November 2, 2009

RE: Ice Monitoring and 2008 Lake Reports

Dear Volunteer of the CAMP:

Thank you for your efforts in monitoring your lake as part of the Citizen Assisted Monitoring Program (CAMP). Volunteers such as you help make the CAMP a successful program. If you monitored a lake in 2008, enclosed is the lake report for the 2008 monitoring season. The lake reports for the 2009 monitoring season will be completed next spring.

The CAMP is beginning a new opportunity for volunteers to participate in gathering additional important data on metro area lakes. We are looking to build a database on the dates when ice forms and ice melts on lakes, so as to determine the duration of ice cover. This information is especially useful because the duration of ice cover is a good indicator of climate change.

We ask volunteers to record ice-on and ice-off dates for lakes, and then send the dates to us. We want to know how many days the lake is covered with ice each winter. So, we need to know if the lake temporarily has ice for a few days or weeks in the autumn, even if it melts and then reforms. You might want to make notes on a calendar every time it freezes and thaws, and then copy the dates to send to us.

We will be sending out Ice Data Forms later this winter, before the spring thaw. The ice-in and ice-out information that you recorded can be copied on the Ice Data Form, and then sent to us in a pre-addressed, pre-stamped envelope, which we will send along with the Ice Data form. If you, or someone you know, have been keeping ice records for years, we would love to receive those historical dates. If you have dates from earlier years, please send them along with your Ice Data Forms.

Reporting ice-on and ice-off dates sounds easy, but there are always complications. Here are some common questions and their answers:

What if the lake develops a thin layer of ice overnight and then breaks up during the day – does this situation need to be recorded? If ice forms and thaws all in one day, feel free to ignore it. However, if the ice stays on for more than one day, then we would like to know about it.

Do you want just the last ice-on date for each autumn? In the past, many people reported only the last ice-on in the autumn, which is ok. But, in the future, we would encourage people to report all ice covers that last for more than a day.

(over)

How thick does the ice need to be to count as ice-on? If there is continuous ice cover across the lake, please record the date, regardless of whether it is safe for walking or driving.

How can I tell if the whole lake is covered with ice? If you see vapors coming off the lake in dark areas, the lake is still open in that location. If you cannot see the whole lake, you should invent your own rule for deciding if ice cover has occurred, write down the definition, and send the definition to us when you send in your dates. For instance, your rule may be what you can see from your house. The important thing is to be consistent in your decisions from year to year.

What are the guidelines for determining ice-off dates? Normally, lakes do not refreeze in the spring once the ice is gone. However, if ice does form again, record the dates of ice-on and ice-off. We define ice-off as the date when the ice is essentially gone from the lake. If there is some ice pushed by the wind up on a shore, but the water is essentially ice-free, then the ice is out. If you have your own definition, which may be necessary on bigger lakes, write it down and send it to us. Your definition may be the ability to navigate a boat from point A to point B, or ice-free as far as you can see from your house. Again, the most important thing is to be consistent in your decisions from year to year.

If you wish to participate in the ice monitoring program, just simply start recording the ice-on and ice-off dates according to the above guidelines. We will mail out the Ice Data Forms before the spring melt so you can copy and send us the data at that time. Thank you in advance if you decide to participate. Please email or call Brian Johnson with any questions about reporting ice cover on lakes.

Sincerely,

Brian M. Johnson

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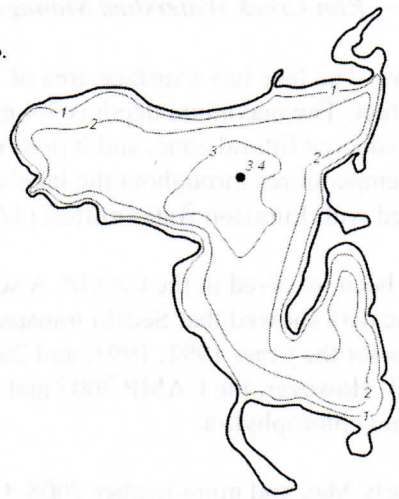
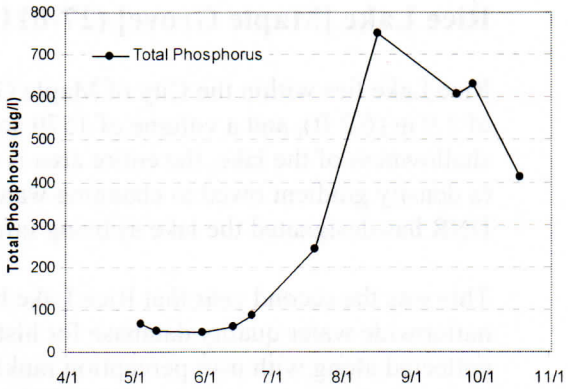
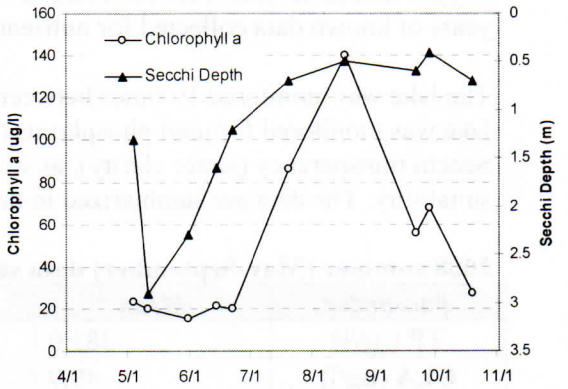
Rice Lake

Maple Grove, Hennepin Co.

