

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.--Occasional low-flow measurements, water years 1970-71, 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.

PEAK DISCHARGES 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)
Mar 8	1700	Ice jam	*6.53	Jul 9	0215	1,920	6.30
May 8	1015	*2,050	6.46				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	182	e40	e14	e8.6	e170	66	67	26	20	5.3	64
2	57	117	e39	e13	e8.7	e145	66	67	27	20	4.8	41
3	49	87	38	e12	e8.8	e130	117	63	28	23	4.4	58
4	43	70	39	e12	e8.8	e120	126	57	24	18	4.2	57
5	40	64	37	e11	e8.7	e130	115	55	22	16	5.7	38
6	38	58	e37	e11	e8.6	e115	413	52	19	14	9.1	28
7	38	53	e36	e10	e8.5	e110	192	49	18	19	15	37
8	147	49	e36	e10	e8.3	e500	116	1230	18	125	13	35
9	123	47	e35	e9.8	e8.2	e450	100	790	16	819	14	76
10	87	45	e35	e9.7	e7.9	e170	88	316	15	126	11	103
11	68	42	e34	e10	e7.7	e95	73	245	15	60	4.0	58
12	56	39	e33	e10	e7.6	e62	69	158	15	80	2.8	38
13	48	39	e32	e9.8	e7.5	e40	75	129	15	100	2.4	28
14	43	37	e32	e9.7	e7.5	e31	109	116	16	49	2.4	22
15	41	34	e31	e9.5	e7.4	e34	113	89	22	30	6.3	19
16	42	33	e29	e9.4	e7.3	e28	97	70	117	22	7.1	15
17	42	31	e26	e9.0	e7.2	e30	81	58	101	17	6.4	15
18	44	31	e23	e9.2	e7.1	e30	75	50	93	14	5.8	13
19	56	33	e20	e9.1	e7.0	30	75	42	92	12	5.3	12
20	54	43	e17	e9.0	e7.0	34	71	37	198	10	4.8	13
21	49	41	e15	e8.9	e7.1	36	65	54	190	9.4	4.9	11
22	43	41	e15	e8.8	e7.3	59	63	123	141	8.6	5.1	11
23	40	43	e14	e8.7	e7.5	85	67	98	96	7.5	5.8	14
24	36	49	e14	e8.6	e15	152	69	65	64	7.2	5.0	17
25	34	50	e17	e8.5	e100	394	68	48	43	6.7	5.2	15
26	32	52	e22	e8.5	e470	190	65	38	61	6.9	6.9	13
27	30	55	e19	e8.4	e290	139	65	31	52	7.3	11	11
28	30	45	e15	e8.4	e240	110	71	31	34	8.1	9.2	11
29	30	41	e18	e8.3	e200	87	76	28	28	8.6	6.9	10
30	873	e41	e22	e8.2	---	74	68	26	24	7.3	6.0	16
31	432	---	e17	e8.3	---	67	---	31	---	6.0	20	---
TOTAL	2815	1592	837	300.8	1495.3	3847	2914	4313	1630	1677.6	219.8	899
MEAN	90.8	53.1	27.0	9.70	51.6	124	97.1	139	54.3	54.1	7.09	30.0
MAX	873	182	40	14	470	500	413	1230	198	819	20	103
MIN	30	31	14	8.2	7.0	28	63	26	15	6.0	2.4	10
AC-FT	5580	3160	1660	597	2970	7630	5780	8550	3230	3330	436	1780
CFSM	1.09	.63	.32	.12	.62	1.48	1.16	1.66	.65	.65	.08	.36
IN.	1.25	.71	.37	.13	.67	1.71	1.30	1.92	.73	.75	.10	.40

04015330 KNIFE RIVER NEAR TWO HARBORS, MN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 2000, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	96.1	78.5	24.0	11.8	14.1	64.1	363	154	89.8	94.2	37.5	84.3
MAX	267	238	75.1	31.4	79.2	204	631	427	240	402	163	314
(WY)	1996	1999	1999	1975	1998	1998	1982	1979	1984	1999	1988	1977
MIN	3.06	1.58	.000	.000	.000	8.65	73.6	16.0	13.0	4.87	2.95	1.43
(WY)	1977	1977	1977	1977	1977	1980	1977	1976	1995	1988	1976	1976

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR	FOR 2000 WATER YEAR	WATER YEARS 1974 - 2000
ANNUAL TOTAL	49680	22540.5	
ANNUAL MEAN	136	61.6	93.1
HIGHEST ANNUAL MEAN			164 1999
LOWEST ANNUAL MEAN			44.2 1977
HIGHEST DAILY MEAN	4840	Jul 5	4840 Jul 5 1999
LOWEST DAILY MEAN	14	Feb 22	.00 ^a Dec 2 1976
ANNUAL SEVEN-DAY MINIMUM	14	Mar 7	4.5 Aug 11 Dec 2 1976
INSTANTANEOUS PEAK FLOW			2050 ^b May 8 Jul 5 1999
INSTANTANEOUS PEAK STAGE			6.53 ^c Mar 8 12.14 Jul 5 1999
INSTANTANEOUS LOW FLOW			1.6 Aug 14 .00 Dec 2 1976
ANNUAL RUNOFF (AC-FT)	98540	44710	67480
ANNUAL RUNOFF (CFSM)	1.63	.74	1.11
ANNUAL RUNOFF (INCHES)	22.11	10.03	15.14
10 PERCENT EXCEEDS	351	121	229
50 PERCENT EXCEEDS	39	33	23
90 PERCENT EXCEEDS	15	7.4	5.0

^a Many days in 1977.
^b Gage height, 6.46 ft.
^c Backwater from ice.
^e Estimated.

