

STREAMS TRIBUTARY TO LAKE SUPERIOR

04015330 KNIFE RIVER NEAR TWO HARBORS, MN

LOCATION.--Lat 46° 56'49", long 91° 47'32", in SW¼NW¼ 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.--85.6 mi².

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1970-71, July 1974 to current year.

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

REMARKS.--Records good except those for estimated daily discharges, which are poor.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft³/s and maximum (*):

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
JUL	AUG	SEP							
1	137	e182	e60	e26	e20	e21	e170	191	35
31	9.8	8.5							
2	99	e120	e57	e28	e20	e21	e180	156	31
38	9.3	7.7							
3	75	e88	e54	e27	e20	e21	e400	133	28
48	8.7	7.0							
4	61	e67	e52	e27	e20	e20	e740	111	27
143	8.9	6.4							
5	54	e58	e50	e27	e20	e20	e1000	100	51
84	9.8	6.4							
6	49	e140	e48	e26	e20	e20	e1600	94	81
58	9.6	6.5							
7	41	e260	e46	e26	e20	e20	e1080	82	54
41	7.9	6.6							
8	38	e200	e45	e26	e20	e20	967	139	47
34	7.2	7.0							
9	42	e150	e43	e25	e20	e20	752	130	37
29	7.1	8.6							
10	42	e110	e41	e25	e20	e20	523	99	30

23	7.3	7.3							
11	37	e85	e36	e25	e20	e20	402	86	24
20	8.2	6.8							
12	34	e65	e33	e25	e20	e20	383	97	21
18	7.9	6.3							
13	32	e40	e30	e24	e20	e20	405	85	19
18	7.2	5.9							
14	29	e54	e27	e24	e20	e20	596	81	17
24	7.3	5.9							
15	29	e90	e25	e24	e20	e20	796	81	20
20	7.5	6.5							
16	29	e650	e25	e24	e20	e20	605	71	34
18	8.4	7.2							
17	146	e1350	e25	e23	e20	e20	437	64	26
18	9.3	9.5							
18	244	e500	e25	e23	e20	e20	618	59	589
15	8.6	11							
19	149	e200	e24	e23	e20	e20	860	78	215
13	7.4	104							
20	119	e150	e24	e23	e20	e20	787	92	114
13	18	56							
21	104	e100	e24	e22	e21	e21	783	74	67
12	27	29							
22	97	e76	e24	e22	e21	e21	720	61	43
12	20	20							
23	261	e60	e24	e22	e22	e22	654	61	31
11	15	15							
24	419	e50	e24	e22	e23	e22	573	130	1410
11	13	12							
25	241	e47	e24	e21	e22	e23	510	115	1390
15	12	11							
26	185	e47	e24	e21	e22	e24	423	79	242
28	11	10							
27	320	e54	e24	e21	e21	e26	417	60	99
20	10	9.6							
28	233	e62	e24	e20	e21	e34	363	50	58
17	8.7	10							
29	245	e66	e25	e20	---	e50	305	45	54
14	8.0	15							
30	1420	e65	e25	e20	---	e190	252	46	42
12	8.0	15							
31	e480	---	e25	e20	---	e180	---	41	---
11	7.7	---							
TOTAL	5491	5186	1037	732	573	1016	18301	2791	4936
869	315.8	437.7							
MEAN	177	173	33.5	23.6	20.5	32.8	610	90.0	165
28.0	10.2	14.6							
MAX	1420	1350	60	28	23	190	1600	191	1410
143	27	104							
MIN	29	40	24	20	20	20	170	41	17

11	7.1	5.9							
AC-FT	10890	10290	2060	1450	1140	2020	36300	5540	9790
1720	626	868							
CFSM	2.07	2.02	.39	.28	.24	.38	7.13	1.05	1.92
.33	.12	.17							
IN.	2.39	2.25	.45	.32	.25	.44	7.95	1.21	2.15
.38	.14	.19							

o a Daily-mean discharge, backwater from ice.

e Estimated.

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1997, BY WATER YEAR (WY)

	JUN	JUL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY
MEAN	94.6	74.9	AUG	SEP	11.8	9.49	52.0	379	163	91.7
86.6	37.0	84.3								
MAX	267	198	60.6	31.4	22.2	136	631	427	241	
345	163	14								
(WY)	1996	1992	1983	1975	1984	1976	1982	1979	1984	
1993	1988	977								
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								

<i>SUMMARY STATISTICS</i>	<i>FOR 1996 CALENDAR YEAR</i>	<i>FOR 1997 WATER YEAR</i>	<i>WATER YEARS 1974 - 1997</i>	
ANNUAL TOTAL	44536.5	41685.5		
ANNUAL MEAN	122	114		92.7
HIGHEST ANNUAL MEAN				
147	1986			
LOWEST ANNUAL MEAN				
44.2	1977			
HIGHEST DAILY MEAN	1990	Sep 27	1600	Apr 6
4480	May 10	1979		
LOWEST DAILY MEAN	7.1	Aug 31	5.9	Sep 13
Dec 2	1976			.00a
ANNUAL SEVEN-DAY MINIMUM	7.7	Aug 26	6.6	Sep 10
.00	Dec 2	1976		
INSTANTANEOUS PEAK FLOW			5780	Jun 24
7440	May 10	1979		
INSTANTANEOUS PEAK STAGE			10.29	Jun 24
11.16	May 10	1979		
INSTANTANEOUS LOW FLOW			.87	Aug 11
ANNUAL RUNOFF (AC-FT)	88340		82680	
67180				
ANNUAL RUNOFF (CFSM)	1.42		1.33	
1.08				
ANNUAL RUNOFF (INCHES)	19.35		18.12	

14.72			
10 PERCENT EXCEEDS	321	311	230
50 PERCENT EXCEEDS	39	26	23
90 PERCENT EXCEEDS	16	9.4	4.9

- o a Many days in 1977.