

Water-Data Report 2009

05129290 GOLD PORTAGE OUTLET FROM KABETOGAMA LAKE NEAR RAY, MN

Rainy Basin
Rainy Lake Subbasin

LOCATION.--Lat 48°31'28", long 93°04'29" referenced to North American Datum of 1927, in SW ¼ NE ¼ sec.30, T.70 N., R.21 W., St. Louis County, MN, Hydrologic Unit 09030003, on right bank in bay at head of Gold Portage Outlet from Kabetogama Lake, 9.8 mi northeast of Ray.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1982 to September 1993, October 1993 to September 1994 (peak gage height and discharge only), October 1997 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,100 ft above sea level (NGVD of 1912, U.S. Army Corp of Engineers benchmark), water surface transfer.

REMARKS.--Records good. Flow completely regulated by outlet dam on Namakan Lake.

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

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	486	337	238	121	75	39	41	207	743	598	502	443
2	471	336	234	117	73	38	42	217	723	592	520	438
3	461	333	226	116	72	37	42	232	722	585	516	434
4	452	321	221	114	72	35	41	251	708	576	503	431
5	455	328	218	111	70	33	40	271	689	561	501	435
6	460	350	210	109	69	32	40	285	698	558	501	432
7	436	348	208	107	65	31	39	297	699	566	504	433
8	432	346	203	107	64	30	39	313	695	572	497	440
9	408	352	196	106	64	29	39	335	689	576	480	434
10	421	368	194	106	63	28	39	352	677	544	474	433
11	422	381	188	104	62	29	41	374	674	528	473	434
12	435	383	186	103	61	29	43	406	681	532	472	427
13	433	379	180	102	60	28	47	425	675	531	471	425
14	430	367	175	100	58	27	53	433	671	544	473	423
15	412	369	175	99	57	26	63	483	667	535	513	421
16	416	371	174	99	56	25	76	490	667	526	522	432
17	416	365	170	98	55	24	92	557	670	538	532	428
18	417	366	165	97	54	23	111	591	667	542	527	442
19	401	336	161	95	52	23	127	634	668	546	550	447
20	391	322	159	95	51	23	136	647	654	553	568	453
21	400	319	154	93	49	23	142	652	661	559	570	456
22	390	316	152	92	47	22	146	679	661	559	581	463
23	378	300	150	89	47	24	151	685	646	558	580	470
24	372	286	146	89	45	27	153	699	631	543	574	469
25	363	283	143	87	44	30	160	720	612	537	537	473
26	345	273	140	85	42	33	166	739	618	544	530	469
27	339	265	135	84	41	33	171	743	626	531	517	459
28	350	257	132	83	40	35	179	739	568	513	506	443
29	352	250	129	80	---	36	188	743	590	517	491	466
30	345	245	126	79	---	37	197	731	596	515	474	473
31	335	---	123	78	---	38	---	754	---	519	458	---
Total	12,624	9,852	5,411	3,045	1,608	927	2,844	15,684	19,946	16,998	15,917	13,326
Mean	407	328	175	98.2	57.4	29.9	94.8	506	665	548	513	444
Max	486	383	238	121	75	39	197	754	743	598	581	473
Min	335	245	123	78	40	22	39	207	568	513	458	421
Ac-ft	25,040	19,540	10,730	6,040	3,190	1,840	5,640	31,110	39,560	33,720	31,570	26,430

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2009, BY WATER YEAR (WY)

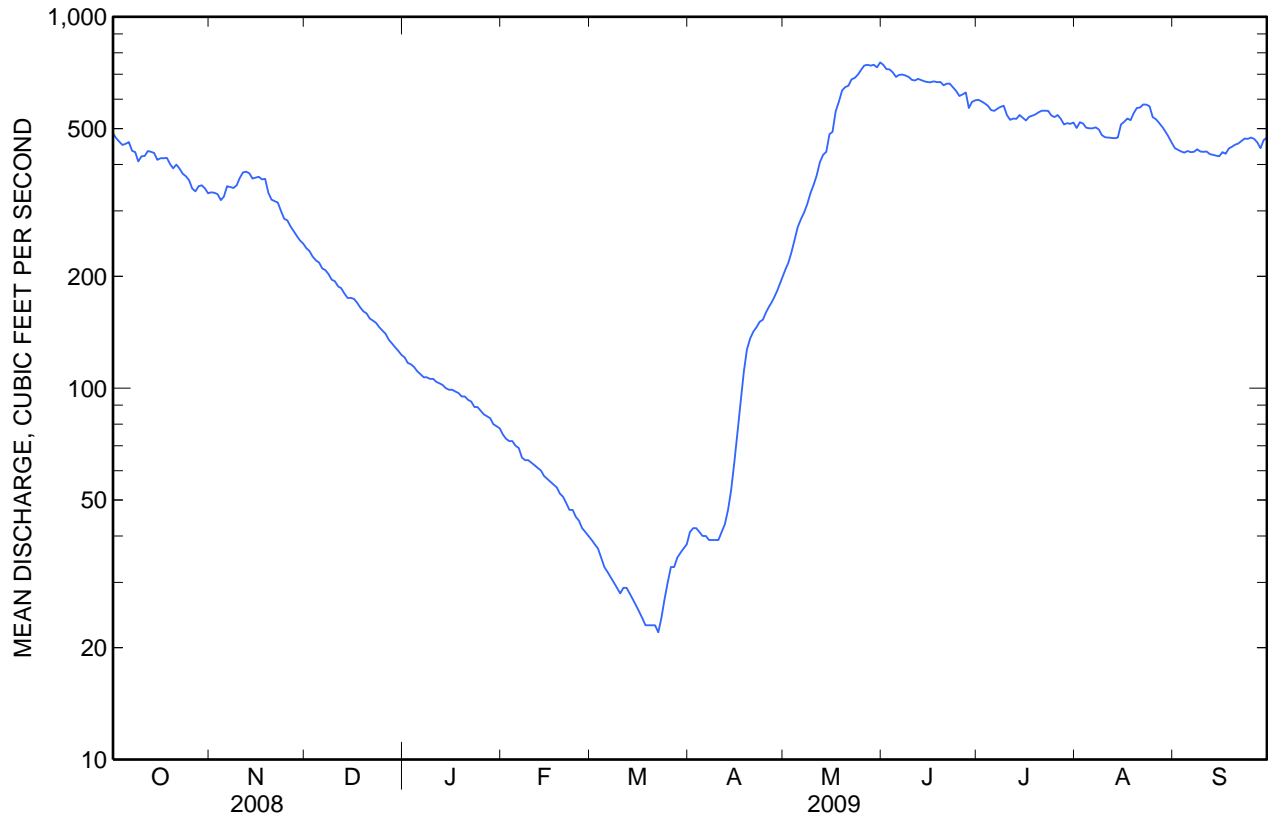
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	366	214	100	38.3	13.9	3.68	24.9	211	484	543	513	471
Max	548	421	188	152	79.0	29.9	142	798	1,082	690	686	787
(WY)	(2008)	(2008)	(2005)	(2005)	(2005)	(2009)	(2006)	(2001)	(2008)	(2002)	(1988)	(1988)
Min	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.1	32.5	0.23	0.12
(WY)	(2004)	(2004)	(2004)	(2004)	(1983)	(1983)	(1983)	(1987)	(2003)	(2003)	(2003)	(2003)

