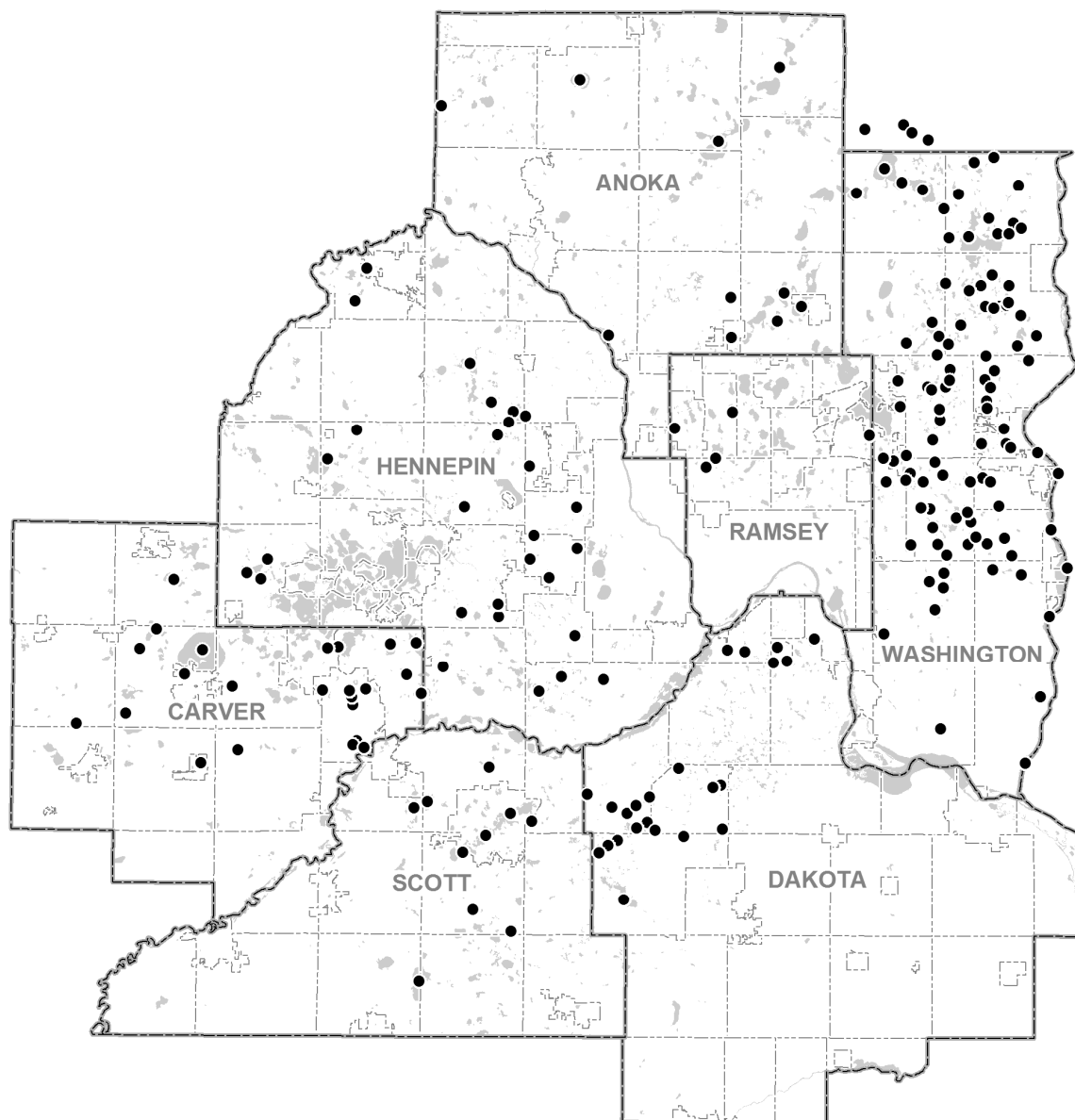


## 2009 Study of the Water Quality Of 194 Metropolitan Area Lakes



By  
**Brian Johnson**  
Senior Environmental Scientist  
Metropolitan Council Environmental Services  
December 2010



## EXECUTIVE SUMMARY

This 2009 report is the latest in a continuing series of reports summarizing results of the annual lake monitoring program of the Metropolitan Council (METC) in the Twin Cities seven-county metropolitan area (TCMA). The METC has collected water quality data on area lakes since 1980. This report contains data from a total of 210 lake sites on 194 lakes monitored in 2009. This year's monitoring program included 6 lakes never before monitored by the Council.

To date, the METC's lake monitoring program (including monitoring by METC staff and volunteers) has provided an important tool for making informed lake management decisions. Data from our regional lake monitoring program are frequently used to determine possible trends in lake water quality, estimate expected ranges in water quality of unmonitored lakes, examine intra-and inter-regional differences, determine potential water quality impairments, and investigate the relationships between land use and water quality.

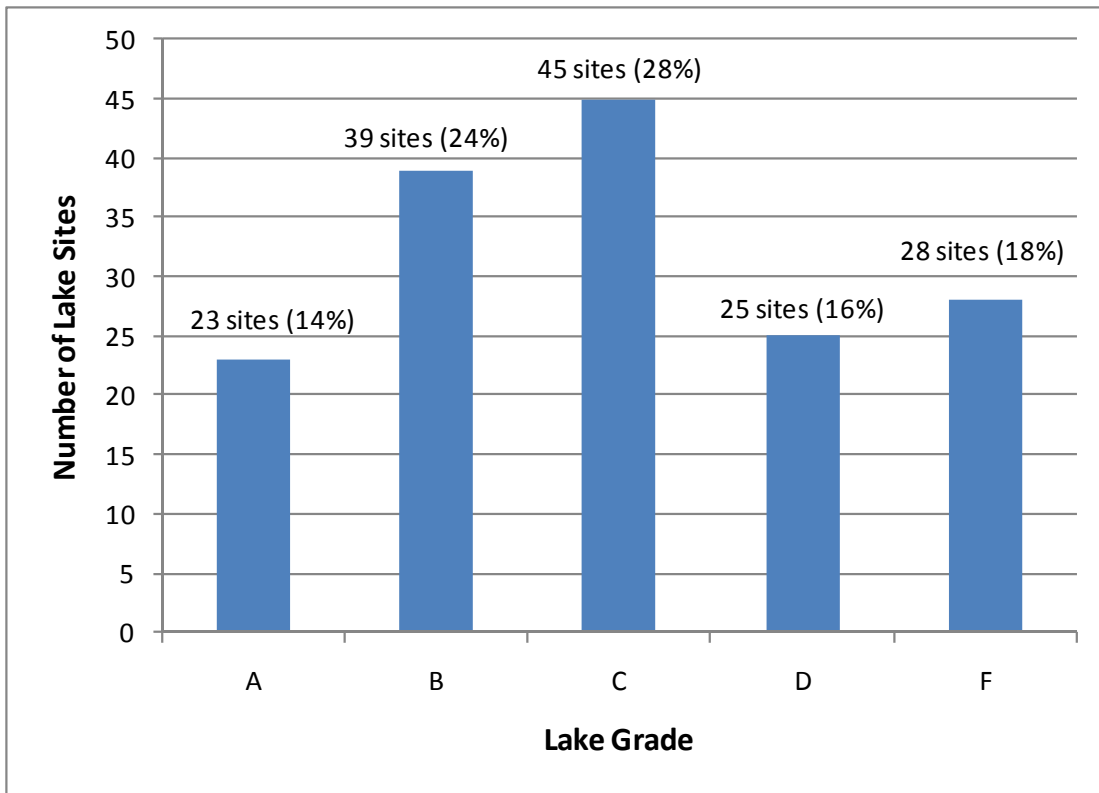
The objectives of this program are:

1. Provide lake water quality data to lake, watershed and water resource managers.
2. Advise managers of known or suspected threats to lake water quality.
3. Continue to compile a water quality database on the five area lakes that support a trout fishery.

The year 2009 marked the seventeenth year that the Citizen-Assisted Monitoring Program (CAMP) was used to increase our knowledge of the water quality of TCMA lakes. CAMP volunteers visited their assigned lake on a biweekly basis from mid April to mid October. The volunteers measured surface water temperature and water transparency, documented lake and weather conditions, and collected surface water samples. The samples were analyzed for total phosphorus, total Kjeldahl nitrogen, and chlorophyll-a by the METC's analytical laboratory located at the Metropolitan Wastewater Treatment Plant in St. Paul, MN. CAMP volunteers are sponsored by a local partner. In 2009, there were 29 sponsors who consisted of a mix of municipalities, watershed management organizations (WMOs), watershed districts (WDs), counties, and a basin water resources planning team.

Each lake was given a lake grade which was calculated on the basis of three parameters: total phosphorus, chlorophyll-a, and Secchi depth (water clarity). Not all lake sites received a lake grade because of an insufficient quantity of data during the summer-time period of May through September. The distribution of lake grades for all the lake sites monitored in 2009 is shown in the following figure.

The greatest percentage of the lake sites (28%) received a lake grade of C. The water quality of these lakes is considered average as compared to other lakes in the TCMA. There were more above-average lakes (38% A and B lake grades) compared to below average lakes (34% D and F lake grades).



### Lake Grades for the 2009 Monitoring Season

Since 1980, 355 TCMA lakes have been monitored through the METC’s lake monitoring program. Since some of these lakes have multiple monitoring sites, a total of 390 lake sites have been monitored. The data from the METC’s lake monitoring program are permanently stored in the U.S. EPA’s national water quality data repository, called STORET (STORage and RETrieval). Data for all METC lake monitoring sites can also be conveniently obtained via the METC’s web-based Environmental Information Management System (EIMS), at: <http://es.metc.state.mn.us/eims/>. While the METC has done its best to enhance and expand the region’s lake water quality database, it is apparent that one of the most economical and efficient methods to expand knowledge of our lakes has been with the assistance of volunteers and the cooperation and financial support of local partners via the CAMP.

The METC’s lake monitoring program, especially the use of volunteer monitors through CAMP, has played a key role in the METC’s recent efforts to use satellite imagery to assess annual lake water clarity for the entire region. The monitoring program provides direct field measurements that are used to calibrate mathematical models, which in turn are used to interpret the satellite images. The use of satellite technology provides a cost-effective way to extend the analysis of the region’s lake water quality beyond just the lakes involved in the METC monitoring program. The satellite-based information can be used to detect how lake water clarity conditions have changed over time and space in relation to changes in land-use and land-cover conditions.

If you have questions pertaining to the lake data or descriptions contained in this report, inquiries about CAMP, or suggestions of lakes the METC should consider monitoring in the future, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

## ACKNOWLEDGMENTS

This report represents the coordinated efforts of many individuals. The author would like to acknowledge the following people for their technical and supportive contributions to the preparation of this report:

### CAMP Volunteers and Local Partners

The enthusiastic participation of local sponsors and volunteers help make the CAMP successful. A list of sponsors and volunteers is shown in Appendix C. The following volunteers are given added appreciation for their multiple years of service:

#### 17 years of service

Diane and Bob Coderre – Sunset Lake

#### 16 years of service

Washington CD – multiple lakes

#### 15 years of service

Bill Aamodt – Wilmes Lake

Carver Co. Env. Services – multiple lakes

#### 14 years of service

City of Circle Pines – Golden Lake

John Ritter – Lake Alimagnet

Wargo Nature Center – George Watch

#### 13 years of service

Anoka Co. Parks – multiple lakes

#### 12 years of service

Glen Gramse – Keller Lake

Wally Shaver – Lac Lavon Lake

#### 11 years of service

Lakeville – Valley and Lee lakes

John Ryski – Bavaria Lake

Westwood Nature Center – Westwood Lake

#### 10 years of service

Dave Hanson – Sweeney Lake

#### 9 years of service

Arnett Family – Crystal Lake

Gene Berwald – Pine Tree Lake

Kevin Bjork – Cloverdale Lake

Tom/Dorothy Goodwin – Orchard Lake

Wally Potter – Marion Lake

Rice Creek WD – Multiple

Terry Riley – Markgrafs Lake

Mike Depth – Tamarack Lake

Sly Family – Downs Lake

Bob Videen – Parkers Lake

#### 8 years of service

Bonnie Juran – Klawitter Lake

Al Kettlekamp – Long Lake

Tom Sletta – Cates Lake

#### 7 years of service

Walt Burris – Lower Prior Lake

Conservation League of Edina – Cornelia Lake

Bill Feely – Long Lake

Kellogg Family – Cobblecrest Lake

Kitty Francy-Payton – Long Lake

#### 6 years service

David Bess – Wood Lake

Carolyn Dindorf – Magda Lake

David Florenzano – Riley Lake

Wayne Hubin – Swede Lake

Sue Morgan & Linda Scott – St. Joe Lake

Shelly Strohmaier – Lotus Lake

Chuck Taylor – Jane Lake

Gordan Warner – Mitchell Lake

#### 5 years service

Carpenter Nature Center – St. Croix Lake (site 7)

Marvin Groth – Bass Lake

Roberta & Jim Harper – St. Croix Lake (site 2)

Arnie Johnson – Sunnybrook Lake

Jeff Keene – O'Connor Lake

Steven Lane – Cedar Island Lake

Sheryl & Rich Lindholm – St. Croix Lake (site 5)

Cecilia & Harry Martin – St. Croix Lake (site 3)

Rick Meierotto – St. Croix Lake (site 6)

Steve Pierson – Fish Lake

#### 4 years service

Dick Bancroft – Sunfish Lake

David Bluhm – White Rock Lake

Terry Bouthilet – Lake Elmo

Bruce Cornwall – Twin Lake

Jerry Edberg – Cedar Lake

Marvin Groth – Bass Lake

Dave Johnson – Hornbean Lake

Scott Knudson – Lake Elmo

Minnesota DOT – Rest Area Pond

Dave Nimmer – Edith Lake

Martha Popp – Lost Lake

Bob Schumacher – Eagle Point Lake

Jim Serley – Echo Lake

Gregg Thompson – Bush Lake

Dan Wallace – Sunset Pond

Joe Williamson – McMahan Lake

**3 years service**

Dan Freeman – Twin Lake south  
Lynne McMullen – Reitz Lake  
Marty Ziermann – Rutz Lake  
Robert Armstrong – Susan Lake  
Jon Hafner & Don Jack – Bone Lake  
Curt Sparks – Sylvan Lake  
George & Pam Christ – Henry Lake  
George Schneider – Rice Lake  
Doug Hennes – Rogers Lake  
Jon Moon/Heidie Dorfmeister – Cornelia Lake

**3 years service (continued)**

John Burton – Wing Lake  
Gary Gerding – Karth Lake  
Tam & Dick McGehee – Langton Lake  
Jim & Tricia Hafner – Loch Ness  
Voit Family – Dean Lake  
Sandy & Mike Boyce – Lake O’Dowd  
Randy Bjorklund – Seidl Lake  
Jim Naves – Horseshoe Lake

**Metropolitan Council Staff**

- The MCES Laboratory Services Section, for laboratory analysis of the lake samples.
- Craig Skone for support with data presentation and for developing all the graphics for this report.
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## INTRODUCTION

This 2009 report continues a series of annual lake reports from 1980 to present. Since 1980, 355 Twin Cities Metropolitan Area (TCMA) lakes have been monitored through the Metropolitan Council's (METC) lake monitoring program. Since some of these lakes have multiple monitoring sites, a total of 390 lake sites have been monitored. This report contains data from 210 lake sites on 194 lakes that were monitored in 2009, including 6 lakes and 11 lake sites that have not been previously monitored by the METC lake monitoring program. The list of lakes in the METC's monitoring database is shown in Appendix A. Refer to Appendix B for morphometry and other lake characteristic data.

METC lake monitoring data are available via:

- the METC's Environmental Information Management System (EIMS), at <http://es.metc.state.mn.us/eims/>,
- the Minnesota Pollution Control Agency's (MPCA) Environmental Data Access (EDA) system, at <http://www.pca.state.mn.us/index.php/water/water-home.html>,
- the STORET Data Warehouse, which is the U.S. EPA's national water quality data repository, at <http://www.epa.gov/storet/dbtop.html>.

The objectives of the METC lake monitoring program are:

1. Provide lake water quality data to lake, watershed and water resource managers.
2. Advise managers of known or suspected threats to lake water quality.
3. Continue to compile a water quality database on the five area lakes that support a trout fishery.

The long-term goal of the METC lake monitoring program is to provide a comprehensive database to enable cities, counties, watershed management organizations (WMOs), and watershed districts (WDs) to better manage TCMA lakes. The Council believes that without such comprehensive lake data, the foundation of lake and watershed management plans is weakened. While the METC has provided a commendable lake monitoring program, monitoring by other organizations is also encouraged (Osgood 1989a).

To date, the METC lake monitoring program has been an important tool for making informed lake management decisions. The majority of the lakes have been visited on a rotating schedule over the past 30 years, so as to develop an historical database to help lake and watershed managers in decision making. Data from the METC lake monitoring program are frequently used to determine possible trends in lake water quality, estimate expected ranges in water quality of unmonitored lakes, examine intra-and inter-regional differences, and investigate the relationships between land use and water quality. A comprehensive regional lake monitoring program should ensure adequate spatial and temporal representation of water quality. However, due to cost and logistical problems, ground-based monitoring programs usually sacrifice spatial coverage (fewer lakes) in favor of more frequent sampling.

As is the case throughout the United States, the majority of lakes in the TCMA suffer from this lack of water quality data. Area lakes and watershed managers need a broad, comprehensive water quality database for regulatory and decision-making purposes. Because of the lack of public funding and the high ratio of area lakes to monitoring staff, very little data exist for the majority of TCMA lakes, and local decision-makers are forced to make management decisions lacking adequate information.

The METC addressed this lack of adequate lake water quality data by initiating a citizen-assisted monitoring program (CAMP) in 1993. The purpose of the CAMP is to provide a more complete and improved water quality database for TCMA lakes. This database gives local decision makers a better idea

of the water quality of their lakes, thereby assisting them in decision making on water quality issues. The METC's goal for the CAMP is to provide a means to gather as much information on TCMA lakes as is economically possible.

The METC lake monitoring program, especially the use of volunteer monitors through the CAMP, has played a key role in the METC's recent efforts to use satellite images to assess annual lake water clarity for the entire TCMA. The monitoring program provides the "ground-based" measurements used to calibrate mathematical models, which in turn are used to interpret the satellite images. The use of satellite technology provides a cost-effective way to extend the analysis of the TCMA's lake water quality from just the lakes involved in our ground-based programs to all the lakes in the region. Over time, the satellite-based information can be used to detect how lake trophic conditions (especially water clarity) have changed over time and space in relation to changes in land-use and land-cover conditions.

# METC STAFF MONITORING PROGRAM

## METHODS

Metropolitan Council staff monitored 11 lake sites on 10 TCMA lakes during 2009 (Figure 1). The lake sites generally were located over the deepest spot of the lake basin or sub-basin (Figures 2 and 3). A hand-held Global Positioning System (GPS) receiver was used to determine the coordinates of a lake site, and to aid in relocating lake sites during subsequent monitoring events. Time, water surface and weather conditions, water depth, and water transparency were recorded on a field data sheet. Water transparency was measured using a 20 cm black-and-white Secchi disk. Temperature, dissolved oxygen (DO), pH, specific conductivity, turbidity, and oxidation reduction potential (Redox) were measured at one-meter intervals throughout the water column. These parameters were measured using a YSI 6920 multi-parameter sonde that was connected to a YSI 650 data logger.

The sonde probes for DO and pH were calibrated before each field trip. These probes were also calibrated again the same day after returning from the field, to check for calibration drift. The conductivity probe was calibrated on a weekly schedule. The turbidity and Redox probes were calibrated on a monthly schedule.

Water was collected from the lake surface (0-2 m) using a two-meter PVC pipe with a two-liter capacity. Three such samples were mixed in an 8-liter plastic jug. Subsurface samples were collected using a 2-liter Van Dorn sampler. All water samples were transported on ice in a dark cooler and processed and preserved within 12 hours of collection.

The surface and subsurface samples were analyzed for the standard parameters as shown in Table 1. Chlorophyll was not analyzed in the subsurface samples. The analytical methods for each parameter also are shown in Table 1. Samples that were analyzed for total dissolved phosphorus (TDP) were filtered through a 0.45  $\mu\text{m}$  membrane filter and then analyzed for TP. All chemical analyses were performed at the Metropolitan Council Environmental Services - Environmental Quality Assurance Department (MCES-EQA) laboratory.

The chlorophyll analysis results are reported by the laboratory according to two different equations: the trichromatic equation and the monochromatic equation. The trichromatic equation gives the following chlorophyll parameters:

- chlorophyll-a (CLA),
- chlorophyll-b,
- chlorophyll-c.

The monochromatic equation gives the following parameters:

- chlorophyll-a corrected for pheophytin,
- pheophytin-a.

The chlorophyll data in this annual report are reported as trichromatic CLA. However all the analytical results from the trichromatic and monochromatic equations can be accessed via the monitoring data databases as provided in the Introduction section.

Figure 1.

# 2009 Monitored Lakes

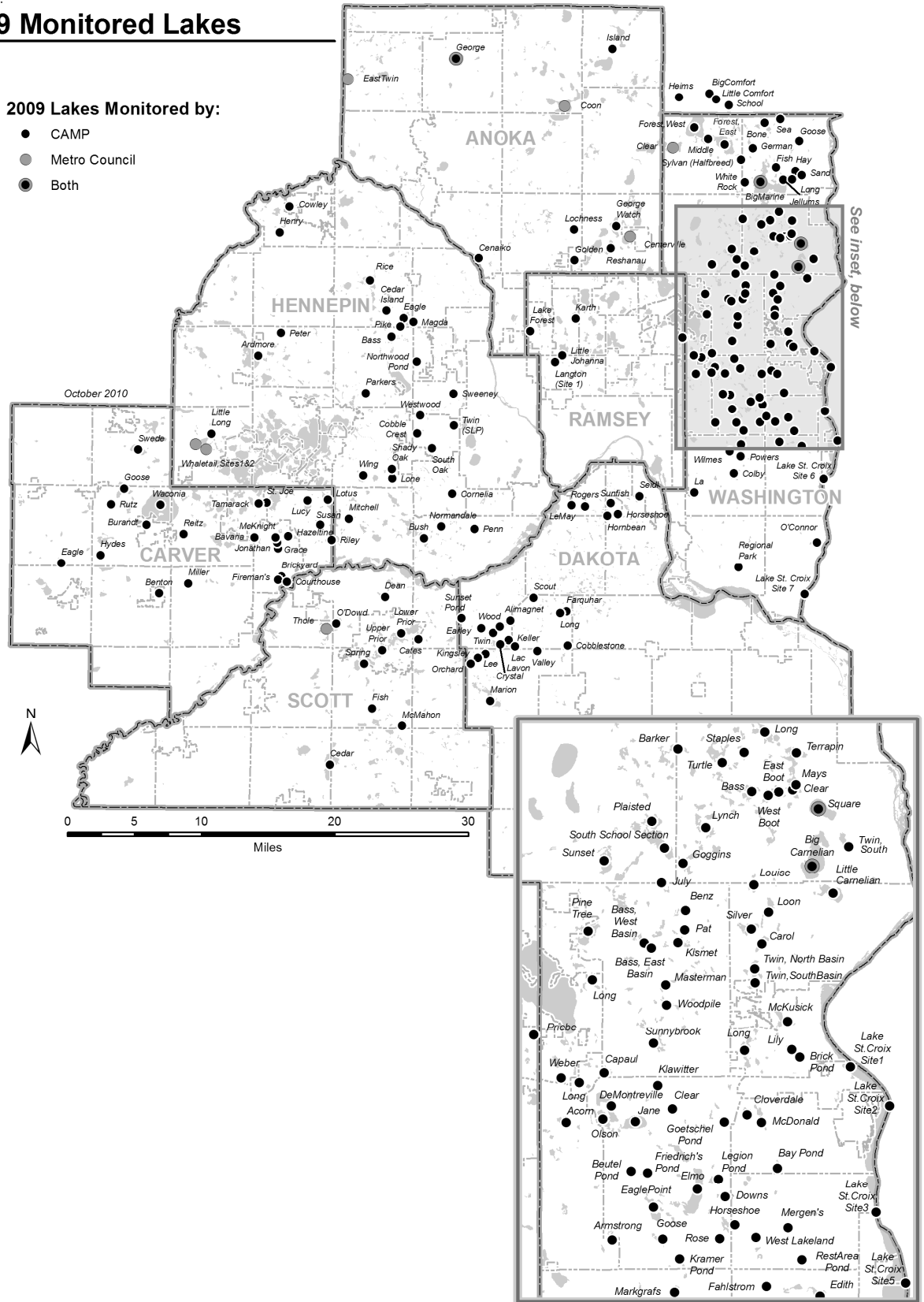
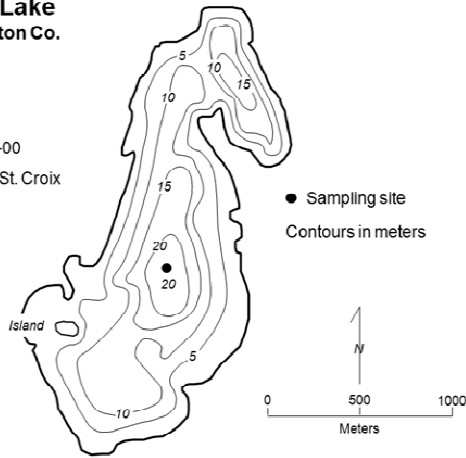


Figure 1. 2009 Monitored Lakes

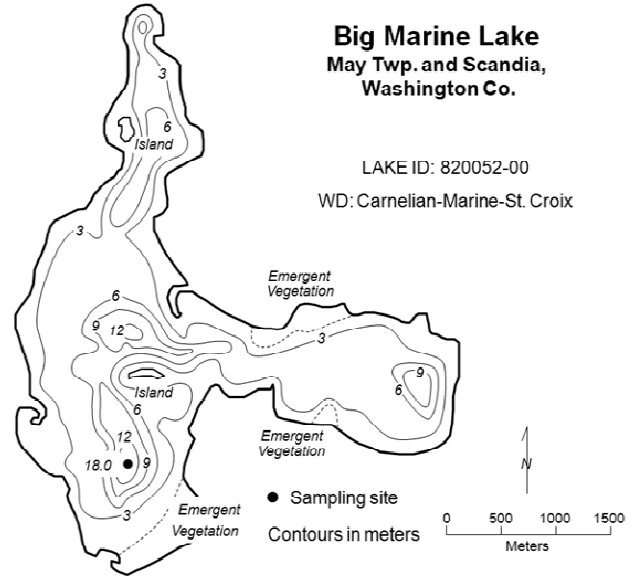
**Big Carnelian Lake**  
May Twp., Washington Co.

LAKE ID: 820049-00  
WD: Carnelian-Marine-St. Croix



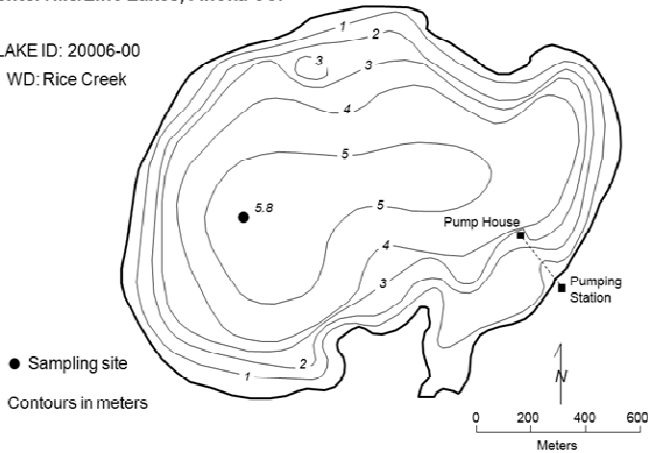
**Big Marine Lake**  
May Twp. and Scandia,  
Washington Co.

LAKE ID: 820052-00  
WD: Carnelian-Marine-St. Croix



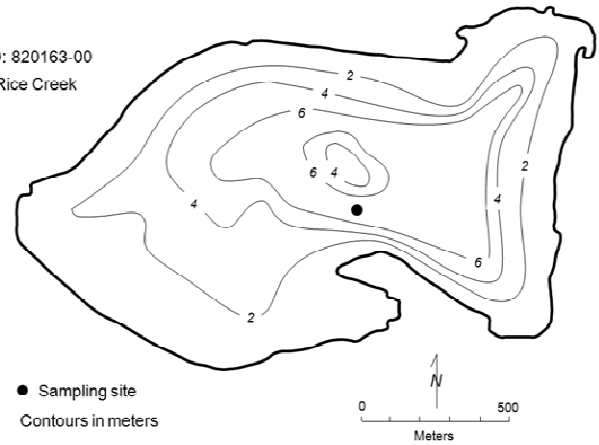
**Centerville Lake**  
Centerville/Lino Lakes, Anoka Co.

LAKE ID: 20006-00  
WD: Rice Creek



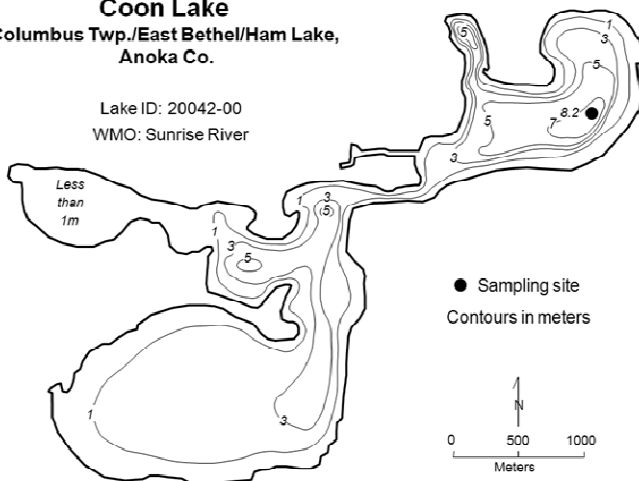
**Clear Lake**  
Forest Lake, Washington Co.

LAKE ID: 820163-00  
WD: Rice Creek



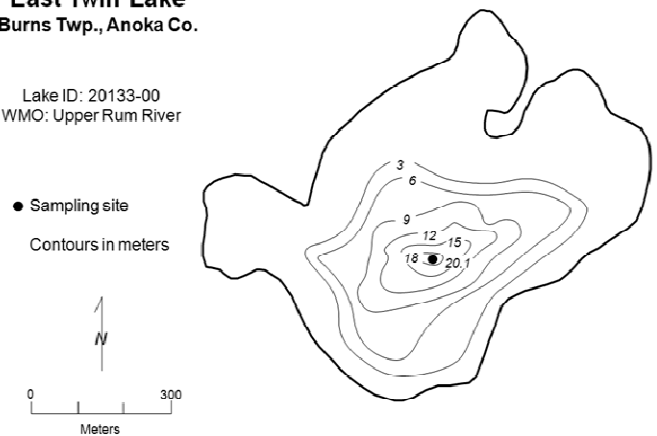
**Coon Lake**  
Columbus Twp./East Bethel/Ham Lake,  
Anoka Co.

Lake ID: 20042-00  
WMO: Sunrise River



**East Twin Lake**  
Burns Twp., Anoka Co.

Lake ID: 20133-00  
WMO: Upper Rum River

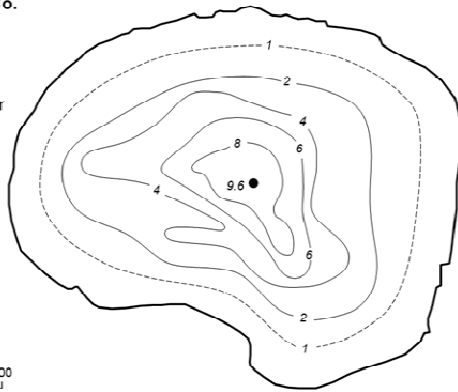
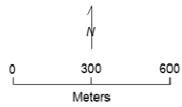


**Figure 2. METC Staff Monitored Lakes (Big Carnelian – East Twin)**

**Lake George**  
Oak Grove, Anoka Co.

LAKE ID: 20091-00  
WMO: Upper Rum River

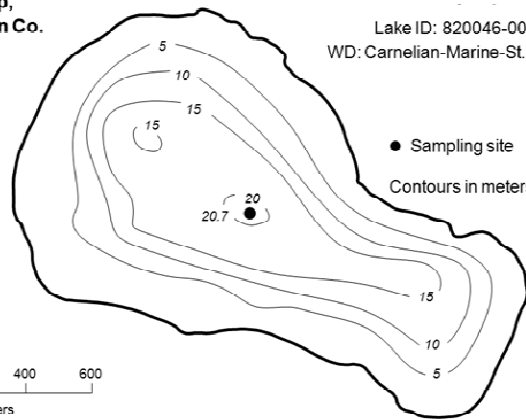
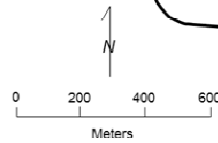
● Sampling site  
Contours in meters



**Square Lake**  
May Twp,  
Washington Co.

Lake ID: 820046-00  
WD: Carnelian-Marine-St. Croix

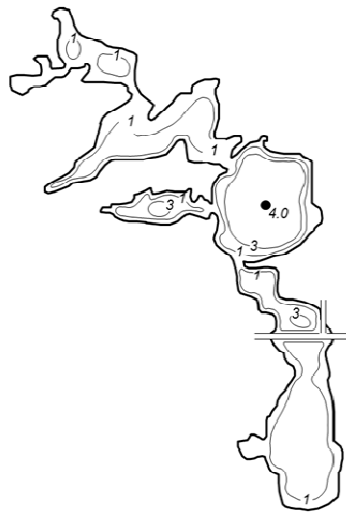
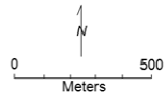
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Contours in meters



**Thole Lake**  
Louisville Twp., Scott Co.

LAKE ID: 700120-00  
WMO: Shakopee Basin

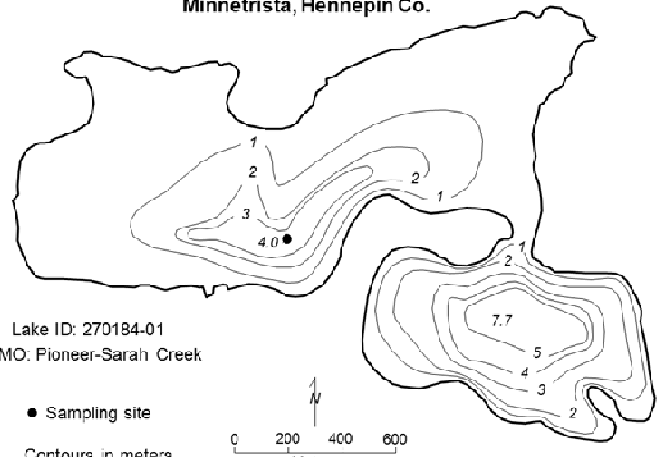
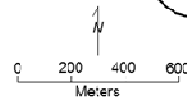
● Sampling site  
Contours in meters



**Whaletail Lake, Site 1**  
Minnetrista, Hennepin Co.

Lake ID: 270184-01  
WMO: Pioneer-Sarah Creek

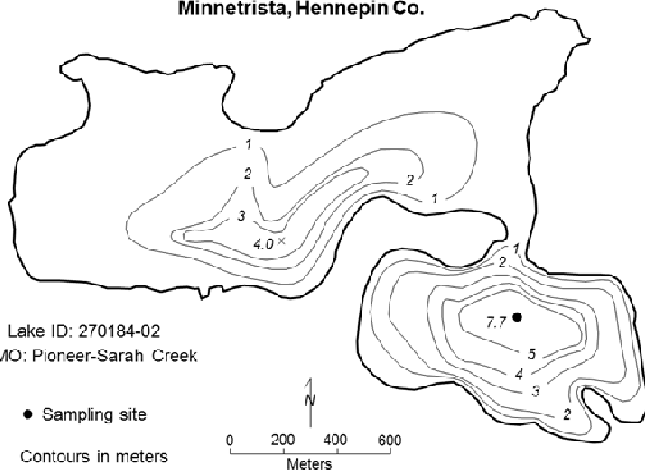
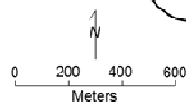
● Sampling site  
Contours in meters



**Whaletail Lake, Site 2**  
Minnetrista, Hennepin Co.

Lake ID: 270184-02  
WMO: Pioneer-Sarah Creek

● Sampling site  
Contours in meters



**Figure 3. METC Staff Monitored Lakes (George – Whaletail)**

**Table 1**  
**Summary of Analytical Methods**

<b>Standard Parameters</b>	<b>Analytical Method</b>
Total Phosphorus (TP)	U.S. EPA Method 365.4
Total Kjeldahl Nitrogen (TKN)	U.S. EPA Method 351.2, Rev. 2.0
Chlorophyll	ASTM Method D3731-87
Chloride	Method 4500-Cl- E , (APHA 1998)
Hardness	Standard Methods for the Examination of Water and Wastewater, Method 2340 C, Online Edition
Sulfate	U.S. EPA Method 300.0
<b>Optional Parameters</b>	
Ortho-phosphate	4500-P E Ascorbic Acid Method, (APHA 1998)
Iron, total	U.S. EPA, Method 200.8, Revision 5.4, 1994 as modified

## RESULTS

Table 2 shows select monitoring data for the METC staff monitored lakes. All of the monitoring data are available via the METC's Environmental Information Management System (EIMS) at <http://es.metc.state.mn.us/eims/>. The monitoring data was also sent to the MPCA for inclusion in their Environmental Data Access system.

Any questions about the 2009 METC lake monitoring data should be directed to Brian Johnson at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

**TABLE 2**  
Select Field and Analytical Data for METC Staff Monitored Lakes 2009

LAKE NAME	DATE	Secchi	CLA	TEMP		DO		TKN		TP		TDP		Chloride	
		Depth	(ug/L)	(deg C)		(mg/L)		(mg/L)		(ug/L)		(ug/L)		(mg/L)	
		(m)		surface	bottom	surface	bottom	surface	bottom	surface	bottom	surface	bottom	surface	bottom
Big Carnelian Lake	5/22/2009	4.7		17.2	6.8	9.92	0.18								
	5/28/2009	5.7	2.5	17.1	6.8	10.19	0.20	0.43	1.10	15	158	< 10	20	12	13
	7/23/2009	6.3	1.6	23.4	7.5	9.71	0.06	0.41	2.00	7	657	3	453	13	13
	8/5/2009	6.5	3.3	22.6	7.7	10.12	0.09	0.42	2.20	8	588	< 3	400	12	13
Big Marine Lake	5/28/2009	4.1	3.1	17.8	15.9	9.64	9.13	0.43	0.51	13	22	< 10	< 10	13	13
	7/17/2009	3.0	5.2	20.6	15.7	8.95	0.12	0.49	0.61	12	35	6	20	13	13
Clear Lake	6/22/2009	1.2		25.3	15.9	8.68	0.48	1.20	1.40	42	36	6	6	86	85
	7/17/2009	1.0	17	20.3	19.5	7.69	7.98	1.60	1.50	37	41	22	18	92	92
Centerville Lake	6/22/2009	2.4		23.9	17.4	8.97	0.91	1.10	0.87	39	40	33	25	37	37
	7/17/2009	1.4	22	20.9	20.9	8.04	7.97	1.20	1.20	52	47	11	12	40	
Coon Lake	6/25/2009	1.2	16	26.0	15.6	8.10	0.47	1.10	1.10	40	37	< 10	< 10	14	14
	7/28/2009	0.8	40	22.8	18.7	11.67	0.11	1.60	1.70	47	44	8	9	14	14
East Twin Lake	6/11/2009	5.2		18.1	4.1	11.43	0.16	0.88	1.80	21	275		71	11	13
	6/25/2009	3.3	5.5	26.9	4.3	8.53	0.28	0.93	2.10	30	314	15	133	11	13
	7/20/2009	3.7	4.4	21.0	4.4	9.45	0.07	0.93	2.10	22	305	10	176	12	13
George Lake	6/25/2009	3.6	4.4	26.3	16.0	8.38	1.29	0.70	0.62	20	28			15	15
	7/20/2009	2.4	8.3	20.5	17.9	9.44	2.40	0.83	0.87	25	33	< 10	< 10	16	15
Square Lake	7/23/2009	5.9	2.3	22.3	6.1	10.59	0.08	0.37	1.20	7	69	3	6	8	9
	8/27/2009	6.7	3.0	23.2	6.4	10.36	0.11	0.38	1.00	10	88	5	10	8	8
Thole Lake	7/24/2009	0.4	180	22.9	20.2	14.46	0.16	2.50	1.90	91	97	20	26	48	47
	8/6/2009	0.5	110	25.3	21.7	11.92	0.32	3.00	2.00	166	106	22	28	51	49
Whaletail Lake (site 1)	6/30/2009	0.4	78	20.8	20.7	8.67	8.75	3.20	3.10	194	198	8	9	18	18
	7/22/2009	0.3	70	22.3	20.0	12.24	8.60	3.20	3.60	119	150	13	9	19	18
	8/6/2009	0.4	60	24.2	22.0	13.10	5.90	2.60	2.90	87	105	6	10	19	19
Whaletail Lake (site 2)	6/30/2009	0.7	31	21.4	15.1	6.89	0.26	3.70	2.50	122	106	12	25	17	17
	7/22/2009	0.9	54	22.3	14.7	11.79	0.09	1.80	5.30	72	397	< 10	44	17	17
	8/6/2009	1.0	28	23.4	16.4	10.37	0.26	1.70	4.40	44	160	8	60	17	17



# **CITIZEN-ASSISTED MONITORING PROGRAM (CAMP)**

## **CAMP OVERVIEW**

The year 2009 marked the seventeenth year of the CAMP since the program began in 1993. The CAMP monitored 203 lake-sites on 189 lakes in 2009, including 5 lakes and 11 lake-sites that have not been previously monitored by the METC (Figure 1). The CAMP is jointly funded by the METC and local sponsors such as WDs, WMOs, counties, and cities.

The main purpose of the CAMP is to provide lake and watershed managers with water quality data that will not only support them in properly managing water resources, but also provide much needed historical data to help document water quality changes and trends. Previous volunteer monitoring programs conducted throughout the United States have shown that, with proper equipment and instructions, volunteers can be trained to produce credible water quality data. Because most of the volunteers live near the lakes they are monitoring, they are very interested in determining any trends and/or changes in local water quality (Nichols 1992). An additional benefit of the monitoring program is the volunteer's increased awareness of the lake's condition and workings throughout the summer, which may foster grass-roots initiatives to protect lakes and promote support for lake management.

Prior to the inception of the CAMP in 1993, The METC conducted a pilot study in 1991 to assure that the data collection methods used by citizen volunteers would be credible. Results of the pilot study showed that the volunteer monitoring methods, as used in the CAMP, yielded results comparable to monitoring methods used by METC staff (Hartsoe and Osgood 1991).

CAMP volunteers collect surface water samples that are analyzed for total phosphorus (TP), total Kjeldahl nitrogen (TKN), and chlorophyll-a (CLA). In addition, they measure surface water temperature and water transparency, and record user perceptions. Some lakes are monitored for dissolved oxygen. Most lakes are visited biweekly from April through October (fourteen sampling dates) and are sampled at the lake's deepest open-water location. In 2009, quite a few of the lakes were not monitored on each of the desired 14 sampling weeks. The reasons for the missed sampling dates varied. However, the majority of the lakes, even with the missed sampling dates, were sampled adequately and often enough to provide an annual overview of the water quality of each lake. Water samples were submitted to METC staff and then analyzed at the MCES-EQA laboratory in St. Paul, MN.

## **ACKNOWLEDGMENTS**

The successful performance of the 2009 CAMP would not have been possible without the greatly appreciated work performed by volunteer monitors, and the support of the organizations that enrolled lakes in the program. The enrolling organizations, which included 13 cities, 11 watershed management organizations and watershed districts, 3 counties, 1 conservation district, and 1 basin planning team, were involved in volunteer recruitment, training, and occasional follow up on the progress of their volunteer lake monitors. Without this help, the program would not have been as successful.

Those deserving the greatest appreciation are the volunteers themselves. Their efforts have made this program successful. A list of the 2009 CAMP volunteers is shown in Appendix C. The METC and the local sponsors thank them for their sustained efforts, including their quality work.

## **CAMP METHODS**

### **Recruiting Volunteers**

Active recruitment of lakes and interested volunteers for the CAMP began in the winter months prior to the monitoring season. Potential sponsors were solicited for their list of lakes that they wished to enroll in the CAMP. The sponsors were encouraged to recruit volunteers for each lake they enrolled in the program. If there were problems finding willing volunteers, the METC assisted with the search; however, the belief was that the supervising organization would benefit in the long run by having direct contact with the volunteers it recruited. This contact would hopefully open a two-way communication line between concerned citizens and the local partners.

### **Training Volunteers**

Volunteer training was conducted by METC staff at various locations throughout the TCMA. Volunteer training was scheduled between early March and early April. At each training session, volunteers were given a handbook describing the program, outlining basics in the biology and ecology of lake systems, and containing detailed written instructions for the lake monitoring and data form completion procedures (Anhorn 2003a).

At each training session, volunteers received the necessary equipment for lake monitoring. This equipment was purchased by the sponsor through the METC, and then loaned to the volunteers. At the end of the monitoring season, equipment was returned to the sponsor for use in future years. Each lake's volunteer received:

- Chlorophyll hand pump, flask, and filters
- Digital thermometer
- Map of lake with sampling site(s)
- Field data sheets
- Sample jug
- Sample vials, Petri dishes, and labels
- Secchi disk
- Aluminum foil
- Tweezers (forceps)

During the training session, volunteers were given a brief description of limnology and lake ecology as described in their handbook, instructed on proper lake monitoring procedures, and shown how each piece of sampling equipment works. After this discussion, the volunteers received a package containing the equipment, and the proper use of each piece of equipment was again described and practiced. Finally, the volunteers were asked to sign a waiver of liability stating that they were not an employee of either the METC or the local partner enrolling the lake in the program.

### **Monitoring Methods**

Volunteers were instructed to monitor their designated lake site(s) on a biweekly basis from mid-April to mid-October, including 14 possible sampling periods. The monitoring methods are detailed in the following paragraphs.

First, during pre-arranged sampling weeks, volunteers located and anchored their boat at pre-determined monitoring locations (typically the deep open-water area of the lake). Once at the monitoring location,

lake and meteorological conditions were recorded on a field data sheet (Figure 4). The form also provides space to record natural and cultural observations which may have influenced what was happening in the lake (e.g. heavy rains prior to monitoring, application of herbicide), and includes an area to document general perceptions of the lake's physical condition and suitability for recreation.

Next, the volunteers took a water transparency reading by lowering a Secchi disk on the shaded side of the boat to the point at which it disappeared. The point where the disk reappears is the Secchi transparency depth that was recorded on the observation form.

The next lake monitoring step involved the collection of the surface water sample. A surface water sample was collected in a clean one-gallon plastic jug. To begin, the volunteer pre-rinsed the jug three times with lake water. After rinsing, the jug was filled by submerging it upside down to forearm depth and turning it upright while still submerged. Immediately after filling the sample jug, the volunteer obtained the water temperature and poured-off aliquots for analytical analysis. The collection methods for each parameter are given as follows:

- **Temperature.** Surface water temperature was measured in the volunteer's sampling jug using a digital thermometer that is readable to 0.1°C. The temperature was measured immediately following sample collection. Special care was taken to keep the sample out of direct sunlight in order to minimize temperature change.
- **Total Phosphorus (TP) and Total Kjeldahl Nitrogen (TKN).** Duplicate samples were decanted from the volunteer's jug in the field into their respective triple pre-rinsed, pre-labeled 50 milliliter (ml) vials. These samples were then placed in the cooler, taken home, and stored in the freezer until they were picked up and delivered to the laboratory for analysis.
- **Chlorophyll.** Chlorophyll samples from the volunteer's jug were filtered in the field (*out of direct sunlight*) using a field filtration apparatus (called a filter holder) and a hand pump. Water from the sampling jug was measured using a graduated cylinder, and then poured into the reservoir of the filter holder. The reservoir holds approximately 250 ml. By squeezing the handle of the pump, the sample water was forced through a 1 micrometer ( $\mu\text{m}$ ) glass-fiber filter, and the suspended planktonic algae were trapped on the filter. The filtered water was then returned to the lake. If possible, this process was repeated until a total of 1,000 ml of sample water was allowed to pass through the filter. However, if the water sample contained much suspended material, and the filter became clogged without allowing more water to pass through, the amount of water that did pass through the filter was recorded on the field data sheet and sample label. The filter was then removed from the filter holder with a tweezers, and placed in a Petri dish. The Petri dish was then labeled, wrapped in aluminum foil to keep the sample in the dark, and frozen until pick-up and delivery to the laboratory for analysis.

The frozen samples were picked up within approximately 30-90 days by METC staff and delivered to the MCES laboratory for analysis. For some CAMP lakes, sub-surface samples were also collected for analysis of TP, TKN, chloride, orthophosphate, and/or total iron. These sub-surface samples were usually collected near the bottom of the lake using a Van Dorn sampler. Vertical profiles of dissolved oxygen and temperature measurements were also obtained on some lakes.

**CITIZEN-ASSISTED MONITORING PROGRAM**

Lake Name: \_\_\_\_\_ Site #: \_\_\_\_\_  
 DNR ID#: \_\_\_\_\_  
 Sampling Date: \_\_\_\_\_ Time: \_\_\_\_\_ (military time)  
 (Use this same time on the sample labels.)  
 Name(s) of Volunteer(s): \_\_\_\_\_  
 \_\_\_\_\_ Quantity of Nutrient: \_\_\_\_\_  
 \_\_\_\_\_ samples collected: CLA: \_\_\_\_\_  
 \_\_\_\_\_

SECCHI DISK DEPTH: \_\_\_\_\_ meters

SURFACE TEMPERATURE: \_\_\_\_\_ °C

VOLUME OF FILTERED LAKE WATER (CLA): \_\_\_\_\_ ml

**GENERAL OBSERVATIONS**

(Circle the one best choice)

<p><b>* Water Color</b></p> <p>Clear    Yellow                  Green    Gray                  Brown    Blue-Green                  Comment:</p>	<p><b>* Odor of Water</b></p> <p>None    Rotten Egg-like                  Fishy    Septic-like                  Musty    Other: _____                  Comment:</p>	<p><b>* Wind Conditions</b></p> <p>Calm    Breezy    Strong                  Wind is coming from the:                  North    South    East    West</p>
<p><b>* Water Surface</b></p> <p>Calm    Moderate Waves                  Ripple    Whitecaps                  Small Waves                  Comment:</p>	<p><b>* Cloud Cover</b></p> <p>0%    75%                  25%    100%                  50%</p>	<p><b>* Lake Level</b></p> <p>Above Normal                  Normal                  Below Normal                  Staff Gage Reading _____</p>
<p><b>* Amount of Aquatic Plants</b></p> <p>None    Moderate                  Minimal    Substantial                  Slight</p>	<p><b>* Air Temperature (°F)</b></p> <p>&lt; 40    81-90                  41-60    &gt; 90                  61-80</p>	<p><b>*Unusual Conditions                  in the past week:                  (storms, high winds,                  temp. extremes):</b></p>
<p><b>* Physical Condition</b></p> <p>Crystal Clear (1)                  Some Algae Present (2)                  Definite Algae Present (3)                  High Algal Color (4)                  Severe Bloom (Odor, Scum) (5)</p>	<p><b>* Suitability for Recreation</b></p> <p>Beautiful (1)                  Minor Aesthetic Problem (2)                  Swimming Slightly Impaired (3)                  No Swimming / Boating OK (4)                  No Aesthetics Possible (5)</p>	

**Figure 4. CAMP Field Data Sheet**

## Laboratory Analytical Methods

The chemical analyses of CAMP water samples were performed at the MCES-EQA laboratory, according to the methods shown in Table 1. Chlorophyll samples collected by the CAMP volunteers were not preserved with magnesium carbonate ( $MgCO_3$ ), which is a change in the method provided in Table 1. Samples that were analyzed for TDP were filtered through a 0.45  $\mu m$  membrane filter and then analyzed for TP.

## Data Management

The field data from the volunteers' sampling forms and the analytical results from the MCES laboratory were entered into the Council's Environmental Information Management System (EIMS). EIMS is a system for providing timely and reliable information for environmental planning and decision-making. The Council's EIMS can be accessed via the internet at <http://es.metc.state.mn.us/eims/>. This data handling system served three purposes:

1. Check-in of forms and tracking of volunteer participation.
2. Entry of nutrient, Secchi, and user perception data into a database for statistical, graphical, and tabular outputs.
3. Storage of the CAMP data in the Metropolitan Council's EIMS, as well as in the U.S. Environmental Protection Agency's (U.S. EPA) national water quality data bank, STORET.

If there were questions concerning the data and lake observations, METC staff contacted the volunteer. The METC maintained contact with most volunteers throughout the season by telephone, in person during sample pick-up, or through their sponsor's CAMP coordinator.

## Quality Assurance

CAMP employs a quality assurance (QA) program which includes quality control (QC) activities. The purpose of the QA program is to assure that CAMP produces and reports scientifically credible water quality data. The MCES laboratory follows its own internal QA program, which employs an extensive internal and external check and balance system to ensure credible data. Documentation of their QA program and QC procedures can be obtained from the laboratory.

The CAMP QA program has several components. One important component is training, which ensures that the volunteers are familiar with the CAMP monitoring methods prior to their first monitoring season. The training also ensures that the same monitoring methods are used by all the volunteers. Another component is that the volunteers' samples are checked by METC staff prior to submitting the samples to the MCES laboratory. The samples are checked for legible and correct labeling and sample integrity (e.g. cracked vials, missing caps, torn filters, etc.). Samples with poor integrity are discarded to avoid producing potentially erroneous data.

QC monitoring is another important component of the CAMP QA program. The purposes of QC monitoring are:

- To verify that the monitoring methods are producing reproducible data.
- To verify the monitoring performance of the volunteers with respect to professional staff.

A METC staff member performs QC monitoring throughout the monitoring season by visiting a volunteer's lake site during a scheduled monitoring week, but not necessarily on the same day as the volunteer's visit. The METC staff member monitors the lake site using the same methods and identical

type of equipment as the volunteer. After the QC samples are collected, they are handled, stored, and submitted to the laboratory in the same manner as the volunteers' samples. Occasionally, an METC staff member accompanies a volunteer in the field during the monitoring season as a check on their monitoring methods. This latter method is used less commonly than the former method. Accompanying a volunteer in the field is usually prompted by noting potential problems during the sample checking process, or if the volunteer expresses that they need further assistance or explanation.

If a problem is discovered during the course of the sample checking or QC monitoring processes, the volunteer is contacted to discuss the cause of the problem. If needed, a METC staff member visits with the volunteer to observe his/her monitoring activities, in an effort to help identify the cause of the problem. Once the cause is identified, the volunteer is given instructions on how to correct the situation. If the problem resulted in erroneous data, then the data are censored and excluded from the database.

The CAMP sample data are reviewed after receipt from the MCES laboratory. The data are reviewed for outliers and other inconsistencies. Data that are determined to be suspect are flagged as such in the database. Data determined to be erroneous are censored and excluded from the database.

The 2009 CAMP QC data are provided in Appendix D. The results of the 2009 QC monitoring indicate good agreement between data from samples and measurements collected by METC staff versus those collected by the volunteer. Figures 5, 6, and 7 show the QC data for TP, CLA, and Secchi depth, respectively. The linear regression for each parameter shows close agreement to a 1:1 relationship between data collected by METC staff versus data collected by the volunteers. The  $R^2$  values for TP and CLA were  $>0.90$ , which indicates that most of the variability between the volunteer- and METC staff-collected data can be explained by a linear relationship. The  $0.85 R^2$  value for the Secchi depth QC data indicates that the linear relationship is not as strong as those for the other two parameters, but is still robust, nonetheless. Considering that METC staff typically collect QC samples on a different day and time than the volunteer (although during the same week), it should be expected that there will be variation between the METC staff- and volunteer-collected data.

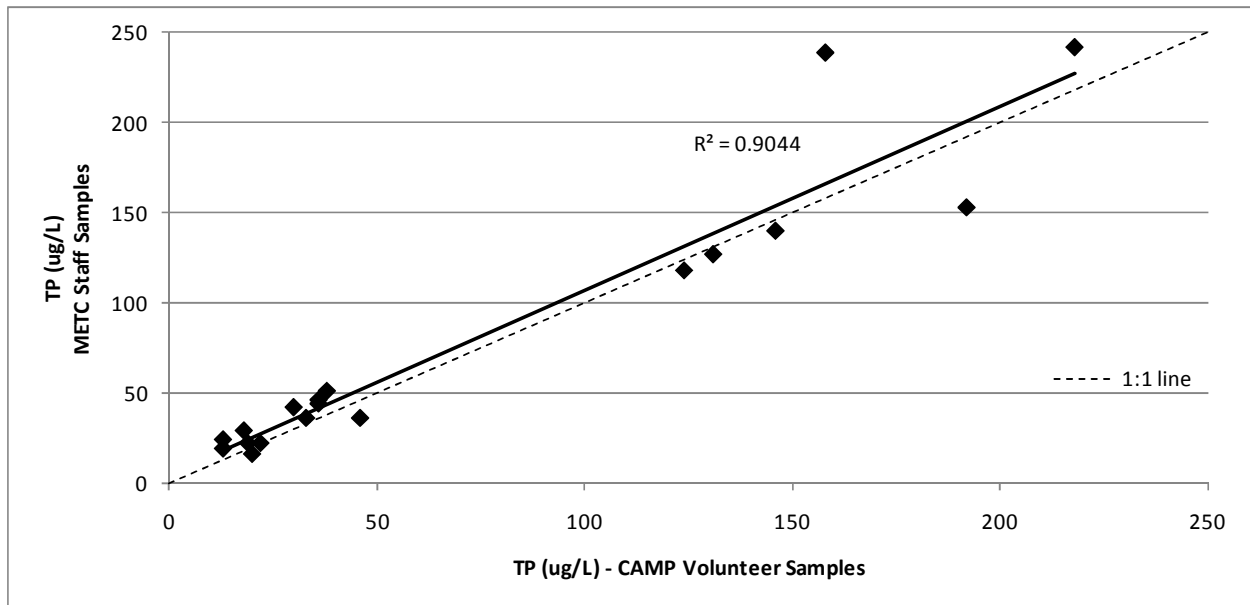
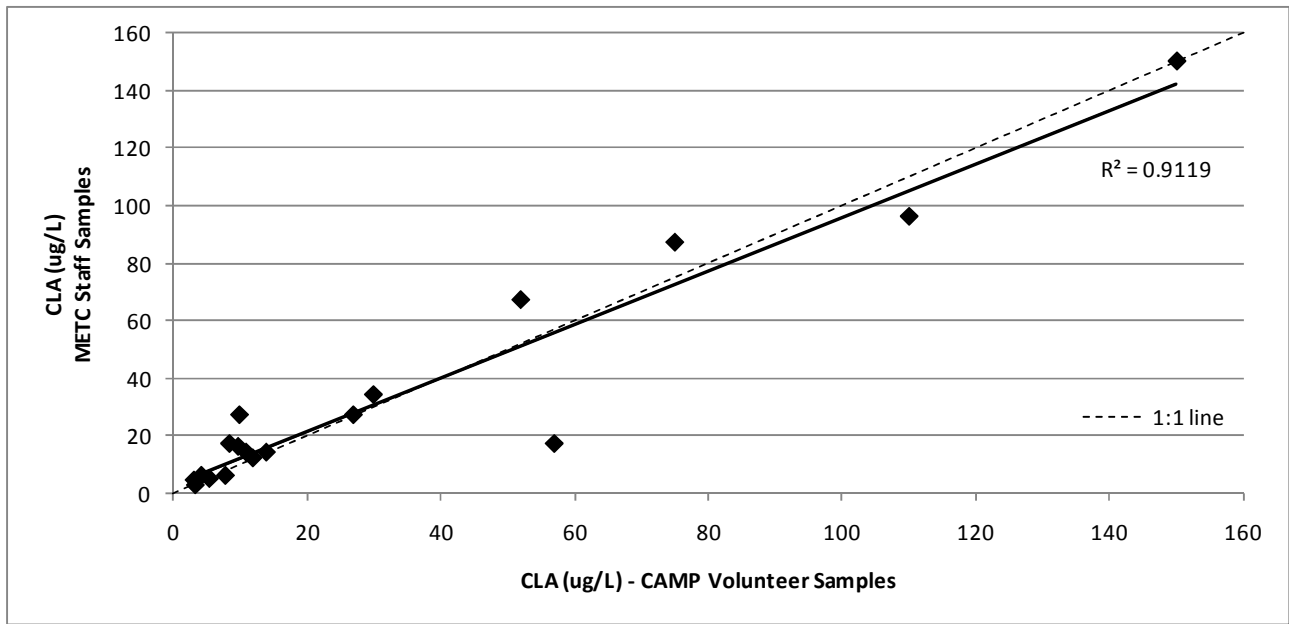
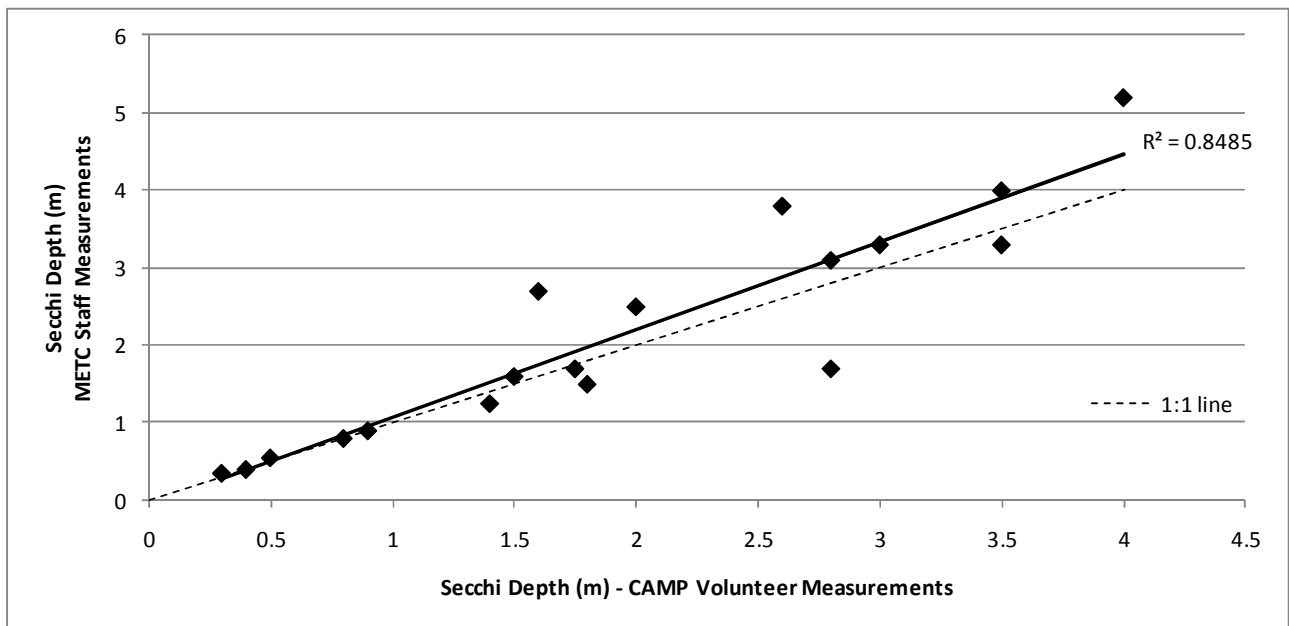


Figure 5. Total Phosphorus Quality Control Data 2009



**Figure 6. Chlorophyll-a Quality Control Data 2009**



**Figure 7. Secchi Depth Quality Control Data 2009**

## LAKE QUALITY REPORT CARD

The Metropolitan Council, following its 1989 lake survey (Osgood 1989b), developed the lake quality report card. The idea is simply that lake water quality characteristics can be ranked by comparing measured values to those of other Metro Area lakes. In this way, technical information, which in the past had required professional analysis, can more easily be used by a less technical audience to visualize the water quality of their lake relative to other TCMA lakes. The lake grading curve (Table 3) represents percentile ranges for three water quality indicators: the summertime (May - September) average values for total phosphorus, chlorophyll-a, and Secchi depth. These percentiles use ranked data from 120 lakes that were monitored from 1980 – 1988:

**Table 3. Lake Grading Curve**

<u>GRADE</u>	<u>PERCENTILE</u>	<u>TP (µg/l)</u>	<u>CLA (µg/l)</u>	<u>Secchi (m)</u>
A	< 10	< 23	< 10	> 3.0
B	10-30	23-32	10-20	2.2-3.0
C	30-70	32-68	20-48	1.2-2.2
D	70-90	68-152	48-77	0.7-1.2
F	> 90	> 152	> 77	< 0.7

The three variables used in the grading system (TP, CLA, Secchi depth) give an indication of the trophic status of the lake (Carlson 1977, Osgood 1982). The trophic status is the condition of the biological productivity of the lake ecosystem. The trophic status is strongly related to open-water nuisance-aspects of a lake (e.g. algal blooms, excess vegetation growth, poor water clarity), which can indicate accelerated aging (cultural eutrophication). For example, lake phosphorus concentration has been related to increased algal abundance, increased frequency of algal blooms, and to the increased abundance of blue-green algae (Osgood 1988). Chlorophyll-a, which is a pigment in plants (including algae) essential in the photosynthesis process, is used to estimate the algal abundance of a lake. Secchi depth relates to the appearance of a lake (generally the fewer algae, the better the transparency of a lake). TKN concentration was not included in the grading process because most lake nuisances in the area are related to the phosphorus concentration of the lake (Osgood 1988).

These water quality grades, however, only characterize the open-water quality of lakes. Other nuisances, such as the abundance of aquatic macrophytes, are not indicated in these grades.

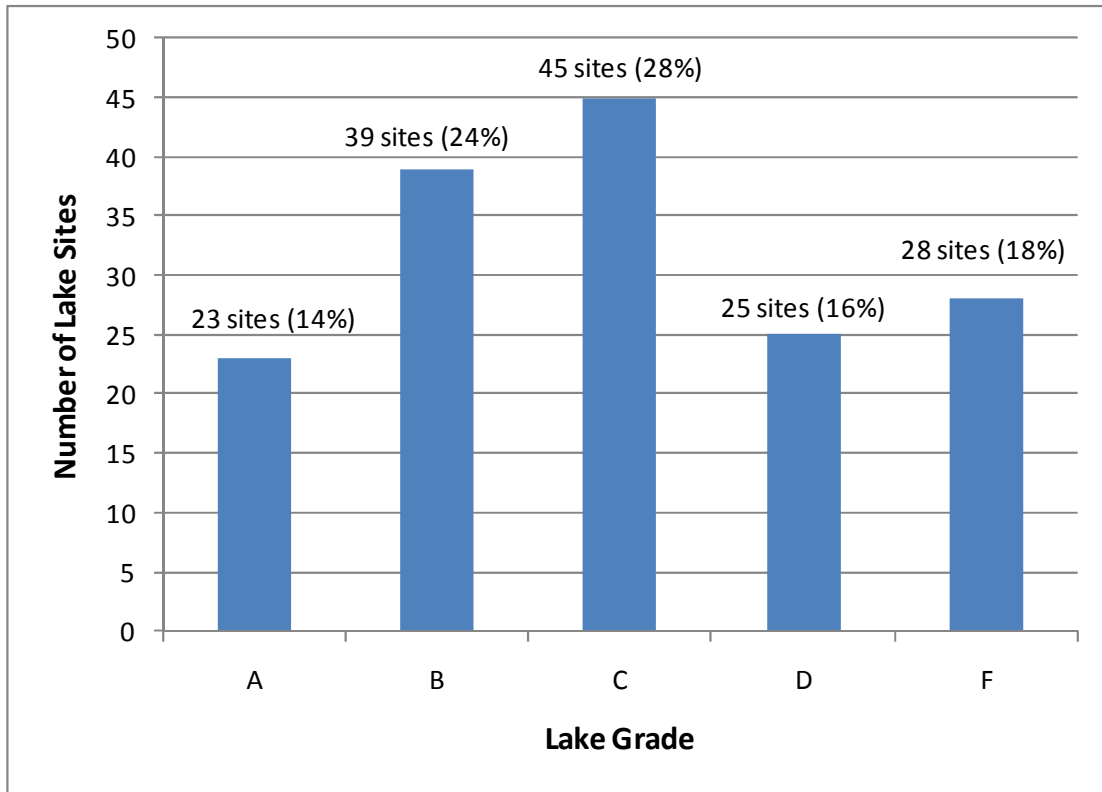
The percentile curve can be used to assign individual grades for TP, CLA and Secchi depth to the monitored lakes. For example, a lake having a mean summertime Secchi depth of 1.7 m would receive a “C” grade for Secchi depth. A grade of C is considered average for TCMA lakes. Lakes were also assigned a single, overall grade, called a lake grade. Lake grades were determined by averaging the individual parameter grades. A lake grade generally corresponds to descriptive rankings and recreational-use conditions of the lake. Lakes receiving an “A” grade (upper 10 percentile) can be deemed as having full recreational use capability. A lake receiving a B lake grade is considered to have very good water quality and some recreational use impairment. Lakes receiving a “C” lake grade are considered to have average water quality but are recreationally impaired. A “D” grade lake translates to a very poor ranking with severely impaired recreational use. Lakes receiving an F lake grade have extremely poor water quality with little to no possible recreational use.



In 2000, the percentiles determined from the 1980-1988 water quality database of 120 lakes were compared to calculated percentiles from a more current and expanded 1980-1999 water quality database of 230 lakes. It was found that the percentiles from the expanded database were very similar to those determined from the 1980-1988 database. For this reason, and in an attempt to maintain consistency, the original 1980-1988 percentiles continued to be used for lake quality grading purposes (Anhorn 2003b).

## 2009 LAKE GRADES

Each lake monitoring site was given a lake grade if there were sufficient data to calculate the grade. At least 5 monitoring events are required to calculate a lake grade, and these 5 events must occur during the May-September (summer) period. Some lakes were not monitored sufficiently, so they did not receive a lake grade. The distribution of lake grades for lake sites monitored in 2009 is shown in Figure 8.



**Figure 8. Distribution of 2009 Lake Grades**

The greatest percentage of the lake sites (28%) received a lake grade of C. The water quality of these lakes is considered average as compared to other lakes in the TCMA. More lakes were above average (38% A and B lakes) than below average (34% D and F lakes).

A summary of the best ten and worst ten lakes with respect to the three water quality indicators is shown in Table 4. All of the best ten and worst ten lakes received A and F grades, respectively. The best ten and worst ten lakes include only those lakes that are equal to or greater than 35 acres in surface area.

**Table 4. Summary of the Best Ten and Worst Ten Lakes  
METC Lake Monitoring Program 2009**  
(for lakes greater than or equal to 35 acres)

	Lake Name	DNR ID #	Location	Summer-time Average			Lake Grade
				Secchi (m)	CLA (ug/L)	TP (ug/L)	
<b>Best Ten</b>	Clear Lake	82004500	May Twp.	6.1	3.2	16	A
	Mays Lake	82003300	May Twp.	5.8	2.8	18	A
	Sylvan Lake	82008000	Forest Lake	5.0	2.7	15	A
	Long Lake	82011800	Pine Springs	4.8	2.6	9.4	A
	Twin Lake south	82004800	May Twp.	4.8	4.3	20	A
	Jane Lake	82010400	Lake Elmo	4.5	3.8	14	A
	Little Long Lake	27017901	Minnetrista	4.4	3.1	16	A
	Elmo Lake	82010600	Lake Elmo	4.0	2.8	17	A
	Shady Oak Lake	27008902	Minnetonka	4.0	3.3	15	A
	Lac Lavon Lake	19044600	Apple Valley	3.8	4.0	13	A
<b>Worst Ten</b>	Henry Lake	27017500	Hassan Twp.	0.4	81	245	F
	Goose Lake	10008900	Waconia Twp.	0.4	106	104	F
	Long Lake	19002200	Apple Valley	0.4	114	216	F
	Swede Lake	10009500	Watertown Twp.	0.4	159	392	F
	Downs Lake	82011000	Lake Elmo	0.3	75	206	F
	Cedar Island Lake	27011900	Maple Grove	0.3	130	343	F
	Goose Lake	82011301	Lake Elmo	0.3	196	300	F
	Hazeltine Lake	10001400	Chaska	0.3	287	277	F
	Benton Lake	10006900	Cologne	0.2	94	196	F
	Lynch Lake	82004200	May Twp.	0.2	543	518	F

Similar to past years, there is no distinct pattern as to where lakes with specific water quality were located. The lakes with below average lake grades (D's and F's) were not area specific. They were located in all of the seven TCMA counties. Common similarities between the majority of lakes with D and F grades are their size and mean depth. These lakes are generally shallow with small surface areas. Shallow lakes typically do not stratify during the summer months, allowing the potential release of phosphorus from sediments to mix through the water column and become available for plant growth during the summer season. Also, smaller lakes generally have higher watershed-to-lake ratios. Smaller lakes with high watershed-to-lake ratios have a more difficult time handling larger pollutant loads than larger lakes in watersheds of similar size and land-use.

Similarly, the lake sites with above-average grades (A's and B's) were not area specific. They were located in six of the seven TCMA counties. Common characteristics of the above-average lakes were deeper maximum and mean depths, development of a thermocline, and small contributing watersheds relative to the lake's surface area.

The MPCA has released its draft 2010 Minnesota Impaired Waters Inventory. The draft 2010 inventory indicates that 77 of the 194 lakes monitored in 2009 by the METC are listed as impaired. Seventy three

lakes are listed as impaired for not meeting recreational use, and 8 lakes are listed as impaired for not meeting aquatic consumption use. Some lakes have multiple impairments. The impairments for aquatic recreational use were caused by excess phosphorus and enhanced eutrophication, as measured by the presence of too much algae (chlorophyll-a) and reduced water clarity (Secchi depth). The aquatic consumption impairments were driven by contaminants in fish tissue, such as mercury, polychlorinated biphenyls (PCB), and/or perfluorooctane sulfonate (PFOS). To learn more about the impaired lakes listings and potential next steps, refer to MPCA's webpage: <http://www.pca.state.mn.us/water/tmdl/index.html>.

If there are questions pertaining to the lake data or descriptions contained in this report, inquiries about CAMP, or suggestions of lakes that the METC should consider monitoring in the future, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

## **MONITORING RESULTS FOR CAMP LAKES 2009**

The water quality of each CAMP lake is discussed in the following section. Each lake report includes a written section describing the lake's water quality condition and a lake information sheet. Each information sheet includes 2009 water quality data, shown in tables and figures, and the water quality grades from 1980 through 2009.

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](mailto:brian.johnson@metc.state.mn.us).

## Acorn Lake (82-0102) Valley Branch Watershed District

Acorn Lake is a 44-acre lake located within City of Oakdale (Washington County). This lake is also called Mud Lake. The mean and maximum depth of the lake is 0.7 m (roughly 2.4 feet) and 3.0 m (10 feet), respectively. The entire surface area is considered littoral zone, which is 0 – 15 feet depth zone that is typically dominated by aquatic vegetation. The lake does not maintain a thermocline, which is a density gradient caused changing water temperatures throughout the water column. There is no public access to the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The 2009 data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	28.5	19.0	39.0	NA
<b>CLA</b> ( $\mu\text{g/l}$ )	4.7	3.6	6.3	NA
<b>Secchi</b> (m)	0.9	0.8	1.1	NA
<b>TKN</b> (mg/l)	1.38	1.10	1.60	
			<b>Lake Grade</b>	NA

There was an insufficient quantity of data to calculate a lake grade for 2009. At least 5 dates spread throughout the summer monitoring season (May – September) are required to calculate a grade.

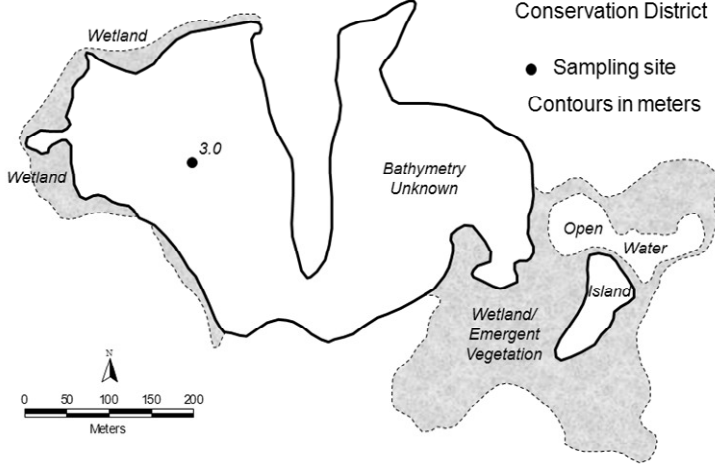
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Acorn Lake**  
Oakdale, Washington Co.

Lake ID: 820102-00  
WD: Valley Branch  
Volunteer: Washington  
Conservation District



**2009 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
4/20	12.1	12.2	5.06	2.82	15	60		0.9	2	2
6/1	21	19.3	10.3	3.53	4	29		1.1	2	4
6/15	24.1	18.8	10.05	0.08	3.6	39		0.9	1	4
7/13	22.6	20.5	6.63	0.13	5	27		0.8	2	4
9/8	20.2	19.1	3.8	0.19	6.3	19		0.9	2	4
10/5	10.1	10.8	7.64	2.28	4.1	86		0.9	2	4

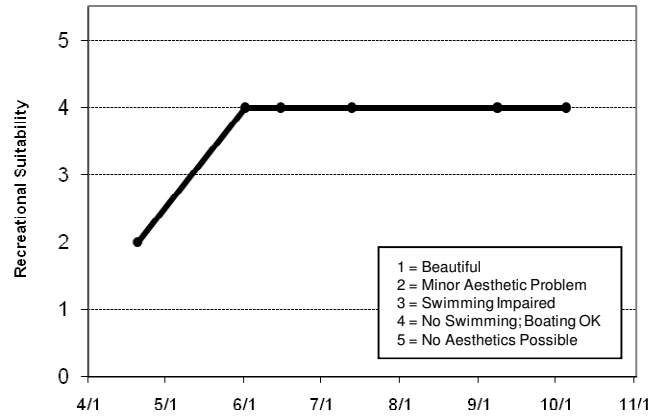
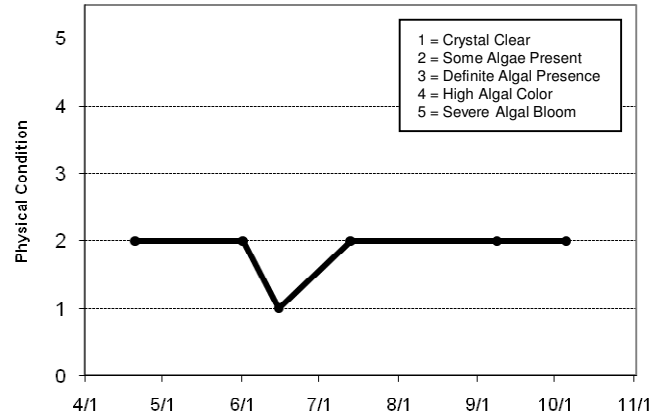
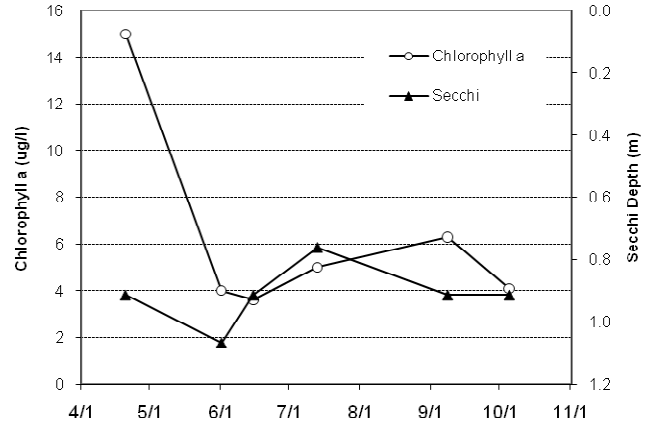
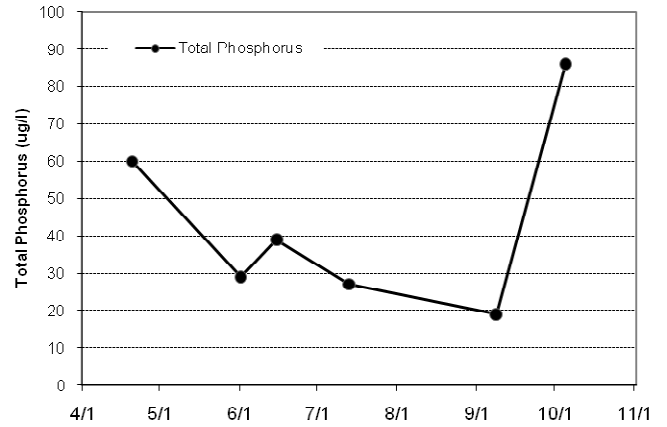
**Lake Water Quality Grades Based on Summertime Averages**

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			C			
Chlorophyll a			A			
Secchi Depth			F			
<b>Lake Grade</b>			<b>C</b>			<b>NA</b>

Source: Metropolitan Council and STORET data



## Alimagnet Lake (19-0021) City of Apple Valley

Approximately half of Alimagnet Lake's 109-acre surface area is located within the City of Apple Valley, the other half in the City of Burnsville (Dakota County). The lake has maximum and mean depths of 3.0 and 1.5 m, respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has a 1,094-acre watershed and a watershed-to-lake area ratio of 10:1 (Blue Water Science 2005). The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The 2009 data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	88.5	59.0	123.0	D
<b>CLA</b> (µg/l)	44.8	20.0	120.0	C
<b>Secchi</b> (m)	0.6	0.3	1.0	F
<b>TKN</b> (mg/l)	1.65	1.20	2.50	
<b>Lake Grade</b>				D

The 2008 lake grade was a D. The lake's historic lake grades indicate that the lake fluctuates between a C and D. Most recently the lake's lake grade has consistently been a D (1999-2009 excluding 2006). The mean secchi depth continues to provide this lake with a water clarity grade of F.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

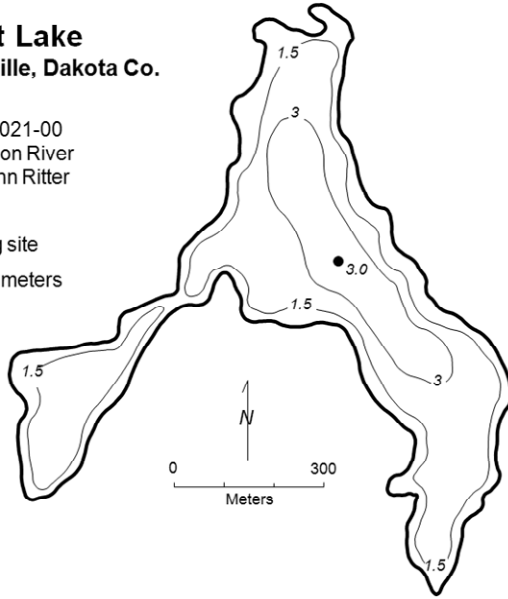


# Alimagnet Lake

Apple Valley/Burnsville, Dakota Co.

