Water-Data Report 2013

12340500 CLARK FORK ABOVE MISSOULA, MT

Pend Oreille Basin
Middle Clark Fork Subbasin

LOCATION.--Lat 46°52'38", long 113°55'55" referenced to North American Datum of 1983, in NW ¼ NW ¼ NW ¼ sec.19, T.13 N., R.18 W., Missoula County, MT, Hydrologic Unit 17010204, on right bank 0.2 mi downstream from county road bridge, 2.8 mi east of Missoula, 2.8 mi downstream from former Milltown Dam, 3.0 mi downstream from Blackfoot River, and at river mile 361.6.

DRAINAGE AREA.--5,999 mi^2.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--March 1929 to current year. Monthly discharge only for some periods, published in Water Supply Paper (WSP) 1316.

REVISED RECORDS.--WSP 1042: 1936. WSP 1152: 1942. WSP 1246: 1929-30; 1935, drainage area. WSP 1316: 1932-33.

GAGE.--Water-stage recorder. Elevation of gage is 3,198.30 ft, referenced to the National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to May 27, 1929, nonrecording gage.

REMARKS.--Records are good except for estimated daily discharges, which are poor. Milltown dam was removed March 28, 2008. Diversions for irrigation of about 120,000 acres occur upstream from station. U.S. Geological Survey satellite telemeter is located at the station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1908 reached a discharge of 48,000 ft^3/s, provided by The Montana Power Company.

12340500 CLARK FORK ABOVE MISSOULA, MT—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1,150	1,620	1,730	e1,350	1,490	1,320	2,130	3,960	6,910	2,910	1,150	828
2	1,150	1,620	1,860	e1,300	1,490	1,390	2,370	3,770	6,430	2,770	1,230	817
3	1,190	1,630	2,080	e1,100	1,450	1,480	2,630	3,600	6,480	2,610	1,280	829
4	1,200	1,640	2,050	e1,000	1,450	1,560	2,960	3,540	6,680	2,460	1,250	854
5	1,240	1,640	2,020	e1,100	1,490	1,460	3,280	3,530	6,500	2,370	1,180	871
6	1,280	1,630	2,050	e1,300	1,470	1,420	3,740	3,730	6,150	2,290	1,130	938
7	1,300	1,630	2,020	e1,450	1,450	1,450	4,080	4,370	6,140	2,230	1,100	989
8	1,320	1,630	1,960	1,540	1,410	1,440	4,120	5,460	6,330	2,140	1,060	981
9	1,320	1,660	1,730	1,540	1,420	1,420	3,890	6,660	6,360	2,110	1,050	998
10	1,330	1,630	1,680	1,570	1,400	1,420	3,640	7,760	6,160	2,030	1,120	981
11	1,340	1,520	1,760	1,470	1,340	1,440	3,490	8,630	5,810	1,970	1,130	953
12	1,340	1,510	1,810	e1,250	1,350	1,460	3,320	9,240	5,520	1,920	1,100	921
13	1,350	1,570	1,790	e1,000	1,370	1,470	3,180	10,400	5,470	1,920	1,100	895
14	1,360	1,630	1,660	e950	1,410	1,560	3,090	12,300	5,730	1,870	1,070	878
15	1,370	1,630	1,580	e1,100	1,390	1,690	2,950	12,000	5,420	1,800	1,030	894
16	1,490	1,620	1,620	e1,150	1,390	1,870	2,790	10,500	4,820	1,750	993	896
17	1,580	1,600	1,650	e1,150	1,410	1,940	2,630	9,140	4,410	1,720	970	903
18	1,570	1,620	1,640	e1,200	1,410	1,880	2,540	8,170	4,160	1,700	947	933
19	1,510	1,620	1,510	e1,350	1,380	1,820	2,480	7,630	4,090	1,670	925	961
20	1,500	1,610	e1,300	e1,400	1,390	1,800	2,450	7,200	4,340	1,610	907	967
21	1,500	1,810	e1,350	e1,350	1,360	1,850	2,470	6,910	4,540	1,540	885	969
22	1,500	2,010	e1,500	e1,300	1,350	1,850	2,530	7,110	4,270	1,490	871	976
23	1,510	1,890	1,590	e1,300	1,370	1,780	2,500	7,800	4,020	1,450	865	997
24	1,520	1,770	1,570	e1,450	1,360	1,700	2,470	7,890	3,840	1,390	857	1,030
25	1,520	1,770	1,480	1,510	1,330	1,680	2,450	7,400	3,820	1,340	864	1,120
26	1,510	1,720	e1,400	1,490	1,320	1,680	2,450	6,780	3,830	1,300	869	1,190
27	1,520	1,550	e1,500	1,470	1,300	1,700	2,560	6,500	3,690	1,250	854	1,220
28	1,580	1,520	1,590	1,420	1,300	1,710	2,960	6,730	3,420	1,210	853	1,220
29	1,630	1,620	1,500	1,410	---	1,770	3,620	7,260	3,210	1,180	865	1,230
30	1,660	1,680	1,400	1,420	---	1,860	3,970	7,350	3,060	1,160	870	1,330
31	1,650	---	e1,400	1,440	---	1,980	---	7,380	---	1,140	843	---
Total	43,990	49,600	51,780	40,830	39,050	50,850	89,740	220,700	151,610	56,300	31,218	29,569
Mean	1,419	1,653	1,670	1,317	1,395	1,640	2,991	7,119	5,054	1,816	1,007	986
Max	1,660	2,010	2,080	1,570	1,490	1,980	4,120	12,300	6,910	2,910	1,280	1,330
Min	1,150	1,510	1,300	950	1,300	1,320	2,130	3,530	3,060	1,140	843	817
Ac-ft	87,250	98,380	102,700	80,990	77,460	100,900	178,000	437,800	300,700	111,700	61,920	58,650

