

UPPER MISSISSIPPI RIVER MAIN STEM

05355200 CANNON RIVER AT WELCH, MN

LOCATION.--Lat 4433'50", long 9243'55", in NW 1 / 4 SW 1 / 4 sec. 27, T. 113 N., R. 16 W., Goodhue County, on right bank 0.3 mile downstream from highway bridge at Welch and 1.8 miles upstream from Belle Creek.

DRAINAGE AREA.--1,340 mi² (revised).

PERIOD OF RECORD.--June 1909 to January 1914 (no winter records 1909-11), November 1930 to September 1971, October 1972 to September 1987 (annual maximum only), October 1991 to current year.

REVISED RECORDS.--WSP 1308: 1912(M). WSP 1508: 1933. WSP 1914: 1960.WRD MN-98: 1986 (M), 1997.

GAGE.--Water-stage recorder. Datum of gage is 699.16 ft above mean sea level. Prior to Nov. 11, 1930, nonrecording gage on highway bridge at site 0.3 mile upstream at datum 3.00 ft lower. Nov. 11, 1930 to Oct. 11, 1938, water-stage recorder at site 0.3 mile upstream at present datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, 17.1 ft, present datum, in April 1888, from floodmark at mill about 2,400 ft upstream.

REVISIONS.-- The maximum discharge for the water year 1986 has been revised to 18,900 ft³/s, Sept. 22, 1986; gage height, 13.80 ft. Discharges above a stage of 5.00 ft have been revised from May 23, 1997 to Sept. 30, 1997. The maximum discharge for the 1997 water year has been revised to 8670 ft³ /s, and the maximum stage has been revised to 10.33 ft, both occurring on July 26, 1997.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow affected at lower stages by regulation from power plant upstream.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1997 TO SEPTEMBER 1998

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	857	782	598	350	432	1510	7240	1440	e1400	4470	838	503
2	853	843	569	461	390	1430	8060	1360	e1300	3690	901	481
3	851	809	585	486	307	1490	7150	1350	1070	3600	939	479
4	772	760	592	382	362	1480	6220	1280	999	3110	948	460
5	750	791	563	449	383	1410	5470	1250	954	2670	786	426
6	692	754	560	480	348	1350	4600	1160	904	2350	542	410

7	700	758	542	453	370	1280	4300	1200	876	1900	542	394
8	680	768	536	446	367	1220	3710	1450	813	1870	563	357
9	657	765	569	414	409	1170	3470	1500	831	1960	556	382
10	632	767	544	233	376	881	3380	1550	834	1740	553	370
11	631	755	529	318	373	989	3140	1530	809	1510	538	358
12	656	749	524	e420	369	939	2970	1450	875	1310	517	362
13	1140	713	513	e430	363	988	2890	1300	835	1220	441	351
14	1300	724	496	e430	377	884	2670	1190	763	1080	437	340
15	1260	717	510	e430	369	899	2560	1180	781	1160	435	329
16	1140	711	508	e420	384	889	2490	2460	892	1300	433	324
17	1070	610	507	e420	738	819	2510	2190	855	1130	913	338
18	1040	688	500	e420	987	818	2480	1840	e800	1080	987	327
19	1000	671	499	e420	995	790	2450	1700	e1200	1140	630	320
20	936	708	492	e420	1180	754	2380	1490	e1800	1050	951	395
21	895	638	453	e430	1260	720	2340	1380	e1500	1170	1030	355
22	881	649	480	429	1250	745	2180	1230	1060	1280	850	287
23	852	622	479	417	1170	761	2060	1110	1050	990	1080	329
24	828	551	483	382	1190	815	1840	1250	991	931	817	354
25	827	627	467	389	1250	922	1780	1380	2030	882	743	341
26	768	695	449	390	1280	1200	1740	1570	2650	829	645	385
27	764	608	375	384	1420	1700	1700	1510	15100	773	632	403
28	732	635	429	390	1580	2760	1640	e1600	15000	714	634	382
29	707	642	471	395	---	4310	1540	e1600	8140	638	592	383
30	694	653	472	392	---	5700	1500	e1550	5140	629	545	373
31	676	---	390	411	---	5880	---	e1500	---	707	529	---
TOTAL	26241	21163	15684	12691	20279	47503	98460	45550	72252	48883	21547	11298
MEAN	846	705	506	409	724	1532	3282	1469	2408	1577	695	377
MAX	1300	843	598	486	1580	5880	8060	2460	15100	4470	1080	503
MIN	631	551	375	233	307	720	1500	1110	763	629	433	287
AC-FT	52050	41980	31110	25170	40220	94220	195300	90350	143300	96960	42740	22410

CFSM	.63	.53	.38	.31	.54	1.14	2.45	1.10	1.80	1.18	.52	.28
IN.	.73	.59	.44	.35	.56	1.32	2.73	1.26	2.01	1.36	.60	.31

e Estimated

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1998, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	379	368	287	236	299	1000	1355	742	776	573	441	389
MAX	1806	1708	1105	662	1141	2627	8240	2966	4144	3343	2951	1823
(WY)	1969	1971	1992	1992	1966	1992	1965	1944	1993	1993	1993	1993
MIN	65.5	78.8	75.0	76.9	110	149	145	84.9	80.0	71.2	78.1	72.8
(WY)	1934	1934	1938	1938	1913	1911	1911	1934	1934	1934	1936	1933

SUMMARY STATISTICS	FOR 1997 CALENDAR YEAR		FOR 1998 WATER YEAR		WATER YEARS 1909 - 1998		
ANNUAL TOTAL	426896		441551				
ANNUAL MEAN	1170		1210			593	
HIGHEST ANNUAL MEAN						2132	1993
LOWEST ANNUAL MEAN						137	1934
HIGHEST DAILY MEAN	7910	Jul 26	15100	Jun 27	28700	Apr 8	1965
LOWEST DAILY MEAN	330	Jan 16	233	Jan 10	19	Jan 2	1950
ANNUAL SEVEN-DAY MINIMUM	334	Jan 14	333	Sep 13	42	Aug 12	1936
INSTANTANEOUS PEAK FLOW			23500	Jun 27	36100	Apr 8	1965
INSTANTANEOUS PEAK STAGE			15.05	Jun 27	15.05	Jun 27	1998
INSTANTANEOUS LOW FLOW			160a	Jan 10	2.5	Jan 3	1950
ANNUAL RUNOFF (AC-FT)	846700		875800			429800	

ANNUAL RUNOFF (CFSM)	.87		.90		.44		
ANNUAL RUNOFF (INCHES)	11.85		12.26		6.02		
10 PERCENT EXCEEDS	2630		2340		1280		
50 PERCENT EXCEEDS	732		790		270		
90 PERCENT EXCEEDS	360		383		100		

a Result of freezeup.

