

04010500 PIGEON RIVER AT MIDDLE FALLS, NEAR GRAND PORTAGE, MN

Northwestern Lake Superior Basin
Baptism-Brule Subbasin

LOCATION.--Lat 48°00'44", long 89°36'58" referenced to North American Datum of 1927, in SW ¼ NE ¼ sec.24, T.64 N., R.6 E., Cook County, MN, Hydrologic Unit 04010101, on the Grand Portage Indian Reservation, on right bank 400 ft upstream from Middle Falls, 2.5 mi upstream from Grand Portage Port of Entry, 3.5 mi upstream from mouth, and 4.7 mi northeast of city of Grand Portage.

DRAINAGE AREA.--609 mi².

SURFACE-WATER RECORDS

PERIOD OF RECORD.--June to October 1921, April to November 1922, March 1923 to current year. Published as "at International Bridge" April 1924 to September 1940; as "below International Bridge" October 1940 to September 1965. Monthly discharge only for some periods, published in WSP 1307.

REVISED RECORDS.--WSP 744:1927-28. WSP 804: 1934(M). WSP 974: Drainage area. WSP 1337:1924(M), 1925, 1926-28(M), 1930-31(M), 1938(M), 1941(M), 1945-46(M), 1947, 1948(M), 1950(M). Unpublished, 2009: 1926(M),

GAGE.--Water-stage recorder. Datum of gage is 787.58 ft above sea level (NGVD of 1929). Prior to Sept. 30, 1940, non-recording gage at International Bridge, 5.8 mi upstream at datum 102.24 ft higher. Oct. 1, 1940 to Dec. 31, 1975, at present site at datum 2.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,700 ft³/s and (or) maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr 19	2330	2,990	8.11
May 1	0130	*4,180	*9.16

Minimum discharge, 80 ft³/s, Sept. 26, gage height, 2.32 ft.

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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	326	259	e445	e277	e237	e153	e418	4,100	971	351	199	175
2	318	254	e440	e277	e233	e151	533	3,810	963	337	193	164
3	294	257	e423	e278	e231	e155	582	3,430	909	324	189	155
4	271	266	e411	e275	e227	e165	578	3,150	858	302	184	148
5	253	352	e404	e273	e230	e165	568	2,950	837	282	172	145
6	237	1,110	e395	e274	e240	e160	553	3,020	827	268	164	138
7	228	2,180	e391	e271	e235	e155	541	3,390	788	260	156	133
8	291	2,190	e386	e267	e235	e165	538	3,390	732	243	149	128
9	323	1,750	e381	e263	e240	e161	548	3,080	735	226	144	124
10	320	1,360	e375	e260	e250	e159	564	2,780	807	216	138	127
11	307	1,120	e373	e257	e260	e157	583	2,490	890	207	134	128
12	304	997	e366	e255	e245	e155	619	2,260	843	204	131	124
13	306	945	e363	e255	e235	e162	685	2,130	780	200	128	120
14	315	928	e359	e253	e225	e192	748	2,080	720	188	124	116
15	318	879	e353	e252	e218	e252	890	1,970	664	187	123	112
16	311	811	e350	e250	e209	e308	1,260	1,990	609	179	128	108
17	298	e652	e349	e251	e205	e321	e1,870	1,970	570	177	129	102
18	286	e571	e347	e251	e197	e312	e2,790	1,840	534	176	126	98
19	275	e551	e339	e249	e195	e302	2,800	1,680	553	167	124	94
20	266	e519	e335	e246	e190	e290	2,070	1,590	573	157	152	92
21	259	e496	e330	e247	e180	e305	2,000	1,670	560	151	214	89
22	253	e489	e327	e245	e173	e320	2,140	1,690	530	148	214	87
23	248	e482	e321	e243	e169	e309	2,260	1,560	491	146	196	85
24	239	e475	e315	e243	e178	e304	2,710	1,440	462	148	181	83
25	264	e468	e315	e243	e174	e325	3,330	1,340	437	152	170	82
26	301	e466	e306	e241	e168	e350	3,440	1,250	409	155	154	80
27	311	e466	e300	e240	e163	e345	4,020	1,190	384	168	144	86
28	305	e461	e295	e241	e158	e343	3,950	1,160	363	168	153	87
29	294	e452	e289	e241	---	e340	3,780	1,100	359	169	166	87
30	278	e445	e284	e238	---	e337	3,930	1,040	364	200	176	89
31	268	---	e281	e246	---	e333	---	987	---	204	182	---
Total	8,867	22,651	10,948	7,902	5,900	7,651	51,298	67,527	19,522	6,460	4,937	3,386
Mean	286	755	353	255	211	247	1,710	2,178	651	208	159	113
Max	326	2,190	445	278	260	350	4,020	4,100	971	351	214	175
Min	228	254	281	238	158	151	418	987	359	146	123	80
Ac-ft	17,590	44,930	21,720	15,670	11,700	15,180	101,700	133,900	38,720	12,810	9,790	6,720
Cfsm	0.47	1.24	0.58	0.42	0.35	0.41	2.81	3.58	1.07	0.34	0.26	0.19
In.	0.54	1.38	0.67	0.48	0.36	0.47	3.13	4.12	1.19	0.39	0.30	0.21

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 2009, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	365	354	210	152	126	173	1,207	1,577	840	412	234	274
Max	2,095	1,461	720	431	300	1,169	2,724	4,016	2,801	1,127	1,029	2,985
(WY)	(1978)	(1971)	(1978)	(1975)	(1969)	(1945)	(2001)	(1950)	(1947)	(1968)	(1950)	(1977)
Min	17.4	11.4	2.85	2.18	8.02	41.5	290	138	125	78.0	46.5	36.6
(WY)	(1977)	(1977)	(1977)	(1977)	(1977)	(2007)	(1977)	(1977)	(1977)	(1958)	(1998)	(2006)

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SUMMARY STATISTICS

	Calendar Year 2008		Water Year 2009		Water Years 1921 - 2009	
Annual total	246,176		217,049			
Annual mean	673		595		496	
Highest annual mean					840 1971	
Lowest annual mean					138 2007	
Highest daily mean	5,670	Jun 7	4,100	May 1	10,700	May 5, 1934
Lowest daily mean	112	Mar 8	80	Sep 26	^a 1.0	Jan 15, 1977
Annual seven-day minimum	115	Mar 3	84	Sep 22	1.0	Jan 15, 1977
Maximum peak flow			4,180	May 1	^b 11,000	May 5, 1934
Maximum peak stage			9.16	May 1	^c 12.37	Sep 24, 1977
Instantaneous low flow			80	Sep 26	^a 1.0	Jan 15, 1977
Annual runoff (ac-ft)	488,300		430,500		359,300	
Annual runoff (cfsm)	1.10		0.976		0.814	
Annual runoff (inches)	15.04		13.26		11.07	
10 percent exceeds	1,660		1,680		1,280	
50 percent exceeds	315		289		220	
90 percent exceeds	124		144		82	

^a Minimum observed, occurred Jan. 15-21, 1977.

^b Gage height 7.60 ft, site and datum then in use.

^c At present site and datum, discharge 10,500 ft³/s.