Lake ID: 190021-00  
 WMO: Vermillion River  
 Volunteer: John Ritter

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/2	13				20	59		1.0	3	2
5/16	17				24	73		0.7	4	3
6/7	16				35	78		0.8	3	3
6/28	22				32	76		0.8	3	3
7/9	23				120	112		0.4	4	3
7/27	24				80	123		0.3	4	3
8/16	24.7				26	100		0.7	3	3
9/2	19				21	87		0.5	3	3
10/4	11.8				25	186		0.7	3	3
10/18	7.2				8.3	78		1.2	3	3

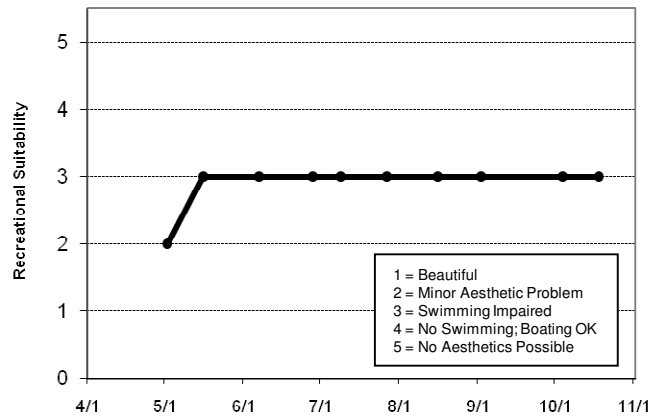
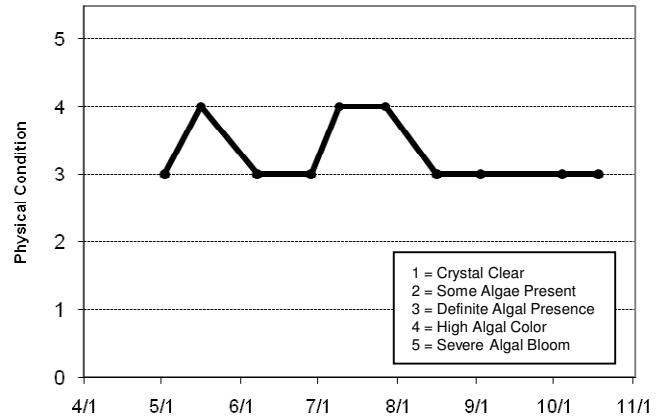
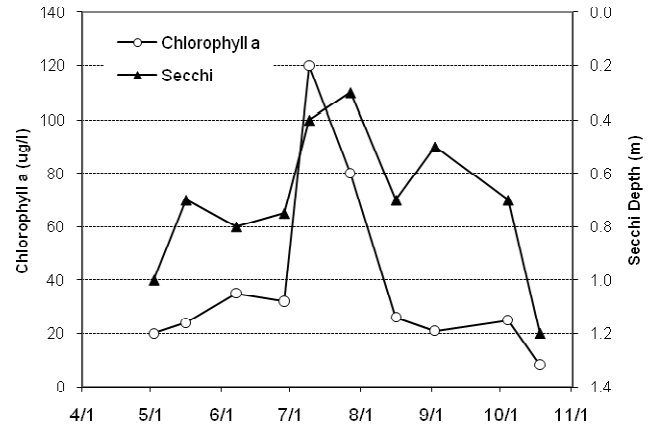
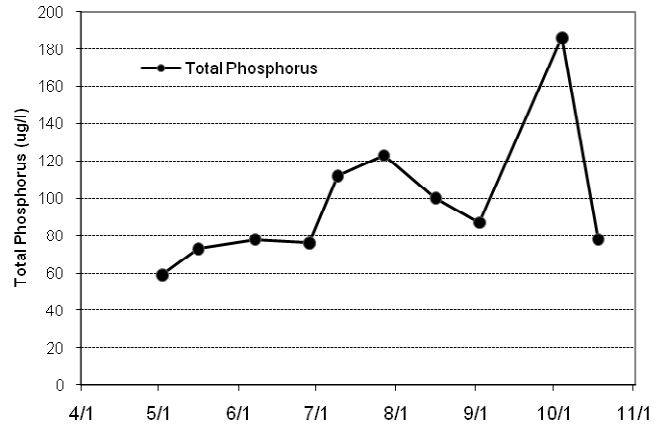
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	F	D										F
Chlorophyll a												D
Secchi Depth	F	F	D	D	C	D	F	F	F	F	D	C
<b>Lake Grade</b>												<b>D</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus				D	D	C	D	F	D	D	D	D
Chlorophyll a				B	C	C	C	D	D	C	C	C
Secchi Depth	D	C	C	C	D	C	C	D	F	D	F	F
<b>Lake Grade</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	F	D	D	D
Chlorophyll a	D	D	D	D	D	C
Secchi Depth	F	F	F	F	F	F
<b>Lake Grade</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>D</b>	<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



## **Ardmore Lake (27-0153) Pioneer-Sarah Watershed Management Commission**

Ardmore Lake is located in the City of Medina (Hennepin County). The lake has surface area of 10.1 acres and a maximum depth of 6.1 m (20 feet), and an average depth of 2.4 m (7.7 feet). Most of the lake is considered littoral zone (approximately 9 acres), which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. A search via STORET revealed historical secchi depth data and CAMP data.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The 2009 data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	161.8	114.0	230.0	F
<b>CLA</b> (µg/l)	105.6	33.0	200.0	F
<b>Secchi</b> (m)	0.5	0.4	0.6	F
<b>TKN</b> (mg/l)	2.74	1.70	3.50	
<b>Lake Grade</b>				F

The water quality lake grade was an F for 2009. The TP and chlorophyll summer-time means translate to grades of F. These are similar grades that the lake received in 2007 and 2008.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

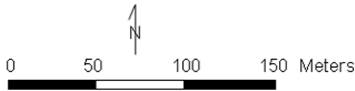
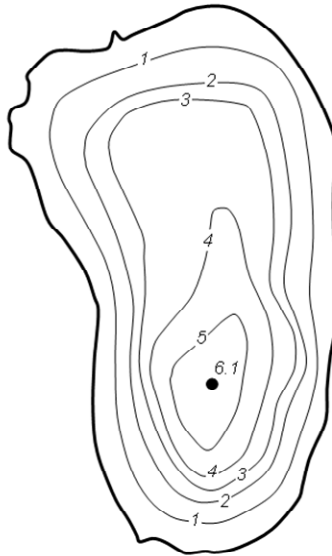
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Ardmore Lake Medina, Hennepin Co.

Lake ID: 270153  
WMO: Pioneer-Sarah Creek  
Volunteer: Greg Durand

● Sampling site  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	14.4				190	513		0.4	2	3
5/3	17.4				150	230		0.4	2	2
5/24	24.1				33	181		0.5	2	3
5/31	21.7				200	185		0.6	2	1
6/15	24.3				60	138		0.5	3	2
6/21	25.6				120	142		0.4	2	2
7/13	26				120	174		0.4	3	4
7/25	23.8				82	147		0.5	2	2
8/9	28.3				130	183		0.4	3	3
8/19	23.5				120	146		0.5	3	3
9/4	20.5				84	140		0.5	3	3
9/19	24.4				63	114		0.6	2	3
10/10	10				71	506		0.5	2	3
10/18	8				74	431		0.5	2	3

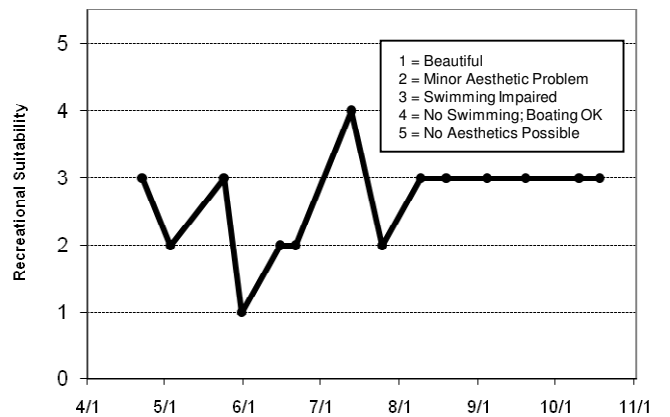
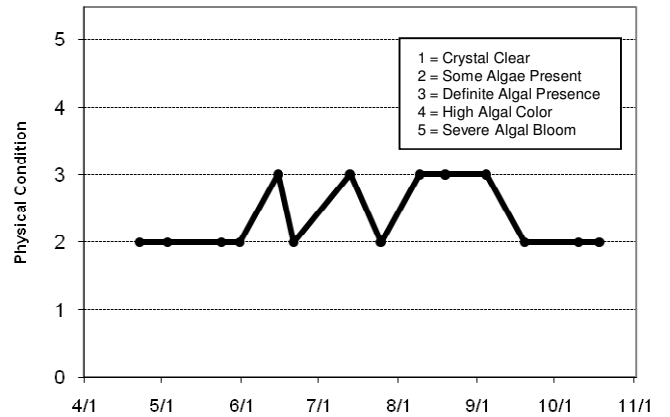
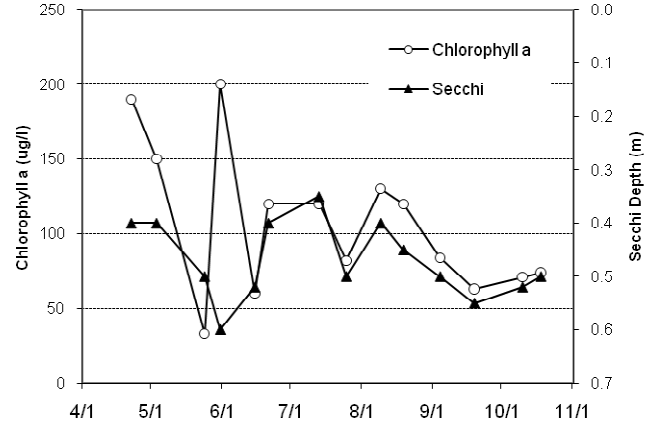
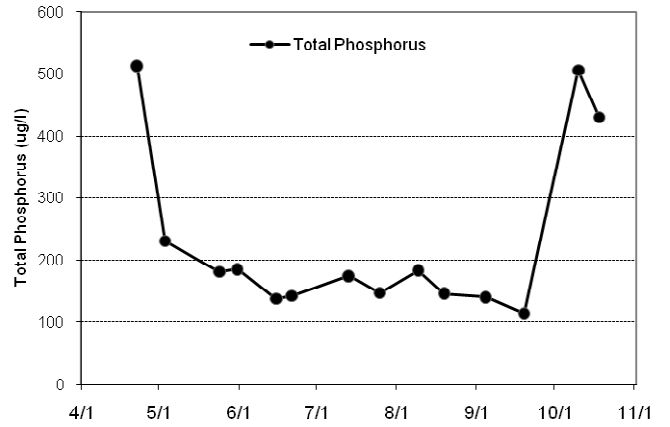
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												<b>F</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus				F	F	F
Chlorophyll a				F	F	F
Secchi Depth				F	F	
<b>Lake Grade</b>				<b>F</b>	<b>F</b>	<b>F</b>

Source: Metropolitan Council and STORET data



## **Armstrong Lake (82-0116) South Washington Watershed District**

Armstrong Lake has been monitored through CAMP since 1998. The lake is located within the cities of Lake Elmo and Oakdale (Washington County). The lake has a surface area of 39 acres, and it has a mean and maximum depth of 1.0 m and 1.5 m, respectively. Because of the shallowness of the lake, its entire area is considered littoral, which is the shallow depth zone (0-15 feet) dominated by aquatic vegetation. It does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	66.8	47.0	105.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	10.1	4.7	19.0	B
<b>Secchi</b> (m)	1.1	0.9	1.3	D
<b>TKN</b> (mg/l)	1.24	0.78	2.00	
			<b>Lake Grade</b>	C

The 2009 lake grade of C was a similar to the grade obtained last year. The water quality over the past decade has fluctuated between C and D, with a C being more frequent.

According to the lake's historic database of TP, CLA, and water clarity grades, it is apparent that the TP and Secchi grades are worse than the CLA grade. The better than expected CLA grade indicates that water clarity is not as affected by algal abundance, but may be affected by suspended matter such as from surface runoff or the resuspension of lake sediments from mixing events.

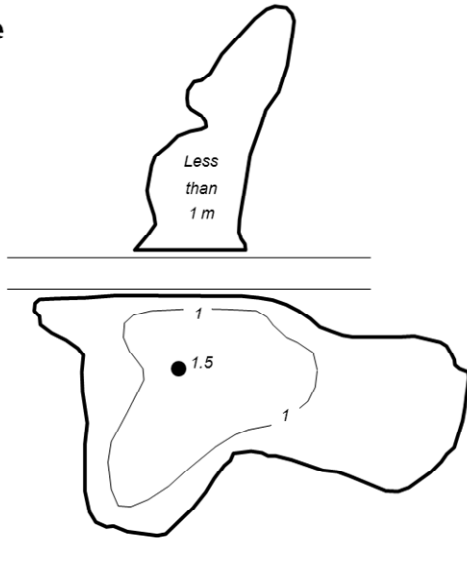
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

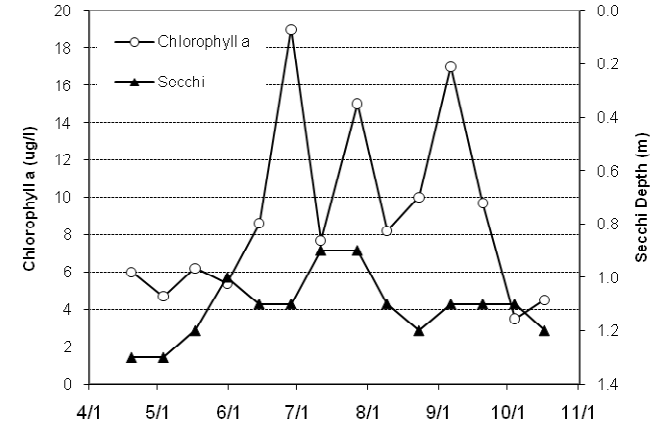
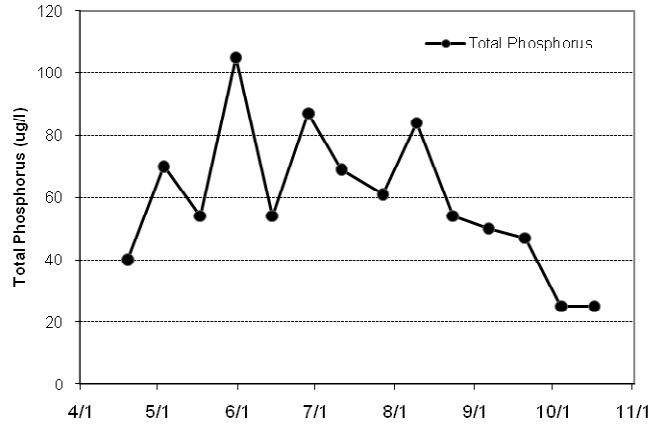
# Armstrong Lake

## Lake Elmo/Oakdale, Washington Co.

LAKE ID: 820116-00  
 WD: South Washington  
 Volunteers: Todd and  
 Brandon Heruth

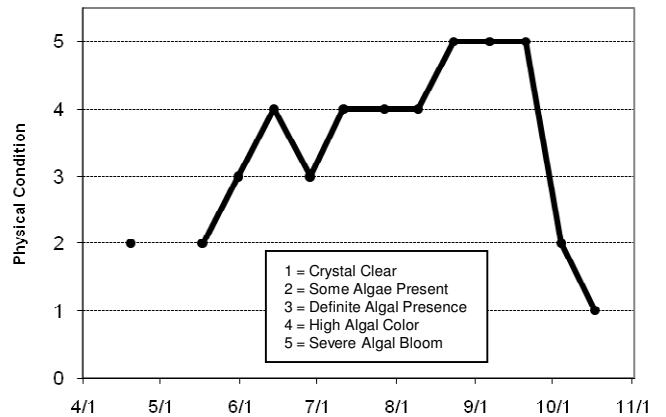


● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	13.5				6	40		1.3	2	
5/3	15				4.7	70		1.3		
5/17	17				6.2	54		1.2	2	
5/31	23				5.4	105		1.0	3	
6/14	21.3				8.6	54		1.1	4	
6/28	21.7				19	87		1.1	3	
7/11	24.7				7.7	69		0.9	4	
7/27	24				15	61		0.9	4	
8/9	23.7				8.2	84		1.1	4	
8/23	23.6				10	54		1.2	5	
9/6	23.6				17	50		1.1	5	
9/20	21.7				9.7	47		1.1	5	
10/4	10				3.5	25		1.1	2	
10/17	5.4				4.5	25		1.2	1	



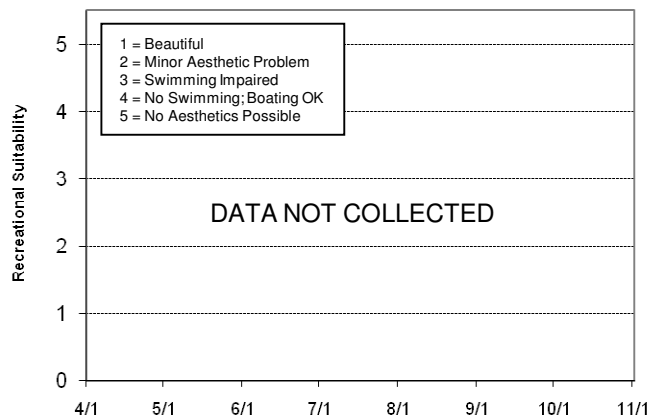
### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	D	D	C	C
Chlorophyll a	A	A	B	C	A	B
Secchi Depth	D	D	D	D	D	D
Lake Grade	C	C	C	D	C	C

Source: Metropolitan Council and STORET data



**Barker Lake (82-0076) Carnelian - Marine - St. Croix Watershed District**

Barker Lake is a 45-acre lake located within May Township (Washington County). The lake has an 823-acre watershed and a large watershed-to-lake area ratio of about 18:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for Secchi transparency, a depth profile of oxygen and temperature, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

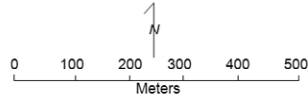
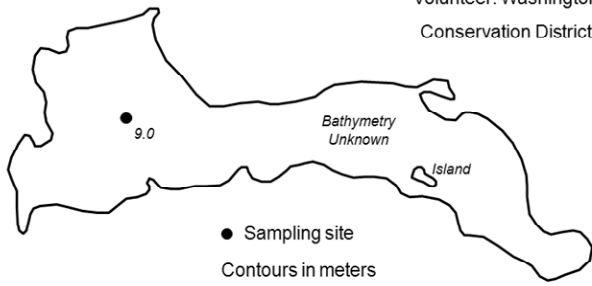
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)				
<b>CLA</b> (µg/l)				
<b>Secchi</b> (m)	1.3	0.5	3.4	C
<b>TKN</b> (mg/l)				
			<i>Lake Grade</i>	

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Barker Lake**  
Hugo, May Twp., Washington Co.

LAKE ID: 820076-00  
WD: Carnelian-Marine-St. Croix  
Volunteer: Washington  
Conservation District



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/5	15.2	8	10.29	0.25				1.8	2	2
5/19	18.9	7.2	9.85	0.1				3.4	2	3
6/30	21.4	8.7	8.29	0.07				1.1	3	4
7/29	23.8	9.6	11.86	0.03				0.5	4	4
8/26	22.1	10.4	10.76	0.05				0.6	3	4
9/21	22.1	10.4	10.3	0.04				0.6	2	2
10/20	8.6	7.4	8.52	6.95				2.3	3	3

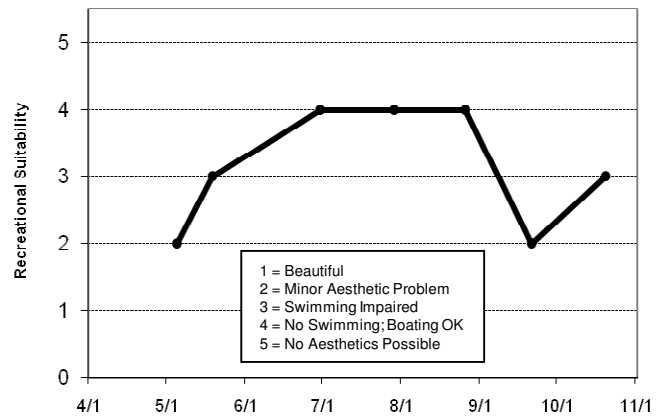
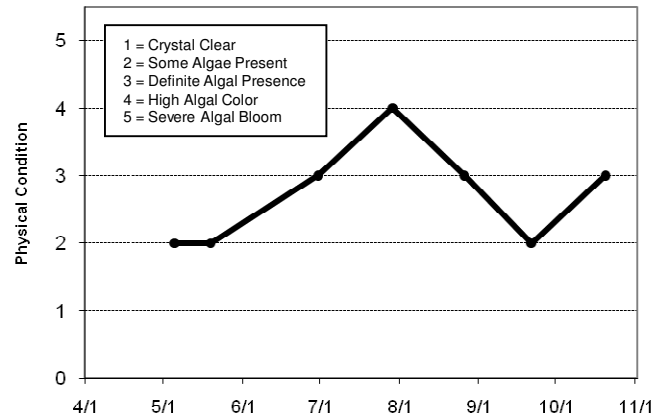
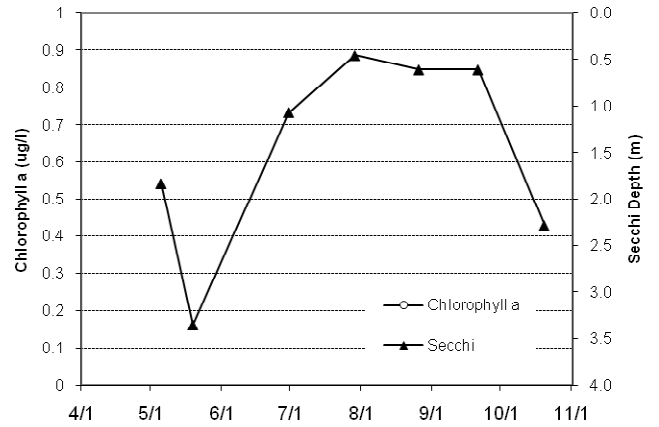
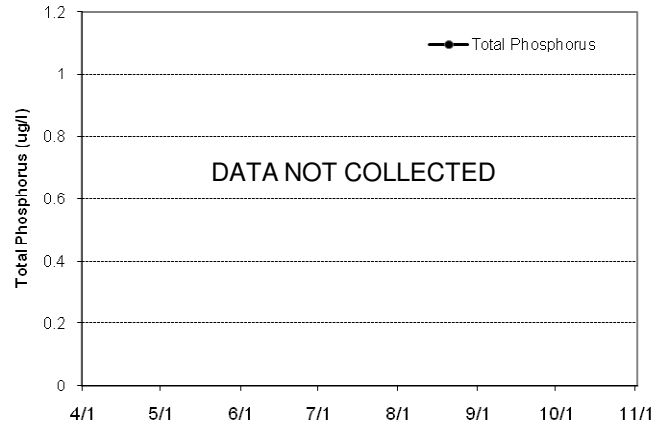
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						D
Chlorophyll a						D
Secchi Depth	C	D	C	D	D	C
<b>Lake Grade</b>					<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



## **Bass Lake (27-0098) Shingle Creek Watershed Management Commission**

Bass Lake is located in the City of Plymouth (Hennepin County). The lake has a surface area of 194 acres and a watershed area of 3,100 acres, giving a large watershed-to-lake area ratio of 16:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	63.4	23.0	113.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	28.2	3.8	61.0	C
<b>Secchi</b> (m)	1.3	0.6	2.4	C
<b>TKN</b> (mg/l)	1.42	0.81	1.90	
<b>Lake Grade</b>				C

The 2009 lake grade was a C, and all three parameters were also a C, which is consistent with the historical database. Overall, the lake appears represented well by a lake grade of C since 1994.

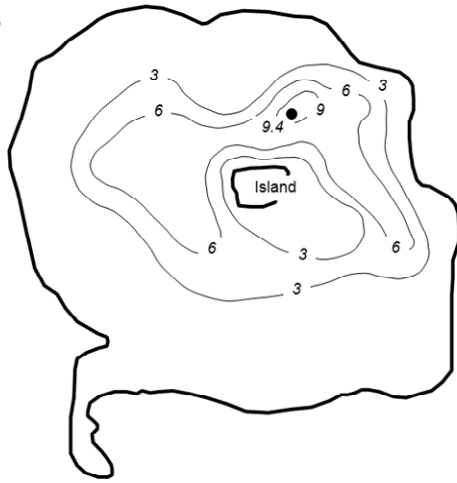
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

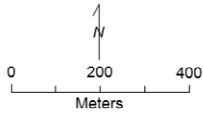


# Bass Lake Plymouth, Hennepin Co.

LAKE ID: 270098-00  
WMO: Shingle Creek  
Volunteer: Marvin Groth



● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/6	16.3				4.6	23		1.8	2	1
5/14	15.1				3.8	25		2.1	2	2
6/1	19.2				12	29		1.8	2	2
6/11	17.9				16	43		2.4	3	3
6/25	28.2				29	38		0.9	3	3
7/7	25.4				41	58		0.8	3	3
7/21	23.5				61	113		0.6	4	4
7/31	23.1				42	82		0.8	4	4
8/22	22.1				32	95		0.9	4	3
8/31	21.6				27	75		1.1	3	3
9/16	23.1				42	90		0.9	3	3
9/30	16.2					90		1.8	1	1

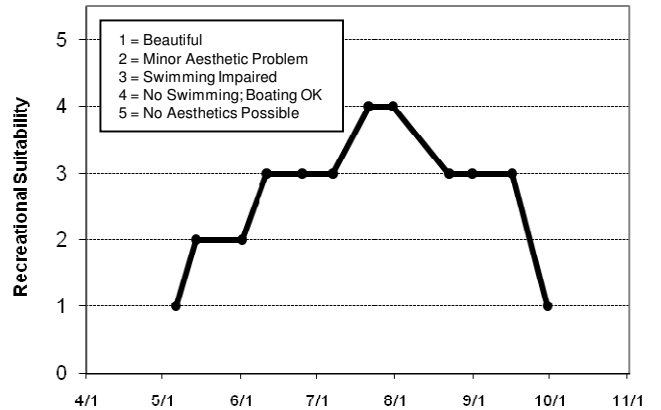
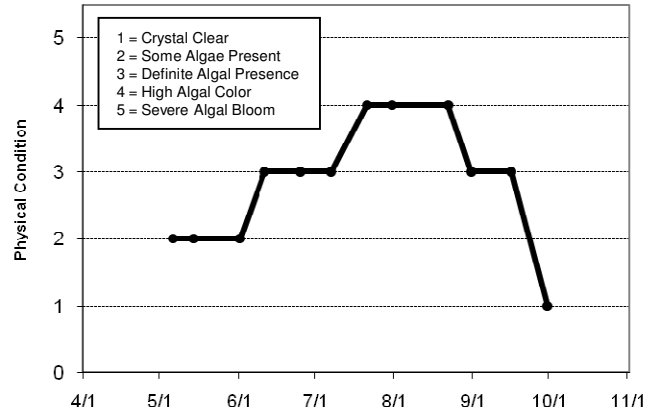
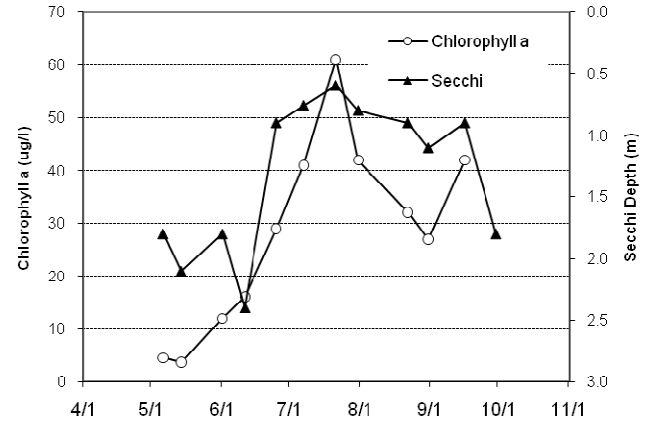
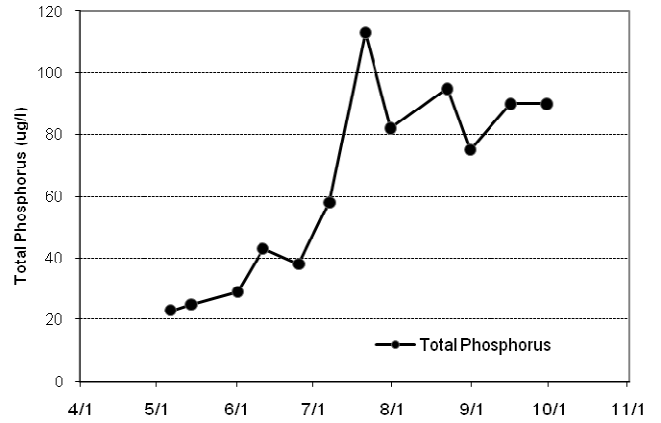
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		C		C		C
Chlorophyll <i>a</i>		D		D		C
Secchi Depth		C		D		C
<b>Lake Grade</b>		<b>C</b>		<b>D</b>		<b>C</b>

Source: Metropolitan Council and STORET data



**Bass Lake (82-0035) Carnelian - Marine - St. Croix Watershed District**

Bass Lake is an 81-acre lake located within May Township (Washington County). The maximum depth of the lake is 4.3 m (roughly 14 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for secchi transparency, and the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>Secchi (m)</b>	2.5	1.7	4.0	B

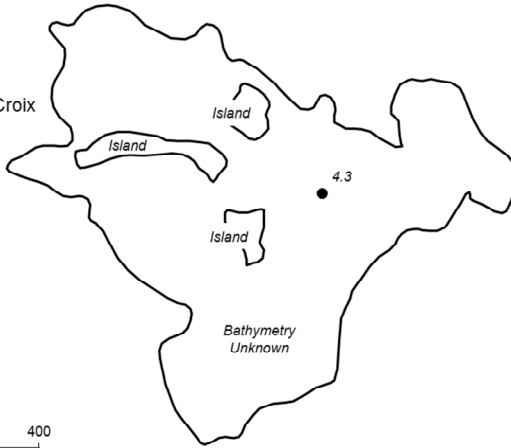
The lake did not receive a lake grade for 2008 because only secchi depth (water clarity) data was collected. The lake’s water clarity was similar in 2008 as it was in 2007. The water clarity of recent years appears to be better than it was in the 1990’s. The water clarity since 2002 has been characterized by mostly B grades, whereas the water clarity of the 1990’s was marked by C grades only.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Bass Lake**  
May Twp., Washington Co.

LAKE ID: 820035-00  
WD: Carnelian-Marine-St. Croix  
Volunteer:  
Washington  
Conservation District



● Sampling site  
Contours in meters

**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°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	15.5	13.9	10.73	0.07				4.0	2	1
5/19	18.2	16.3	10.58	0.11				2.7	2	2
6/29	23.2	20.9	8.31	0.08				2.4	2	2
7/28	23.1	19.9	9.01	0.06				1.8	3	3
8/24	22.2	20.7	7.3	0.08				1.7	2	3
9/21	22.6	21.7	6.38	0.08				2.4	1	1
10/20	8.6	8.5	10	0.45				2.7	2	2

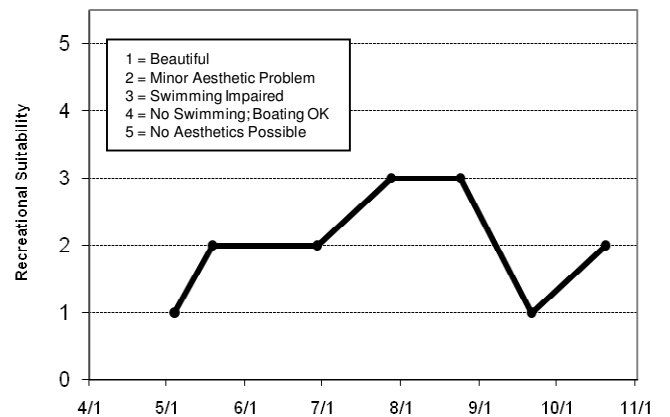
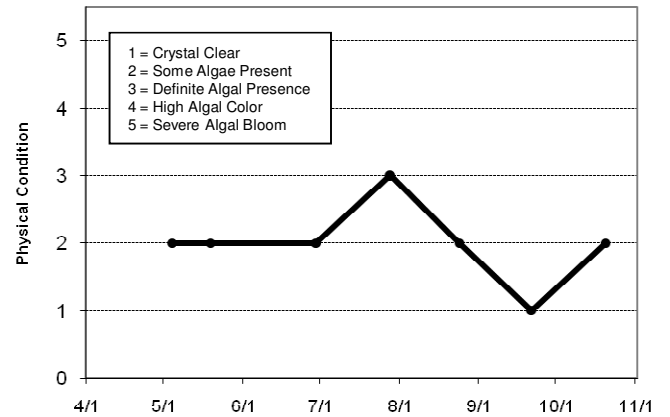
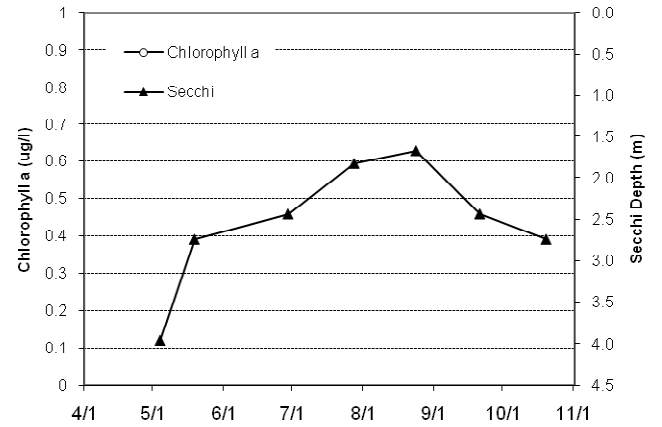
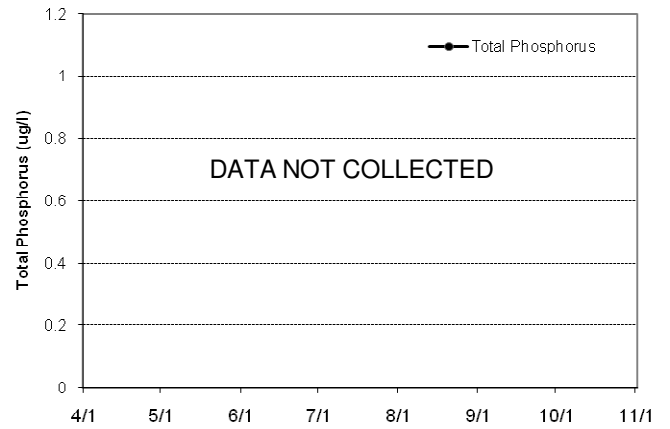
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												C
Chlorophyll a												B
Secchi Depth												C
<b>Lake Grade</b>												<b>C</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus	B				C	C	C	C	C	C		C
Chlorophyll a	B				C	C	B	B	B	B		B
Secchi Depth	C	C	C	C	C	C	C	C	C	C	B	C
<b>Lake Grade</b>	<b>B</b>					<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>		<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	C	C	B		
Chlorophyll a	A	B	B	B		
Secchi Depth	B	B	C	B	B	B
<b>Lake Grade</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>B</b>		

Source: Metropolitan Council and STORET data



**Bass Lake [West] (82-0123) Browns Creek Watershed District**

Bass Lake (west) is located west of Joliet Lane in Grant Township. There is little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	33.4	21.0	60.0	<b>C</b>
<b>CLA</b> (µg/l)	12.3	5.7	32.0	<b>B</b>
<b>Secchi</b> (m)	1.7	1.4	2.1	<b>C</b>
<b>TKN</b> (mg/l)	0.96	0.84	1.10	
<b>Lake Grade</b>				<b>C</b>

The lake received a lake grade of C for 2009 which is lower than the previous 3 years. Given that there are 4 years of water quality data available, additional monitoring is necessary to determine water quality trends.

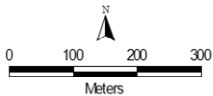
Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

## Bass Lake West Grant, Washington Co.

LAKE ID: 820123-00  
 WD: Browns Creek  
 Volunteer: Washington  
 Conservation District

● Sampling site  
 Contours in meters



Bathymetry  
 Unknown

### 2009 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
4/27	12	12.1	9.45	9.98	6.1	31		1.5	2	3
5/27	18.5	18.5	6.98	2.3	7.5	27		1.8	2	3
6/24	26.6	22.2	8.44	0.13	5.7	25		2.1	2	4
7/23	22.3	20.8	10.6	0.45	8.3	21		1.8	2	3
8/19	23.3	23	7.04	1.61	32	34		1.4	2	3
9/16	22.7	22.7	7.46	3.64	8.1	60		1.4	2	2
10/14	6	6.1	12.35	10.99	2.9	17		1.2	1	2

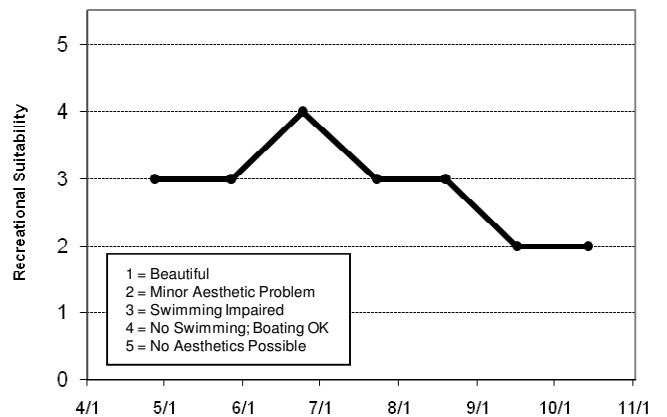
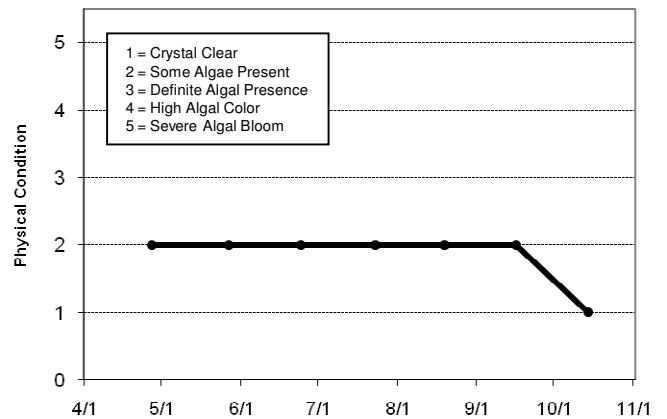
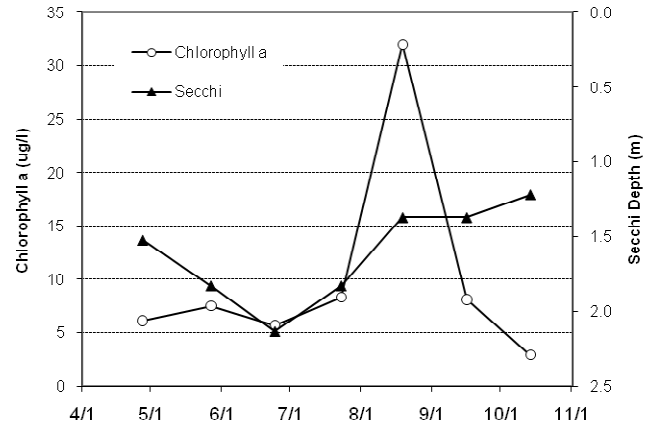
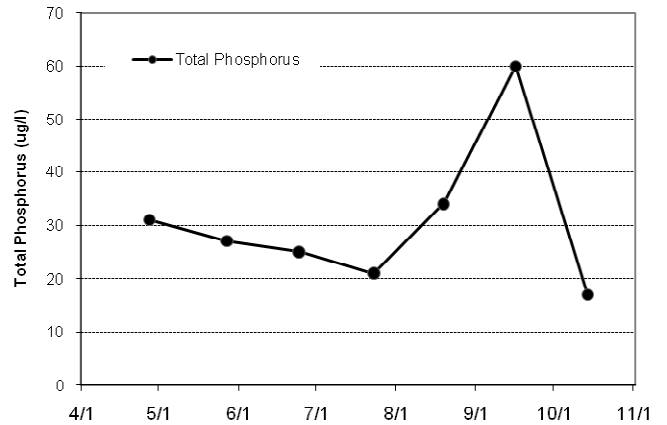
### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		B	B	B	B	C
Chlorophyll a		A	A	B	B	
Secchi Depth		A	B	B	C	
Lake Grade		A	B	B	C	

Source: Metropolitan Council and STORET data



## **Bass Lake [East] (82-0124) Browns Creek Watershed District**

Bass Lake (east) is located east of Joliet Lane in Grant Township. There is little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	51.8	39.0	71.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	9.6	6.6	18.0	A
<b>Secchi</b> (m)	2.5	1.8	3.2	B
<b>TKN</b> (mg/l)	1.09	0.95	1.20	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009. The lake received a CLA grade of A, which was the highest grade received for the past 4 years. But, given that there are 4 years of water quality data available, additional monitoring is necessary to determine water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

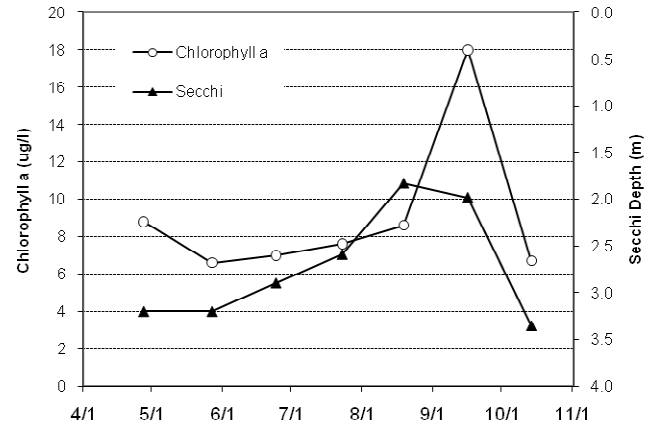
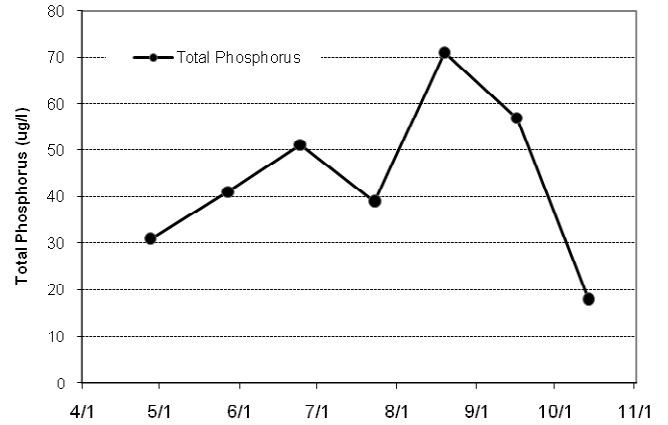
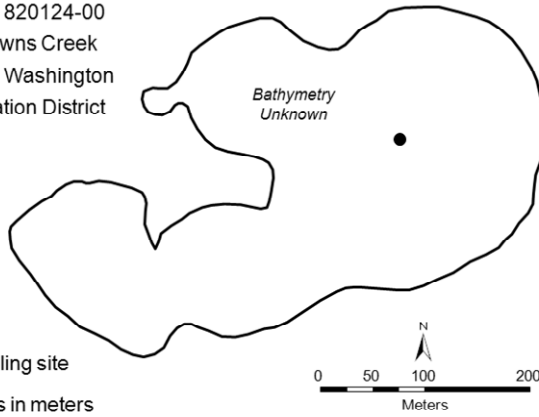
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Bass Lake East

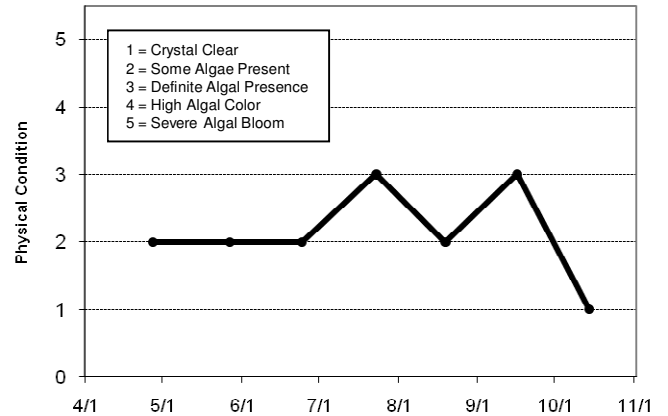
## Grant, Washington Co.

LAKE ID: 820124-00  
 WD: Browns Creek  
 Volunteer: Washington  
 Conservation District



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/27	13	12.7	9.95	0.11	8.8	31		3.2	2	2
5/27	19	16.6	8.58	0.09	6.6	41		3.2	2	4
6/24	26.6	17.1	9.14	0.06	7	51		2.9	2	3
7/23	22.5	19.3	10.53	0.08	7.6	39		2.6	3	3
8/19	23	19.2	6.42	0.06	8.6	71		1.8	2	2
9/16	22.6	19.7	7.5	0.05	18	57		2.0	3	4
10/14	6.4	6.8	12.47	0.15	6.7	18		3.4	1	1

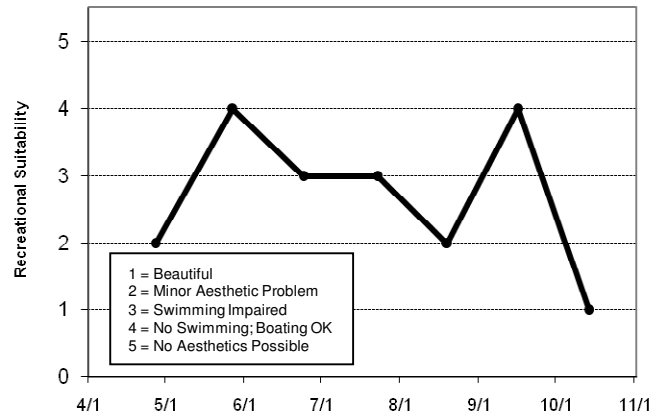


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			C	C	C	C
Chlorophyll a			B	B	C	A
Secchi Depth			C	B	C	B
Lake Grade			C	B	C	B



Source: Metropolitan Council and STORET data

**Bavaria Lake (10-0019) Carver County Environmental Services**

Lake Bavaria is located in the City of Chaska (Carver County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The 200-acre lake has a mean and maximum depth of 5.6 m (18 ft) and 18.3 m (60 ft), respectively. The lake has a surface area of 200 acres and a watershed area of 711 acres, giving a watershed-to-lake area ratio of 3.6:1, which is relatively low. The larger the ratio the greater the potential stress put on the lake from surface runoff. The DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*). The MPCA has listed the lake as impaired for mercury content in fish.

The lake has been enrolled in the CAMP for 14 years. The lake also has been monitored by Council staff in the past, and it has been involved in the MPCA’s volunteer Secchi transparency program. Additionally, the lake was included within the MPCA’s Lake Assessment Program (LAP) in 2001.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	39.1	19.0	79.0	C
<b>CLA</b> (µg/l)	9.7	2.0	19.0	A
<b>Secchi</b> (m)	2.2	1.0	4.0	B
<b>TKN</b> (mg/l)	1.36	0.87	1.80	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009 which is consistent with its historical database. The database shows that the historic lake grades have fluctuated in the A to C range, with B being the most common grade received.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

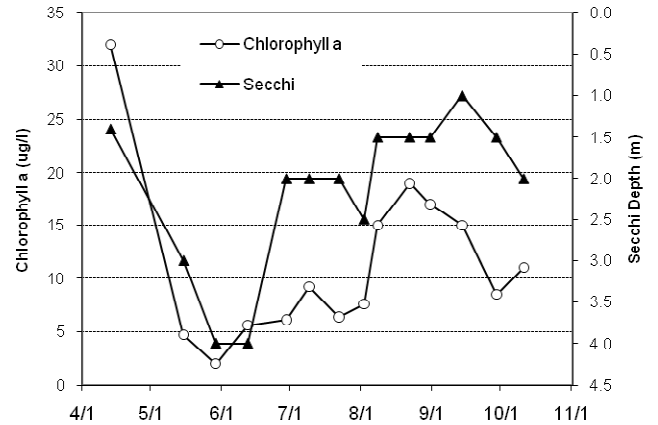
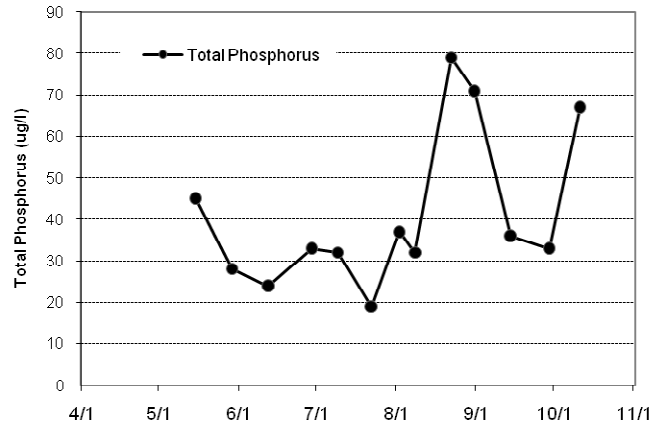
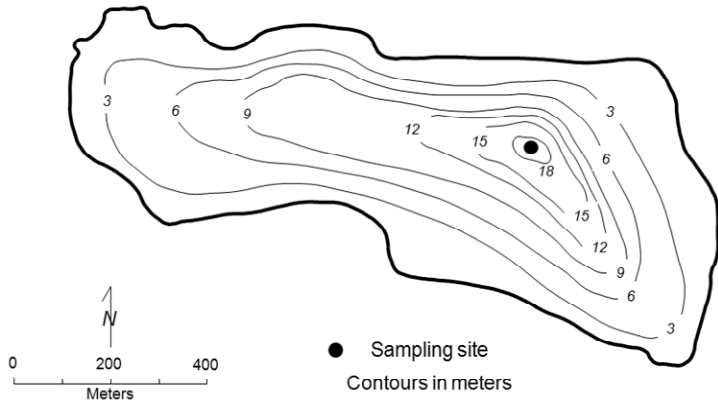
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).



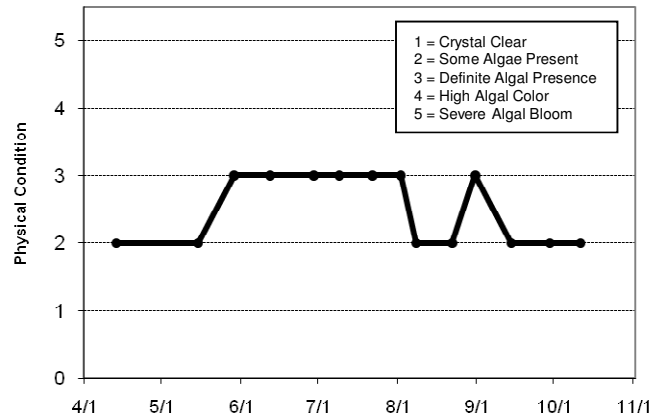
**Lake Bavaria**  
Chaska/Laketown Twp., Carver Co.

LAKE ID: 100019-00  
WMO: Hazeltine-Bavaria  
Volunteer: John Ryski



**2009 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
4/13	7.1		9.23		32			1.4	2	2
5/15	14				4.7	45		3.0	2	3
5/29	17				2	28		4.0	3	2
6/12	18				5.6	24		4.0	3	3
6/29	20				6.1	33		2.0	3	2
7/9	22				9.2	32		2.0	3	3
7/22	22				6.4	19		2.0	3	3
8/2	20				7.6	37		2.5	3	3
8/8	20				15	32		1.5	2	3
8/22	20				19	79		1.5	2	3
8/31	21				17	71		1.5	3	3
9/14	22				15	36		1.0	2	3
9/29	20				8.5	33		1.5	2	3
10/11	10				11	67		2.0	2	2

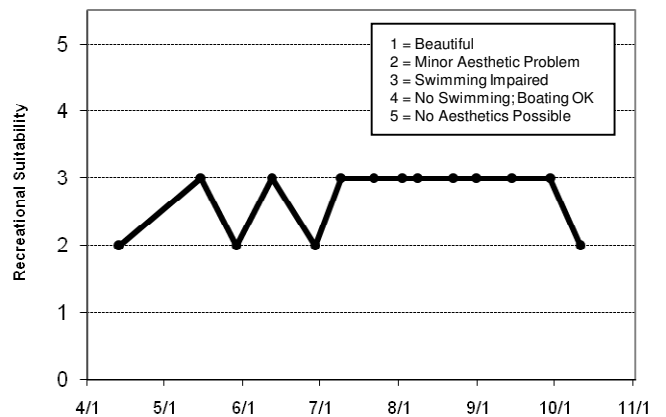


**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	C	B	C	C	C
Chlorophyll a	B	C	A	A	B	A
Secchi Depth	C	C	B	B	C	B
Lake Grade	B	C	B	B	C	B



Source: Metropolitan Council and STORET data

## **Bay Pond (Bay Lake) (82-0011) Valley Branch Watershed District**

Bay Pond Lake is a land-locked lake located within Baytown Township (Washington County). It has a surface area of 10.2 acres. The maximum depth of the lake is approximately 1.0 m (3.3 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake's surface area and watershed area (849 acres) give a very large watershed-to-lake ratio of 83:1. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	347.0	160.0	622.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	288.8	48.0	590.0	F
<b>Secchi</b> (m)	0.3	0.1	0.6	F
<b>TKN</b> (mg/l)	4.68	2.00	7.60	
			<b>Lake Grade</b>	F

The lake received a lake grade of F for 2009 and in the previous two years. There are 4 years of data, which is an insufficient quantity to determine water quality trends. Additional monitoring is necessary to determine water quality trends.

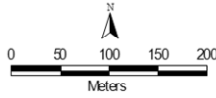
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Bay Pond (Bay Lake) Baytown Twp., Washington Co.

LAKE ID: 820011-00  
WD: Valley Branch  
Volunteer: Washington  
Conservation District

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	12.2	11.8	11.91	0.14	36	60		0.9	3	4
6/1	23.3	20	9.36	5.6	48	212		0.5	3	4
6/16	23.9	18.7	12.92	0.51	66	160		0.6	2	3
7/15	22.1	22	6.98	3.59	310	319		0.3	3	4
8/11	23.2	21.7	6.84	0.12	430	422		0.2	4	4
9/9	22.8	19.5	10.99	0.16	590	622		0.1	4	4
10/7	11.3	10.2	13.17	0.11	650	764		0.1	4	4

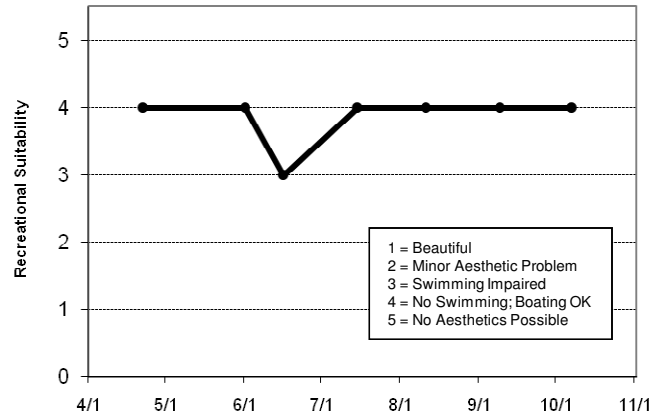
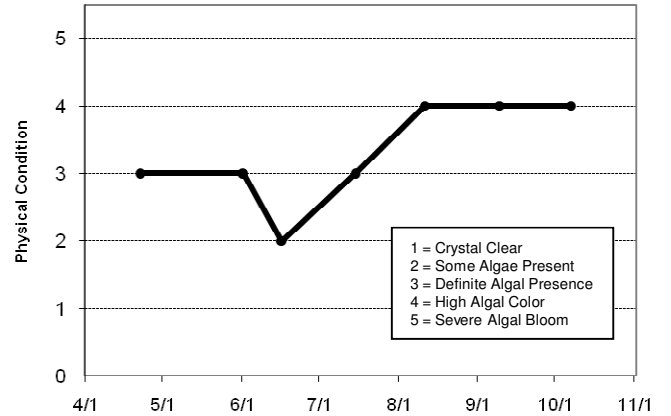
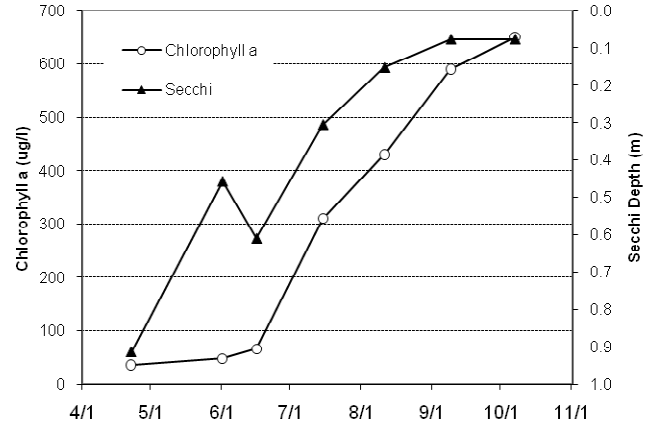
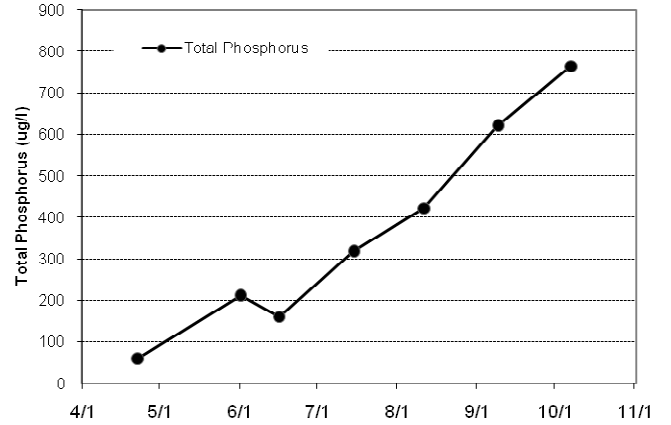
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		F	F	F	F	F
Chlorophyll a		F	F	F	F	F
Secchi Depth		F	D	F	F	F
Lake Grade		F	F	F	F	F

Source: Metropolitan Council and STORET data



## **Benton Lake (10-0069) Carver County Environmental Services**

Benton Lake is located within Benton Township (Carver County). The maximum depth of the lake is 2.0 m (roughly 6.5 feet). Because of the shallowness of the lake, the entire area is considered littoral zone (area of aquatic plant dominance) and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column).

The lake has a surface area of 115 acres and a watershed of 322 acres, which gives a watershed-to-lake area ratio of 2.8:1. The larger the ratio the greater the potential stress put on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	196.4	60.0	398.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	94.3	46.0	230.0	F
<b>Secchi</b> (m)	0.2	0.1	0.3	F
<b>TKN</b> (mg/l)	4.14	1.10	7.70	
			<b>Lake Grade</b>	F

The lake received a lake grade of F for 2009, which is similar to the lake grades received for the past decade. The lake's water quality appears to be best represented by a lake grade of F.

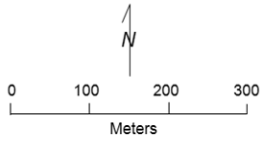
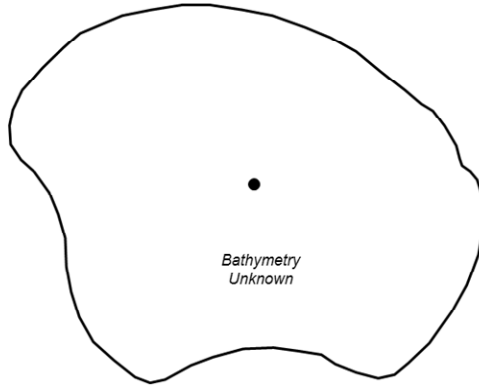
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Lake Benton Cologne, Carver Co.

Lake ID: 100069-00  
WMO: Carver Creek  
Volunteers: Don Smith &  
Jacob Steinbauer

● Sampling site  
Contours in meters



## 2009 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
4/16	15				50	131		0.4	3	4
5/1	11				99	160		0.2	3	4
5/15	15				95	121		0.2	4	4
5/29	20				120	390		0.1	4	4
6/8	15				230	398		0.1	4	4
6/22	25				58	205		0.2	4	4
7/8	26				100	147		0.1	4	4
7/20	21				70	60		0.2	4	4
8/5	25				57	186		0.1	3	4
8/18	25				99	206		0.2	4	4
9/1	21				63	144		0.3	3	4
9/14	20				46	143		0.3	4	4
10/4	11				72	140		0.5	3	4
10/16	9				31	100		0.9	2	4

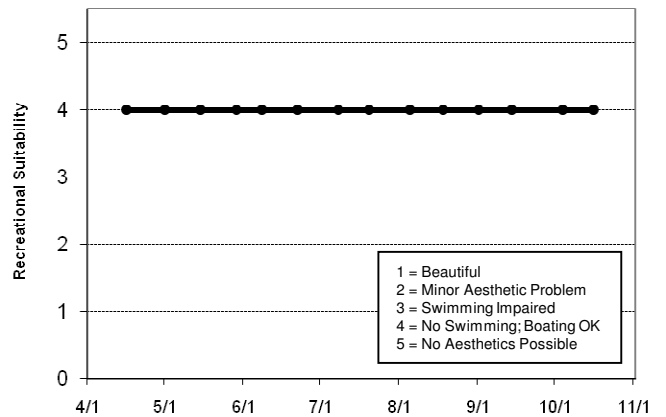
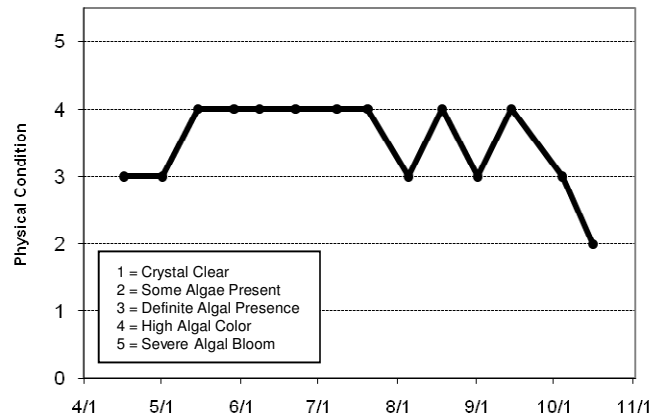
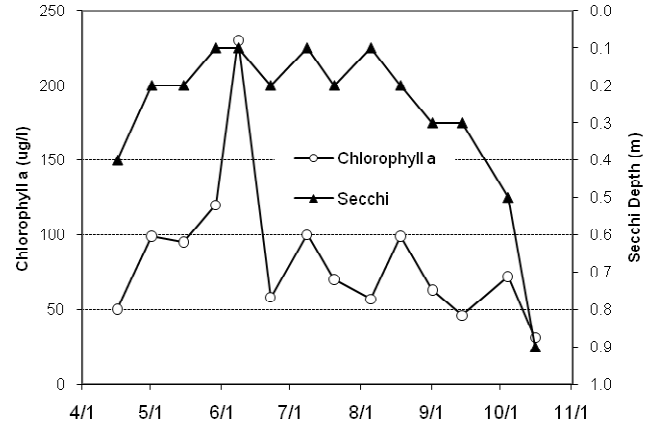
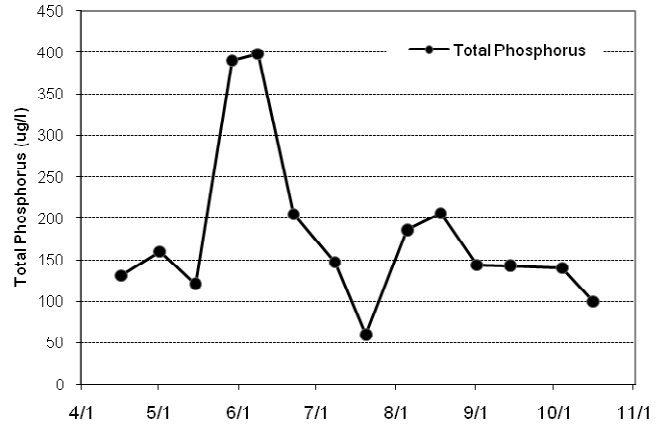
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus								F	F	F		F
Chlorophyll a								F	F	F		F
Secchi Depth			C					F	F	F		F
<b>Lake Grade</b>								F	F	F		F

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	F	F	F	F	F	F
Chlorophyll a	F	F	F	F	F	F
Secchi Depth	F	F	F	F	F	F
<b>Lake Grade</b>	F	F	F	F	F	F

Source: Metropolitan Council and STORET data



### **Benz Lake (82-0120) Browns Creek Watershed District**

Benz Lake is a 36-acre lake located in Grant Township (Washington County) with a maximum depth of approximately 2.7 m (about 9 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	91.6	65.0	130.0	D
<b>CLA</b> (µg/l)	24.7	2.2	60.0	C
<b>Secchi</b> (m)	1.2	0.6	1.7	D
<b>TKN</b> (mg/l)	1.79	1.50	2.10	
<b>Lake Grade</b>				C

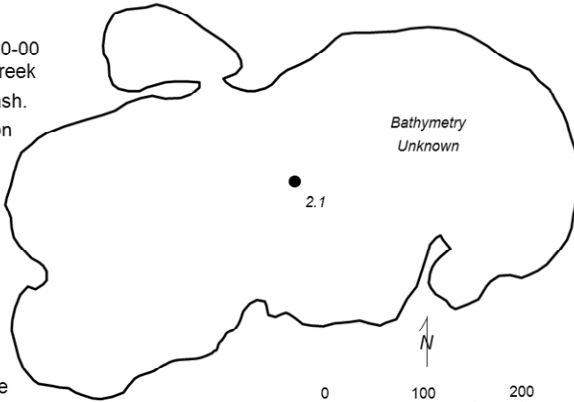
The lake received a lake grade of D in 2009 which was a similar to some grades received in the past. There are only 5 years of water quality data in the lake’s database, so additional monitoring is needed to determine water quality trends.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Benz Lake**  
Grant, Washington Co.

Lake ID: 820120-00  
WD: Browns Creek  
Volunteer: Wash.  
Conservation  
District



● Sampling site  
Contours in meters

**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	13.1	11.6	11.7	11.52	15	57		2.0	2	1
4/27	12.8	12.8	10.91	0.28	44	68		1.4	3	3
5/12	15.6	15.4	10.01	0.14	30	72		1.1	3	4
5/27	19.1	19.2	7.44	0.11	19	88		1.2	3	4
6/9	16.5	16.1	7.35	0.11	2.2	83		1.5	3	4
6/24	27.5	24.9	7.35	0.08	35	114		1.7	3	3
7/7	24.7	23.3	10.73	0.11	12	75		1.5	3	4
7/23	23.3	21.1	11.91	0.11	25	87		1.2	3	4
8/3	24.8	22.2	10.52	0.11	36	111		0.9	3	4
8/18	23.7	23.5	7.12	0.09	60	130		0.6	3	4
9/1	22.2	20.3	9.53	0.03	20	85		0.9	2	3
9/15	23.9	23.1	7.61	0.12	17	65		0.9	3	4
9/30	13.6	14	10.04	0.12	16	98		1.4	3	3
10/13	7	7.1	12.24	0.17	12	47		1.8	3	3

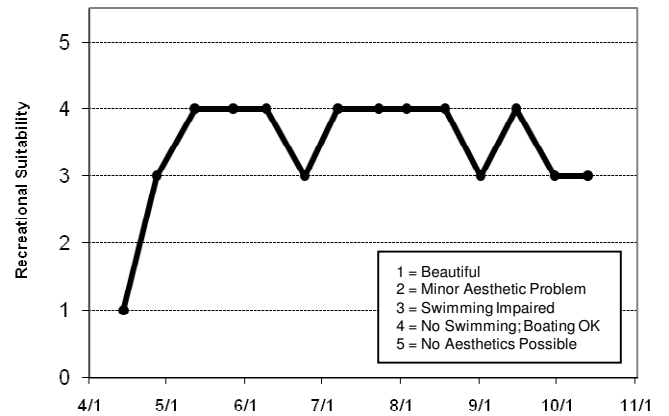
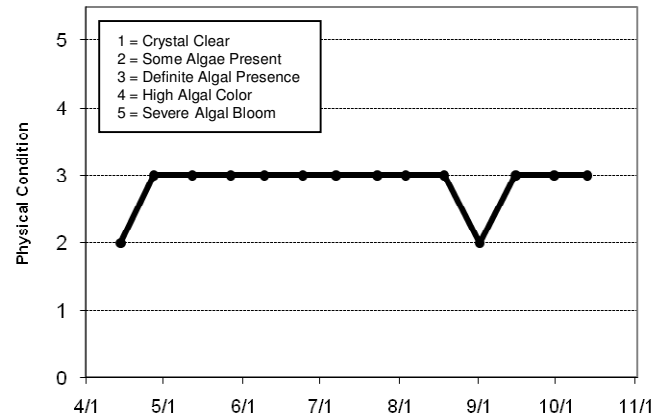
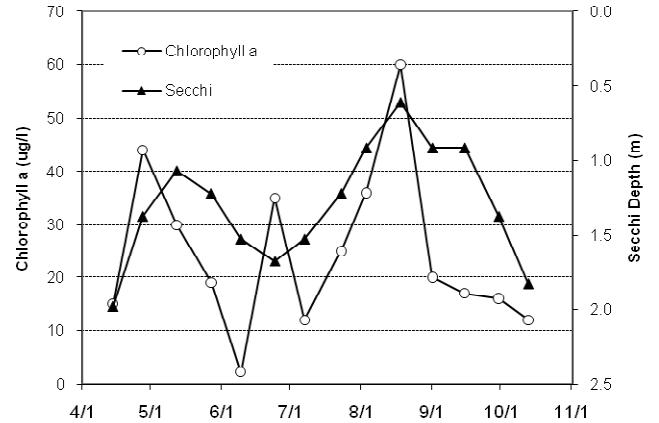
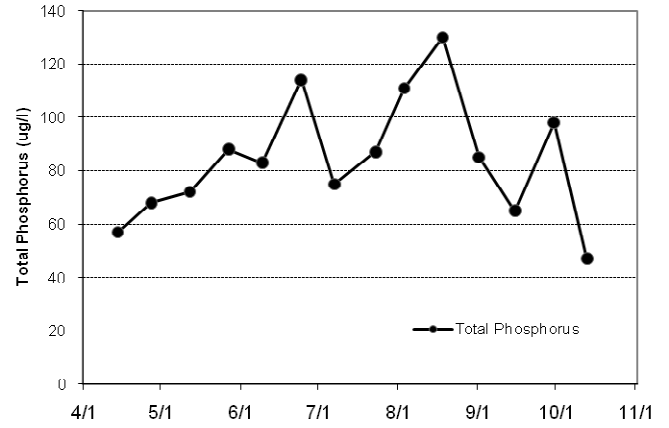
**Lake Water Quality Grades Based on Summertime Averages**

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>							F					

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	F	F	F	D	D	
Chlorophyll a	F	D	F	B	C	
Secchi Depth	F	D	F	C	D	
<b>Lake Grade</b>	<b>F</b>	<b>D</b>	<b>F</b>	<b>C</b>	<b>D</b>	

Source: Metropolitan Council and STORET data



## **Beutel Pond (82-0399) Valley Branch Watershed District**

Beutel Pond is located in the City of Lake Elmo. There are little bathymetric data available for the lake other than that the maximum depth is 1.1 m (3.5 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. A search through the STORET system provided no historical water quality data.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	69.7	55.0	96.0	NA
<b>CLA</b> ( $\mu\text{g/l}$ )	24.3	8.8	54.0	NA
<b>Secchi</b> (m)	0.7	0.6	0.9	NA
<b>TKN</b> (mg/l)	1.67	1.30	1.90	
			<b>Lake Grade</b>	NA

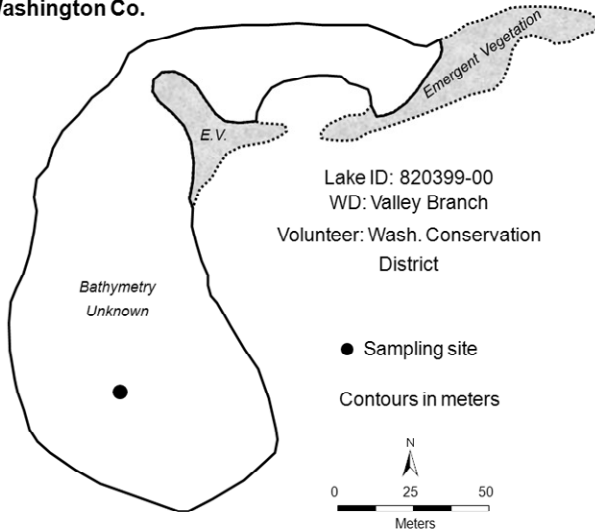
There were insufficient data to calculate the water quality grades (at least 5 data points for the summer-time period are required). Therefore a lake grade was not determined either.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

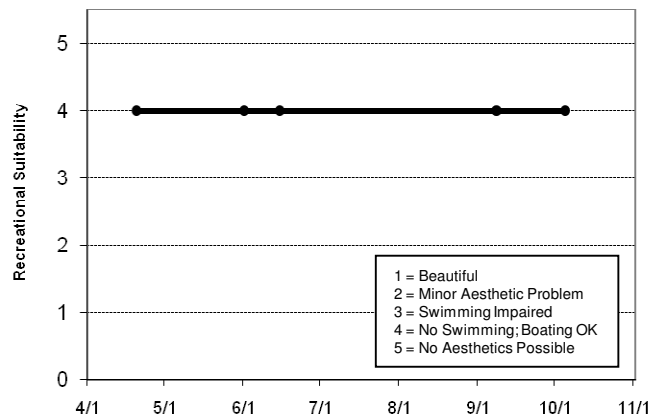
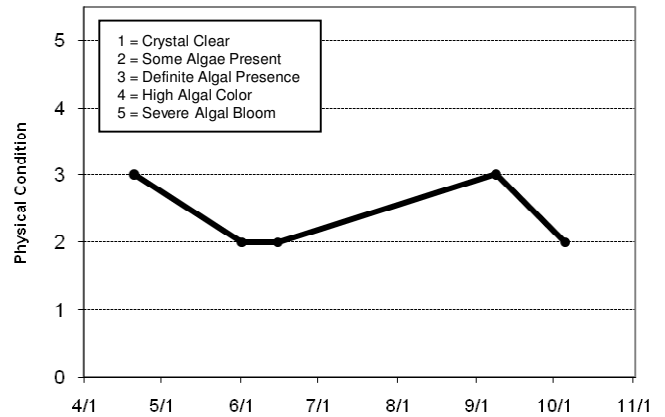
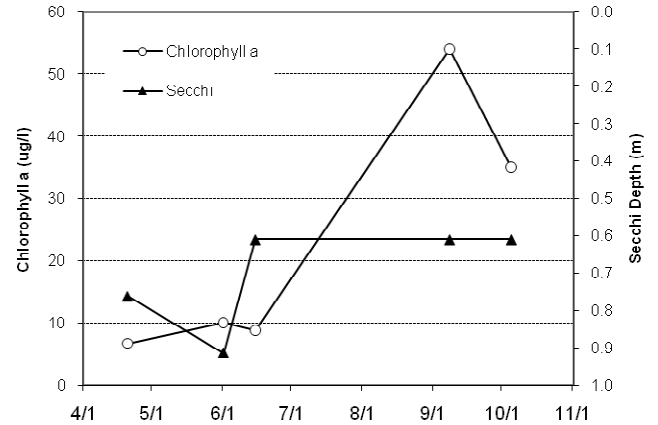
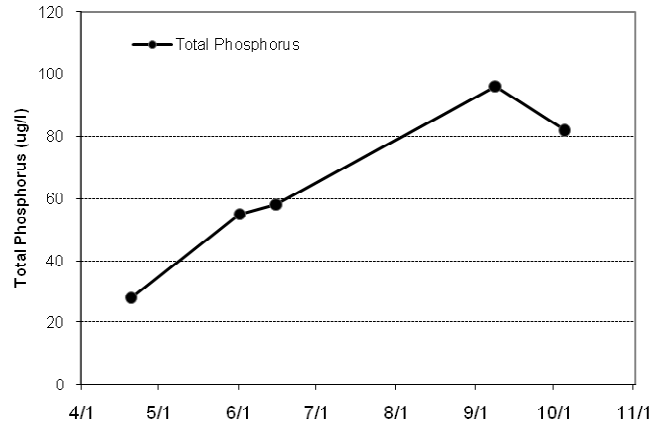


**Beutel Pond**  
Lake Elmo, Washington Co.



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/20	12.5	12.6	5.33	4.67	6.7	28		0.8	3	4
6/1	20.7	19.8	4.6	0.05	10	55		0.9	2	4
6/15	21.5	20.5	5.33	0.09	8.8	58		0.6	2	4
9/8	17.6		5.86		54	96		0.6	3	4
10/5	10.9		7.79		35	82		0.6	2	4



**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												
Lake Grade												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						C
Chlorophyll a						
Secchi Depth						D
Lake Grade						NA

Source: Metropolitan Council and STORET data

**Big Carnelian Lake (82-0049) Carnelian - Marine - St. Croix Watershed District**

Big Carnelian Lake is located in May Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value and exceptional water clarity (METC 2007). The lake has a maximum and mean depth of 20 m (66 feet) and 9.8 m (32 feet), respectively. The lake has a surface area of 455 acres and a watershed of 1,900 acres, giving a small watershed-to-lake area ratio of 4.2:1. The larger the ratio the greater the potential stress put on the lake from surface.

On each sampling day the lake was monitored for secchi transparency and the lake’s perceived physical condition and recreational suitability. A depth profile of oxygen and temperature was also performed. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>Secchi (m)</b>	6.2	5.2	7.9	A

The lake received a grade of A for water clarity for 2009, which is consistent with the historical database. A lake grade was not determined because total phosphorus and chlorophyll-a were not monitored in 2009.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

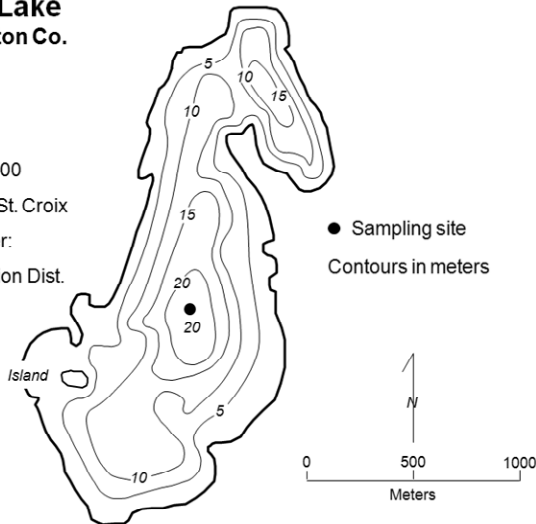
# Big Carnelian Lake May Twp., Washington Co.