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2013, BY WATER YEAR (WY)

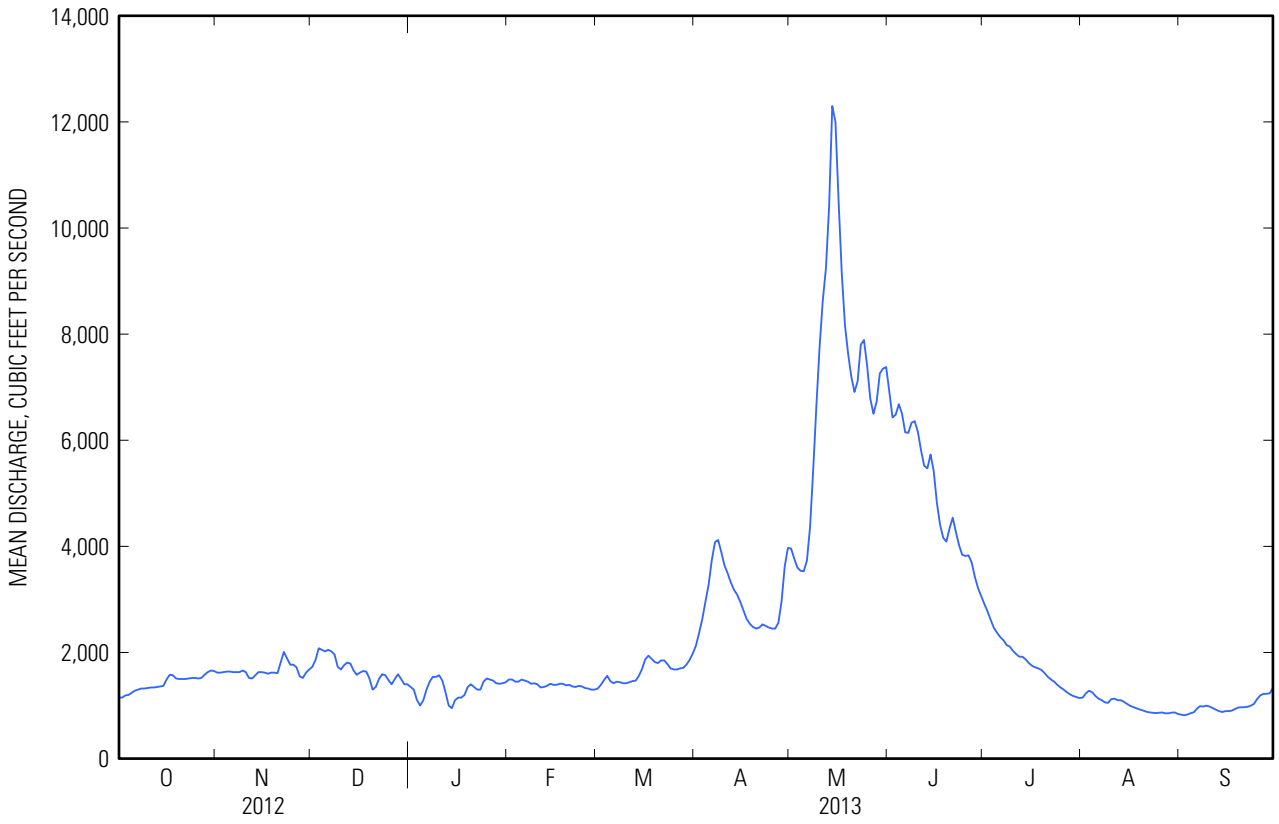
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	1,548	1,559	1,408	1,331	1,456	1,857	3,747	7,893	8,259	3,160	1,480	1,389
Max	2,987	2,852	3,323	2,546	3,431	4,124	10,080	17,240	20,150	8,996	3,448	2,874
(WY)	(1960)	(1960)	(1976)	(1976)	(1996)	(1986)	(1934)	(1976)	(2011)	(2011)	(1975)	(1965)
Min	854	882	874	606	674	1,037	1,191	2,005	2,122	868	627	653
(WY)	(1936)	(1938)	(1945)	(1937)	(1933)	(1937)	(1941)	(1941)	(1992)	(1931)	(1988)	(1937)

