



Water-Data Report 2012

06038800 MADISON RIVER AT KIRBY RANCH, NEAR CAMERON, MT

Missouri Headwaters Basin
Madison Subbasin

LOCATION.--Lat 44°53'19", long 111°34'51" referenced to North American Datum of 1983, in NE ¼ NE ¼ SE ¼ sec.10, T.11 S., R.1 E., Madison County, MT, Hydrologic Unit 10020007, 75 ft upstream from county bridge, 0.2 mi upstream from West Fork Madison River, and 22 mi south of Cameron, and at river mile 89.8.

DRAINAGE AREA.--1,065 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD.--September 1959 to September 1963, May 1978 to September 1994 (seasonal records only), October 1994 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 5,860 ft, referenced to the National Geodetic Vertical Datum of 1929. Aug. 31, 1959 to Oct. 2, 1959, nonrecording gage 75 ft downstream at elevation 0.96 ft lower. Oct. 3, 1959 to September 1963, water-stage recorder at present site and elevation. May 1978 to September 1994, nonrecording gage 75 ft downstream at present elevation.

REMARKS.--Records are good except for estimated daily discharges, which are fair. Flow is regulated by Hebgen Lake (station 06038000). Diversions for irrigation of about 1,500 acres occur upstream from station. U.S. Geological Survey satellite telemeter is located at the station. Several unpublished observations of water temperature and specific conductance were made during the year.

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06038800 MADISON RIVER AT KIRBY RANCH, NEAR CAMERON, 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	1,140	1,250	1,250	1,200	1,230	1,150	1,100	1,340	1,990	1,250	1,410	1,080
2	1,140	1,230	1,240	1,190	1,230	1,140	1,100	1,320	2,030	1,230	1,400	1,090
3	1,150	1,230	1,230	1,180	1,230	1,140	1,100	1,290	2,180	1,220	1,380	1,060
4	1,150	1,240	e1,220	1,170	1,220	1,140	1,110	1,270	2,340	1,210	1,370	1,040
5	1,190	1,250	e1,200	1,180	1,210	1,140	1,120	1,310	2,670	1,190	1,360	1,030
6	1,270	1,230	e1,200	1,240	1,200	1,130	1,170	1,290	2,690	1,180	1,360	1,030
7	1,290	1,220	1,210	1,240	1,200	1,120	1,190	1,270	2,570	1,230	1,330	1,030
8	1,270	1,240	1,200	1,230	1,200	1,120	1,180	1,290	2,610	1,240	1,250	1,020
9	1,260	1,350	1,200	1,230	1,200	1,120	1,180	1,390	2,610	1,230	1,210	1,020
10	1,260	1,360	1,190	1,220	1,200	1,120	1,190	1,540	2,570	1,220	1,150	1,010
11	1,260	1,360	1,190	1,210	1,190	1,120	1,220	1,530	2,520	1,210	1,130	1,010
12	1,250	1,360	1,180	e1,200	1,200	1,110	1,260	1,460	2,450	1,200	1,120	1,000
13	1,240	1,350	1,180	1,190	1,190	1,110	1,250	1,410	2,270	1,200	1,110	1,000
14	1,230	1,340	1,180	1,180	1,190	1,110	1,240	1,480	2,090	1,290	1,100	1,000
15	1,230	1,340	1,170	1,170	1,180	1,110	1,220	1,610	1,960	1,340	1,090	996
16	1,230	1,320	1,170	1,170	1,180	1,120	1,210	1,690	1,940	1,330	1,090	996
17	1,210	1,330	1,160	e1,150	1,180	1,140	1,210	1,650	1,990	1,360	1,090	995
18	1,190	1,330	1,150	1,160	1,180	1,150	1,230	1,630	2,010	1,350	1,080	991
19	1,190	1,320	1,170	1,230	1,170	1,140	1,320	1,590	1,860	1,340	1,080	990
20	1,180	1,310	1,240	1,240	1,170	1,120	1,340	1,550	1,680	1,320	1,070	988
21	1,180	1,310	1,270	1,240	1,170	1,110	1,370	1,560	1,620	1,310	1,070	984
22	1,180	1,300	1,250	1,220	1,180	1,110	1,420	1,730	1,640	1,310	1,070	984
23	1,170	1,300	1,240	1,210	1,170	1,110	1,480	1,740	1,700	1,290	1,070	979
24	1,190	1,290	1,230	1,240	1,160	1,110	1,580	1,590	1,730	1,290	1,060	978
25	1,260	1,280	1,230	1,250	1,160	1,110	1,670	1,530	1,730	1,280	1,050	983
26	1,260	1,270	1,220	1,260	1,160	1,120	1,740	1,590	1,660	1,270	1,050	983
27	1,260	1,270	1,210	1,250	1,140	1,150	1,870	1,580	1,580	1,270	1,050	980
28	1,260	1,260	1,210	1,240	1,140	1,080	1,610	1,590	1,400	1,370	1,040	979
29	1,250	1,260	1,210	1,240	1,150	1,060	1,400	1,690	1,360	1,430	1,040	982
30	1,250	1,260	1,210	1,240	---	1,070	1,330	1,750	1,330	1,430	1,030	977
31	1,250	---	1,200	1,240	---	1,080	---	1,900	---	1,420	1,030	---
Total	37,840	38,760	37,410	37,610	34,380	34,660	39,410	47,160	60,780	39,810	35,740	30,185
Mean	1,221	1,292	1,207	1,213	1,186	1,118	1,314	1,521	2,026	1,284	1,153	1,006
Max	1,290	1,360	1,270	1,260	1,230	1,150	1,870	1,900	2,690	1,430	1,410	1,090
Min	1,140	1,220	1,150	1,150	1,140	1,060	1,100	1,270	1,330	1,180	1,030	977
Ac-ft	75,060	76,880	74,200	74,600	68,190	68,750	78,170	93,540	120,600	78,960	70,890	59,870