LAKE ID: 820049-00

WD: Carnelian-Marine-St. Croix

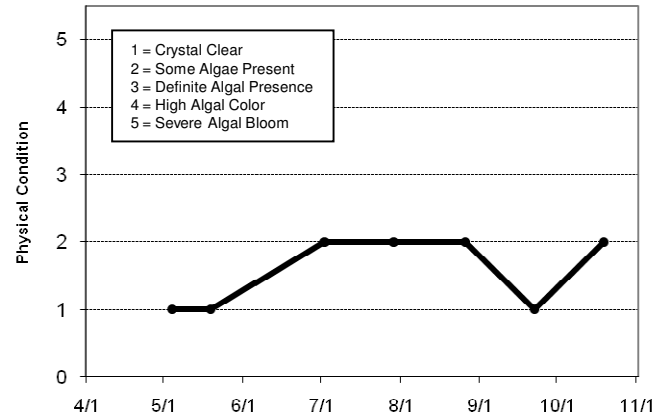
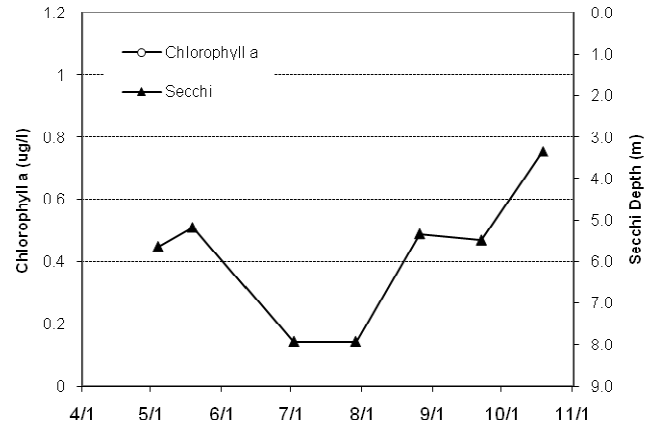
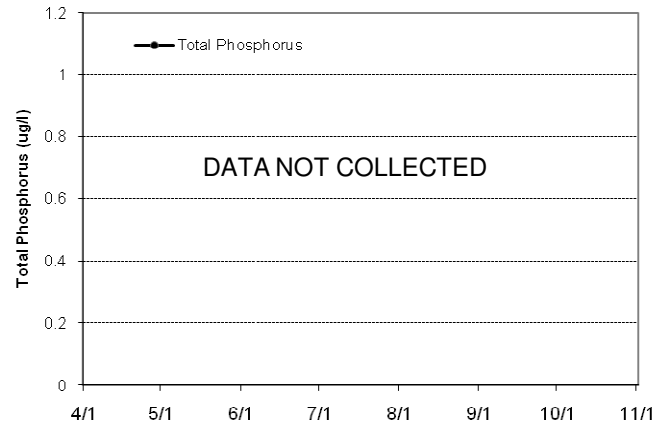
Primary Volunteer:

Washington Conservation Dist.



## 2009 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	12.5	5.5	11.77	0.02				5.6	1	1
5/19	14.7	7	11.09	0.08				5.2	1	1
7/2	21	7.6	8.28	0.05				7.9	2	1
7/29	22.5	8.3	8.84	0.03				7.9	2	1
8/26	23.3	8.6	8.93	0.04				5.3	2	1
9/22	22.6	8.7	8.63	0.02				5.5	1	1
10/19	11	8.1	10.05	0.05				3.4	2	1



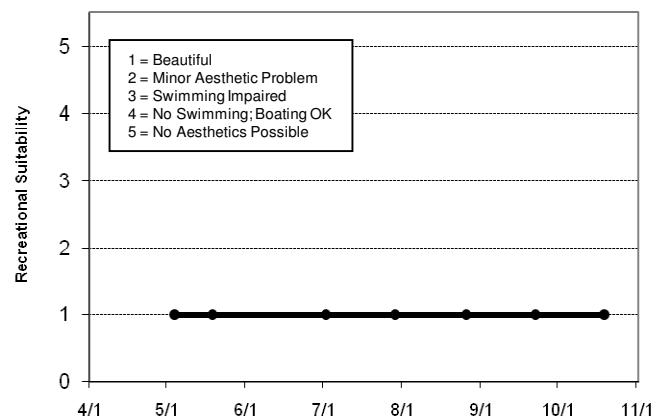
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	A				B					A		A
Chlorophyll a	A				B					A		A
Secchi Depth	A				B					A		B
<b>Lake Grade</b>	<b>A</b>				<b>B</b>					<b>A</b>		<b>A</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus			A	A	A	A	A	A	A	A	B	A
Chlorophyll a			A	A	A	A	A	B	A	A	A	A
Secchi Depth	B	B	B	B	B	A	A	B	A	A	A	B
<b>Lake Grade</b>			<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	B	A		
Chlorophyll a	A	A	A	A		
Secchi Depth	A	A	A	A	A	A
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>		

Source: Metropolitan Council and STORET data



## **Big Comfort Lake (13-0053) *Comfort Lake-Forest Lake Watershed District***

Big Comfort Lake is located northeast of the City of Forest Lake in Chisago County. The lake has a maximum depth of 14.3 m (47 feet). A lake assessment was performed on the lake by the MPCA in 1994, and a lake and watershed diagnostic/feasibility study was completed by BlueWater Science in the early-2000's.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	27.6	12.0	53.0	<b>B</b>
<b>CLA</b> (µg/l)	11.8	3.9	21.0	<b>B</b>
<b>Secchi</b> (m)	2.1	1.5	2.5	<b>C</b>
<b>TKN</b> (mg/l)	0.96	0.68	1.40	
			<b>Lake Grade</b>	<b>B</b>

The lake received a lake grade of B for 2009, which is similar to grades received in some previous years. The lake typically receives a Secchi grade of C. Additional monitoring is recommended to determine the direction of potential trends in the water quality of the lake.

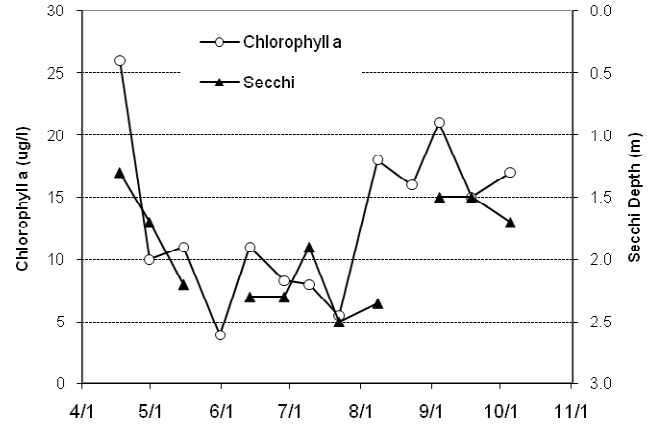
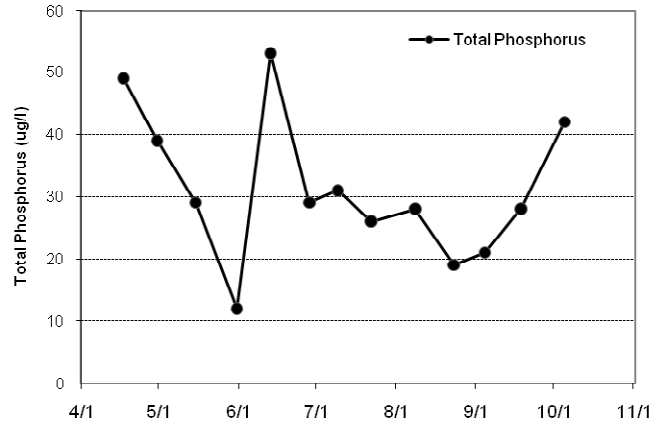
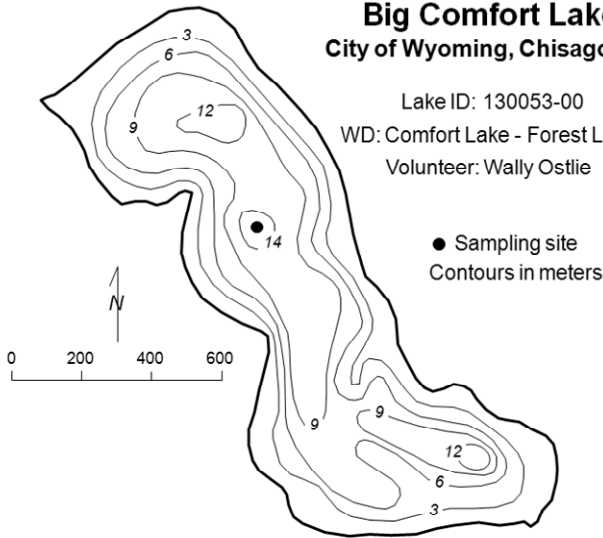
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

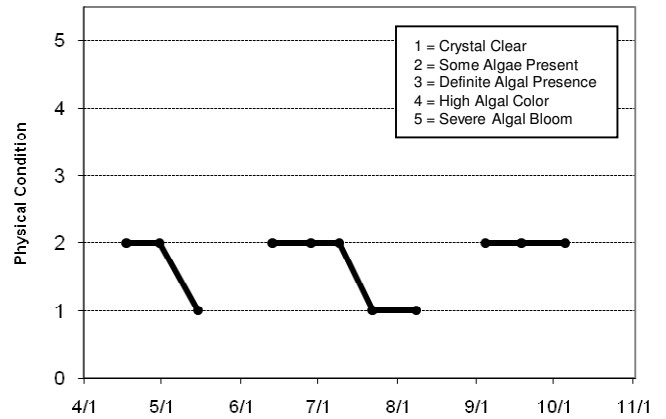
# Big Comfort Lake City of Wyoming, Chisago Co.

Lake ID: 130053-00  
WD: Comfort Lake - Forest Lake  
Volunteer: Wally Ostlie



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/17	11				26	49		1.3	2	2
4/30					10	39		1.7	2	2
5/15	14.8				11	29		2.2	1	1
5/31	18.6				3.9	12				2
6/13	21.3				11	53		2.3	2	1
6/28	22.7				8.3	29		2.3	2	2
7/9	24				8	31		1.9	2	2
7/22	23.2				5.5	26		2.5	1	1
8/8	22.5				18	28		2.4	1	1
8/23					16	19				
9/4	23.4				21	21		1.5	2	2
9/18	25.5				15	28		1.5	2	2
10/5	14.6				17	42		1.7	2	2

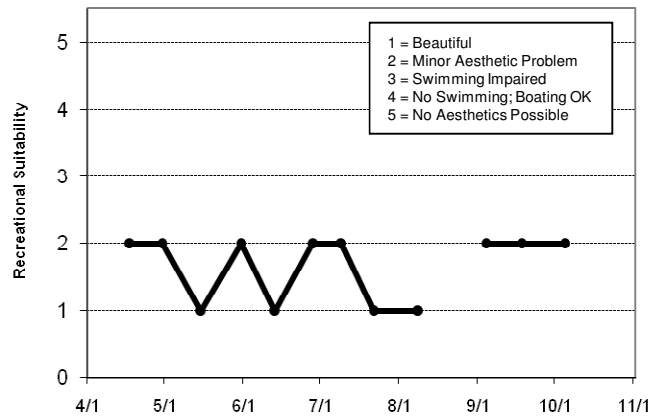


## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth									B	B	B	
<b>Lake Grade</b>												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	B	C	A	B	B
Chlorophyll a	B	B	B	A	A	B
Secchi Depth	C	C	C	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>B</b>



Source: Metropolitan Council and STORET data

## **Big Marine Lake (82-0052) Carnelian - Marine - St. Croix Watershed District**

Big Marine Lake is located in City of Scandia (Washington County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a maximum and mean depth of 15.2 m (50 ft) and 7.6 m (25 feet), respectively. The lake has a surface area of 1,706 acres and a watershed of 2,659 acres, giving a small watershed-to-lake area ratio of 1.6:1. The larger the ratio the greater the potential stress put on the lake from surface runoff. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for secchi transparency, as well as the lake's perceived physical condition and recreational suitability. A depth profile of dissolved oxygen and temperature was also measured. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

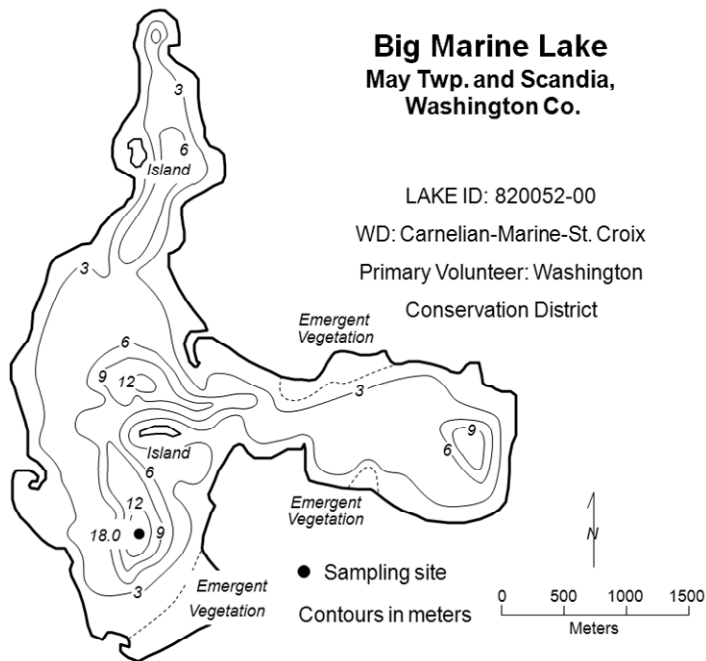
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>Secchi (m)</b>	4.2	2.7	6.2	A

The lake received a Secchi grade of A which is consistent with the historical data.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



#### 2009 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	12.6	11.5	10.66	0.04				6.2	1	1
5/19	14.7	13.8	10.35	0.07				5.5	1	1
7/2	20.3	16.1	7.85	0.06				3.7	1	1
7/29	22.2	16.4	8.79	0.05				3.8	2	2
8/26	22.1	16.9	8.25	0.05				2.7	2	1
9/22	21.8	18.2	7.9	0.03				3.4	1	1
10/19	8.7	8.9	12.58	0.09				4.6	1	1

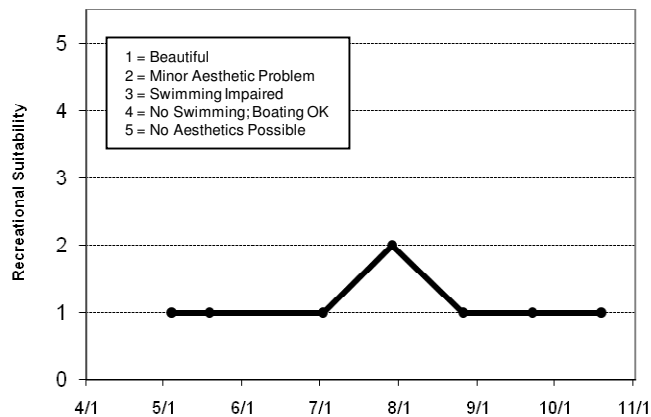
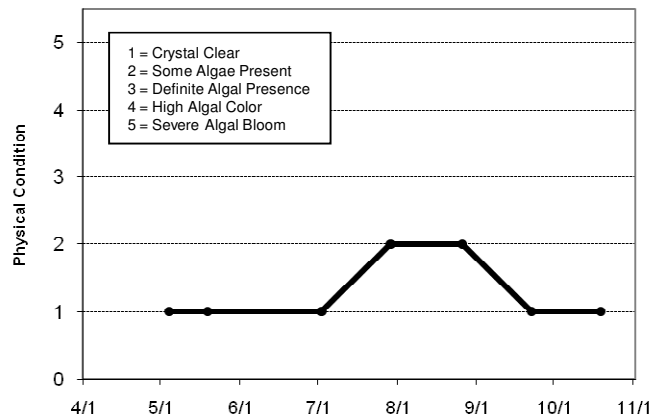
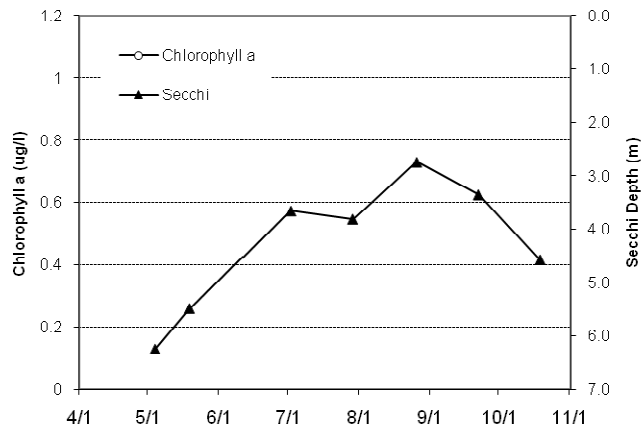
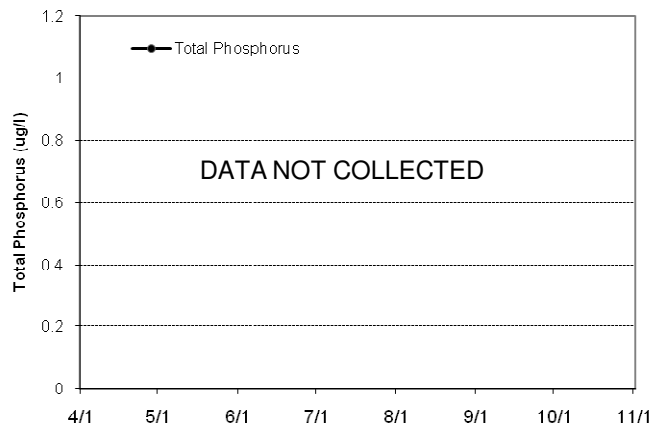
#### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	B	B			B					A		B
Chlorophyll a	B	B			B					A		A
Secchi Depth	B	B			B	B	B	B	C	A	C	B
<b>Lake Grade</b>	<b>B</b>	<b>B</b>			<b>B</b>					<b>A</b>		<b>B</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus			A		B	A	A	A	A	A	B	A
Chlorophyll a			A		A	A	A	B	A	A	B	A
Secchi Depth	A	A	B		A	B	A	B	A	A	B	B
<b>Lake Grade</b>			<b>A</b>		<b>A</b>	<b>A</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>B</b>	<b>A</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	C	A		
Chlorophyll a	A	A	A	A		
Secchi Depth	A	A	A	A	A	A
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>B</b>	<b>A</b>		

Source: Metropolitan Council and STORET data



## **Bone Lake (82-0054) Comfort Lake-Forest Lake Watershed District**

Bone Lake is located in the City of Scandia (Washington County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a maximum and mean depth of 9.8 m and 3.7 m (32 ft and 12 ft), respectively. The lake has a surface area of 212 acres and a watershed of 5,177 acres, giving a large watershed-to-lake area ratio of 24:1. The greater the ratio, the greater the potential stress on the lake from surface runoff. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	39.4	28.0	97.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	16.7	5.4	73.0	B
<b>Secchi</b> (m)	1.8	1.1	3.5	C
<b>TKN</b> (mg/l)	1.23	0.96	1.50	
			<b>Lake Grade</b>	C

The lake received a lake grade of C for 2009 which is consistent with the historical database. The lake appears to be represented best by a lake grade of C.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

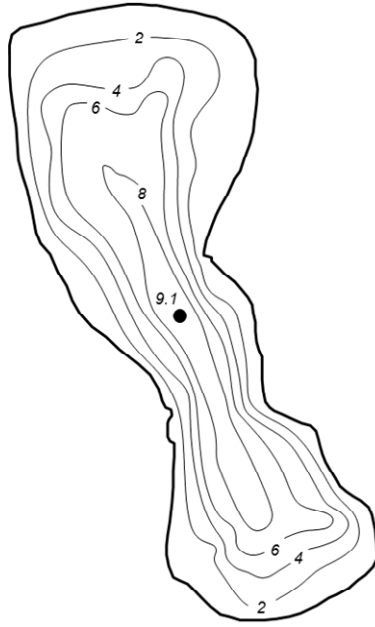
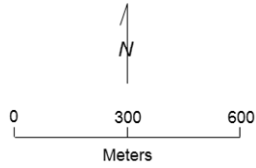
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



# Bone Lake Scandia, Washington Co.

Lake ID: 820054-00  
WD: Comfort Lake - Forest Lake  
Volunteers: Jon Hafner & Don Jack

● Sampling site  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/11	17				6.3	97		2.4		
5/18	16				14	44		2.0	2	2
5/28	20.5				27	31		1.7	2	2
6/9	18.3				10	40		1.8		
6/15	23				7.7	33		2.0	2	2
6/20	26				5.4	36		2.1	2	3
7/1	20				8.2	31		3.5	2	2
7/19	23				14	31		1.2	3	3
8/2	23.1				17	36		1.2	2	2
9/6	22.7				73	36		1.1	2	2
9/15	23				11	30		1.3	3	2
9/26	22				6.4	28		1.4	3	3

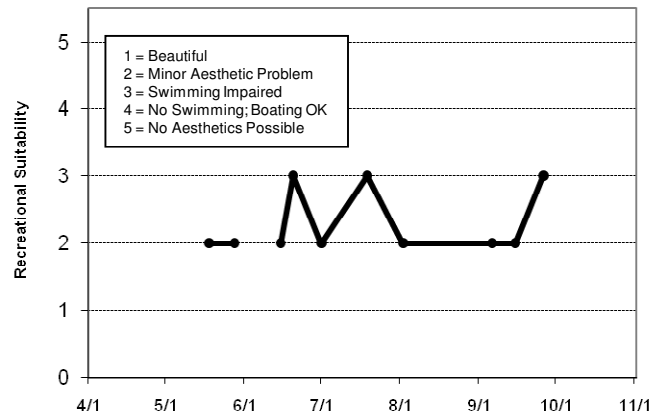
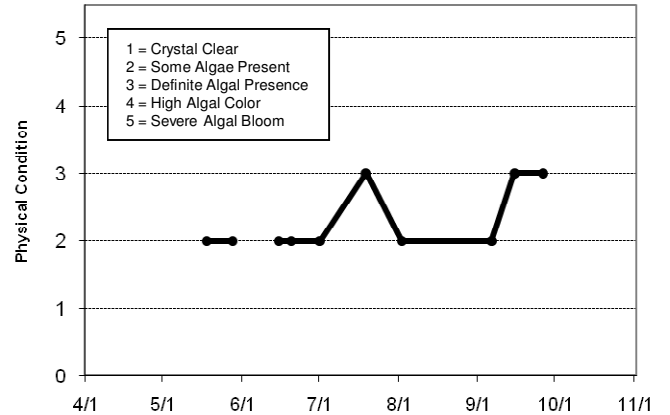
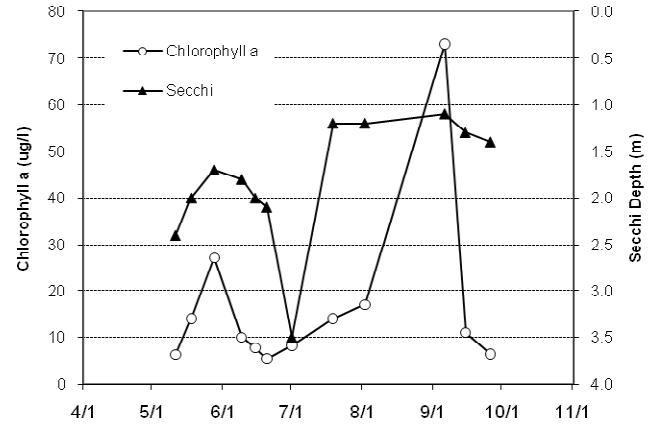
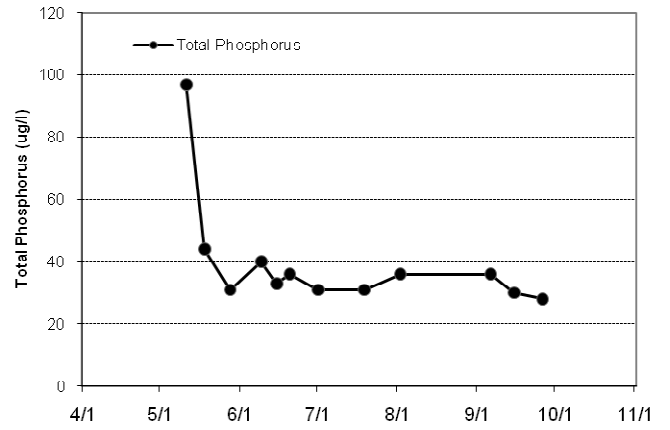
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus					D				C	C	C	D
Chlorophyll a					C				B	C	C	C
Secchi Depth					C	D	C	D	C	C	C	C
<b>Lake Grade</b>					<b>C</b>				<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	C
Chlorophyll a	C	B	B	B	B	B
Secchi Depth	C	C	C	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data



**Brick Pond (82-0308) Middle St. Croix Watershed Management Organization**

Brick Pond is located in the City of Stillwater (Washington County). The maximum depth of the lake is 1.5 m (5.0 ft). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. This year was the second year that Brick Pond has been involved in the CAMP. A search through the STORET system provided no historical water quality data.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	69.7	36.0	92.0	D
<b>CLA</b> (µg/l)	5.7	2.5	9.3	A
<b>Secchi</b> (m)	0.8	0.5	1.2	D
<b>TKN</b> (mg/l)	0.86	0.55	1.20	
<b>Lake Grade</b>				C

The lake received a lake grade of C for year 2009. The lake grade and individual parameter grades were identical for 2009 compared to 2008. Usually the letter grades for each parameter are within a letter grade of each other. The relatively low CLA summer-time mean concentration, which yielded a CLA grade of A versus the D grades for the other parameters, indicate that suspended sediment may be a possible cause of the low water clarity during 2009. The relatively high TP concentrations indicate that either sediment was being resuspended in the water column or the lake received substantial amounts of particulate-laden runoff or both. In either case, the increase turbidity would decrease available light (i.e. reduced water clarity), and thereby suppress algal growth.

To the best of our knowledge, there are no water quality data available for Brick Pond other than the 2008 and 2009 CAMP data. Additional years of data collection are needed to determine water quality trends.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

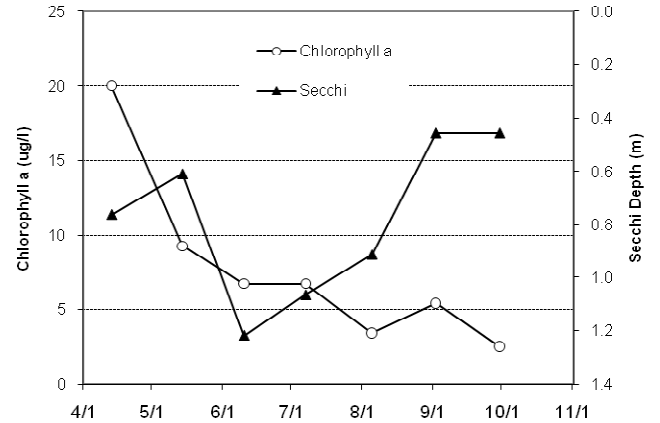
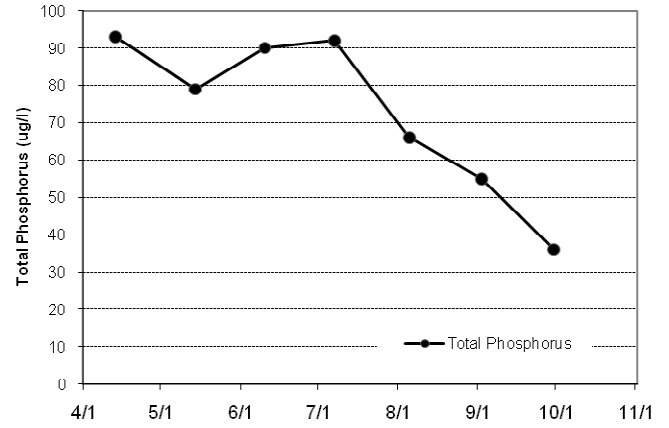
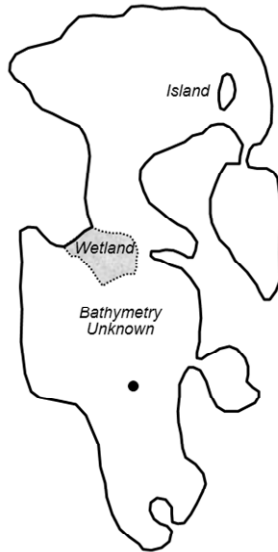
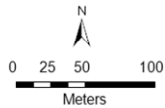
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Brick Pond Stillwater, Washington Co.

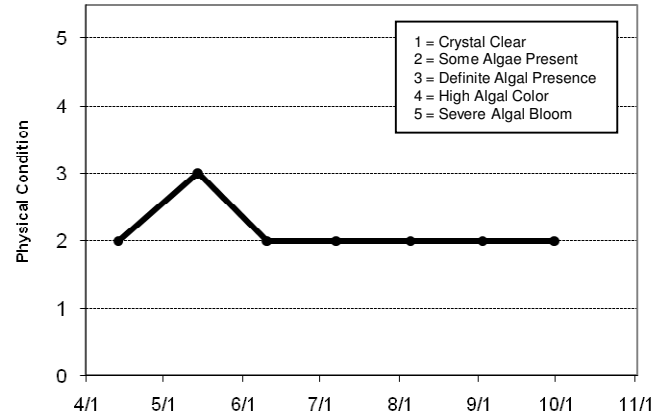
Lake ID: 820308-00  
WMO: Middle St. Croix  
Volunteer: Washington Conservation District

● Sampling site  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	12.5	12.3	13.01	11.53	20	93		0.8	2	4
5/14	15	15	9.72	0.09	9.3	79		0.6	3	4
6/10	16.5	14.9	10.49	5.75	6.7	90		1.2	2	2
7/7	26.5	24.7	13.25	0.09	6.7	92		1.1	2	4
8/5	23.2	23.2	7.95	1.05	3.4	66		0.9	2	4
9/2	20.1		11.01		5.4	55		0.5	2	4
9/30	13.1		14.96		2.5	36		0.5	2	2

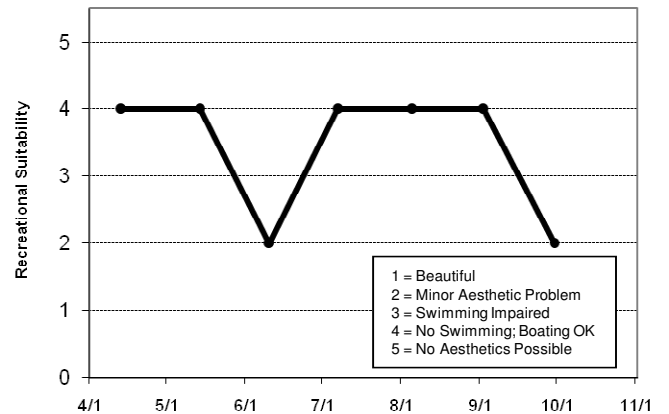


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					D	D
Chlorophyll a					A	A
Secchi Depth					D	D
Lake Grade					C	C



Source: Metropolitan Council and STORET data

## Brickyard Lake (10-0225) Carver County Environmental Services

Brickyard Lake is a 17-acre lake located in the City of Chaska (Carver County). The maximum depth of the lake is 13.1 m (43 feet).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	22.1	9.0	69.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	4.2	1.5	13.0	A
<b>Secchi</b> (m)	4.4	2.7	5.8	A
<b>TKN</b> (mg/l)	0.58	0.30	1.20	
<b>Lake Grade</b>				A

The lake received a lake grade of A for 2009. The lake's water quality is well represented by a lake grade of A according to its historical database.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

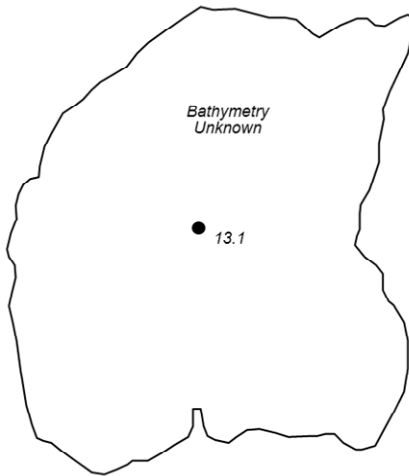
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

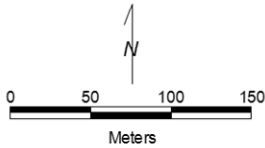
# Brickyard Clayhole Lake

## Chaska, Carver Co.

Lake ID: 100225  
 WD: Lower Minnesota River  
 Volunteer: Carver County



● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	10.41		9.94		4.9			1.2	2	2
4/28	12.36		12.97		5.5			1.7	1	1
5/14	15.23		9.92		4.1	17		3.2	2	2
5/28	18.44		10.04		2.2	13		5.7	1	1
6/10	17.47		9.84		3.5	14		5.0	2	3
6/24	24.88		9.88		1.5	13		4.5	1	1
7/8	24.17		11.88		1.5	9		5.8	3	3
7/23	22.75		9.7		2.1			5.5	2	1
8/5	23.62		9.17		4.3	13		4.3	2	2
8/19	24.19		9.02		4.1	13		4.0	1	2
9/2	21.38		8.57		3.9	69		3.9	2	2
9/17	23.27		9.89		6.3	36		3.3	2	2
9/30	18.39		8.55		13	24		2.7	1	1
10/19	10.74		8.8		10	31		3.0	2	2

### 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												
Lake Grade												

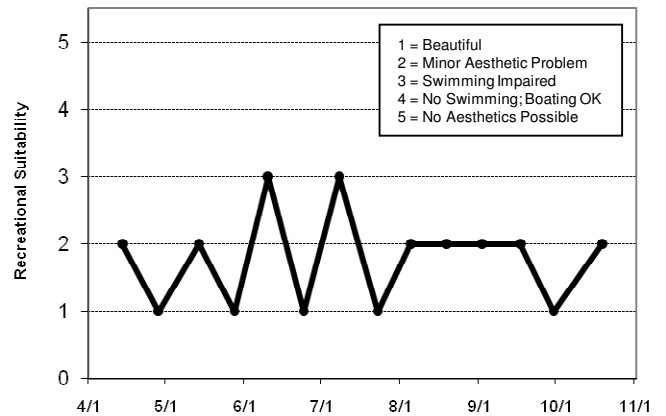
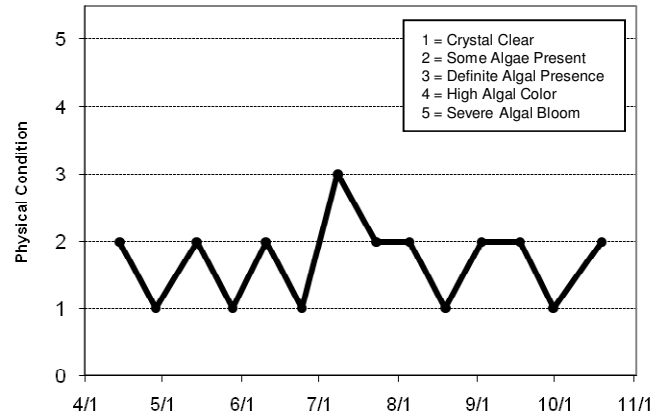
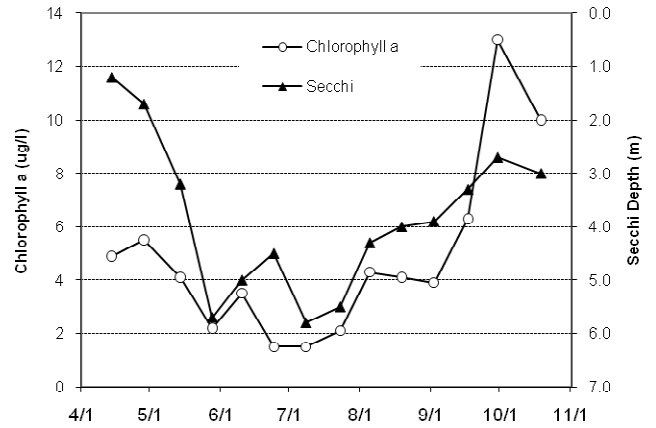
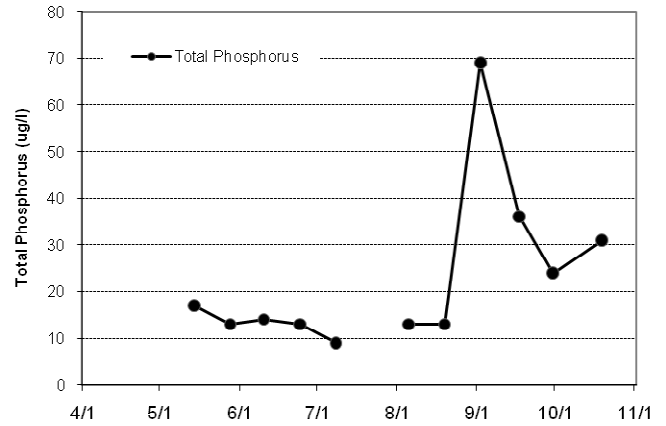
  

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus											A	A
Chlorophyll a											A	A
Secchi Depth											A	A
Lake Grade											A	A

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	B	A	B	A
Chlorophyll a	A	A	A	A	A	A
Secchi Depth	A	A	A	A	A	A
Lake Grade	A	A	A	A	A	A

Source: Metropolitan Council and STORET data



## Burandt Lake Lake (10-0084) Carver County Environmental Services

Burandt Lake is a 96-acre lake located in the City of Waconia (Carver County). The maximum depth of the lake is 7.3 m (24 feet). The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	40.0	33.0	48.0	NA
<b>CLA</b> (µg/l)	17.6	2.7	38.0	NA
<b>Secchi</b> (m)	0.5	0.3	0.6	NA
<b>TKN</b> (mg/l)	1.14	0.73	1.60	
			<i>Lake Grade</i>	NA

The lake did not receive a lake grade in 2008 because there were too few monitoring events during the summer-time period (May – September). At least five monitoring events are needed in that time frame to calculate a lake grade.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Burandt Lake**  
Waconia, Carver Co.

Lake ID: 100084-00  
WMO: Carver Creek  
Volunteer: Dan Durkin



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	18				1.1	56		0.9	1	1
5/12	20				2.7	33		0.6	1	1
5/28	21				12	39		0.5	2	1
8/16	23				38	48		0.3		

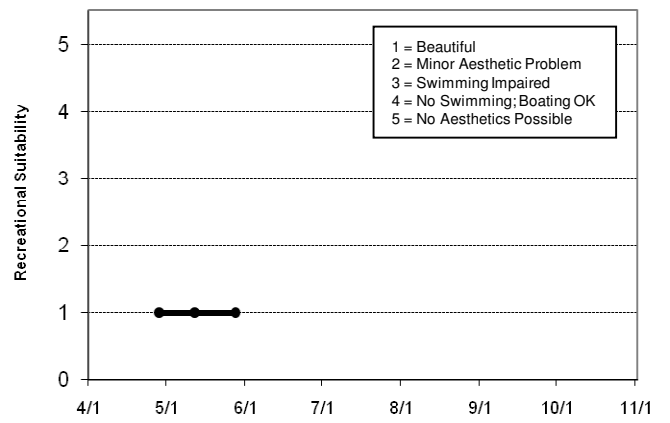
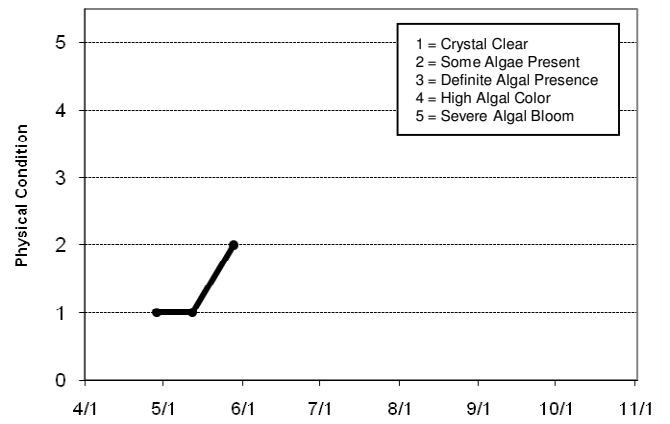
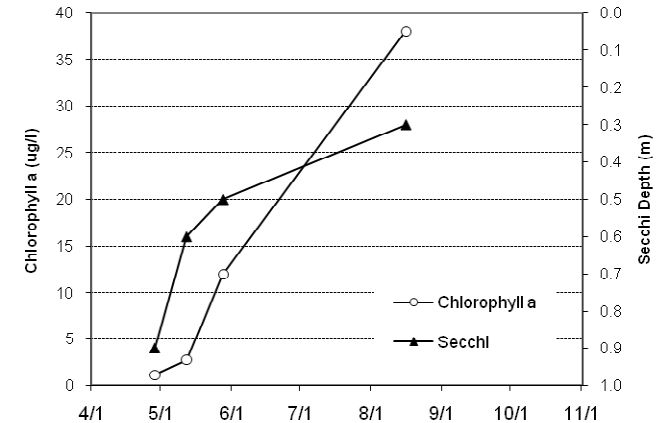
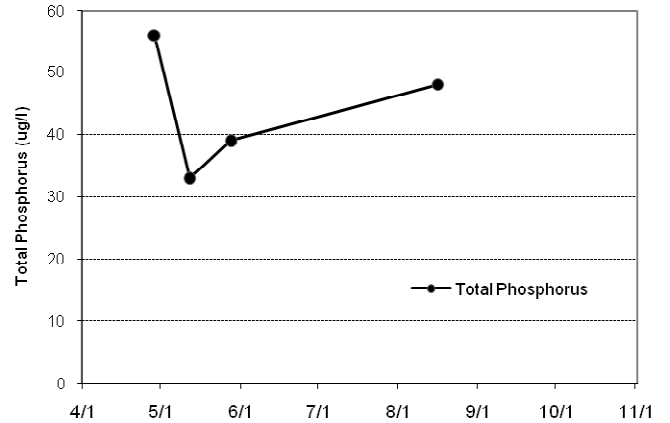
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C				
Chlorophyll a	C	C				
Secchi Depth	C	C				
<b>Lake Grade</b>	<b>C</b>	<b>C</b>				<b>NA</b>

Source: Metropolitan Council and STORET data



**Bush Lake (27-0047) Nine Mile Creek Watershed District**

Bush Lake is located in the City of Bloomington (Hennepin County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value and exceptional water clarity (METC 2007). The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

This is the fourth year that Bush Lake has been enrolled in the CAMP. Council staff has monitored the lake in the past. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	15.4	10.0	30.0	A
<b>CLA</b> (µg/l)	3.8	2.4	6.6	A
<b>Secchi</b> (m)	3.2	2.6	4.3	A
<b>TKN</b> (mg/l)	0.62	0.44	0.79	
<b>Lake Grade</b>				A

For 2008, the lake received a lake grade of A in addition to receiving letter grades of A for TP, CLA, and secchi transparency. The lake received these same grades in 1984, 1993, and 2008. The lake grades appear to fluctuate between A and B on the basis of the historical database.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



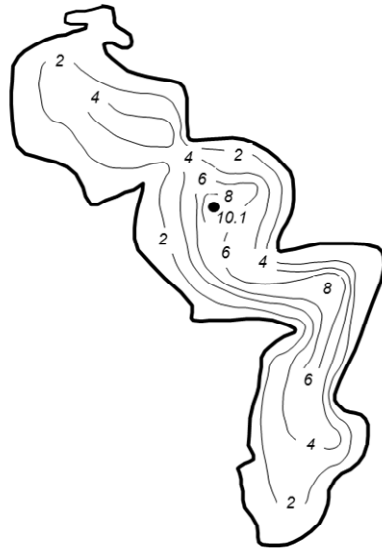
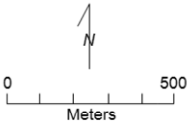
# Bush Lake

Bloomington, Hennepin Co.

Lake ID: 270047-00  
 WD: Nine Mile Creek

Volunteer: Gregg Thompson

● Sampling site  
 Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/10	16.8				2.8	13		3.8	1	1
5/18	18				2.6	15		4.3	1	1
6/7	19.7				2.4	18		3.4	1	1
6/17	22.3				3.4	30		3.5	2	1
6/24	27.7				2.7	14		3.5	2	2
7/3	24.2				3.3	13		3.0	2	2
7/19	23.9				4.4	11		3.0	2	2
8/10	25.9				4.5	11		3.0	3	2
8/23	23.4				6.6	10		2.6	2	2
9/3	24.6				4.5	23		2.7	2	2
9/21	24.4				4.2	11		2.9	2	
10/4	15.3				6.4	19		2.9	2	2
10/11	11.9				4.8	27		3.0	2	1

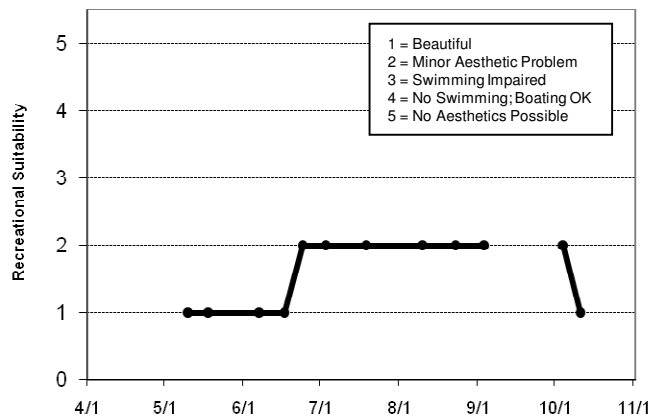
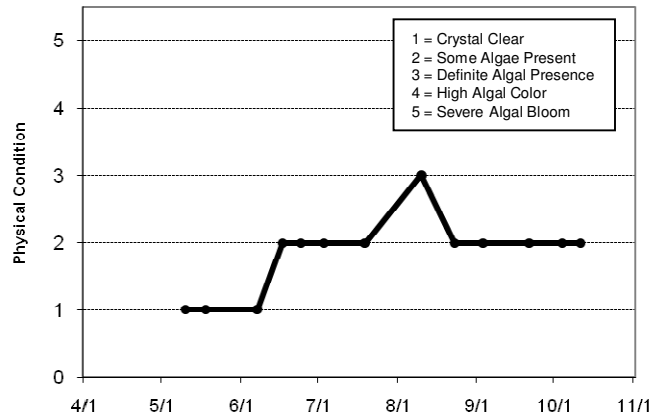
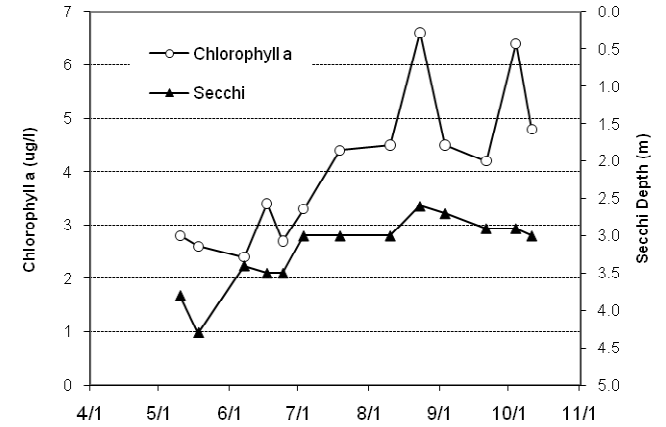
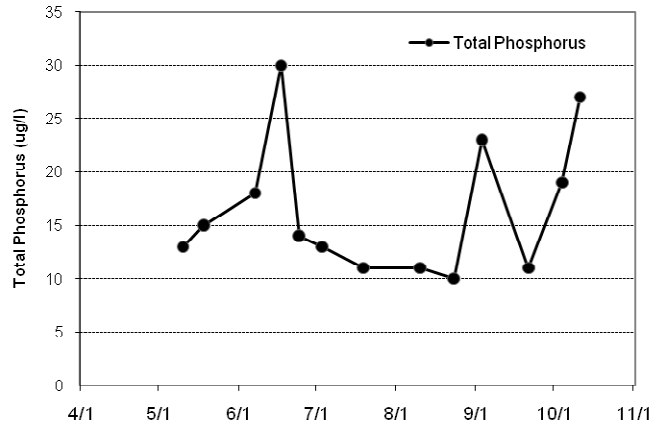
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus				B	A							
Chlorophyll <i>a</i>				B	A							
Secchi Depth				B	A	B	A	B	C			
<b>Lake Grade</b>				<b>B</b>	<b>A</b>							

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus	A	A						B	A			
Chlorophyll <i>a</i>	A	A						B	B			
Secchi Depth	A	B						B	A			
<b>Lake Grade</b>	<b>A</b>	<b>A</b>						<b>B</b>	<b>A</b>			

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	A	A	A	A
Chlorophyll <i>a</i>	B	A	B	A	A	A
Secchi Depth	B	B	B	A	A	A
<b>Lake Grade</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>A</b>

Source: Metropolitan Council and STORET data



## Capaul's Pond [east basin] (82-0365) Valley Branch Watershed District

Capaul's Pond is located in Grant Township (Washington County). There is no bathymetric information available for the east basin. The basin is to the east of the Gateway State Trail.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. A depth profile of dissolved oxygen and temperature was also measured. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	191.0	99.0	364.0	NA
<b>CLA</b> (µg/l)	82.7	29.0	170.0	NA
<b>Secchi</b> (m)	0.8	0.5	1.1	NA
<b>TKN</b> (mg/l)	2.23	1.70	3.30	
			<b>Lake Grade</b>	NA

There were insufficient data to calculate the water quality grades and the lake grade (at least 5 data points for the summer-time period are required). Additional years of monitoring are suggested to build an historical water quality database for this lake.

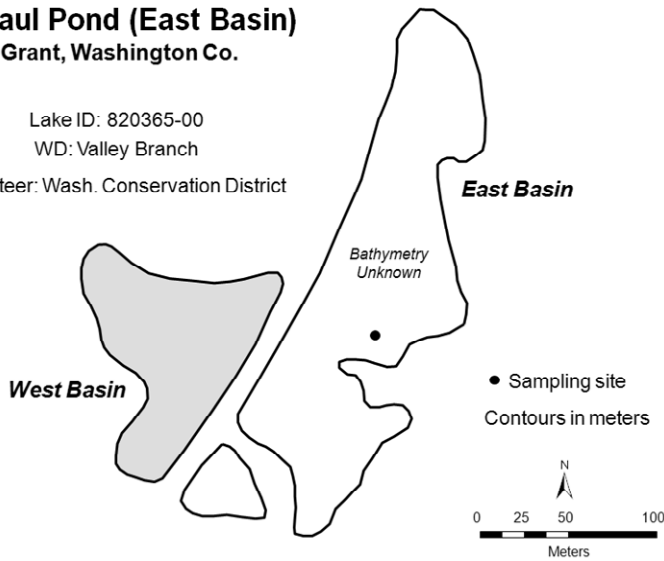
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Capaul Pond (East Basin) Grant, Washington Co.

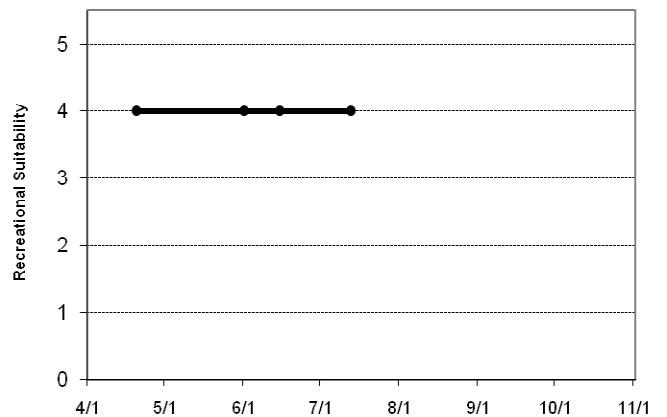
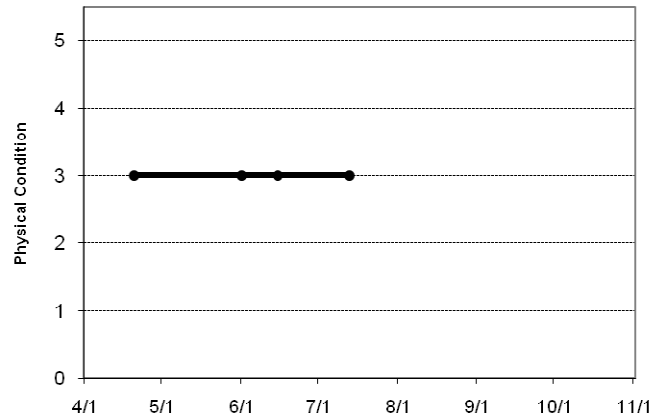
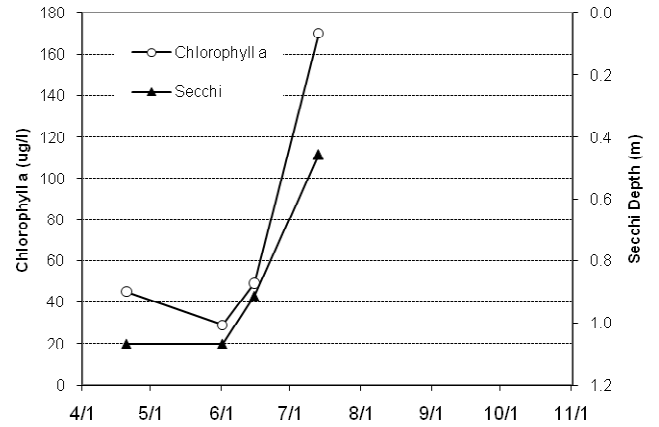
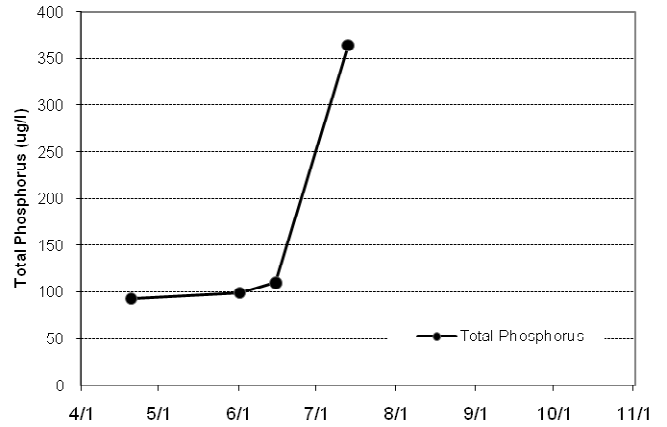
Lake ID: 820365-00  
WD: Valley Branch

Volunteer: Wash. Conservation District



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/20	13	13.2	8.19	0.11	45	93		1.1	3	4
6/1	20.2	19.8	7.14	6.85	29	99		1.1	3	4
6/15	24.3	4.88	10.09	0	49	110		0.9	3	4
7/13	23.6	23	6.86	0.09	170	364		0.5	3	4



## 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												
Lake Grade												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						D
Chlorophyll a						C
Secchi Depth						D
Lake Grade						D NA

Source: Metropolitan Council and STORET data

**Carol Lake (82-0017) Carnelian - Marine - St. Croix Watershed District**

Carol Lake is located within Stillwater Township (Washington County). The lake has a maximum and mean depth of 1.8 m (5.9 feet) and 0.9 m (3 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. A depth profile of dissolved oxygen and temperature was also measured. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)				
<b>CLA</b> (µg/l)				
<b>Secchi</b> (m)	1.3	0.9	1.5	C
<b>TKN</b> (mg/l)				
<b>Lake Grade</b>				

The secchi depth grade for 2009 was a C, which is an increase in comparison to the past few years. Water clarity has been decreasing since the late 1990s, so continued monitoring is suggested to determine if this year’s water clarity improvement is the beginning of a trend or an anomaly.

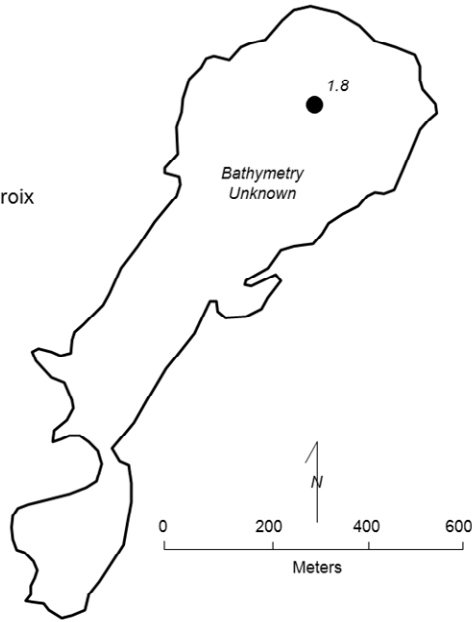
Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Carol Lake Stillwater Twp., Washington Co.

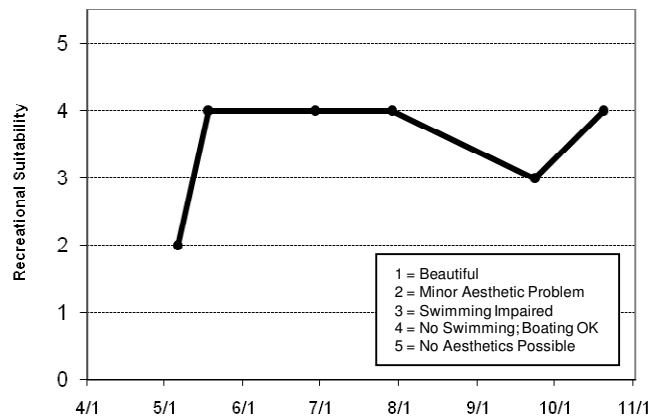
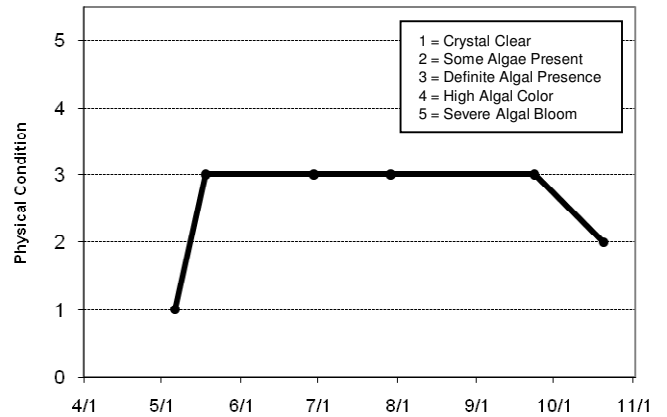
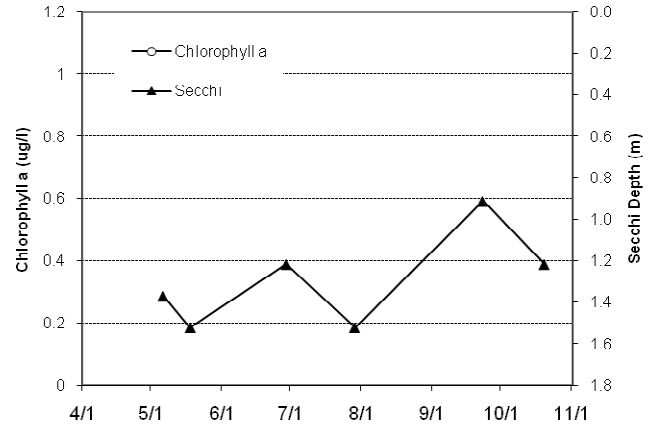
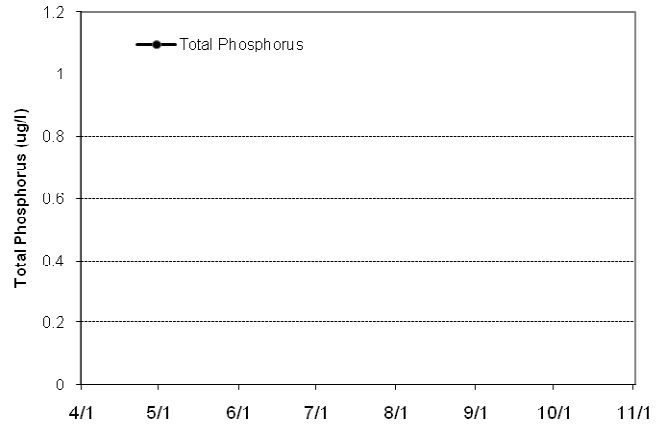
LAKE ID: 820017-00  
 WD: Carnelian-Marine-St. Croix  
 Volunteer: Washington  
 Conservation District

● Sampling site  
 Contours in meters



## 2009 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
5/6	16.3	16.1	7.49	5.32				1.4	1	2
5/18	16	15.2	11.66	2.86				1.5	3	4
6/29	21.7	21.6	5.52	4.99				1.2	3	4
7/29	21.7	20.8	4.59	0.11				1.5	3	4
9/23	20.4	20.3	1.85	0.41				0.9	3	3
10/20	9	8.9	11.75	0.11				1.2	2	4



## 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												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					B	A	A	A	A	B		C
Chlorophyll a					B	C	C	C	A	A		B
Secchi Depth					B	B	B	B	C	C	D	D
<b>Lake Grade</b>					<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>		<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	B		
Chlorophyll a	B	B	A	A		
Secchi Depth	D	D	D	D	D	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>		

Source: Metropolitan Council and STORET data

## **Cates Lake (70-0018) Prior Lake – Spring Lake Watershed District**

Cates Lake is a 27-acre lake located in the City of Savage (Scott County). The maximum depth of the lake is 4.0 m (13 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<b>Parameter</b>	<b>Mean</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Grade</b>
<b>TP</b> (µg/l)	19.5	8.0	36.0	A
<b>CLA</b> (µg/l)	4.9	2.9	8.5	A
<b>Secchi</b> (m)	2.0	1.6	2.4	C
<b>TKN</b> (mg/l)	0.90	0.66	1.20	
<b>Lake Grade</b>				<b>B</b>

The lake received a lake grade of B for 2009, which is the same grade it has received for the previous 6 years. Given the available historical water quality data, the water quality of the lake is well represented by a lake grade of B. The individual parameter grades were similar for 2009 as for 2002, 2005, 2007, and 2008. The water quality of the lake appears to be relatively stable since 2002.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Cates Lake

## Prior Lake, Scott Co.

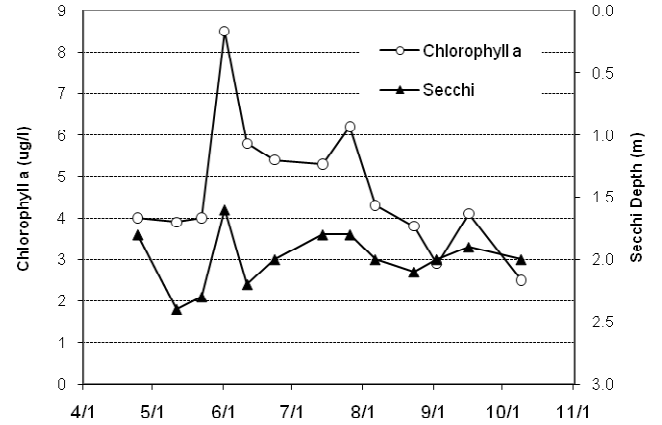
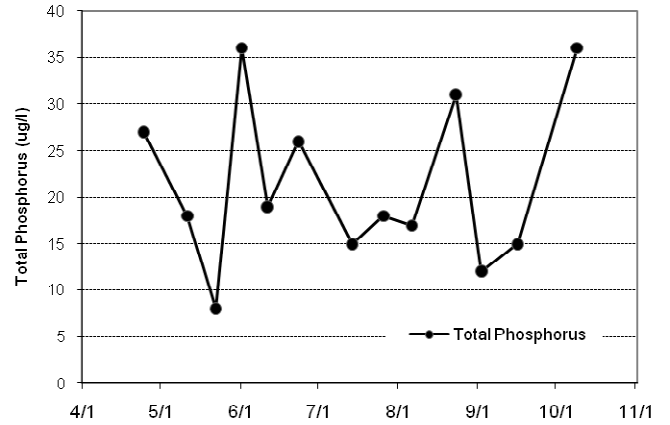
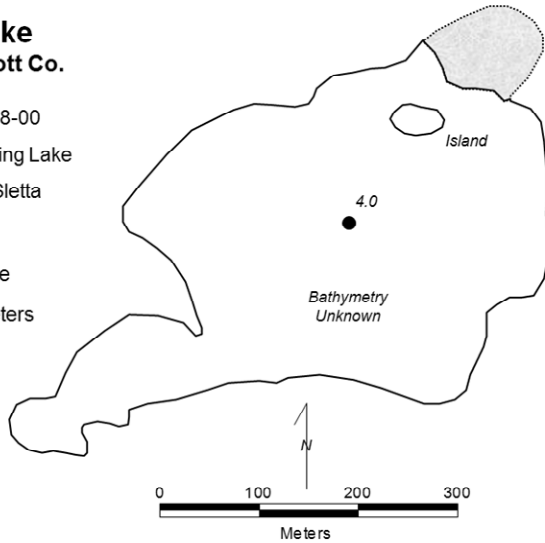
LAKE ID: 700018-00

WD: Prior Lake-Spring Lake

Volunteer: Tom Sletta

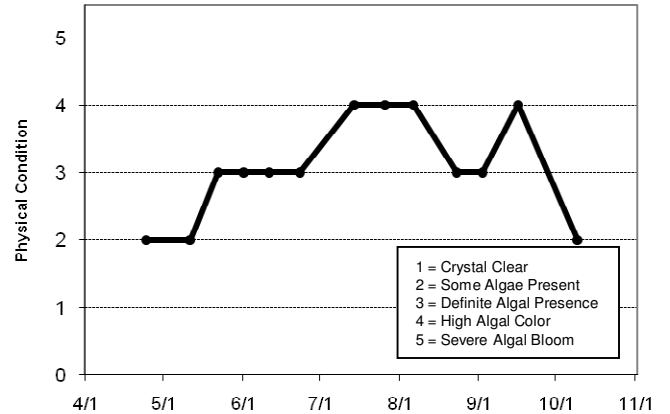
● Sampling site

Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/24	15.4				4	27		1.8	2	4
5/11	16.3				3.9	18		2.4	2	4
5/22	18.7				4	8		2.3	3	4
6/1	21.1				8.5	36		1.6	3	4
6/11	17.8				5.8	19		2.2	3	4
6/23	27.2				5.4	26		2.0	3	4
7/14	24.3				5.3	15		1.8	4	4
7/26	25.9				6.2	18		1.8	4	4
8/6	23.3				4.3	17		2.0	4	4
8/23	23.4				3.8	31		2.1	3	4
9/2	21				2.9	12		2.0	3	4
9/16	23.4				4.1	15		1.9	4	4
10/9	10.6				2.5	36		2.0	2	4

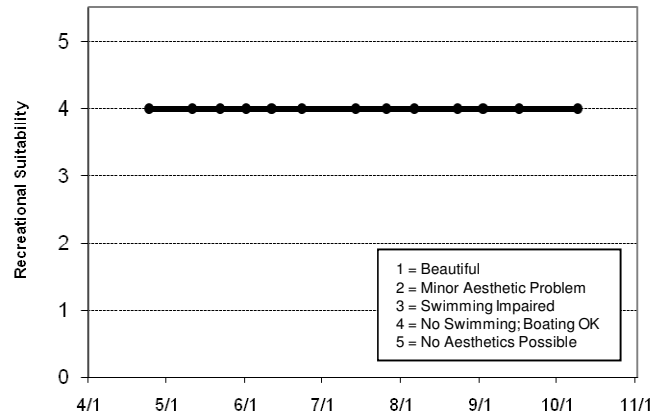


### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus											A	B
Chlorophyll a											A	A
Secchi Depth											C	C
<b>Lake Grade</b>											<b>B</b>	<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	A	B	A	A	A
Chlorophyll a	A	A	A	A	A	A
Secchi Depth	C	C	C	C	C	C
<b>Lake Grade</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>



Source: Metropolitan Council and STORET data

## **Cedar Island Lake (27-0119) Shingle Creek Watershed Management Commission**

Cedar Island Lake is located within the City of Maple Grove (Hennepin County). The maximum depth of the lake is 2.1 m (6.9 ft), and the mean depth is 1.4 m (4.6 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has a surface area of 80 acres and a watershed area of 800 acres, giving a watershed to lake area ratio of 10:1. The larger the ratio the greater the potential effects of runoff on the water quality of the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	343.3	250.0	464.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	129.7	81.0	170.0	F
<b>Secchi</b> (m)	0.3	0.3	0.4	F
<b>TKN</b> (mg/l)	5.25	4.00	6.00	
<b>Lake Grade</b>				F

The lake received a lake grade of F for 2009, which is consistent with the lake's historical database. Continued monitoring is recommended to build the water quality database of this lake.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

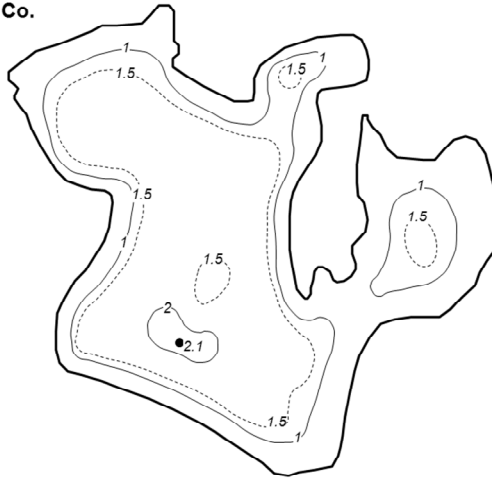
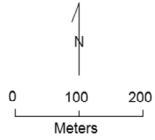
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



**Cedar Island Lake**  
Maple Grove, Hennepin Co.

Lake ID: 270119-00  
WMO: Shingle Creek  
Volunteer: Steven Lane

● Sampling site  
Contours in meters



**2009 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
5/3	16.6				86	250		0.4		3
5/17	18.7				81	301		0.4		3
5/31	20.3				140	286		0.4	4	4
6/10	18.8				170	325		0.3	4	4
7/11	24.3				160	464		0.3	4	4
7/23	23.5				140	420		0.3	4	4
8/9	26.1				110	351		0.3	4	4
8/16	25.1				150	409		0.3	4	4
9/2	21.6				150	352		0.3	4	4
9/18	23.4				110	275		0.3	4	4
10/18	7.8				42	129		0.3	4	4

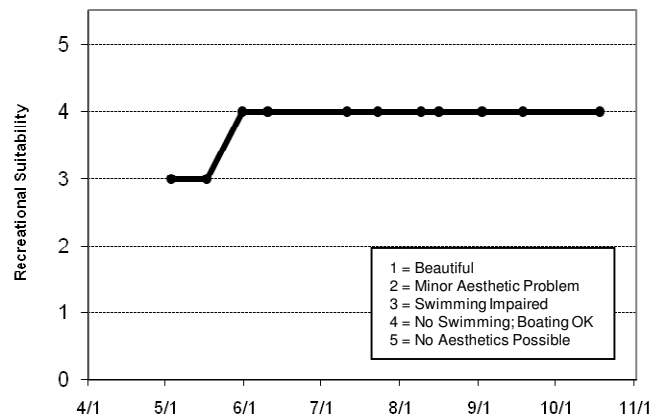
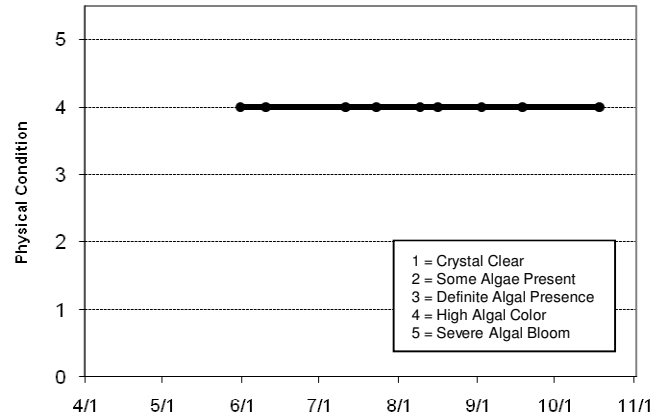
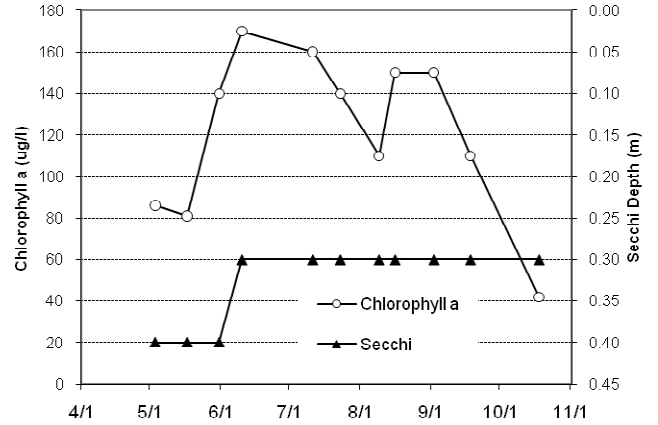
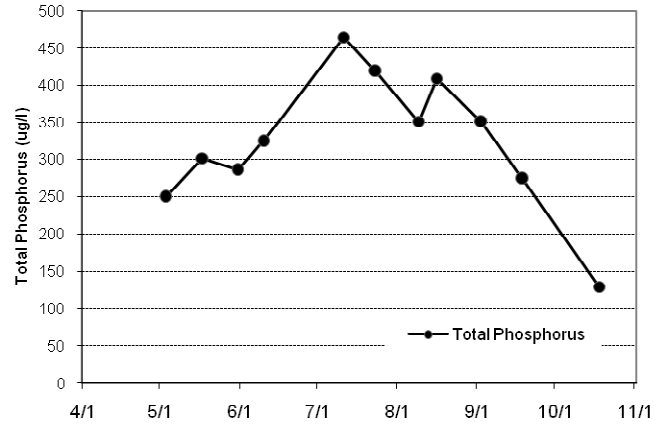
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus						D						
Chlorophyll a						B						
Secchi Depth						D					F	
<b>Lake Grade</b>						<b>C</b>						

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					D					D		F
Chlorophyll a					F					D		F
Secchi Depth	F	F	F	F	F	F	F	F	F	D	F	F
<b>Lake Grade</b>					<b>F</b>					<b>D</b>		<b>F</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			F			F
Chlorophyll a			F			F
Secchi Depth			F			F
<b>Lake Grade</b>			<b>F</b>			<b>F</b>

Source: Metropolitan Council and STORET data



## **Cedar Lake (70-0091) Scott County Watershed Management Organization**

Cedar Lake is located in Cedar Lake Township (Scott County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a maximum depth of 4.7 m (15 ft) and a mean depth of 2.1 m (6.9 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has a surface area of 742 acres and watershed area of 11,104 acres, giving a watershed to lake area ratio of 15:1. The larger the ratio the greater the potential effects of runoff on the water quality of the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	156.0	35.0	296.0	F
<b>CLA</b> (µg/l)	50.2	3.3	150.0	D
<b>Secchi</b> (m)	1.3	0.5	3.7	C
<b>TKN</b> (mg/l)	1.91	0.86	3.00	
			<b>Lake Grade</b>	D

The lake received a lake grade of D for 2009, which is consistent with the lake's historic database. The lake's water quality seems to be best represented by a lake grade of D.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

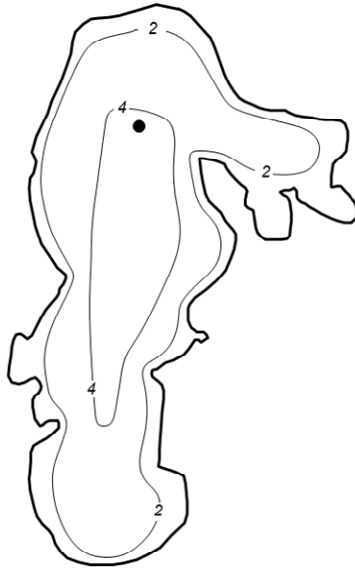
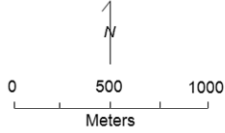
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

**Cedar Lake**  
Cedar Lake Twp./Helena Twp.,  
Scott Co.

LAKE ID: 700091-00  
WMO: Sand Creek  
Volunteer: Jerry Edberg

● Sampling site

Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/24	13				8.5	49		1.3	2	2
5/4	13.7				5	35		1.4	2	2
5/17	14.4				7.8	44		1.4	2	1
5/31	18.2				9.6	66		1.5	2	3
6/12	18.4				3.3	66		2.5	1	2
6/26	26.1				4.2	37		3.7	1	2
7/10	23.4				36	188		0.8	3	2
7/24	23.2				75	218		0.8	3	3
8/6	24.4				150	248		0.5	4	3
8/22	21.7				85	266		0.5	4	3
9/4	24.3				110	252		0.6	4	3
9/18	23.2				66	296		0.8	5	4
10/3	13.2				100	278		0.7	4	3
10/17	8.3				56	130		0.9	2	2

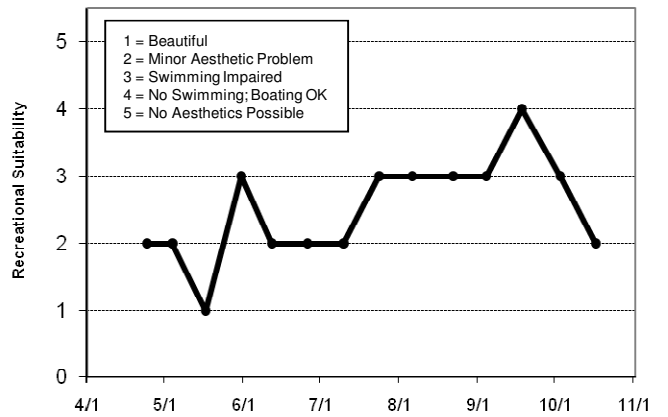
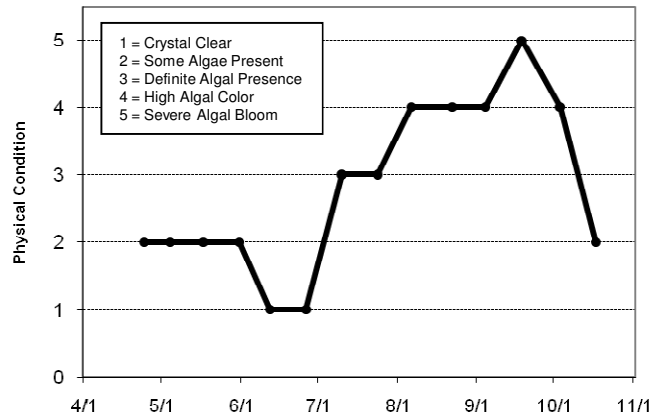
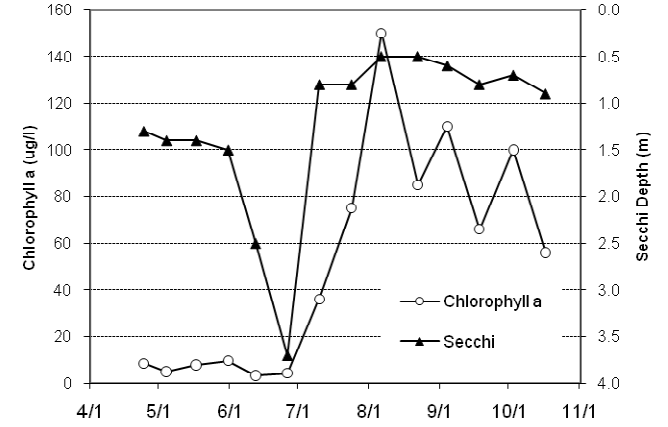
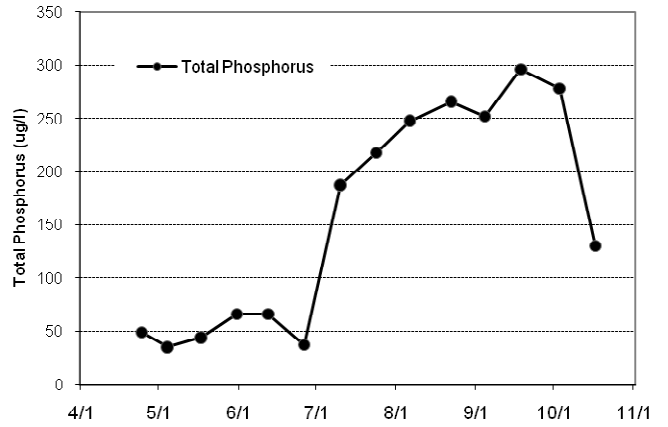
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	F	F			F							
Chlorophyll a	F	D			D						D	
Secchi Depth	C	C	C	C	C	C				F	D	D
<b>Lake Grade</b>	<b>F</b>	<b>D</b>			<b>D</b>							

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	F	F	F	F	F
Chlorophyll a	C	D	D	D	D	D
Secchi Depth	C	D	D	D	D	C
<b>Lake Grade</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



## Cenaiko Lake (2-0654) Anoka County Parks

Cenaiko Lake is located within Coon Rapids Dam Regional Park in the City of Coon Rapids in Anoka County. The lake is maintained by groundwater and has a very small watershed that is completely publicly owned (MDNR 1996). The lake is stocked with trout (brook and rainbow). The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	17.3	5.0	60.0	A
<b>CLA</b> (µg/l)	3.0	1.8	5.1	A
<b>Secchi</b> (m)	2.0	1.3	3.2	C
<b>TKN</b> (mg/l)	0.60	0.42	0.93	
<b>Lake Grade</b>				<b>B</b>

The lake received a water quality lake grade of B for 2009. The lake has received A grades for TP and CLA since 1997. The water clarity shows variation however. The annual mean summer-time water clarity grade has varied in the range of A to C.