12340500 CLARK FORK ABOVE MISSOULA, MT—Continued

SUMMARY STATISTICS

	Calendar Year 2012		Water Year 2013		Water Years 1929 - 2013	
Annual total	1,209,390		855,237			
Annual mean	3,304		2,343		2,931	
Highest annual mean					5,099	2011
Lowest annual mean					1,344	1941
Highest daily mean	17,600	Apr 28	12,300	May 14	30,800	Jun 21, 1975
Lowest daily mean	1,130	Sep 23	817	Sep 2	340	Sep 27, 1937
Annual seven-day minimum	1,140	Sep 19	844	Aug 28	446	Jan 7, 1937
Maximum peak flow			13,000	May 14	32,300	Jun 21, 1975
Maximum peak stage			8.00	May 14	13.75	Jun 21, 1975
Instantaneous low flow					[a]115	Oct 25, 1943
Annual runoff (ac-ft)	2,399,000		1,696,000		2,123,000	
10 percent exceeds	8,020		5,490		6,900	
50 percent exceeds	1,660		1,560		1,650	
90 percent exceeds	1,240		986		1,000	

[a]Gage height, 0.64 ft.; power plant shutdown.



12340500 CLARK FORK ABOVE MISSOULA, MT—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-71, 1977-83, 1986 to current year. Water years 1969-71 samples collected 3.4 miles downstream from gaging station.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: June 1977 to September 1983, February 2002 to September 2002.
TURBIDITY: April to September 2007.
SUSPENDED-SEDIMENT DISCHARGE: July 1986 to April 1987, June 1988 to January 1996, March 1996 to March 2003, August 2003 to current year.

REMARKS.--Sediment records are rated good for most of water year 2013. Several unpublished observations of specific conductance and water temperature were made during the year.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: Maximum, 22.5°C, Aug. 7, 8, 1983, July 13-15, 2002; minimum, 0.0°C on many days during winter periods.
TURBIDITY: During period of seasonal collection, maximum, 55 FNU, May 4, 2007; minimum, 1.0 FNU, July 21-24, 2007.
SEDIMENT CONCENTRATION: Maximum daily mean, 1,060 mg/L, May 20, 2008; minimum daily mean, 1 mg/L, on many days.
SEDIMENT LOAD: Maximum daily, 46,400 tons, May 20, 2008; minimum daily, 1.6 tons, Dec. 27, 1992.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATION: Maximum daily mean, 155 mg/L, May 14, 2013; minimum daily mean, 1 mg/L, January 1-2, 2013.
SEDIMENT LOAD: Maximum daily, 5,150 tons, May 14, 2013; minimum daily, 3.5 tons, January 2, 2013.

