

Water-Data Report 2009

05062500 WILD RICE RIVER AT TWIN VALLEY, MN

Upper Red Basin
Eastern Wild Rice Subbasin

LOCATION.--Lat 47°16'00", long 96°14'40" referenced to North American Datum of 1927, in NW ¼ NE ¼ sec.27, T.144 N., R.44 W., Norman County, MN, Hydrologic Unit 09020108, on left bank, 100 ft upstream from County Highway 29 bridge, 0.8 mi northeast of Twin Valley, and 2 mi upstream from small tributary.

DRAINAGE AREA.--934 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD.--June 1909 to September 1917, July 1930 to September 1983, October 1989 to current year. Monthly discharge only for some periods, published in WSP 1308. October 1983 to September 1989, annual maximums only.

REVISED RECORDS.--WSP 955: 1941. WSP 1308: 1915(M), 1917(M).

GAGE.--Water-stage recorder. Datum of gage is 1,008.16 ft above sea level (NGVD of 1929, U.S. Army Corps of Engineers bench mark). June 1909 to September 1917, non-recording gage at site 0.2 mi downstream at different datum. July 23, 1930 to Nov. 24, 1934, non-recording gage at highway bridge 100 ft downstream from present site at present datum. Nov. 25, 1934 to Aug. 2, 1950, water-stage recorder 80 ft upstream from present site at present datum.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Flow slightly regulated by Rice Lake and many other small lakes above station.

05062500 WILD RICE RIVER AT TWIN VALLEY, MN—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009
DAILY MEAN VALUES

[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	136	694	e420	e161	e141	e138	2,430	e1,020	e522	e184	61	78
2	131	647	e406	e158	e139	e140	2,240	e988	e496	e162	62	74
3	125	612	e376	e154	e138	e140	2,100	e940	e473	e147	62	72
4	119	592	e347	e152	e140	e141	2,040	e888	e450	e132	62	70
5	114	712	e300	e150	e141	e142	1,990	e843	e423	e122	61	68
6	135	846	e259	e149	e142	e141	1,940	e811	e397	e115	59	64
7	643	1,400	e237	e148	e142	e140	1,970	e794	e375	e107	57	63
8	580	1,380	e225	e147	e144	e138	1,950	e777	e359	e100	60	65
9	464	1,210	e221	e146	e156	e135	e1,990	e756	e346	e99	65	78
10	409	1,020	e217	e145	e169	e133	e2,110	e730	e336	e94	62	82
11	630	872	e210	e143	e184	e132	e2,150	e697	e316	e89	61	115
12	886	761	e206	e139	e190	e134	e2,100	e663	e292	e85	59	120
13	1,710	703	e200	e136	e190	e140	e1,980	e645	e264	e83	58	113
14	1,860	e660	e187	e132	e183	e158	e1,820	e674	e237	e84	58	112
15	1,620	e610	e176	e132	e174	e191	e1,690	e705	e228	e88	87	106
16	1,390	e560	e171	e135	e166	e244	e1,590	e708	e228	e80	121	101
17	1,190	e520	e169	e137	e160	e500	e1,510	e693	e248	e78	205	95
18	1,030	e500	e168	e136	e155	e1,200	e1,440	e671	e286	e83	392	90
19	924	e475	e166	e136	e151	e2,000	e1,380	e639	e355	e84	294	99
20	840	e460	e165	e135	e148	e2,450	e1,320	e605	e468	e77	218	91
21	770	e451	e164	e134	e146	e3,000	e1,270	e574	e666	e73	272	85
22	711	e482	e163	e134	e144	e3,700	e1,220	e548	e917	e70	255	76
23	768	e506	e163	e134	e144	e4,900	e1,170	e526	e1,000	e66	203	70
24	791	e517	e162	e133	e142	e6,000	e1,120	e502	e986	e74	174	70
25	976	e520	e163	e133	e140	e6,700	e1,070	e481	e887	e76	151	69
26	981	e517	e164	e133	e138	e5,530	e1,030	e463	e713	e100	132	72
27	1,020	e500	e164	e133	e136	e3,590	e996	e473	e548	e104	114	67
28	938	e475	e165	e137	e137	e3,230	e980	e514	e394	e80	102	64
29	859	e455	e164	e144	---	e3,000	e1,020	e547	e294	e69	93	61
30	804	e435	e164	e147	---	e2,780	e1,040	e554	e226	e63	89	58
31	751	---	e163	e143	---	2,630	---	e544	---	e61	82	---
Total	24,305	20,092	6,625	4,376	4,280	53,597	48,656	20,973	13,730	2,929	3,831	2,448
Mean	784	670	214	141	153	1,729	1,622	677	458	94.5	124	81.6
Max	1,860	1,400	420	161	190	6,700	2,430	1,020	1,000	184	392	120
Min	114	435	162	132	136	132	980	463	226	61	57	58
Ac-ft	48,210	39,850	13,140	8,680	8,490	106,300	96,510	41,600	27,230	5,810	7,600	4,860
Cfsm	0.84	0.72	0.23	0.15	0.16	1.85	1.74	0.72	0.49	0.10	0.13	0.09
In.	0.97	0.80	0.26	0.17	0.17	2.13	1.94	0.84	0.55	0.12	0.15	0.10

