Water-Data Report 2012

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.

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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	1,670	2,010	1,810	e1,600	1,680	1,570	5,090	11,800	6,670	4,300	1,710	1,210
2	1,690	1,990	1,700	1,650	1,610	1,540	5,320	10,700	7,060	4,130	1,660	1,190
3	1,690	1,930	1,680	1,680	1,580	1,560	5,000	9,560	8,000	3,940	1,630	1,180
4	1,730	1,940	1,680	1,720	1,480	1,630	4,800	8,820	8,710	3,740	1,600	1,170
5	1,830	1,960	1,560	1,680	1,380	2,260	4,670	8,370	9,400	3,570	1,570	1,170
6	1,930	1,950	1,550	1,660	1,380	2,710	4,540	7,960	11,300	3,380	1,530	1,170
7	1,970	1,880	1,610	1,600	1,520	2,420	4,420	7,380	11,500	3,230	1,500	1,180
8	1,980	1,850	1,600	1,570	1,430	2,030	4,200	7,070	10,300	3,110	1,480	1,170
9	1,950	1,890	1,560	1,580	1,470	1,880	4,040	7,170	9,370	3,030	1,480	1,170
10	1,930	1,870	1,490	1,600	1,530	1,990	3,970	7,910	8,920	2,930	1,470	1,170
11	1,970	1,860	1,480	1,570	1,500	2,340	4,130	8,240	8,470	2,860	1,450	1,160
12	2,000	1,890	1,530	1,360	1,480	2,580	4,990	8,000	7,930	2,760	1,420	1,160
13	2,000	1,920	1,540	1,270	1,470	2,490	6,250	7,850	7,780	2,640	1,390	1,160
14	1,980	1,940	1,590	1,430	1,470	2,340	6,610	8,050	8,540	2,580	1,350	1,170
15	2,040	1,930	1,660	1,550	1,450	2,220	6,600	8,640	8,380	2,540	1,340	1,180
16	2,100	1,820	1,650	1,470	1,410	2,400	6,470	9,680	8,000	2,560	1,340	1,170
17	2,140	1,790	1,680	1,480	1,430	2,950	6,200	11,000	7,820	2,560	1,340	1,150
18	2,110	1,890	1,630	1,380	1,440	2,900	6,050	11,400	7,960	2,520	1,330	1,150
19	2,080	1,800	1,670	1,350	1,430	2,740	6,010	10,600	7,920	2,440	1,300	1,140
20	2,040	1,660	1,620	1,500	1,420	2,430	5,980	9,570	7,400	2,360	1,290	1,140
21	2,050	1,740	1,660	1,650	1,430	e2,300	6,470	8,940	6,800	2,340	1,300	1,140
22	2,020	1,850	1,530	1,650	1,630	e2,260	7,430	9,350	6,360	2,260	1,320	1,140
23	2,040	1,920	1,360	1,590	2,750	2,500	8,630	10,500	6,210	2,170	1,320	1,130
24	2,090	1,920	1,350	1,460	2,270	2,740	10,500	9,750	6,300	2,090	1,290	1,130
25	2,140	1,950	1,620	1,480	1,990	2,730	13,100	8,680	6,320	2,020	1,290	1,130
26	2,110	1,890	1,690	1,640	1,830	2,860	14,900	7,860	6,150	1,940	1,270	1,140
27	2,060	1,790	1,630	1,570	1,710	3,030	17,400	7,470	5,850	1,910	1,270	1,140
28	2,040	1,880	e1,650	1,470	1,600	3,190	17,600	7,390	5,310	1,900	1,270	1,150
29	2,010	1,870	e1,650	1,540	1,540	3,320	15,200	7,320	4,840	1,890	1,260	1,150
30	2,010	1,850	e1,630	1,820	---	3,430	13,100	7,020	4,520	1,810	1,230	1,150
31	2,010	---	e1,620	1,900	---	4,140	---	6,720	---	1,750	1,210	---
Total	61,410	56,430	49,680	48,470	46,310	77,480	229,670	270,770	230,090	83,260	43,210	34,760
Mean	1,981	1,881	1,603	1,564	1,597	2,499	7,656	8,735	7,670	2,686	1,394	1,159
Max	2,140	2,010	1,810	1,900	2,750	4,140	17,600	11,800	11,500	4,300	1,710	1,210
Min	1,670	1,660	1,350	1,270	1,380	1,540	3,970	6,720	4,520	1,750	1,210	1,130
Ac-ft	121,800	111,900	98,540	96,140	91,860	153,700	455,600	537,100	456,400	165,100	85,710	68,950

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2012, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	1,549	1,558	1,404	1,331	1,456	1,860	3,756	7,902	8,297	3,176	1,486	1,394
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)