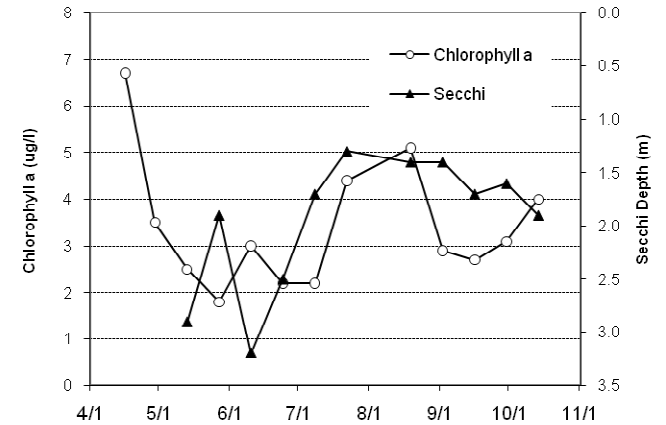
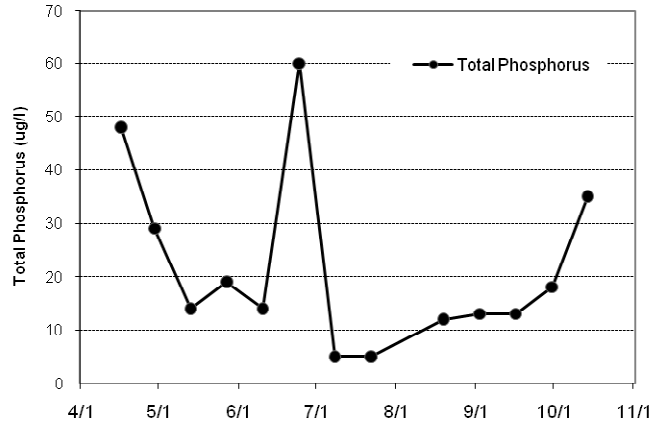
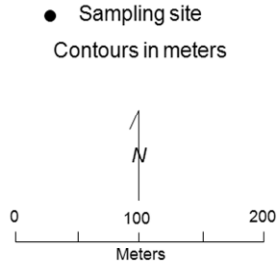
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

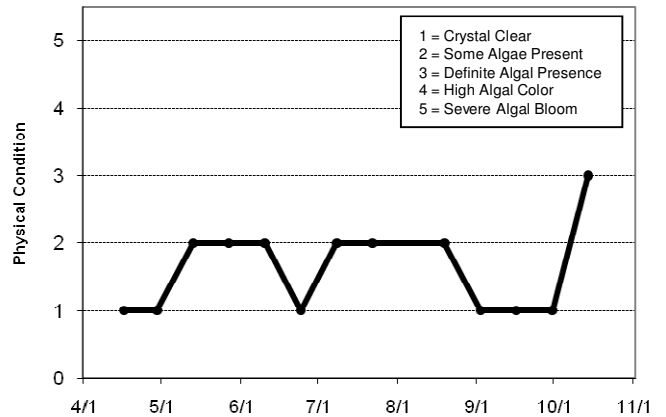
# Lake Cenaiko Coon Rapids, Anoka Co.

Lake ID: 20654-00  
WD: Coon Creek  
Volunteer: Melanie Shipman



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/16	13.3				6.7	48			1	1
4/29	13.2				3.5	29			1	1
5/13	16.8				2.5	14		2.9	2	1
5/27	18.7				1.8	19		1.9	2	1
6/10	17.7				3	14		3.2	2	1
6/24	27.4				2.2	60		2.5	1	1
7/8	25.6				2.2	5		1.7	2	1
7/22	25				4.4	5		1.3	2	1
8/19	23				5.1	12		1.4	2	1
9/2	21.8				2.9	13		1.4	1	1
9/16	23.2				2.7	13		1.7	1	1
9/30	17.1				3.1	18		1.6	1	1
10/14	9.4				4	35		1.9	3	1

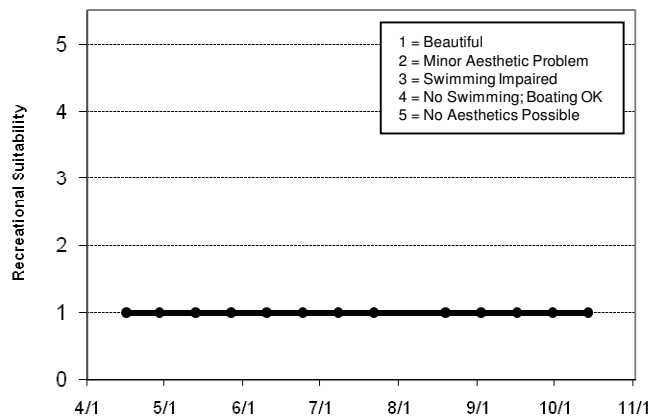


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	A	A	A	A
Chlorophyll a	A	A	A	A	A	A
Secchi Depth	B	B	A	B	C	C
Lake Grade	A	A	A	A	B	B



Source: Metropolitan Council and STORET data

### **Clear Lake (82-0045) Carnelian-Marine Watershed District**

Clear Lake is located in May Township (Washington County). The maximum depth of the lake is 8.2 m (27 ft). Approximately 94 percent of the lake's surface area is considered littoral (the 0-15 feet depth zone of aquatic vegetation dominance).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	16.4	3.0	34.0	A
<b>CLA</b> (µg/l)	3.2	2.0	4.6	A
<b>Secchi</b> (m)	6.1	5.2	7.2	A
<b>TKN</b> (mg/l)	0.70	0.37	1.00	
<b>Lake Grade</b>				A

The lake received a lake grade of A for 2009. The lake was rated as having the highest water quality of the lakes monitored by the METC lake monitoring program during 2009 (Table 4). To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

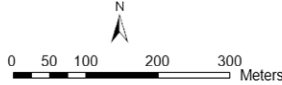
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

**Clear Lake**  
May Twp., Washington Co.

Lake ID: 820045-00  
WD: Carnelian-Marine-St. Croix  
Volunteer: Warner Nature Center

● Sampling site

Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	12.3				2.7	24		6.8	1	1
4/29	13.3				2.1	44		7.2	1	1
5/14	15.2				2.2	15		7.2	1	1
5/28	19.9				3.8	20		6.5	2	1
6/8	17.7				3.9	34		6.6	2	1
6/23	28.8				2	16		5.7	2	1
7/7	26.5				2.5	12		6.6	1	1
7/22	24.5				3.8	3		5.8	2	1
8/5	24				2.9	8		6.3	2	1
8/18	25.2				3.5	25		5.3	2	1
9/2	22.9				2.3	20		6.4	2	1
9/16	24.6				3.3	11		5.9	2	1
9/29	17.4				4.6	16		5.2	2	2
10/13	9.1				3.6	38		7.2	1	1

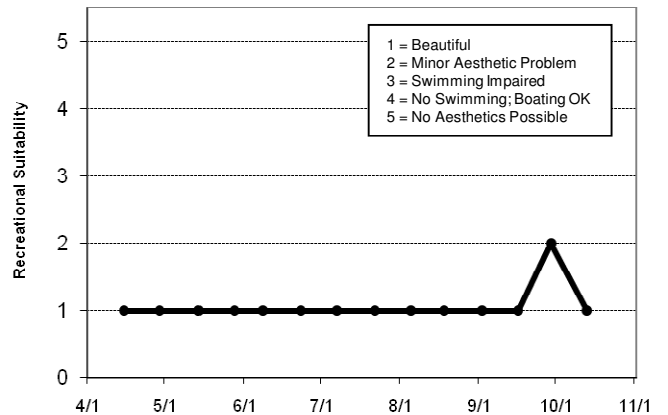
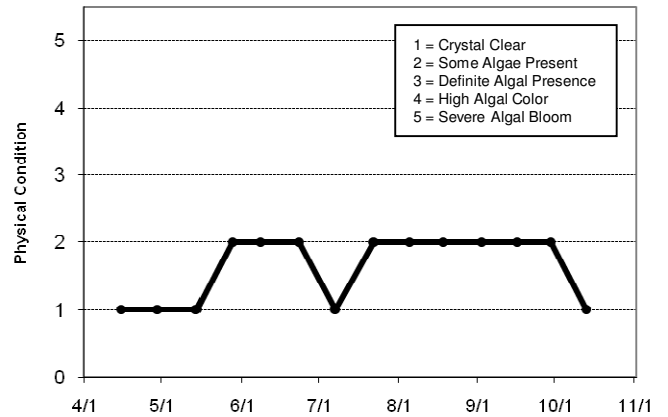
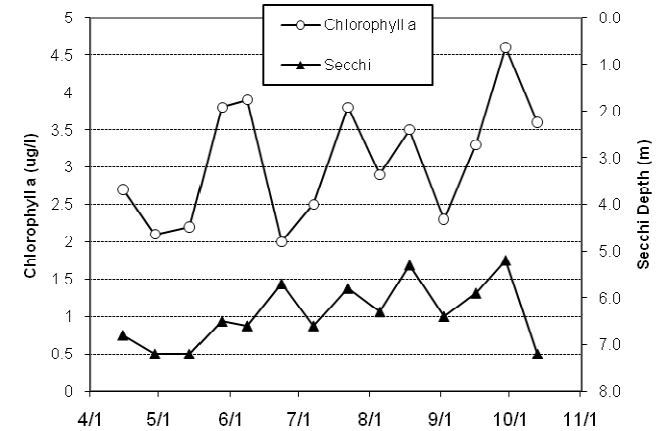
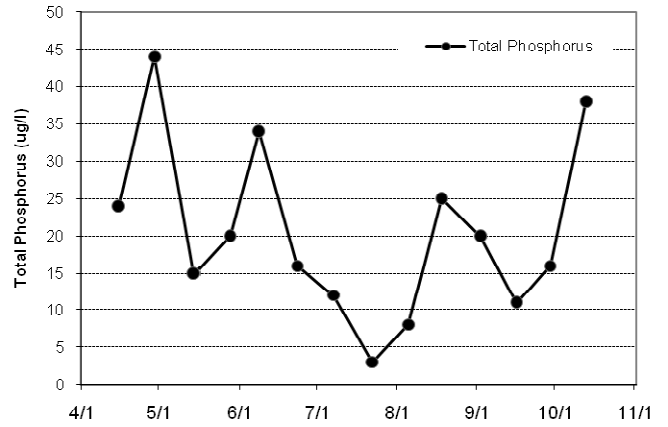
**Lake Water Quality Grades Based on Summertime Averages**

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					A	A
Chlorophyll a					A	A
Secchi Depth					A	A
<b>Lake Grade</b>					A	A

Source: Metropolitan Council and STORET data



## **Clear Lake, site 1 (82-0099) Washington Conservation District**

Clear Lake is located within the City of Lake Elmo (Washington County). Little bathymetric information is available for the lake. A search through the MPCAs Environmental Data Access System showed no historical water quality data for this lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. A depth profile of dissolved oxygen and temperature was also measured. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	246.3	171.0	338.0	NA
<b>CLA</b> ( $\mu\text{g/l}$ )	8.0	7.2	8.4	NA
<b>Secchi</b> (m)	0.7	0.3	0.9	NA
<b>TKN</b> (mg/l)	2.50	1.80	3.40	
			<b>Lake Grade</b>	NA

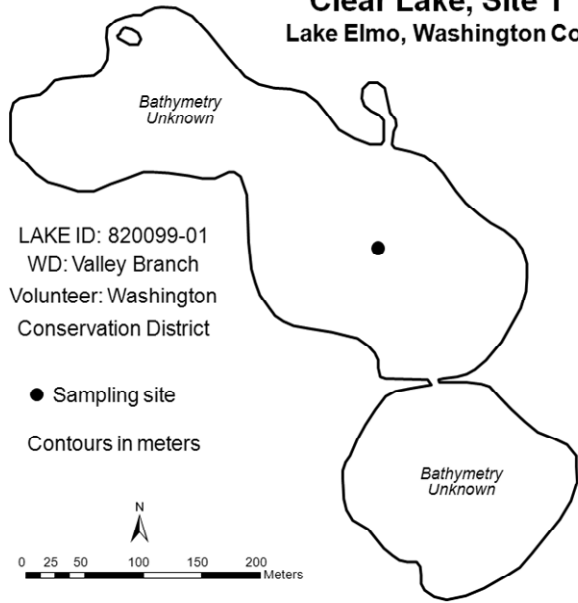
There was an insufficient quantity of data to calculate a lake grade for site 1. At least 5 monitoring events are needed during the summer-time period (May – September) to calculate a grade.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

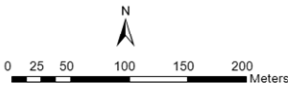


## Clear Lake, Site 1 Lake Elmo, Washington Co.



LAKE ID: 820099-01  
WD: Valley Branch  
Volunteer: Washington  
Conservation District

● Sampling site  
Contours in meters



### 2009 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
4/22	13.7	12.3	15.99	0.11	150	280		0.5	4	4
6/2	19.9	19.9	4.38	0.11	8.3	171		0.9	3	4
6/16	23.1		7.17		8.4	338		0.8	2	2
7/15	20.7		6.28		7.2	230		0.3	5	5

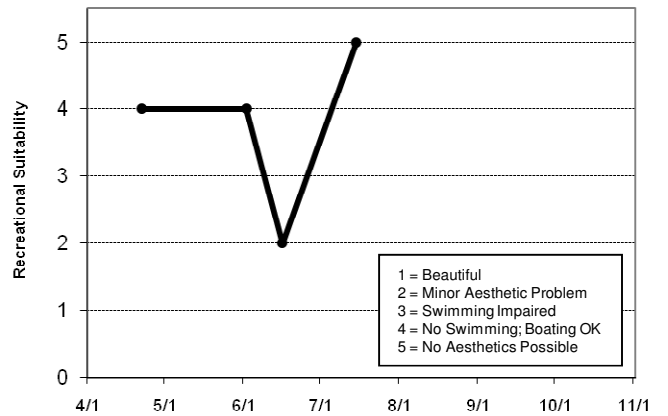
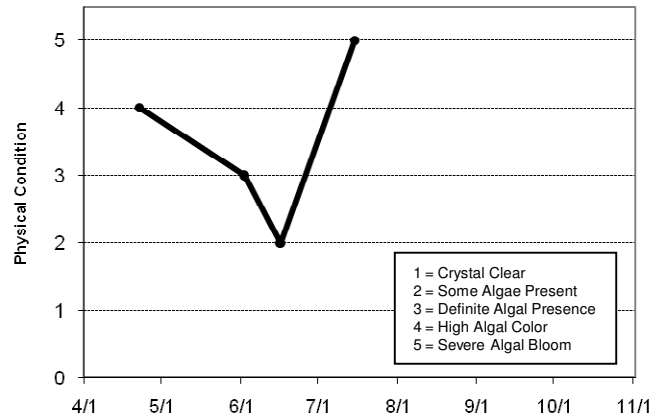
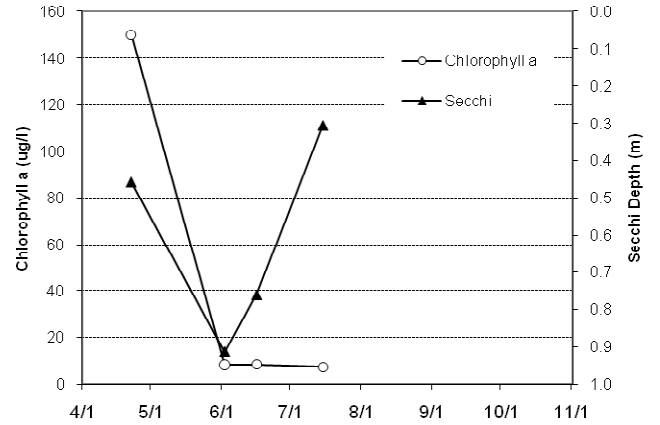
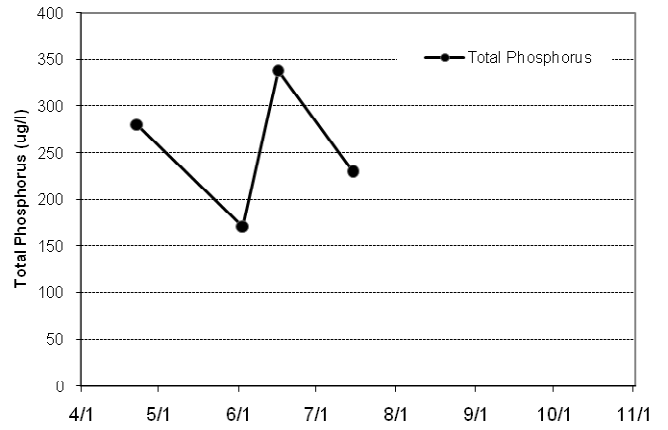
### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						
Chlorophyll a						
Secchi Depth						
Lake Grade						NA

Source: Metropolitan Council and STORET data



## Clear Lake, site 2 (82-0099) Washington Conservation District

Clear Lake is located within the City of Lake Elmo (Washington County). Little bathymetric information is available for the lake. A search through the MPCAs Environmental Data Access System showed no historical water quality data for this lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. A depth profile of dissolved oxygen and temperature was also measured. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

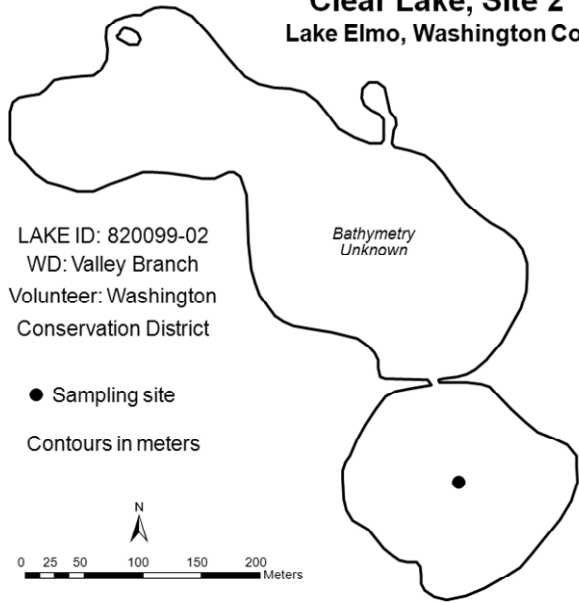
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	888.2	372.0	2640.0	F
<b>CLA</b> (µg/l)	60.3	2.7	190.0	D
<b>Secchi</b> (m)	0.7	0.3	0.9	F
<b>TKN</b> (mg/l)	5.38	1.80	19.00	
<b>Lake Grade</b>				F

The lake received a lake grade of F for 2009. Additional monitoring is needed to build the water quality database for this lake.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

## Clear Lake, Site 2 Lake Elmo, Washington Co.



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	13	11.9	15.43	14.31	44	316		0.5	3	4
6/2	20.4	20.4	4.7	0.09	2.7	378		0.9	2	4
6/16	23.6		5.12		4.6	372		0.8	2	1
7/15	21.3		5.8		31	525		0.6	3	4
8/11	25.1		10.54		73	526		0.3	3	4
9/9	23.8		10.99		190	2640		0.8	4	4

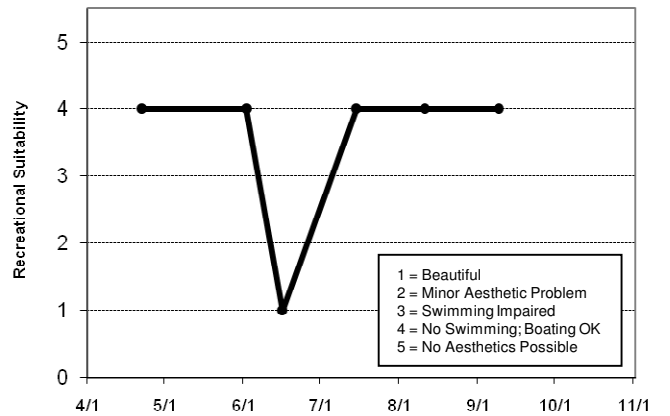
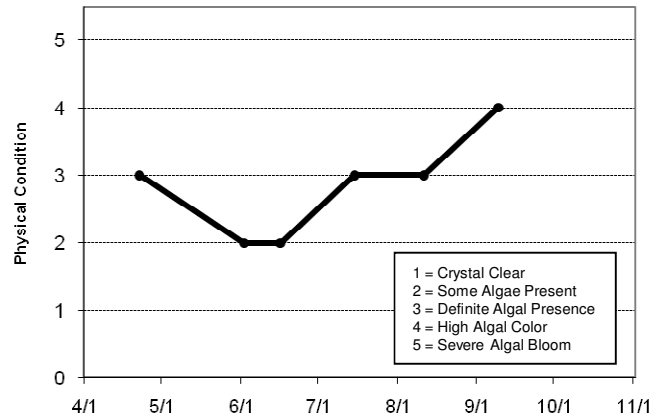
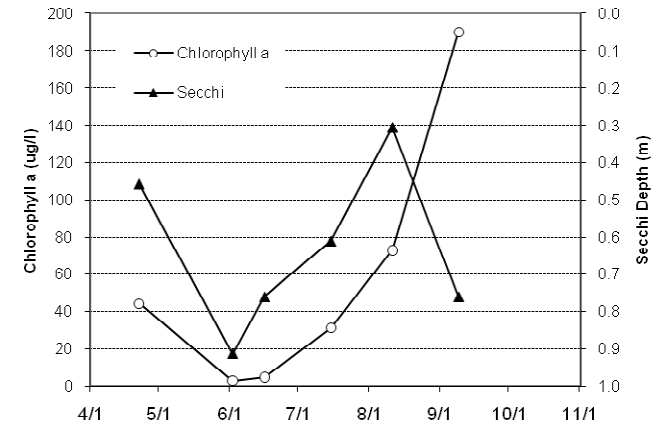
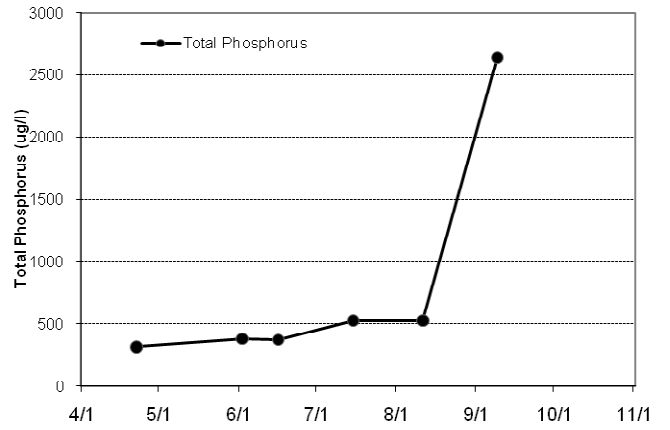
### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						F
Chlorophyll a						D
Secchi Depth						F
Lake Grade						F

Source: Metropolitan Council and STORET data



## **Cloverdale Lake (82-0009) Valley Branch Watershed District**

Cloverdale Lake is located in Baytown Township (Washington County). The mean and maximum depth of the lake is 3.0 m (10 ft) and 8.5 m (28 ft), respectively. The lake has a surface area of 45 acres, and a watershed area of 819 acres, giving a large watershed to lake area ratio of 18:1. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	41.3	19.0	82.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	7.2	1.0	28.0	A
<b>Secchi</b> (m)	2.6	1.8	4.1	B
<b>TKN</b> (mg/l)	1.02	0.63	1.70	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009. For 7 of the past 9 years, the lake has received a lake grade of B with a C and an A received in the other two years. The historical database suggests that the lake is best represented by a lake grade of B.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

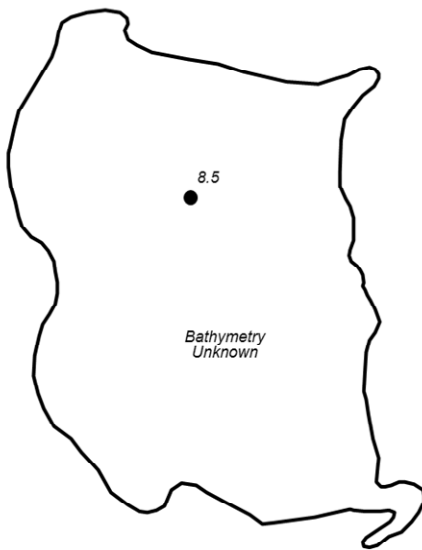
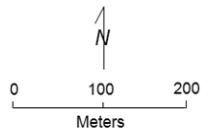
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Cloverdale Lake Lake Elmo, Washington Co.

● Sampling site  
Contours in meters

Lake ID: 820009-00  
WD: Valley Branch  
Volunteer: Dr. Kevin Bjork



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/18	10.4				1.3	41		4.6	1	1
5/3	13				1.1	20		3.8	1	1
5/24	20.6				1	19		4.1	2	1
6/14	23.6				2.6	30		3.1	2	2
7/5	23.8				1.8	33		2.3	2	3
7/18	24.2				28	82		2.0	2	2
7/30	24.5				12	71		1.8	3	3
8/21	23.9				7.3	49		2.3	2	2
9/2	22.4				7.7	42		1.8	2	2
9/13	26.1				3.2	26		2.4	2	2
10/18	9.5				9.4	58		3.4	2	2

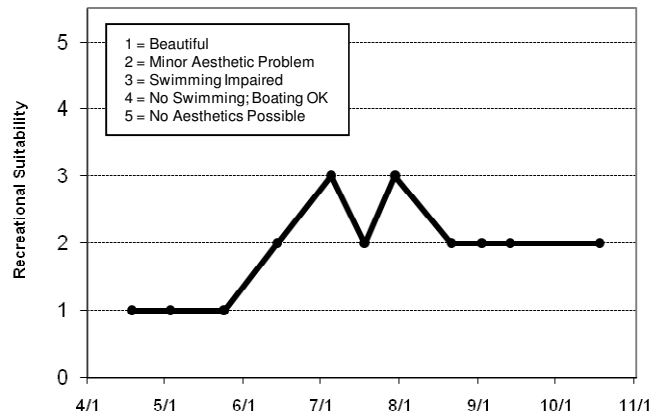
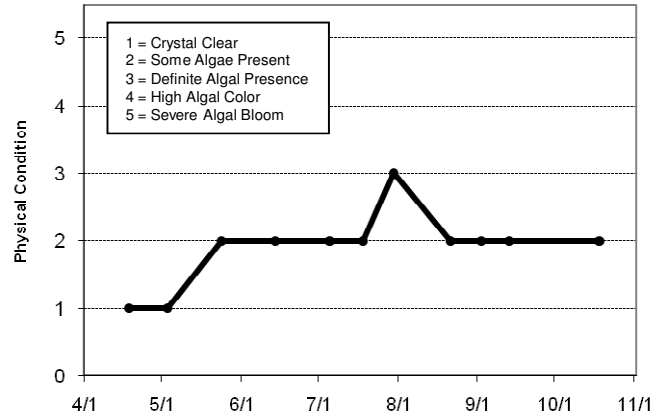
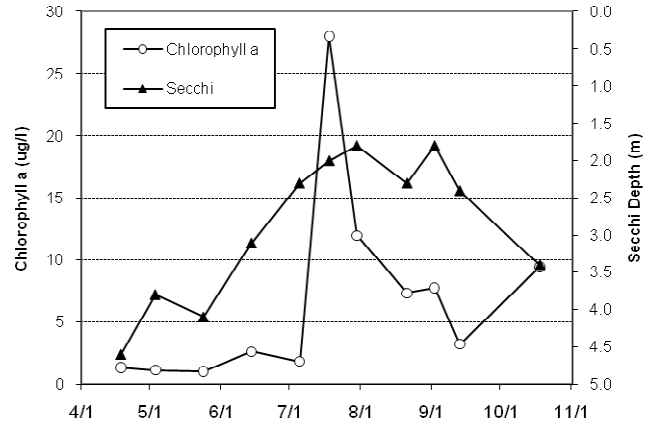
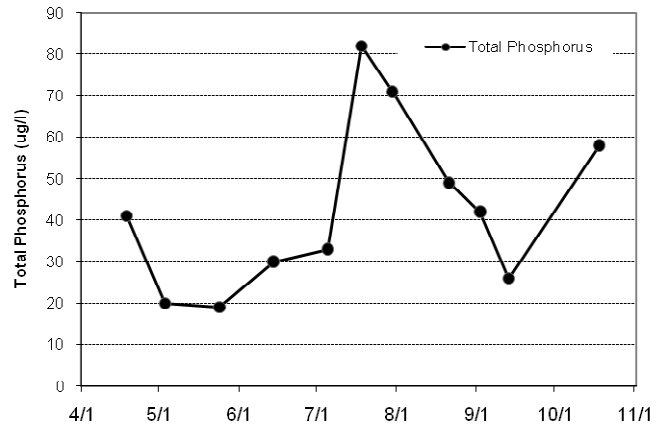
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus										C	C	C
Chlorophyll a										B	B	B
Secchi Depth										C	B	B
<b>Lake Grade</b>										<b>C</b>	<b>B</b>	<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	B	B	B	B	C
Chlorophyll a	B	A	B	A	B	A
Secchi Depth	A	A	A	B	B	B
<b>Lake Grade</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>

Source: Metropolitan Council and STORET data



### **Cobblecrest (27-0053) City of St. Louis Park**

Cobblecrest Lake is a small shallow lake located within City of St. Louis Park (Hennepin County). There is very little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	186.6	90.0	265.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	133.8	60.0	200.0	F
<b>Secchi</b> (m)	0.3	0.2	0.4	F
<b>TKN</b> (mg/l)	3.06	1.70	4.00	
<b>Lake Grade</b>				F

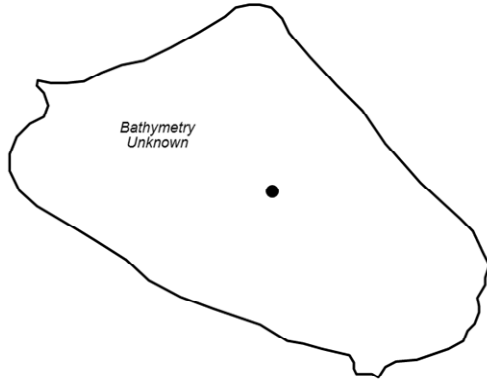
The lake's 2009 lake grade of F is consistent with the lake grades received since 2004. For the past 6 years, the lake appears to be represented well by a lake grade of F.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

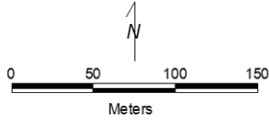
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

**Cobblecrest Lake**  
St. Louis Park, Hennepin Co.

Lake ID: 270053-00  
WD: Minnehaha Creek  
Volunteer: Jim Kellogg



● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	18				60	143		0.4	1	4
5/31	23.6				130	252		0.3	2	4
6/7	15.5				200	265		0.3	2	4
6/14	24.5				120	227		0.2	3	4
7/12	23.6				170	193		0.2	3	4
8/6	21.8				160	188		0.3	3	4
8/9	26.4				130	90		0.2	3	4
9/20	22.7				100	135		0.3	3	4
10/5	12.1				110	129		0.3	3	4
10/20	10.6				92	116		0.4	3	4

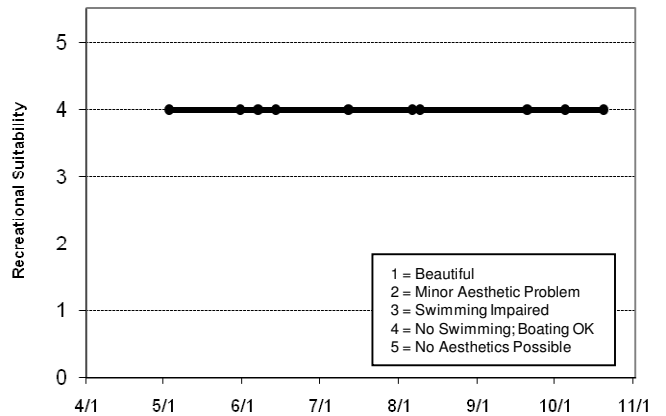
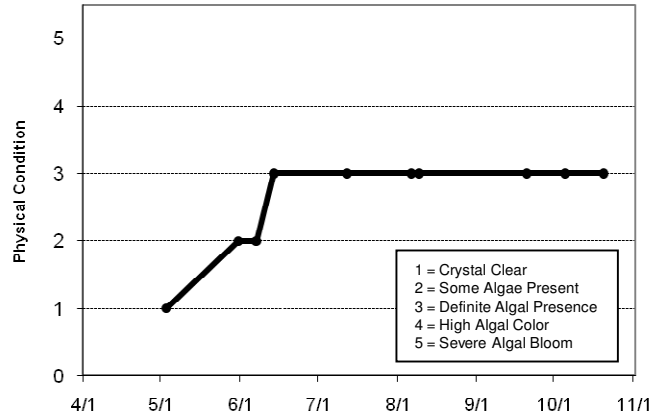
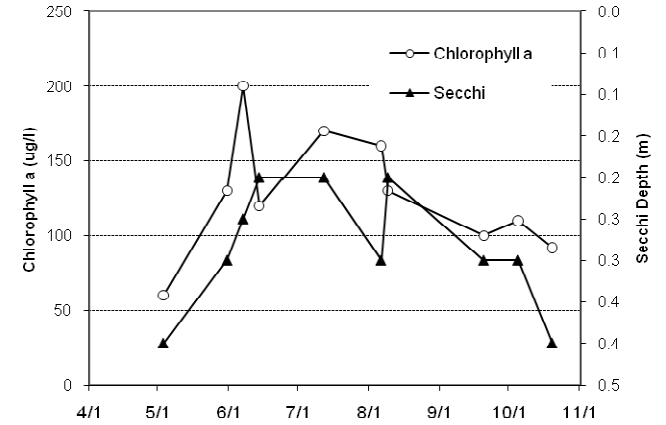
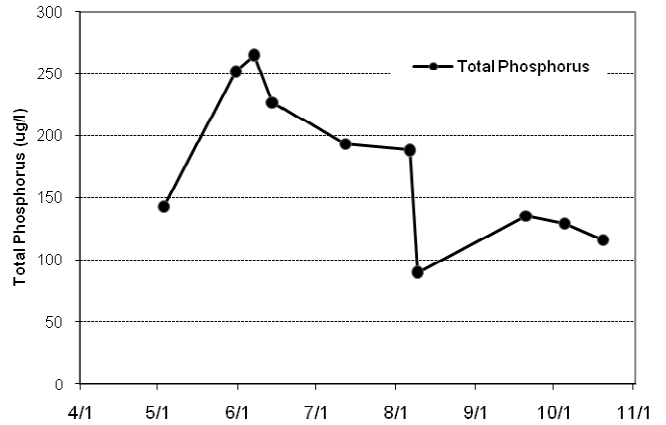
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	F	D	F	F	F
Chlorophyll a	F	F	F	F	F	F
Secchi Depth	F	F	F	F	F	F
<b>Lake Grade</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>

Source: Metropolitan Council and STORET data



## **Cobblestone Lake (19-0456) City of Apple Valley**

Cobblestone Lake is located in the City of Apple Valley (Dakota County). The lake has a surface area of 37 acres, and a maximum depth of 6 meters.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	35.4	25.0	59.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	15.9	4.8	29.0	B
<b>Secchi</b> (m)	1.0	0.7	1.8	D
<b>TKN</b> (mg/l)	1.01	0.67	1.40	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009 which is similar to the lake grades received for the previous three years. The lake received a B grade for CLA, which is the highest grade it has received for this parameter since CAMP monitoring began in 2005. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

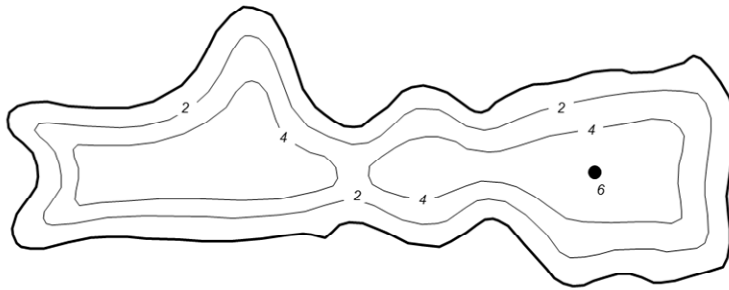
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).



**Cobblestone Lake**  
Apple Valley, Dakota Co.

Lake ID: 190456-00  
WMO: Vermillion River  
Volunteer: Jeff Sluiter



● Sampling site  
Contours in meters

**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/1	13.2				17	48		0.7	2	2
5/14	27.3				5.5	41		0.8	2	2
5/29	20.8				4.8	29		1.8	3	4
6/14	18.8					25		0.8	2	3
6/28	19.6				18	32		0.8	2	
7/10	23				16	27		0.9	3	3
7/25	13.8				22	36		0.9	2	2
8/5	23.8				15	28		1.1	3	3
8/20					29	59				
9/3	16.3				6.1	34		1.1	3	3
9/19	21.3				13	25		1.3		
9/30	14.5				28	41		1.1	2	2
10/18	7.9				14	38		1.4	2	2

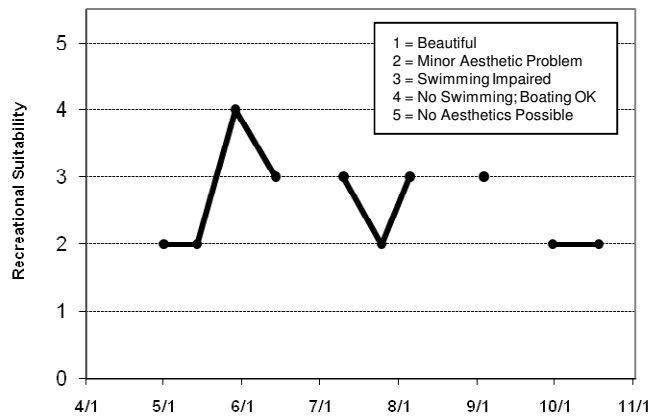
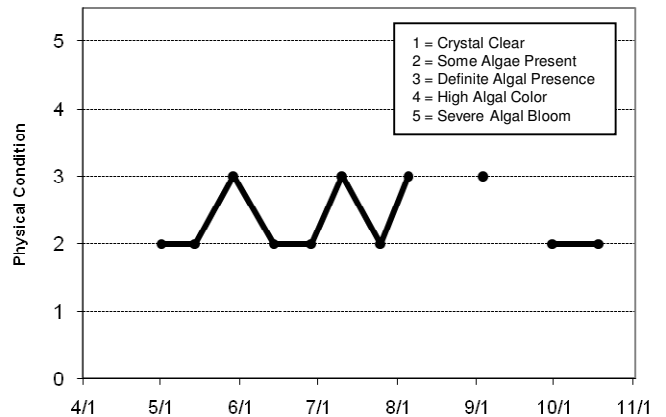
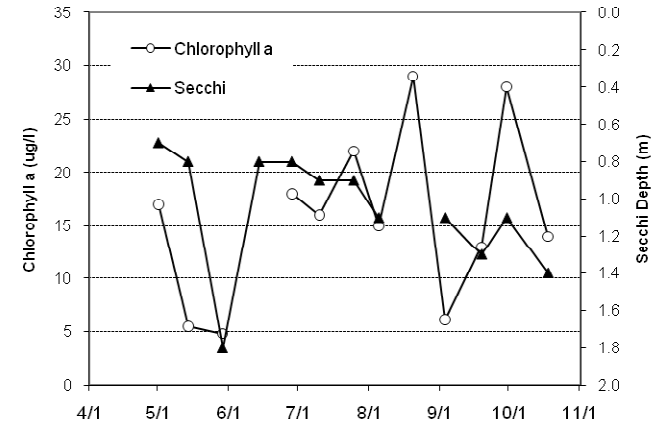
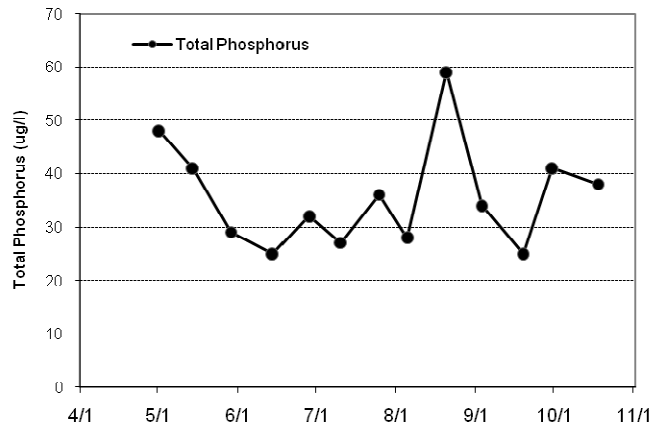
**Lake Water Quality Grades Based on Summertime Averages**

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	C	C	C	C	C
Chlorophyll a	D	C	C	C	C	B
Secchi Depth	F	D	D	D	D	D
<b>Lake Grade</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## Colby Lake (82-0094) City of Woodbury

Colby Lake is located in the City of Woodbury in Washington County. The lake has a surface area of 71 acres and a maximum depth of 3.4 m (11 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has a watershed area of 8,088 acres which gives a large watershed to lake area ratio of 114:1. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	125.3	92.0	145.0	
<b>CLA</b> ( $\mu\text{g/l}$ )	35.0	26.0	50.0	
<b>Secchi</b> (m)	0.5	0.5	0.6	
<b>TKN</b> (mg/l)	2.57	2.00	3.10	
				<i>Lake Grade</i>

There was an insufficient quantity of data to calculate grades for the lake in 2009. At least 5 monitoring events during the summer-time period (May – September) are needed.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

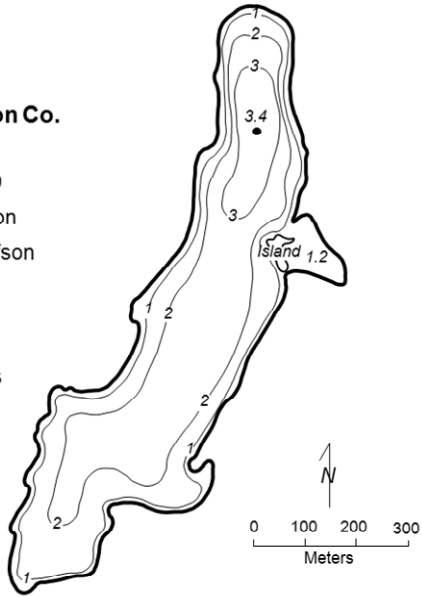
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Colby Lake

## Woodbury, Washington Co.

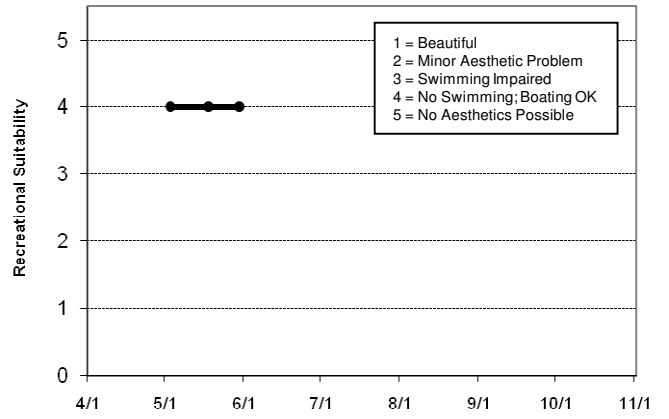
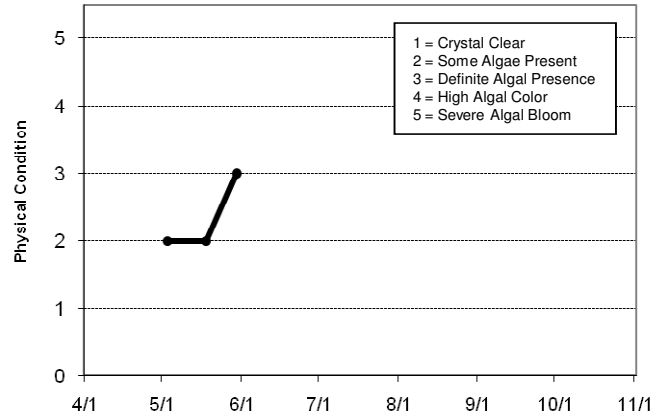
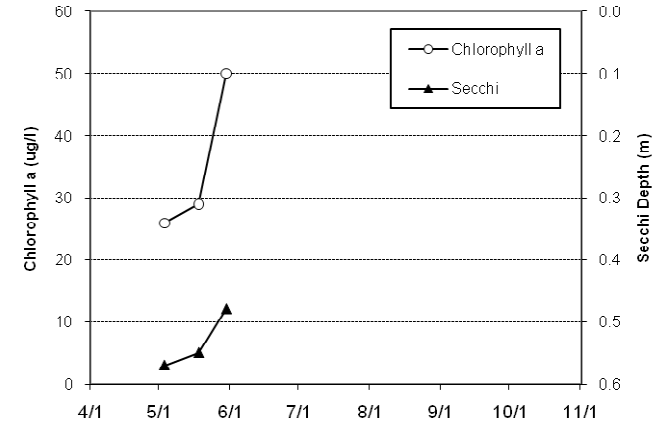
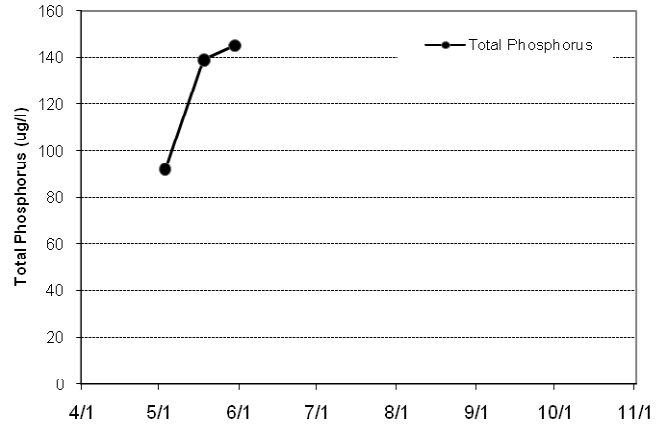
Lake ID: 820094-00  
 WD: South Washington  
 Volunteer: Annie Gustafson

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	15.7				26	92		0.6	2	4
5/18	16.2				29	139		0.6	2	4
5/30	19.3				50	145		0.5	3	4



### 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												
Lake Grade												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	F	D	F	
Chlorophyll a	C	F	F	D	D	
Secchi Depth	F	D	F	F	F	
Lake Grade	D	D	F	D	F	NA

Source: Metropolitan Council and STORET data

## **Cornelia Lake (27-0028-01) *Nine Mile Creek Watershed District***

Lake Cornelia is located in the City of Edina (Hennepin County). The lake has a surface area of approximately 52 acres, and has a maximum depth of 2.0 meters. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	113.4	81.0	170.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	39.9	19.0	69.0	C
<b>Secchi</b> (m)	0.5	0.4	0.7	F
<b>TKN</b> (mg/l)	1.56	1.00	2.70	
<b>Lake Grade</b>				D

The lake received a water quality lake grade of D for 2009. This is the second year in a row that the lake obtained a D lake grade. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

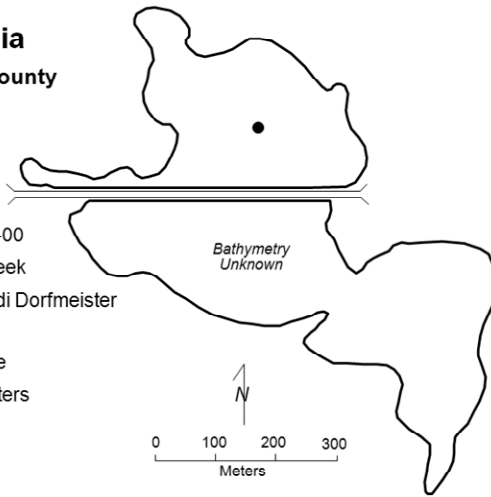
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Lake Cornelia**  
Edina, Hennepin County

Lake ID: 270028-00  
WD: Nine Mile Creek  
Volunteers: Jon Moon & Heidi Dorfmeister

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/18	16				14	179		0.8	1	4
5/3	15				19	92		0.7	2	4
5/17	18				22	96		0.5	2	4
5/29	22				37	170		0.4	3	4
6/12	20				28	93		0.6	2	4
6/26	31				22	92		0.6	3	4
7/10	28				42	110		0.5	2	4
7/24	26				52	141		0.5	3	4
8/7	21				69	154		0.5	2	4
8/21	20				50	130		0.5	2	4
9/5	21				68	88		0.4	2	4
9/17	26				30	81		0.4	2	4
10/3	11				52	103		0.6	2	4
10/17	8				30	59		0.9	2	4

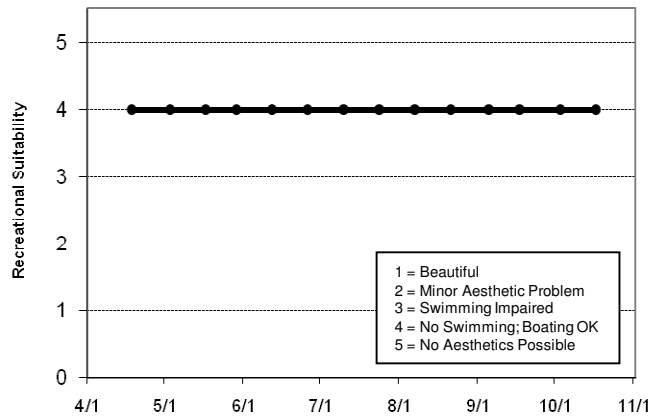
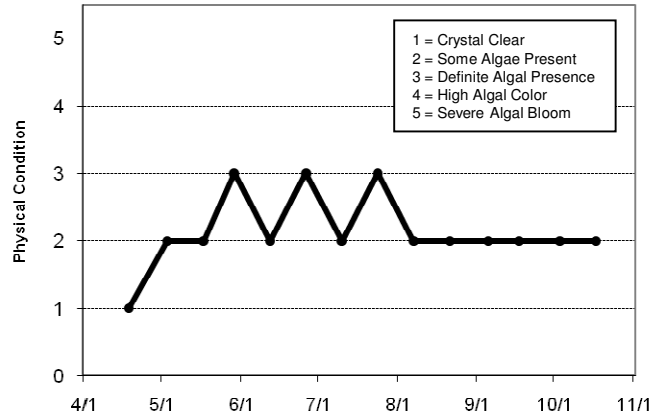
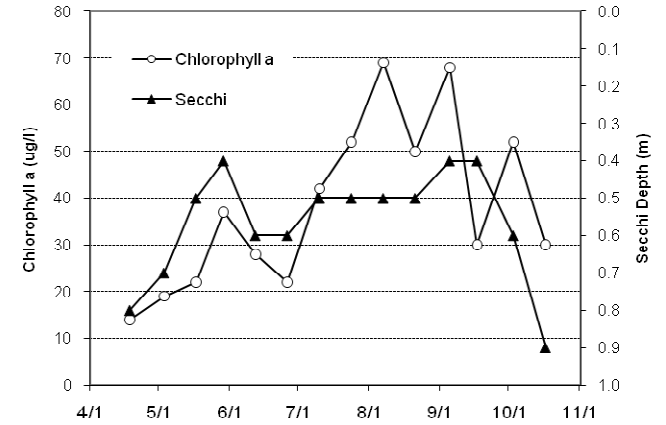
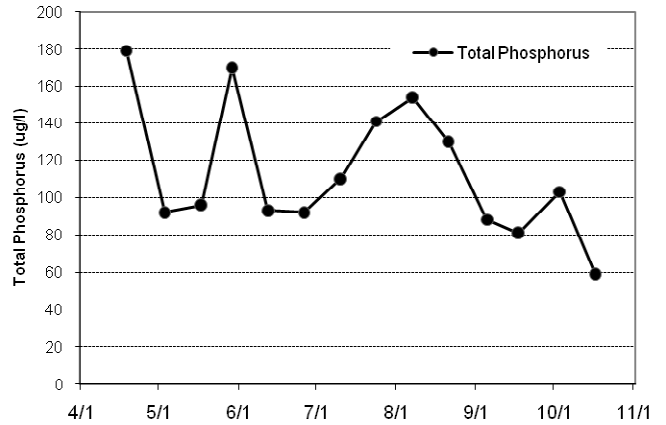
**Lake Water Quality Grades Based on Summertime Averages**

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												F
Chlorophyll a												F
Secchi Depth												F
<b>Lake Grade</b>												<b>F</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	F	F	F	F	D	D
Chlorophyll a	D	D	F	F	D	C
Secchi Depth	F	F	F	F	F	F
<b>Lake Grade</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



## **Courthouse Lake (10-0005) Carver County Environmental Services**

Courthouse Lake, located in the City of Chaska (Carver County) is a trout lake that is stocked with rainbow trout. The 10-acre lake has a maximum depth of 17.4 m (57 feet). The lake's level is maintained by groundwater. It has a very small watershed that is completely publicly owned (MDNR 1996).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	18.4	11.0	29.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	4.1	1.9	13.0	A
<b>Secchi</b> (m)	4.5	3.2	6.0	A
<b>TKN</b> (mg/l)	0.66	0.50	0.77	
<b>Lake Grade</b>				A

The lake received a lake grade of A for 2009, which is consistent with the historical water quality database. The lake's water quality seems well represented by a lake grade of A.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

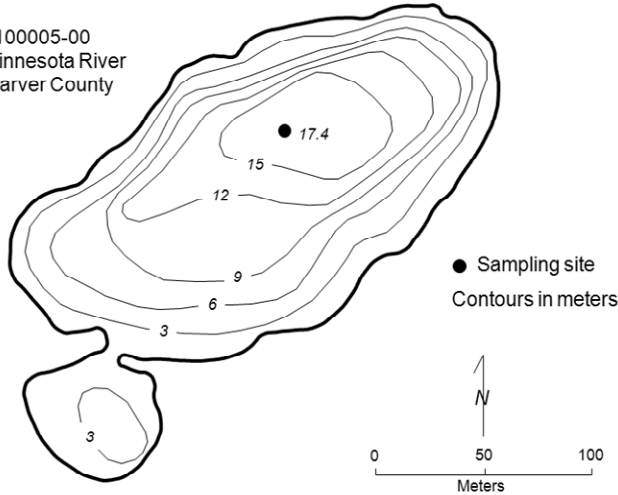
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Courthouse Lake

## Chaska, Carver Co.

Lake ID: 100005-00  
 WD: Lower Minnesota River  
 Volunteer: Carver County



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	10.31		9.53		13	50		1.6	2	2
4/28	12.77		14.08		6.6	29		2.3	1	1
5/13	16.33		9.85		2.1			6.0	1	1
5/28	18.95		10.52		2.5	20		5.0	2	1
6/10	18.19		10.54		13	18		4.7	2	3
6/24	25.99		9.91		3.2	11		4.0	3	2
7/8	24.87		11.26		4.6	11		5.1	2	3
7/23	23.12		10.55		3	17		5.7	2	1
8/5	23.82		9.02		3.2	12		4.1	2	2
8/19	24.73		8.48		1.9	25		4.0	1	1
9/2	22.33		9		2.6	16		4.2	2	2
9/17	23.85		9.81		2.8	29		3.8	2	1
9/30	19.12		9.33		5.8	25		3.2	1	1
10/19	11.3		9.62		9.4	30		3.2	1	2

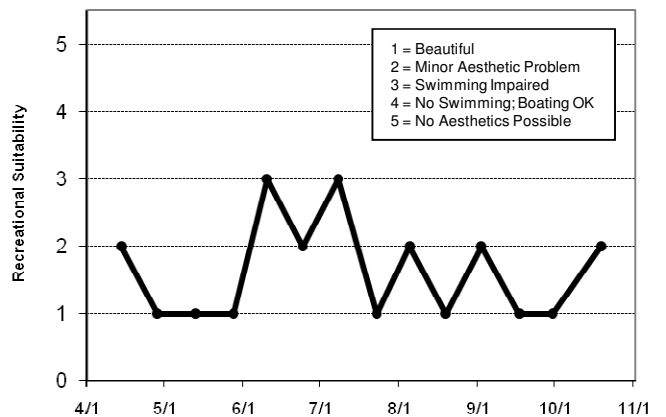
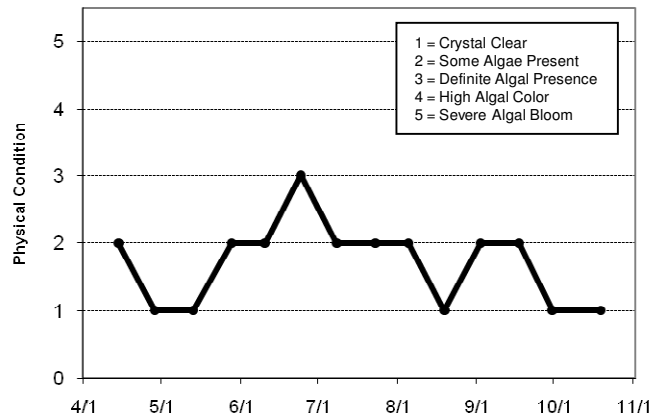
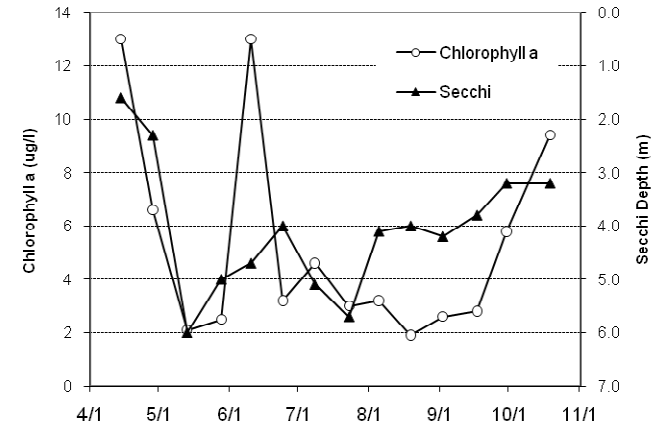
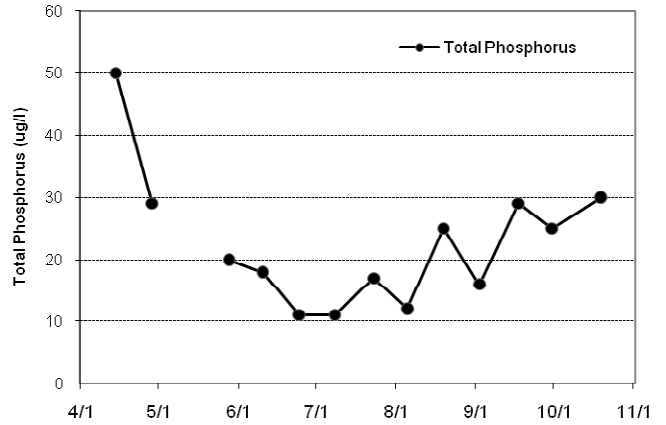
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					A	A	A	A	A	A	B	A
Chlorophyll a					A	A	A	A	A	A	A	A
Secchi Depth					A	C	A	B	A	A	B	A
<b>Lake Grade</b>					<b>A</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>B</b>	<b>A</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	A	A	A	A
Chlorophyll a	A	A	A	A	A	A
Secchi Depth	B	A	A	A	A	A
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>

Source: Metropolitan Council and STORET data



## **Cowley Lake (27-0169) Elm Creek Watershed Management Commission**

Cowley Lake is located within Hassan Township (Hennepin County). Little morphological data are available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	1095.0	798.0	1860.0	
<b>CLA</b> ( $\mu\text{g/l}$ )	35.9	3.5	62.0	
<b>Secchi</b> (m)	0.4	0.4	0.4	
<b>TKN</b> (mg/l)	8.50	5.40	14.00	
			<b>Lake Grade</b>	

There was an insufficient quantity of data to calculate grades for the lake in 2009. At least 5 monitoring events during the summer-time period (May – September) are needed.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

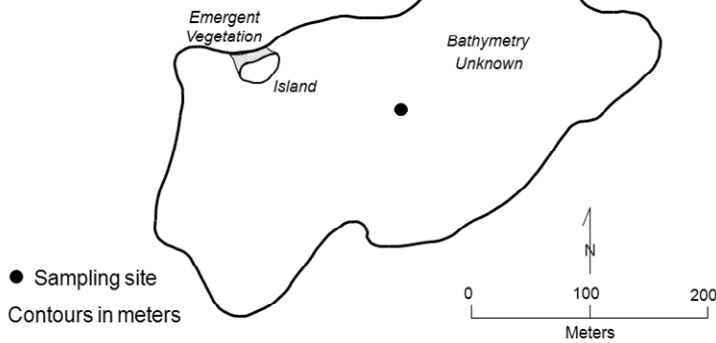
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



# Cowley Lake

Hassan Twp., Hennepin Co.

Lake ID: 270169-00  
 WMO: Elm Creek  
 Volunteer: Lori Ende



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/27	19.3				3.5	798			3	4
6/23	20.1				52	1860		0.4	4	4
7/11	20.6				26	887		0.4	4	4
8/5	20.7				62	835		0.4	4	4

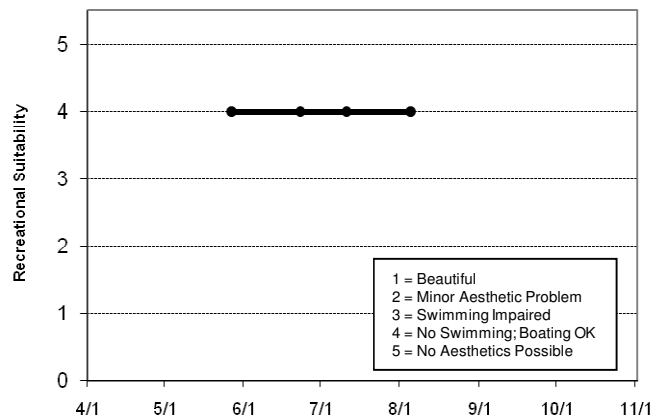
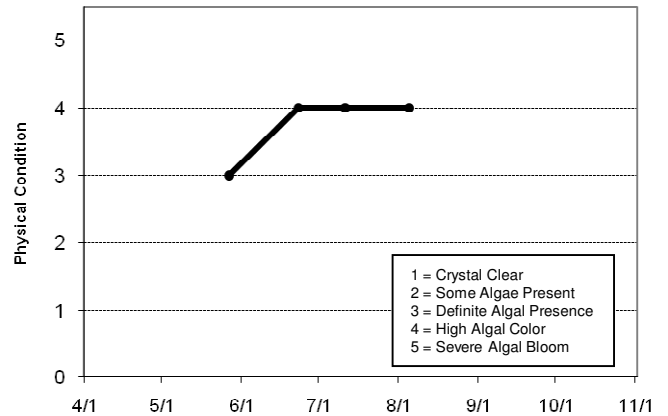
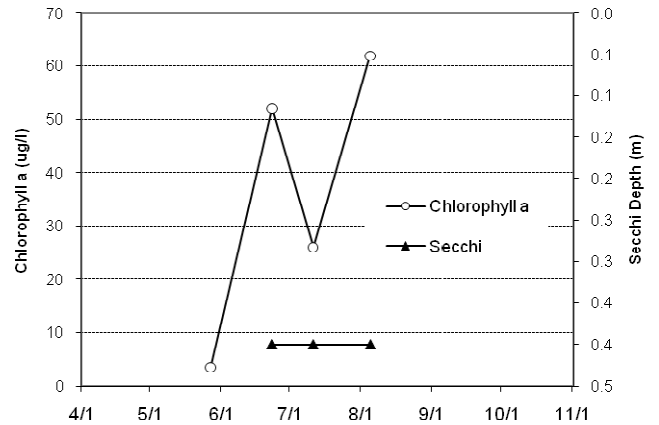
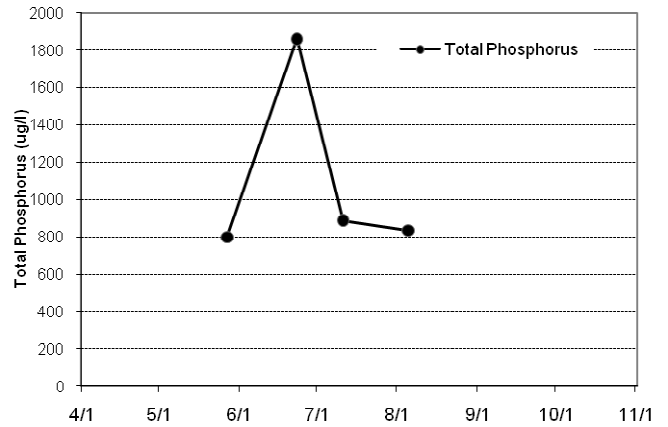
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					F							
Chlorophyll <i>a</i>												
Secchi Depth					D							
Lake Grade												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			F	F		
Chlorophyll <i>a</i>			F	F		
Secchi Depth			D	C		
Lake Grade			F	D		NA

Source: Metropolitan Council and STORET data



## Crystal Lake [Burnsville] (19-0027) Black Dog Watershed Management Commission

Crystal Lake located mainly in the City of Burnsville (Dakota County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a surface area of 292 acres. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*). The MPCA has listed the lake as impaired for mercury content in fish.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	30.8	17.0	49.0	B
<b>CLA</b> ( $\mu\text{g/l}$ )	13.7	4.6	24.0	B
<b>Secchi</b> (m)	2.1	1.3	3.8	C
<b>TKN</b> (mg/l)	0.92	0.71	1.20	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009. This lake grade is the only second B for this lake since 1994. The lake typically receives a C lake grade.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

## Crystal Lake, Burnsville, Dakota Co.



● Sampling site  
Contours in meters

Lake ID: 190027-00  
WMO: Black Dog  
Volunteer: Carroll Arnett, PhD

### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/18	13.6				5.1	24		2.2	2	2
5/2	12.8				7.2	26		2.5	2	1
5/16	14.8				4.6	36		2.7	2	1
5/30	19.8				7.9	23		3.3	2	2
6/14	20.5				5.3	17		3.8	2	2
6/27	26.3				9.4	34		2.2	2	2
7/11	23.8				23	35		1.3	3	2
7/25	22.4				24	31		1.4	3	2
8/8	22.7				15	32		1.6	2	2
8/22	22.3				21	24		1.6	2	1
9/5	22.6				13	32		1.7	2	1
9/19	24				20	49		1.5	3	2
10/3	15.2				18	51		2.0	2	1
10/17	9.4				12	22		3.0	1	1

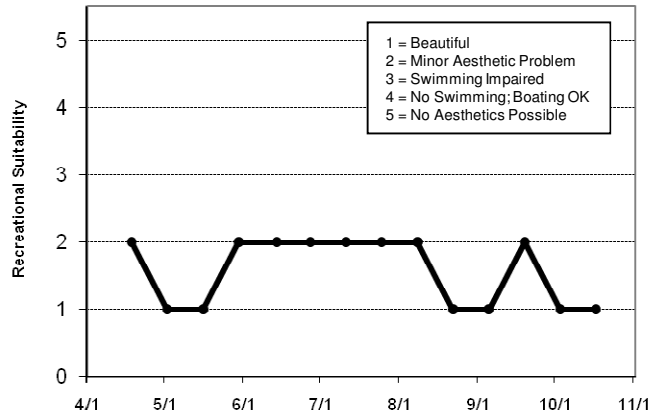
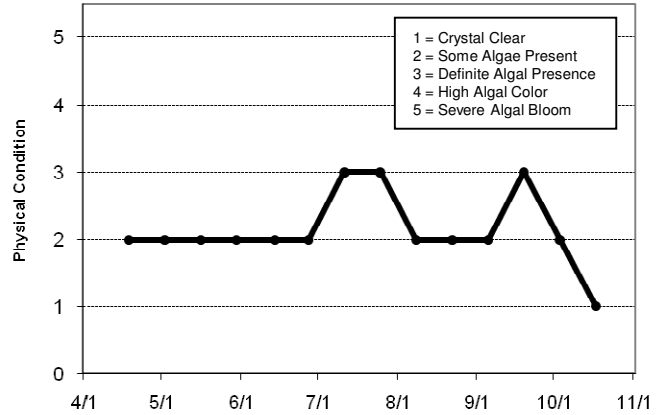
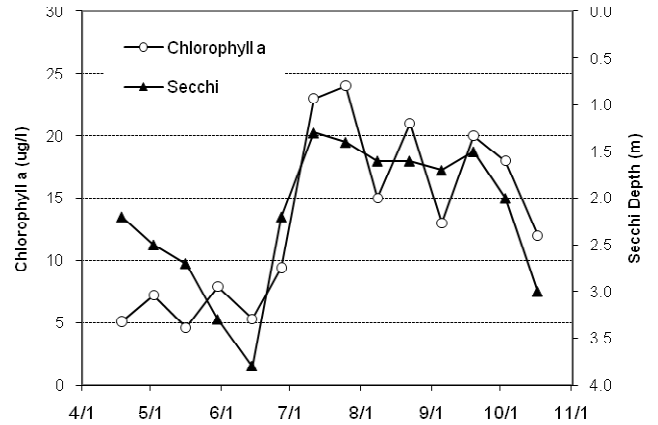
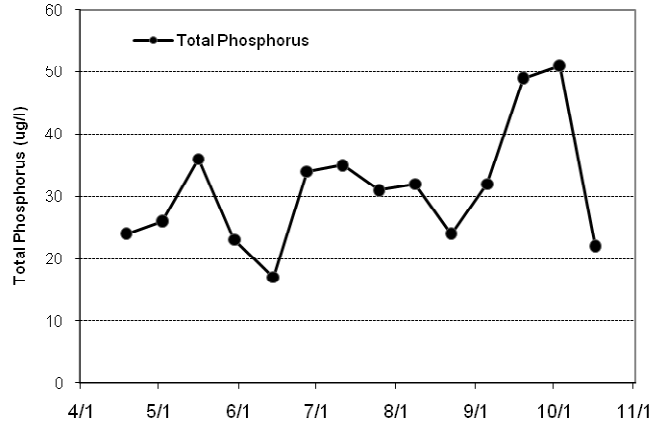
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	C	C		C							B	
Chlorophyll a	C			B				C		B		
Secchi Depth	C	C	C	B	C	B	B	C	C	B	C	B
<b>Lake Grade</b>	<b>C</b>			<b>B</b>						<b>B</b>		

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus			C	C	C	C	C	C	C	B	C	C
Chlorophyll a			B	C	C	C	C	B	C	B	B	C
Secchi Depth	B		C	C	C	C	C	C	C	C	C	C
<b>Lake Grade</b>			<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	B
Chlorophyll a	B	C	C	C	C	B
Secchi Depth	C	C	C	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>

Source: Metropolitan Council and STORET data



## Dean Lake (70-0074) City of Shakopee

Dean Lake is a small shallow lake located within City of Shakopee (Scott County). There is little morphological data available for the lake. Because of the shallowness of the lake, its entire area is considered littoral zone (the 0-15 foot depth area dominated by aquatic vegetation). Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	503.4	145.0	845.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	68.5	8.0	210.0	D
<b>Secchi</b> (m)				N/A
<b>TKN</b> (mg/l)	4.84	1.30	7.90	
<b>Lake Grade</b>				N/A

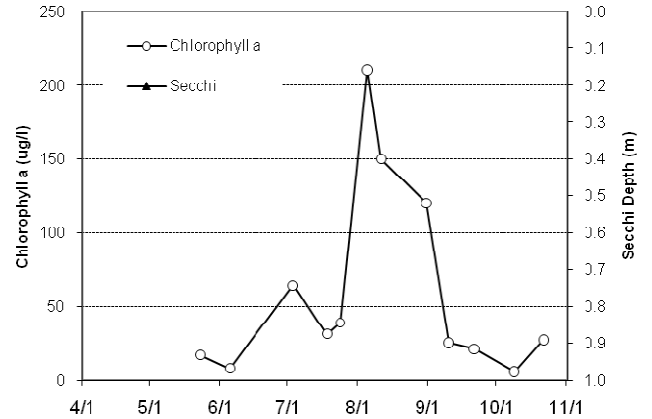
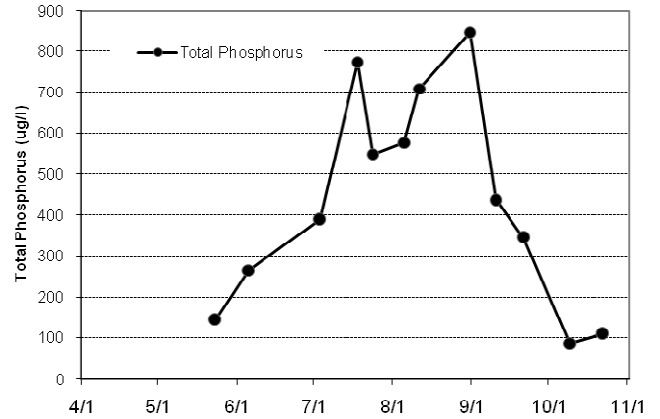
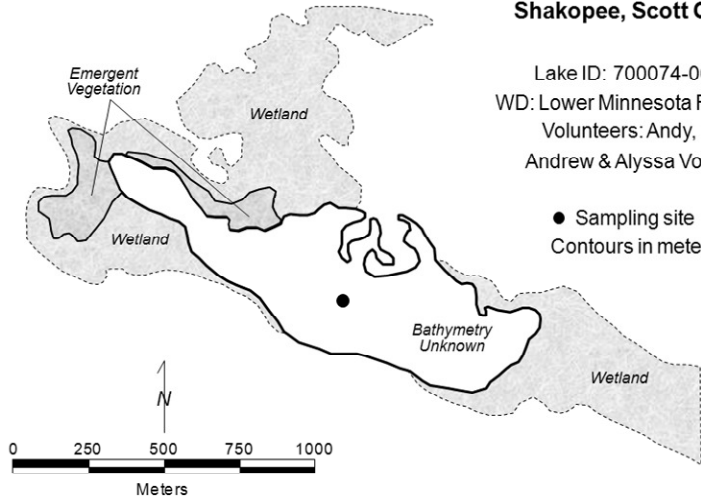
Water levels were too low at the sampling site to measure Secchi depths during the 2009 monitoring season. A new monitoring site will be determined to improve sampling conditions in the future.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

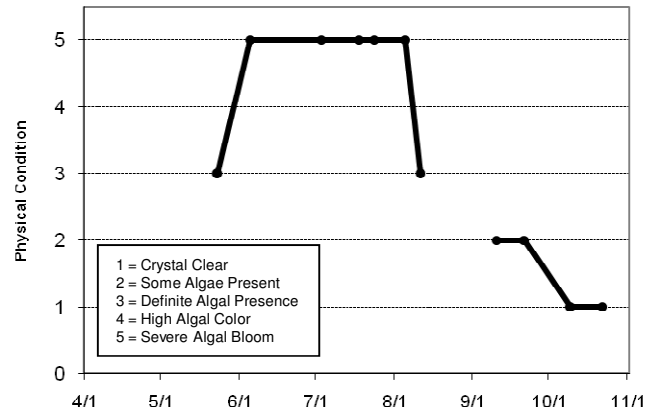
## Dean Lake, Shakopee, Scott Co.

Lake ID: 700074-00  
 WD: Lower Minnesota River  
 Volunteers: Andy, Andrew & Alyssa Voit



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/23	26.4				17	145			3	4
6/5	25.6				8	264			5	4
7/3	25.7				64	390			5	4
7/18	33				31	773			5	4
7/24	29.7				39	549			5	4
8/5	31.7				210	577			5	4
8/11	31.2				150	708			3	4
8/31	23				120	845				
9/10	29.1				25	437			2	1
9/21	26.1				21	346			2	2
10/9	12				5.8	86			1	1
10/22	7				27	110			1	1

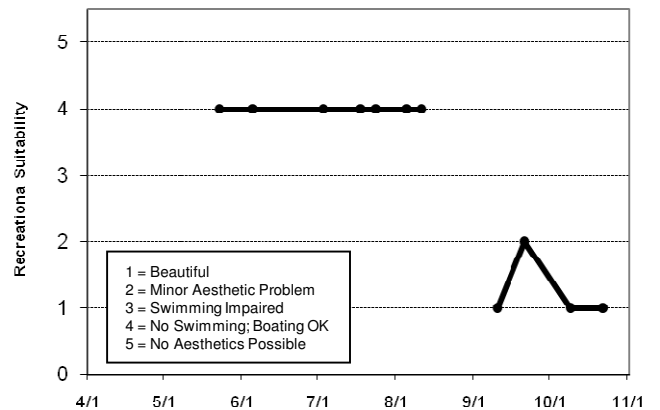


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	F	F	F	F	F
Chlorophyll a	B	C	D	D	C	D
Secchi Depth	F	F	F	F	C	
<b>Lake Grade</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>F</b>	<b>D</b>	



Source: Metropolitan Council and STORET data

## DeMontreville Lake (82-0101) Valley Branch Watershed District

Lake DeMontreville is located in Lake Elmo (Washington County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value and exceptional water clarity (METC 2007). The 160-acre lake has a mean and maximum depth of 2.4 m (~8 feet) and 7.3 m (24 feet). The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	23.0	13.0	30.0	B
<b>CLA</b> (µg/l)	9.3	2.1	25.0	A
<b>Secchi</b> (m)	2.8	1.2	4.0	B
<b>TKN</b> (mg/l)	0.75	0.46	1.20	
			<b>Lake Grade</b>	B

The lake received a lake grade of B for 2009. Historically, the lake grades for the years 1980 through 2008 show that the quality of the lake has improved over the past 25 years (see lake information sheet on the following page). The lake has been fluctuating between an A and B grades since the early 1990s, except for 2007.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

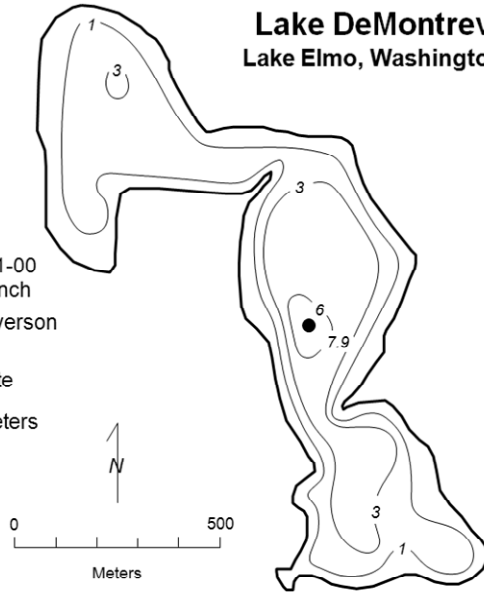
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

## Lake DeMontreville Lake Elmo, Washington Co.

Lake ID: 820101-00  
WD: Valley Branch  
Volunteer: Steve Iverson

● Sampling site  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/17	16.4				2.9	29		3.6	1	1
5/31	19.7				3.1	25		3.5	1	1
6/14	22.2				2.8	13		3.8	2	1
6/28	24.6				3.2	20		4.0	2	1
7/7	25.1				2.1	18		3.4	2	1
7/24	23.5				4.3	19		3.0	2	1
8/6	24.4				8.3	17		2.0	2	1
8/23	23.2				25	30		1.3	2	1
9/12	24				25	29		1.2	2	2
9/20	23.7				16	30		1.7	2	1
10/7	12.7				8	22		3.4	2	1
10/27	7.7				9.5	18		3.4	2	1

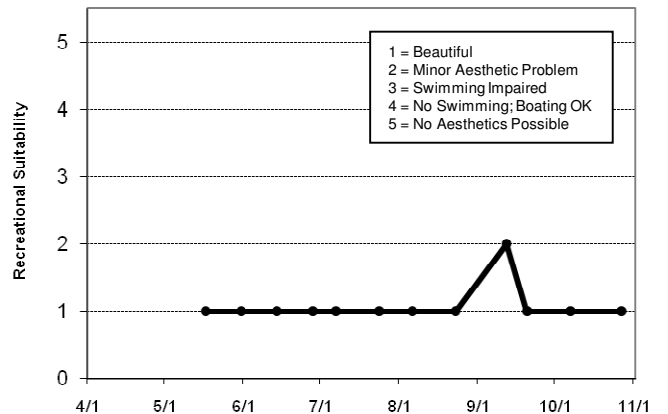
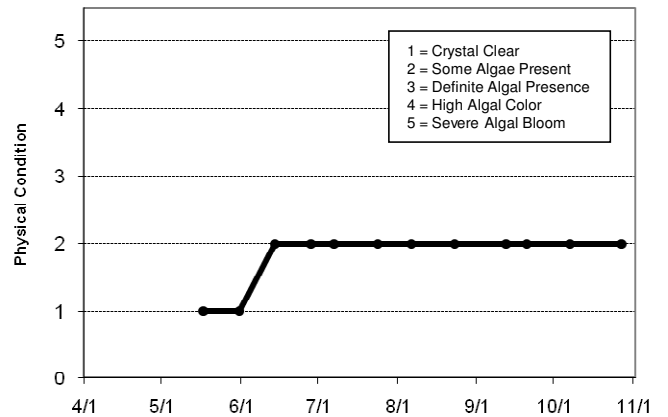
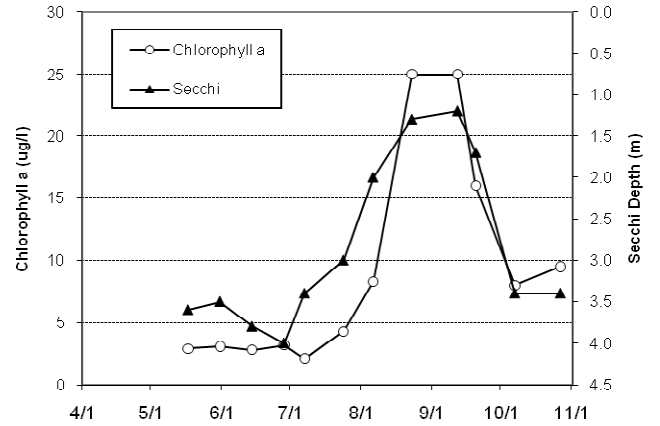
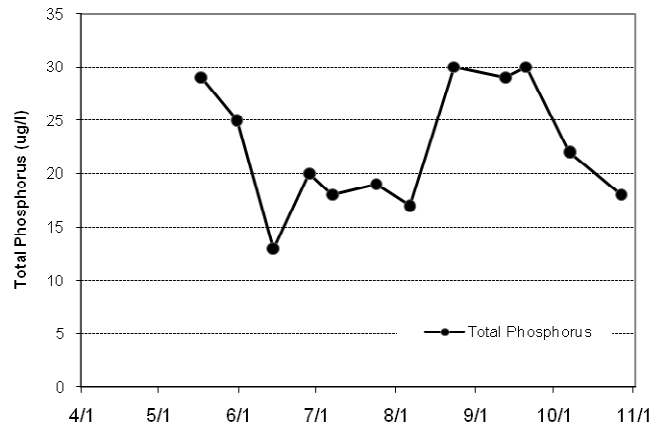
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	C				C							B
Chlorophyll <u>a</u>	C				C							C
Secchi Depth	C				C	C	C		C	D		C
<b>Lake Grade</b>	<b>C</b>				<b>C</b>							<b>C</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus	B		C						A			A
Chlorophyll <u>a</u>	A		B						A			B
Secchi Depth	B		B						A			A
<b>Lake Grade</b>	<b>B</b>		<b>B</b>						<b>A</b>			<b>A</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	B	C	B	A	B
Chlorophyll <u>a</u>	A	B	B	C	A	A
Secchi Depth	B	A	B	C	A	B
<b>Lake Grade</b>	<b>A</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>A</b>	<b>B</b>

Source: Metropolitan Council and STORET data



### **Downs Lake (82-0110) Valley Branch Watershed District**

Downs Lake is located in Lake Elmo (Washington County). The lake has mean and maximum depths of 1.5 m (5 feet) and 2.1 m (7 feet), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has a surface area of 35 acres and a watershed area of 2,400 acres, giving a large watershed-to-lake size ratio of 69:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	205.8	115.0	339.0	F
<b>CLA</b> (µg/l)	74.6	28.0	140.0	D
<b>Secchi</b> (m)	0.3	0.2	0.6	F
<b>TKN</b> (mg/l)	2.86	1.90	4.00	
<b>Lake Grade</b>				F

The lake received a lake grade of F for 2009, which is consistent with its historical database.

