

UPPER MISSISSIPPI RIVER MAIN STEM--Continued

05378500 MISSISSIPPI RIVER AT WINONA, MN

LOCATION.--Lat 44°03'21", long 91°38'16", in sec. 23, T.107 N., R.7 W., Winona County, Hydrologic Unit 07040003, on right bank at Winona pumping station in Winona, 9.5 mi upstream from Trempealeau River, and at mile 725.7 upstream from the Ohio River.

DRAINAGE AREA.--59,200 mi² (approximately).

PERIOD OF RECORD.--June 1928 to current year. Gage-height records collected in this vicinity since 1878 are contained in reports of Mississippi River Commission.

GAGE.--Water-stage recorder. Datum of gage is 639.64 ft above sea level. June 10, 1928 to Apr. 15, 1931, nonrecording gage at site 800 ft upstream. Prior to Oct. 1, 1929, at datum 0.20 ft higher and Oct. 1, 1929 to Apr. 15, 1931, at datum 0.12 ft lower. Apr. 16, 1931 to Nov. 12, 1934, nonrecording gage at present site and datum. Since Mar. 31, 1937, auxiliary water-stage recorder 2.7 mi upstream at tailwater of navigation dam 5A.

REMARKS.-- Records good except those for estimated days, which are fair to poor. Some regulation by reservoirs, navigation dams, and power plants at low and medium stages. Daily discharges for some estimated days provided by the U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Minimum gage height, -3.38 ft, Aug. 31, 1934 (prior to dam construction in 1936); minimum gage height since 1938, after completion of dam, 1.95 ft, Jan. 27, 1944.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16000	27900	27900	e14300	e14800	24000	33000	57600	75500	38900	49100	30800
2	15100	27300	28800	e15000	e15200	22400	36100	55100	72100	37700	45500	32100
3	e12900	27100	27400	e16000	e15700	21000	41400	51600	68200	37800	43500	30800
4	e12000	27300	26000	e17000	e16200	21100	42800	46400	63700	38700	43900	30200
5	e10900	27100	26200	e17000	e16500	20700	45200	47500	60200	39300	41700	29700
6	e9900	27100	25900	e17000	e16600	20700	49600	46800	60700	41700	39700	27800
7	e12800	26400	26200	e17000	e16700	21200	50900	42000	58200	41200	38600	24400
8	e16400	22400	26300	e17000	e16800	21400	55500	42900	55900	39000	37700	26100
9	e16500	21200	26500	e17000	e17000	20600	62300	41400	52700	43900	38000	28100
10	e14600	22500	26400	e17000	e17400	22600	66300	43000	52600	43700	38100	28400
11	e14700	24000	26500	e17000	17800	23500	69800	51300	52200	40600	e35000	27600
12	e15500	26100	26000	e17000	19400	23200	73700	55400	51500	41700	33900	27400
13	e16200	27500	25700	e16700	21400	22200	74600	59600	51600	43500	32600	27700
14	e16000	29300	25600	e16600	22700	22100	74700	61000	52100	43300	32000	28000
15	e12600	29800	25300	e16500	23800	21200	75400	64900	52400	40200	31500	28300
16	e12700	29500	25400	e16400	23100	20600	76200	69300	52500	38400	30300	28600
17	e14700	28400	25100	e16500	23100	22500	75300	74600	52700	41100	30600	28200
18	22000	28400	23800	e16700	23400	26800	74100	78700	52600	40200	33700	27800
19	23500	28100	23400	e17000	23500	30900	73600	83800	52000	38500	35000	27100
20	23300	28600	23100	e17400	23600	33300	72700	91300	50100	35800	34700	26400
21	21700	28500	e17000	e17900	23400	33400	72300	99100	49600	e36000	34500	25600
22	24900	27500	e15000	e18000	22800	32900	73300	104000	48700	40900	35400	24200
23	28000	27700	e12000	e18100	21100	32900	73300	108000	48100	39600	36000	23600
24	27800	28300	e10300	e18000	20500	34700	72000	109000	48100	e40000	37700	23900
25	26700	27900	e10000	e17000	20700	36200	71600	107000	47100	e40000	39700	23300
26	26500	27500	e10300	e15000	21000	36400	70200	104000	43600	e40000	e40000	21900
27	26600	27000	e11400	e14300	21500	36000	67900	101000	43000	42600	41000	21200
28	26700	27300	e13000	e14400	23400	33700	66600	97100	42800	43800	41600	21200
29	27200	27600	e13600	e14400	---	32000	64500	90500	41500	46600	40200	21200
30	26800	27300	e14000	e14500	---	32400	61500	85500	40100	49600	35800	21000
31	27600	---	e14300	e14600	---	31800	---	80400	---	51100	32200	---
TOTAL	598800	812600	658400	508300	559100	834400	1916400	2249800	1592100	1275400	1159200	792600
MEAN	19320	27090	21240	16400	19970	26920	63880	72570	53070	41140	37390	26420
MAX	28000	29800	28800	18100	23800	36400	76200	109000	75500	51100	49100	32100
MIN	9900	21200	10000	14300	14800	20600	33000	41400	40100	35800	30300	21000
AC-FT	1188000	1612000	1306000	1008000	1109000	1655000	3801000	4462000	3158000	2530000	2299000	1572000
CFSM	.33	.46	.36	.28	.34	.45	1.08	1.23	.90	.69	.63	.45