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2012, BY WATER YEAR (WY)*

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	1,297	1,305	1,108	1,016	1,004	990	1,000	1,369	1,865	1,338	1,112	1,174
Max	2,570	2,780	3,005	1,449	1,521	1,611	1,527	2,865	3,862	2,125	1,672	2,799
(WY)	(1962)	(1960)	(1960)	(1999)	(1999)	(1999)	(1995)	(1997)	(1997)	(1982)	(1997)	(2008)
Min	701	691	739	737	626	525	370	445	619	716	734	732
(WY)	(2008)	(2008)	(1961)	(1961)	(1963)	(1963)	(1961)	(1961)	(1960)	(1979)	(1960)	(1960)

*During periods of operation [September 1959 to September 1963; May 1978 to September 1994 (seasonal records only), October 1994 to current year.]

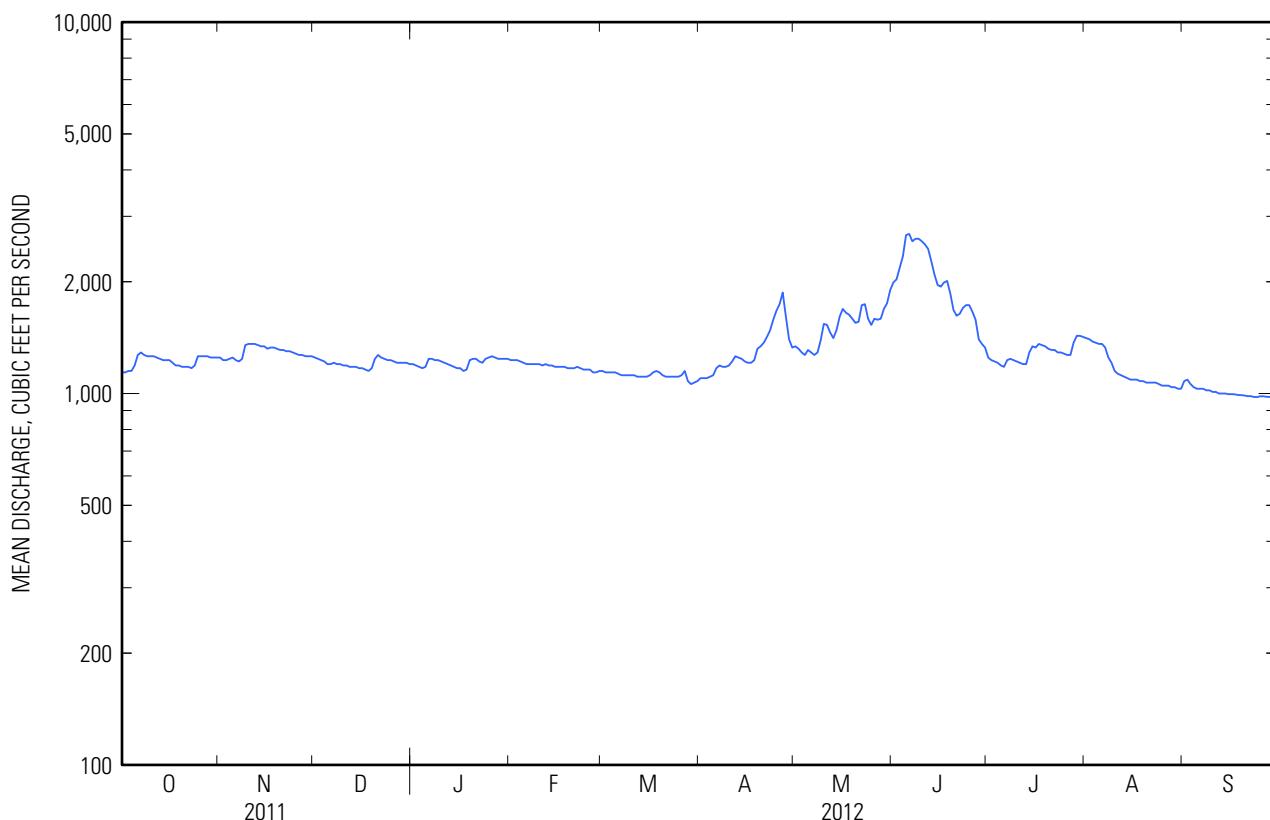
06038800 MADISON RIVER AT KIRBY RANCH, NEAR CAMERON, MT—Continued**SUMMARY STATISTICS**

	Calendar Year 2011	Water Year 2012		Water Years 1959 – 2012*	
Annual total	517,793	473,745			
Annual mean	1,419	1,294		1,227	
Highest annual mean				1,896	1997
Lowest annual mean				733	1961
Highest daily mean	3,910	Jun 24	2,690	Jun 6	5,030 May 31, 1993
Lowest daily mean	905	Mar 9	977	Sep 30	139 Sep 1, 1959
Annual seven-day minimum	911	Mar 3	980	Sep 24	152 Sep 1, 1959
Maximum peak flow			2,760	Jun 6	^a 5,030 May 30, 1993
Maximum peak stage			3.03	Jun 6	3.97 Jun 7, 1996
Instantaneous low flow				^b 139	Sep 1, 1959
Annual runoff (ac-ft)	1,027,000		939,700		889,100
10 percent exceeds	2,530		1,620		1,900
50 percent exceeds	1,180		1,220		1,080
90 percent exceeds	970		1,060		758

*During periods of operation [September 1959 to September 1963; May 1978 to September 1994 (seasonal records only), October 1994 to current year.]

^aObserved, gage height, 3.15 ft; previous site at present datum.

^bObserved, present site and datum.



06038800 MADISON RIVER AT KIRBY RANCH, NEAR CAMERON, MT—Continued**WATER-QUALITY RECORDS**

PERIOD OF RECORD.--Water years 1994-2004, April 2009 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1994 to September 2002, April 2009 to current year.

REMARKS.--Water temperature data is rated excellent for the year except for partial days (Feb. 19, 23-29, Mar. 1-8, and June 11-19) which are poor and missing record. Several unpublished observations of specific conductance and water temperature were made during the year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum 22.2°C, July 28, 2012; minimum, 0.0°C many days during winter months.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum 22.2°C, July 28; minimum, 0.0°C, Jan. 11.