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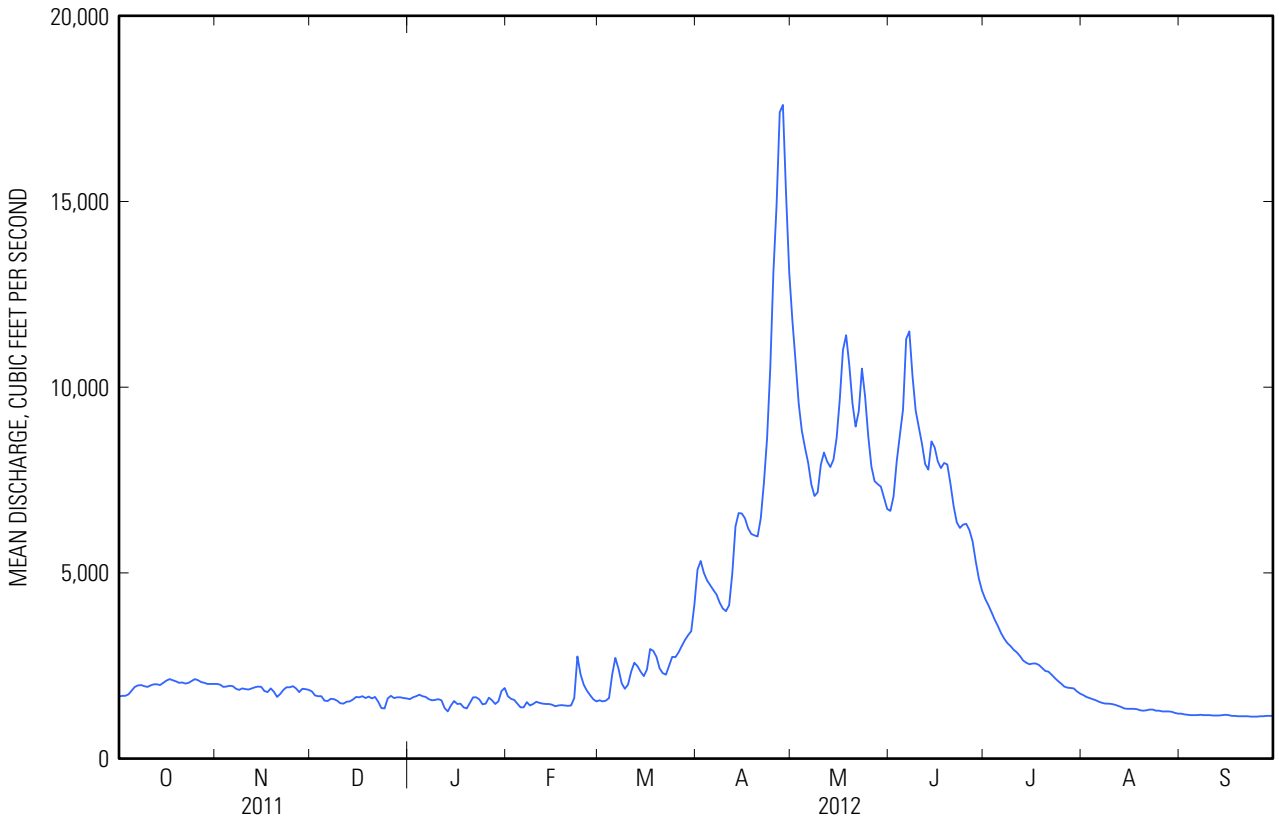
SUMMARY STATISTICS

	Calendar Year 2011		Water Year 2012		Water Years 1929 - 2012	
Annual total	1,893,020		1,231,540			
Annual mean	5,186		3,365		2,938	
Highest annual mean					5,099	2011
Lowest annual mean					1,344	1941
Highest daily mean	28,100	Jun 10	17,600	Apr 28	30,800	Jun 21, 1975
Lowest daily mean	1,100	Jan 1	1,130	Sep 23	340	Sep 27, 1937
Annual seven-day minimum	1,310	Jan 1	1,140	Sep 19	446	Jan 7, 1937
Maximum peak flow			18,500	Apr 27	32,300	Jun 21, 1975
Maximum peak stage			9.70	Apr 27	13.75	Jun 21, 1975
Instantaneous low flow					[a]115	Oct 25, 1943
Annual runoff (ac-ft)	3,755,000		2,443,000		2,128,000	
10 percent exceeds	16,900		8,020		6,930	
50 percent exceeds	2,050		1,920		1,650	
90 percent exceeds	1,600		1,270		1,000	

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



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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 2012. 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, 250 mg/L, April 27, 2012; minimum daily mean, 1 mg/L, January 17-19, 2012.
SEDIMENT LOAD: Maximum daily, 11,800 tons, April 27, 2012; minimum daily, 3.7 tons, January 18, 2012.

