



Water-Data Report 2009

04015330 KNIFE RIVER NEAR TWO HARBORS, MN

Northwestern Lake Superior Basin
Beaver-Lester Subbasin

LOCATION.--Lat 46°56'49", long 91°47'32" referenced to North American Datum of 1927, in SW ¼ NW ¼ sec.31, T.52 N., R.11 W., Lake County, MN, 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.

SURFACE-WATER RECORDS

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 to fair 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 (or) maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar 25	0600	*e1,200	--
No peak greater than base discharge			

e Estimated daily-mean, backwater from ice.

Minimum discharge, 3.3 ft³/s, Sept. 25, gage height, 2.20 ft.

04015330 KNIFE RIVER NEAR TWO HARBORS, MN—Continued

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009
DAILY MEAN VALUES

[e, estimated]

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	58	40	e15	e5.9	e5.1	e6.6	107	335	38	9.2	11	21
2	44	36	e13	e5.9	e5.1	e6.5	128	234	40	8.6	10	16
3	33	34	e11	e5.9	e5.1	e6.5	116	183	32	8.3	8.6	14
4	26	33	e9.4	e5.9	e5.1	e6.6	103	150	26	7.6	7.9	11
5	21	49	e8.0	e5.9	e5.1	e6.7	100	135	22	6.8	7.1	9.9
6	21	187	e7.3	e5.8	e5.0	e7.0	106	196	19	6.1	6.4	8.8
7	57	249	e7.2	e5.7	e5.1	e8.7	125	165	20	5.6	6.2	8.1
8	227	188	e7.0	e5.7	e5.1	e9.7	149	133	31	5.5	6.8	7.6
9	127	132	e6.8	e5.7	e5.4	11	241	110	112	5.4	16	7.2
10	97	97	e7.0	e5.7	e5.9	11	349	98	83	5.4	23	7.4
11	131	74	e6.9	e5.7	e6.3	11	412	85	60	5.2	13	8.2
12	176	71	e6.8	e5.7	e7.1	10	480	76	46	4.7	9.6	7.5
13	142	75	e6.6	e5.7	e8.0	10	513	72	37	4.4	7.7	7.2
14	145	85	e6.6	e5.7	e10	10	566	69	34	4.9	6.6	6.7
15	98	75	e6.5	e5.7	e17	12	692	64	29	19	6.3	6.4
16	76	63	e6.5	e5.7	e41	e20	724	95	23	17	14	6.3
17	61	51	e6.5	e5.6	e50	e102	884	93	19	11	15	6.1
18	53	60	e6.5	e5.5	e33	e140	1,090	75	16	9.6	13	6.0
19	47	57	e6.4	e5.5	e18	e100	667	66	17	8.6	22	5.9
20	41	47	e6.3	e5.7	e11	e150	519	59	20	7.5	394	6.3
21	37	e42	e6.2	e5.7	e8.4	e170	408	55	16	17	268	6.2
22	32	e40	e6.1	e5.7	e7.0	e200	398	49	14	44	137	6.2
23	29	e39	e6.0	e5.7	e6.9	e330	334	44	23	41	76	6.4
24	30	e37	e6.1	e5.7	e6.9	e1,100	352	39	18	30	51	6.3
25	110	e37	e6.0	e5.7	e6.9	e1,200	334	34	14	22	37	6.0
26	111	e35	e6.0	e5.7	e6.9	e600	258	31	11	17	25	6.2
27	93	e33	e6.0	e5.5	e6.8	e508	455	30	9.5	15	18	6.6
28	75	e29	e6.0	e5.3	e6.7	e290	331	29	9.7	12	28	7.3
29	61	e23	e6.0	e5.3	---	231	228	25	9.9	9.4	58	8.2
30	53	e18	e6.0	e5.2	---	198	376	23	9.5	9.6	44	7.7
31	47	---	e6.0	e5.2	---	154	---	22	---	11	30	---
Total	2,359	2,036	223.7	175.3	309.9	5,626.3	11,545	2,874	858.6	388.4	1,376.2	244.7
Mean	76.1	67.9	7.22	5.65	11.1	181	385	92.7	28.6	12.5	44.4	8.16
Max	227	249	15	5.9	50	1,200	1,090	335	112	44	394	21
Min	21	18	6.0	5.2	5.0	6.5	100	22	9.5	4.4	6.2	5.9
Ac-ft	4,680	4,040	444	348	615	11,160	22,900	5,700	1,700	770	2,730	485
Cfs/m	0.91	0.81	0.09	0.07	0.13	2.17	4.60	1.11	0.34	0.15	0.53	0.10
In.	1.05	0.91	0.10	0.08	0.14	2.50	5.14	1.28	0.38	0.17	0.61	0.11