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 2009, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	111	121	72.4	53.9	52.7	183	649	452	398	273	115	104
Max	784	1,082	343	200	336	1,729	2,471	2,259	3,441	1,926	1,024	842
(WY)	(2009)	(2005)	(2001)	(2001)	(1998)	(2009)	(1997)	(1950)	(2002)	(1909)	(1993)	(1999)
Min	6.10	9.31	6.00	4.00	4.00	12.8	73.8	30.9	26.4	8.04	3.02	2.96
(WY)	(1933)	(1933)	(1933)	(1933)	(1933)	(1940)	(1931)	(1977)	(1977)	(1934)	(1932)	(1936)

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SUMMARY STATISTICS

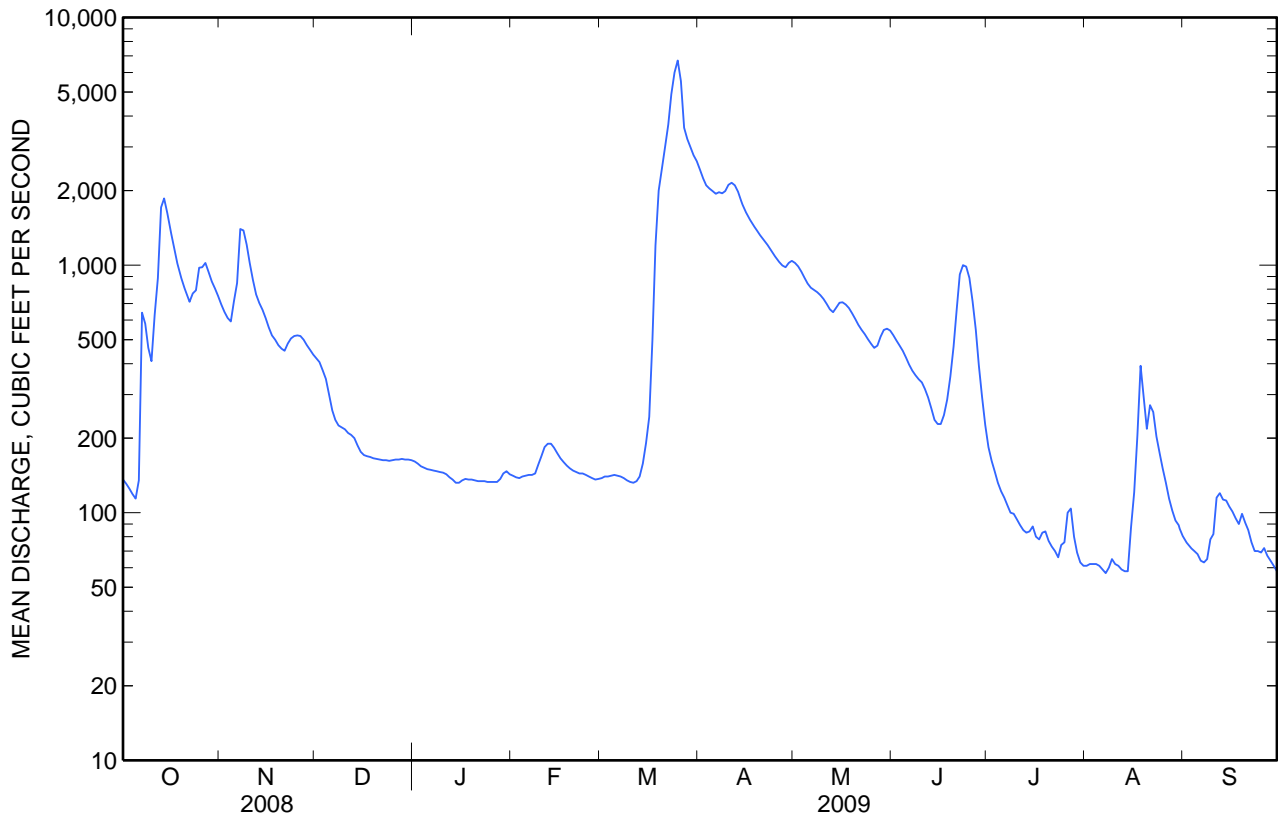
	Calendar Year 2008		Water Year 2009		Water Years 1909 - 2009	
Annual total	129,833		205,842			
Annual mean	355		564		^a 213	
Highest annual mean					656	2002
Lowest annual mean					22.7	1977
Highest daily mean	1,860	Oct 14	6,700	Mar 25	16,600	Jun 24, 2002
Lowest daily mean	26	Sep 1	57	Aug 7	1.1	Aug 13, 1932
Annual seven-day minimum	29	Aug 26	60	Aug 7	1.3	Aug 11, 1932
Maximum peak flow			^b 6,700	Mar 25	20,300	Jun 24, 2002
Maximum peak stage			^c 13.53	Mar 25	^d 17.96	Jun 24, 2002
Instantaneous low flow					0.50	Nov 4, 1939
Annual runoff (ac-ft)	257,500		408,300		154,300	
Annual runoff (cfsm)	0.380		0.604		0.228	
Annual runoff (inches)	5.17		8.20		3.10	
10 percent exceeds	839		1,380		532	
50 percent exceeds	217		191		80	
90 percent exceeds	64		75		17	