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SUMMARY STATISTICS

	Calendar Year 2008		Water Year 2009		Water Years 1983 - 2009	
Annual total	136,910.1		118,182			
Annual mean	374		324		250	
Highest annual mean					393	2008
Lowest annual mean					67.1	2003
Highest daily mean	1,160	Jun 11	754	May 31	1,310	May 30, 2001
Lowest daily mean	8.4	Apr 1	22	Mar 22	^a 0.00	Jan 21, 1983
Annual seven-day minimum	10	Mar 28	23	Mar 17	0.00	Jan 21, 1983
Maximum peak flow			772	May 31	1,310	May 29, 2001
Maximum peak stage			18.36	May 31	20.53	May 31, 2001
Instantaneous low flow			20	Mar 23	^a 0.00	Jan 21, 1983
Annual runoff (ac-ft)	271,600		234,400		180,900	
10 percent exceeds	947		632		591	
50 percent exceeds	351		348		172	
90 percent exceeds	28		40		0.00	

^a Many days, several years.



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WATER-QUALITY RECORDS

REMARKS.--This site is part of a nutrient cycling study in Kabetogama Lake, Voyageurs National Park. Objectives of this study are to determine if the changes in Kabetogama Lake water levels since a change in rules governing dam operation (2000 rule curves) are affecting algal production (chlorophyll-a) and nutrient enrichment (total phosphorus) in the lake. Another objective is to assess nutrient loading to the lake from inflow sources and the potential contribution of nutrients from lake bottom sediment.

WATER-QUALITY DATA
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009

Part 1 of 2

[Remark codes: M, presence verified but not quantified.]

Date	Time	Medium name	Dissolved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specific conductance, wat unf μS/cm @ 25 degC (00095)	Temperature, water, deg C (00010)	Sampling depth, feet (00003)	Alkalinity, wat flt inf tit field, mg/L as CaCO3 (39086)	Bicarbonate, wat flt infl pt titr., field, mg/L (00453)	Ammonia water, unfltrd mg/L (71845)
May										
14...	1000	Surface water	11.5	8.0	83	8.9	--	33.4	40.6	M
14...	1422	Surface water	11.5	8.0	83	8.9	.50	--	--	--
14...	1424	Surface water	11.5	8.0	84	8.9	3.30	--	--	--
14...	1426	Surface water	11.5	8.0	84	8.9	6.60	--	--	--
Jun										
17...	0930	Surface water	--	--	--	--	--	--	--	.01
Jul										
13...	0934	Surface water	--	--	--	--	--	--	--	.01
Aug										
04...	0950	Surface water	8.3	7.9	93	18.2	.50	38.4	46.8	.02
Sep										
10...	1011	Surface water	--	--	--	--	--	--	--	.04

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WATER-QUALITY DATA
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009

Part 2 of 2

[Remark codes: M, presence verified but not quantified.]

Date	Nitrate + nitrite water, flt'd, mg/L as N (00631)	Ortho- phos- phate, water, flt'd, mg/L as P (00671)	Phos- phorus, water, flt'd, mg/L as P (00666)	Phos- phorus, water, unflt'd, mg/L as P (00665)	Total nitro- gen, wat unf by anal ysis, mg/L (62855)	Chloro- phyll a phyto- plank- ton, acid m, µg/L (32211)
May						
14...	.003	.001	.001	.017	.41	--
14...	--	--	--	--	--	--
14...	--	--	--	--	--	--
14...	--	--	--	--	--	--
Jun						
17...	.003	.002	.005	.004	.38	.800
Jul						
13...	.021	.002	.006	.014	.45	2.80
Aug						
04...	.000	.001	.004	.013	.44	3.10
Sep						
10...	.000	.002	.005	.250	.51	3.60