12340500 CLARK FORK ABOVE MISSOULA, MT—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Day	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)
	October		November		December		January		February		March	
1	4	12	8	35	6	28	1	3.6	4	16	6	21
2	3	9.3	8	35	7	35	1	3.5	4	16	7	26
3	3	9.6	8	35	8	45	2	5.9	5	20	8	32
4	2	6.5	9	40	8	44	3	8.1	5	20	12	51
5	3	10	9	40	8	44	4	12	5	20	9	35
6	4	14	8	35	9	50	4	14	6	24	8	31
7	5	18	7	31	7	38	4	16	6	23	8	31
8	6	21	7	31	5	26	5	21	6	23	8	31
9	6	21	6	27	4	19	5	21	6	23	8	31
10	7	25	6	26	4	18	5	21	6	23	8	31
11	7	25	5	21	5	24	5	20	6	22	8	31
12	7	25	5	20	6	29	4	14	6	22	8	32
13	7	26	6	25	5	24	4	11	6	22	9	36
14	8	29	7	31	5	22	4	10	6	23	12	51
15	10	37	7	31	4	17	5	15	6	23	16	73
16	11	44	6	26	3	13	5	16	6	23	22	111
17	10	43	6	26	4	18	6	19	6	23	18	94
18	9	38	6	26	3	13	6	19	6	23	14	71
19	8	33	6	26	3	12	5	18	6	22	12	59
20	7	28	6	26	2	7.0	5	19	6	23	11	53
21	7	28	11	54	2	7.3	5	18	6	22	13	65
22	7	28	11	60	3	12	5	18	6	22	10	50
23	6	24	7	36	7	30	5	18	5	18	9	43
24	6	25	7	33	8	34	6	23	4	15	9	41
25	6	25	7	33	6	24	6	24	4	14	8	36
26	6	24	5	23	3	11	5	20	4	14	8	36
27	6	25	4	17	4	16	4	16	5	18	9	41
28	6	26	4	16	6	26	4	15	5	18	11	51
29	7	31	4	17	2	8.1	3	11	---	---	11	53
30	9	40	5	23	2	7.6	3	12	---	---	12	60
31	8	36	---	---	3	11	4	16	---	---	15	80
Total	---	786.4	---	905	---	713.0	---	478.1	---	575	---	1,487

12340500 CLARK FORK ABOVE MISSOULA, MT—Continued

SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2012 TO SEPTEMBER 2013

Day	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)	Mean concen-tration (mg/L)	Sediment discharge (tons/day)
	April		May		June		July		August		September	
1	19	109	14	150	20	373	6	47	9	28	6	13
2	23	147	12	122	16	278	7	52	7	23	6	13
3	26	185	10	97	16	280	5	35	10	35	6	13
4	30	240	10	96	18	325	4	27	8	27	6	14
5	29	257	10	95	19	333	4	26	7	22	6	14
6	32	323	12	121	18	299	4	25	7	21	7	18
7	34	375	18	212	16	265	3	18	6	18	9	24
8	22	245	34	501	16	273	3	17	6	17	7	19
9	14	147	47	845	16	275	3	17	5	14	9	24
10	14	138	53	1,110	17	283	3	16	8	24	6	16
11	14	132	60	1,400	15	235	5	27	7	21	5	13
12	12	108	63	1,570	12	179	6	31	7	21	5	12
13	12	103	84	2,360	15	222	4	21	7	21	4	9.7
14	10	83	155	5,150	15	232	4	20	7	20	4	9.5
15	9	72	142	4,600	14	205	4	19	7	19	4	9.7
16	8	60	70	1,980	12	156	4	19	8	21	5	12
17	6	43	46	1,140	11	131	4	19	8	21	5	12
18	6	41	33	728	10	112	3	14	7	18	6	15
19	8	54	24	494	9	99	3	14	7	17	6	16
20	8	53	21	408	9	105	4	17	7	17	5	13
21	6	40	20	373	10	123	6	25	7	17	5	13
22	5	34	20	384	8	92	8	32	6	14	5	13
23	6	40	23	484	6	65	8	31	6	14	6	16
24	7	47	24	511	6	62	8	30	6	14	7	19
25	8	53	22	440	7	72	7	25	6	14	10	30
26	8	53	19	348	7	72	6	21	6	14	12	39
27	11	76	16	281	7	70	5	17	6	14	13	43
28	14	112	17	309	5	46	5	16	6	14	12	40
29	18	176	24	470	5	43	6	19	6	14	11	37
30	20	214	26	516	5	41	7	22	6	14	12	43
31	---	---	24	478	---	---	8	25	6	14	---	---
Total	---	3,760	---	27,773	---	5,346	---	744	---	582	---	582.9