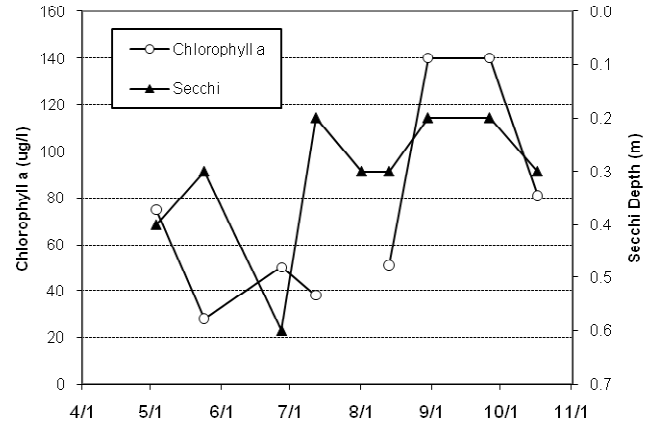
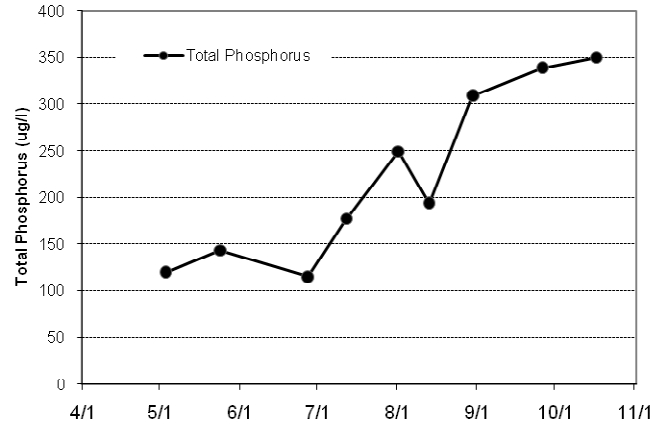
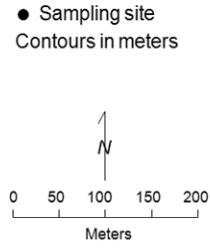
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



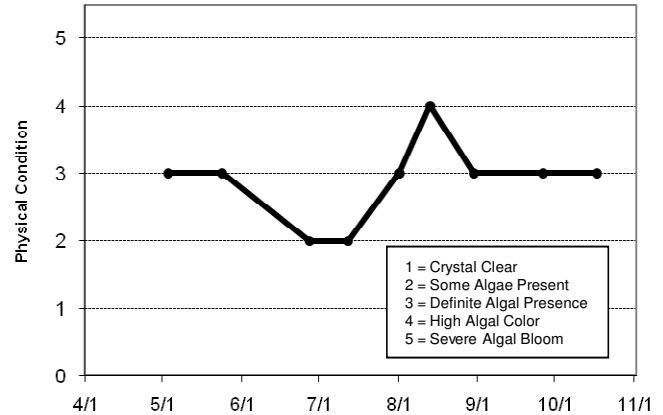
**Downs Lake**  
**Lake Elmo, Washington Co.**

Lake ID: 820110-00  
 WD: Valley Branch  
 Volunteers: Wesley Sly Family



**2009 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
5/3	16.9				75	120		0.4	3	4
5/24	24.2				28	143		0.3	3	4
6/27	26.7				50	115		0.6	2	4
7/12	27.1				38	177		0.2	2	4
8/1	28.1					249		0.3	3	4
8/13	29.8				51	194		0.3	4	4
8/30	22.4				140	309		0.2	3	4
9/26	22.7				140	339		0.2	3	4
10/17	8.9				81	350		0.3	3	4

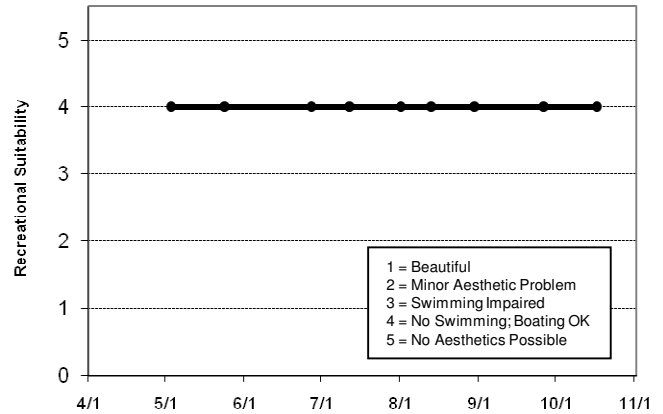


**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	F	D	F	F	F	F
Chlorophyll a	D	D	F	F	F	D
Secchi Depth	F	F	F	F	F	F
Lake Grade	F	D	F	F	F	F



Source: Metropolitan Council and STORET data

## Eagle Lake [Carver County] (10-0121) Carver County Environmental Services

Eagle Lake is located in Young America Township in Carver County. The lake is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a surface area of 186 acres and a maximum 4.0 m (14 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The DNR has designated the lake as being infested with Eurasian Water Milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	193.7	69.0	299.0	F
<b>CLA</b> (µg/l)	79.5	32.0	140.0	F
<b>Secchi</b> (m)	0.4	0.3	0.7	F
<b>TKN</b> (mg/l)	2.38	1.20	3.40	
			<b>Lake Grade</b>	F

The lake received a lake grade of F for 2009. The lake appears to fluctuate between a lake grade of D and F, but with F being dominant for the past 4 years.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

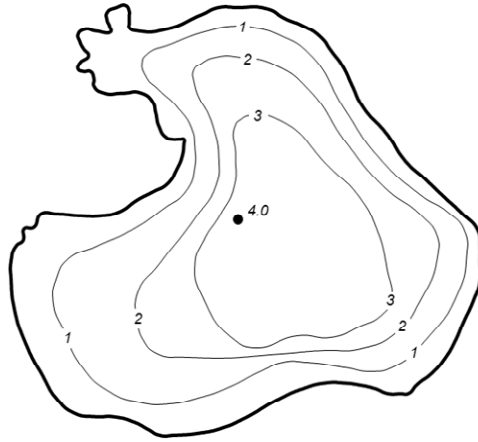
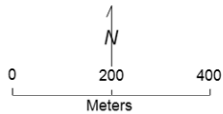
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Eagle Lake, Camden Twp. Carver Co.

Lake ID: 100121-00  
WMO: Crow River  
Volunteer: Carver County

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	8.24		8.14		77			0.5	3	3
4/28	11.95		12.7		79	133		0.6	3	3
5/15	15.29		8.29		32	69		0.5	1	1
5/26	18.67		9.7		84	84		0.4	3	3
6/9	15.93		5.7		55	196		0.4	5	4
6/23	26.35		17.8		51	170		0.7	5	5
7/7	24.43		18.78		72	286		0.4	4	4
7/21	22.06		12.56		140	299		0.3	4	4
8/4	23.13		10.65		120	275		0.3	5	5
8/18	23.04		6.64		74	238		0.4	4	4
9/1	20.51		9.24		88	227		0.4	4	4
9/15	22.51		13.05		49	95		0.6	5	5
9/29	16.11		9.46		110	192		0.4	4	4
10/13	7.57		12.54		49	154		0.5	4	4

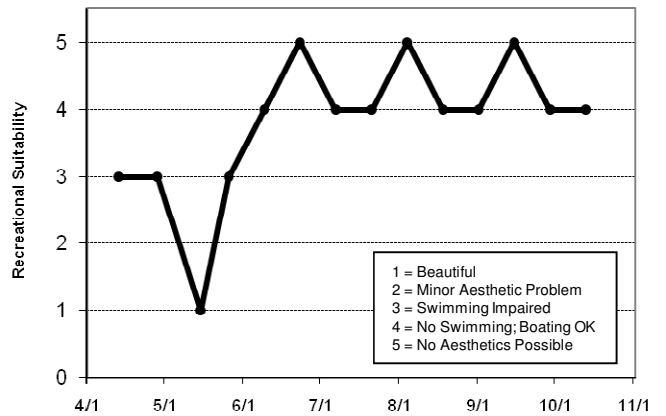
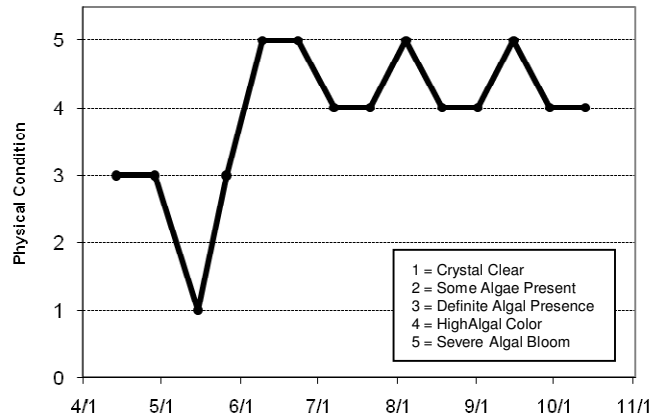
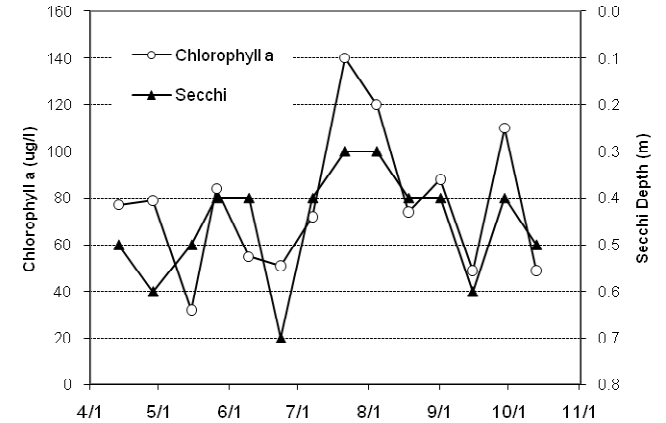
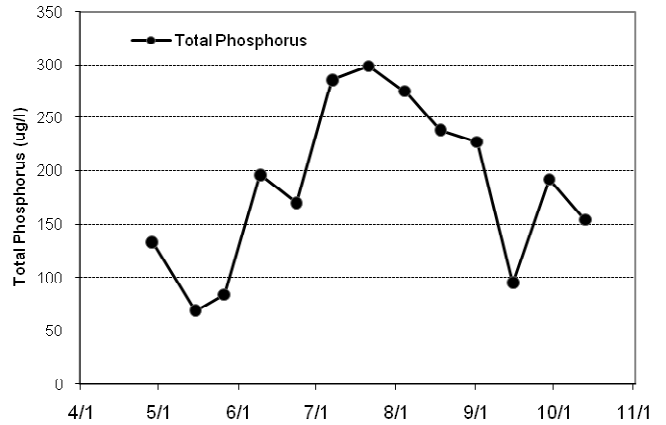
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	F	F				F						
Chlorophyll a	D	C				F						
Secchi Depth	C	C				F						
<b>Lake Grade</b>	<b>D</b>	<b>D</b>				<b>F</b>						

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					F	F	F	F	F	F	F	F
Chlorophyll a					C	C	C	C	D	D	D	C
Secchi Depth					B	C	B	C	D	F	D	C
<b>Lake Grade</b>					<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>D</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	F	D	F	F	F	F
Chlorophyll a	C	C	F	F	F	F
Secchi Depth	D	C	D	F	F	F
<b>Lake Grade</b>	<b>D</b>	<b>C</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>

Source: Metropolitan Council and STORET data



## Eagle Lake (27-0111-01) Shingle Creek Watershed Management Commission

Eagle Lake is located within the City of Maple Grove (Hennepin County). The maximum depth of the lake is 10.4 m (34 ft). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	28.7	18.0	49.0	B
<b>CLA</b> ( $\mu\text{g/l}$ )	13.4	7.2	31.0	B
<b>Secchi</b> (m)	3.3	1.0	8.0	A
<b>TKN</b> (mg/l)	1.04	0.80	1.30	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009, which is consistent with its historical database. The mean Secchi depth was heavily influenced by a very clear reading of 8.0 m on June 14, 2010, which is quite uncommon for this lake. Continued monitoring is suggested to determine water quality trends.

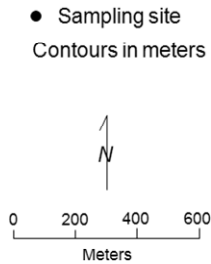
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Eagle Lake, Maple Grove, Hennepin Co.

Lake ID: 270111-01  
WMO: Shingle Creek  
Volunteer: Larry McGough



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/6	15.1					18		4.5	1	1
6/2	20				31	26			1	
6/14	20.7				7.5	20		8.0	2	1
7/5	23.5				7.2	20		1.6	2	1
7/20	23.8				14	49		1.2	2	1
8/17	23				7.5	39		1.0	2	2

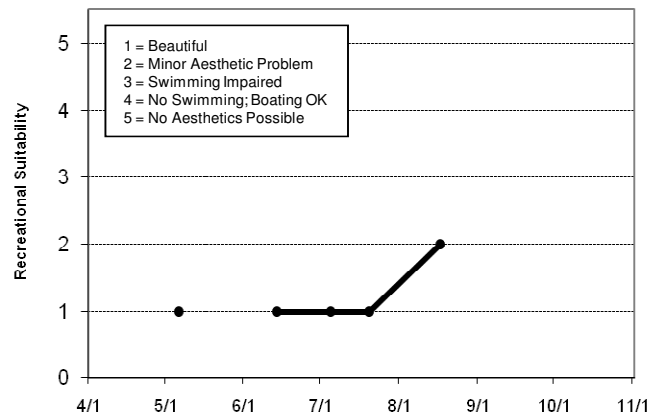
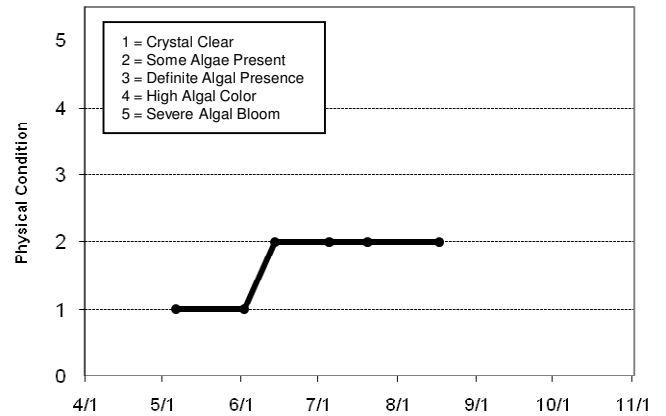
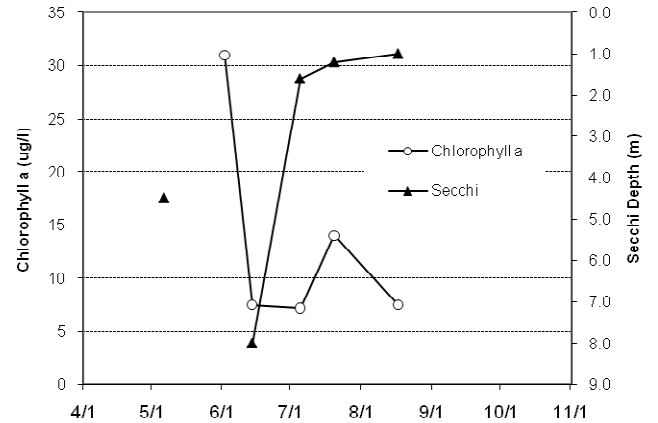
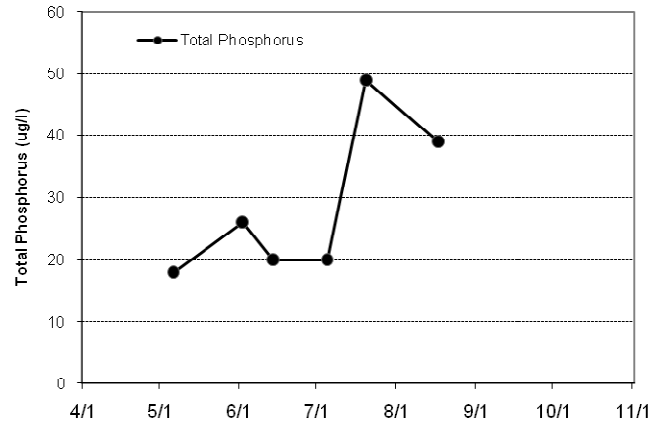
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	C		C				C	C				C
Chlorophyll a	D		C				B	C				C
Secchi Depth	D		C				C	C				C
<b>Lake Grade</b>	<b>D</b>		<b>C</b>				<b>C</b>	<b>C</b>				<b>C</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus	B				B	B	B		C			C
Chlorophyll a	B				B	A	B		A			A
Secchi Depth	B				C	C	C		B			D
<b>Lake Grade</b>	<b>B</b>				<b>B</b>	<b>B</b>	<b>B</b>		<b>B</b>			<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		C				B
Chlorophyll a		B				B
Secchi Depth		B				A
<b>Lake Grade</b>		<b>B</b>				<b>B</b>

Source: Metropolitan Council and STORET data



## Eagle Point Lake (82-0109) Valley Branch Watershed District

Eagle Point Lake is located within the City of Lake Elmo (Washington County). It has a surface area of approximately 120-acres. The mean and maximum depths of the lake are 0.9 m (3 feet) and 1.8 m (roughly 6 feet), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake's 11,502-acre watershed translates to a large watershed-to-lake size ratio of 96:1, which is a large ratio. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	138.5	138.0	139.0	NA
<b>CLA</b> ( $\mu\text{g/l}$ )	17.0	12.0	22.0	NA
<b>Secchi</b> (m)	0.6	0.5	0.8	NA
<b>TKN</b> (mg/l)	2.20	1.90	2.50	
			<i>Lake Grade</i>	NA

The lake was monitored 2 times in 2009. Low lake water levels prevented access to open water for most of the year because of drought conditions. There were fewer than 5 monitoring events during the summer period, so there were insufficient data to calculate letter grades. Furthermore, there were insufficient data to make comparisons of 2009 data to previous monitoring years. There are insufficient data to determine trends in the lake's water quality. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

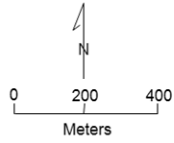
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Eagle Point Lake Lake Elmo, Washington Co.

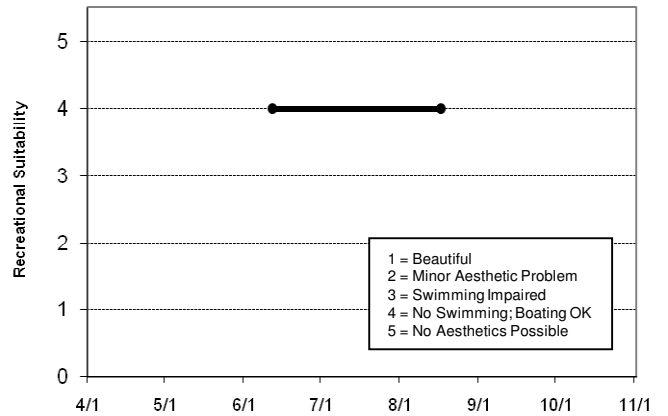
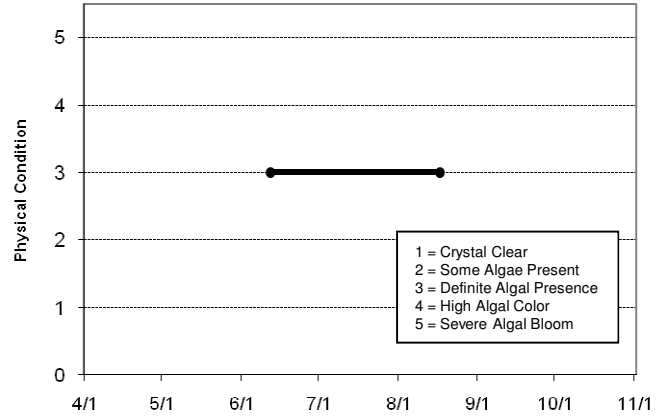
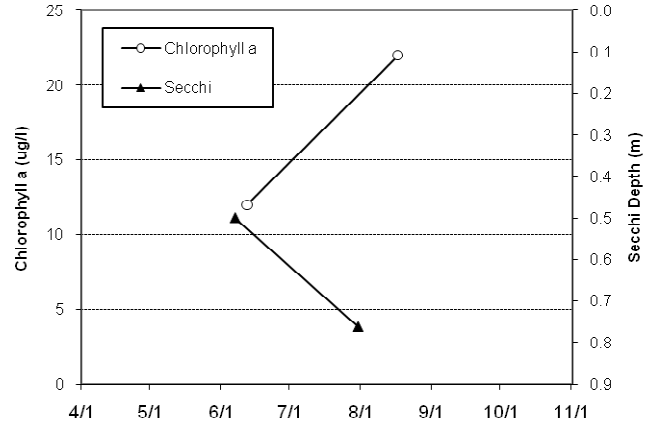
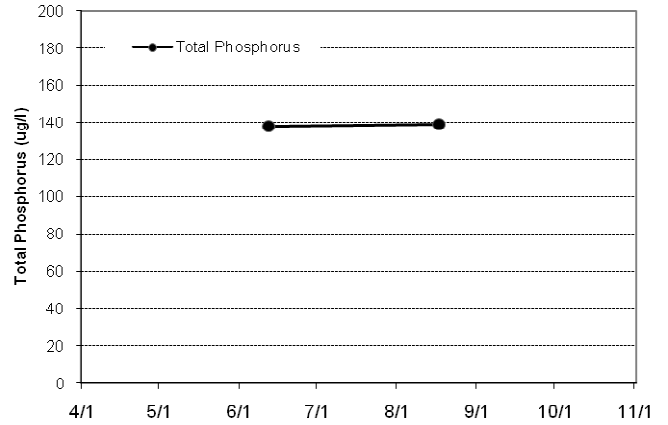
Lake ID: 820109-00  
WD: Valley Branch  
Volunteer: Bob Schumacher

● Sampling station  
Contours in meters



### 2009 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
6/12	21				12	138		0.5	3	4
8/17	23.7	23.7	5.38	0.11	22	139		0.8	3	4



### 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												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						
Chlorophyll a						
Secchi Depth						
<b>Lake Grade</b>						

Source: Metropolitan Council and STORET data

## Earley Lake (19-0033) Black Dog Watershed Management Commission

Earley Lake is located within the City of Burnsville in Dakota County. The 29-acre lake receives flow from Crystal Lake (Burnsville) and the Earley Lake watershed. Most of its 1,629-acre watershed is either parkland or open space. The watershed-to-lake size ratio is a rather large 56:1. Generally, the larger the ratio the greater the potential stress on the lake from surface runoff. Earley Lake outlets at its west end to Sunset Pond. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	42.0	22.0	68.0	C
<b>CLA</b> (µg/l)	6.5	1.6	12.0	A
<b>Secchi</b> (m)	2.1	1.8	2.5	C
<b>TKN</b> (mg/l)	0.78	0.46	1.30	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009, which is similar to water quality observed in 2006 and 2008. The summer-time mean CLA concentration continues to be low with respect to the lakes historic database. Additional monitoring is suggested to determine if recent lower mean CLA concentrations are indication of improving water quality.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

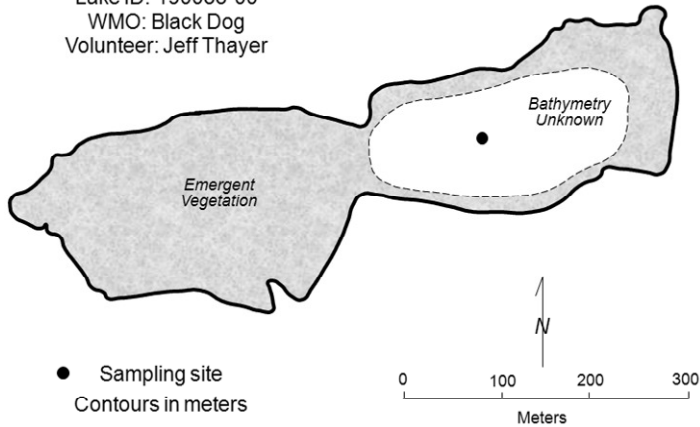
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



# Earley Lake

## Burnsville, Dakota Co.

Lake ID: 190033-00  
 WMO: Black Dog  
 Volunteer: Jeff Thayer



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	15.5				11	52		1.1	1	1
5/9	17.7				3.5	23		2.1	1	1
5/28	19.9				2.7	62		2.5	2	2
6/18	24.3				1.6	22		2.1	3	
7/12	28.7				6.2	29		2.4	3	4
7/31	24.8				8.9	68		2.1	3	4
8/16	25.5				7.2	43		1.8	2	4
8/30					12	46			3	4
9/20					10	43		2.0	3	
10/27					5.2	20		2.4	1	4

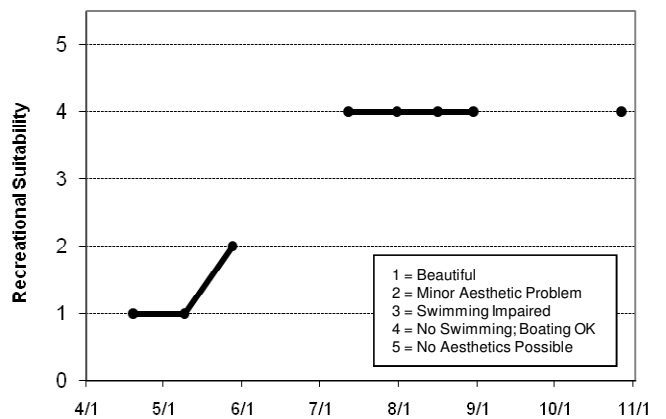
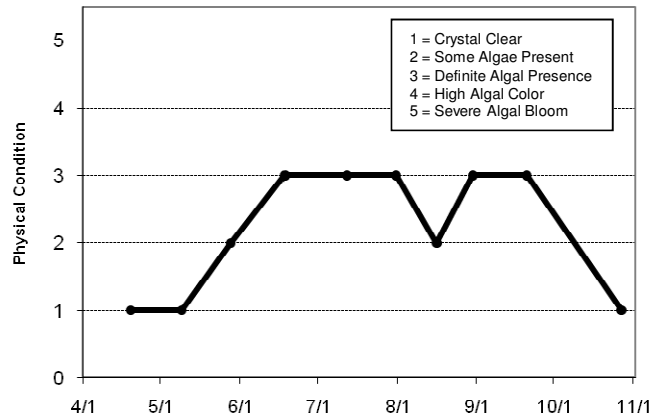
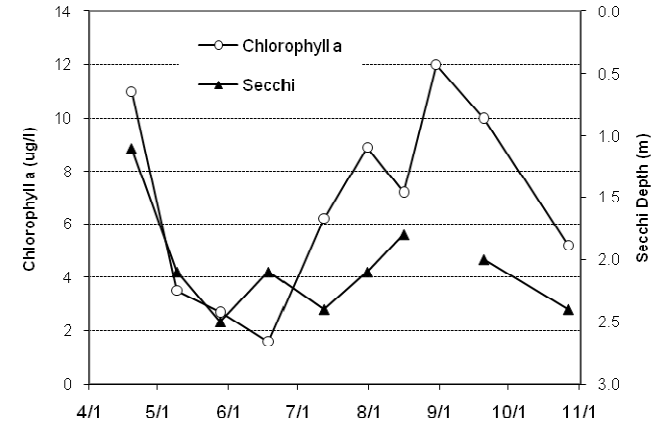
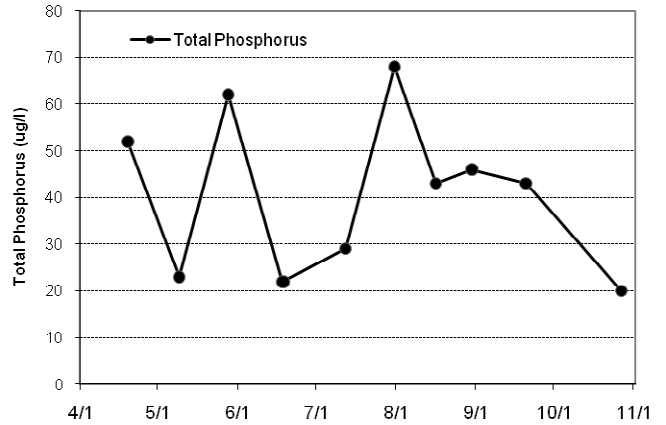
### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	C
Chlorophyll a	B	B	A	B	A	A
Secchi Depth	C	C	C	C	C	C
Lake Grade	C	C	B	C	B	B

Source: Metropolitan Council and STORET data



### **East Boot Lake (82-0034) Carnelian - Marine - St. Croix Watershed District**

East Boot Lake is located in May Township (Washington County). The mean and maximum depths of the 47-acre lake are 8.2 m (27 feet) and 0.9 m (3 feet), respectively. The lake's small 93-acre immediate watershed translates to a small watershed-to-lake size ratio of 2:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	23.8	20.0	28.0	B
<b>CLA</b> ( $\mu\text{g/l}$ )	6.9	2.2	11.0	A
<b>Secchi</b> (m)	3.4	1.8	6.1	A
<b>TKN</b> (mg/l)	0.92	0.78	1.10	
<b>Lake Grade</b>				A

The lake received a lake grade of A for 2009, which is the best lake grade this lake has received since 1996. This was the first year the lake received an A grade for CLA. The lake continues to achieve better water quality than it used to receive in the period from the mid 1990s and early 2000s. Additional monitoring is suggested to help determine if the lake continues to improve.

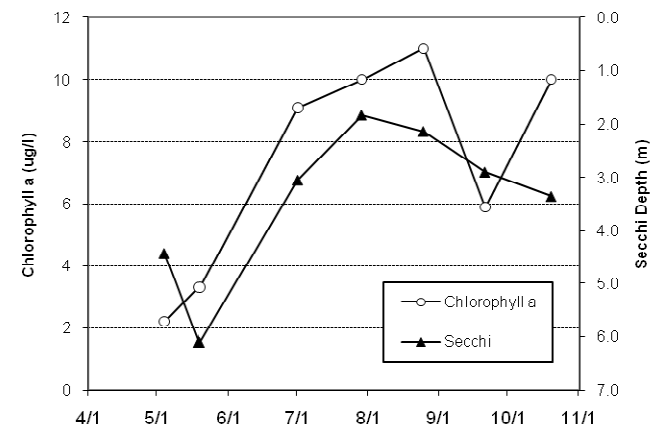
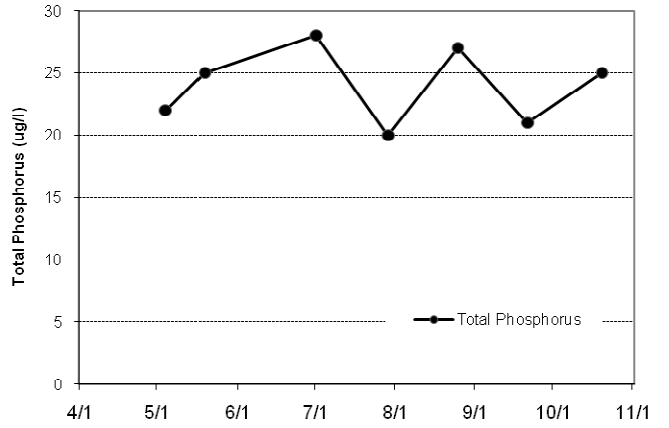
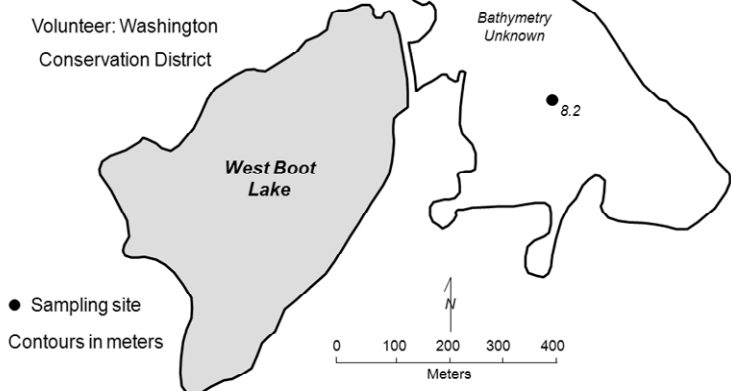
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

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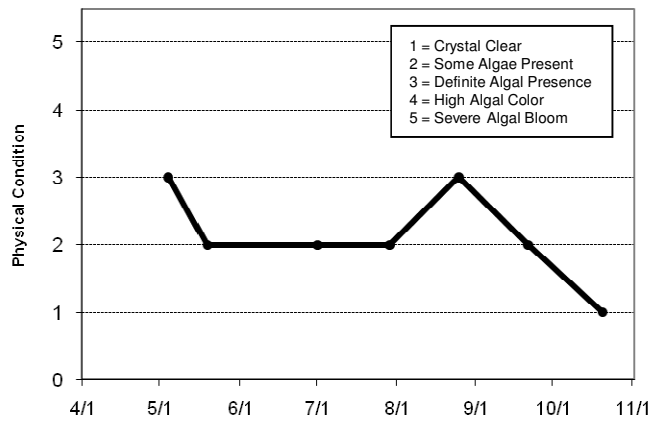
**East Boot Lake**  
May Twp., Washington Co.

LAKE ID: 820034-00  
WD: Carnelian-Marine-St. Croix  
Volunteer: Washington  
Conservation District



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°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	15	11.2	11.25	0.04	2.2	22		4.4	3	4
5/19	18	6.9	11.02	0.08	3.3	25		6.1	2	3
7/1	21.1	7.9	7.49	0.05	9.1	28		3.0	2	3
7/29	23.4	8.3	9.63	0.04	10	20		1.8	2	2
8/25	22.8	8.7	8.78	0.05	11	27		2.1	3	3
9/21	22.8	9.1	10.04	0.04	5.9	21		2.9	2	2
10/20	9	8.3	11.86	0.44	10	25		3.4	1	1



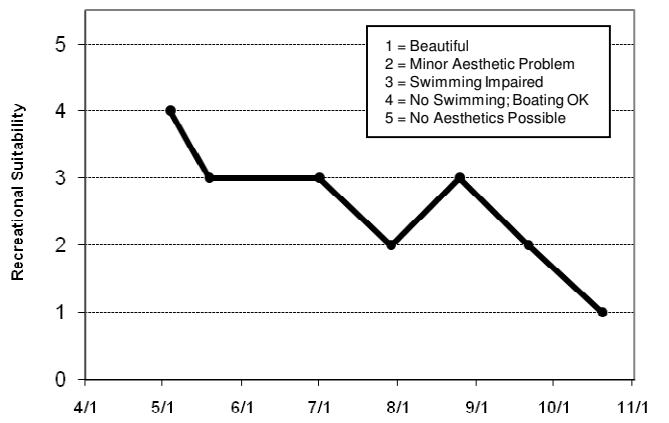
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	B
Chlorophyll a	B	B	C	B	B	A
Secchi Depth	A	A	A	A	A	A
Lake Grade	B	B	B	B	B	A

Source: Metropolitan Council and STORET data



## Edith Lake (82-0004) Valley Branch Watershed District

### Primary Report

Edith Lake is a 81-acre lake located within Afton (Washington County). The lake has a maximum depth of approximately 13.0 m (43 feet). Roughly 42 percent of the lake's surface area is considered littoral zone (the 0-15 foot depth area of aquatic plant dominance). The lake has a watershed of 1,576 acres, which gives a watershed-to-lake area ratio of 19:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	25.6	17.0	44.0	B
<b>CLA</b> ( $\mu\text{g/l}$ )	8.0	3.1	22.0	A
<b>Secchi</b> (m)	2.1	1.4	3.0	C
<b>TKN</b> (mg/l)	0.71	0.49	0.85	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009, which is similar to the grade it received in 2006 and 2008. For the 5 years that the lake has been monitored via the CAMP, the lake has fluctuated between a lake grade of A and B. Continued monitoring is suggested to help determine the long term nature of the water quality for this lake.

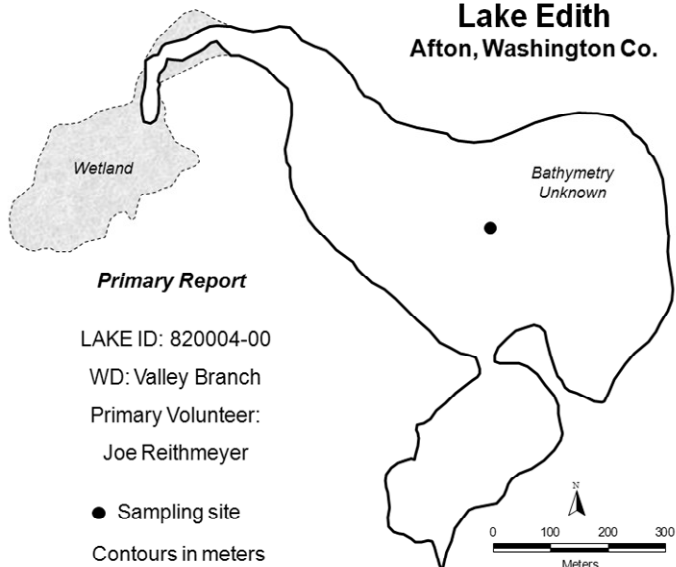
The lake experienced a relatively low CLA summer-time mean concentration compared to the secchi depth mean summer-time value (which yielded a CLA grade of A versus the C grade for water clarity). The relatively low CLA concentrations indicate that something other than algae was causing the diminished water clarity. Suspended particulates may be a possible cause of the low water clarity. Likely causes may be either that lake sediment was resuspended in the water column because of frequent mixing events, or the lake received significant quantities of suspended solids from the watershed via runoff events, or both. In either case, the increase turbidity would decrease available light via reduced water clarity, and thereby suppress algal growth.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR 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](mailto:brian.johnson@metc.state.mn.us).

## Lake Edith Afton, Washington Co.



### Primary Report

LAKE ID: 820004-00

WD: Valley Branch

Primary Volunteer:

Joe Reithmeyer

● Sampling site

Contours in meters

### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	10.9				24	44		1.4	2	2
5/2	12.6				22	44		1.4	2	2
5/17	17.5				7.5	26		2.7	2	2
6/1	21.6				9.8	29		1.4	2	2
6/15	22				6.2			1.7	2	2
7/11	25.3				6.4	17		1.8	2	2
9/7	23.5				3.8	24		2.2	2	2
9/18	24.4				3.1	17		2.8	2	2
9/30	17				5.2	22		3.0	2	2
10/18	9.5				2.2	25		3.4	2	2

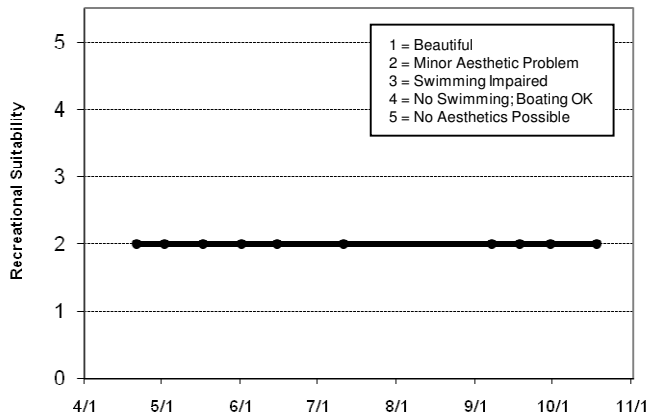
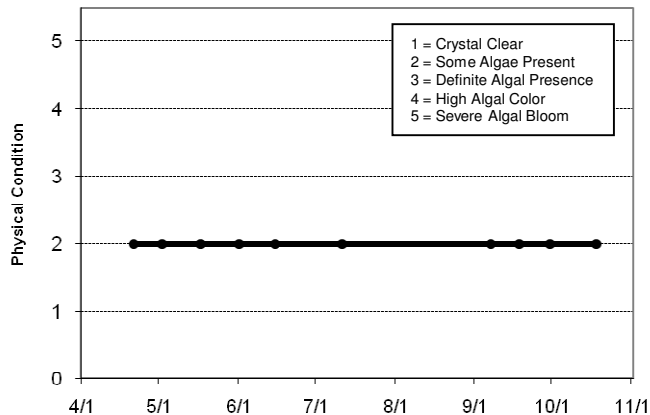
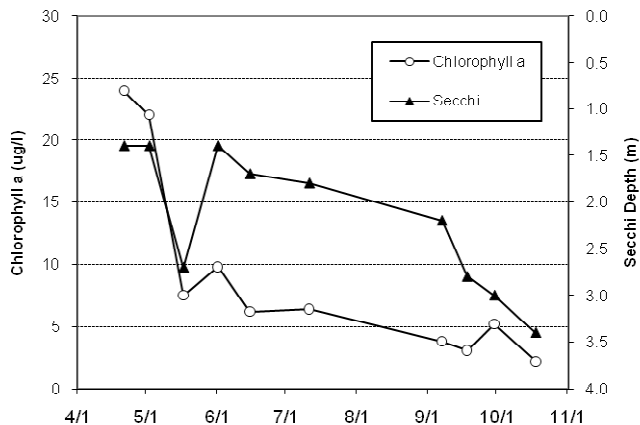
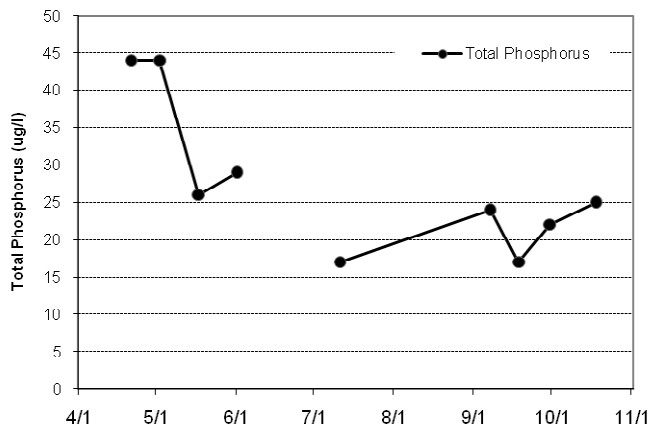
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	B	A	B	B	
Chlorophyll <i>a</i>	A	A	A	A	A	
Secchi Depth	B	C	B	C	C	
<b>Lake Grade</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>B</b>	

Source: Metropolitan Council and STORET data



## Edith Lake (82-0004) Washington Conservation District

### Secondary Report

Edith Lake was also monitored by the Washington Conservation District (WCD) in 2009. The monitoring by the WCD provided duplicate monitoring for the lake. For more detailed information on the lake, refer to its primary report.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles of temperature and dissolved oxygen were also collected. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	23.8	17.0	36.0	B
<b>CLA</b> ( $\mu\text{g/l}$ )	8.7	6.3	17.0	A
<b>Secchi</b> (m)	1.7	1.1	2.1	C
<b>TKN</b> (mg/l)	0.82	0.60	0.92	
<b>Lake Grade</b>				<b>B</b>

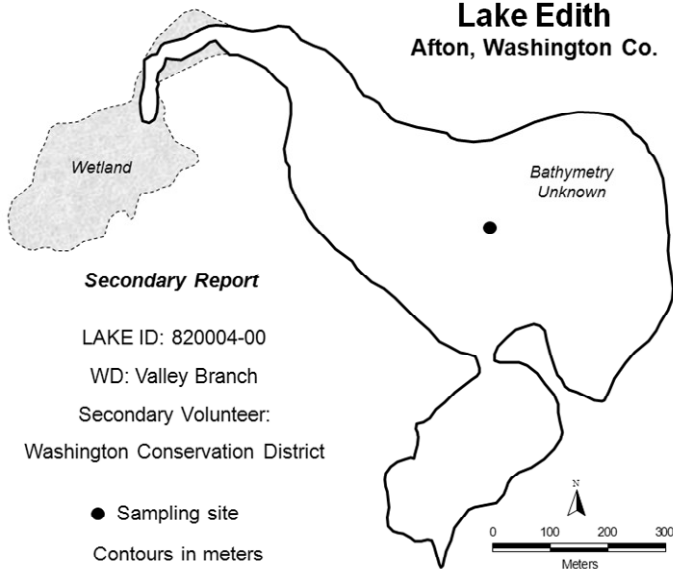
The lake received a lake grade of B for 2009, similar to the lake grade given in the primary report. TP concentrations were of similar magnitude and temporal pattern over the summer-time period as compared to those given in the primary report. CLA concentrations were in general agreement with respect to magnitude and temporal pattern with respect to those given in the primary report. Overall, the data collected by the primary and secondary volunteers concur with each other.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR 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](mailto:brian.johnson@metc.state.mn.us).

## Lake Edith Afton, Washington Co.



**Secondary Report**

LAKE ID: 820004-00

WD: Valley Branch

Secondary Volunteer:

Washington Conservation District

● Sampling site

Contours in meters

### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	10.2	4.3	13.5	0.04	30	56	170	1.4	3	4
6/1	20	5	10.71	0.02	17	26	208	1.1	3	4
6/15	22.6	4.9	10.21	0	7.2	36	165	1.8	3	2
7/14	24.3	5.2	10.27	0.03	6.5	22	277	1.7	3	3
8/10	24.6	5.9	8.32	0.02	6.3	18	110	2.1	2	3
9/9	24.4	5.8	10.02	0	6.5	17	382	1.8	2	2
10/7	12.5	5.9	8.22	0	6	19	397	3.5	2	2

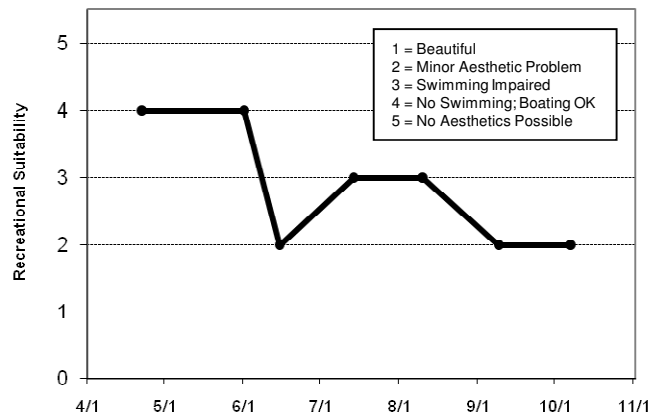
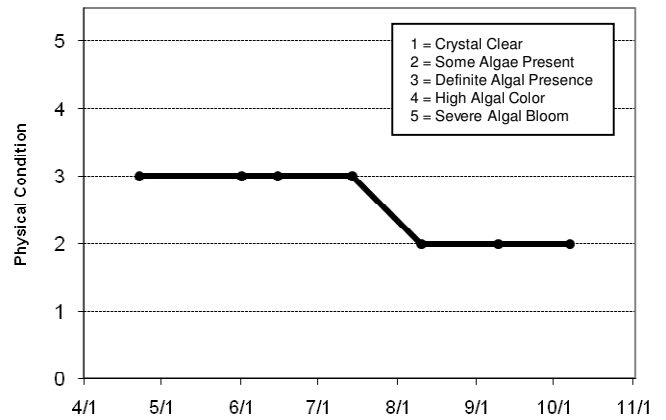
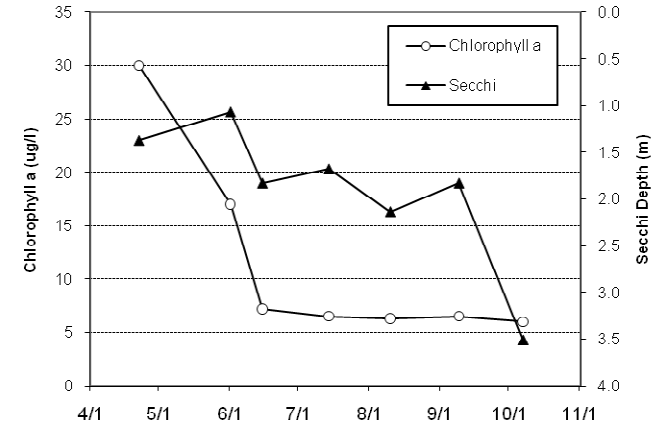
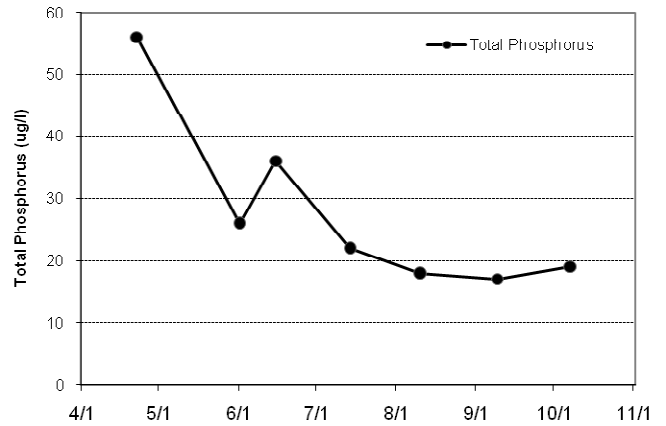
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	B	A	B	B	
Chlorophyll <i>a</i>	A	A	A	A	A	
Secchi Depth	B	C	B	C	C	
<b>Lake Grade</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>B</b>	

Source: Metropolitan Council and STORET data



## Lake Elmo (82-0106) Valley Branch Watershed District

Lake Elmo is located in Lake Elmo (Washington County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value and exceptional water clarity (METC 2007). The 284-acre lake has a maximum depth of 41.7 m (137 ft) which is the deepest lake in the TCMA. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*). The MPCA has listed the lake as impaired for perfluorooctane (PFO) content in fish.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	17.0	10.0	24.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	2.8	1.2	4.1	A
<b>Secchi</b> (m)	4.0	2.5	6.0	A
<b>TKN</b> (mg/l)	0.43	0.29	0.50	
<b>Lake Grade</b>				A

The lake received a lake grade of A for 2009, which is similar to the lake grades it has received for the past 20 years. The lake's database indicates that the lake's recent water quality is well represented by a lake grade of A.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR 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](mailto:brian.johnson@metc.state.mn.us).



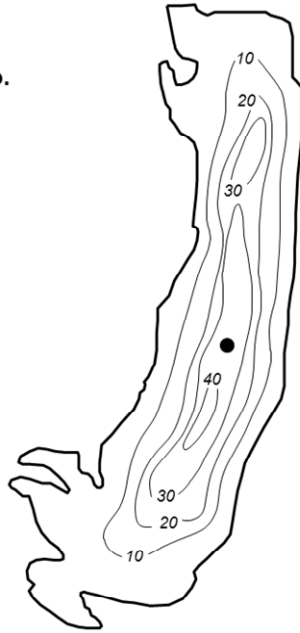
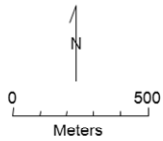
# Lake Elmo

Lake Elmo, Washington Co.

Lake ID: 820106-00  
WD: Valley Branch

Volunteers: Scott Knudson & Terry Bouthilet

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	13.2				4.1	23		3.0	1	1
5/17	16.1				3.6	18		2.5	1	1
5/31	18.8				1.2	21		3.0	1	1
6/14	21.3				2.3	16		5.1	1	1
6/28	25.5				2.1	10		5.1	1	1
7/12	24.7				2.5	10		6.0	1	1
7/26	23.5				2.6	18		4.5	1	1
8/9	24.8				3.4	13		2.6	1	1
8/23	23.6				3.6	24		4.0	1	1

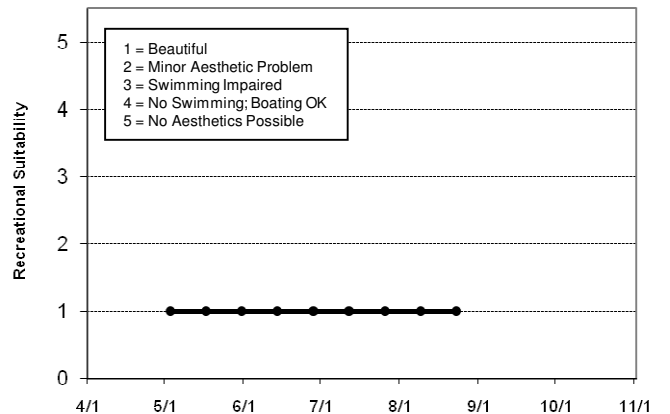
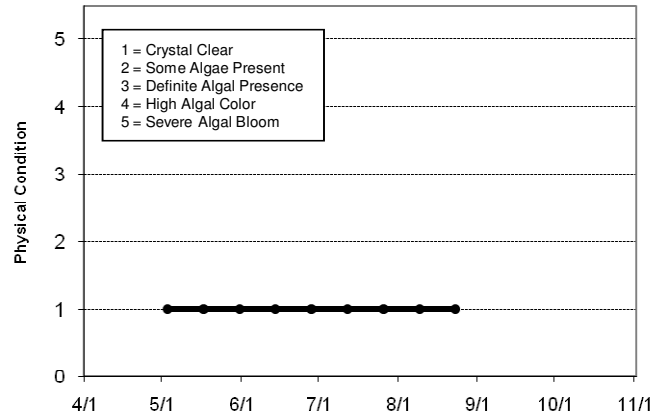
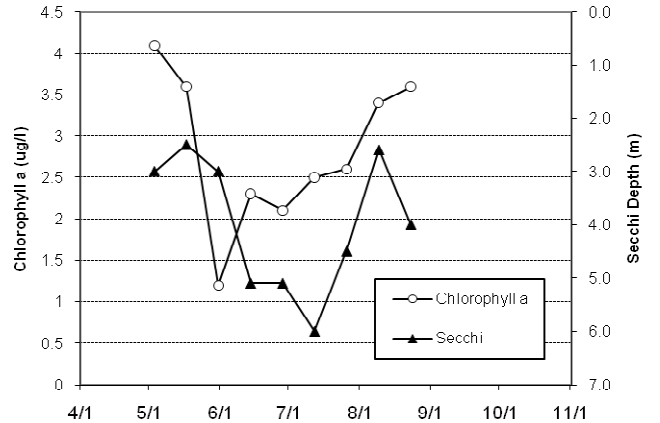
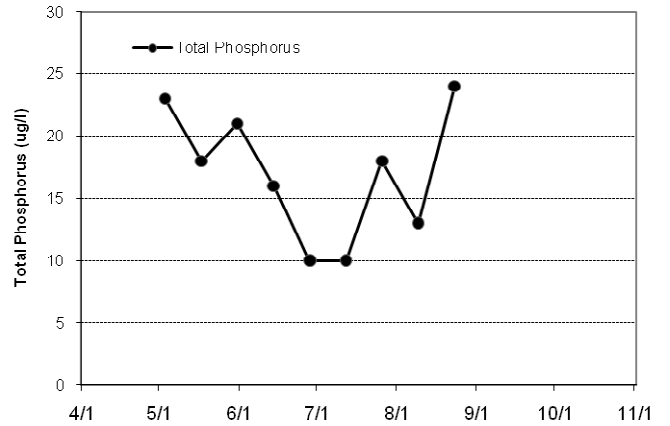
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	B	A	B		B				B			A
Chlorophyll a	B	A	B		A				A			A
Secchi Depth	C	B	C		B	A	B	B	A	A	A	A
<b>Lake Grade</b>	<b>B</b>	<b>A</b>	<b>B</b>		<b>B</b>				<b>A</b>			<b>A</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus				A								
Chlorophyll a				A								
Secchi Depth	A	A	A									
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>								

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		A	A	A	A	A
Chlorophyll a		A	A	A	A	A
Secchi Depth		A	A	A	A	A
<b>Lake Grade</b>		<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>

Source: Metropolitan Council and STORET data



## **Fahlstrom Pond [east basin] (82-0005) Washington Conservation District**

Fahlstrom Pond (east basin) is located in Afton (Washington County). There is very little morphological information available for this water body. There is no public access.

The year 2009 was the second year that this water body has been involved in the CAMP. A search of the STORET nationwide water quality database revealed no other historic monitoring data other than the 2008 CAMP data.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles of dissolved oxygen and temperature were also collected. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	282.2	114.0	518.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	28.9	3.8	110.0	C
<b>Secchi</b> (m)	0.9	0.8	1.2	D
<b>TKN</b> (mg/l)	1.76	0.89	3.10	
			<b>Lake Grade</b>	D

Additional monitoring data are needed to build a water quality database for this water body.

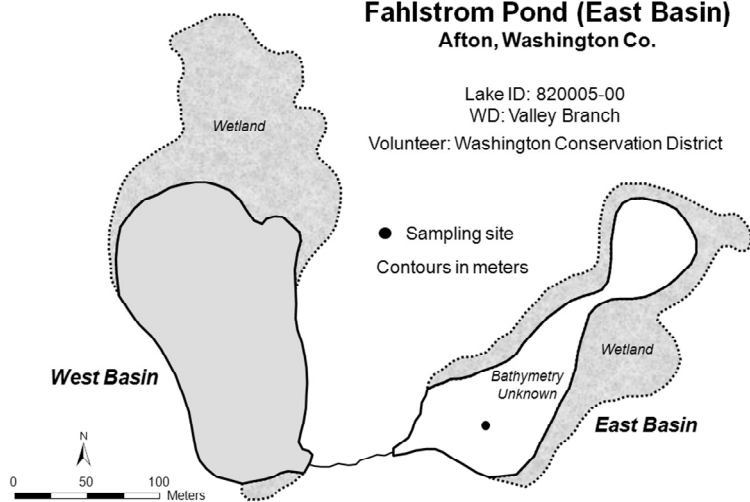
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

### Fahlstrom Pond (East Basin) Afton, Washington Co.

Lake ID: 820005-00  
WD: Valley Branch

Volunteer: Washington Conservation District



#### 2009 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
4/21	9.7	8.6	6.12	0.2	16	124		0.9	2	4
6/2	20.1	19.2	3.95	0.29	3.8	286		1.1	2	3
6/16	22.3		7.16		9	518		1.2	1	1
7/13	23.2	22.9	9.03	1.12	110	358		0.8	3	4
8/10	27.1	24.3	10.89	2.05	9.8	135		0.8	2	4
9/9	20.7	20.2	8.69	0.42	12	114		0.9	2	4
10/7	9.6		10.25		13	40		0.8	2	4

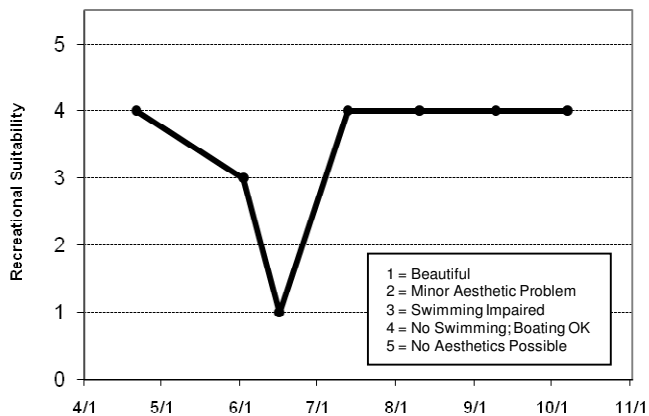
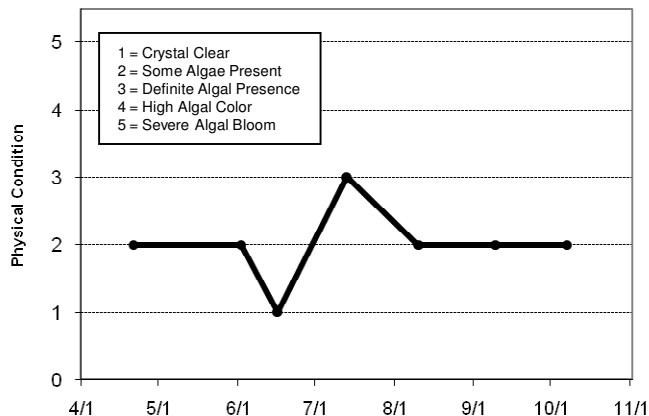
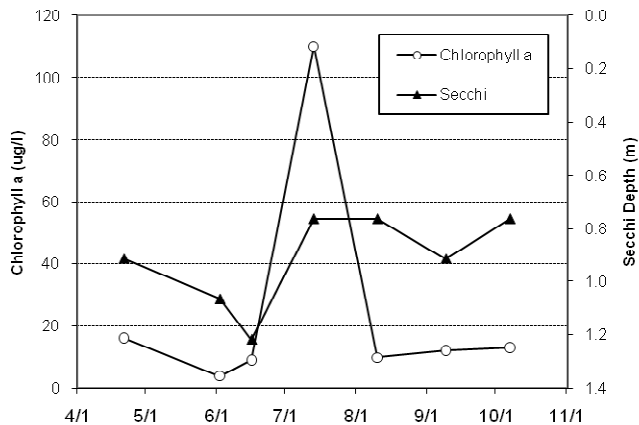
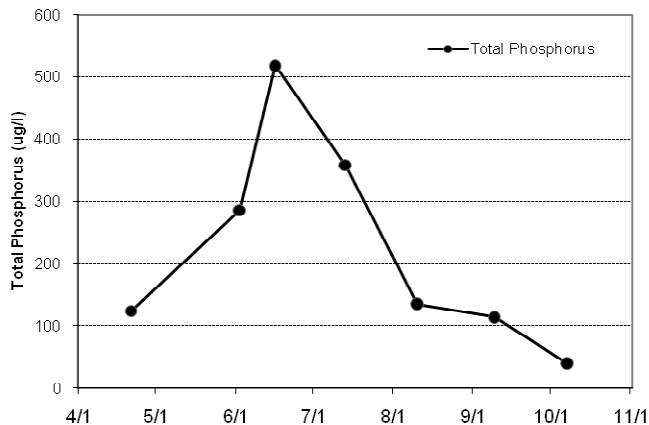
#### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
Lake Grade												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						F
Chlorophyll <i>a</i>						C
Secchi Depth						D
Lake Grade					NA	D

Source: Metropolitan Council and STORET data



## **Fahlstrom Pond [west basin] (82-0005) Washington Conservation District**

Fahlstrom Pond (west basin) is located in Afton (Washington County). There is very little morphological information available for this water body. There is no public access.

The year 2008 was the second year that this water body has been involved in the CAMP. A search of the STORET nationwide water quality database revealed no other historic monitoring data except the 2008 CAMP data.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles of dissolved oxygen and temperature were also collected. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	226.3	198.0	257.0	NA
<b>CLA</b> ( $\mu\text{g/l}$ )	21.6	3.8	32.0	NA
<b>Secchi</b> (m)	0.7	0.6	0.9	NA
<b>TKN</b> (mg/l)	1.67	1.50	1.80	
			<b>Lake Grade</b>	NA

There were insufficient data to calculate a lake grade for 2009. At least 5 monitoring events are required during the summer-time period to determine water quality grades. Additional monitoring data are needed to build a water quality database for this water body.

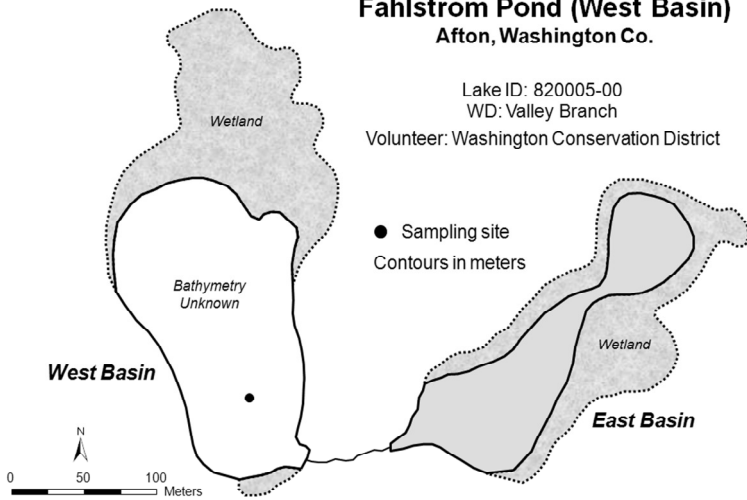
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

## Fahlstrom Pond (West Basin) Afton, Washington Co.

Lake ID: 820005-00  
WD: Valley Branch

Volunteer: Washington Conservation District



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	9.7	9.5	8.86	8.81	6.9	169		0.9	2	4
6/2	20.9	21	6.99	0.99	3.8	198		0.9	2	4
6/16	23.4		7.5		29	224		0.6	3	1
7/13	23.5		6.2		32	257		0.6	2	4
10/7	9.1		11.28		11	138		0.5	2	4

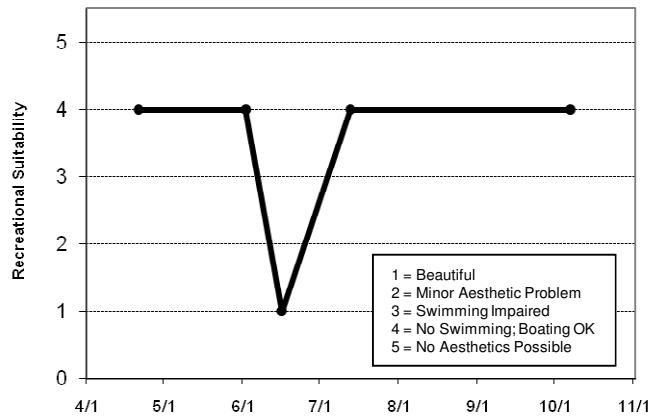
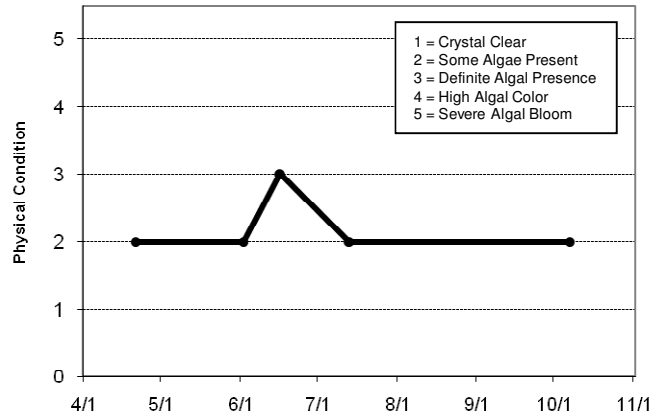
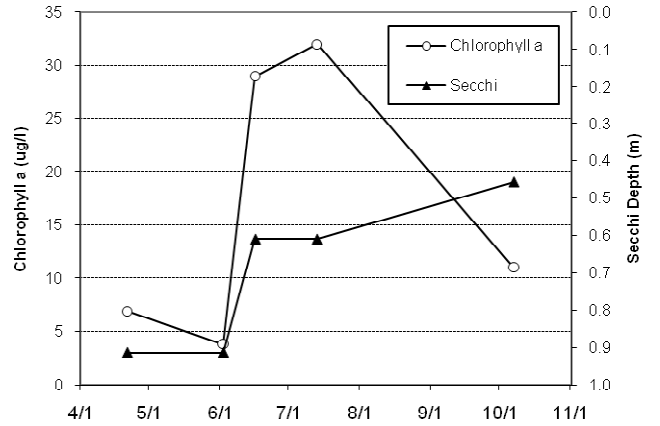
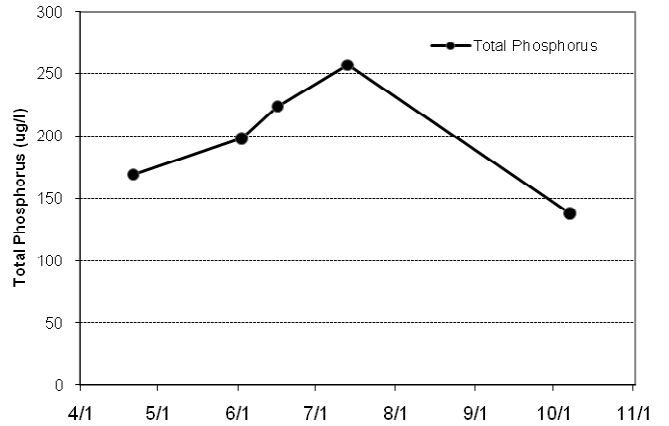
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
Lake Grade												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						
Chlorophyll <i>a</i>						
Secchi Depth						
Lake Grade				NA	NA	

Source: Metropolitan Council and STORET data



## Farquhar Lake (19-0023) City of Apple Valley

Farquhar Lake is located in the City of Apple Valley (Dakota County). The lake covers an area of 67 acres and has a maximum depth of 3.0 m (10 feet). The lake's mean depth of 1.4 m (4.6 feet) and surface area translates to an approximate lake volume of 290 ac-ft. Because the maximum depth is only 3.0 m, the entire lake area is considered littoral (the area of aquatic plant dominance), and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	229.4	60.0	786.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	82.1	14.0	210.0	F
<b>Secchi</b> (m)	0.5	0.2	1.0	F
<b>TKN</b> (mg/l)	2.80	1.30	4.30	
<b>Lake Grade</b>				F

The lake received a lake grade of F for 2009, which is consistent with the lake grades received over the past decade.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

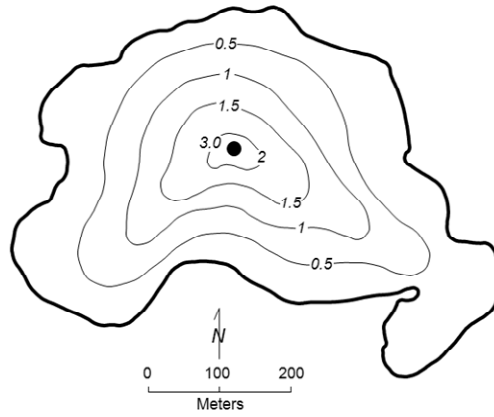
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Farquar Lake

Apple Valley, Dakota Co.

Lake ID: 190023-00  
 WMO: Vermillion River  
 Volunteer: Jeff Christianson

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	13.3				9.8	90		1.0	1	1
5/3	14.9				14	74		1.0	1	1
5/17	20.1				15	60		1.0	2	1
5/31	21.4				18	786		0.8	2	3
6/14	22.5				77	104		0.6	3	3
6/28	23				80	144		0.5	3	3
7/11	25.1				38	114		0.4	4	3
7/26	23				64	316		0.4	4	3
8/9	24.7				190	229		0.3	4	3
8/23	23.8				210	233		0.2	5	3
9/6	24.2				110	217		0.2	4	3
9/20	23				87	246		0.2	5	3
10/4	12.4				180	202		0.2	4	
10/17	6.5				75	156		0.4	4	3

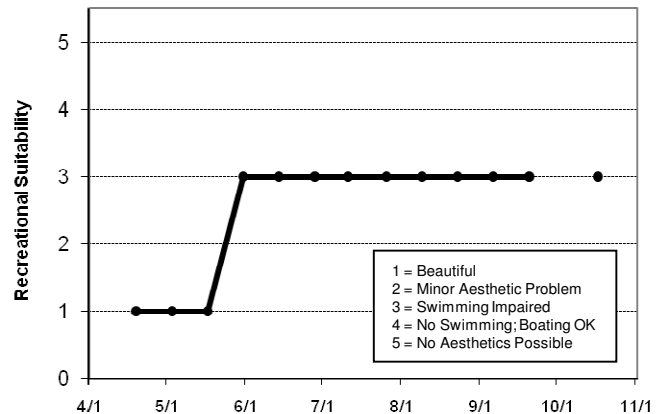
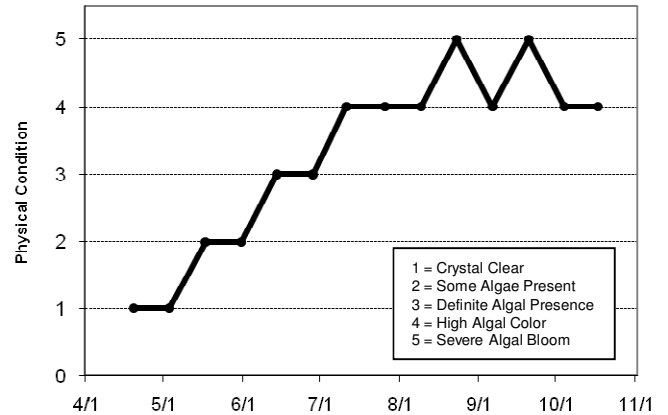
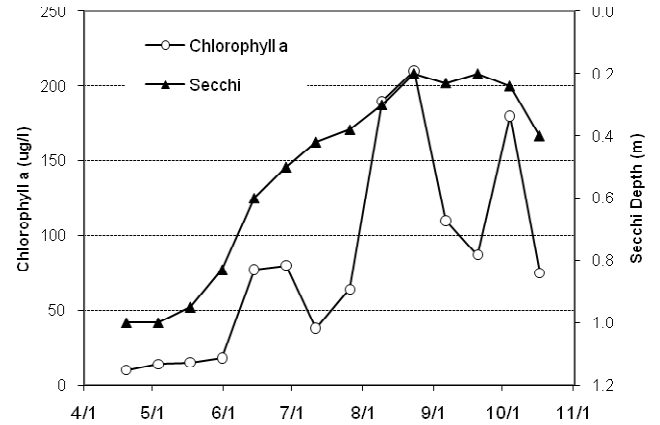
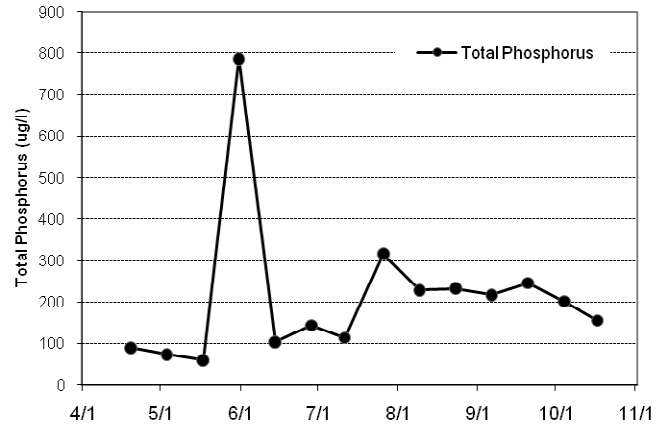
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus		C	D	D	D		F	F	F	F	F	D
Chlorophyll a		B	C	C	D		F	F	F	F	F	F
Secchi Depth		C	D	C	D		F	F	F	F	F	F
<b>Lake Grade</b>		<b>C</b>	<b>D</b>	<b>C</b>	<b>D</b>		<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	F	F	F	F	D	F
Chlorophyll a	F	D	C	D	F	F
Secchi Depth	F	F	F	F	D	F
<b>Lake Grade</b>	<b>F</b>	<b>F</b>	<b>D</b>	<b>F</b>	<b>D</b>	<b>F</b>

Source: Metropolitan Council and STORET data



## Fireman's Lake (10-0226) Carver County Environmental Services

Fireman's Lake is located within the City of Chaska. This lake has an area of 8 acres and a maximum depth of 7.0 m (23 feet). Roughly 88 percent of the lake's surface area is considered littoral zone (area of aquatic plant dominance). The DNR has designated the lake as being infested with Eurasian Water Milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	32.1	14.0	132.0	C
<b>CLA</b> (µg/l)	3.7	1.1	6.9	A
<b>Secchi</b> (m)	3.5	2.4	4.6	A
<b>TKN</b> (mg/l)	0.69	0.41	2.50	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009, which is lower than the typical A grade. The TP grade was C, which is the lowest grade this lake has received for this parameter. But the TP summer-time mean was greatly influenced by a single elevated concentration of TP observed on September 17, 2010. The reason for this spike in TP is unknown.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fishery 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/>.

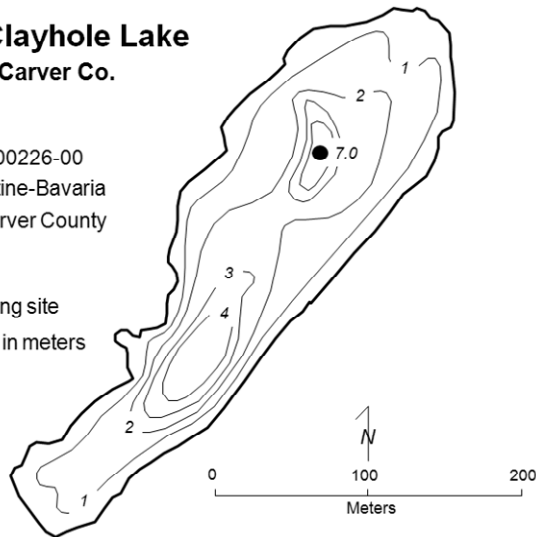
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



# Fireman's Clayhole Lake Chaska, Carver Co.

Lake ID: 100226-00  
WMO: Hazeltine-Bavaria  
Volunteer: Carver County

● Sampling site  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	10.44		9.48		3.9	18		1.8	2	2
4/28	12.8		11.12		2.1	20		2.4	1	1
5/14	17.28		9.69		1.6	14		3.6	2	1
5/28	19.22		9.87		1.1	15		4.5	1	1
6/10	17.77		4.64		4.5			2.8	2	2
6/24	26.06		9.63		4.6	17		3.3	2	2
7/8	25.08		16.17		6.3	26		2.9	2	3
7/23	23.63		15.4		6.9	16		2.4	2	2
8/5	24.42		14.67		4.6	23		3.2	2	2
8/20	24.11		7.73		2.6	21		4.0	2	2
9/2	21.64		8.64		2.6	26		4.6	2	2
9/17	24.32		10.72		2.5	132		4.4	2	2
9/30	17.84		4.56		3.3	31		3.1	1	1
10/19	9.62		10.3		3	29		3.8	2	2

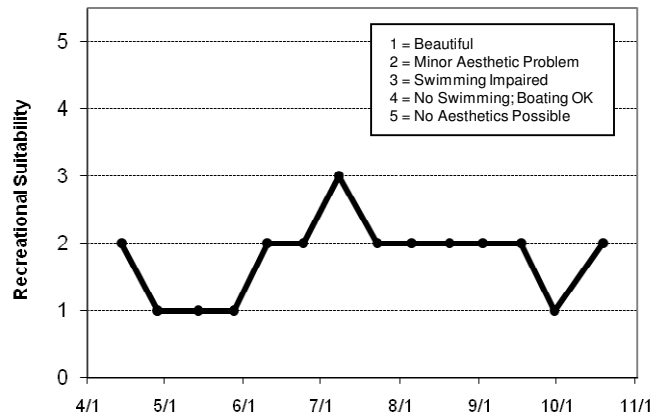
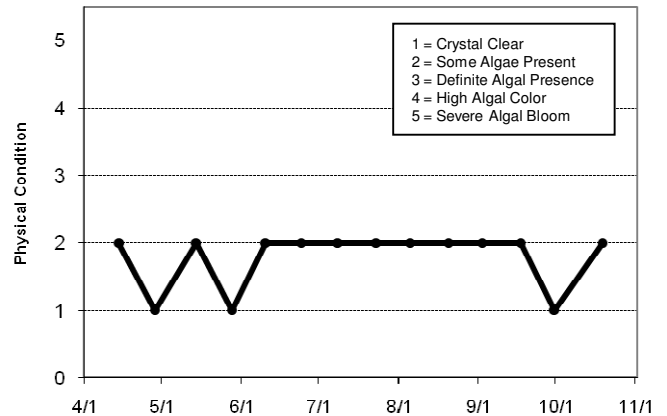
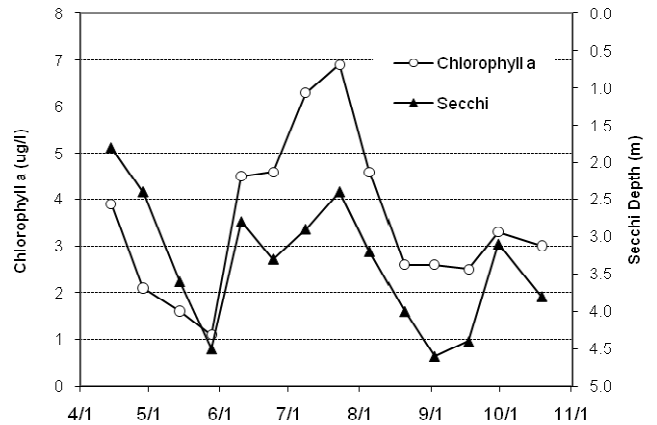
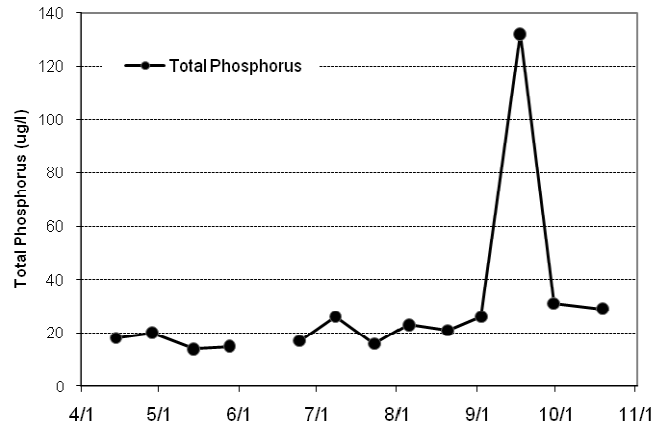
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus										A	A	B
Chlorophyll a										A	A	A
Secchi Depth										B	A	A
<b>Lake Grade</b>										<b>A</b>	<b>A</b>	<b>A</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	B	B	A	A	C
Chlorophyll a	A	A	A	A	A	A
Secchi Depth	A	A	B	B	A	A
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>B</b>

Source: Metropolitan Council and STORET data



**Fish Lake [Scott County] (70-0069) Prior Lake - Spring Lake Watershed District**

Fish Lake is located in Spring Lake Township (Scott County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a surface area of 171 acres. The lake has a mean and a maximum depth of 4.4 m (14 feet) and 8.5 m (28 feet). The MPCA has listed the lake as impaired for mercury content in fish.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	36.8	20.0	57.0	C
<b>CLA</b> (µg/l)	21.6	11.0	45.0	C
<b>Secchi</b> (m)	1.4	0.6	1.9	C
<b>TKN</b> (mg/l)	1.39	1.00	1.90	
			<b>Lake Grade</b>	C

The lake received a lake grade of C for 2009. The lake appears to be represented by a lake grade of C given the historical water quality database.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

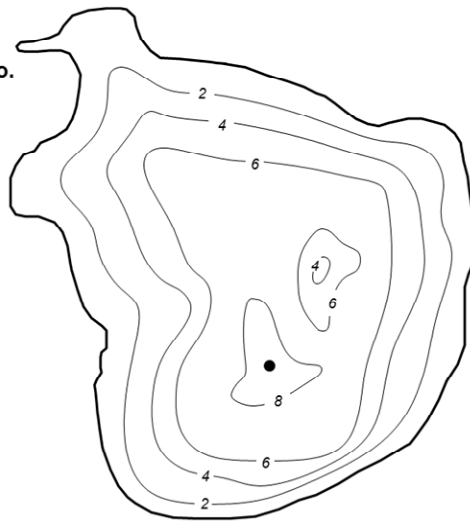
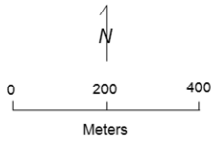
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Fish Lake Spring Lake Twp., Scott Co.