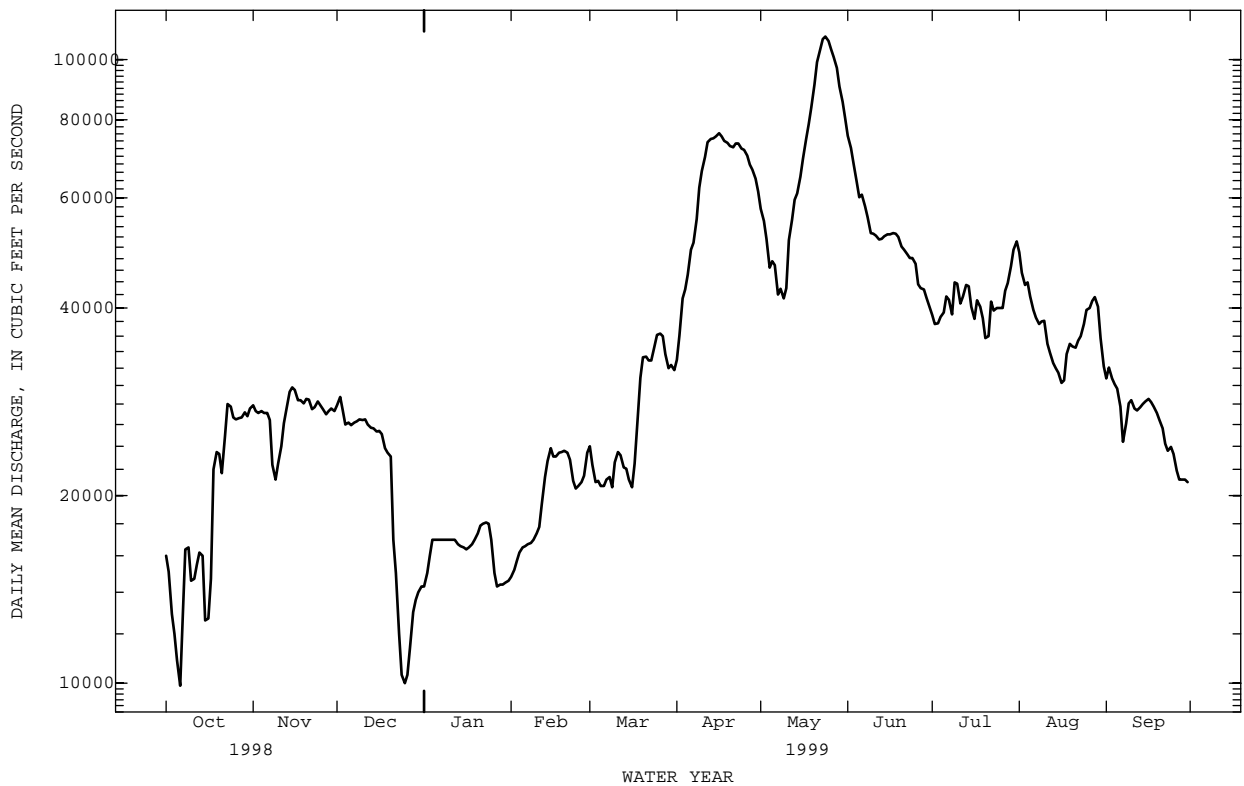
e Estimated

05378500 MISSISSIPPI RIVER AT WINONA, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 1999, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	22600	23020	17800	15300	15600	30610	61780	48840	39310	31870	21650	22490
MAX	85950	50040	40440	30480	35900	86420	152600	111500	100200	118800	67560	69490
(WY)	1987	1972	1992	1983	1984	1983	1965	1986	1993	1993	1993	1986
MIN	6774	7367	6286	6742	7874	9023	12810	11930	8450	7063	5391	6790
(WY)	1934	1934	1934	1940	1977	1934	1931	1931	1934	1934	1934	1933
SUMMARY STATISTICS			FOR 1998 CALENDAR YEAR				FOR 1999 WATER YEAR			WATER YEARS 1928 - 1999		
ANNUAL TOTAL	11722100			12957100			29270					
ANNUAL MEAN	32120			35500			56850			1986		
HIGHEST ANNUAL MEAN							9742			1934		
LOWEST ANNUAL MEAN							264000			Apr 20 1965		
HIGHEST DAILY MEAN	117000			Apr 5			109000			May 24		
LOWEST DAILY MEAN	9900			Oct 6			9900			Oct 6		
ANNUAL SEVEN-DAY MINIMUM	11500			Dec 23			11500			Dec 23		
INSTANTANEOUS PEAK FLOW							110000			May 24		
INSTANTANEOUS PEAK STAGE							12.35			May 24		
INSTANTANEOUS LOW FLOW										20.77 ^a		
ANNUAL RUNOFF (AC-FT)	23250000			25700000			21200000			1940 ^b		
ANNUAL RUNOFF (CFSM)	.54			.60			.49					
10 PERCENT EXCEEDS	64400			67100			60500					
50 PERCENT EXCEEDS	26800			28300			21200					
90 PERCENT EXCEEDS	15000			16100			10000					

a From highwater mark.