Lake ID: 270116
WMO: Elm Creek
Volunteer: George Schneider

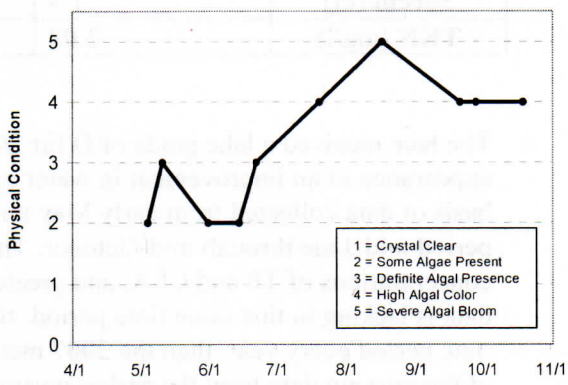






2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/4	12				23	68		1.3	2	3
5/11	14				20	49		2.9	3	3
5/31	20				15	45		2.3	2	2
6/14	21				21	60		1.6	2	2
6/22	24				20	87		1.2	3	3
7/20	27				86	243		0.7	4	4
8/17	26				140	749		0.5	5	4
9/21	22				56	607		0.6	4	4
9/28	18				68	630		0.4	4	3
10/19	12				27	411		0.7	4	3

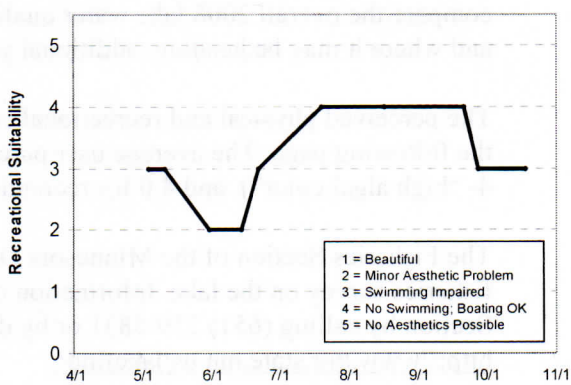


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												D
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth		C									D	D
Lake Grade												

Year	2004	2005	2006	2007	2008
Total Phosphorus				F	F
Chlorophyll a				F	D
Secchi Depth	C	D	D	F	C
Lake Grade				**F**	**D**



Source: Metropolitan Council and STORET data

Rice Lake [Maple Grove] (27-0116) – *Elm Creek Watershed Management Commission*

Rice Lake lies within the City of Maple Grove. The lake has a surface area of 252 acres, an average depth of 1.9 m (6.2 ft), and a volume of 1570 acre-feet. The maximum depth is 3.4 m (11 ft). Because of the shallowness of the lake, the entire area is considered littoral zone, and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column). The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

This was the second year that Rice Lake has been involved in the CAMP. A search through the STORET nationwide water quality database for historic data showed that Secchi transparency measurements were collected along with user perception rankings for the years 1991, 1993, and 2002-2007. Dissolved oxygen measurements were collected in 1993. However, the CAMP 2007 and 2008 data are the only years of known data collected for nutrients and chlorophyll-a.

The lake was monitored 10 times between early May and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency (water clarity), as well as the lake's perceived physical condition and recreational suitability. The data are summarized in the figures and graphs on the following page.

2008 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	282.0	45.0	749.0	F
CLA (µg/l)	49.9	15.0	140.0	D
Secchi (m)	1.3	0.4	2.9	C
TKN (mg/l)	2.08	1.60	2.80	
			Lake Grade	D

The lake received a lake grade of D for 2008 compared to last year's lake grade of F, which gives the appearance of an improvement in water quality. However, the 2008 lake grade was calculated on the basis of data collected from early May through mid-October, whereas the available 2007 data spans the period mid-June through mid-October. The 2008 data shows that the lake experienced relatively lower concentrations of TP and CLA, and greater water clarity during April, May, and early June. The 2007 data is lacking in this same time period. If the lake typically experiences better water quality during this time period every year, then the 2007 mean values would be skewed towards worse water quality because of the missing data from the earlier portion of the monitoring season. Therefore, it would be difficult to compare the overall 2008 lake water quality to that of 2007. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown in the figures on the following page. The average user perception rankings were 3.9 for physical condition (approximately 4- "high algal color"), and 4.0 for recreational suitability (4- "no swimming – boating ok").

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.