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 2009, BY WATER YEAR (WY)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	91.6	75.8	22.7	10.5	12.0	66.6	375	153	92.3	76.8	32.4	68.6
Max	320	238	75.1	31.4	79.2	204	889	427	240	402	163	314
(WY)	(2008)	(1999)	(1999)	(1975)	(1998)	(1998)	(2001)	(1979)	(1984)	(1999)	(1988)	(1977)
Min	3.06	1.58	0.00	0.00	0.00	3.20	73.6	16.0	13.0	4.87	2.95	1.43
(WY)	(1977)	(1977)	(1977)	(1977)	(1977)	(2008)	(1977)	(1976)	(1995)	(1988)	(1976)	(1976)

04015330 KNIFE RIVER NEAR TWO HARBORS, MN—Continued

SUMMARY STATISTICS

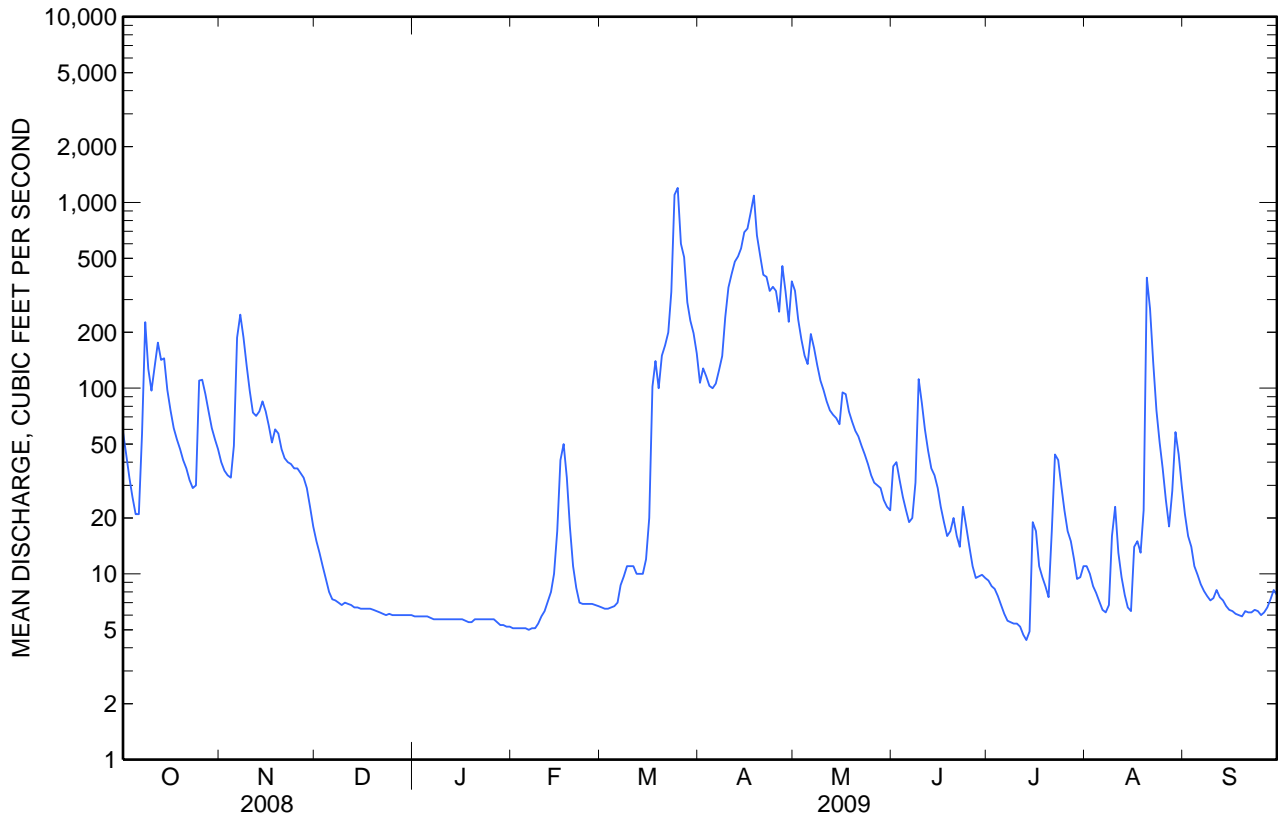
	Calendar Year 2008		Water Year 2009		Water Years 1974 - 2009	
Annual total	30,591.02		28,017.1			
Annual mean	83.6		76.8		90.0	
Highest annual mean					164	1999
Lowest annual mean					44.2	1977
Highest daily mean	1,560	Jun 6	1,200	Mar 25	4,840	Jul 5, 1999
Lowest daily mean	0.10	Feb 24	4.4	Jul 13	^a 0.00	Dec 2, 1976
Annual seven-day minimum	0.10	Feb 24	5.1	Jul 8	0.00	Dec 2, 1976
Maximum peak flow			^b 1,200	Mar 25	9,100	Jul 5, 1999
Maximum peak stage			^c 6.45	Mar 25	12.14	Jul 5, 1999
Instantaneous low flow			^d 3.3	Sep 25	0.00	Dec 2, 1976
Annual runoff (ac-ft)	60,680		55,570		65,190	
Annual runoff (cfsm)	1.000		0.918		1.08	
Annual runoff (inches)	13.61		12.47		14.62	
10 percent exceeds	227		199		220	
50 percent exceeds	15		17		22	
90 percent exceeds	0.12		5.7		4.6	

^a Many days, several years.