 b Result of ice jam upstream.



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WATER-QUALITY RECORDS

PERIOD OF RECORD.-- Daily sediment, temperature, and specific conductance station, water years 1976 to 88. Periodic sediment station, water years 1989 to current.

REMARKS.-- Suspended-sediment samples were collected at five points in a river cross-section.

SUSPENDED-SEDIMENT CONCENTRATIONS, WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SEDI- MENT SUS- SPENDED MG/L (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 22...	1400	24,600	17	--
JUN 28...	1705	42,800	22	--

PARTICLE-SIZE DISTRIBUTION OF BED-MATERIAL SEDIMENT, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DATE	TIME	NUMBER OF SAM- PLING POINTS (COUNTS) (00063)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM (80164)	BED MAT. SIEVE DIAM. % FINER THAN .125 MM (80165)	BED MAT. SIEVE DIAM. % FINER THAN .250 MM (80166)	BED MAT. SIEVE DIAM. % FINER THAN .500 MM (80167)	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM (80168)	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM (80169)	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM (80170)	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM (80171)
*APR 04	1440	4	0.1	0.8	10	50	89	97	98	100
OCT 22	1353	8	0.7	2.9	12	54	88	97	99	100
JUN 28	1740	9	0.3	1.6	13	63	95	99	100	100



Helley-Smith Stream Bedload sampler.