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SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

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	5	23	5	26	12	61	10	43	13	57	11	45
2	5	23	4	22	15	68	9	40	9	38	10	40
3	6	25	4	21	17	77	8	37	7	30	8	34
4	7	30	5	24	29	134	7	33	6	22	21	96
5	9	43	5	26	31	129	6	28	4	16	92	576
6	11	56	4	24	27	112	6	25	4	16	81	603
7	9	49	4	20	25	107	5	22	5	20	56	375
8	8	43	3	17	22	97	5	21	5	19	20	112
9	7	39	3	16	20	86	5	21	5	20	16	79
10	7	37	3	15	20	81	5	22	5	22	16	89
11	8	40	3	16	23	90	5	23	5	19	35	227
12	8	43	4	18	28	116	6	21	4	16	42	291
13	8	43	4	20	32	135	6	20	4	16	34	230
14	8	43	4	20	28	119	4	16	4	15	28	175
15	9	51	3	18	21	95	3	12	4	14	23	137
16	10	57	3	15	15	65	2	7.6	3	13	28	181
17	10	58	3	15	8	38	1	4.4	3	12	44	352
18	10	54	4	19	6	28	1	3.7	3	13	38	296
19	9	49	4	22	6	25	1	4.1	3	14	24	182
20	8	44	5	23	5	21	3	13	4	14	19	124
21	8	44	6	28	4	19	6	27	5	19	17	103
22	8	44	7	34	4	16	8	35	30	140	17	107
23	8	44	8	40	4	15	7	30	199	1,540	20	138
24	8	45	9	45	5	19	6	24	62	382	24	180
25	8	45	9	47	13	56	5	20	25	137	28	206
26	7	38	9	45	13	58	4	19	19	94	30	228
27	6	31	8	41	11	50	4	17	14	67	32	261
28	4	24	8	42	11	49	4	16	10	43	37	322
29	4	22	8	41	11	49	4	18	6	27	38	339
30	4	23	9	45	11	47	13	67	---	---	38	355
31	5	25	---	---	10	45	18	90	---	---	73	828
Total	---	1,235	---	805	---	2,107	---	779.8	---	2,855	---	7,311

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SUSPENDED-SEDIMENT
WATER YEAR OCTOBER 2011 TO SEPTEMBER 2012

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	103	1,410	56	1,800	12	207	7	80	3	14	4	14
2	88	1,260	41	1,200	14	276	6	68	3	15	4	13
3	73	982	32	838	24	515	6	64	3	15	4	13
4	43	557	28	675	33	765	6	60	4	16	4	13
5	33	415	27	605	40	1,020	5	53	4	17	4	13
6	26	323	24	519	83	2,570	5	46	4	16	4	13
7	23	279	22	443	76	2,360	5	39	4	14	4	13
8	20	231	22	415	48	1,340	4	34	3	13	4	13
9	21	224	21	399	31	777	4	33	3	12	4	13
10	23	249	24	512	25	598	4	31	3	13	4	13
11	22	250	24	531	23	526	3	27	4	14	4	13
12	40	546	21	447	19	408	3	23	4	14	4	12
13	94	1,600	20	424	18	372	3	21	4	15	4	13
14	75	1,330	22	488	24	544	3	21	3	13	4	13
15	56	1,000	29	677	20	445	3	21	3	11	4	13
16	50	875	44	1,170	18	380	3	21	4	13	4	13
17	37	622	72	2,170	15	322	4	24	4	14	4	12
18	32	519	65	1,990	15	322	4	27	4	13	4	12
19	27	444	45	1,290	15	314	2	13	3	12	4	12
20	28	446	30	786	13	257	2	13	3	11	4	12
21	34	607	24	574	13	237	2	16	3	11	4	12
22	61	1,230	26	650	12	213	3	18	3	11	4	12
23	97	2,290	41	1,150	10	175	3	18	3	11	4	12
24	169	4,830	30	783	11	188	3	16	3	10	4	12
25	245	8,660	19	453	12	200	2	13	3	11	4	12
26	194	7,780	16	336	11	181	2	11	3	12	4	12
27	250	11,800	14	279	10	154	3	13	4	14	4	12
28	185	8,870	16	324	8	117	3	16	5	16	4	12
29	109	4,510	15	298	8	105	4	18	5	17	4	12
30	70	2,470	14	262	8	95	4	19	5	16	4	12
31	---	---	12	219	---	---	3	16	4	15	---	---
Total	---	66,609	---	22,707	---	15,983	---	893	---	419	---	376