Lake ID: 700069-00  
WD: Prior Lake-Spring Lake  
Volunteer: Steve Pierson

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	11.9					63		1.1	2	1
5/10	15.1				12	46		1.8	2	2
5/31	20.6				12	43		1.7	3	2
6/7	18.1				26	42		1.7	2	2
6/13	20.9				45	57		0.6	5	3
7/2	23				34	41		0.9	4	2
7/18	20.7				17	28		1.2	2	2
8/2	22.7				30	37		1.1	3	2
8/22	23.2				15	27		1.5	2	2
8/30	22.3				14	27		1.7	2	2
9/13	25.6				11	20		1.9	2	1
10/7	13.8				13	83		2.0	2	2

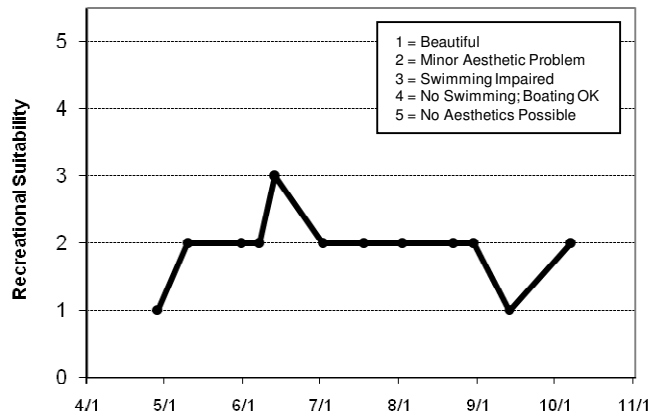
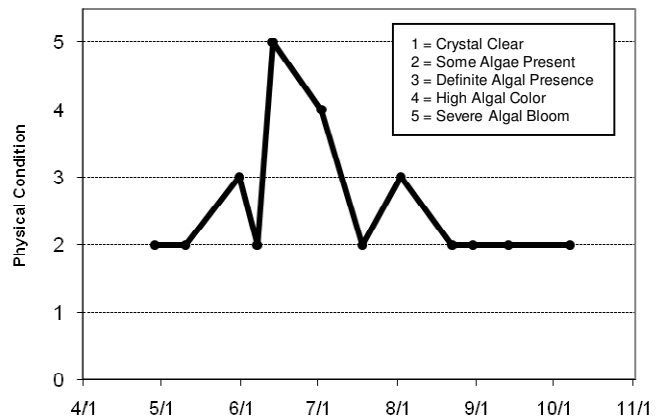
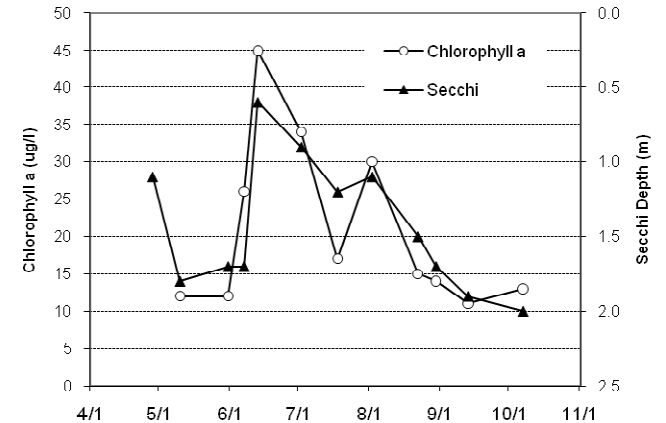
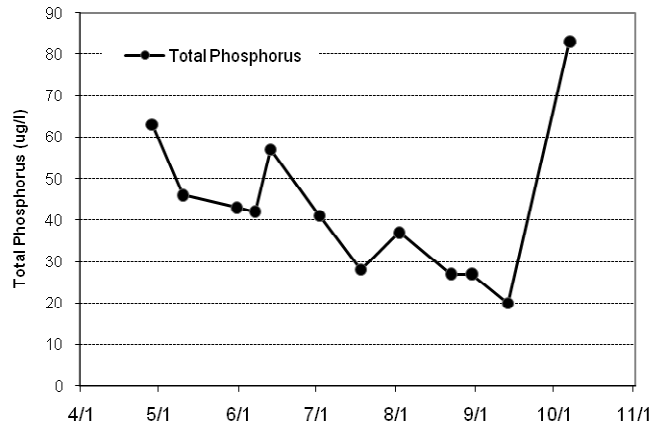
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	C
Chlorophyll a	C	C	B	C	B	C
Secchi Depth	C	C	C	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## **Fish Lake [Washington County] (82-0064) Carnelian - Marine - St. Croix Watershed District**

Fish Lake is located in City of Scandia in Washington County. The lake has a surface area of 72 acres, and a maximum and mean depth of 3.0 m (10 feet) and 1.5 m (5 feet), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	74.4	60.0	101.0	D
<b>CLA</b> (µg/l)	24.4	12.0	59.0	C
<b>Secchi</b> (m)	1.5	0.5	2.3	C
<b>TKN</b> (mg/l)	1.24	0.98	1.70	
			<i>Lake Grade</i>	C

The lake received a lake grade of C for 2009, which continues the improvement in water quality that this lake has been experiencing over the past decade. This was the third year in a row that this lake received a lake grade of C. Continued monitoring is suggested to determine if the improvement in water quality is on-going trend.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Fish Lake Scandia, Washington Co.

LAKE ID: 820064-00

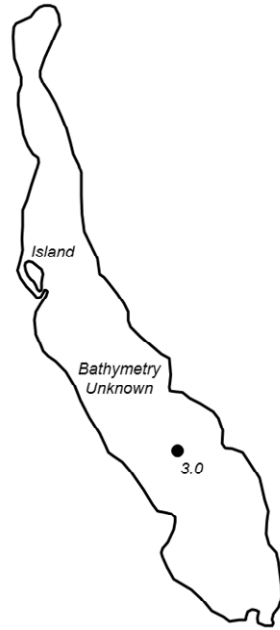
WD: Carnelian-Marine-St. Croix

Volunteer: Washington

Conservation District

● Sampling site

Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	13.8	12.8	10.17	0.19	6.3	67		2.1	2	2
5/27	18.8	18.8	6.23	6.1	12	63		2.1	2	3
6/23	27.2	23.9	8.3	0.08	13	83		2.3	3	3
7/20	22.2	21	9.69	0.11	24	65		1.2	3	4
8/18	23.5	23.5	5.6	0.11	59	101		0.5	3	4
9/15	23.1	23	7.05	0.11	14	60		1.5	3	3
10/14	6.9	6.9	11.16	7.05	4.6	28		2.1	1	1

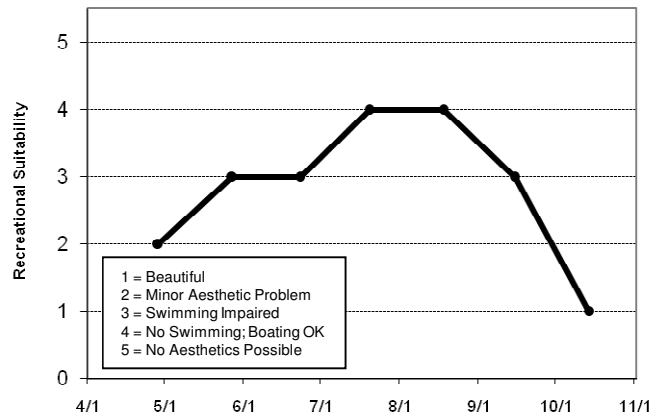
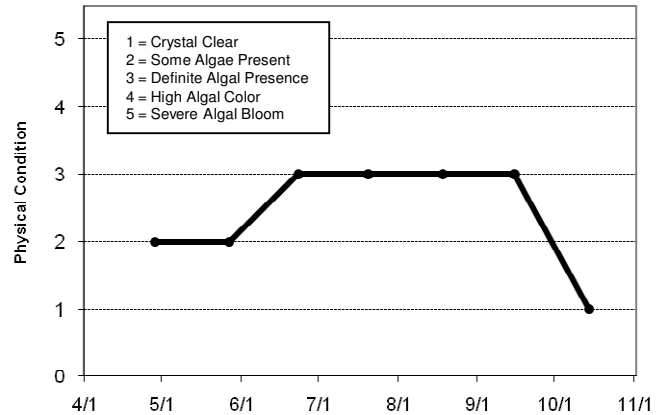
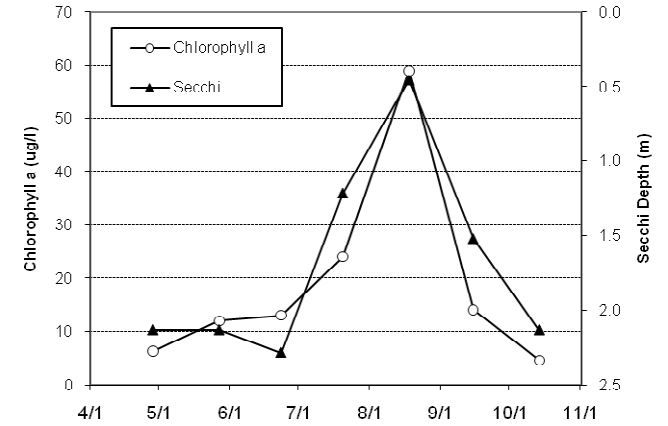
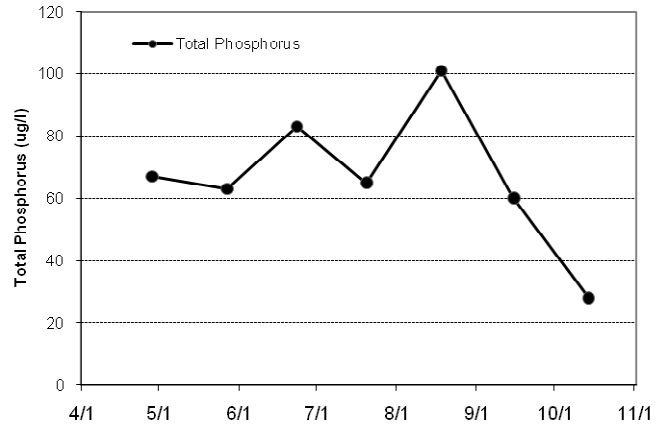
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	D	D	D	D
Chlorophyll a	F	C	D	C	C	C
Secchi Depth	D	D	D	C	C	C
Lake Grade	D	D	D	C	C	C

Source: Metropolitan Council and STORET data



## Lake Forest (62-0187) Rice Creek Watershed District

Lake Forest is located within the City of New Brighton (Ramsey County). Little morphological information is available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	171.1	97.0	295.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	104.7	6.4	370.0	F
<b>Secchi</b> (m)	0.7	0.2	1.4	F
<b>TKN</b> (mg/l)	3.15	1.60	5.40	
<b>Lake Grade</b>				F

The lake received a lake grade of F for 2009. Additional years of monitoring are suggested to build a water quality database to better understand the lake's water quality and determine potential water quality trends.

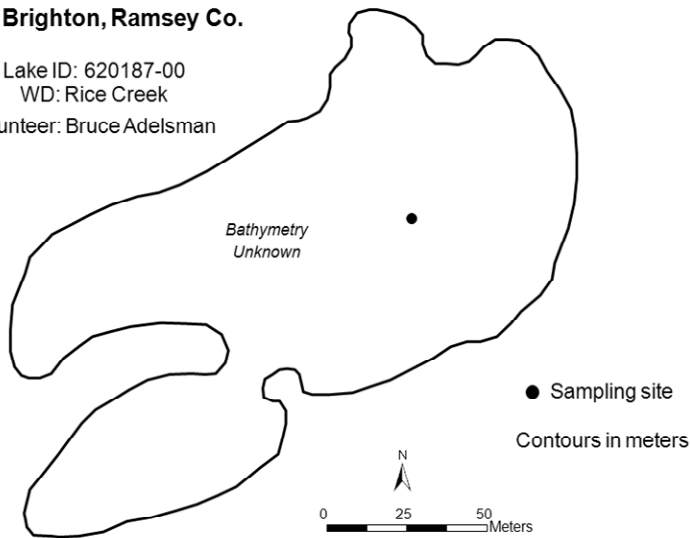
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Lake Forest New Brighton, Ramsey Co.

Lake ID: 620187-00  
WD: Rice Creek

Volunteer: Bruce Adelsman



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/1	14.2				35	138		0.9	1	2
5/14	16.9				30	102		0.9	1	1
5/29	19.9				6.4	97		1.4	1	2
6/11	18.6				31	172		0.7	2	2
6/25	29.4				19	100		0.9	3	3
7/7	25.1				130	186		0.5	4	3
7/24	22.6				370	295		0.3	4	3
8/6	24				200	230		0.2	4	4
8/23	22.2				160	216		0.3	4	4
9/3	21.9				100	200		0.5	4	4
9/18	23.1				70	146		0.6	4	4

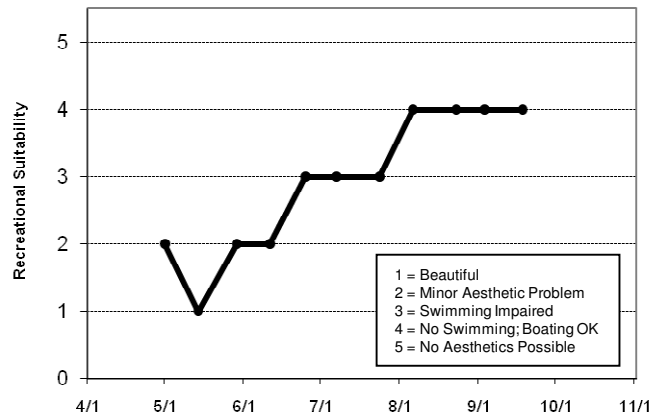
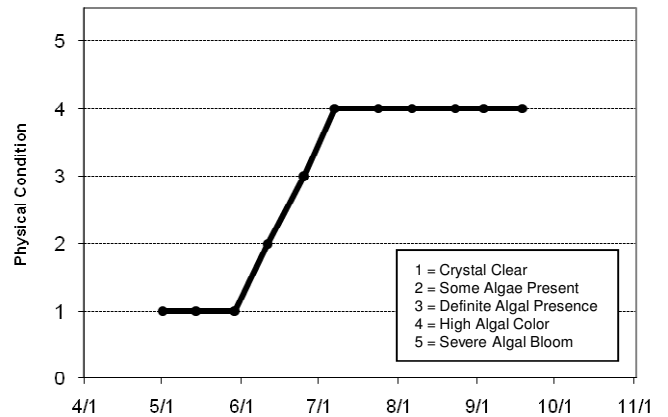
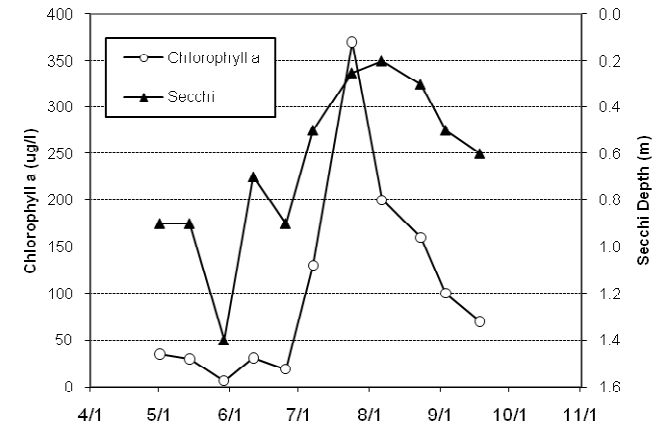
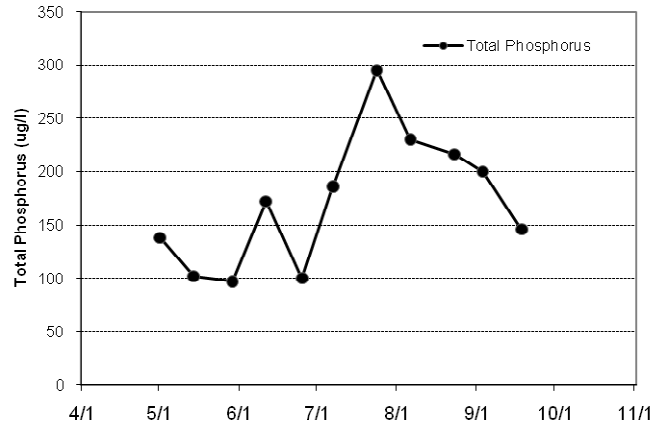
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
Lake Grade												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					F	F
Chlorophyll <i>a</i>					F	F
Secchi Depth					F	F
Lake Grade					F	F

Source: Metropolitan Council and STORET data



**Forest Lake [East Basin] (82-0159) Comfort Lake-Forest Lake Watershed District**

Forest Lake is located in the City of Forest Lake (Washington County). It is divided into three distinct basins. The entire lake is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The MN DNR has designated the lake as being infested with Flowering rush (*Butomus umbellatus*). The MPCA has listed the lake as impaired for polychlorinated biphenyl (PCB) content in fish.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

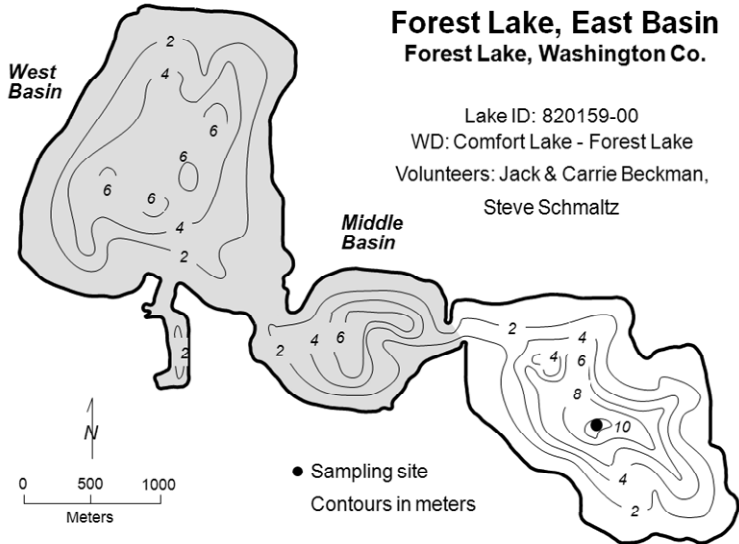
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)				
<b>CLA</b> (µg/l)				
<b>Secchi</b> (m)	2.2	1.6	3.0	C
<b>TKN</b> (mg/l)				
<b>Lake Grade</b>				N/A

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).





**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22								2.3	1	1
5/15								2.8	1	1
6/9								2.8	2	1
7/2								3.0	2	1
7/19								1.6	2	1
8/5								1.7	2	1
8/17								1.6	2	1
9/15								1.7	2	2

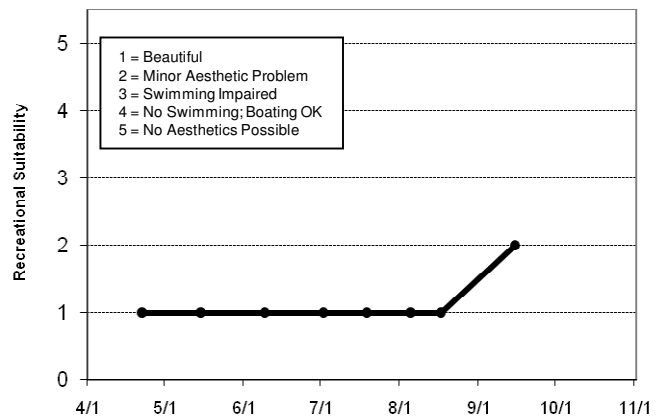
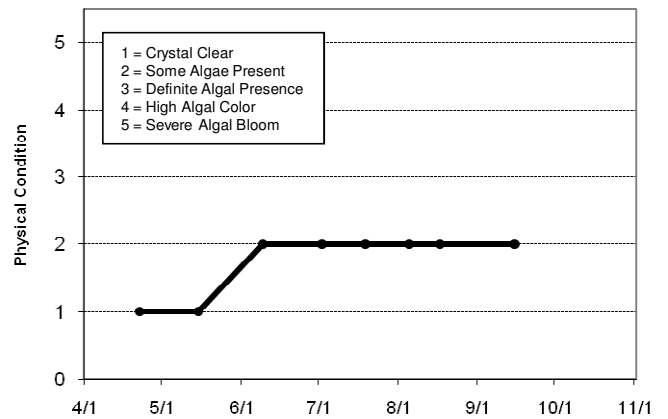
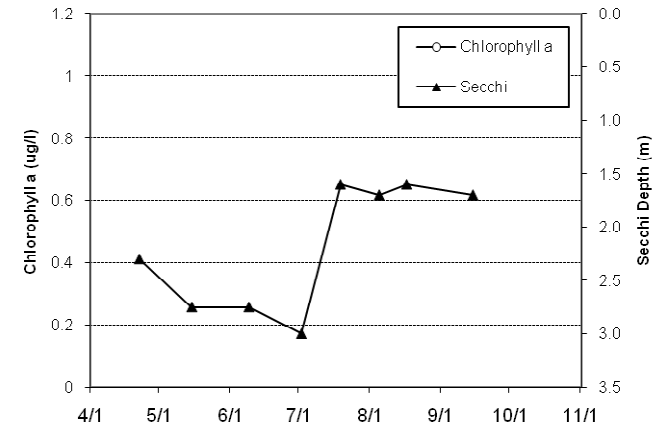
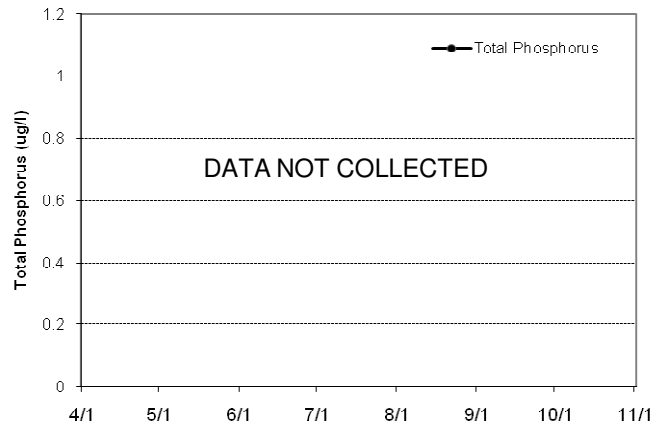
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	C				C		D	C			B	B
Chlorophyll <i>a</i>	D				C		C				B	B
Secchi Depth	C				C		C	C	C		C	C
<b>Lake Grade</b>	<b>C</b>				<b>C</b>		<b>C</b>				<b>B</b>	<b>C</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus	C				C							B
Chlorophyll <i>a</i>	B				B							B
Secchi Depth	C				C							C
<b>Lake Grade</b>	<b>C</b>				<b>C</b>							<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C				
Chlorophyll <i>a</i>	C	B				
Secchi Depth	C	C				C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>				

Source: Metropolitan Council and STORET data



**Forest Lake [Middle Basin] (82-0159) Comfort Lake-Forest Lake Watershed District**

Forest Lake is located in the City of Forest Lake (Washington County). It is divided into three distinct basins. The entire lake is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The MN DNR has designated the lake as being infested with Flowering rush (*Butomus umbellatus*). The MPCA has listed the lake as impaired for polychlorinated biphenyl (PCB) content in fish.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

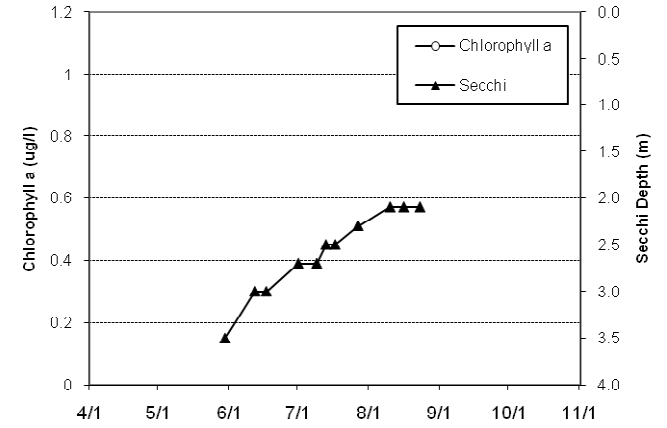
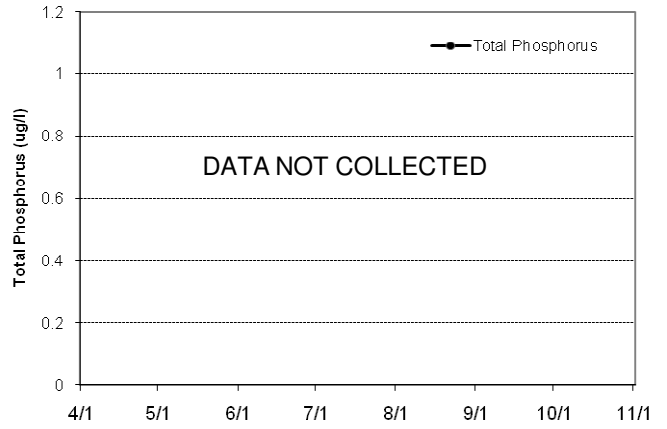
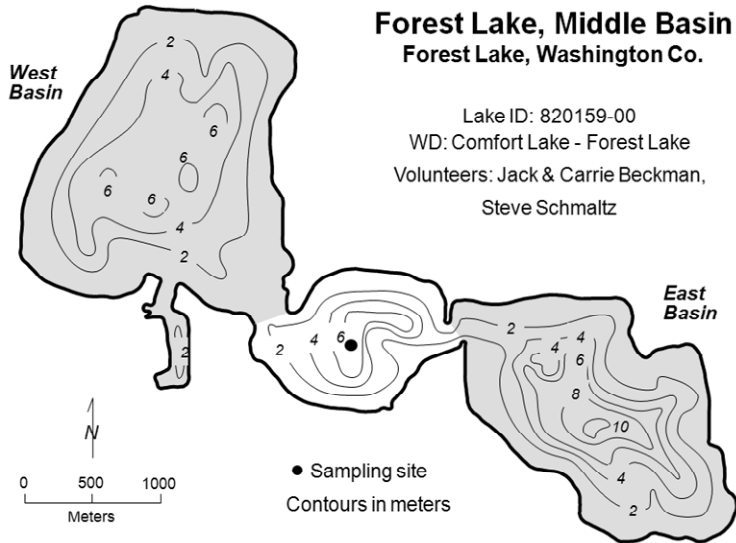
**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)				
<b>CLA</b> (µg/l)				
<b>Secchi</b> (m)	2.6	2.1	3.5	B
<b>TKN</b> (mg/l)				
<b>Lake Grade</b>				N/A

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

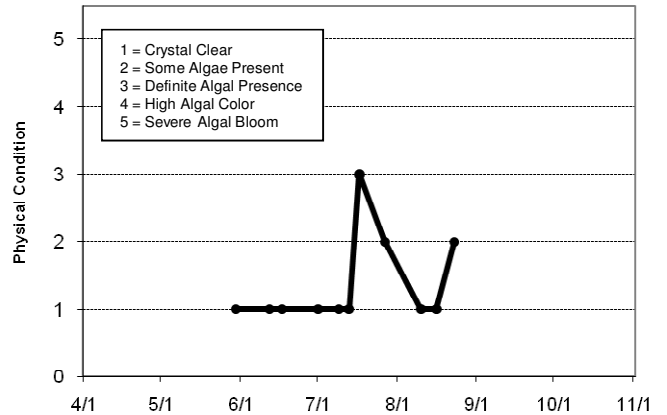
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).



#### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/30								3.5	1	1
6/12								3.0	1	
6/17								3.0	1	
7/1								2.7	1	
7/9								2.7	1	
7/13								2.5	1	
7/17								2.5	3	
7/27								2.3	2	
8/10								2.1	1	
8/16								2.1	1	
8/23								2.1	2	1



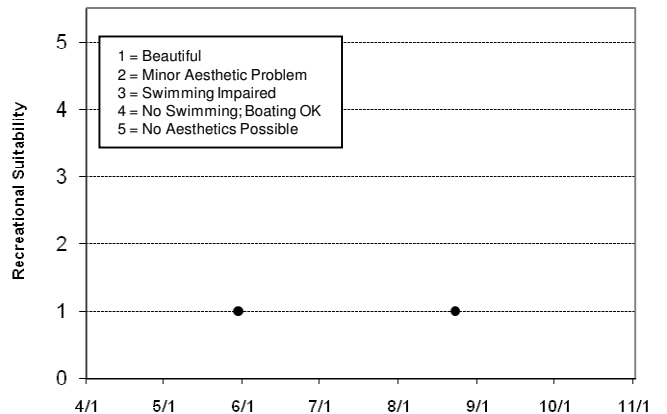
#### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus				C	C	C	C	C	C	B	B	C
Chlorophyll a				C	C	C	C	C	C	B	B	B
Secchi Depth				C	C	C	C	C	C	C	C	C
<b>Lake Grade</b>				<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>C</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus		C	B								A	
Chlorophyll a		B	B								B	
Secchi Depth		C	C								C	
<b>Lake Grade</b>		<b>C</b>	<b>B</b>								<b>B</b>	

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		C	C			
Chlorophyll a		C	B			
Secchi Depth		C	C			B
<b>Lake Grade</b>		<b>C</b>	<b>C</b>			

Source: Metropolitan Council and STORET data



## Forest Lake [West Basin] (82-0159) *Comfort Lake-Forest Lake Watershed District*

Forest Lake is located in the City of Forest Lake (Washington County). It is divided into three distinct basins. The entire lake is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The MN DNR has designated the lake as being infested with Flowering rush (*Butomus umbellatus*). The MPCA has listed the lake as impaired for polychlorinated biphenyl (PCB) content in fish.

The lake has a surface area of 2,249 acres but the west basin has an area of 1,109 acres. The western basin has mean and maximum depths of 3.0 m and 6.7 m. The total volume of the whole lake is 24,986 ac-ft. Sixty eight percent of the lake's surface area is considered littoral, (the shallow [0-15 feet] area dominated by aquatic plants). The 4,285-acre watershed translates to a watershed-to-lake area ratio of 2:1 (the greater the ratio, the greater the potential stress on the lake from surface runoff). The lake has several public accesses.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	24.5	10.0	37.0	<b>B</b>
<b>CLA</b> (µg/l)	9.9	2.9	20.0	<b>A</b>
<b>Secchi</b> (m)	1.9	1.0	3.0	<b>C</b>
<b>TKN</b> (mg/l)	0.76	0.57	0.92	
			<b>Lake Grade</b>	<b>B</b>

The lake received a lake grade of B for 2008. The water quality of the lake fluctuates between lake grades of B and C over the years.

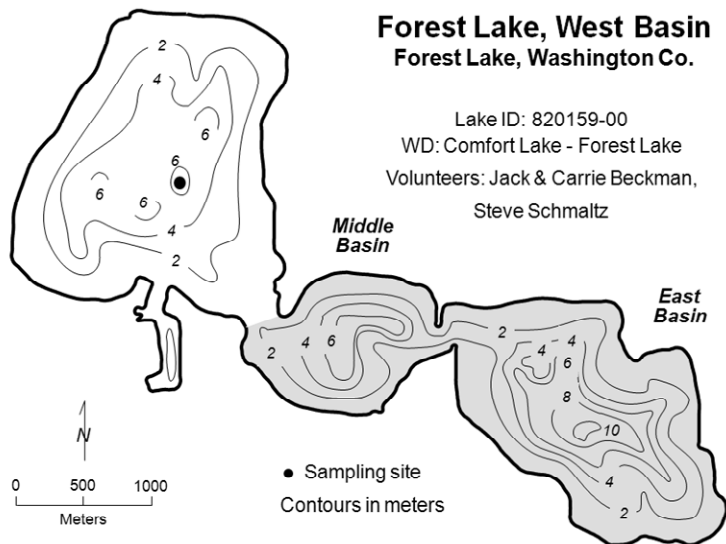
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

## Forest Lake, West Basin Forest Lake, Washington Co.

Lake ID: 820159-00  
WD: Comfort Lake - Forest Lake  
Volunteers: Jack & Carrie Beckman,  
Steve Schmaltz



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	11.9				3	23		2.7	1	1
5/3	12.8				3.4	10		3.0	1	1
5/11	15.9				2.9	22		3.0	1	1
5/29	19.1				3.4	19		3.0	1	1
6/12	20.9				3.8	13		2.4	1	1
7/2	21.1				9.1	23		1.3	2	
7/13	24.2				8.1	25		1.4	2	1
7/29	23.1				9.7	35		1.6	2	1
8/14	25.2				17	35		1.6		1
8/30	21.8				20	30		1.5	2	1
9/9	21.2				9.8	22		1.6	2	1
9/20	20.1				12	23		1.5	2	1
9/30	15.9				19	37		1.0	1	1
10/11	8.7				12	18		1.8	1	1

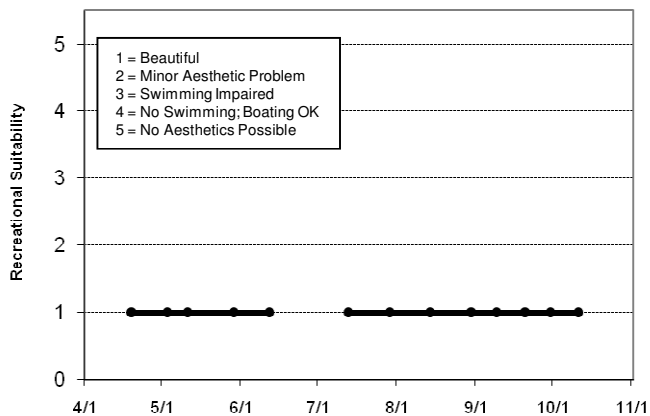
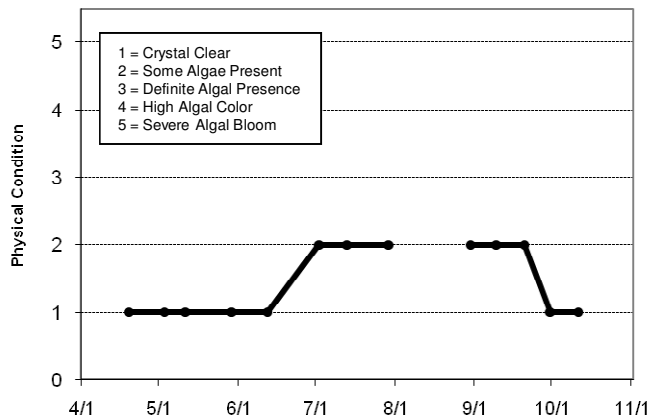
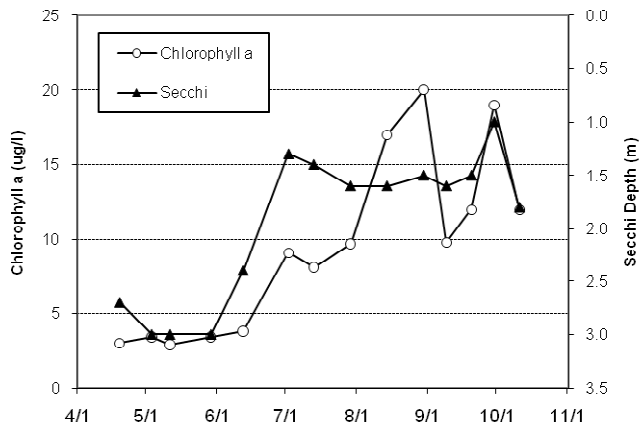
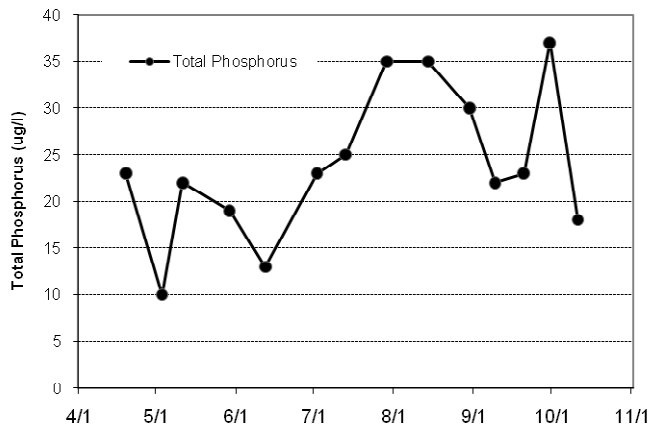
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus					C	C	C	C	C	B	C	C
Chlorophyll a					C	C	C	C	B	C	C	B
Secchi Depth					C	C	C	C	C	C	C	C
<b>Lake Grade</b>					<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus	C	C	B	B	B	B	C	C	B	C	C	C
Chlorophyll a	B	B	B	B	B	B	B	B	B	B	B	B
Secchi Depth	C	C	C	C	C	C	C	C	C	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	C	C	C	C	B
Chlorophyll a	A	C	B	C	A	A
Secchi Depth	B	C	C	C	C	C
<b>Lake Grade</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>B</b>

Source: Metropolitan Council and STORET data



### **Friedrich's Pond Lake (82-0108) *Valley Branch Watershed District***

Friedrich's Pond is a 14.5-acre lake located within the City of Lake Elmo (Washington County). There is little morphological information available for the lake. The lake's surface area and watershed size (360 acres) translates to a 25:1 watershed-to-lake size ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

Only one monitoring event occurred in 2009, so a lake grade was not calculated.

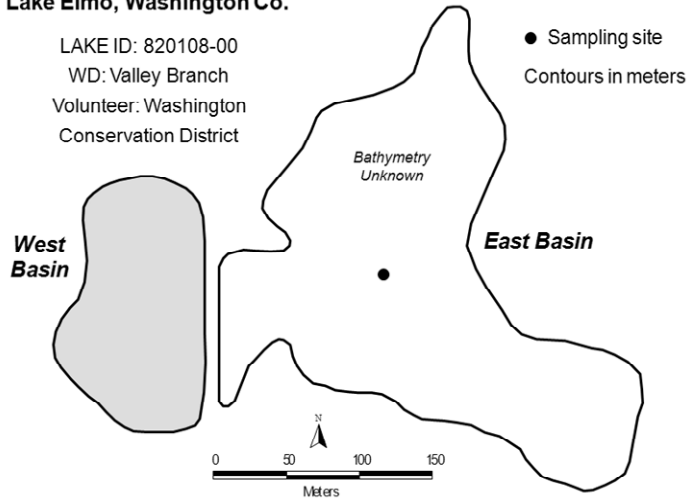
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Friedrich's Pond (East Basin)

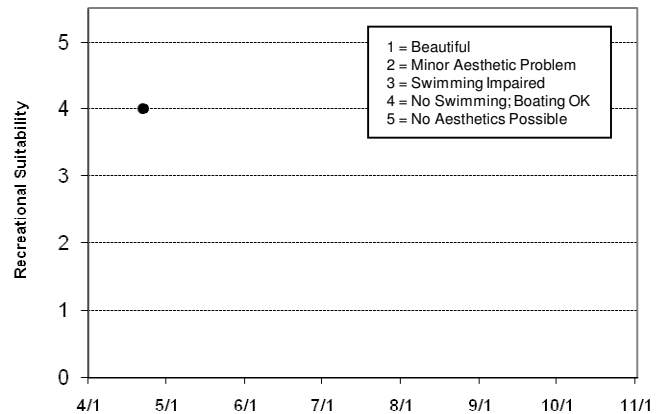
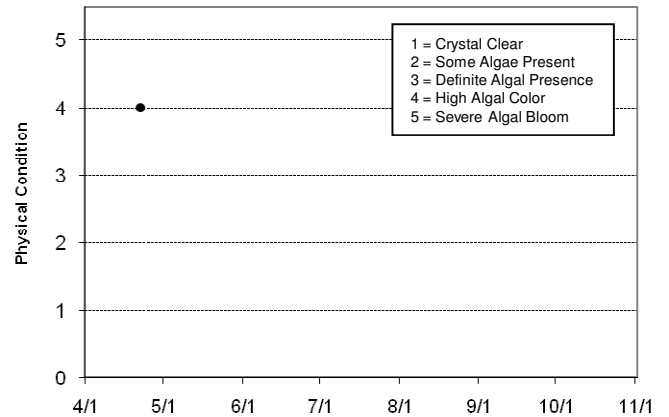
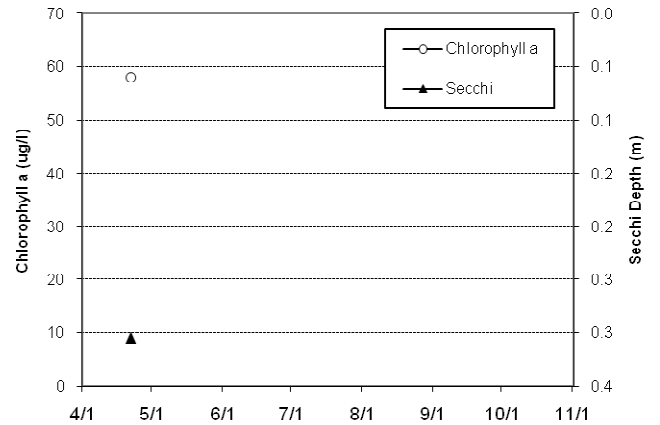
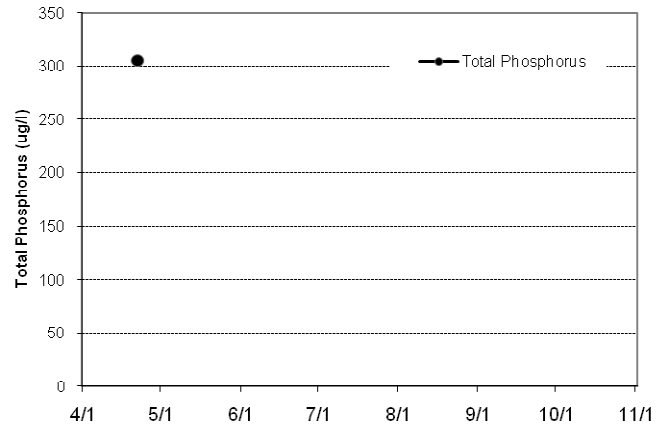
Lake Elmo, Washington Co.

LAKE ID: 820108-00  
 WD: Valley Branch  
 Volunteer: Washington  
 Conservation District



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	15.1		15.18		58	305		0.3	4	4



## 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												
Lake Grade												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			F	F	F	
Chlorophyll a			F	F	C	
Secchi Depth			F	F	F	
Lake Grade			F	F	D	NA

Source: Metropolitan Council and STORET data

## George Lake (2-0091) Anoka County Parks

George Lake is located within Oak Grove Township (Anoka County). The lake has a surface area of 488 acres and a maximum depth of 9.8 m (32 ft). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ( $\mu\text{g/l}$ )	26.2	12.0	78.0	B
CLA ( $\mu\text{g/l}$ )	7.0	3.2	12.0	A
Secchi (m)	2.9	2.1	4.2	B
TKN (mg/l)	0.81	0.66	1.10	
			<i>Lake Grade</i>	B

The lake received a lake grade of B for 2009.

The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings, were 3.8 for physical condition (between 3- "definite algae present" and 4- "high algal color"), and 4.3 for recreational suitability (between 4- "no swimming/boating ok" and 5- "no aesthetics possible").

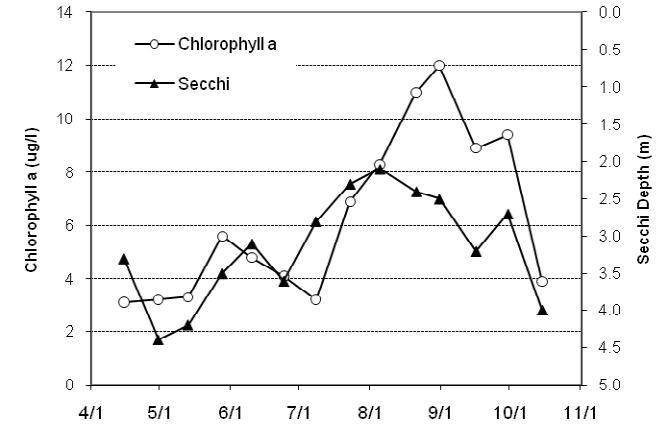
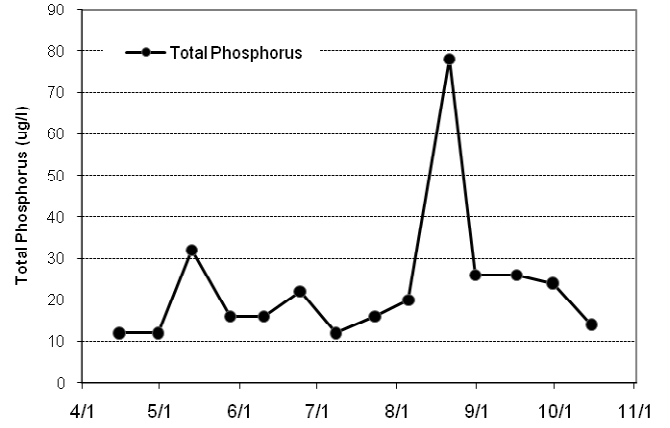
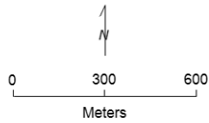
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



**Lake George**  
Oak Grove, Anoka Co.

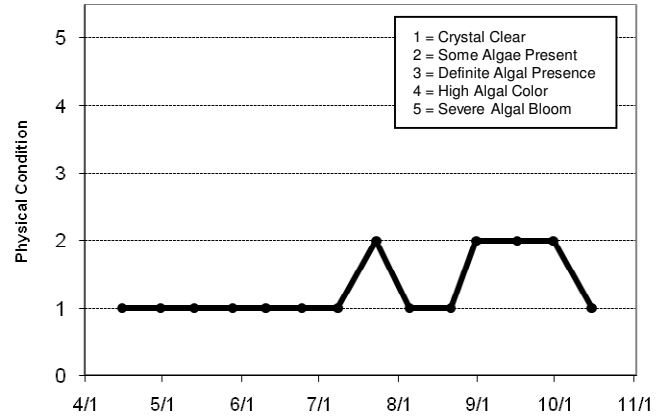
LAKE ID: 20091-00  
WMO: Upper Rum River  
Volunteer:  
Andy Nelson

● Sampling site  
Contours in meters



**2009 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
4/15	9.5				3.1	12	3.3	1	1	1
4/30	11				3.2	12	4.4	1	1	1
5/13	17.2				3.3	32	4.2	1	1	1
5/28	17.5				5.6	16	3.5	1	1	1
6/10	16.5				4.8	16	3.1	1	1	1
6/24	27.2				4.1	22	3.6	1	1	1
7/8	22.9				3.2	12	2.8	1	1	1
7/23	21.8				6.9	16	2.3	2	1	1
8/5	22.2				8.3	20	2.1	1	1	1
8/21	21.3				11	78	2.4	1	1	1
8/31	20.7				12	26	2.5	2	1	1
9/16	23				8.9	26	3.2	2	1	1
9/30	15.6				9.4	24	2.7	2	1	1
10/15	7.6				3.9	14	4.0	1	1	1

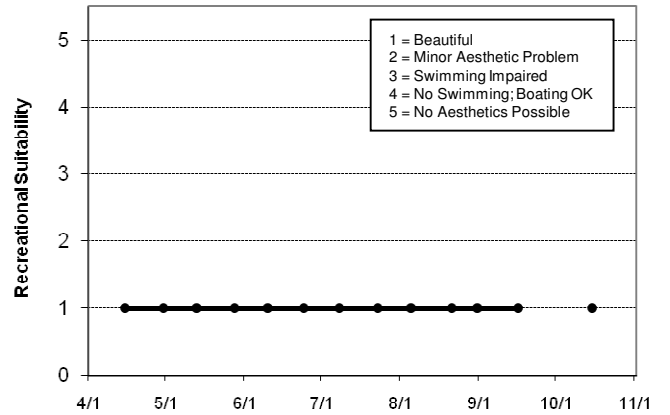


**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	A	A	A		B					A		
Chlorophyll a	A	A	A		A					A		
Secchi Depth	A	A	A	B	A	B		B	A	A		B
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>		<b>A</b>					<b>A</b>		

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus			A				A					
Chlorophyll a			A				A					
Secchi Depth			B				B					
<b>Lake Grade</b>			<b>A</b>				<b>A</b>					

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						B
Chlorophyll a						A
Secchi Depth						B
<b>Lake Grade</b>						<b>B</b>



Source: Metropolitan Council

## George Watch Lake (2-0005) Rice Creek Watershed District

George Watch Lake is located in the City of Lino Lakes (Anoka County). The 528-acre lake has a mean and maximum depth of 1.5 m (5 feet) and 2.0 m (6.5 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The major land uses within the lake's immediate watershed are undeveloped and park land.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	121.8	69.0	234.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	13.3	3.4	27.0	B
<b>Secchi</b> (m)	0.5	0.2	0.7	F
<b>TKN</b> (mg/l)	2.01	1.60	2.80	
			<b>Lake Grade</b>	D

The lake received a lake grade of D for 2009, which is consistent with previous lake grades received in the past. The historical lake grades seem to indicate that the lake water quality has fluctuated between an F and D lake grade throughout the 20+ years of data. The TP and Secchi grades have remained fairly consistent throughout the monitoring years with respect to the more variable CLA grades.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

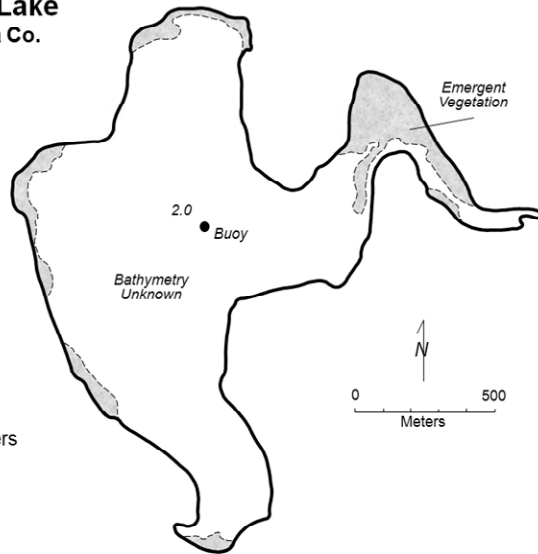
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

**George Watch Lake**  
Lino Lakes, Anoka Co.

Lake ID: 20005-00  
WD: Rice Creek

Volunteer:  
Wargo Nature  
Center

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	14.1				7.7	55		0.5	2	4
5/8					15	70		0.7	2	4
5/19	21.1				3.5	85		0.6	3	2
6/1	22.5				12	113		0.7	2	4
6/12	21.5				3.4	69			3	4
6/26	24.5				6.9	78			3	4
7/7	26.7				27	142		0.4	2	4
7/21	24.5				19	214		0.2	4	4
8/4	24.2				23	234			4	4
8/22	19				4.3	103			3	4
9/5	20					107		0.6	2	4
9/24	22.9				19	125		0.6	4	4
10/3	9.4				8.1	62		0.6	3	4
10/18	8.9				6.3	83		0.6	3	4

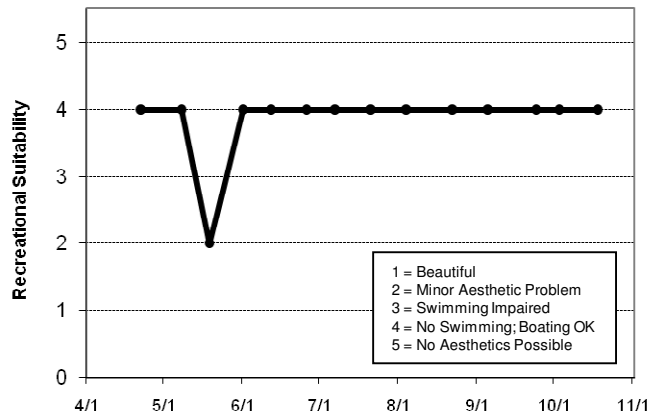
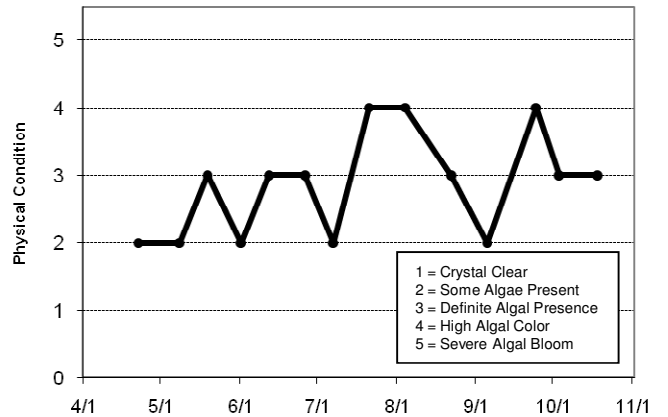
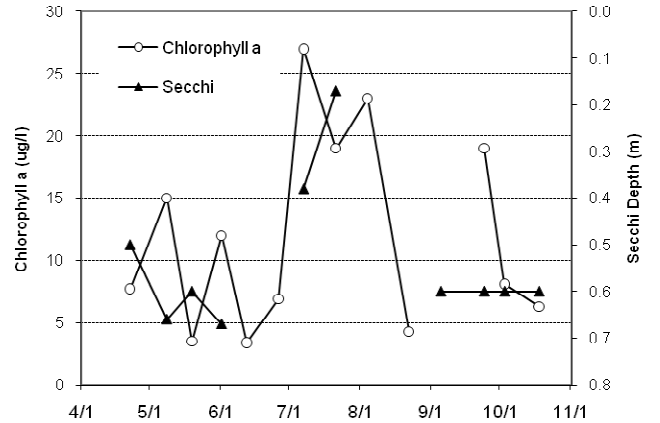
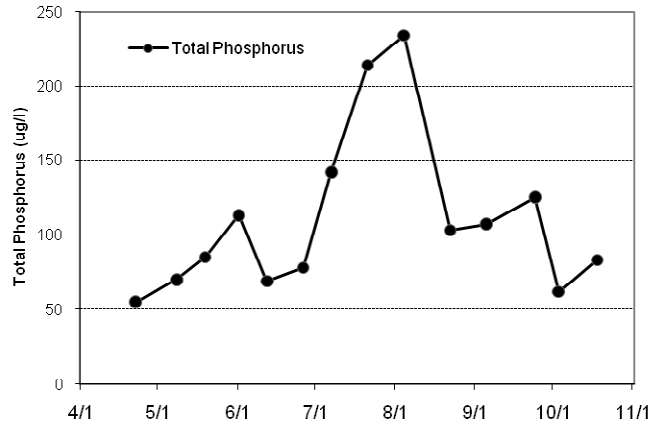
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	F	F	F	F	F	F	F	F	F	F	F	F
Chlorophyll a	F	C	B	B	C	B	D	C	F			
Secchi Depth	F	D	F	F	F	F	F	F	D	F		
<b>Lake Grade</b>	<b>F</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>D</b>	<b>F</b>		

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	F	F	F	F	F	D
Chlorophyll a	D	C	F	D	C	B
Secchi Depth	F	F	F	F	F	F
<b>Lake Grade</b>	<b>F</b>	<b>D</b>	<b>F</b>	<b>F</b>	<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



**German Lake (82-0056) Carnelian – Marine Watershed District**

German Lake is located in City of Scandia (Washington County). It has an area of 109 acres. There is little known morphological data available for the lake.

On each sampling day the lake was monitored for secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)				
<b>CLA</b> (µg/l)				
<b>Secchi</b> (m)	1.5	1.1	2.0	C
<b>TKN</b> (mg/l)				
<b>Lake Grade</b>				N/A

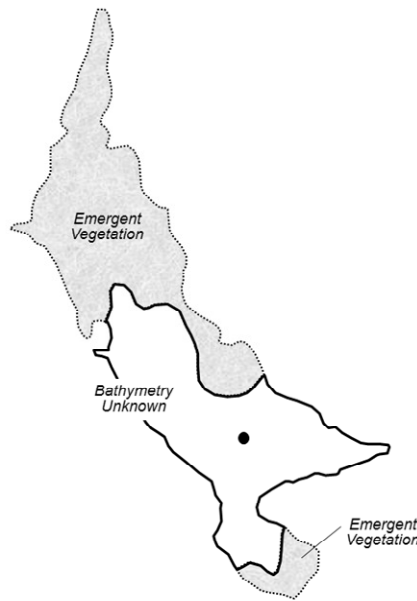
Continued monitoring is suggested to continue building the water quality database for the lake.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

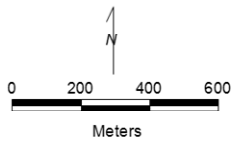
If you notice any errors in the lake’s data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# German Lake Scandia, Washington Co.

Lake ID: 820056-00  
 WD: Carnelian-Marine-St. Croix  
 Volunteer: Washington  
 Conservation District



● Sampling site  
 Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/5	15.7	14.3	10.75	2.27				2.0	1	1
5/18	15	15	10.96	10.1				1.8	1	1
6/29	21.9	21.9	5.74	5.12				1.4	2	2
7/27	23.6	22.4	9.48	1.17				1.4	1	1
8/24	21.7	20.3	9.99	0.24				1.4	1	1
9/22	21.4	21.4	5.6	0.37				1.1	2	3
10/19	8.1	7.2	15.75	11.5				1.4	1	1

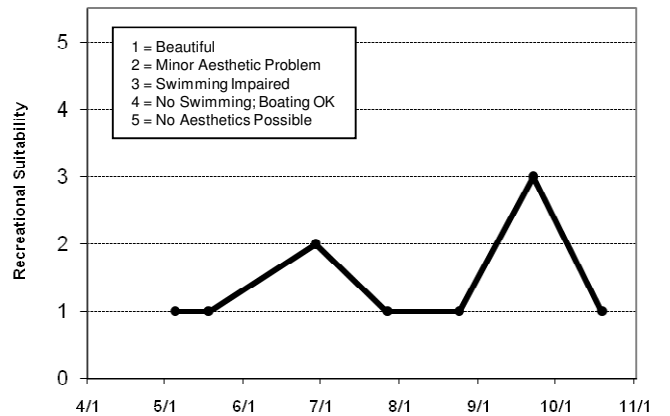
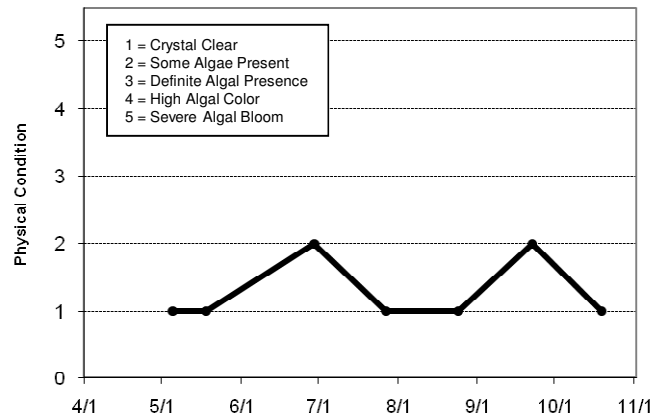
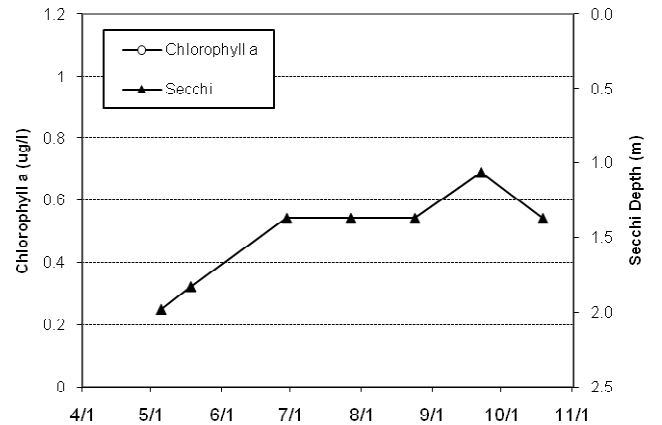
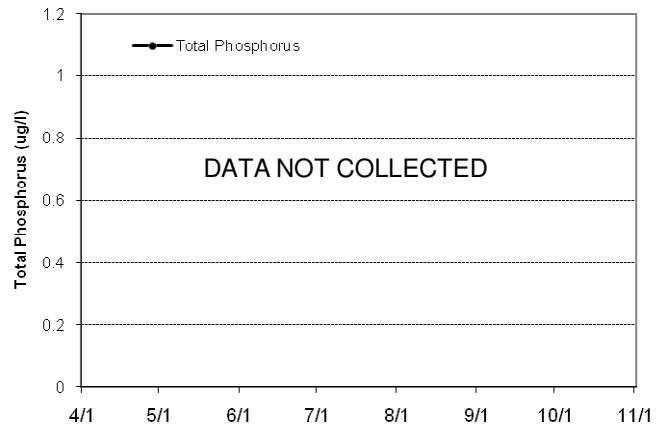
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus											B	B
Chlorophyll <i>a</i>											A	A
Secchi Depth											C	B
<b>Lake Grade</b>											<b>B</b>	<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	B	C	A		
Chlorophyll <i>a</i>	A	A	A	A		
Secchi Depth	B	B	B	C	C	C
<b>Lake Grade</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>		

Source: Metropolitan Council and STORET data



## Goetschel Pond (82-0313) Valley Branch Watershed District

Goetschel Lake is located in Grant Township (Washington County). The lake has a surface area of 22-acres. The lake has a mean and a maximum depth of 1.2 m (4 feet) and 4.2 m (14 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has a 2,812-acre watershed which yields a watershed-to-lake area ratio of 122:1. The larger the ratio the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	33.2	25.0	41.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	7.0	4.4	9.8	A
<b>Secchi</b> (m)	0.9	0.5	1.5	D
<b>TKN</b> (mg/l)	0.97	0.88	1.10	
			<b>Lake Grade</b>	C

The lake received a lake grade of C for 2008, which is the lowest grade received by the lake in its 8-year monitoring history. The lower grade was driven by a lower mean Secchi depth in 2009 compared to previous years. Continued monitoring is suggested to determine if there is a developing trend in the lake's water quality.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

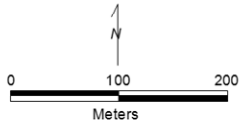
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

**Goetschel Pond**  
Lake Elmo, Washington Co.

Lake ID: 820313-00  
WD: Valley Branch  
Volunteer: Washington Conservation District

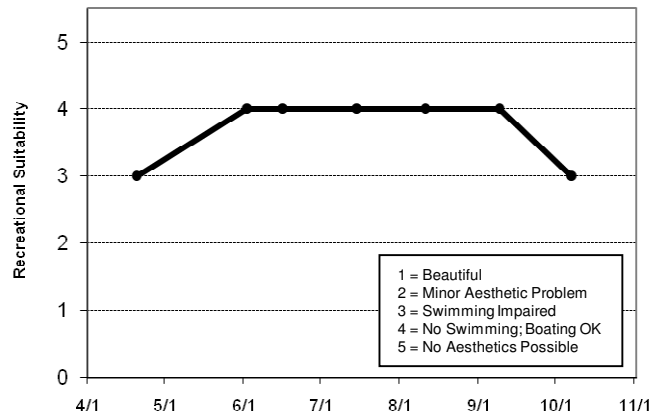
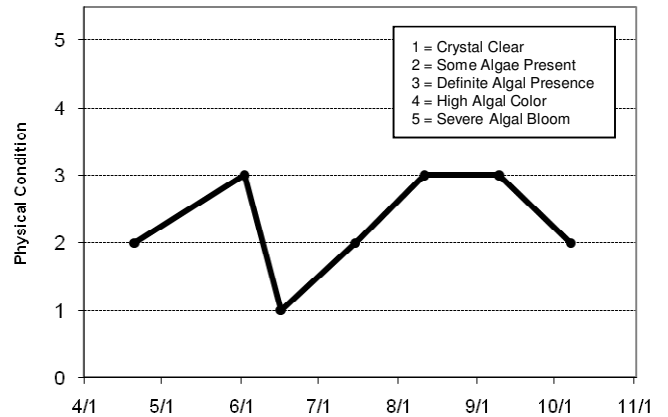
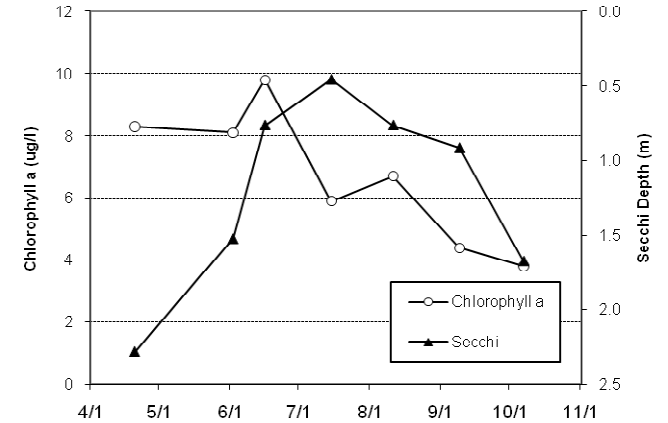
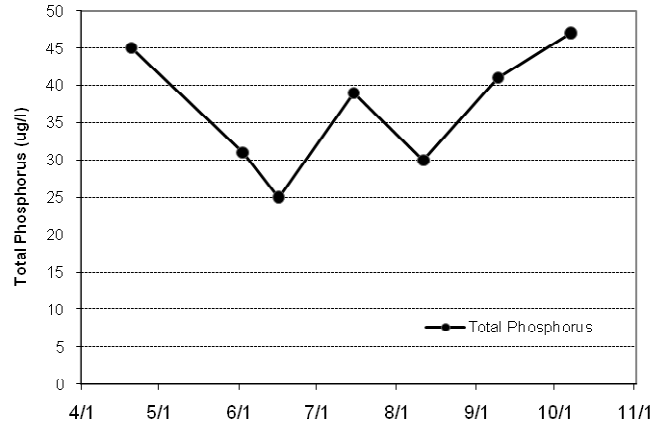


● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/20	13.8	13.5	8.55	4.76	8.3	45		2.3	2	3
6/2	19.8	15.7	10.37	0.09	8.1	31		1.5	3	4
6/16	22.2	17.4	11.28	0.52	9.8	25		0.8	1	4
7/15	21.6	21.6	6.7	5.23	5.9	39		0.5	2	4
8/11	24.6	20.4	5.99	0.2	6.7	30		0.8	3	4
9/9	23.1	22	12.99	0.06	4.4	41		0.9	3	4
10/7	11.1	10.1	12.06	9.01	3.8	47		1.7	2	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												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus											C	C
Chlorophyll a											A	A
Secchi Depth											C	B
<b>Lake Grade</b>											<b>B</b>	<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	C	C	B	B	C
Chlorophyll a	B	A	A	A	A	A
Secchi Depth	C	C	B	C	C	D
<b>Lake Grade</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>C</b>

Source: Metropolitan Council and STORET data

## **Goggins Lake (82-0077) Browns Creek Watershed District**

Goggins Lake is located within May Township (Washington County). It has a surface area of a 11 acres. Little bathymetric information is available for the lake but the maximum depth is approximately 4.0 m (13 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	100.8	59.0	152.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	39.5	9.7	87.0	C
<b>Secchi</b> (m)	1.0	0.5	2.6	D
<b>TKN</b> (mg/l)	2.41	1.70	3.70	
<b>Lake Grade</b>				D

The lake received a lake grade of D for 2008 which is consistent with those received in some previous years. The lake's water quality seems to be represented by a lake grade of C or D, depending on the year. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

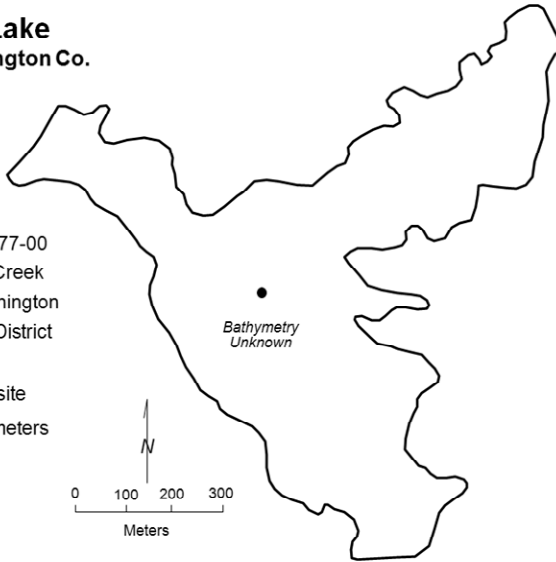
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**Goggins Lake**  
May Twp., Washington Co.

Lake ID: 820077-00  
WD: Browns Creek  
Volunteer: Washington  
Conservation District

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	9.3	8.9	12.85	0.17	30	73	90	1.4	3	4
4/28	11.9	11.7	10.78	0.03	23	66	61	1.4	3	4
5/11	14.7	14.3	8.87	0.11	9.7	59	81	2.6	3	4
5/26	19.1	18.7	8.98	0.09	27	81	69	1.2	3	4
6/10	16.5	15.5	8.07	0.09	30	106	117	1.1	3	4
6/22	24	16.9	9.92	0.13	31	91		1.2	3	4
7/6	23.4	19.3	13.04	0.11	60	114	110	0.9	3	4
7/20	20.2	19.2	12.86	0.11	87	152	141	0.5	4	4
8/4	22.8	20.9	8.92	0.04	36	126	128	0.5	3	4
8/17	24.1	22.4	6.01	0.06	23	106	133	0.9	3	4
8/31	19.9	19.7	7.53	0.09	37	107	103	0.8	3	4
9/14	23.2	21.2	8.66	0.09	28	68	111	1.1	3	4
9/29	15	15.7	7.36	0.09	66	99	91	0.6	3	4
10/14	7	7.3	12.96	0.11	32	58	48	1.2	3	4

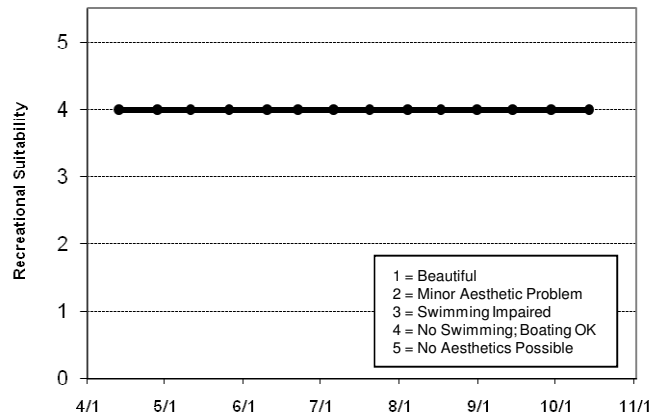
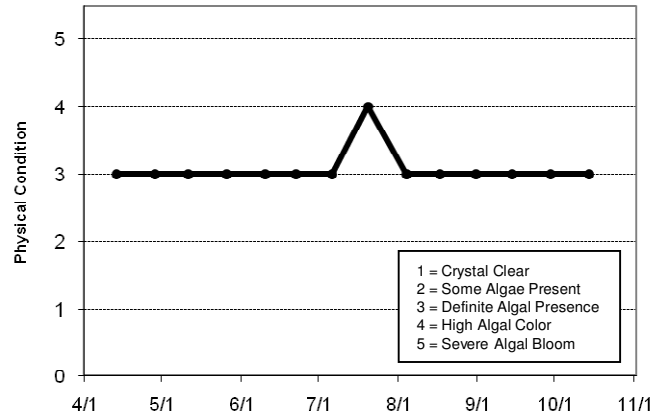
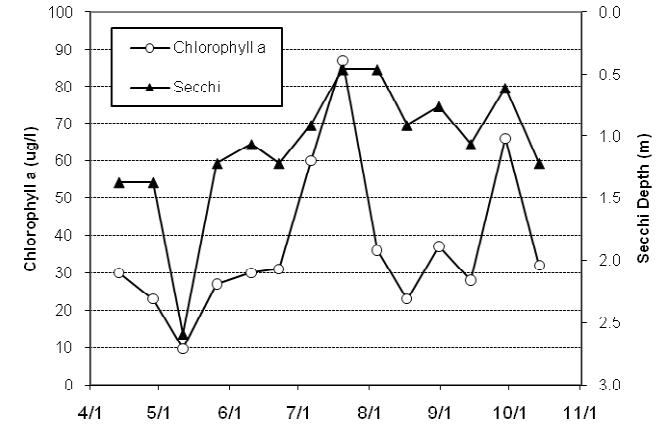
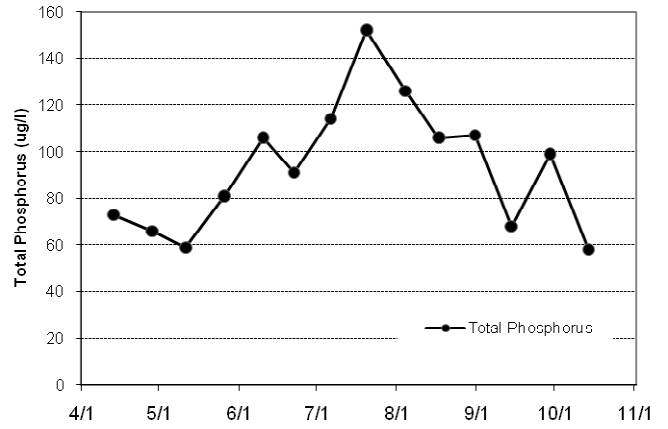
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	D	D	D	D	D
Chlorophyll a	C	C	C	D	C	C
Secchi Depth	D	C	D	D	D	D
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



## Golden Lake (2-0045) Rice Creek Watershed District

Golden Lake is located in the City of Circle Pines (Anoka County). The mean and maximum depths of the lake are 2.5 m (8 feet) and 7.3 m (24 feet), respectively. The lake has a surface area of 57 acres and a watershed area of 7,680 acres, giving a watershed-to-lake area ratio of 135:1, which is quite large. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	49.5	28.0	115.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	12.4	5.6	24.0	B
<b>Secchi</b> (m)	2.2	1.3	3.2	C
<b>TKN</b> (mg/l)	1.64	1.50	2.00	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009. The year 2009 was the second year in a row that a letter grade of B was received for CLA, which is an indicator of improved water quality with respect to algal abundance. Golden Lake has a fairly extensive water quality database. The lake's water quality grade has fluctuated between C, D, and F throughout 20+ years of monitoring data. However, continued monitoring is suggested to determine if the recent apparent improvements in CLA concentrations are an indication of potential improving water quality.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

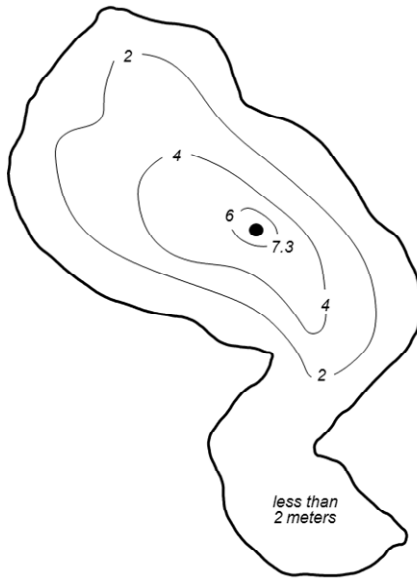
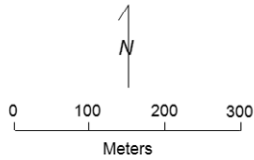
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

**Golden Lake**  
Circle Pines, Anoka Co.

Lake ID: 20045-00  
WD: Rice Creek  
Volunteer: Dave Phipps

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	9.9				24	57		1.3	1	1
4/29	12.7				12	29		1.7	1	1
5/18	17				12	35		1.8	1	1
6/3	19.5				5.6	28		2.6	3	2
6/10	17.9				6.3	30		2.8	2	2
6/22	26.5				7	35		3.2	2	2
7/8	23.3				24	43		1.3	3	2
7/20	21				17	46		2.1	2	2
8/11	27.8				6.8	44		2.2	1	1
8/19	23.1				13	61		2.1	1	1
8/31	22.7				15	67		1.8	2	2
9/14	23.5				11	40		2.3	2	2
9/28	18.7				19	115		1.7	2	2

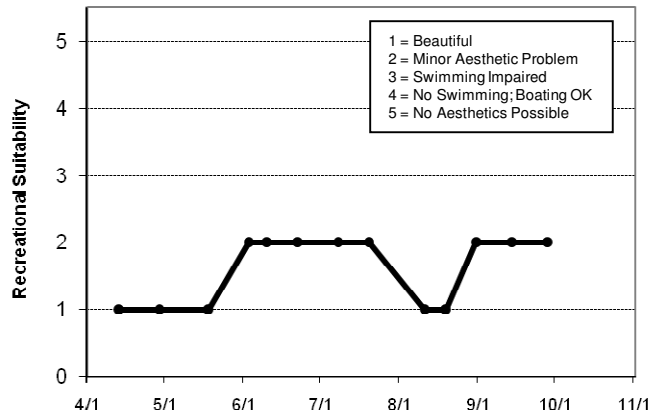
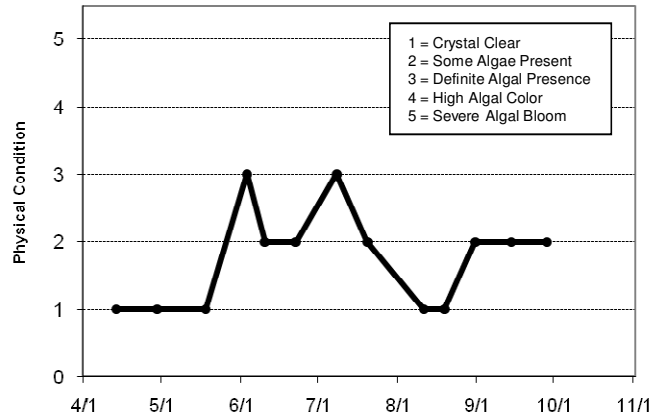
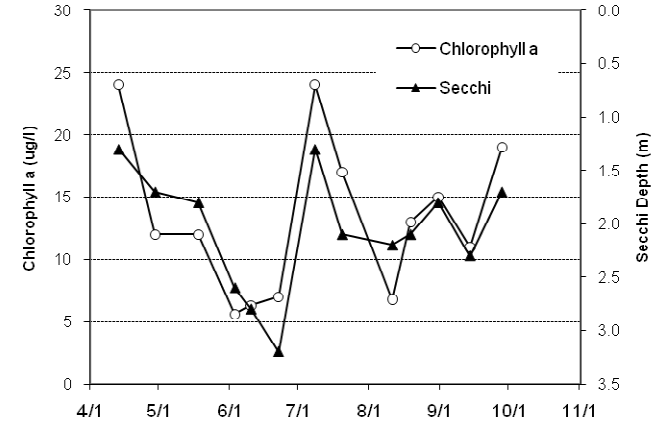
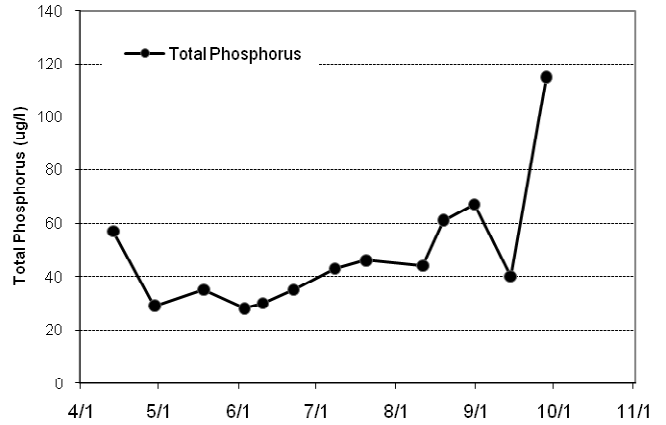
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	C	D			D	F	C	F	D	D	D	D
Chlorophyll a	D					C	C	D	F	F	F	F
Secchi Depth	D	D				C	C	C	F	F	F	F
<b>Lake Grade</b>	<b>D</b>					<b>D</b>	<b>C</b>	<b>D</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	C	D	C	C	C
Chlorophyll a	D	C	C	C	B	B
Secchi Depth	F	C	C	C	C	C
<b>Lake Grade</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## Goose Lake (10-0089) Carver County Environmental Services

Goose Lake is located in Waconia Township (Carver County). It has a surface area of 407-acres. The maximum depth of the lake is 3.0 m; therefore the entire lake area is considered littoral zone which is the 0-15 feet depth area of the lake dominated by aquatic vegetation. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	104.0	56.0	150.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	106.0	66.0	150.0	F
<b>Secchi</b> (m)	0.4	0.3	0.4	F
<b>TKN</b> (mg/l)	3.44	1.60	4.40	
<b>Lake Grade</b>				F

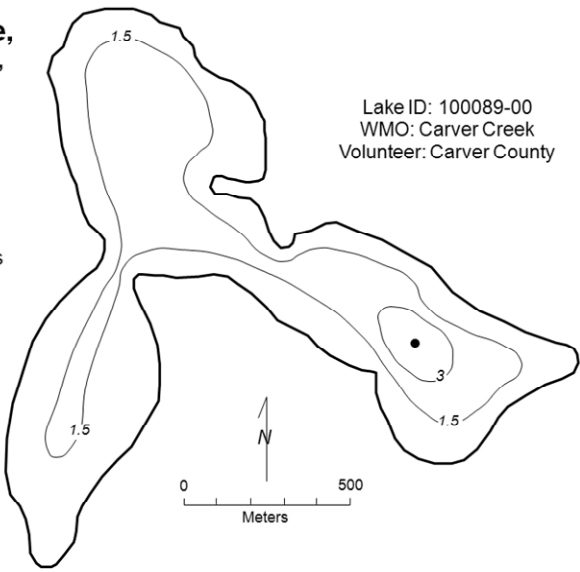
The lake received a lake grade of F for 2008 which is consistent with its historical database. The lake has experienced variability in water quality over the long term (i.e. grades ranging from C to F), with F grades being predominant for the past 6 years. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

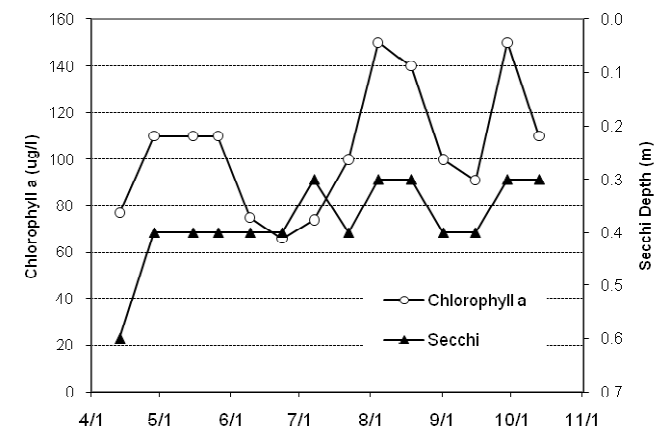
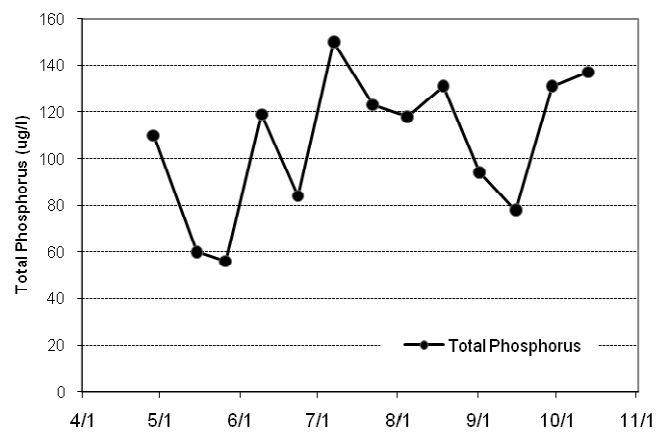
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

**Goose Lake,  
Waconia Twp.,  
Carver Co.**

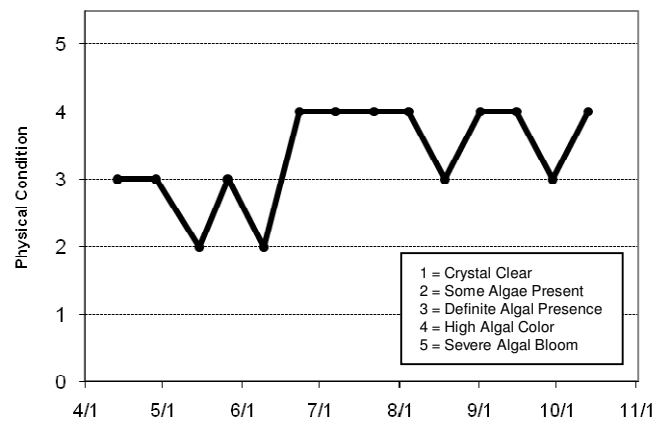


● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	9.27		10		77			0.6	3	3
4/28	12.08		14.4		110	110		0.4	3	3
5/15	15.67		10.03		110	60		0.4	2	3
5/26	18.97		8.54		110	56		0.4	3	4
6/9	15.83		8.73		75	119		0.4	2	4
6/23	27.7		12.24		66	84		0.4	4	4
7/7	26.44		14.33		74	150		0.3	4	4
7/22	21.35		12.45		100	123		0.4	4	4
8/4	23.25		10.26		150	118		0.3	4	4
8/18	23.4		7.85		140	131		0.3	3	3
9/1	20.33		11.25		100	94		0.4	4	4
9/15	23		12.69		91	78		0.4	4	4
9/29	15.3		10.7		150	131		0.3	3	3
10/13	6.27		14.28		110	137		0.3	4	4

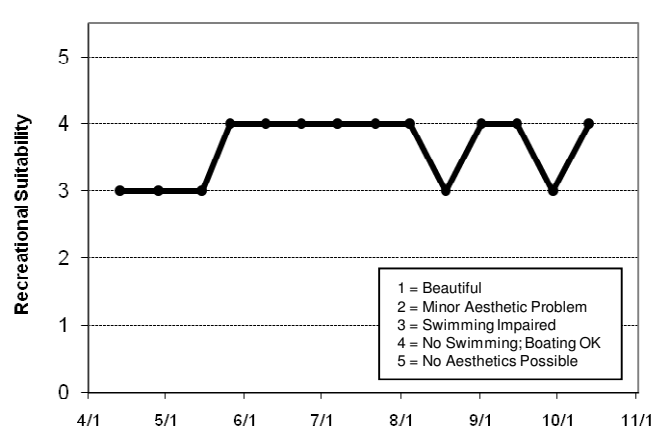


**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	D	D	D	
Chlorophyll a	F	F	F	F	F	
Secchi Depth	F	F	F	F	F	
<b>Lake Grade</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	



Source: Metropolitan Council and STORET data

### **Goose Lake (82-0059) Carnelian - Marine - St. Croix Watershed District**

Goose Lake is located in the City of Scandia (Washington County). The lake has a surface area of 83 acres. The lake has a maximum and mean depth of 7.6 m (25 feet) and 2.4 m (8 feet), respectively.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	52.5	31.0	81.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	28.0	14.0	51.0	C
<b>Secchi</b> (m)	1.6	0.9	2.4	C
<b>TKN</b> (mg/l)	1.48	1.20	1.80	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2008, which is similar to the lake grades received in the past. The lake's overall water quality seems to be represented by a lake grade of C given the historical water quality database.

