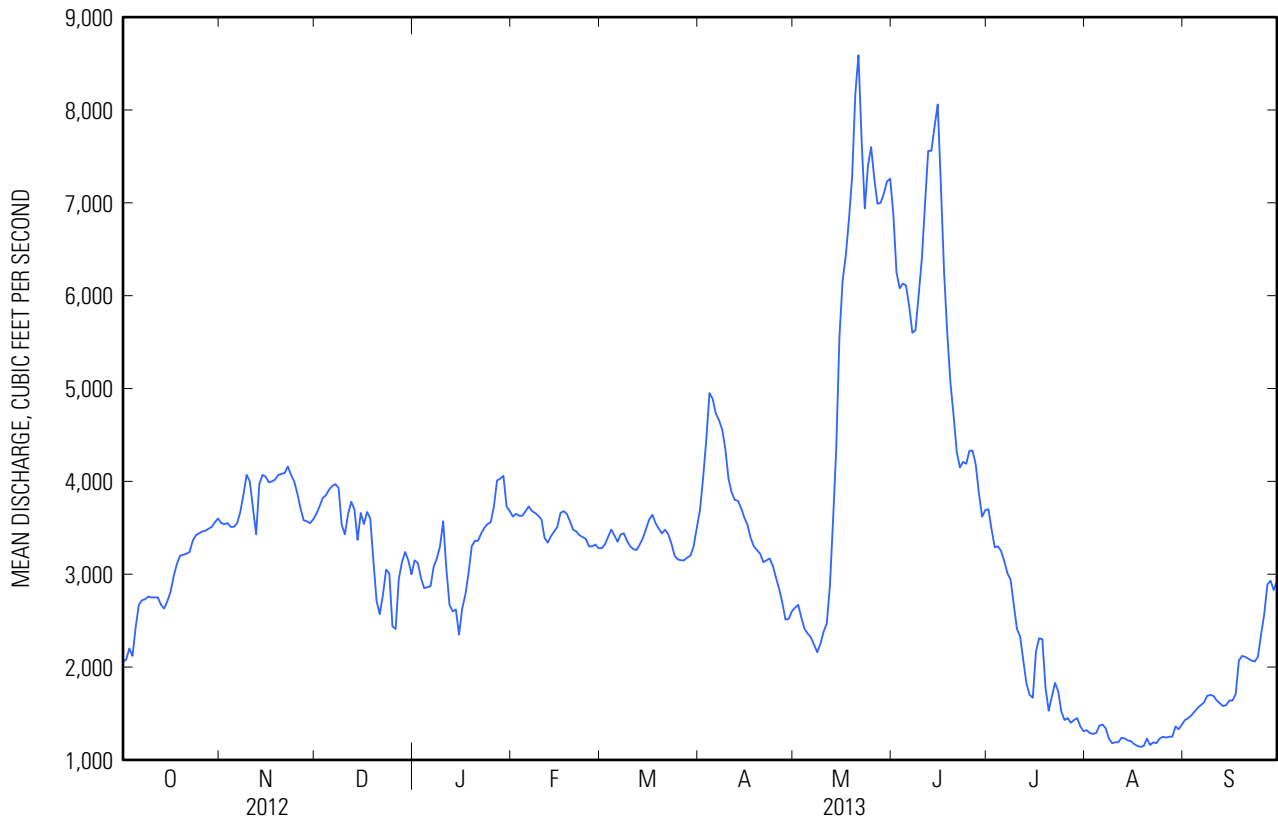
06054500 MISSOURI RIVER AT TOSTON, MT—Continued