^a Median of annual mean discharges is 190 ft³/s.

^b Estimated daily-mean discharge.

^c Backwater from ice.

^d From floodmark. Gage-height, 20.00 ft, July 22, 1909; site and datum then in use.



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WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 1976 to September 1979 and July to Aug. 2006.

pH: July to Aug. 2006.

WATER TEMPERATURES: May 1976 to Sep. 1979 and July to Aug. 2006.

DISSOLVED OXYGEN: July to Aug. 2006.

DISSOLVED OXYGEN, % OF SATURATION: July to Aug., 2006.

REMARKS.--This site is part of a sediment study of the Wild Rice River. The objectives of this study are to describe sediment concentration and load as a function of streamflow and season at selected sites in the Wild Rice River Basin. Also to describe the relationship between mean cross-sectional suspended sediment concentrations and point measurements of water transparency.

These sites will be operated for a period of five years to develop sediment-transport curves that can be used to determine long-term sediment transport relative to previous studies. These data also will be used to better understand how suspended sediment concentrations relate to total maximum daily loads (TMDLs) for turbidity along the Wild Rice River.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 984 $\mu\text{S}/\text{cm}$, Jan. 3, 1977; minimum, 185 $\mu\text{S}/\text{cm}$, Apr. 6, 1978.

pH: Maximum, 8.4, many days in the 2006; minimum, 8.1, many days in 2006.

WATER TEMPERATURES: Maximum, 33.0 C., July 17, 1977; minimum, 0.5 C., Jan. 13, 1977. Probably reaches 0.0 C. many days most winters.

DISSOLVED OXYGEN: Maximum, 9.8 mg/L, Aug. 7, 2006; minimum, 5.1 mg/L, July 31, 2006.

DISSOLVED OXYGEN, % OF SATURATION: Maximum, 126, July 27 and Aug. 7, 2006; minimum, 66, July 31, 2006.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009

Part 1 of 2

Date	Time	Medium name	Temperature, air, deg C (00020)	Instantaneous discharge, ft ³ /s (00061)	Specific conductance, $\mu\text{S}/\text{cm}$ @ 25 degC (00095)	Temperature, water, deg C (00010)	Transparency wat unf trans- parency tube, cm (65225)	Turbdty white det ang 90+/-30 degrees NTU (63675)	Turbdty white det ang 90+/-30 NTRU (63676)
Oct									
17...	1215	Surface water	9.7	1,190	558	8.8	19	49	40
Feb									
23...	1128	Surface water	-2.7	144	--	.5	50	9.3	5.3
Mar									
26...	1130	Surface water	--	4,920	280	.0	9	110	120
26...	1138	Surface water	--	4,920	--	.0	--	--	--
Apr									
14...	1045	Surface water	10.3	1,850	401	7.4	12	59	79
14...	1050	Surface water	--	1,850	--	--	--	--	--
Jun									
11...	1255	Surface water	--	320	507	--	66	12	5.0
Aug									
04...	1056	Surface water	18.1	66	538	19.6	76	11	6.4
Sep									
14...	1128	Surface water	--	107	524	21.8	62	12	--

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WATER-QUALITY DATA
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009

Part 2 of 2

Date	Sampler type, code (84164)	Suspnd. sedimnt sieve diametr percent <0.0625 mm (70331)	Sus- pended sedi- ment concen- tration mg/L (80154)
Oct			
17...	US DH-95 plastic	43	164
Feb			
23...	Weighted-bottle	47	26
Mar			
26...	Weighted-bottle	--	--
26...	Weighted-bottle	--	347
Apr			
14...	Weighted-bottle	--	--
14...	Sampler US D-74	71	196
Jun			
11...	Grab sample	94	13
Aug			
04...	Grab sample	96	12
Sep			
14...	Grab sample	97	13