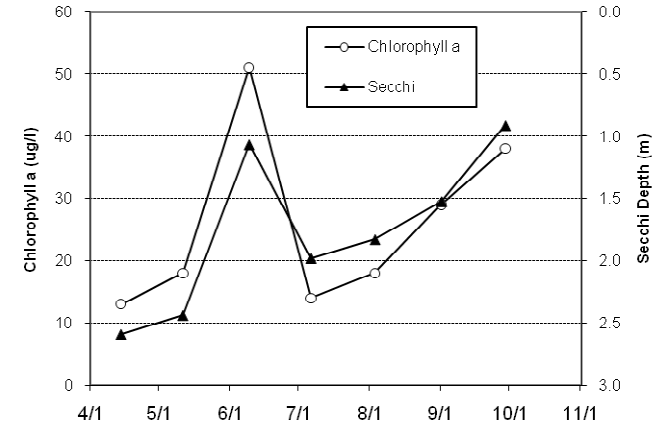
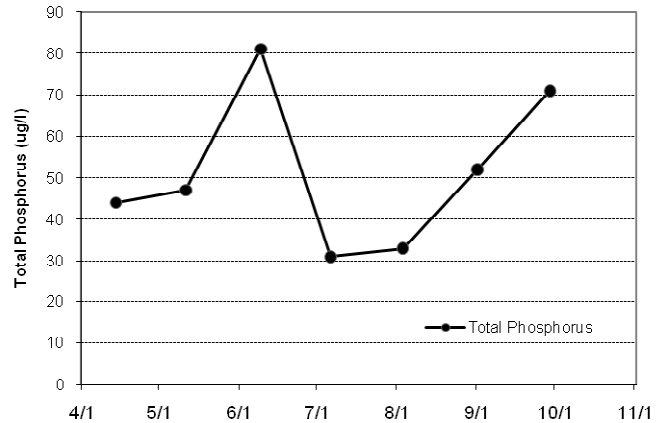
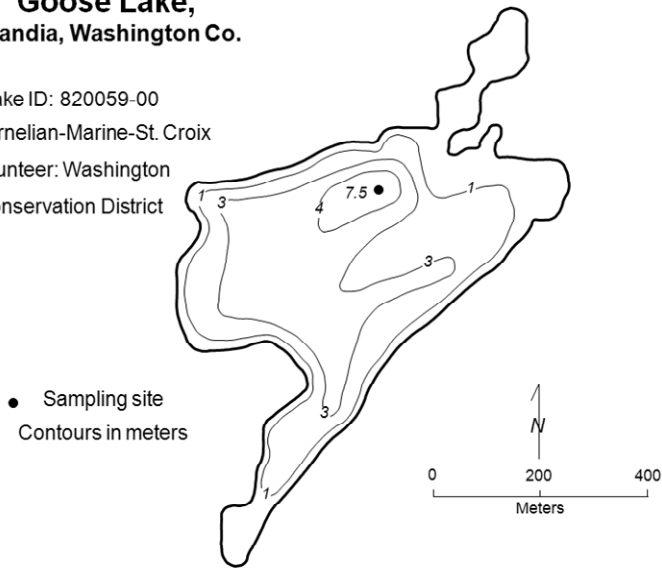
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

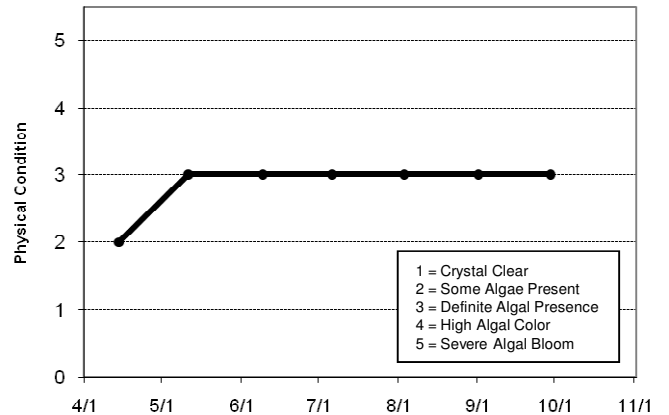
# Goose Lake, Scandia, Washington Co.

Lake ID: 820059-00  
 WD: Carnelian-Marine-St. Croix  
 Volunteer: Washington Conservation District



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	9.5	8.1	11.63	10	13	44		2.6	2	2
5/11	16.4	12.8	9.98	0.14	18	47		2.4	3	4
6/9	18	16.2	8.94	0.09	51	81		1.1	3	4
7/6	25.2	15.8	10.01	0.07	14	31		2.0	3	3
8/3	22.4	17.9	7.48	0.11	18	33		1.8	3	3
9/1	20.7	19.8	7.55	0.02	29	52		1.5	3	2
9/29	16.8	17	6.42	0.09	38	71		0.9	3	4

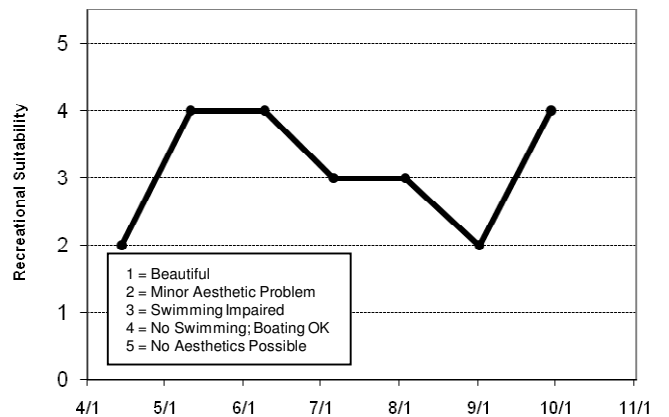


## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	D	C	C	C
Chlorophyll a	C	C	C	C	C	C
Secchi Depth	B	C	C	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>



Source: Metropolitan Council and STORET data

## Goose Lake [north basin] (82-0113-01) Valley Branch Watershed District

Goose Lake is located in the City of Lake Elmo (Washington County). The year 2009 was the second year that Goose Lake was monitored via the CAMP. The lake is split into two basins by county highway 10. The north basin is Site #1 of Goose Lake. The depth of the north basin at the sampling location is 1.8 m (6 ft). There is no other bathymetric information available for the lake. A search via STORET revealed no historical monitoring data prior to 2008.

On each sampling day the lake site was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	300.4	155.0	477.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	196.2	41.0	310.0	F
<b>Secchi</b> (m)	0.3	0.2	0.5	F
<b>TKN</b> (mg/l)	3.84	1.80	5.60	
			<b>Lake Grade</b>	F

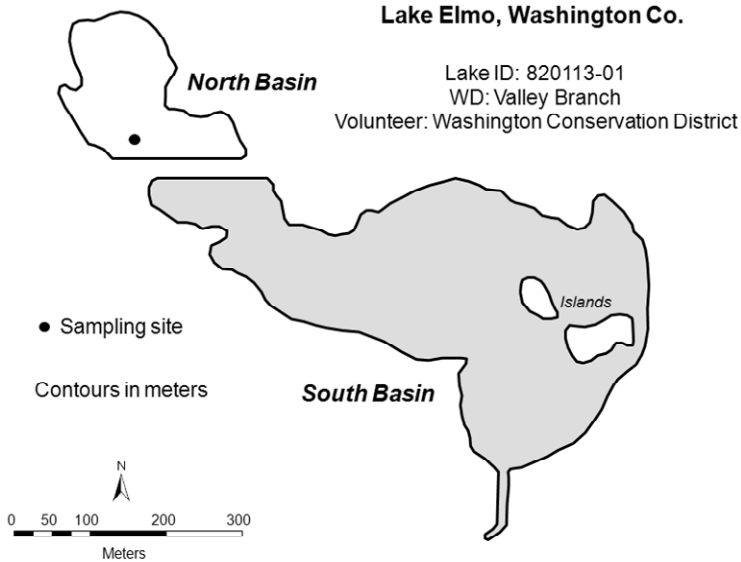
The north basin received a lake grade of F for 2009. Continued monitoring is suggested to build an historical water quality database for this lake site.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



## Goose Lake (North Basin) Lake Elmo, Washington Co.



### 2009 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
4/22	12.1	11.8	11.32	0.11	130	143		0.6	3	4
6/1	24	19.4	14.63	0.09	120	155		0.5	3	4
6/15	24.4	17.9	11.3	0.08	41	236		0.5	4	5
7/13	27.7	23.5	17.59	0.23	200	248		0.2	4	4
8/11	24	22.1	9.09	0.11	310	386		0.2	4	4
9/8	21.9	20.6	10.65	0.14	310	477		0.2	4	4
10/5	12.9	11.2	14.95	0.13	340	652		0.2	3	4

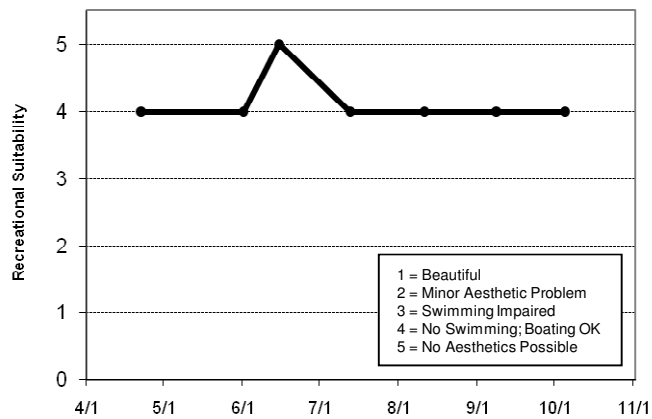
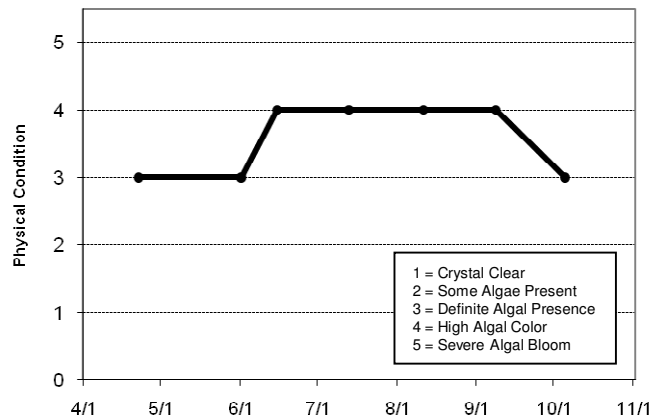
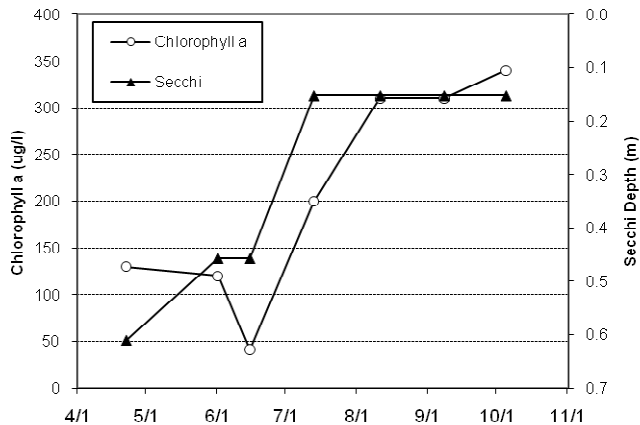
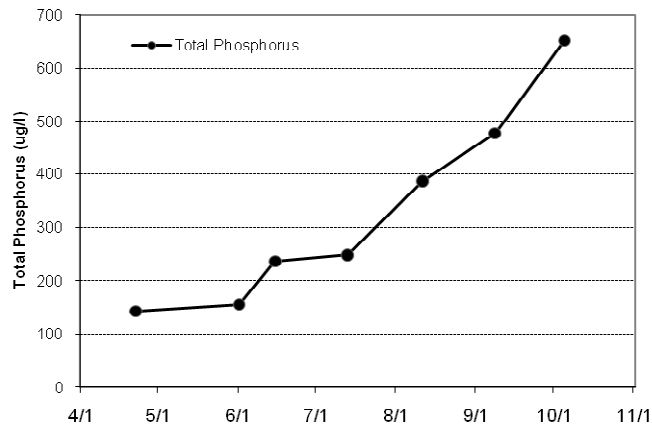
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					F	F
Chlorophyll <i>a</i>					F	F
Secchi Depth					F	F
<b>Lake Grade</b>					F	F

Source: Metropolitan Council and STORET data



## Goose Lake [south basin] (82-0113-02) Valley Branch Watershed District

Goose Lake is located in the City of Lake Elmo (Washington County). The year 2009 was the second year that Goose Lake was monitored via the CAMP. The lake is split into two basins by county highway 10. The south basin is Site #2 of Goose Lake. The depth of the south basin at the sampling location is 2.1 m (7 ft). There is no other bathymetric information available for the lake. A search via STORET revealed no historical monitoring data prior to 2008.

On each sampling day the lake site was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	346.4	150.0	488.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	454.0	350.0	580.0	F
<b>Secchi</b> (m)	0.1	0.1	0.2	F
<b>TKN</b> (mg/l)	14.68	4.10	48.00	
			<b>Lake Grade</b>	F

The south basin received a lake grade of F for 2009. Continued monitoring is suggested to build an historical water quality database for this lake site.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

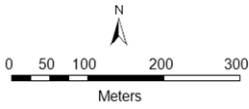
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

## Goose Lake (South Basin) Lake Elmo, Washington Co.



Lake ID: 820113-02  
WD: Valley Branch  
Volunteer: Washington Conservation District

● Sampling site  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	11.1	10.9	12.26	0.13	160	176		0.3	4	4
6/1	23.1	19.5	15.42	6.99	460	150		0.2	4	4
6/15	22.5	16.8	13.39	0.04	390	308		0.2	4	5
7/13	23.8	22.2	11.35	0.09	580	450		0.1	4	4
8/11	24.6	22.8	6.39	0.09	490	488		0.1	4	5
9/8	22.6	20.1	12.86	0.16	350	336		0.2	4	4
10/5	12.9	10.9	16.25	0.11	490	622		0.1	4	5

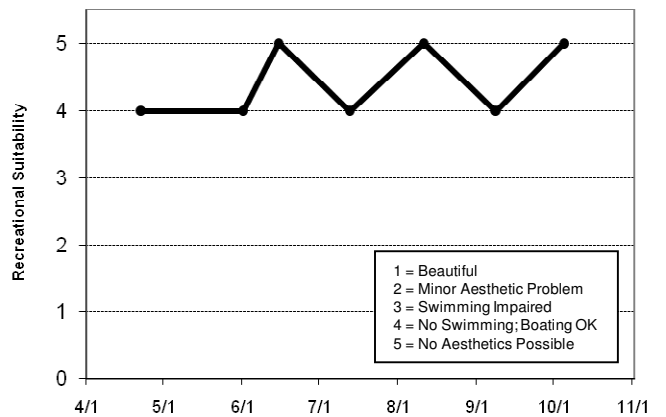
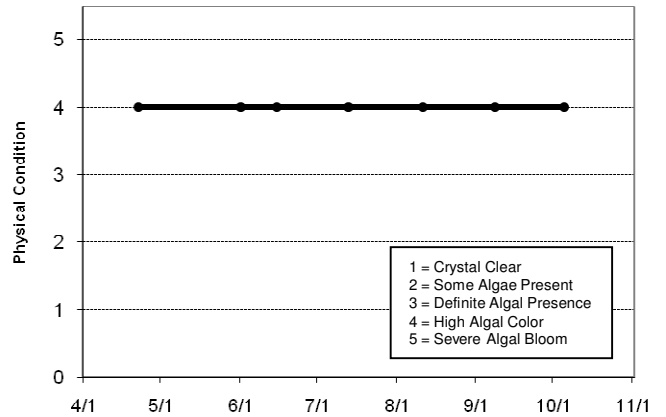
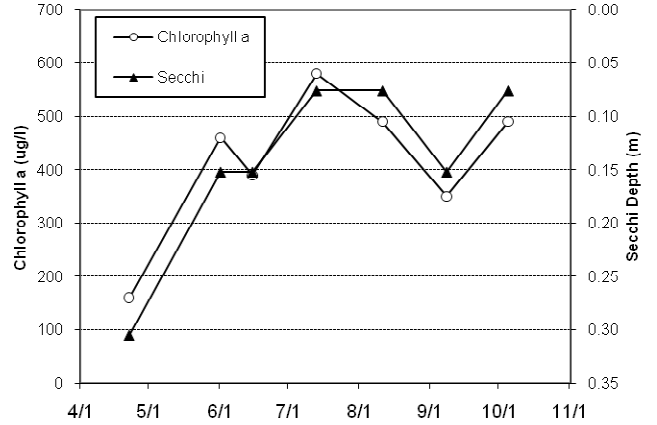
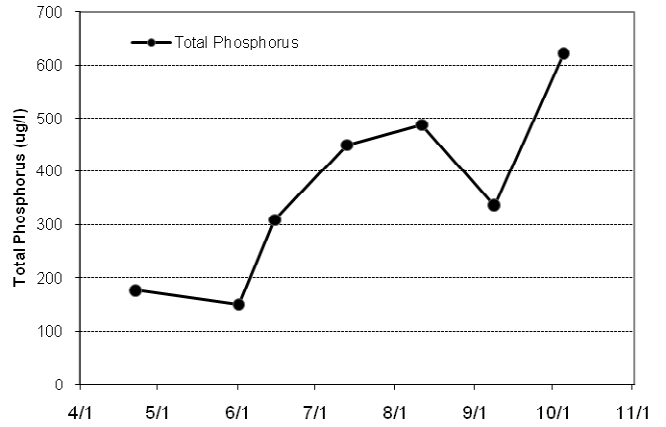
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					F	F
Chlorophyll a					F	F
Secchi Depth					F	F
<b>Lake Grade</b>					<b>F</b>	<b>F</b>

Source: Metropolitan Council and STORET data



## Grace Lake (10-0218) Carver County Environmental Services

Grace Lake is a 22-acre lake located near the City of Chaska (Carver County). The lake has a maximum depth of 6.7 m (22 feet). A search through the STORET nationwide water quality database for historical data provided no data other than CAMP data.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	112.3	49.0	306.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	56.6	3.1	120.0	D
<b>Secchi</b> (m)	0.8	0.3	2.4	D
<b>TKN</b> (mg/l)	2.14	0.50	2.90	
<b>Overall Grade</b>				D

The lake received a lake grade of D for 2009 which is consistent with its historical database. Further monitoring is suggested for this lake to develop an historical water quality database.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

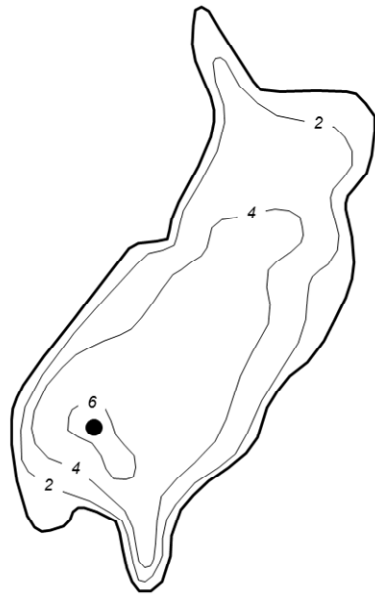
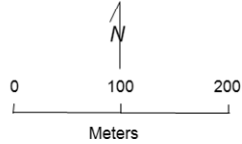
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 297-4916 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Grace Lake Chaska, Carver Co.

LAKE ID: 100218-00  
WMO: Hazeltine-Bavaria  
Volunteer: Carver Co.

● Sampling station  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	10.4		14.7		96			0.6	2	2
4/28	12.24		10.6		40			0.8	3	3
5/14	15.34		5.47		3.1	64		2.4	2	2
5/28	18.67		9.58		13			1.5	3	3
6/10	17.05		8.2		19	80		1.3	3	4
6/24	26.69		18.56		66	75		0.5	4	4
7/8	24.57		14.37		65	77		0.4	5	5
7/22	24.98		14.66		59	82		0.6	4	4
8/5	23.78		13.05		50	66		0.4	5	5
8/20	22.39		5.6		62	49		0.6	3	4
9/2	20.38		9.82		120	179		0.4	4	4
9/17	22.81		15.25		110	145		0.3	4	4
9/30	16.87		1.23		55	306		0.6	4	4
10/19	8.3		11		55	139		0.8	4	4

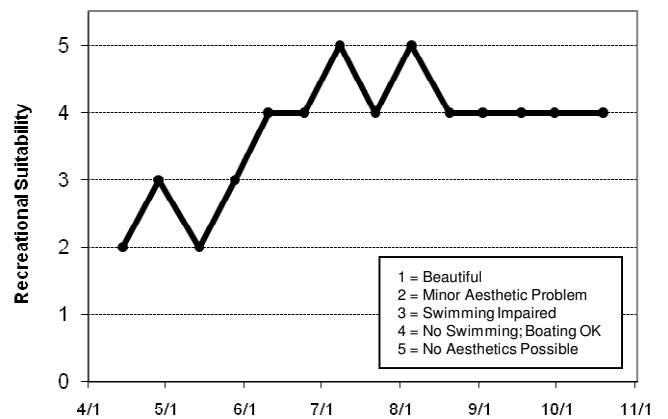
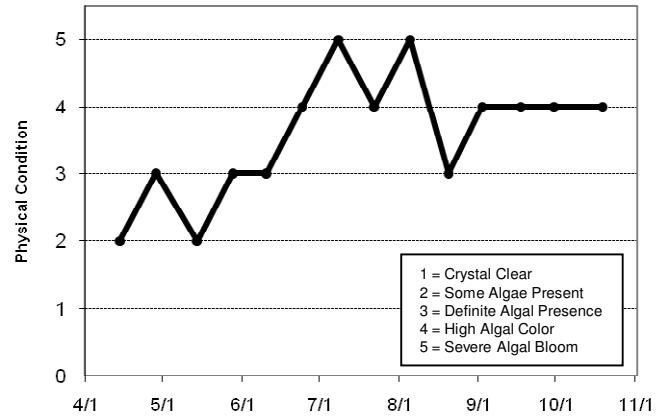
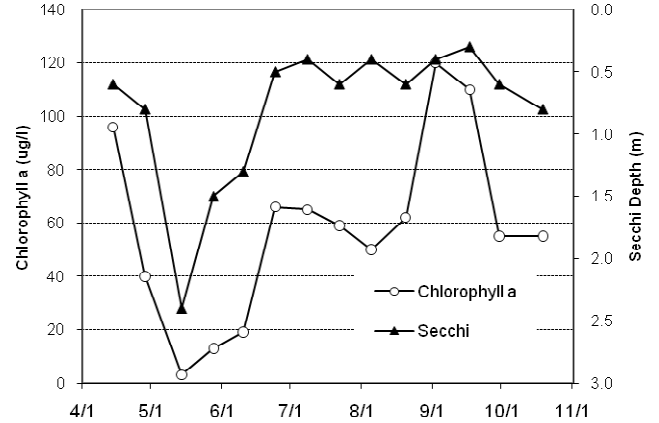
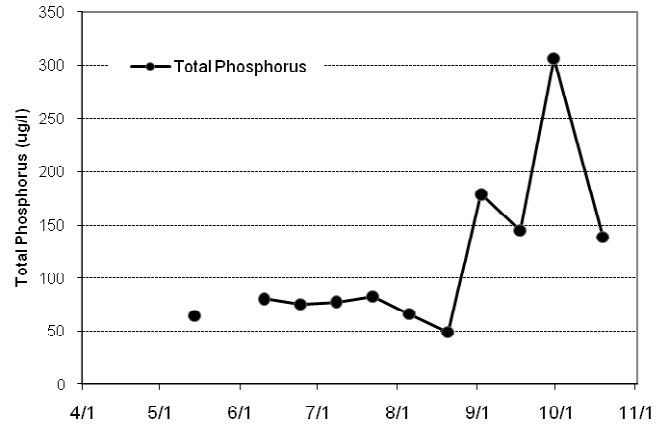
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D		D	D	D
Chlorophyll a	C	B		C	C	D
Secchi Depth	D	D		D	D	D
<b>Lake Grade</b>	<b>D</b>	<b>C</b>		<b>D</b>	<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



**Hay Lake (82-0065) Carnelian - Marine - St. Croix Watershed District**

Hay lake is located in City of Scandia (Washington County). The lake has a surface area of 33 acres, and a maximum depth of 6.1 m (20 feet).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	60.2	47.0	76.0	C
<b>CLA</b> (µg/l)	23.3	8.5	44.0	C
<b>Secchi</b> (m)	1.8	1.5	2.1	C
<b>TKN</b> (mg/l)	1.26	0.94	1.60	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009, which continues the improved water quality in comparison to the water quality during the late 1990s and early 2000s. The year 2008 was the second year in a row that all of the individual water quality parameters received C grades, which is better than all other past years of monitoring. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

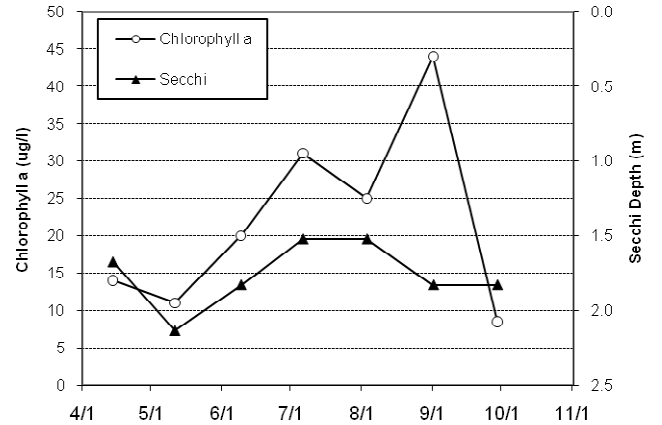
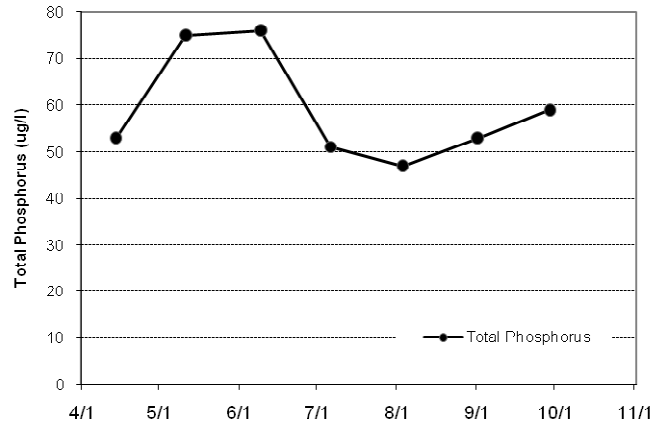
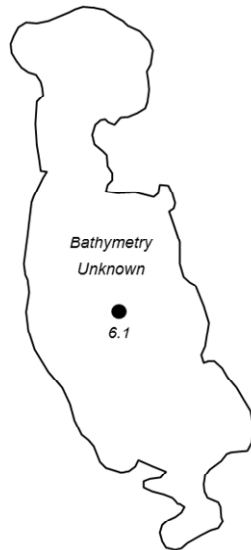
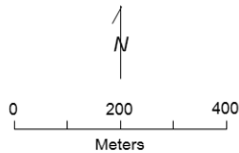
If you notice any errors in the lake’s data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Hay Lake

Scandia,  
Washington Co.

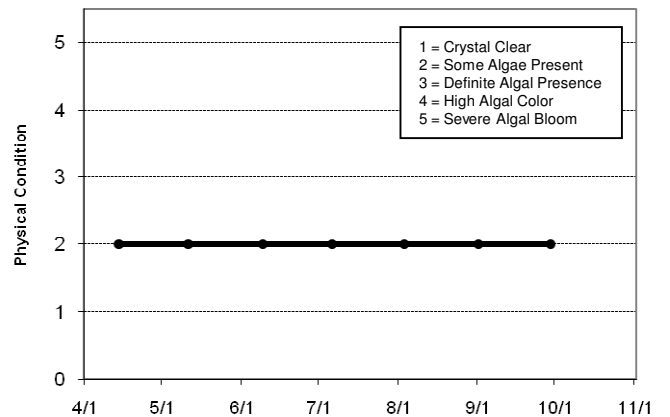
LAKE ID: 820065-00  
WD: Carnelian-Marine-St. Croix  
Volunteer: Washington  
Conservation District

● Sampling site  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	11.2	10.4	9.79	9.5	14	53		1.7	2	1
5/11	16.7	14.8	8.99	0.4	11	75		2.1	2	2
6/9	16.5	15.8	7.22	0.09	20	76		1.8	2	2
7/6	24.8	20.9	9.93	0.14	31	51		1.5	2	3
8/3	21.9	20.9	7.11	0.13	25	47		1.5	2	3
9/1	19	18.8	6.58	6.94	44	53		1.8	2	2
9/29	14	13.9	7.03	0.54	8.5	59		1.8	2	2



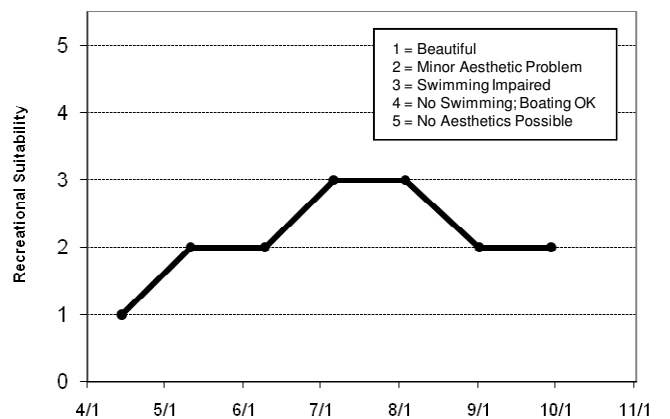
### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	D	D	C	C
Chlorophyll a	D	F	B	C	C	C
Secchi Depth	D	D	C	C	C	C
<b>Lake Grade</b>	<b>D</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## Hazeltine Lake (10-0014) Carver County Environmental Services

Hazeltine Lake is located in the City of Chaska (Carver County). The lake has a surface area of 236 acres and a maximum depth of 2.0 m (6.5 ft).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	276.9	122.0	416.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	286.9	27.0	660.0	F
<b>Secchi</b> (m)	0.3	0.2	0.5	F
<b>TKN</b> (mg/l)	5.41	1.90	7.50	
<b>Lake Grade</b>				F

The lake received a lake grade of F for 2009, which is consistent with its historical database. Continued monitoring is suggested to continue to build the water quality database for this lake.

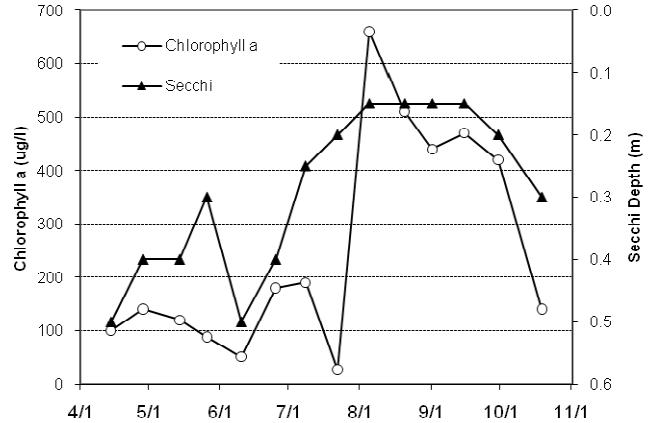
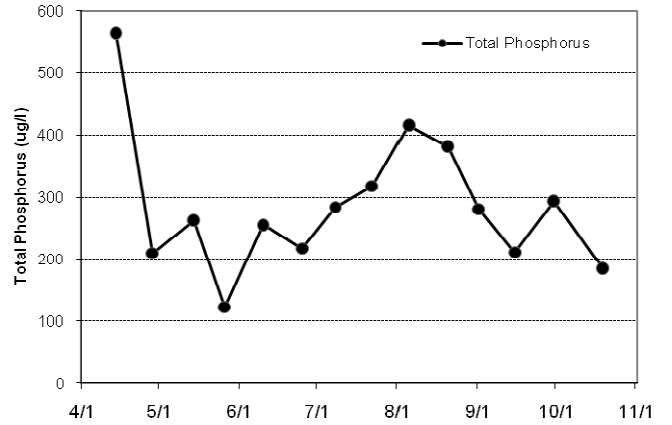
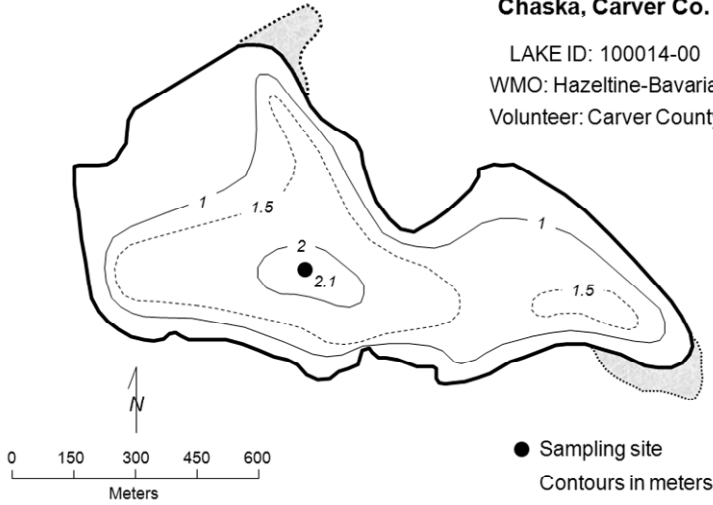
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



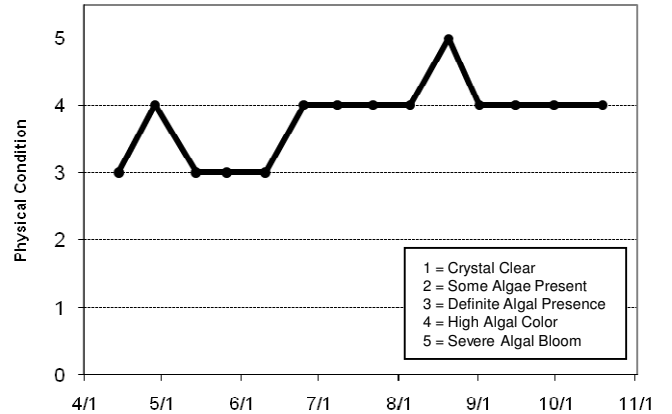
# Lake Hazeltine Chaska, Carver Co.

LAKE ID: 100014-00  
WMO: Hazeltine-Bavaria  
Volunteer: Carver County



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	11.39		12.83		100	564		0.5	3	3
4/28	11.22		13.7		140	210		0.4	4	3
5/14	14.63		9.61		120	263		0.4	3	4
5/26	19.81		6.3		88	122		0.3	3	4
6/10	15.95		5.82		51	256		0.5	3	4
6/25	26.84		13.85		180	218		0.4	4	4
7/8	24.33		12.3		190	284		0.3	4	5
7/22	21.79		15.24		27	318		0.2	4	4
8/5	23.32		13.67		660	416		0.2	4	5
8/20	21.23		7.29		510	382		0.2	5	5
9/1	20.56		11.8		440	281		0.2	4	4
9/15	23.3		18.7		470	212		0.2	4	5
9/30	12.8		8.99		420	294		0.2	4	4
10/19	8.05		8.74		140	185		0.3	4	4

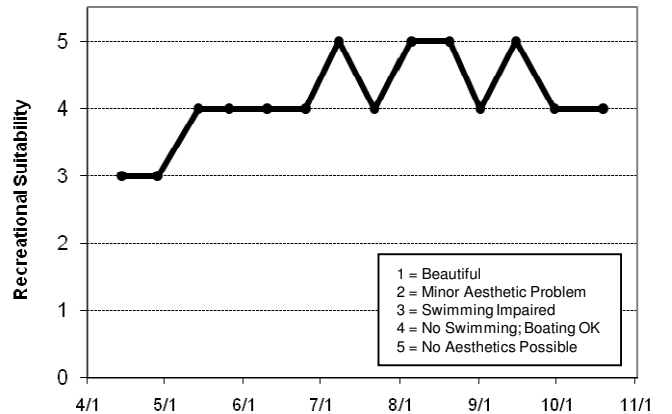


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		F	F			F
Chlorophyll a		F	F			F
Secchi Depth		F	F			F
Lake Grade		F	F			F



Source: Metropolitan Council and STORET data

**Heims Lake (13-0056) Comfort Lake - Forest Lake Watershed District**

Heims Lake is located in Wyoming Township (Chisago County). There are known bathymetric data available for this lake. This was the first year this lake was part of the CAMP.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	41.4	24.0	82.0	C
<b>CLA</b> (µg/l)	16.9	3.0	82.0	B
<b>Secchi</b> (m)	0.5	0.4	0.6	F
<b>TKN</b> (mg/l)	1.61	1.00	2.10	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009. Continued monitoring is suggested build the baseline water quality database for this lake.

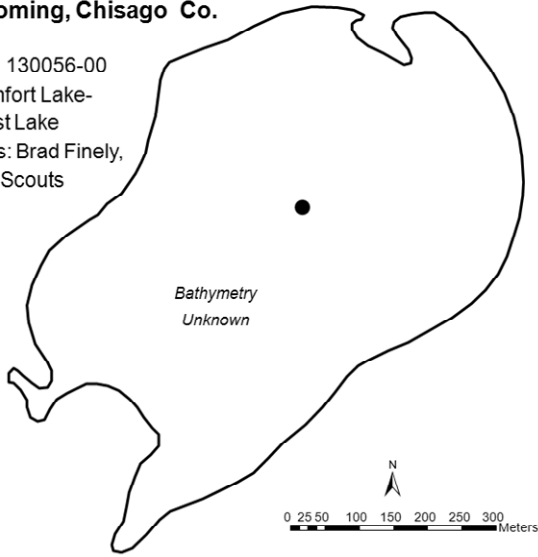
Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Heims Lake

City of Wyoming, Chisago Co.

LAKE ID: 130056-00  
 WD: Comfort Lake-  
 Forest Lake  
 Volunteers: Brad Finely,  
 Boy Scouts



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/27					22	82			2	5
6/10	21				13	44			2	5
6/27	21				82	57		0.4	2	5
7/12	21				3.4	34		0.5	3	5
7/16	20				5.1	29			3	5
7/24	24				3	32		0.5	2	4
8/9	25				26	60		0.6	2	4
8/23	25.8				4.8	24			2	4
9/2	21.9				4.9	26		0.6	2	5
9/20	21.4				4.8	26			2	4

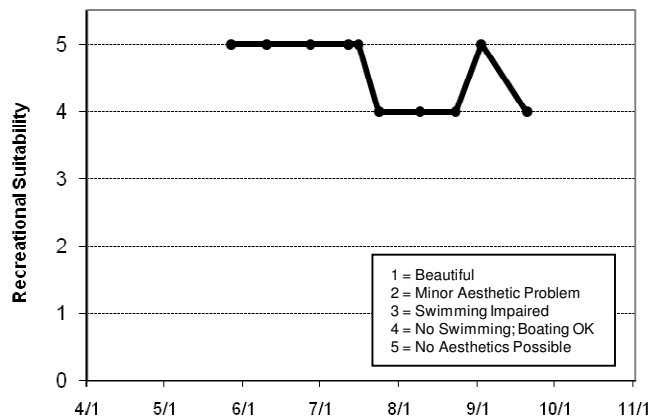
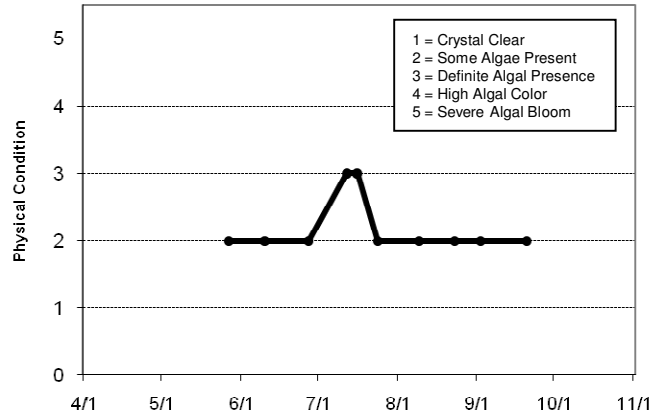
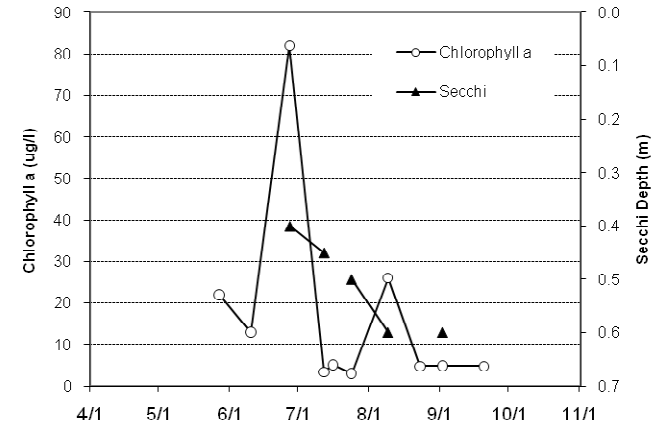
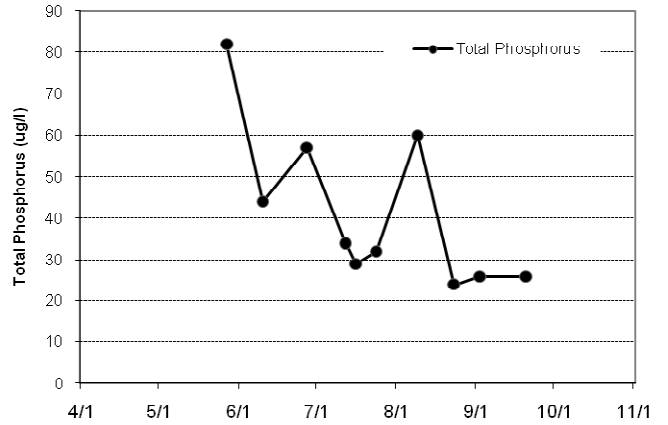
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						C
Chlorophyll a						B
Secchi Depth						F
Lake Grade						C

Source: Metropolitan Council and STORET data



## Henry Lake (27-0175) Elm Creek Watershed Management Commission

Henry Lake is a 77-acre lake located within Hassan Township (Hennepin County). Because the maximum depth of the lake is only 1.5 m (5 feet), the entire lake area is considered littoral zone (the 0-15 foot depth area of the lake dominated by aquatic vegetation). Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	245.0	64.0	443.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	80.6	16.0	130.0	F
<b>Secchi</b> (m)	0.4	0.3	0.7	F
<b>TKN</b> (mg/l)	2.54	1.90	3.30	
<b>Lake Grade</b>				F

The lake received a lake grade of F for 2009 which is the worst grade the lake has received according to its historical water quality database. Additional years of data are needed to determine trends in water quality.

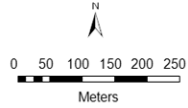
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

## Lake Henry Hassan Twp., Hennepin Co.

Lake ID: 270175-00  
WMO: Elm Creek  
Volunteers: Pam & George Christ

● Sampling site  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/30	20.1				71	443		0.4	2	5
6/8	23.3				16	257		0.7	3	5
7/4	25.4				130	291		0.5	4	5
7/26	25.3				66	256		0.3	3	5
8/8	26.3				120	242		0.4	4	5
8/19	21.4					64		0.3	3	5
9/6						162		0.5	2	5

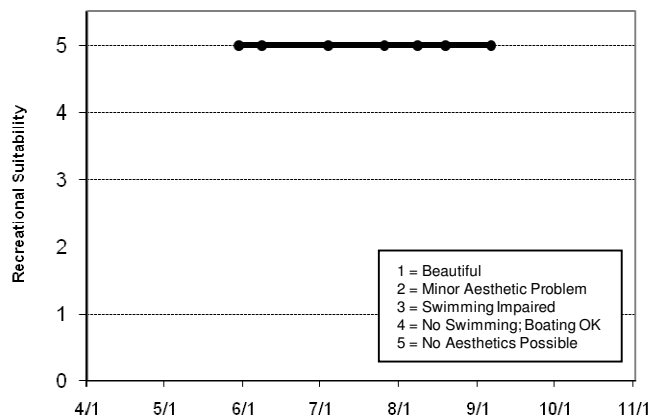
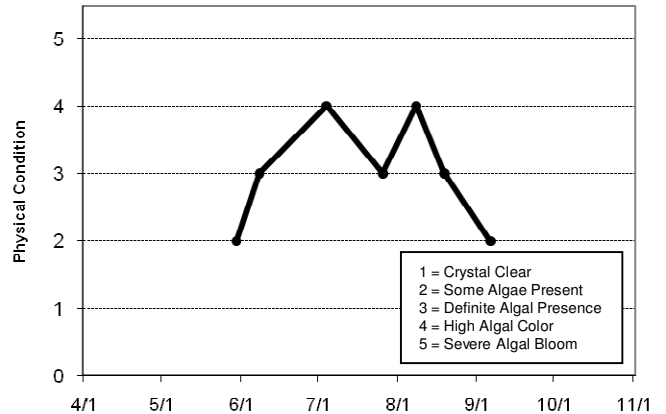
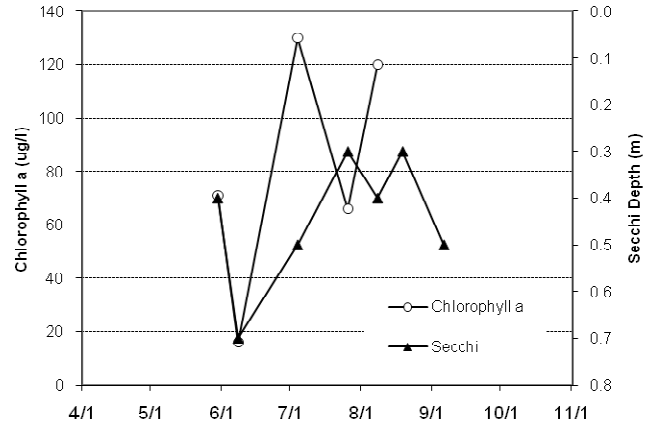
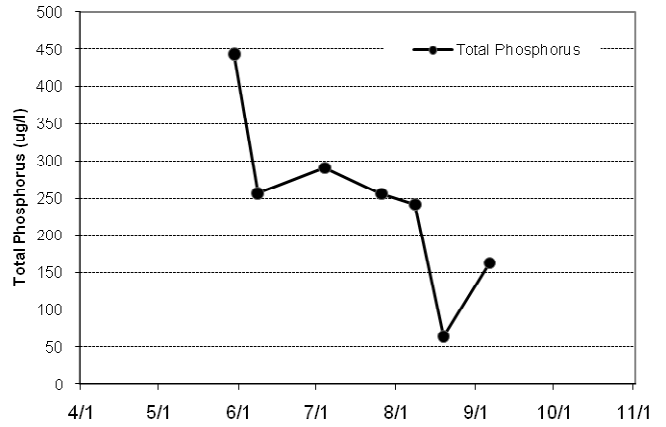
### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	F	C	F	F	F
Chlorophyll a	C	B	D	C	F	F
Secchi Depth	D	C	D	D	F	F
<b>Lake Grade</b>	<b>D</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>F</b>

Source: Metropolitan Council and STORET data



## Hornbean Lake (19-0047) City of Sunfish Lake

Hornbean Lake is located within the City of Sunfish Lake (Dakota County), and has an area of approximately 22-acres. There is very little morphological information available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in the tables and figures on the next page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	44.7	20.0	77.0	N/A
<b>CLA</b> ( $\mu\text{g/l}$ )	20.2	4.5	36.0	N/A
<b>Secchi</b> (m)	1.7	0.8	2.7	N/A
<b>TKN</b> (mg/l)	1.49	0.96	1.80	
			<i>Lake Grade</i>	N/A

There was an insufficient quantity of data to calculate grades for the lake in 2009. At least 5 monitoring events during the summer-time period (May – September) are needed. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

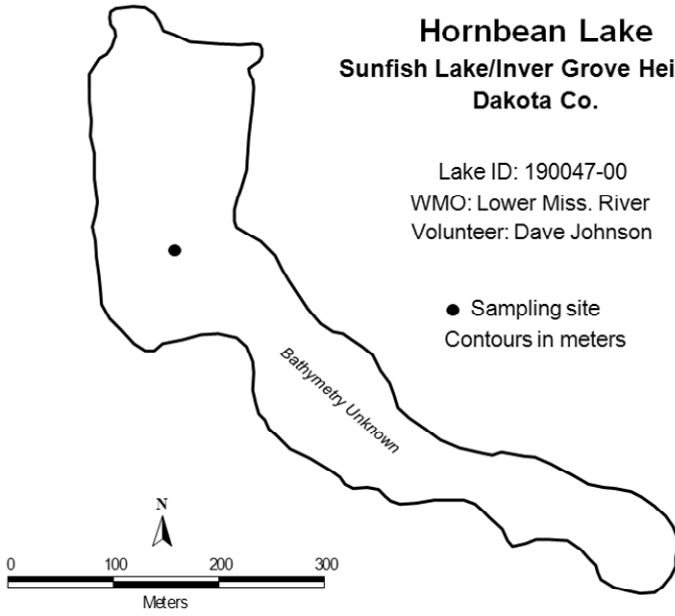
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

## Hornbean Lake Sunfish Lake/Inver Grove Heights, Dakota Co.

Lake ID: 190047-00  
WMO: Lower Miss. River  
Volunteer: Dave Johnson

● Sampling site  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	13.2				5.8	19		3.0	2	2
5/22	21.3				4.5	20		2.7	2	2
6/15	24.8				36	37		0.8	4	3
8/9	25.1				20	77		1.5	3	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 <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

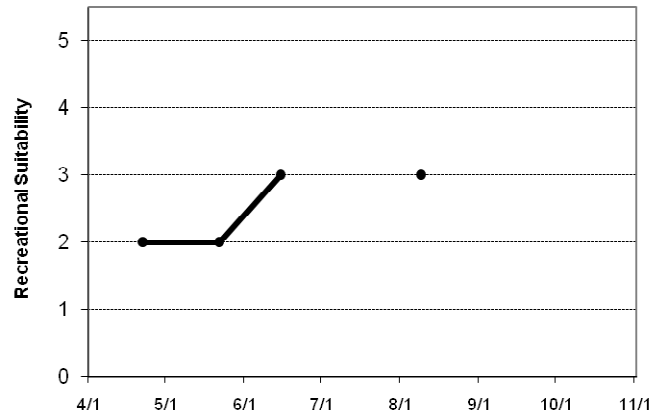
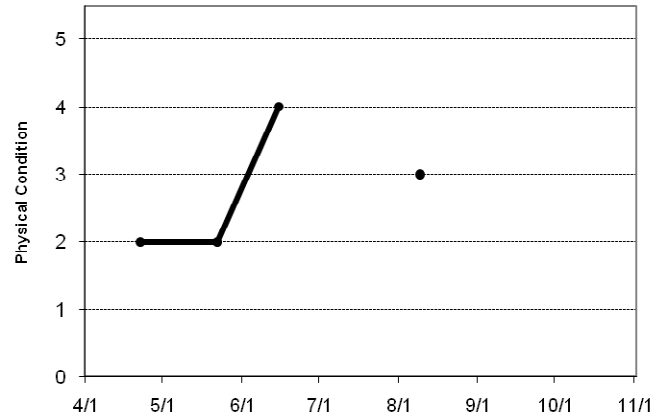
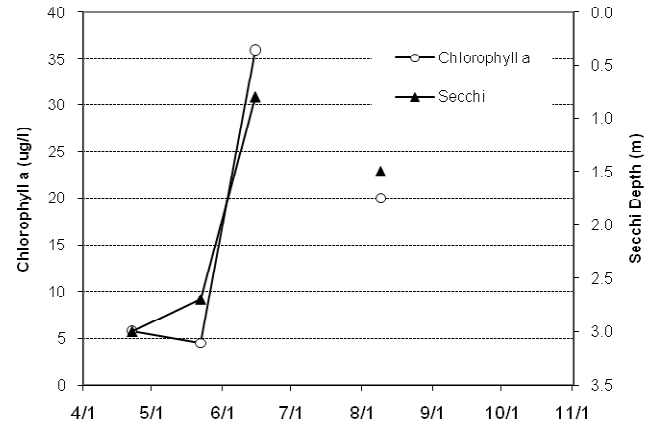
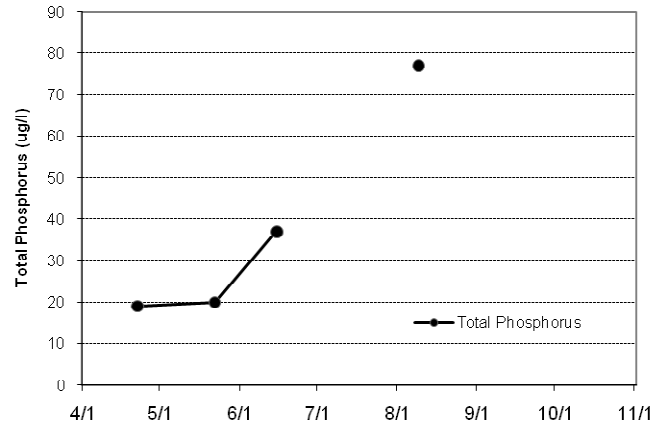
  

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			C	C	C	
Chlorophyll <i>a</i>			B	C	A	
Secchi Depth			C	C	B	
<b>Lake Grade</b>			<b>C</b>	<b>C</b>	<b>B</b>	<b>NA</b>

Source: Metropolitan Council and STORET data



## Horseshoe Lake [Sunfish Lake] (19-0051) City of Sunfish Lake

Horseshoe Lake is an approximate 16-acre lake located within the City of Sunfish Lake (Dakota County). There is very little morphological information available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data and graphs appear on the next page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	25.6	16.0	42.0	B
<b>CLA</b> ( $\mu\text{g/l}$ )	4.5	2.7	10.0	A
<b>Secchi</b> (m)	2.3	2.0	3.2	B*
<b>TKN</b> (mg/l)	0.69	0.55	0.88	
<b>Lake Grade</b>				B

\* see discussion below

The lake's 2009 lake water quality grade was a B, which was similar to last year's lake grade. However, the water clarity was better than the Secchi depth data would suggest since most of the measurements were made with the Secchi disk visible on the lake bottom. Therefore the Secchi depth mean and grade given above underestimate the actual water clarity. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

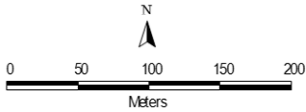
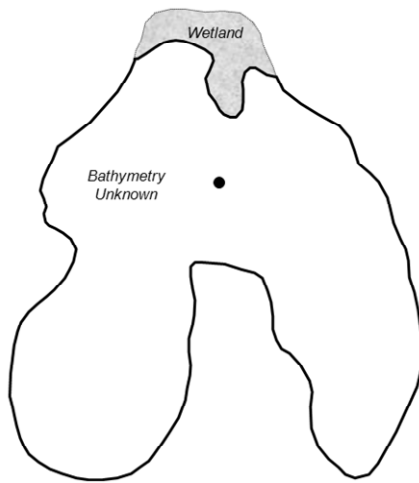
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



# Horseshoe Lake Sunfish Lake, Dakota Co.

Lake ID: 190051-00  
WMO: Lower Miss. River  
Volunteer: Jim Nayes

● Sampling site  
Contours in meters



## 2009 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
4/11	10.3				3.5	23		2.5	1	1
5/3	16.7				5.8	26		2.4	1	1
5/17	18.7				10	42		2.0	2	1
6/1	20.4				3.8	30		2.0	2	1
6/13	18.6				3.2	25		2.4	1	1
6/27	27.6				3.7	20		2.2	1	1
7/11	25.2				3.5	16		2.4	1	1
7/25	24.5				2.8	31		3.2	1	1
8/8	24				2.7	25		2.2	1	1
8/22	22				4.4	25		2.2	2	1
9/5	24.4				3.9	20		2.2	2	1
9/19	23.7				4.8	23		2.2	2	1
9/30	14.7				5.6	24		2.4	1	1
10/17	8.1				3.5	13		2.5	1	1

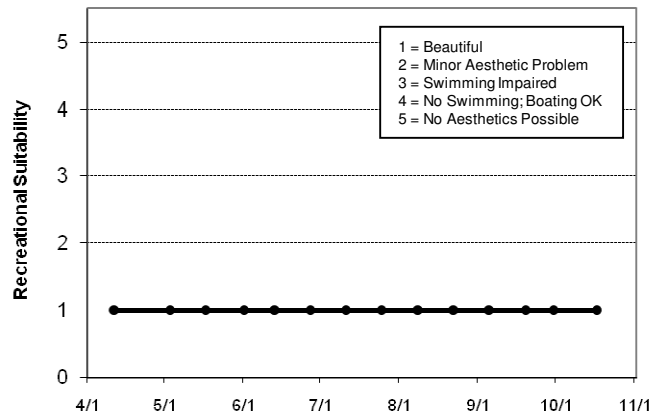
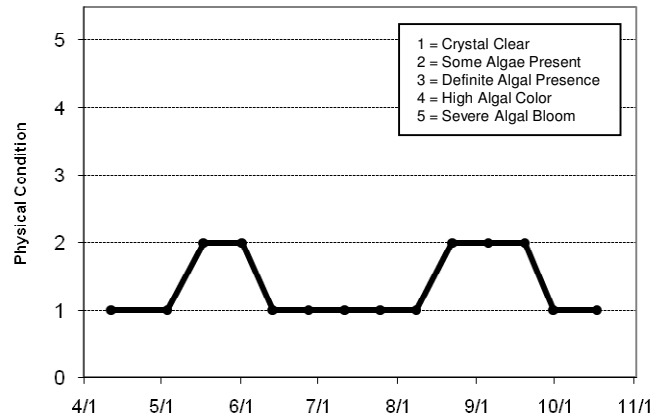
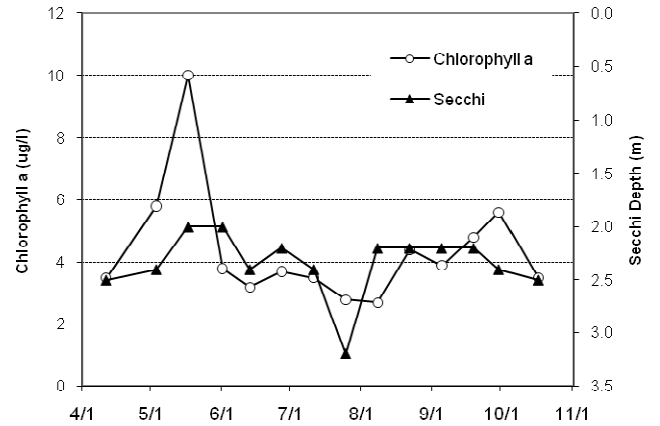
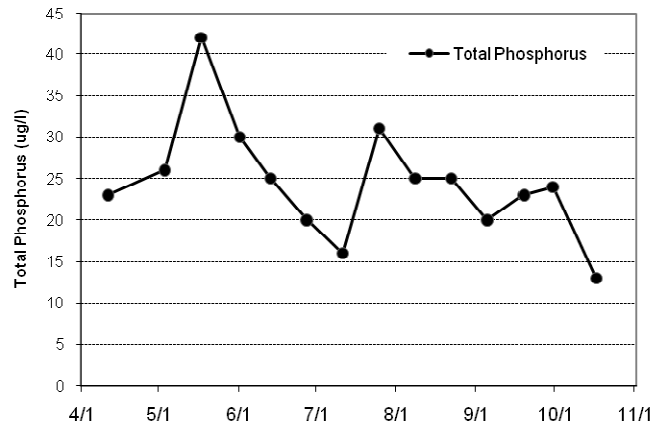
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			C	C	A	B
Chlorophyll a			A	A	A	A
Secchi Depth			C	C	C	B
Lake Grade			B	B	B	B

Source: Metropolitan Council and STORET data



## Horseshoe Lake [site 2] (82-0074) Washington Conservation District

Horseshoe Lake is located in the City of Lake Elmo and West Lakeland Township (Washington County). The lake has a surface area of 53 acres and a maximum depth 3.4 m (11 ft).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

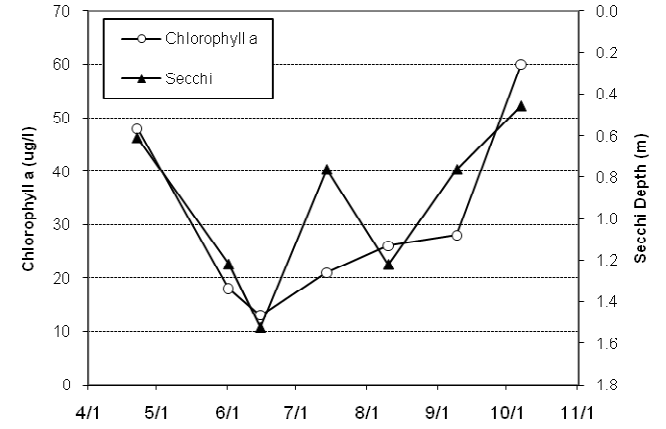
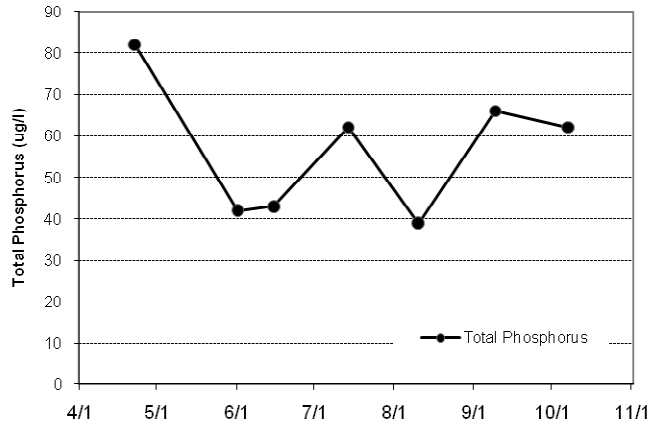
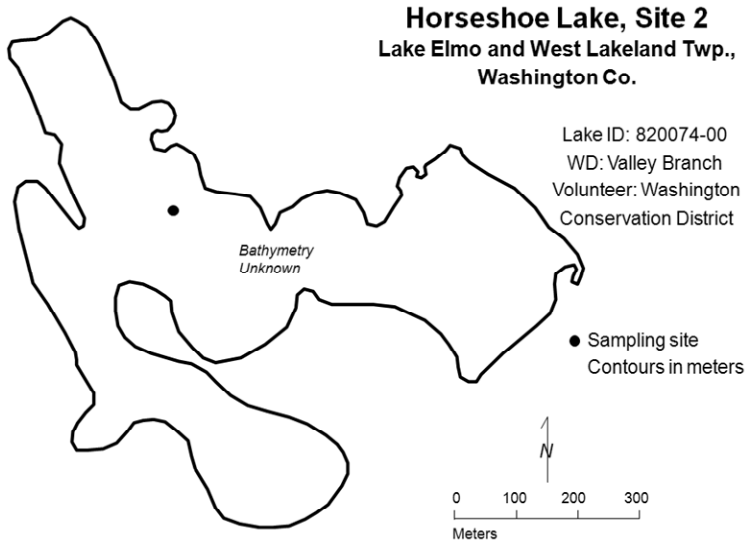
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	50.4	39.0	66.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	21.2	13.0	28.0	C
<b>Secchi</b> (m)	1.1	0.8	1.5	D
<b>TKN</b> (mg/l)	1.54	1.30	1.90	
<b>Lake Grade</b>				C

The lake site received a lake grade of C for 2009. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

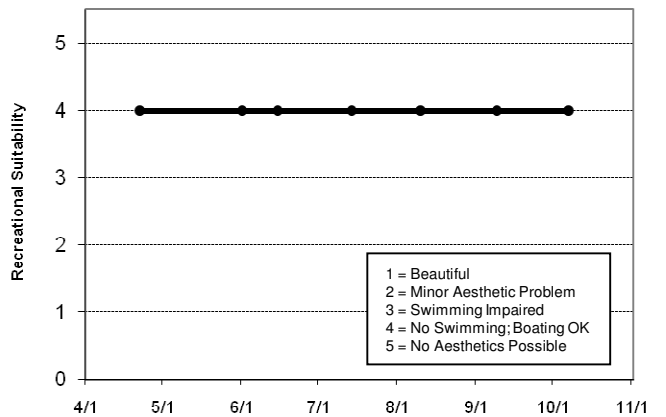
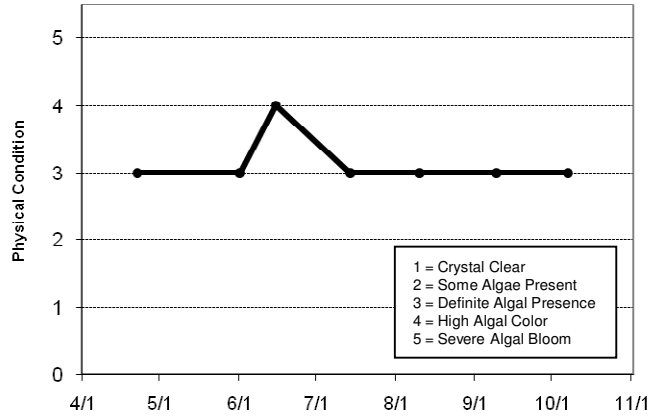
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 297-4916 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).



#### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	11.2	11	10.82	0.13	48	82	109	0.6	3	4
6/1	19.8	19.5	10.73	0.11	18	42	47	1.2	3	4
6/15	22.5	17.8	10.55	0.05	13	43	89	1.5	4	4
7/14	24.3	23.3	8.99	0.09	21	62	76	0.8	3	4
8/10	24.7	22.8	9.37	0.12	26	39	70	1.2	3	4
9/9	22.3	22	9.74	0.12	28	66	65	0.8	3	4
10/7	10.3	10.7	10.96	0.12	60	62	66	0.5	3	4



#### 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												
Lake Grade												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						C
Chlorophyll a						C
Secchi Depth						D
Lake Grade						C

Source: Metropolitan Council and STORET data

### **Horseshoe Lake [site 3] (82-0074) Washington Conservation District**

Horseshoe Lake is located in the City of Lake Elmo and West Lakeland Township (Washington County). The lake has a surface area of 53 acres. The lake has a surface area of 53 acres and a maximum depth 3.4 m (11 ft).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	55.8	40.0	68.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	18.6	11.0	29.0	B
<b>Secchi</b> (m)	1.2	0.9	1.7	C
<b>TKN</b> (mg/l)	1.52	1.30	1.80	
<b>Lake Grade</b>				C

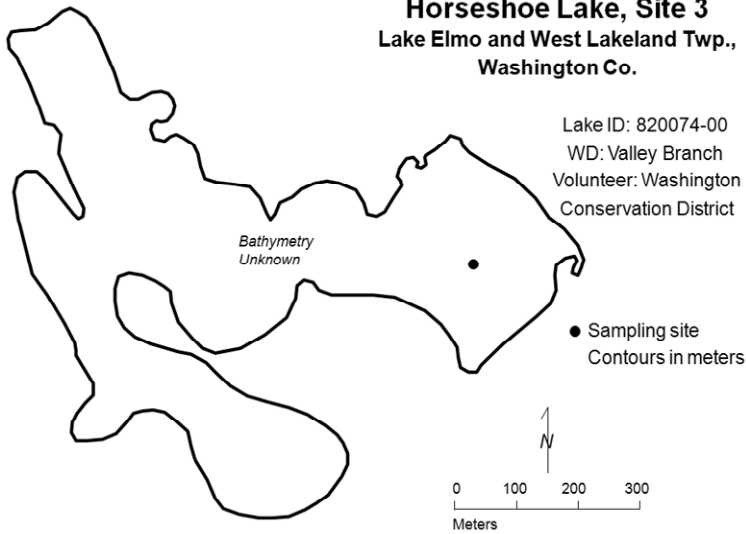
The lake site received a lake grade of C for 2009. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

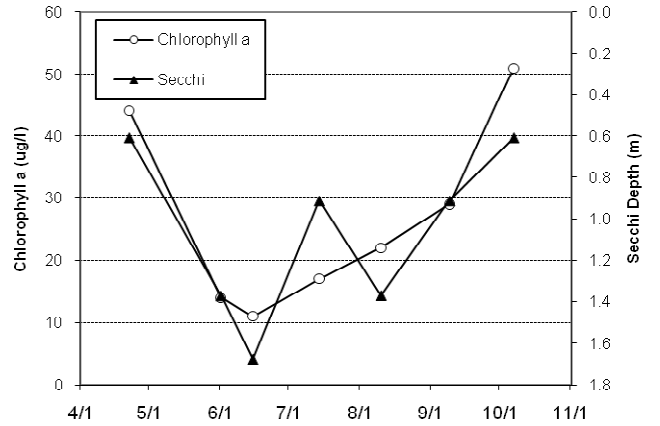
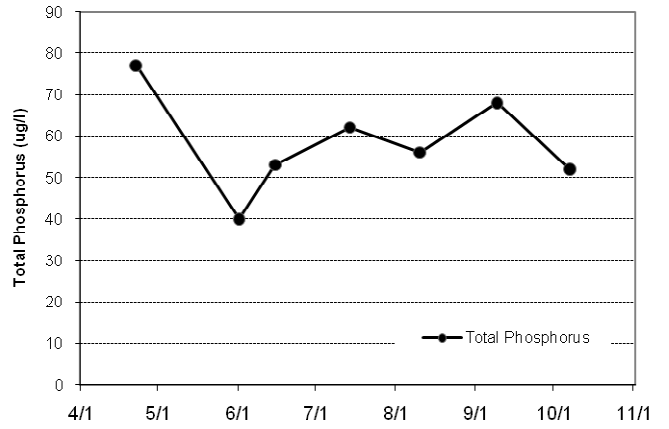
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 297-4916 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

### Horseshoe Lake, Site 3 Lake Elmo and West Lakeland Twp., Washington Co.

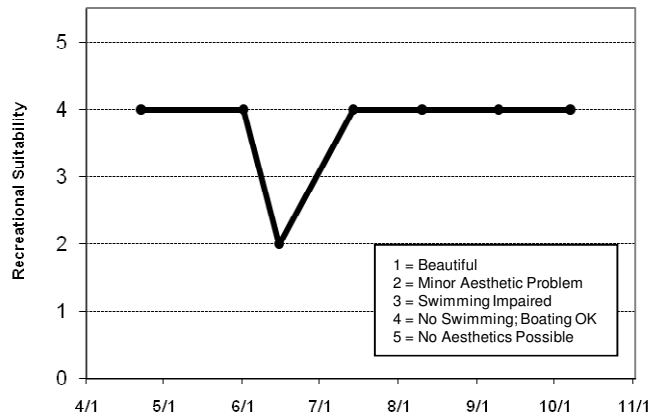
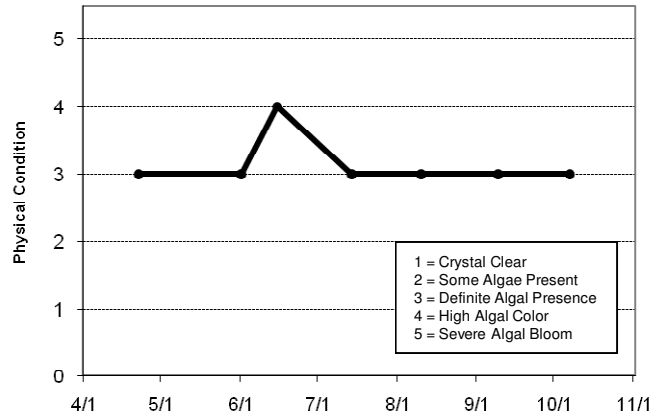


Lake ID: 820074-00  
WD: Valley Branch  
Volunteer: Washington  
Conservation District



#### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	11.1	10.7	11.46	0.15	44	77	83	0.6	3	4
6/1	20.1	19.2	10.8	6.75	14	40	43	1.4	3	4
6/15	22.5	17.7	10.22	0.06	11	53	53	1.7	4	2
7/14	24.3	23.3	8.57	0.31	17	62	63	0.9	3	4
8/10	25.1	22.8	8.08	0.09	22	56	54	1.4	3	4
9/9	21.9	20.9	10.05	0.11	29	68	43	0.9	3	4
10/7	10.6	11.2	10.61	0.13	51	52	59	0.6	3	4



#### 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												
Lake Grade												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						C
Chlorophyll a						B
Secchi Depth						C
Lake Grade						C

Source: Metropolitan Council and STORET data

## Hydes Lake (10-0088) Carver County Environmental Services

Hydes Lake is located within Waconia Township (Carver County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a surface area of 215 acres. The mean and maximum depth of the lake is 3.0 (10 feet) and 5.5 m (18 feet). Most of the lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	185.5	91.0	278.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	39.0	4.8	100.0	C
<b>Secchi</b> (m)	1.7	0.8	3.3	C
<b>TKN</b> (mg/l)	2.15	1.50	3.00	
			<b>Lake Grade</b>	D

The lake received a lake grade of D for 2009, which is consistent with its historical database. The water quality of 2009 appears to be an improvement over that observed in 2008. Additional monitoring is suggested to build the database for use in determining trends in the lake's water quality.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

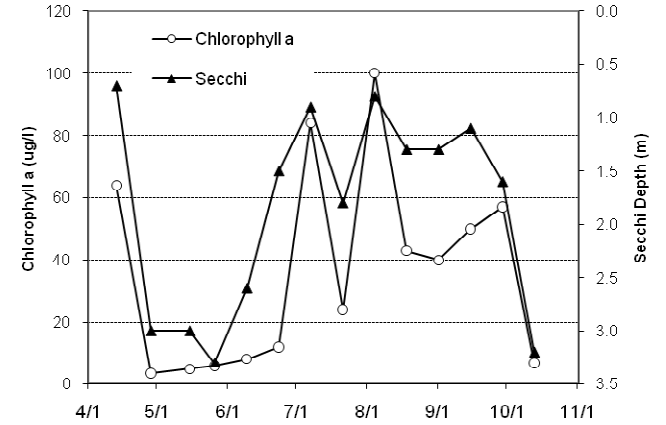
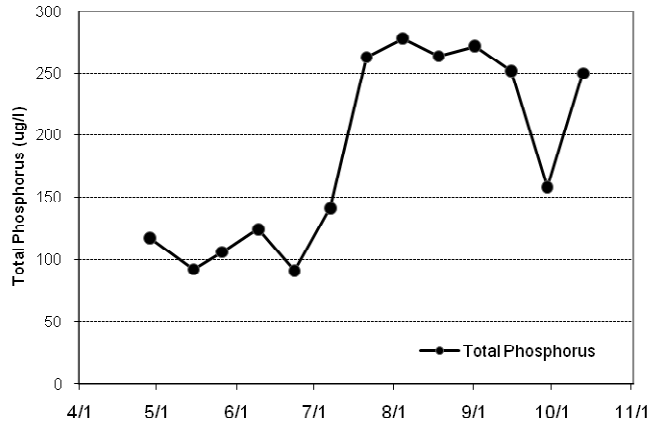
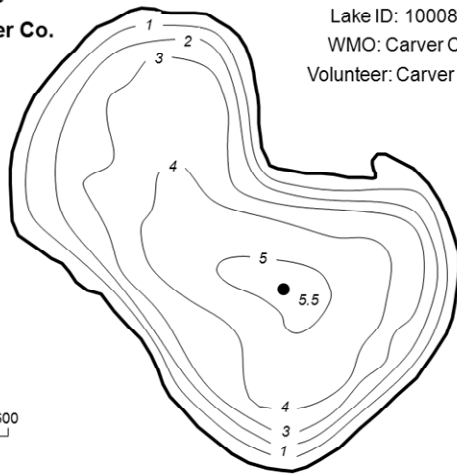
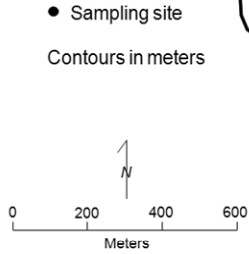
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Hydes Lake

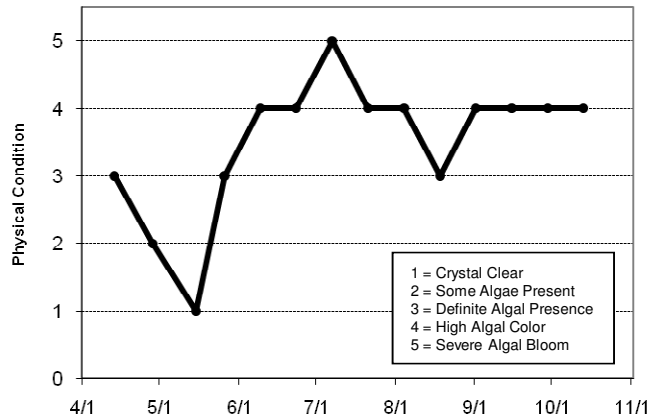
Waconia Twp., Carver Co.