SUMMARY STATISTICS

	Calendar Year 2012		Water Year 2013		Water Years 1890 – 2013*	
<b>Annual total</b>	1,617,590		1,212,820			
<b>Annual mean</b>	4,420		3,323		5,089	
<b>Highest annual mean</b>					7,742 1997	
<b>Lowest annual mean</b>					2,830 2004	
<b>Highest daily mean</b>	13,600	Jun 6	8,590	May 21	33,400	Jun 12, 1997
<b>Lowest daily mean</b>	1,550	Aug 29	1,140	Aug 18	700	Jan 12, 1963
<b>Annual seven-day minimum</b>	1,590	Aug 25	1,170	Aug 16	811	Jul 31, 1961
<b>Maximum peak flow</b>			8,870	May 21	34,000	Jun 12, 1997
<b>Maximum peak stage</b>			6.48	May 21	12.22	Jun 12, 1997
<b>Instantaneous low flow</b>					<sup>a</sup> 450	Jul 31, 1989
<b>Annual runoff (ac-ft)</b>	3,208,000		2,406,000		3,687,000	
<b>10 percent exceeds</b>	8,480		5,000		9,130	
<b>50 percent exceeds</b>	3,990		3,320		4,000	
<b>90 percent exceeds</b>	1,770		1,430		2,290	

\*During periods of operation (April 1890 to February 1891, April 1910 to December 1916, April 1941 to current year).

<sup>a</sup>Gage height, 1.68 ft, result of regulation.



**06054500 MISSOURI RIVER AT TOSTON, MT—Continued**

**WATER-QUALITY RECORDS**

PERIOD OF RECORD.--Water years 1949-53, 1965, 1972 to current year. Sampling location moved in October 1978, from old bridge on U.S. Highway 287 at Toston, to cableway 2.4 miles upstream.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1973 to September 1981.

WATER TEMPERATURE: May 1949 to June 1953, April 1973 to current year.

SUSPENDED-SEDIMENT DISCHARGE: March 1949 to June 1953.

INSTRUMENTATION.--Water temperature recorder was installed July 6, 1977.

REMARKS.--Annual water temperature records are complete and rated excellent except for Oct. 1-23, Oct. 29 to Nov. 9, Mar. 14-18, 21, Mar. 27 to Apr. 8, Apr. 10-15, Apr. 19 to Sept. 30 which are rated good. Water-temperature records represent water temperature at sensor within 0.2 °C.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 524 microsiemens per centimeter ( $\mu\text{S}/\text{cm}$ ) at 25°C, Mar. 4, 1978; minimum daily, 159  $\mu\text{S}/\text{cm}$  at 25°C, May 28, 1979.

WATER TEMPERATURE: Maximum, 29.0°C, July 31, 1988, July 20, 1989; minimum, -0.1°C on many days during winter, 2013.

SEDIMENT CONCENTRATION: Maximum daily mean, 670 mg/L, Mar. 22, 25, 1951; minimum daily mean, 5 mg/L, Jul. 12, 1951.

SEDIMENT LOAD: Maximum daily, 16,100 tons, May 5, 1952; minimum daily, 51 tons Feb. 1, 1951.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 26.0°C, July 26; minimum, -0.1°C, many days November through February.

