

## STREAMS TRIBUTARY TO LAKE SUPERIOR

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

LOCATION.--Lat 48°00'44", long 89°36'58", in SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 24, T.64 N., R.6 E., Cook County, 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<sup>2</sup>.

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), 1931(M), 1938(M), 1941(M), 1945-46(M), 1947, 1948(M), 1950(M).

GAGE.--Water-stage recorder. Datum of gage is 787.58 ft above sea level (NGVD of 1929). Prior to Sept. 30, 1940, nonrecording 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<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr 17	1300	*2,890	*8.03	No other peak greater than base discharge.			

Minimum discharge, 46 ft<sup>3</sup>/s, Sept. 27, 28, gage height, 2.23 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2001 TO SEPTEMBER 2002  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	94	399	e600	e215	e145	e115	e110	603	420	349	176	79
2	93	414	e560	e215	e140	e115	e110	571	394	312	220	99
3	90	385	e520	e210	e140	e115	e110	548	361	282	233	144
4	89	360	e500	e205	e140	e115	e110	540	335	256	211	115
5	86	318	e540	e205	e140	e115	e110	596	318	236	181	110
6	86	288	e760	e200	e135	e115	e110	618	307	214	155	107
7	88	266	e700	e200	e135	e115	e115	605	294	198	135	96
8	88	308	e620	e195	e135	e115	e120	610	284	189	122	86
9	89	326	e540	e195	e135	e115	e130	803	274	182	113	81
10	102	324	e490	e190	e135	e115	e150	864	259	172	105	90
11	112	297	e460	e185	e130	e110	e200	808	257	161	100	86
12	120	273	e430	e185	e130	e100	e400	711	285	152	98	81
13	131	262	e410	e180	e130	e90	e830	669	301	144	100	78
14	324	250	e390	e180	e130	e145	1320	655	310	139	98	74
15	411	243	e370	e180	e130	e125	1480	668	423	131	120	69
16	349	233	e355	e175	e125	e115	1730	637	515	125	152	65
17	293	227	e340	e175	e125	e115	2180	618	442	119	220	60
18	262	221	e325	e175	e125	e110	2040	569	375	111	233	57
19	252	221	e315	e170	e125	e110	1830	524	327	105	216	59
20	240	219	e300	e170	e125	e110	1480	493	325	98	193	57
21	225	221	e290	e170	e120	e110	1170	465	343	95	165	53
22	208	210	e280	e170	e120	e110	979	444	326	103	143	50
23	217	206	e275	e170	e120	e110	842	436	316	101	128	49
24	252	370	e270	e150	e120	e110	798	434	381	96	115	48
25	316	1870	e260	e140	e120	e110	795	429	619	94	104	49
26	395	1610	e250	e190	e120	e110	722	401	721	89	96	49
27	382	1010	e240	e170	e120	e110	653	386	633	85	89	47
28	345	e605	e235	e160	e120	e110	608	371	531	101	85	48
29	305	e660	e230	e155	---	e110	604	357	448	97	82	49
30	284	e670	e225	e150	---	e110	615	362	389	106	79	48
31	339	---	e220	e145	---	e110	---	402	---	106	77	---
TOTAL	6667	13266	12300	5575	3615	3490	22451	17197	11513	4748	4344	2183
MEAN	215	442	397	180	129	113	748	555	384	153	140	72.8
MAX	411	1870	760	215	145	145	2180	864	721	349	233	144
MIN	86	206	220	140	120	90	110	357	257	85	77	47
AC-FT	13220	26310	24400	11060	7170	6920	44530	34110	22840	9420	8620	4330
CFSM	0.35	0.73	0.65	0.30	0.21	0.18	1.23	0.91	0.63	0.25	0.23	0.12
IN.	0.41	0.81	0.75	0.34	0.22	0.21	1.37	1.05	0.70	0.29	0.27	0.13

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STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 2002, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	359	356	209	151	126	176	1203	1602	836	417	241	286
MAX	2095	1461	720	431	300	1169	2724	4016	2801	1127	1029	2985
(WY)	1978	1971	1978	1975	1969	1945	2001	1950	1947	1968	1950	1977
MIN	17.4	11.4	2.85	2.18	8.02	60.0	290	138	125	78.0	46.5	40.2
(WY)	1977	1977	1977	1977	1977	1941	1977	1977	1977	1958	1998	1976

SUMMARY STATISTICS FOR 2001 CALENDAR YEAR FOR 2002 WATER YEAR WATER YEARS 1921 - 2002

ANNUAL TOTAL		249138		107349								
ANNUAL MEAN		683		294					499			
HIGHEST ANNUAL MEAN									840			1971
LOWEST ANNUAL MEAN									158			1958
HIGHEST DAILY MEAN				5710	Apr 26		2180	Apr 17	10700		May 5	1934
LOWEST DAILY MEAN				65	Jan 1		47	Sep 27	1.0a		Jan 15-21	1977
ANNUAL SEVEN-DAY MINIMUM				67	Jan 1		48	Sep 24	1.0		Jan 15	1977
MAXIMUM PEAK FLOW							2890	Apr 17	11000b		May 5	1934
MAXIMUM PEAK STAGE							8.03	Apr 17	12.37c		Sep 24	1977
INSTANTANEOUS LOW FLOW							46	Sep 27	1.0a		Jan 15	1977
ANNUAL RUNOFF (AC-FT)			494200				212900		361800			
ANNUAL RUNOFF (CFSM)			1.12				0.48		0.82			
ANNUAL RUNOFF (INCHES)			15.22				6.56		11.14			
10 PERCENT EXCEEDS			2000				616		1280			
50 PERCENT EXCEEDS			264				193		223			
90 PERCENT EXCEEDS			87				90		84			

- a Minimum observed.
- b Gage height 7.60 ft, site and datum then in use.
- c At present site and datum, discharge 10,500 ft<sup>3</sup>/s.
- e Estimated.



