

Water-Data Report 2007

06214500 YELLOWSTONE RIVER AT BILLINGS, MT

Upper Yellowstone Basin
Upper Yellowstone-Pompeys Pillar Subbasin

LOCATION.--Lat 45°48'00", long 108°28'00" referenced to North American Datum of 1927, in SE ¼ SE ¼ SE ¼ sec.27, T.1 N., R.26 E., Yellowstone County, MT, Hydrologic Unit 10070007, on right bank 0.3 mi downstream from bridge on U.S. Highway 87, 1 mi northeast of Billings, 10 mi upstream from Pryor Creek, and at river mile 360.3.

DRAINAGE AREA.--11,805 mi² of which 397 mi² probably is noncontributing.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--May 1904 to December 1905 (gage heights only January to March, December 1905), August 1928 to current year. Monthly discharge only for some periods, published in Water Supply Paper (WSP) 1309. Published as "near Billings" 1904-5.

REVISED RECORDS.-- Water Data Report (WDR) MT 1968: 1967, maximum discharge. WSP 1729: Drainage area. WDR-MT-2003-2: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,080 ft, referenced to the National Geodetic Vertical Datum of 1929. May 1904 to December 1905, nonrecording gage at bridge 0.3 ft upstream at different elevation. Aug. 24, 1928, to June 30, 1932, nonrecording gage at bridge 0.3 mi upstream at elevation 2.0 ft higher. July 1, 1932, to Oct. 12, 1937, water-stage recorder at old diversion dam 3.3 mi upstream at different elevation. Oct. 13, 1937, to Jan. 9, 1963 and Dec. 2, 1967 to Sept. 12, 1990, water-stage recorder 0.3 mi upstream at elevation 3,081.36 ft. Jan. 10, 1963 to Dec. 2, 1967, water-stage recorder 2.1 mi upstream at elevation 3,069.9 ft.

REMARKS.--Records are good except those for estimated daily discharges, which are poor. Diversions for irrigation include about 350,000 acres upstream from station. U.S. Army Corps of Engineers 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 Several unpublished observations of water temperature and specific conductance were made during the year.