**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	16.6	12.1	13.7	7.9	5.8	6.6	2.9	0.6	1.3	2.6	1.1	1.7	
2	15.5	12.5	13.7	8.4	5.6	6.5	2.1	0.6	1.1	2.6	0.7	1.5	
3	15.4	12.0	13.3	8.2	5.7	6.6	2.4	0.6	1.3	3.6	1.2	1.9	
4	14.1	12.8	13.2	8.3	6.1	6.9	1.3	0.1	0.8	3.4	1.2	1.9	
5	13.4	12.4	12.7	7.1	6.2	6.5	1.9	0.1	0.6	3.1	1.1	1.8	
6	12.6	11.1	12.0	7.7	5.8	6.3	1.8	0.1	0.6	2.9	0.9	1.6	
7	11.8	10.8	11.3	7.8	5.1	6.0	2.0	0.5	1.2	3.2	0.7	1.8	
8	13.8	10.7	11.6	7.4	5.1	6.0	2.7	0.5	1.5	2.7	0.6	1.6	
9	13.8	10.2	11.4	7.1	4.7	5.5	2.8	0.7	1.4	3.2	1.0	1.7	
10	12.4	10.2	11.0	7.2	4.5	5.4	2.4	0.4	1.1	2.7	0.2	1.9	
11	12.8	10.3	11.2	7.1	4.6	5.5	2.6	0.6	1.3	2.5	0.0	0.7	
12	13.1	9.9	10.9	5.4	4.7	5.1	2.5	0.8	1.4	2.2	0.1	0.7	
13	12.0	9.7	10.5	6.5	4.7	5.2	2.9	0.6	1.4	2.5	0.6	1.3	
14	13.2	9.9	11.0	6.1	4.3	4.9	2.6	1.3	1.8	2.9	1.2	1.7	
15	12.7	10.0	10.8	5.3	3.2	4.3	2.9	1.5	2.1	2.4	0.5	1.3	
16	11.0	9.6	10.4	5.1	2.7	3.7	2.9	1.0	1.8	2.3	0.1	0.7	
17	12.5	9.0	10.2	5.4	2.9	4.2	3.1	1.1	1.8	2.0	0.1	0.7	
18	12.5	8.3	9.9	5.3	1.6	3.7	2.9	0.5	1.5	2.1	0.4	1.3	
19	11.5	8.7	9.8	4.3	1.6	2.9	3.5	1.0	2.1	2.8	1.7	2.2	
20	11.8	8.5	9.8	4.7	2.1	3.2	2.6	1.0	1.6	3.6	1.9	2.4	
21	11.3	9.4	10.0	5.1	3.6	4.1	1.8	0.6	1.1	3.3	1.3	2.3	
22	12.1	9.0	10.0	4.0	3.1	3.6	2.1	0.5	0.9	3.1	0.8	1.6	
23	11.6	8.9	9.9	5.1	3.2	3.8	2.0	0.2	0.8	3.0	1.3	2.0	
24	10.3	7.8	9.2	4.2	2.8	3.3	1.8	0.2	1.0	2.6	0.2	1.3	
25	9.6	7.3	8.0	3.4	2.1	2.9	2.5	0.6	1.3	3.6	1.4	2.1	
26	10.4	7.2	8.3	3.4	1.3	2.1	2.6	0.8	1.5	3.7	1.3	2.2	
27	10.0	7.2	8.2	3.1	1.1	1.9	3.1	1.2	2.0	3.3	0.8	1.5	
28	9.1	6.8	7.7	3.9	1.7	2.5	2.8	1.5	2.1	2.7	0.8	1.5	
29	9.8	7.1	8.1	3.1	1.3	2.2	3.4	1.7	2.3	3.4	1.4	2.1	
30	10.1	6.7	7.9	3.1	0.6	2.2	3.1	2.0	2.5	4.0	1.4	2.3	
31	9.9	6.7	8.1	---	---	---	3.0	0.7	1.6	3.8	1.2	2.2	
Month	16.6	6.7	10.4	8.4	0.6	4.5	3.5	0.1	1.4	4.0	0.0	1.7	

