Water-Data Report 2011

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 mi^2.

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 Unpublished, 2009: 1926(M),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 ft^3/s and (or) maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)
May 1	0130	*3,500	*8.59

Minimum discharge, 21 ft^3/s, Oct. 21, gage height, 1.69 ft.

Suggested citation: U.S. Geological Survey, 2012, Water-resources data for the United States, Water Year 2011: U.S. Geological Survey Water-Data Report WDR-US-2011, site 04010500, accessed at http://wdr.water.usgs.gov/wy2011/pdfs/04010500.2011.pdf

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DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY MEAN VALUES
[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	64	563	e157	e124	e82	e73	e157	3,350	922	530	483	176
2	68	494	e157	e120	e82	e71	e168	2,940	1,040	703	482	174
3	56	451	e155	e119	e81	e70	e193	2,370	894	516	459	166
4	48	406	e154	e117	e83	e70	e214	2,030	834	475	434	159
5	43	367	e154	e115	e82	e70	e246	1,880	816	482	410	153
6	39	337	e152	e115	e81	e69	e264	1,910	739	456	390	146
7	36	317	e149	e114	e80	e69	e293	1,930	693	421	379	142
8	33	294	e147	e113	e78	e71	e358	1,800	684	405	365	138
9	31	274	e145	e112	e77	e72	e527	1,670	634	454	349	134
10	32	259	e143	e112	e77	e73	e951	1,600	586	631	335	127
11	36	250	e143	e111	e76	e75	e1,970	1,580	531	545	325	123
12	36	237	e144	e110	e76	e76	e2,320	1,590	493	453	315	120
13	33	227	e144	e110	e77	e78	e2,460	1,480	462	401	306	124
14	28	232	e141	e108	e77	e80	e2,530	1,370	432	360	297	120
15	26	226	e137	e106	e78	e82	e2,430	1,270	397	329	286	115
16	25	222	e136	e103	e78	e85	1,830	1,170	373	313	275	111
17	24	214	e134	e101	e79	e95	1,380	1,090	351	297	269	106
18	23	209	e132	e98	e79	e103	1,220	1,020	334	292	258	105
19	22	e201	e132	e96	e79	e115	1,170	960	327	278	253	105
20	23	e189	e132	e93	e78	e124	1,060	905	328	419	243	104
21	22	e182	e134	e93	e77	e131	1,010	888	331	1,770	236	120
22	22	e176	e135	e91	e77	e138	1,110	1,250	835	1,970	229	125
23	22	e168	e133	e89	e76	e147	1,240	1,350	1,380	1,400	223	128
24	24	e164	e130	e89	e75	e154	1,540	1,380	1,130	1,090	216	123
25	25	e163	e129	e89	e74	e157	1,860	1,260	842	900	210	119
26	83	e162	e128	e88	e74	e161	2,050	1,100	664	771	204	114
27	1,530	e162	e127	e87	e74	e165	1,910	990	564	682	198	110
28	1,510	e161	e127	e86	e73	e165	1,810	912	677	631	192	106
29	1,070	e158	e130	e86	---	e162	1,920	924	752	582	186	104
30	823	e158	e130	e85	---	e160	1,980	919	628	545	179	101
31	662	---	e129	e84	---	e157	---	906	---	517	180	---
Total	6,519	7,623	4,320	3,164	2,180	3,318	38,171	45,794	19,673	19,618	9,166	3,798
Mean	210	254	139	102	77.9	107	1,272	1,477	656	633	296	127
Max	1,530	563	157	124	83	165	2,530	3,350	1,380	1,970	483	176
Min	22	158	127	84	73	69	157	888	327	278	179	101
Ac-ft	12,930	15,120	8,570	6,280	4,320	6,580	75,710	90,830	39,020	38,910	18,180	7,530
Cfsm	0.35	0.42	0.23	0.17	0.13	0.18	2.09	2.43	1.08	1.04	0.49	0.21
In.	0.40	0.47	0.26	0.19	0.13	0.20	2.33	2.80	1.20	1.20	0.56	0.23

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 2011, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	360	351	208	151	125	174	1,197	1,562	831	411	232	270
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	275	138	125	78.0	40.2	36.6
(WY)	(1977)	(1977)	(1977)	(1977)	(1977)	(2007)	(2010)	(1977)	(1977)	(1958)	(2010)	(2006)