06054500 MISSOURI RIVER AT TOSTON, MT—Continued

TEMPERATURE, WATER, DEGREES CELSIUS  
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
	October			November			December			January		
1	15.8	14.8	15.3	8.3	7.8	8.1	4.5	3.8	4.2	0.2	-0.1	0.0
2	15.4	14.5	14.9	7.8	7.3	7.5	5.0	4.5	4.8	0.1	-0.1	0.0
3	14.6	11.2	13.0	7.6	6.7	7.0	5.0	3.6	4.5	0.0	0.0	0.0
4	11.2	9.1	10.1	7.4	6.4	6.9	3.6	2.7	2.9	0.1	-0.1	0.0
5	9.3	8.3	8.9	8.3	7.4	7.9	3.8	2.7	3.4	0.1	-0.1	0.0
6	8.3	7.4	7.9	8.7	8.2	8.4	3.7	2.6	3.3	0.3	0.0	0.1
7	8.8	7.3	8.0	8.5	7.7	8.2	2.6	1.5	2.0	0.2	0.0	0.1
8	9.0	8.3	8.7	7.7	5.1	6.5	1.5	0.0	0.6	0.2	0.1	0.1
9	8.7	8.1	8.4	5.1	1.5	3.4	0.1	0.0	0.0	0.4	0.1	0.1
10	9.2	8.2	8.6	1.5	-0.1	0.4	0.2	0.0	0.1	0.1	0.0	0.0
11	9.3	8.4	8.8	0.3	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0
12	10.0	9.0	9.4	0.5	0.0	0.1	0.1	0.0	0.1	0.1	-0.1	0.0
13	10.1	9.2	9.6	0.5	0.1	0.2	0.2	0.0	0.1	0.1	-0.1	0.0
14	9.9	9.3	9.5	0.7	0.1	0.3	0.2	-0.1	0.1	0.0	0.0	0.0
15	10.0	9.3	9.6	1.7	0.7	1.3	0.2	0.0	0.0	0.1	0.0	0.1
16	10.0	9.3	9.7	1.2	0.8	1.0	0.3	0.0	0.1	0.1	0.0	0.0
17	9.3	7.6	8.4	1.8	0.8	1.3	0.2	0.0	0.1	0.3	0.0	0.1
18	7.6	6.8	7.2	3.2	1.7	2.4	0.2	-0.1	0.0	0.3	0.0	0.1
19	8.2	6.9	7.5	3.2	2.8	3.0	0.1	-0.1	0.0	0.3	0.0	0.1
20	9.1	8.2	8.6	4.6	3.0	3.9	0.2	0.0	0.1	0.3	0.0	0.1
21	9.0	8.4	8.7	5.3	4.6	5.0	0.4	0.0	0.1	0.3	-0.1	0.1
22	8.5	7.4	8.2	4.8	2.9	4.0	0.4	0.0	0.1	0.2	-0.1	0.1
23	7.4	5.7	6.3	2.9	1.4	2.1	0.3	-0.1	0.1	0.2	0.0	0.1
24	5.7	5.0	5.3	2.7	1.3	2.0	0.1	-0.1	0.0	0.3	0.1	0.1
25	5.1	4.2	4.8	3.5	2.7	3.1	0.1	0.0	0.0	0.3	0.1	0.1
26	4.2	3.5	3.8	3.0	1.0	2.0	0.3	0.0	0.1	0.3	0.1	0.1
27	4.1	3.5	3.8	1.0	0.3	0.6	0.2	0.0	0.1	0.2	0.0	0.1
28	5.6	4.1	4.8	1.0	0.2	0.6	0.3	0.0	0.1	0.2	0.0	0.0
29	7.1	5.6	6.5	2.7	1.0	1.7	0.1	0.0	0.0	0.1	-0.1	0.0
30	7.9	7.0	7.4	3.8	2.7	3.3	0.2	-0.1	0.0	0.2	0.0	0.1
31	8.5	7.8	8.1	---	---	---	0.1	-0.1	0.0	0.2	0.1	0.1
Month	15.8	3.5	8.4	8.7	-0.1	3.4	5.0	-0.1	0.9	0.4	-0.1	0.1

