

STREAMS TRIBUTARY TO LAKE SUPERIOR--Continued

04015330 KNIFE RIVER NEAR TWO HARBORS, MN

LOCATION.--Lat 46°56'49", long 91°47'32", in SW¹/₄NW¹/₄ 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 on 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 mi².

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 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov 7	1215	2,430	6.87	Apr 12	0200	2,840	7.27
Apr 7	1530	(ice jam)	*7.69	Apr 21	1530	1,810	6.13
Apr 8	(daily)	e1910	--	Apr 23	1815	*3,240	7.66

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 2000 TO SEPTEMBER 2001
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	41	e27	e6.2	e5.0	e3.8	e13	374	65	24	56	9.1
2	11	167	e25	e6.2	e4.9	e3.9	e16	631	64	17	46	7.4
3	10	117	e23	e6.2	e4.9	e4.1	e21	377	60	16	25	6.8
4	9.3	76	e21	e6.3	e4.9	e4.2	e28	234	51	16	16	4.9
5	8.7	54	e20	e6.4	e4.8	e4.4	e100	163	43	15	12	4.5
6	8.2	258	e19	e6.5	e4.8	e4.5	e300	302	39	12	9.8	4.1
7	8.3	1810	e18	e6.6	e4.7	e4.6	e900	371	35	12	8.2	10
8	8.4	871	e17	e6.8	e4.6	e4.6	e1910	248	31	e11	8.6	20
9	8.7	377	e15	e7.0	e4.6	e4.6	e1310	165	39	e9.2	22	25
10	9.4	182	e14	e7.1	e4.5	e4.6	947	239	43	8.5	14	16
11	8.8	121	e13	e7.1	e4.5	e4.5	1380	203	39	7.4	11	12
12	8.6	222	e13	e7.0	e4.4	e4.5	2240	143	44	6.7	9.1	9.8
13	8.6	747	e12	e6.8	e4.4	e4.5	1620	135	39	6.2	7.8	8.0
14	13	334	e12	e6.6	e4.3	e4.6	1550	120	115	5.8	6.5	7.2
15	23	186	e11	e6.3	e4.3	e4.7	1340	106	112	6.0	6.4	7.2
16	25	e112	e10	e6.1	e4.2	e4.9	786	122	69	7.0	31	7.0
17	21	e84	e9.8	e5.7	e4.0	e5.3	e451	109	48	7.6	24	6.5
18	18	e60	e9.5	e5.6	e3.9	e5.7	e360	91	39	10	64	6.5
19	16	e50	e9.1	e5.4	e3.9	e6.0	415	76	38	12	57	6.7
20	14	e45	e8.7	e5.3	e3.8	e6.4	581	68	33	17	32	7.2
21	12	e41	e8.3	e5.2	e3.7	e7.0	1140	257	29	11	21	6.8
22	11	e43	e8.0	e5.1	e3.6	e7.5	1230	383	26	9.5	16	6.5
23	10	e45	e7.7	e5.0	e3.6	e8.2	2640	231	23	8.1	13	8.7
24	9.7	e47	e7.5	e5.0	e3.5	e9.0	1770	143	20	6.9	9.9	14
25	9.2	e48	e7.2	e5.0	e3.5	e10	1220	130	18	5.4	8.8	11
26	12	e46	e7.0	e5.0	e3.5	e11	857	240	18	4.5	8.5	9.0
27	27	e39	e6.7	e5.0	e3.6	e12	625	199	15	4.1	7.6	8.3
28	40	e34	e6.6	e5.0	e3.7	e14	393	129	e13	8.2	6.3	7.2
29	27	e32	e6.4	e5.0	---	e13	271	130	e13	12	4.6	7.0
30	23	e29	e6.3	e5.0	---	e12	252	103	27	11	6.9	7.0
31	25	---	e6.2	e5.0	---	e11	---	80	---	26	12	---
TOTAL	457.9	6318	385.0	182.5	118.1	209.1	26666	6302	1248	333.1	581.0	271.4
MEAN	14.8	211	12.4	5.89	4.22	6.75	889	203	41.6	10.7	18.7	9.05
MAX	40	1810	27	7.1	5.0	14	2640	631	115	26	64	25
MIN	8.2	29	6.2	5.0	3.5	3.8	13	68	13	4.1	4.6	4.1
AC-FT	908	12530	764	362	234	415	52890	12500	2480	661	1150	538
CFSM	.18	2.52	.15	.07	.05	.08	10.6	2.43	.50	.13	.22	.11
IN.	.20	2.81	.17	.08	.05	.09	11.87	2.80	.56	.15	.26	.12

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STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 2001, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	93.1	83.4	23.6	11.6	13.7	62.0	383	156	88.0	91.2	36.9	81.6
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	.000	.000	.000	6.75	73.6	16.0	13.0	4.87	2.95	1.43
(WY)	1977	1977	1977	1977	1977	2001	1977	1976	1995	1988	1976	1976

SUMMARY STATISTICS	FOR 2000 CALENDAR YEAR	FOR 2001 WATER YEAR	WATER YEARS 1974 - 2001
ANNUAL TOTAL	24457.4	43072.1	
ANNUAL MEAN	66.8	118	94.1
HIGHEST ANNUAL MEAN			164
LOWEST ANNUAL MEAN			44.2
HIGHEST DAILY MEAN	1810	Nov 7	2640
LOWEST DAILY MEAN	2.4	Aug 13	3.5
ANNUAL SEVEN-DAY MINIMUM	4.5	Aug 11	3.6
MAXIMUM PEAK FLOW			3240b
MAXIMUM PEAK STAGE			7.69c
INSTANTANEOUS LOW FLOW			.80
ANNUAL RUNOFF (AC-FT)	48510	85430	68150
ANNUAL RUNOFF (CFSM)	.80	1.41	1.13
ANNUAL RUNOFF (INCHES)	10.88	19.17	15.29
10 PERCENT EXCEEDS	129	257	230
50 PERCENT EXCEEDS	21	12	23
90 PERCENT EXCEEDS	7.2	4.6	5.0

- a Many days in 1977.
- b Gage height, 7.66 ft.
- c Backwater from ice.
- e Estimated.