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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	2,540	3,240	e2,400	2,160	2,130	2,340	3,430	e12,000	12,700	7,520	2,630	1,860
2	2,530	3,010	e2,500	2,270	1,970	2,270	3,700	e15,000	12,000	7,190	2,490	1,850
3	2,720	3,060	e2,600	2,750	1,760	2,200	3,750	17,500	12,500	6,620	2,470	1,840
4	2,920	3,330	e2,700	2,920	1,770	2,310	3,420	18,300	14,500	6,140	2,490	1,850
5	3,040	3,510	e2,800	2,630	2,180	2,360	3,300	15,300	15,900	5,770	2,480	1,830
6	3,140	3,450	2,870	2,300	2,770	2,610	3,270	12,500	18,000	5,460	2,480	1,830
7	3,280	3,360	3,100	1,990	2,840	2,770	3,170	10,500	26,000	5,550	2,470	1,890
8	3,560	3,400	3,160	1,730	2,610	3,110	3,100	9,510	25,100	6,020	2,420	2,080
9	4,450	4,110	3,180	2,220	2,390	3,230	3,140	10,200	19,300	5,430	2,310	2,150
10	5,080	5,340	3,210	2,900	2,320	2,890	3,320	12,800	17,400	4,830	2,240	2,160
11	4,730	5,150	3,070	2,610	2,340	2,690	3,770	15,200	17,200	4,340	2,160	2,160
12	4,640	4,440	3,000	e2,000	2,470	2,590	3,700	17,400	17,900	4,020	2,130	2,160
13	4,480	4,180	3,020	e1,600	2,330	2,590	3,460	19,700	17,600	3,650	2,110	2,120
14	4,210	3,890	3,030	e1,700	2,080	2,950	3,280	22,100	16,900	3,400	2,040	2,100
15	4,010	3,910	3,070	e1,700	2,010	3,130	3,180	22,100	17,000	3,440	2,000	2,130
16	4,180	3,760	2,910	e1,800	2,140	3,000	3,210	18,900	17,600	3,310	1,990	2,120
17	5,030	3,570	e2,700	e1,900	2,640	2,770	3,520	17,400	17,600	3,060	1,980	2,080
18	4,800	3,700	e2,400	1,970	2,810	2,640	3,690	17,400	17,800	3,030	1,990	2,130
19	4,410	3,600	e2,300	2,060	2,800	2,620	5,000	17,300	15,500	2,900	2,030	2,180
20	4,430	3,470	e2,400	2,160	2,760	2,770	5,610	17,500	13,000	2,750	2,150	2,230
21	4,590	3,430	e2,400	2,390	2,700	2,870	5,060	17,900	12,400	2,700	2,090	2,280
22	4,490	3,410	e2,500	2,470	2,570	3,030	4,480	18,500	12,300	2,700	2,000	2,240
23	4,230	3,390	2,560	2,450	2,550	3,050	4,360	16,900	12,200	2,680	2,000	2,320
24	4,080	3,330	2,400	2,570	2,530	2,900	4,590	13,900	12,000	2,620	2,000	2,340
25	3,920	3,160	2,370	2,540	2,510	2,820	4,810	12,500	11,400	2,570	1,990	2,320
26	3,860	2,890	2,620	2,580	2,510	2,770	5,000	11,600	10,600	2,750	1,990	2,380
27	3,820	3,070	2,870	2,510	2,440	2,890	5,690	10,600	9,710	3,470	1,950	2,370
28	3,690	e2,900	2,950	2,330	2,380	3,440	6,260	10,600	8,910	3,440	1,900	2,330
29	3,590	e2,700	2,880	2,240	---	3,830	6,710	12,900	8,340	3,630	1,900	2,320
30	3,590	e2,400	2,390	2,200	---	3,770	9,770	14,000	7,910	3,180	1,900	2,300
31	3,520	---	2,060	2,120	---	3,430	---	12,900	---	2,870	1,870	---
Total	121,560	106,160	84,420	69,770	67,310	88,640	128,750	470,910	447,270	127,040	66,650	63,950
Mean	3,921	3,539	2,723	2,251	2,404	2,859	4,292	15,190	14,910	4,098	2,150	2,132
Max	5,080	5,340	3,210	2,920	2,840	3,830	9,770	22,100	26,000	7,520	2,630	2,380
Min	2,530	2,400	2,060	1,600	1,760	2,200	3,100	9,510	7,910	2,570	1,870	1,830
Ac-ft	241,100	210,600	167,400	138,400	133,500	175,800	255,400	934,000	887,200	252,000	132,200	126,800

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2007, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	3,985	3,536	2,785	2,470	2,629	2,989	4,109	12,760	24,880	13,200	5,016	3,954
Max	6,803	5,163	4,451	3,834	4,382	5,478	8,799	24,070	53,910	37,180	9,776	7,301
(WY)	(1942)	(1984)	(1976)	(1984)	(1997)	(1979)	(1943)	(1997)	(1997)	(1975)	(1997)	(1968)
Min	2,128	2,283	1,579	1,363	1,559	1,767	1,438	5,635	9,849	3,410	1,462	1,527
(WY)	(2002)	(1932)	(1933)	(1940)	(1932)	(2002)	(1961)	(1953)	(1934)	(1934)	(2001)	(2001)

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SUMMARY STATISTICS

	Calendar Year 2006		Water Year 2007		Water Years 1929 - 2007	
Annual total	2,110,110		1,842,430			
Annual mean	5,781		5,048		6,866	
Highest annual mean					12,100	1997
Lowest annual mean					3,763	2001
Highest daily mean	31,900	Jun 10	26,000	Jun 7	80,100	Jun 12, 1997
Lowest daily mean	1,870	Sep 14	1,600	Jan 13	450	Dec 12, 1932
Annual seven-day minimum	1,920	Sep 8	1,810	Jan 12	794	Dec 10, 1932
Maximum peak flow			30,200	Jun 7	82,000	Jun 12, 1997
Maximum peak stage			9.35	Jun 7	15.00	Jun 12, 1997
Instantaneous low flow					430	Dec 12, 1932
Annual runoff (ac-ft)	4,185,000		3,654,000		4,974,000	
10 percent exceeds	14,100		12,900		17,400	
50 percent exceeds	3,040		3,010		3,660	
90 percent exceeds	2,290		2,050		2,140	