## 06054500 MISSOURI RIVER AT TOSTON, MT—Continued

**TEMPERATURE, WATER, DEGREES CELSIUS**  
**WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013**

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
	February			March			April			May		
<b>1</b>	0.5	0.0	0.1	3.0	1.7	2.3	10.0	8.6	9.4	9.2	7.8	8.3
<b>2</b>	0.4	0.0	0.1	4.1	2.9	3.4	10.3	9.3	9.8	10.7	8.6	9.7
<b>3</b>	0.4	0.0	0.1	4.7	3.6	4.3	10.8	9.8	10.3	12.2	10.4	11.4
<b>4</b>	0.3	0.1	0.1	3.6	1.3	2.3	10.5	9.8	10.2	12.1	11.1	11.6
<b>5</b>	0.4	0.1	0.1	1.3	0.7	1.0	10.6	10.2	10.3	12.7	10.8	11.6
<b>6</b>	0.4	0.0	0.1	1.9	0.9	1.4	10.2	9.2	9.6	15.0	11.6	13.5
<b>7</b>	0.4	0.0	0.1	3.5	1.5	2.4	9.4	8.5	9.1	16.3	14.4	15.5
<b>8</b>	0.3	0.0	0.1	4.5	3.4	3.9	8.5	5.2	7.1	17.1	15.5	16.1
<b>9</b>	0.5	0.0	0.1	4.5	3.6	4.0	5.5	4.4	4.8	17.7	15.7	16.7
<b>10</b>	0.2	-0.1	0.0	4.5	3.6	4.0	6.8	5.5	6.2	17.0	15.7	16.4
<b>11</b>	0.4	-0.1	0.0	5.0	3.8	4.4	8.0	6.7	7.4	17.0	15.8	16.4
<b>12</b>	0.3	0.0	0.1	4.9	3.9	4.3	8.1	7.3	7.7	17.5	16.2	16.8
<b>13</b>	0.4	0.1	0.1	5.5	4.1	4.7	9.2	8.0	8.4	18.3	17.0	17.7
<b>14</b>	0.3	0.0	0.1	6.6	5.5	6.1	8.0	6.2	6.9	17.6	16.8	17.2
<b>15</b>	0.6	0.0	0.1	7.6	6.3	6.9	6.3	4.5	5.5	16.8	15.8	16.2
<b>16</b>	0.6	0.0	0.2	7.8	6.9	7.3	4.5	3.3	4.0	16.1	15.0	15.4
<b>17</b>	0.2	0.0	0.1	7.2	6.1	6.7	3.9	3.3	3.5	15.3	14.1	14.5
<b>18</b>	0.6	0.0	0.2	6.1	3.8	4.6	4.7	3.5	4.1	14.3	13.7	14.0
<b>19</b>	0.5	0.1	0.2	4.4	3.2	3.8	6.3	4.7	5.2	14.3	12.2	13.3
<b>20</b>	0.4	0.1	0.2	5.7	4.3	4.9	7.6	6.2	6.7	12.5	11.6	12.0
<b>21</b>	0.7	0.1	0.3	6.4	5.3	5.7	7.8	6.8	7.5	14.4	11.7	12.5
<b>22</b>	0.9	0.4	0.6	5.6	3.7	5.0	6.8	5.5	6.0	14.8	12.8	13.7
<b>23</b>	1.0	0.6	0.8	3.7	2.2	2.8	6.7	5.4	5.9	13.3	11.4	12.4
<b>24</b>	1.1	0.4	0.7	3.8	2.4	3.0	8.1	6.4	7.2	13.1	11.2	11.7
<b>25</b>	1.3	0.7	0.9	4.4	3.1	3.8	10.7	8.1	9.5	13.3	12.0	12.6
<b>26</b>	0.9	0.4	0.6	5.7	4.0	4.9	11.9	10.4	11.1	13.1	12.5	12.8
<b>27</b>	1.3	0.4	0.8	7.2	5.6	6.4	13.1	11.7	12.3	13.9	12.8	13.3
<b>28</b>	2.1	1.3	1.5	8.5	6.8	7.7	13.9	12.0	12.8	14.9	13.9	14.5
<b>29</b>	---	---	---	9.2	8.0	8.6	13.0	11.0	12.3	15.2	14.2	14.8
<b>30</b>	---	---	---	9.3	8.1	8.8	11.0	8.0	9.4	14.5	13.5	14.0
<b>31</b>	---	---	---	9.6	8.6	9.1	---	---	---	13.7	11.1	12.2
<b>Month</b>	2.1	-0.1	0.3	9.6	0.7	4.8	13.9	3.3	8.0	18.3	7.8	13.8

