

STREAMS TRIBUTARY TO LAKE SUPERIOR--Continued

04015330 KNIFE RIVER NEAR TWO HARBORS, MN

LOCATION.--Lat 46°56'49", long 91°47'32", in SW<sup>1</sup>/<sub>4</sub>NW<sup>1</sup>/<sub>4</sub> sec. 31, T.52 N., R.11 W., Lake County, Hydrologic Unit 04010102, on right bank 600 ft downstream from bridge on U.S. Highway 61, 0.5 mi upstream from bridge from County Highway 102, in town of Knife River, 0.8 mi upstream from Lake Superior, and 7.8 mi southwest of Two Harbors.

DRAINAGE AREA.--83.6 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1974 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 640 ft above sea level (from topographic map).

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated intermittently by fish ladder operation just upstream of gage.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,800 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)
Jun 23	1130	2,170	6.56	Jul 8	0700	*2,390	*6.79

Minimum discharge, 0.45 ft<sup>3</sup>/s, July 5, gage height, 2.04 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	7.0	33	69	e11	e3.9	e3.1	e31	133	22	18	22	14
2	7.0	29	62	e10	e3.9	e3.0	e29	111	20	13	28	24
3	6.8	26	51	e10	e3.9	e2.9	e27	92	19	11	19	40
4	6.7	23	50	e9.3	e3.9	e2.9	e24	89	19	8.5	16	24
5	6.7	22	206	e10	e3.9	e2.9	e23	116	19	6.9	13	56
6	6.6	21	237	e11	4.0	e2.8	e21	119	18	8.4	11	44
7	6.7	21	98	e13	e4.2	2.8	e75	105	18	16	10	28
8	7.4	51	69	e14	e4.3	e2.9	e290	188	17	1210	11	20
9	8.7	51	39	e13	e4.4	e3.0	e230	647	15	457	11	15
10	20	42	53	e11	e4.4	3.0	e600	339	14	136	8.5	176
11	37	36	42	e9.6	e4.4	e3.2	1110	195	14	72	7.5	83
12	28	32	36	e8.8	e4.4	e3.5	817	279	14	42	21	42
13	26	30	33	e7.8	e4.4	e4.0	971	232	16	28	37	27
14	44	29	e38	e7.0	4.3	e4.6	971	167	19	21	23	21
15	37	27	e39	e6.4	e4.3	e5.2	796	132	16	16	22	15
16	30	26	27	e5.8	e4.4	e5.9	619	114	13	13	77	12
17	24	24	31	e5.4	e4.6	e6.7	439	96	11	11	162	11
18	21	23	32	e5.0	e5.0	e6.2	401	82	9.6	11	118	10
19	19	23	30	e5.1	e4.7	e5.6	333	71	12	8.9	70	12
20	18	22	e28	e5.4	e4.5	e5.2	196	63	24	8.4	47	20
21	16	21	e26	e5.6	e4.5	e4.4	138	57	26	9.2	38	16
22	16	21	e24	e5.7	e4.5	e5.0	116	52	21	10	41	13
23	30	21	e22	e5.4	e4.9	e5.6	106	50	1510	8.7	33	14
24	65	144	e20	e5.0	e4.6	e6.2	97	47	951	7.8	31	22
25	75	662	e19	e6.5	e4.2	e6.6	89	43	477	13	26	22
26	62	218	e18	e6.1	e3.8	e6.8	78	41	176	20	18	26
27	51	132	e16	e5.0	e3.5	e7.2	71	37	95	16	15	23
28	43	108	e15	e4.4	e3.2	e9.0	81	34	57	20	13	19
29	38	95	e14	e4.1	---	e14	115	32	37	18	13	18
30	37	62	e13	e4.0	---	e21	177	29	25	13	13	18
31	33	---	e12	e3.9	---	e30	---	27	---	13	12	---
TOTAL	833.6	2075	1469	234.3	119.0	195.2	9071	3819	3704.6	2264.8	987.0	885
MEAN	26.9	69.2	47.4	7.56	4.25	6.30	302	123	123	73.1	31.8	29.5
MAX	75	662	237	14	5.0	30	1110	647	1510	1210	162	176
MIN	6.6	21	12	3.9	3.2	2.8	21	27	9.6	6.9	7.5	10
AC-FT	1650	4120	2910	465	236	387	17990	7570	7350	4490	1960	1760
CFSM	0.32	0.83	0.57	0.09	0.05	0.08	3.62	1.47	1.48	0.87	0.38	0.35
IN.	0.37	0.92	0.65	0.10	0.05	0.09	4.04	1.70	1.65	1.01	0.44	0.39

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STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 2002, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	90.7	82.9	24.4	11.4	13.4	60.0	380	155	89.3	90.6	36.7	79.8
MAX	267	238	75.1	31.4	79.2	204	889	427	240	402	163	314
(WY)	1996	1999	1999	1975	1998	1998	2001	1979	1984	1999	1988	1977
MIN	3.06	1.58	0.000	0.000	0.000	6.30	73.6	16.0	13.0	4.87	2.95	1.43
(WY)	1977	1977	1977	1977	1977	2002	1977	1976	1995	1988	1976	1976

SUMMARY STATISTICS FOR 2001 CALENDAR YEAR FOR 2002 WATER YEAR WATER YEARS 1974 - 2002

ANNUAL TOTAL	40288.8		25657.5		93.2	
ANNUAL MEAN	110		70.3		44.2	
HIGHEST ANNUAL MEAN					164 1999	
LOWEST ANNUAL MEAN					44.2 1977	
HIGHEST DAILY MEAN	2640	Apr 23	1510	Jun 23	4840	Jul 5 1999
LOWEST DAILY MEAN	3.5	Feb 24	2.8	Mar 6-7	0.00a	Dec 2 1976
ANNUAL SEVEN-DAY MINIMUM	3.6	Feb 21	2.9	Mar 2	0.00	Dec 2 1976
MAXIMUM PEAK FLOW			2390		9100 Jul 5 1999	
MAXIMUM PEAK STAGE			6.79		12.14 Jul 5 1999	
INSTANTANEOUS LOW FLOW			0.45b		Jul 5	
ANNUAL RUNOFF (AC-FT)	79910		50890		67530	
ANNUAL RUNOFF (CFSM)	1.32		0.84		1.12	
ANNUAL RUNOFF (INCHES)	17.93		11.42		15.15	
10 PERCENT EXCEEDS	238		134		229	
50 PERCENT EXCEEDS	16		21		23	
90 PERCENT EXCEEDS	4.6		4.4		5.0	

a Many days in 1977.  
 b Result of regulation.  
 e Estimated.