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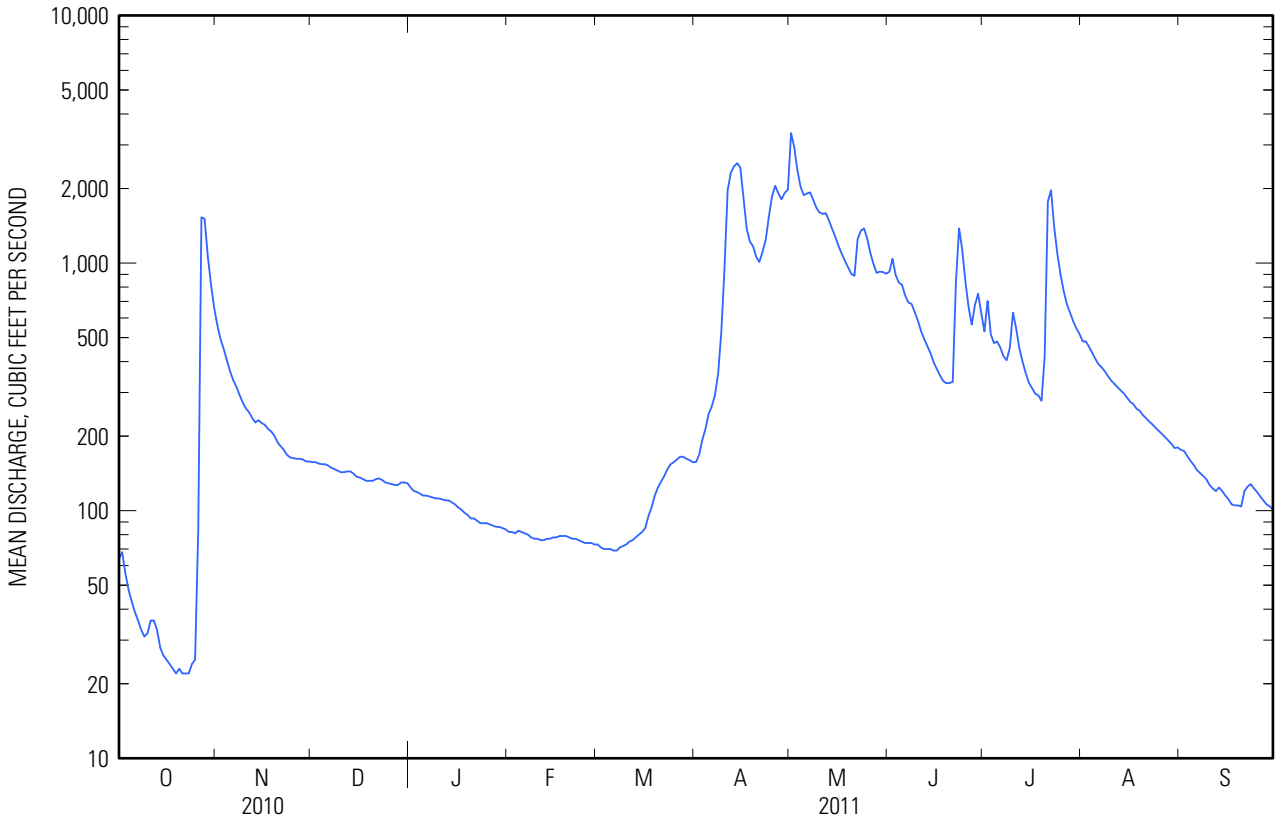
SUMMARY STATISTICS

	Calendar Year 2010		Water Year 2011		Water Years 1921 - 2011	
Annual total	63,321		163,344			
Annual mean	173		448		492	
Highest annual mean					840	1971
Lowest annual mean					138	2007
Highest daily mean	1,530	Oct 27	3,350	May 1	10,700	May 5, 1934
Lowest daily mean	22	Sep 21	[a]22	Oct 19	[b]1.0	Jan 15, 1977
Annual seven-day minimum	23	Oct 17	23	Oct 17	1.0	Jan 15, 1977
Maximum peak flow			3,500	May 1	[c]11,000	May 5, 1934
Maximum peak stage			8.59	May 1	[d]12.37	Sep 24, 1977
Instantaneous low flow			21	Oct 21	1.0	Jan 15, 1977
Annual runoff (ac-ft)	125,600		324,000		356,100	
Annual runoff (cfsm)	0.285		0.735		0.807	
Annual runoff (inches)	3.87		9.98		10.97	
10 percent exceeds	361		1,300		1,260	
50 percent exceeds	125		166		220	
90 percent exceeds	33		74		80	

[a] Also occurred Oct. 21-23.
[b] Minimum observed, occurred Jan. 15-21, 1977.
[c] Gage height 7.60 ft, site and datum then in use.
[d] At present site and datum, discharge 10,500 ft³/s.