## 06054500 MISSOURI RIVER AT TOSTON, MT—Continued

**TEMPERATURE, WATER, DEGREES CELSIUS**  
**WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013**

Day	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
	June			July			August			September		
<b>1</b>	13.8	11.0	11.8	24.4	22.4	23.4	23.5	20.6	21.4	22.8	19.6	20.9
<b>2</b>	15.2	13.8	14.8	25.3	24.0	24.6	23.3	19.8	21.3	22.5	20.0	20.8
<b>3</b>	14.7	12.9	13.9	25.6	24.1	24.8	23.1	19.5	20.8	21.8	19.5	20.3
<b>4</b>	14.4	12.7	13.4	24.9	23.9	24.3	23.2	19.6	21.2	22.1	19.3	20.6
<b>5</b>	15.7	13.5	14.3	24.8	23.5	23.9	23.4	20.2	21.5	22.8	20.7	21.7
<b>6</b>	17.1	15.7	16.5	24.2	22.8	23.4	23.3	20.5	21.6	22.7	20.5	21.5
<b>7</b>	17.7	17.1	17.5	24.6	22.9	23.4	23.6	20.2	21.6	22.3	20.2	21.1
<b>8</b>	18.0	17.3	17.6	23.6	22.1	22.9	24.1	20.4	21.8	22.1	19.5	20.8
<b>9</b>	18.3	18.0	18.2	23.3	21.6	22.3	24.0	20.4	21.8	20.5	18.5	19.6
<b>10</b>	18.3	17.8	18.1	24.0	21.9	22.8	24.1	20.4	21.8	20.1	18.2	18.9
<b>11</b>	18.7	16.6	17.6	23.7	21.9	23.1	23.2	19.9	20.9	20.5	18.1	19.1
<b>12</b>	17.5	16.3	16.8	22.0	19.4	20.9	22.5	19.0	20.4	20.3	18.3	19.2
<b>13</b>	17.9	16.4	17.1	21.9	19.4	20.6	22.7	18.5	20.1	20.4	18.5	19.1
<b>14</b>	16.8	14.5	15.4	22.8	20.0	21.3	23.2	19.0	20.8	20.1	18.4	19.0
<b>15</b>	16.1	14.0	14.7	24.4	21.3	22.7	23.6	19.6	21.2	20.5	18.5	19.2
<b>16</b>	17.7	16.1	16.8	22.8	20.7	22.0	24.1	20.3	21.8	20.1	18.2	19.0
<b>17</b>	19.5	17.7	18.6	23.2	20.7	21.8	24.1	20.3	21.9	18.7	17.0	18.2
<b>18</b>	20.0	19.5	19.8	23.8	21.9	22.7	24.1	20.2	21.9	17.0	14.8	15.9
<b>19</b>	19.7	18.5	19.1	24.4	22.3	23.1	24.5	20.5	22.2	15.8	14.7	15.1
<b>20</b>	18.5	15.1	17.0	24.6	22.0	23.0	24.4	20.6	22.1	16.0	14.7	15.2
<b>21</b>	15.6	14.6	15.2	24.6	21.6	22.9	23.4	20.1	21.4	16.3	14.9	15.4
<b>22</b>	16.1	15.5	15.7	24.1	22.3	23.1	23.6	19.9	21.3	16.2	15.0	15.5
<b>23</b>	17.0	15.7	16.3	24.0	21.9	23.0	23.6	20.1	21.2	16.2	15.1	15.6
<b>24</b>	18.5	17.0	18.0	25.0	21.8	23.2	23.2	20.1	21.3	15.2	13.5	14.6
<b>25</b>	18.7	18.0	18.3	25.6	22.3	23.5	23.0	19.5	20.8	13.5	11.3	12.5
<b>26</b>	18.8	18.3	18.6	26.0	22.0	23.8	23.2	19.6	20.9	11.3	9.8	10.6
<b>27</b>	20.3	18.5	19.3	25.8	23.2	24.1	23.3	19.8	21.2	9.8	8.9	9.2
<b>28</b>	22.2	20.3	21.3	24.8	21.5	23.1	22.6	19.9	20.9	10.5	9.2	9.9
<b>29</b>	23.5	22.2	22.7	23.2	20.6	21.7	22.8	20.0	20.9	10.2	9.5	9.8
<b>30</b>	22.7	21.9	22.4	22.4	20.2	21.1	22.8	19.8	21.0	10.4	9.4	9.8
<b>31</b>	---	---	---	24.1	20.3	21.7	23.3	19.9	21.2	---	---	---
<b>Month</b>	23.5	11.0	17.2	26.0	19.4	22.8	24.5	18.5	21.3	22.8	8.9	16.9