^b Estimated daily-mean.

^c Backwater from ice.

^d Due to regulation.



04015330 KNIFE RIVER NEAR TWO HARBORS, MN—Continued

WATER-QUALITY RECORDS

REMARKS.--This site is part of a statewide sediment study. The objectives of this study are to describe sediment concentrations and load, and turbidity as a function of streamflow and season at selected stream sites. Secondly to describe relations between mean cross-sectional suspended sediment concentrations with point measurements of water transparency.

COOPERATION.--Minnesota Pollution Control Agency.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009

Part 1 of 2

[Remark codes: >, greater than.]

Date	Time	Medium name	Temperature, air, deg C (00020)	Instantaneous discharge, ft ³ /s (00061)	Specific conductance, wat unf lab, μS/cm @ 25 degC (90095)	Specific conductance, wat unf μS/cm @ 25 degC (00095)	Temperature, water, deg C (00010)	Transparency wat unf trans- parency tube, cm (65225)	Turbidity white light, det ang 90+/-30 degrees NTU (63675)	Turbidity white light, det ang 90+/-30 corrctd NTRU (63676)
Oct										
09...	1312	Surface water	--	123	--	--	10.7	--	--	--
09...	1330	Surface water	--	123	--	--	10.7	--	--	--
09...	1335	Surface water	--	123	--	112	10.7	30	35	34
Nov										
06...	1115	Surface water	10.6	186	--	--	8.9	--	--	--
06...	1122	Surface water	10.6	186	--	--	8.9	--	--	--
06...	1138	Surface water	10.6	186	--	--	8.9	--	--	--
06...	1200	Surface water	10.6	186	--	118	8.9	10	81	82
Apr										
16...	0943	Surface water	5.2	--	--	60	.2	17	41	39
16...	1026	Surface water	5.2	--	62	--	.2	--	--	--
16...	1036	Surface water	--	--	--	--	--	--	--	--
16...	1118	Surface water	--	--	66	--	--	--	--	--
Jun										
10...	1055	Surface water	--	106	--	118	13.0	--	--	--
10...	1121	Surface water	--	106	--	--	--	--	--	--
10...	1138	Surface water	--	106	--	118	13.0	37	34	34
Jul										
16...	0915	Surface water	13.1	--	--	191	17.0	>60	3.6	4.5
16...	0950	Surface water	--	--	202	--	--	--	--	--
16...	1000	Surface water	--	--	--	--	--	--	--	--
16...	1020	Surface water	--	--	204	--	--	--	--	--
Aug										
20...	0735	Surface water	--	--	135	--	--	--	--	--
25...	1700	Surface water	--	34	160	--	--	--	--	--
25...	1710	Surface water	--	34	--	--	--	--	--	--
25...	1730	Surface water	--	34	131	--	--	--	--	--
25...	1745	Surface water	25.4	34	--	129	--	>60	13	12
Sep										
10...	1315	Surface water	--	--	192	--	--	--	--	--

04015330 KNIFE RIVER NEAR TWO HARBORS, MN—Continued

WATER-QUALITY DATA
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009

Part 2 of 2

[Remark codes: >, greater than.]

Date	Sampler type, code (84164)	Suspnd. sedimnt sieve diametr percent <0.0625 mm (70331)	Sus- pended sedi- ment concen- tration mg/L (80154)
Oct			
09...	Sampler US D-74	96	19
09...	Sampler US D-74	97	19
09...	Weighted-bottle	--	--
Nov			
06...	Sampler US D-74	95	61
06...	Sampler US DH-59	95	54
06...	Sampler US D-74	97	55
06...	Weighted-bottle	--	--
Apr			
16...	Weighted-bottle	--	--
16...	Sampler US D-74	--	46
16...	Sampler US D-74	85	62
16...	Sampler US D-74	--	46
Jun			
10...	Sampler US D-74	--	--
10...	Sampler US DH-59	--	--
10...	Weighted-bottle	--	--
Jul			
16...	Grab sample	--	--
16...	Sampler US D-74	--	2
16...	Sampler US DH-48	87	4
16...	Sampler US D-74	--	1
Aug			
20...	Sampler US D-74	--	121
25...	Sampler US D-74	--	7
25...	Sampler US DH-48	99	16
25...	Sampler US D-74	--	5
25...	Weighted-bottle	--	--
Sep			
10...	Sampler US D-74	--	3