06038800 MADISON RIVER AT KIRBY RANCH, NEAR CAMERON, 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	3.7	1.2	2.2	---	---	---	4.6	2.3	3.7	8.2	4.7	5.9
2	3.4	1.6	2.3	---	---	---	6.9	1.7	3.6	7.9	4.4	5.6
3	4.0	0.8	2.0	---	---	---	8.0	1.7	4.1	6.6	4.6	5.5
4	3.8	0.5	1.6	---	---	---	8.2	2.6	4.6	9.1	4.6	6.4
5	3.7	0.6	1.6	---	---	---	6.6	2.8	4.2	8.2	4.2	5.4
6	3.2	0.5	1.6	2.3	0.3	1.6	5.4	2.3	3.3	9.4	3.5	5.9
7	3.8	0.9	2.0	5.2	0.3	2.0	6.3	2.0	3.6	10.0	3.9	6.4
8	3.4	0.4	1.7	5.4	0.5	2.4	7.8	2.3	4.4	11.2	4.3	7.1
9	4.3	1.4	2.4	6.0	1.1	2.8	8.0	2.6	4.6	11.6	4.9	7.6
10	3.4	1.2	2.1	6.3	1.2	3.1	8.7	2.7	5.1	9.3	4.7	6.5
11	4.1	1.6	2.3	5.8	1.7	3.3	8.4	3.0	5.0	10.3	4.5	6.9
12	4.3	1.6	2.5	5.0	2.3	3.2	7.1	3.6	4.8	11.7	5.3	8.0
13	3.9	1.7	2.6	4.3	2.4	3.1	6.8	3.4	4.6	12.9	6.1	8.9
14	4.4	1.5	2.6	4.2	2.6	3.2	7.2	2.6	4.5	13.2	6.4	9.2
15	4.6	0.6	2.2	4.2	3.1	3.5	6.1	2.8	4.1	12.9	7.2	9.7
16	3.4	0.3	1.5	4.5	3.1	3.6	7.2	3.1	4.5	11.9	7.3	8.9
17	4.0	1.1	2.3	4.8	3.0	3.6	8.3	3.9	5.3	11.6	7.6	9.1
18	3.2	1.1	2.1	4.8	2.8	3.5	7.8	3.8	5.3	9.7	6.9	7.9
19	4.3	0.6	1.9	5.1	1.2	2.9	7.6	3.2	4.9	11.5	6.5	8.4
20	2.9	0.7	1.7	4.1	1.1	2.4	8.9	4.0	5.7	11.6	6.4	8.6
21	2.8	1.8	2.3	4.5	2.1	3.2	9.0	3.8	5.8	12.8	6.6	9.2
22	4.4	1.1	2.8	7.4	2.4	4.3	9.5	3.6	5.8	9.5	6.4	7.7
23	4.0	1.0	2.1	6.2	2.7	4.0	8.9	4.4	6.1	10.1	6.9	8.2
24	4.0	1.3	2.2	7.5	2.1	4.1	8.4	5.2	6.3	11.0	7.1	8.5
25	---	---	---	7.7	2.5	4.4	9.4	4.8	6.6	8.7	7.0	7.6
26	3.4	0.3	1.7	4.8	2.8	3.6	8.1	5.2	6.4	8.4	6.6	7.2
27	---	---	---	6.7	2.6	3.9	6.2	4.1	5.0	9.0	6.5	7.4
28	4.3	1.0	2.1	5.4	2.8	3.7	6.8	4.1	5.0	10.8	6.8	8.1
29	---	---	---	4.6	2.6	3.4	8.6	4.4	5.8	10.3	6.6	8.2
30	---	---	---	5.1	3.2	3.9	6.5	4.5	5.4	10.6	7.2	8.5
31	---	---	---	7.2	3.6	4.7	---	---	---	11.2	6.9	8.6
Month	---	---	---	---	---	---	9.5	1.7	4.9	13.2	3.5	7.6

06038800 MADISON RIVER AT KIRBY RANCH, NEAR CAMERON, 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	11.3	8.0	9.3	19.5	12.7	15.5	21.2	16.4	18.3	18.1	15.0	16.1
2	12.6	8.6	10.3	19.6	12.7	15.5	21.4	16.1	18.2	19.5	14.4	16.4
3	12.8	7.5	10.3	19.9	11.7	15.4	20.3	16.0	17.5	19.1	13.7	15.8
4	13.9	7.4	10.3	19.5	11.3	15.3	21.4	15.6	18.0	18.2	13.5	15.3
5	13.7	8.3	10.6	15.9	13.6	14.7	21.7	15.8	18.2	18.5	13.2	15.3
6	10.5	7.9	8.9	19.2	13.6	16.1	20.5	16.4	18.0	16.0	13.1	14.5
7	13.2	8.7	10.6	19.3	14.1	16.4	21.3	16.5	18.4	18.6	13.0	15.1
8	13.0	9.4	10.6	19.5	14.9	16.7	20.9	16.0	18.0	18.8	12.4	15.0
9	11.4	9.3	10.3	20.6	14.3	17.1	20.9	16.2	18.2	18.0	12.7	14.8
10	10.7	9.5	10.1	20.2	14.6	16.7	19.0	16.8	17.5	18.6	12.8	15.2
11	13.4	9.5	11.2	18.6	14.4	16.3	21.5	16.2	18.2	16.6	12.0	13.8
12	---	---	---	20.8	14.4	17.0	21.2	15.5	17.7	16.3	11.3	13.3
13	---	---	---	19.9	15.0	16.8	20.8	15.4	17.5	17.6	11.3	13.8
14	---	---	---	18.2	15.9	16.7	20.8	14.8	17.1	17.3	11.8	14.0
15	---	---	---	19.7	14.1	16.9	18.7	14.5	16.0	17.0	12.0	13.9
16	15.6	10.7	12.6	18.5	13.9	16.3	20.2	14.4	16.7	15.1	12.1	13.3
17	---	---	---	20.5	15.3	17.3	20.3	14.5	16.8	16.9	11.7	13.6
18	---	---	---	20.5	14.9	17.1	20.4	14.5	16.8	16.8	11.4	13.5
19	---	---	---	21.0	14.8	17.4	18.2	14.5	16.2	17.0	11.6	13.7
20	15.7	10.6	12.6	21.9	16.3	18.5	19.9	15.7	17.1	16.7	11.4	13.5
21	16.9	10.8	13.3	21.4	15.7	17.9	20.0	15.0	17.1	17.3	11.5	13.8
22	16.9	11.2	13.5	21.5	16.2	18.3	19.1	14.9	16.6	16.9	11.6	13.7
23	16.9	11.0	13.6	21.6	16.8	18.6	20.0	14.4	16.6	15.2	11.9	13.3
24	17.3	11.7	14.1	21.8	16.9	18.8	19.5	13.4	16.0	15.6	12.8	13.8
25	17.6	11.6	14.0	21.5	16.4	18.2	19.2	13.0	15.5	16.6	12.9	13.9
26	15.7	10.0	13.1	21.4	16.0	18.4	19.7	13.8	16.1	16.9	12.4	14.1
27	17.2	10.0	13.5	21.1	17.1	18.4	20.4	15.1	17.0	15.9	11.7	13.5
28	18.4	11.7	14.4	22.2	16.5	18.5	20.2	14.1	16.5	15.4	11.8	13.2
29	18.5	12.0	14.6	21.8	16.5	18.5	19.6	13.5	16.1	16.6	12.6	13.9
30	18.9	12.3	15.1	21.9	16.4	18.6	19.1	13.3	15.5	16.6	11.9	13.5
31	---	---	---	21.9	15.9	18.3	19.5	14.2	16.3	---	---	---
Month	---	---	---	22.2	11.3	17.2	21.7	13.0	17.1	19.5	11.3	14.2