Lake ID: 100088-00  
 WMO: Carver Creek  
 Volunteer: Carver County



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	7.71		10.3		64	0.7	3	3		
4/28	11.81		9.13		3.4	117		3.0	2	2
5/15	15.27		9.22		4.8	92		3.0	1	1
5/26	18.57		9.64		5.9	106		3.3	3	3
6/9	16.73		7.36		8.1	124		2.6	4	4
6/23	26.27		10.78		12	91		1.5	4	4
7/7	25.11		18.1		84	141		0.9	5	5
7/21	22.2		8.55		24	263		1.8	4	4
8/4	23.24		12.33		100	278		0.8	4	5
8/18	23.59		7.22		43	264		1.3	3	3
9/1	20.81		8.81		40	272		1.3	4	4
9/15	22.95		12.8		50	252		1.1	4	4
9/29	17.13		8.92		57	158		1.6	4	4
10/13	8.65		10.34		6.8	250		3.2	4	4

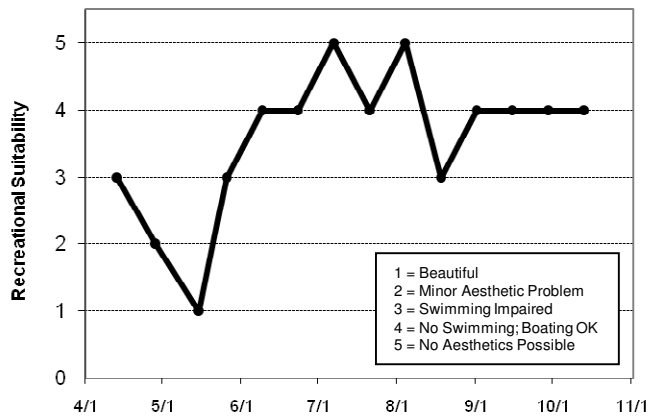


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	F	F	D	F	F
Chlorophyll a	D	D	C	D	F	C
Secchi Depth	D	C	C	C	D	C
Lake Grade	D	D	D	D	F	D



Source: Metropolitan Council and STORET data

## Island Lake (2-0022) Anoka County Parks

Island Lake is located in Linwood Township (Anoka County). The lake has a surface area of 67 acres and a maximum depth of 6.7 m (22 feet). Roughly 87 percent of the lake's surface area is considered littoral zone, which is the zone of aquatic plant dominance.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	28.5	20.0	43.0	B
<b>CLA</b> ( $\mu\text{g/l}$ )	10.9	5.2	18.0	B
<b>Secchi</b> (m)	1.1	0.7	1.4	D
<b>TKN</b> (mg/l)	1.03	0.94	1.10	
<b>Lake Grade</b>				C

The lake received a lake grade of B for 2008, which is consistent with its historical database. The annual lake grades have varied among B's and C's. Continued monitoring is suggested to continue to build the water quality database for determining if the lake is experiencing trends in its water quality.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

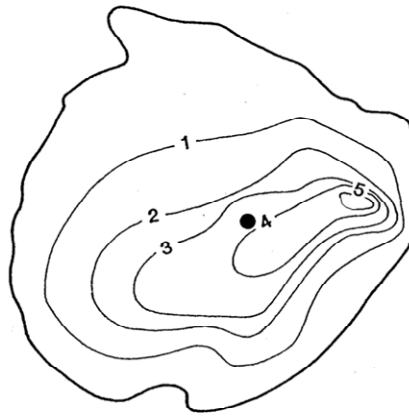
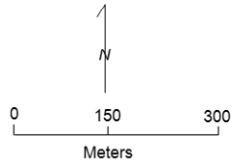
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



# Island Lake Linwood Twp., Anoka Co.

Lake ID: 20022-00  
WMO: Sunrise River  
Volunteer: Andy Nelson

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	11.4				9.3	27		1.2	2	2
4/28	13.2				13	23			2	2
5/13	17.6				14	40		0.9	2	2
5/28	17.8				11	43		1.2	3	
6/10	16.8				15	30		1.3	2	3
6/24	28.1				7.7	20		1.1	3	3
7/8	23.7				6.6	27		0.7	2	2
7/23	23.4				10	22		1.2	2	2
8/5	23.1				6.9	22		1.3	3	2
8/21	20.8				5.2	29		1.1	3	2
8/31	20.4				18	24		1.1	2	2
9/16	23				12	26		1.0	2	2
9/30	14.4				14	30		1.4	2	
10/15	6.3				8.1	16		1.8	2	2

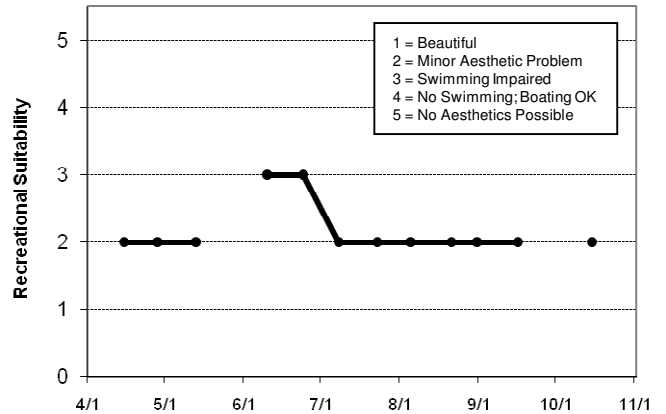
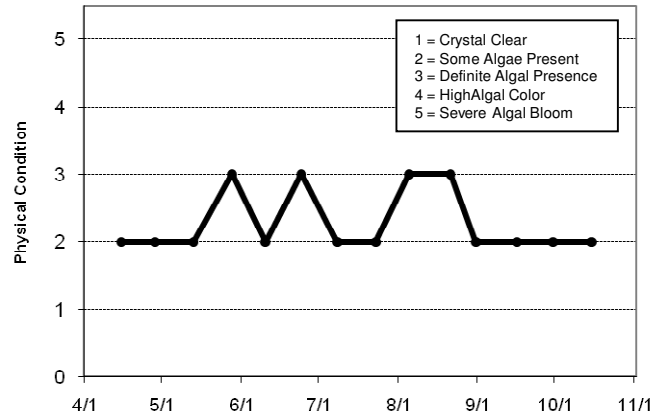
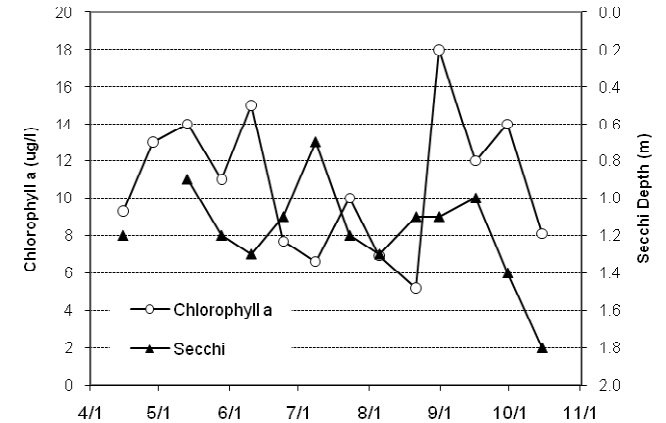
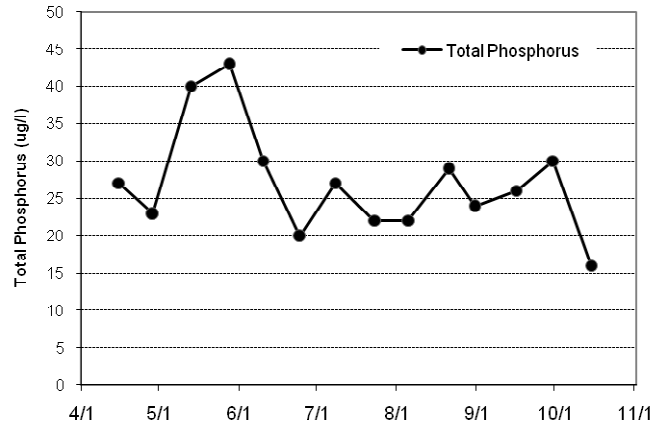
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												B
Chlorophyll a												B
Secchi Depth												C
<b>Lake Grade</b>												<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	B	B	B
Chlorophyll a	A	B	B	B	B	B
Secchi Depth	C	C	C	C	C	D
<b>Lake Grade</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>C</b>

Source: Metropolitan Council and STORET data



### **Jane Lake (82-0104) Valley Branch Watershed District**

Lake Jane is located in the northwest corner of the City of Lake Elmo (Washington County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value and exceptional water clarity (METC 2007). The MPCA has listed the lake as impaired for mercury content in fish.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	14.2	9.0	25.0	A
<b>CLA</b> (µg/l)	3.8	1.6	5.4	A
<b>Secchi</b> (m)	4.5	3.7	5.7	A
<b>TKN</b> (mg/l)	0.59	0.43	0.71	
<b>Lake Grade</b>				A

The lake received a lake grade of A for 2009, which is consistent with lake grades received since the year 2000.

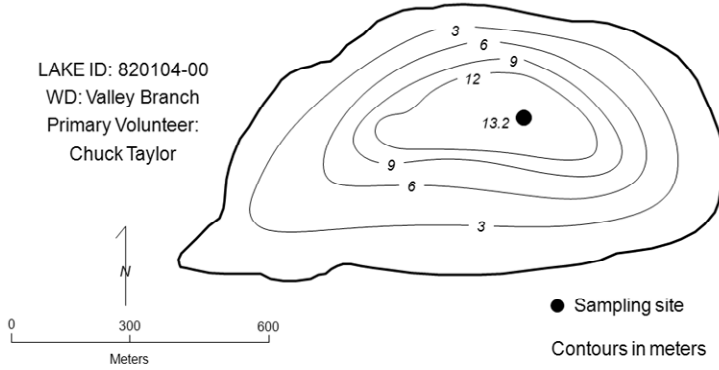
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Lake Jane**  
Lake Elmo, Washington Co.

LAKE ID: 820104-00  
WD: Valley Branch  
Primary Volunteer:  
Chuck Taylor



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/30	12.4				2.3	11		5.7	1	
5/17	15.6				1.6	25		5.7	1	
6/4	20.2				3.5	13		5.2	1	
6/17	21.4				5.4	16		3.7	1	
7/2	21.4				3.7	13		4.2	1	1
7/18	20.9				4.5	10		3.9	1	1
8/3	22.8				4.4	10		4.0		
8/17	24.9				4.6	10		3.9		
9/3	21.6				3.8	22		4.8	1	
9/13	24.5				2.8	9		4.8	1	
10/3	14.4				3.8	11		3.8	1	

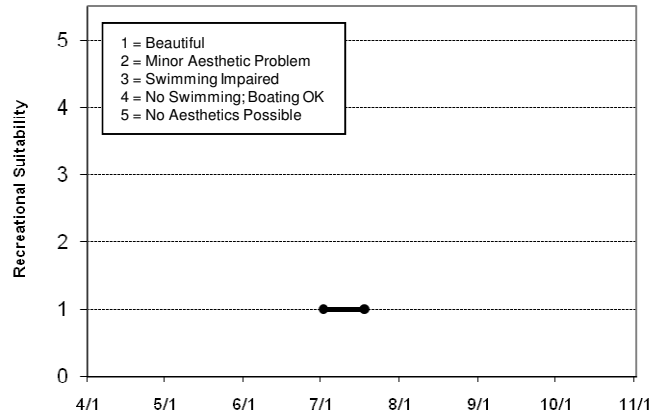
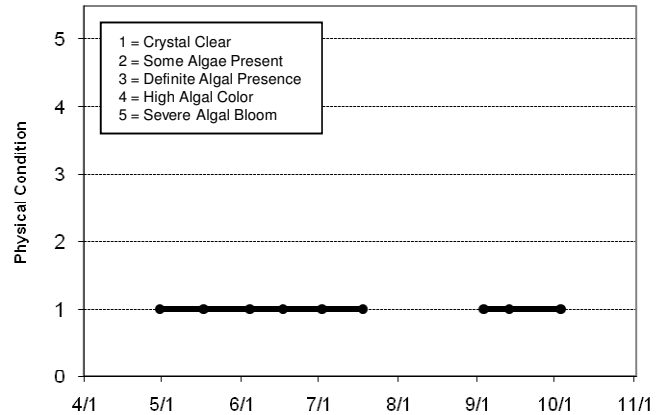
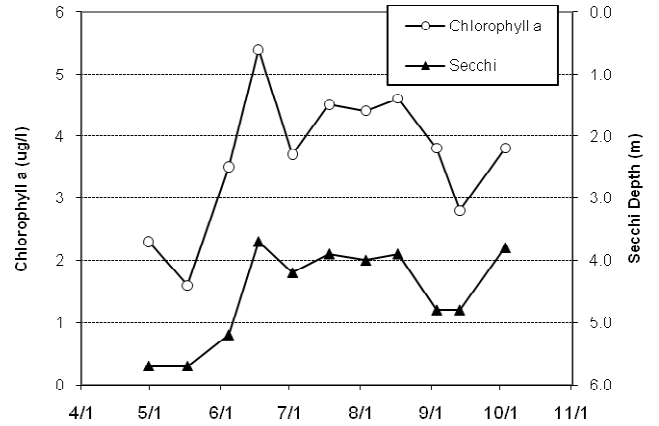
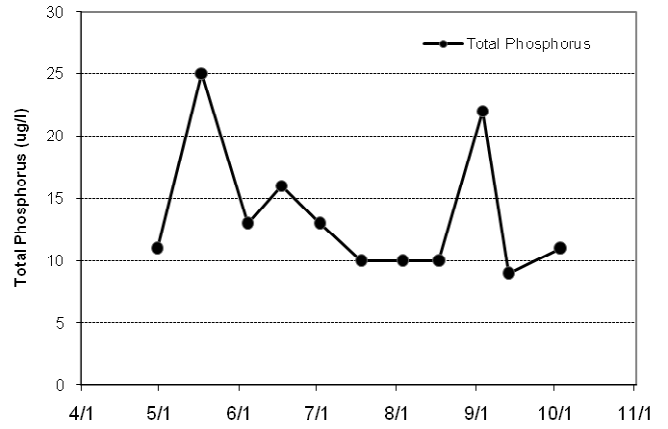
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	B	B			C		B	B				B
Chlorophyll <i>a</i>					C		B	B				B
Secchi Depth	A	A	A	A	B	B	B	B	B	B	B	B
<b>Lake Grade</b>					<b>C</b>		<b>B</b>	<b>B</b>				<b>B</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus			A						A			
Chlorophyll <i>a</i>			A						A			
Secchi Depth	C	B	B						A			
<b>Lake Grade</b>			<b>A</b>						<b>A</b>			

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	A	A	A	A
Chlorophyll <i>a</i>	A	A	A	A	A	A
Secchi Depth	A	A	A	A	A	A
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>

Source: Metropolitan Council and STORET data



## **Jellum's Bay [Site-1] (82-0052-02) Carnelian - Marine - St. Croix Watershed District**

Jellum's Bay is located in City of Scandia in Washington County. It has a surface area of 72 acres. The maximum depth of the lake is 4.9 m (16 feet). Therefore the majority of the surface area of the lake is considered littoral zone, which is the 0-15 feet depth zone that is dominated by aquatic vegetation. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	53.2	28.0	72.0	<b>C</b>
<b>CLA</b> ( $\mu\text{g/l}$ )	8.7	4.8	14.0	<b>A</b>
<b>Secchi</b> (m)	2.7	2.1	3.5	<b>B</b>
<b>TKN</b> (mg/l)	1.18	0.88	1.50	
<b>Lake Grade</b>				<b>B</b>

The lake received a lake grade of B for 2009, which is highest grade it has received according to its historical database. This continues an apparent trend of improving water quality since 2007. There was a notable improvement in the mean summer-time CLA concentration in 2009. With this year's continued improvement in water quality, further monitoring is suggested to determine if the recent improvements are indication of an improving trend over the D lake grades received between 1996 and 2006.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Jellum's Lake, Site 1**  
Scandia, Washington Co.

LAKE ID: 820052-02

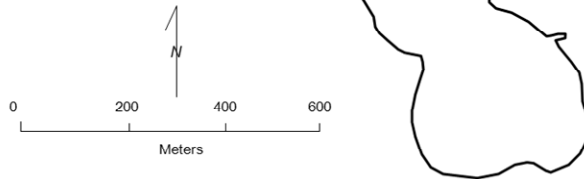
WD: Carnelian-Marine-St. Croix

Volunteer: Washington

Conservation District

● Sampling site

Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	13.2	12.7	8.87	0.15	4.7	41		3.7	2	2
5/27	18.7	18.7	6.89	0.09	9	54		2.1	2	2
6/23	26.7	17.6	6.65	0.09	4.8	42		3.5	2	2
7/20	21.6	20.8	7.38	0.33	10	72		2.1	2	2
8/18	23.9	22.2	4.68	0.06	14	70		2.3	2	3
9/15	23.1	21.8	7.32	0.11	5.5	28		3.5	2	2
10/14	7.6	7.7	9.3	5.04	5.3	35		3.4	1	1

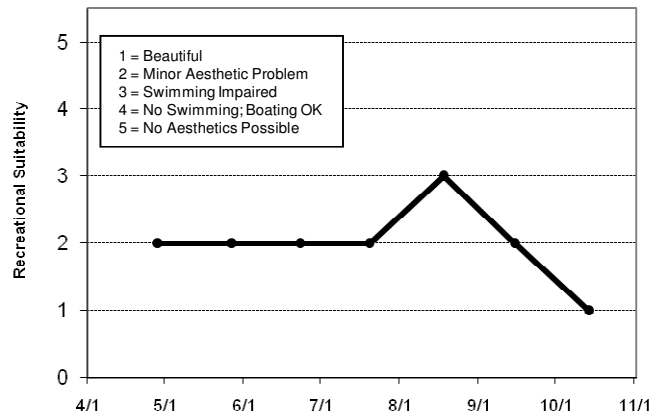
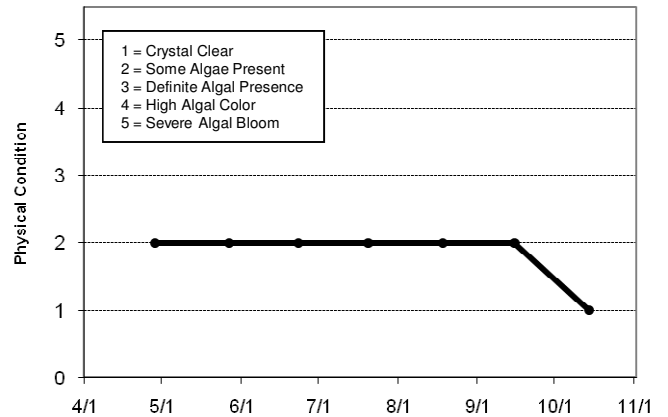
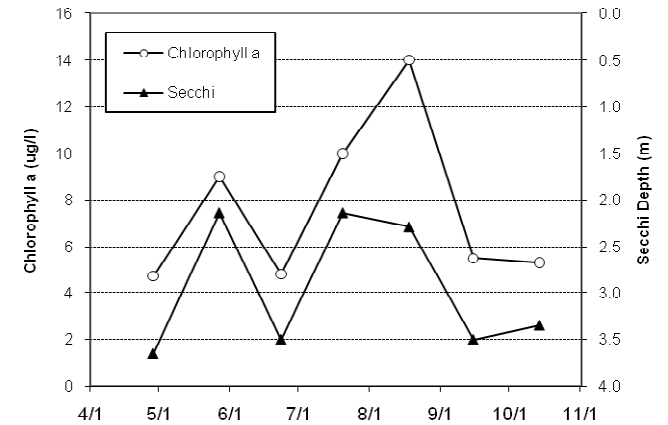
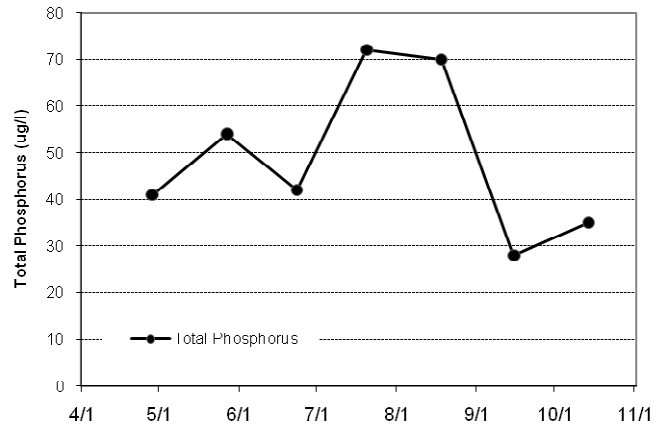
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	D	C	C	C
Chlorophyll a	C	D	C	C	C	A
Secchi Depth	D	D	D	C	C	B
<b>Lake Grade</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>B</b>

Source: Metropolitan Council and STORET data



## Jonathan Lake (10-0217) Carver County Environmental Services

Jonathan Lake is a small lake located in Carver County. There is little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	188.0	106.0	292.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	90.7	9.3	160.0	F
<b>Secchi</b> (m)	0.4	0.2	0.7	F
<b>TKN</b> (mg/l)	2.66	1.40	3.50	
<b>Overall Grade</b>				F

The lake received a lake grade of F for 2008, which is consistent with its limited database. Additional monitoring is suggested to develop a historical water quality database for this lake.

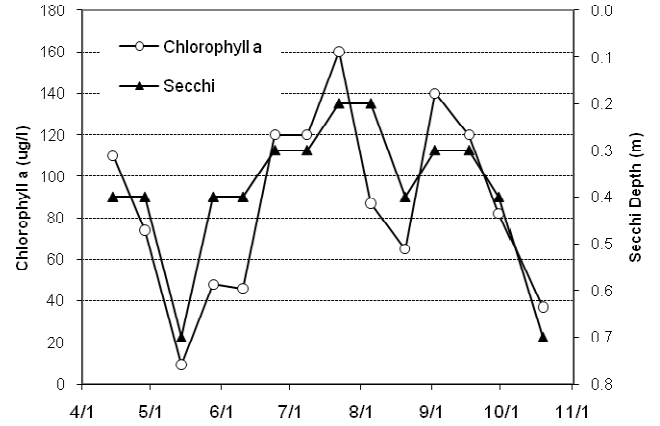
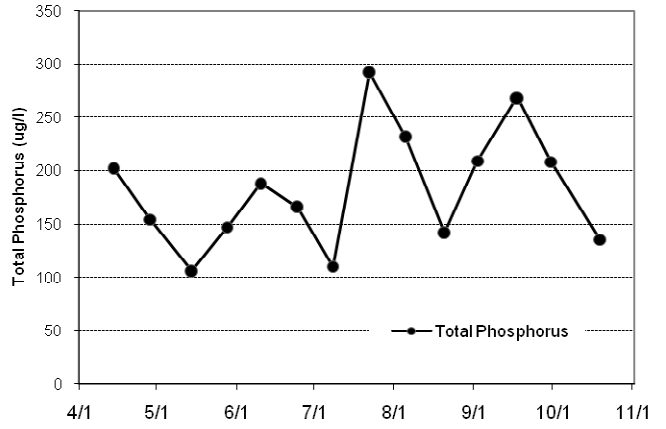
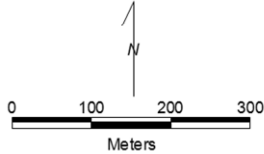
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Jonathan Lake**  
Chaska, Carver Co.

LAKE ID: 100217-00  
WMO: Hazeltine-Bavaria  
Volunteer: Carver Co.

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	11.05		13.2		110	202		0.4	3	3
4/28	11		9.97		74	154		0.4	3	3
5/14	15.34		6.59		9.3	106		0.7	3	4
5/28	17.82		8.7		48	147		0.4	3	4
6/10	16.06		8.32		46	188		0.4	4	4
6/24	26.22		14.57		120	166		0.3	4	5
7/8	24.03		13.22		120	110		0.3	5	5
7/22	21.9		15.55		160	292		0.2	4	4
8/5	23.07		9.58		87	232		0.2	4	5
8/20	21.61		5.61		65	142		0.4	4	5
9/2	20.04		9.51		140	209		0.3	4	4
9/17	23.68		15.07		120	268		0.3	4	4
9/30	14.42		10.26		82	208		0.4	4	4
10/19	8.5		10.5		37	135		0.7	4	4

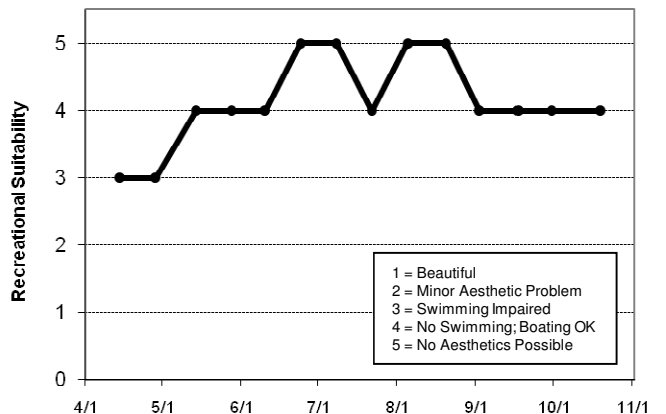
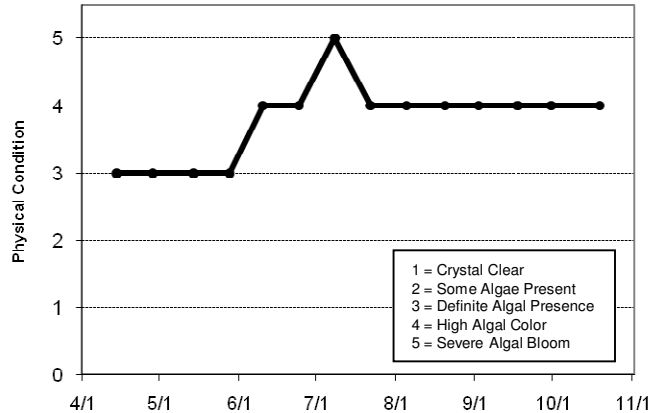
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		F		F	F	
Chlorophyll a		D		D	F	
Secchi Depth		F		F	F	
<b>Lake Grade</b>		<b>F</b>		<b>F</b>	<b>F</b>	

Source: Metropolitan Council and STORET data



## July Lake (82-0318) Browns Creek Watershed District

July Lake is a small lake located in Washington County. There is little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	120.3	47.0	197.0	N/A
<b>CLA</b> ( $\mu\text{g/l}$ )	45.0	14.0	110.0	N/A
<b>Secchi</b> (m)	0.8	0.2	1.2	N/A
<b>TKN</b> (mg/l)	2.30	1.20	3.50	
			<b>Lake Grade</b>	N/A

There was an insufficient quantity of data to calculate grades for the lake in 2009. At least 5 monitoring events during the summer-time period (May – September) are needed.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



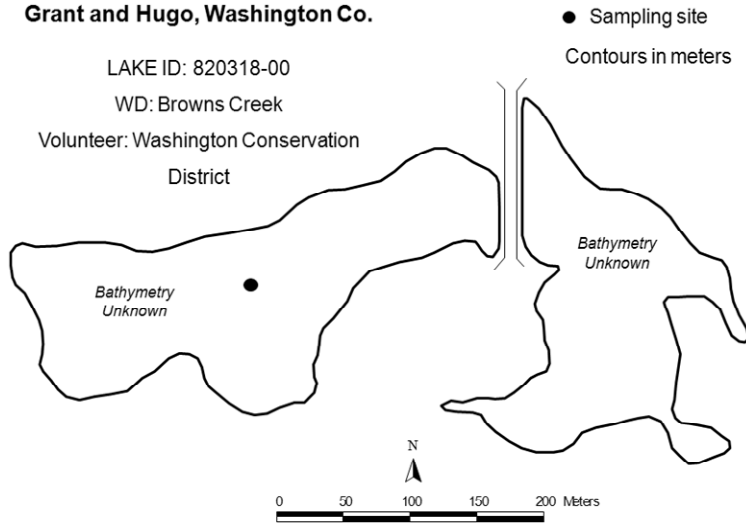
# July Lake

Grant and Hugo, Washington Co.

LAKE ID: 820318-00

WD: Browns Creek

Volunteer: Washington Conservation District



● Sampling site  
Contours in meters

## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	11	11.5	12.13	1.38	12	26		1.4	2	2
5/14	13.8	13.6	8.6	8.62	14	47		1.2	2	4
6/10	16.7	15.4	9.76	0.09	15	85		0.9	2	4
7/7	24.5	23.3	7.79	0.31	41	152		0.8	3	4
9/2	18.2		8.48		110	197		0.2	3	4

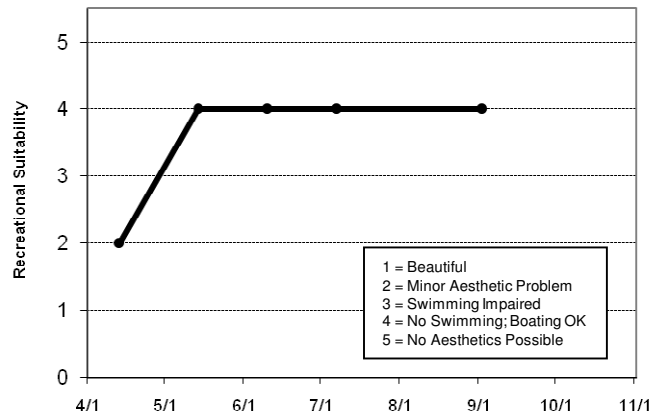
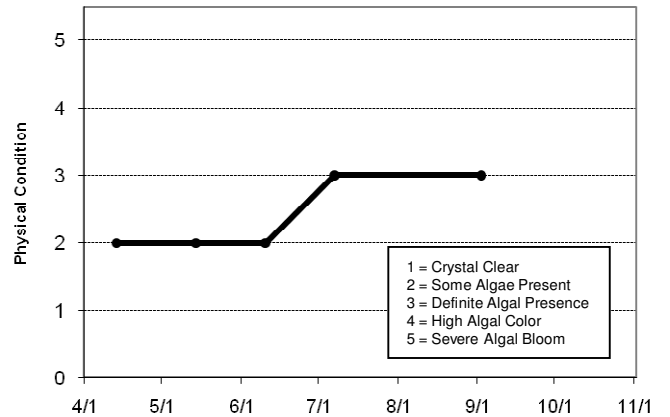
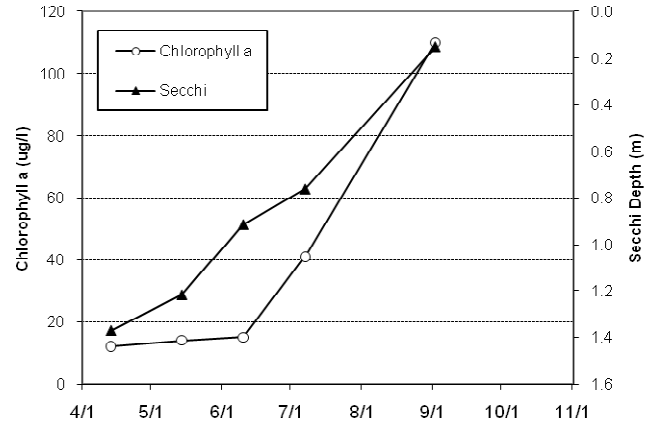
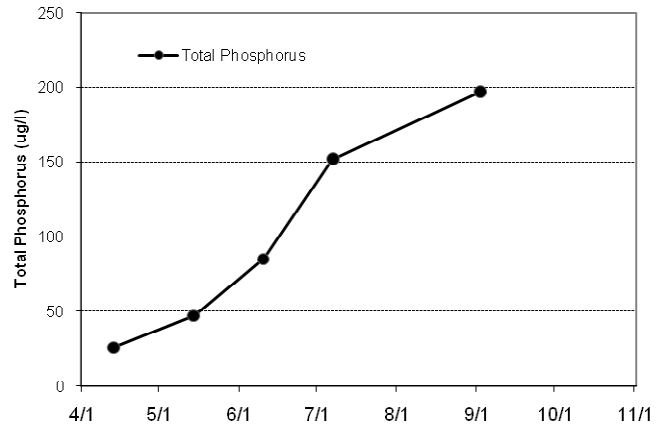
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			F	F	C	
Chlorophyll a			F	F	B	
Secchi Depth			F	F	C	
Lake Grade			F	F	C	NA

Source: Metropolitan Council and STORET data



### **Karth Lake (62-0072) Rice Creek Watershed District**

Karth Lake is located in the City of Arden Hills. There is little physical information available for this lake. A search in STORET showed that the lake was monitored for a variety of parameters on three different dates. Monitoring occurred on one day in July in each of the following years: 1988, 1990, and 1991.

This was the third year that Karth Lake was monitored in the CAMP. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

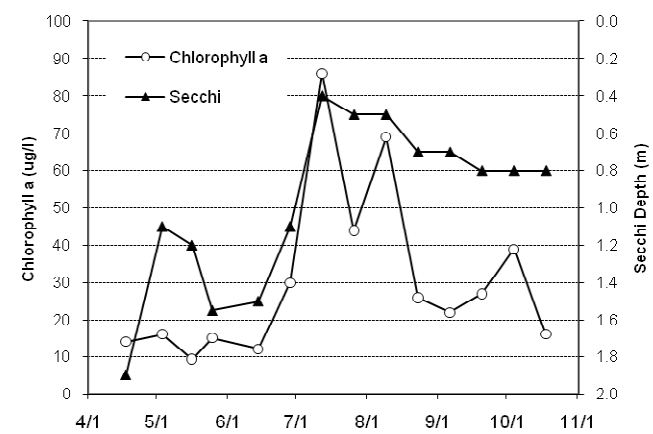
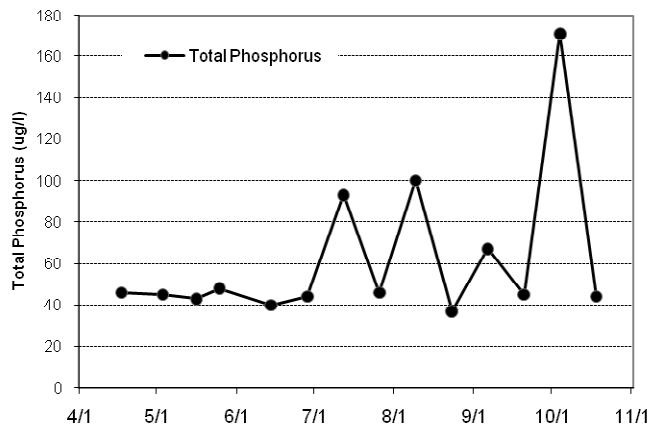
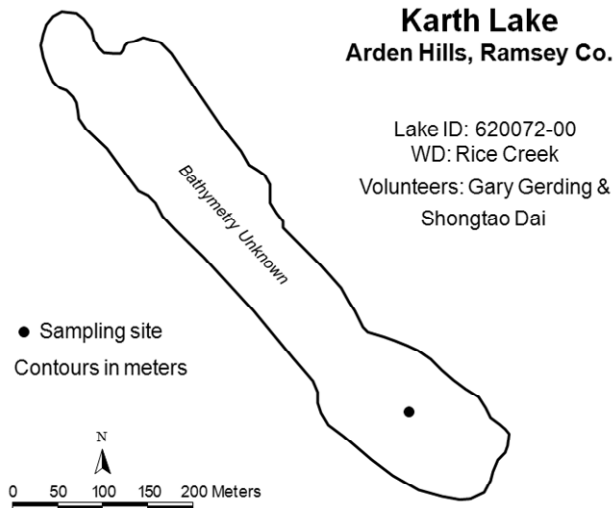
#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	55.3	37.0	100.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	32.4	9.3	86.0	C
<b>Secchi</b> (m)	0.9	0.4	1.6	D
<b>TKN</b> (mg/l)	1.56	1.30	2.20	
			<b>Lake Grade</b>	C

The lake received a lake grade of C for 2009. Further monitoring is suggested to develop a water quality database.

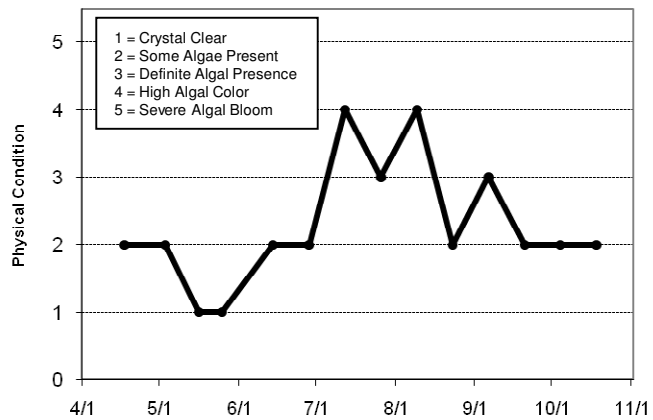
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



#### 2009 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
4/17	13.8				14	46		1.9	2	1
5/3	13.6				16	45		1.1	2	2
5/16	15.9				9.3	43		1.2	1	1
5/25	20.6				15	48		1.6	1	1
6/14	21.4				12	40		1.5	2	4
6/28	25				30	44		1.1	2	4
7/12	24				86	93		0.4	4	4
7/26	22.5				44	46		0.5	3	4
8/9	23.9				69	100		0.5	4	4
8/23	22.1				26	37		0.7	2	4
9/6	22.8				22	67		0.7	3	4
9/20	23.1				27	45		0.8	2	4
10/4	14				39	171		0.8	2	4
10/18	9				16	44		0.8	2	4

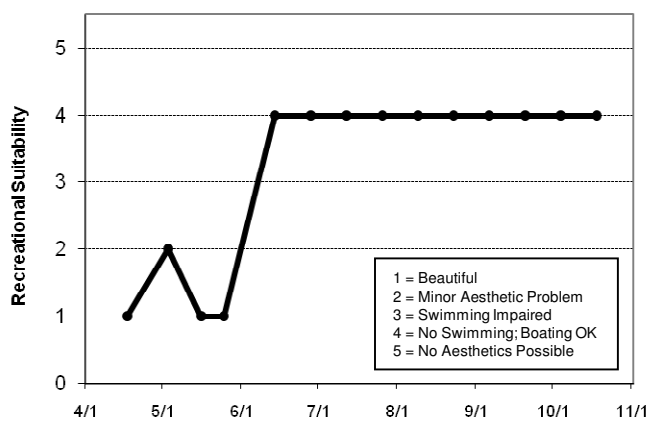


#### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus				C	C	C
Chlorophyll a				C	C	C
Secchi Depth				D	C	D
<b>Lake Grade</b>				<b>C</b>	<b>C</b>	<b>C</b>



Source: Metropolitan Council and STORET data

### **Keller Lake [Burnsville] (19-0025) Black Dog Watershed Management Commission**

Keller Lake is located in the cities of Apple Valley and Burnsville (Dakota County). The surface area of the lake is 55 acres. It has a maximum depth of 3.0 m (10 feet) and a mean depth of 1.1 m (3.7 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	96.0	43.0	218.0	D
<b>CLA</b> (µg/l)	112.0	3.2	430.0	F
<b>Secchi</b> (m)	0.7	0.3	1.6	D
<b>TKN</b> (mg/l)	1.95	0.81	4.30	
			<b>Lake Grade</b>	D

The lake received a lake grade of D for 2009. There was a shift towards poorer water quality in 2009. The mean summer-time concentration of TP and CLA both increased compared to recent years. Notably, the lake received a CLA grade of F, which is the first such F since 1996. Water clarity also decreases in 2009, with a mean summer-time depth of just 0.7 m. Continued monitoring is suggested to determine if 2009 was an anomaly or a sign of shifting conditions in the lake or its watershed.

There were two monitoring events when the Secchi disk was visible on the lake bottom. The measurements from these events were excluded from the statistics given in the table above.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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 Internet information at <http://www.dnr.state.mn.us/lakefind/>.

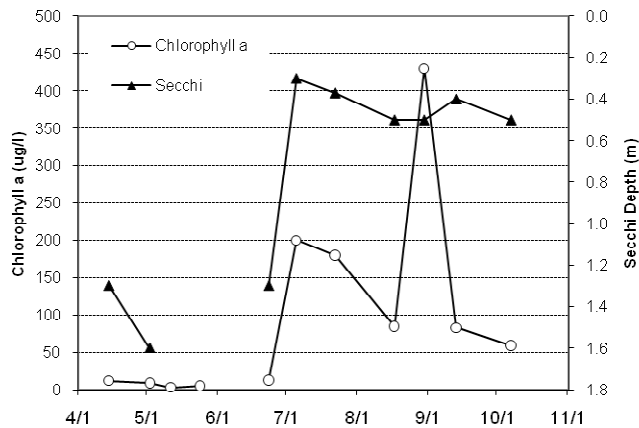
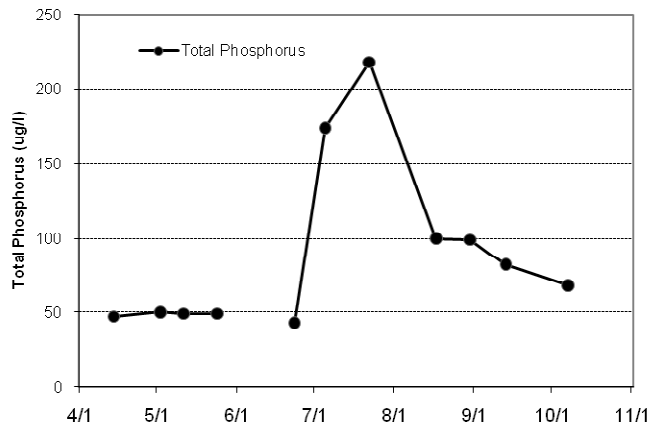
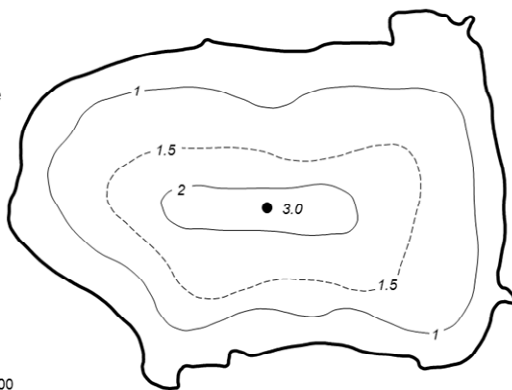
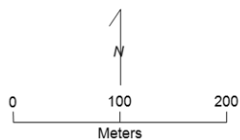
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Keller Lake Burnsville, Dakota Co.

Lake ID: 190025-00  
WMO: Black Dog  
Volunteer: Glenn Gramse

● Sampling site

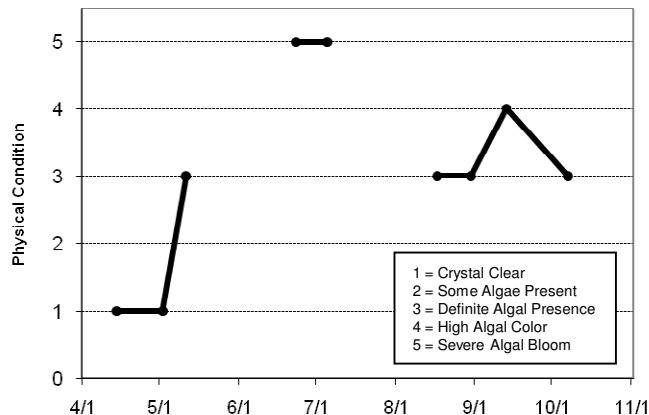
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	14.8				12	47		1.3	1	2
5/2	14.7				8.8	50		1.6	1	1
5/11	17.8				3.2	49		2.0+	3	4
5/24	22.4				4.9	49		1.8+		
6/23	28.8				13	43		1.3	5	5
7/5	25.5				200	174		0.3	5	5
7/22	26.7				180	218		0.4		3
8/17	26.5				85	100		0.5	3	4
8/30	22.7				430	99		0.5	3	4
9/13	27.7				83	82		0.4	4	5
10/7	12				59	68		0.5	3	4

+ Indicates the Secchi Disk was visible on the lake bottom

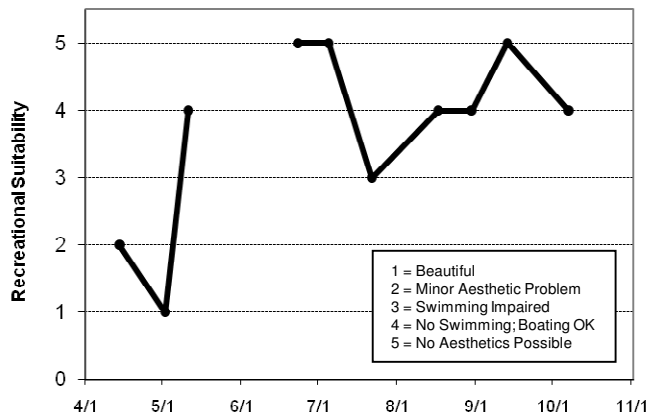


## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	D	D	C	D
Chlorophyll a	B	B	D	B	A	F
Secchi Depth	C	C	D	C	C	D*
Lake Grade	C	C	D	C	B	D



Source: Metropolitan Council and STORET data

## **Kingsley Lake (19-0030) Black Dog Watershed Management Commission**

Kingsley Lake is located in the northwestern corner of the City of Lakeville in Dakota County. The lake has a surface area of 44 acres, and a maximum depth of 4.0 m (13 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	16.3	10.0	23.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	5.8	1.3	36.0	A
<b>Secchi</b> (m)	Likely $\geq 3$	2.3	$\geq 3$	A*
<b>TKN</b> (mg/l)	0.62	0.54	0.73	
<b>Lake Grade</b>				A*

\* See discussion below.

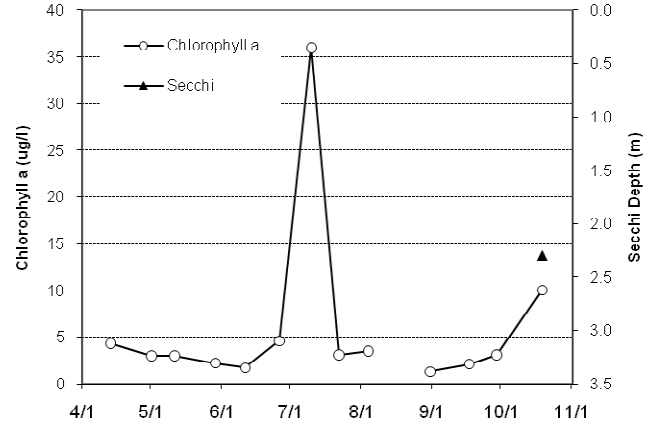
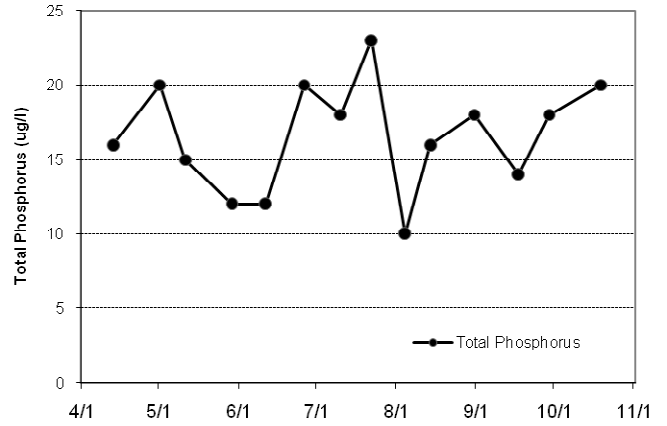
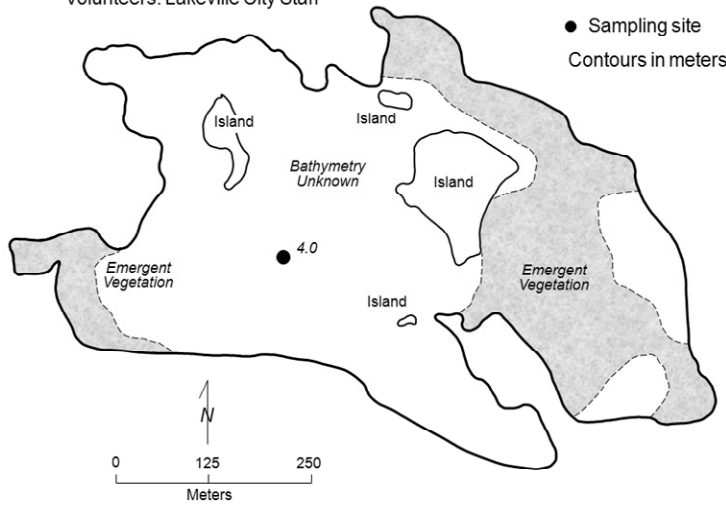
Similar to past years, the Secchi transparency in 2009 would have been greater except that during most monitoring events either the lake's excessive submergent macrophyte growth obscured the secchi disk, or the secchi was visible while resting on the lake bottom. According to the volunteer's judgement, the Secchi depths in these instances would have likely been in excess of 3 meters. Also, the other two water quality parameter received A grades. Therefore, giving a Secchi depth grade of A may be justified.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

Lake ID: 190030-00  
 WMO: Black Dog  
 Volunteers: Lakeville City Staff

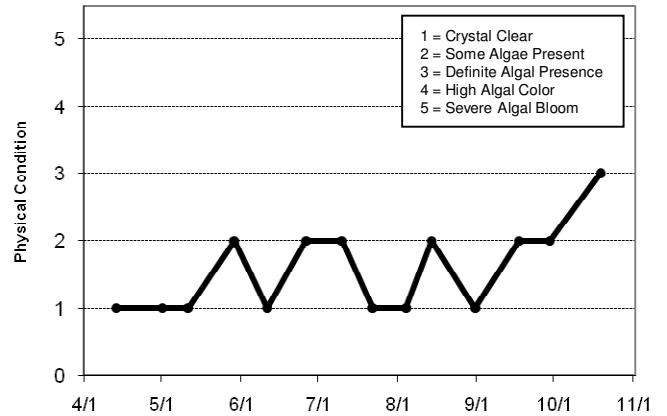
### Kingsley Lake Lakeville, Dakota Co.



#### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	10.9				4.3	16		2.6+	1	1
5/1	15				3	20		3.0+	1	1
5/11	16				3	15		2.8+	1	1
5/29	19.7				2.2	12		2.5+	2	1
6/11	17				1.7	12		3.0+	1	1
6/26	27.1				4.6	20		2.6+	2	1
7/10	25				36	18		3.0+	2	1
7/22	22.4				3.1	23		2.6+	1	1
8/4	23.4				3.5	10		2.5+	1	2
8/14	26					16		2.5+	2	1
8/31	21.4				1.3	18		2.7+	1	1
9/17	23				2.1	14		2.5+	2	1
9/29	16.6				3.1	18		2.3+	2	1
10/19	8.6				10	20		2.3	3	1

+ Indicates the Secchi Disk was visible on the lake bottom

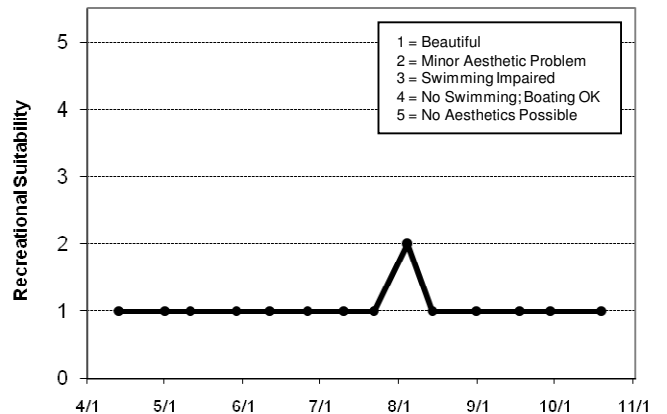


#### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	B	A	A	A
Chlorophyll a	A	A	A	A	A	A
Secchi Depth	B	B	B	B	B	A*
Lake Grade	A	A	B	A	A	A



Source: Metropolitan Council and STORET data

### **Kismet Lake (82-0333) Browns Creek Watershed District**

Kismet Lake is located in Washington County. This relatively small lake has a maximum depth of approximately 3.7 m (12 feet). Because of the shallowness of the lake the whole lake is considered littoral zone, which is the 0 – 15 feet depth zone dominated by aquatic vegetation. TSince the lake is relatively shallow, it does not maintain a thermocline which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	33.3	16.0	44.0	C
<b>CLA</b> (µg/l)	7.3	4.4	16.0	A
<b>Secchi</b> (m)	1.0	0.6	1.7	D
<b>TKN</b> (mg/l)	0.94	0.77	1.10	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009, which is similar to previous years’ lake grades. The 2009 CLA grade of A showed a marked decrease in mean summer-time CLA concentration, in comparison to last year’s D CLA grade. However the Secchi grade decrease to a D, which is the worst grade received according to the lake’s historical database. The incongruency between the CLA grade (A) and the Secchi depth grade (D) points to another factor (or set of factors) besides algal abundance that may be likely influencing water clarity in this lake. For example, the reduced water clarity may be caused by suspended sediment delivered to the lake via its watershed, or resuspension of lake sediment via mixing events.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

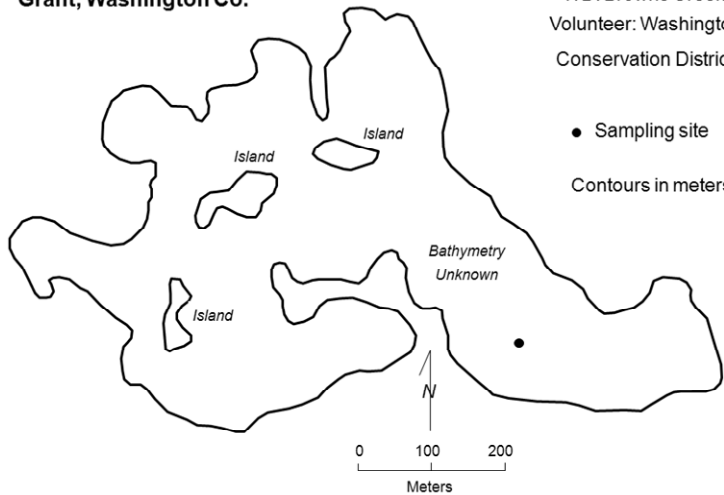
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).



**Kismet Lake**  
Grant, Washington Co.

Lake ID: 820334-00  
WD: Browns Creek  
Volunteer: Washington  
Conservation District



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	13	9.7	10.95	3.9	9	28		1.4	2	1
4/27	12	11.1	9.96	1.54	11	32		1.4	2	2
5/12	15.3	13.3	10.57	0.41	4.4	38		1.7	2	3
5/27	18	15.9	8.48	0.11	5	16		1.5	2	4
6/10	15.8	14.4	7.49	0.16	5.1	44		0.9	2	4
6/24	26.6	20.7	4.28	0.09	5.9	41		1.1	2	3
7/7	24.5	17.8	8.05	0.13	4.5	33		0.9	2	4
7/23	22.2	18.4	9.93	0.19	6.7	28		1.1	2	2
8/3	25.7	19.8	9.32	0.26	6.8	34		0.8	2	4
8/18	21.9	21.7	5.28	2.37	12	40		0.6	2	4
9/2	18.7	17.9	7.98	0.09	9.1	40		0.9	2	4
9/15	22	20.6	7.58	0.39	16	34		0.8	2	4
9/30	11.7	11.7	8.18	7.44	5.2	18		0.6	2	3
10/13	6.5	5.4	11.25	8.99	5.5	12		0.9	2	2

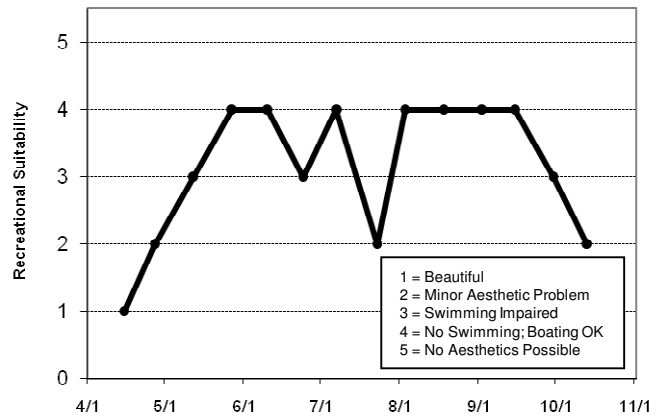
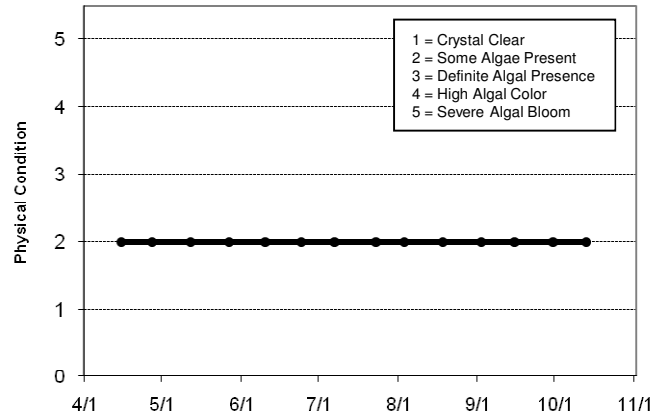
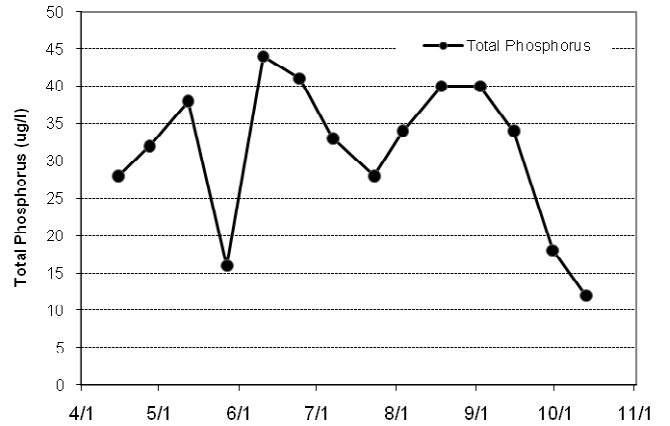
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	C	C	C	C	C
Chlorophyll a	A	B	C	C	D	A
Secchi Depth	B	C	C	C	C	D
<b>Lake Grade</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## **Klawitter Pond (82-0368) Valley Branch Watershed District**

Klawitter Pond is a 4.5-acre lake located within the City of Lake Elmo (Washington County). Because of the shallowness of the lake, it is considered entirely littoral, which is the 0-15 feet depth zone dominated by aquatic vegetation. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column. The lake's surface area and watershed area of 168 acres translate to a 37:1 watershed-to-lake area ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	149.9	110.0	200.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	61.7	20.0	180.0	D
<b>Secchi</b> (m)	0.4	0.2	0.8	F
<b>TKN</b> (mg/l)	3.24	1.90	4.60	
<b>Lake Grade</b>				D

The lake received a lake grade of D for 2009, which is similar to previous years' lake grades. Based on the limited water quality database for the lake, it appears to be represented by a lake grade of D. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

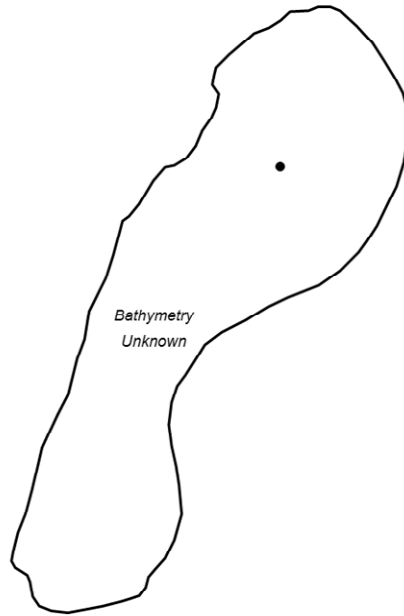
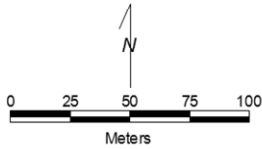
# Klawitter Pond

Lake Elmo, Washington Co.

Lake ID: 820368-00  
 WD: Valley Branch

Volunteers: Bonnie Juran &  
 Pat Barrett

● Sampling site  
 Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/16	15				34	112		0.8	2	2
5/3	15.6				20	124		0.8	2	2
5/17	18.4				31	110		0.6	3	2
5/31	22.3				39	118		0.6	3	2
6/13	21.2				33	137		0.6	3	2
6/26	29.4				24	123		0.6	4	3
7/8	25				26	125		0.5	3	3
7/22	22.7				61	200		0.3	4	4
8/5	25.9				82	183		0.4	4	4
8/23	21.9				150	197		0.3	4	4
9/7	22.3				33	164		0.2	4	5
9/18	23.5				180	168		0.2	4	4
10/7	10.8				180	185		0.2	4	4
10/18	7.8				180	160		0.2	4	4

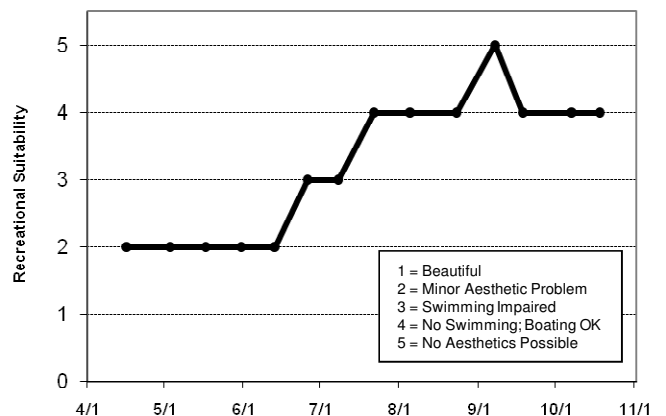
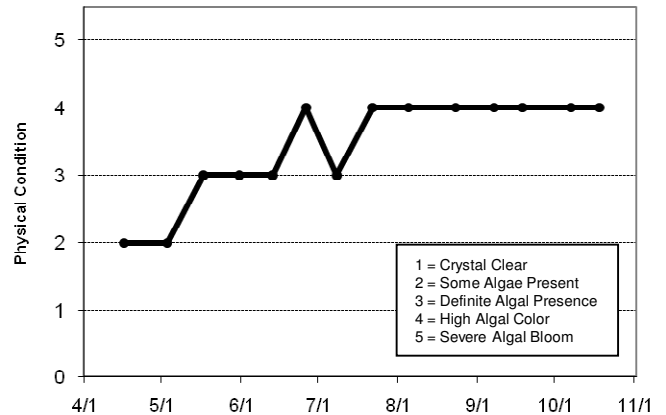
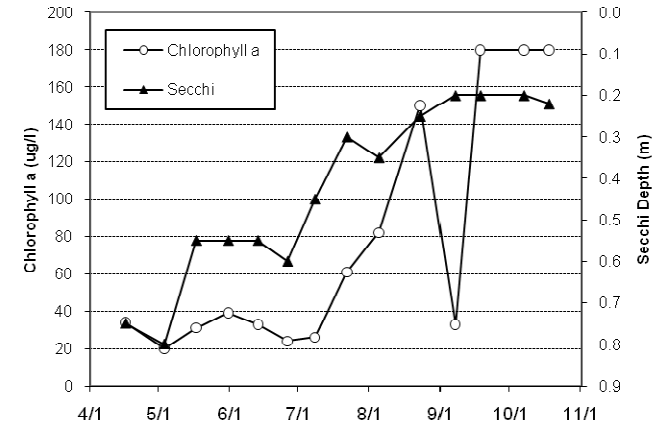
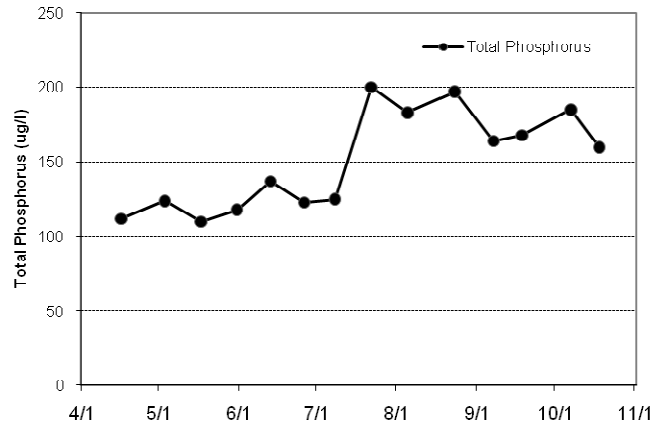
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus											D	D
Chlorophyll a											B	C
Secchi Depth											D	F
<b>Lake Grade</b>											<b>C</b>	<b>D</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	D	D	D	D
Chlorophyll a	C	C	C	C	C	D
Secchi Depth	D	D	F	F	F	F
<b>Lake Grade</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



### **Kramer Pond (82-0117) Valley Branch Watershed District**

Kramer Pond is located within the City of Lake Elmo (Washington County). Little morphological information is available for the lake. The maximum depth at the sampling point is 1.8 m (6.0 feet). Because of the shallowness of the lake, the entire surface area is considered littoral zone, which is the 0-15 feet depth zone dominated by aquatic vegetation. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	696.0	600.0	807.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	265.5	7.5	740.0	F
<b>Secchi</b> (m)	0.4	0.2	0.8	F
<b>TKN</b> (mg/l)	7.54	6.40	8.40	
<b>Lake Grade</b>				F

The lake received a lake grade of F for 2009, which is similar to last year's grade. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Kramer Pond Lake Elmo, Washington Co.

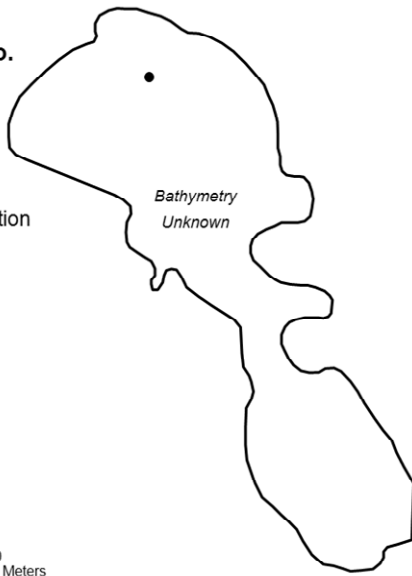
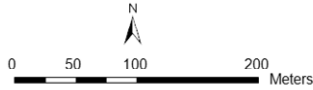
Lake ID: 820117-00

WD: Valley Branch

Volunteer: Washington Conservation District

● Sampling site

Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	10.7		13.06		220	533		0.3	4	4
6/3	18.5		4.76		7.5	681		0.8	2	4
6/16	22.1		8.57		140	742		0.8	3	4
7/15	21		6.09		740	807		0.3	3	4
8/11	24.5		5.19		80	600		0.2	3	4
9/9	21.7		10.14		360	650		0.2	3	4
10/7	8.5		12.43		600	614		0.1	4	4

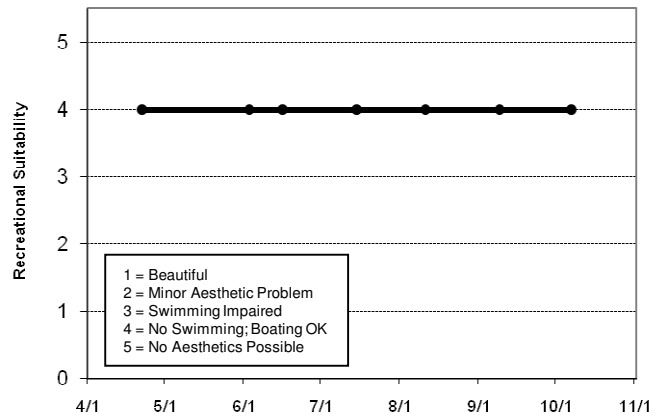
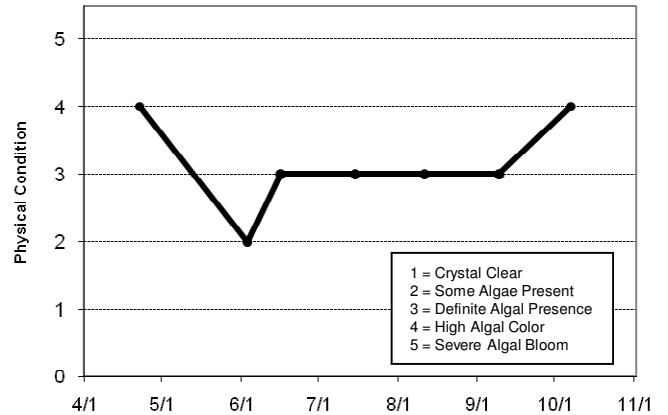
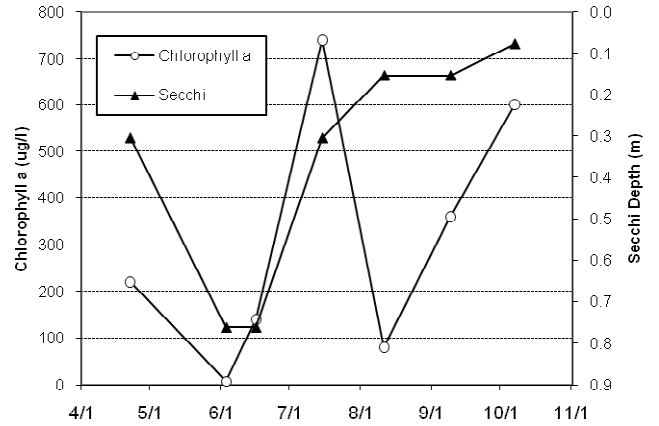
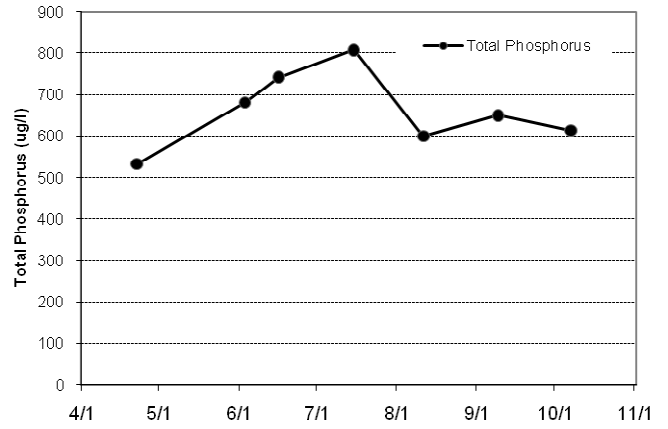
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
Lake Grade												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					F	F
Chlorophyll <i>a</i>					F	F
Secchi Depth					F	F
Lake Grade					F	F

Source: Metropolitan Council and STORET data



## La Lake (82-0097) City of Woodbury

La Lake is located in the City of Woodbury (Washington County). The lake has a surface area of approximately 35 acres and a maximum depth of 3.5 m (11 feet). Because of the shallowness of the lake, it is considered littoral zone, which is the 0-15 feet depth zone of the lake dominated by aquatic vegetation. Furthermore, the lake does not maintain a thermocline which is a density gradient caused by changing water temperatures throughout the lake's water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	124.3	50.0	212.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	34.0	1.5	83.0	C
<b>Secchi</b> (m)	1.7	0.8	$\geq 3$	C*
<b>TKN</b> (mg/l)	1.63	0.90	2.60	
<b>Lake Grade</b>				C

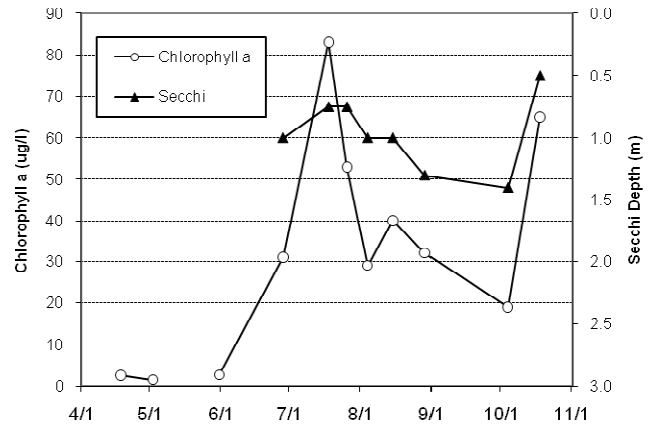
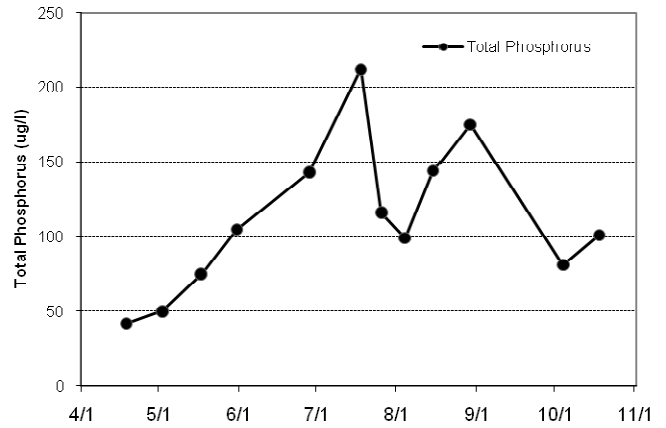
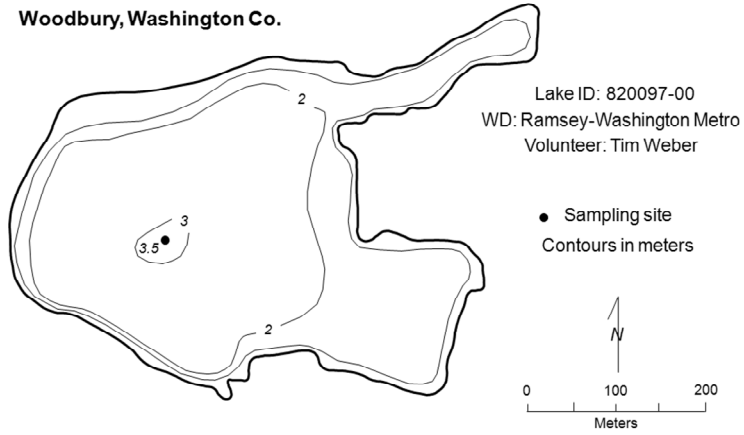
\* See discussion below.

The lake received a lake grade of C for 2009, which is consistent with its historical database. Water quality for the lake has experienced annual variability as indicated by its water quality database. The lake's water quality seems to be represented by lake grades of C or B. Note that the Secchi depth measurements made in April and May 2009 would have been greater except that during these monitoring events the Secchi disk was visible while resting on the lake bottom. The Secchi grade was calculated by assuming that the May measurements were equal to 3.0 meters.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

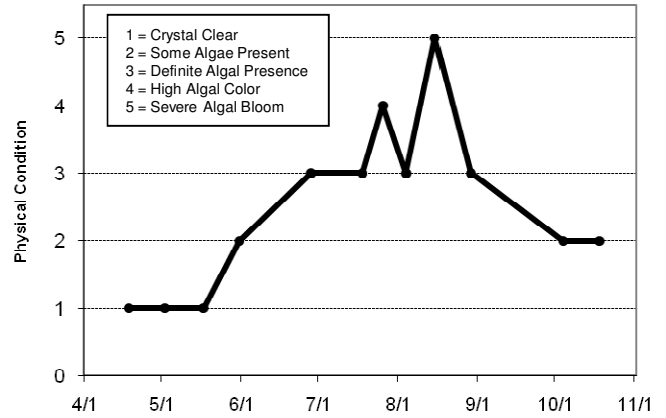
# La Lake Woodbury, Washington Co.



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/18	16.4				2.5	42		3.0+	1	1
5/2	14.5				1.5	50		3.0+	1	1
5/17	18.2					75		3.0+	1	1
5/31	22.1				2.6	105		3.0+	2	2
6/28	24.7				31	143		1.0	3	3
7/18	24.6				83	212		0.8	3	4
7/26	25.4				53	116		0.8	4	4
8/4	25.7				29	99		1.0	3	4
8/15	25.7				40	144		1.0	5	4
8/29	20.9				32	175		1.3	3	4
10/4	1.6				19	81		1.4	2	2
10/18	8.2				65	101		0.5	2	2

+ Indicates the Secchi Disk was visible on the lake bottom



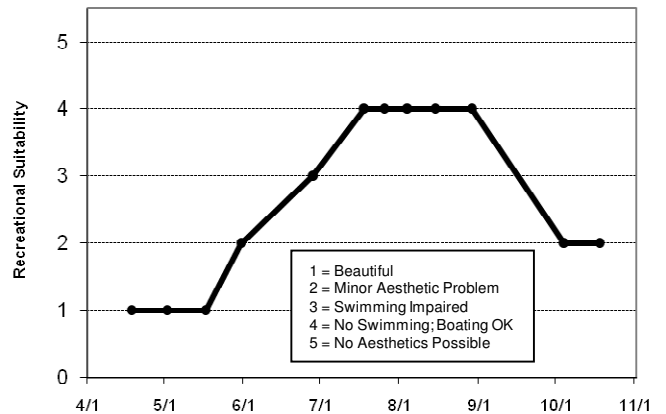
### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	D	D	D	D	D
Chlorophyll a	B	C	D	B	C	C
Secchi Depth	C	C	D	C	C*	C
Lake Grade	C	C	D	C	C	C

Source: Metropolitan Council and STORET data



## Lac Lavon Lake (19-0446) Black Dog Watershed Management Commission

Lac Lavon is located within the City of Apple Valley (Dakota County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007). The lake is an abandoned gravel pit maintained by groundwater (MDNR 1996). The lake has been designated by the Minnesota DNR as being infested with the aquatic plants Eurasian Water Milfoil (*Myriophyllum spicatum*) and Brittle Naiad (*Najas minor*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	12.6	8.0	20.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	4.0	1.5	6.9	A
<b>Secchi</b> (m)	3.8	2.1	5.1	A
<b>TKN</b> (mg/l)	0.77	0.48	1.40	
<b>Lake Grade</b>				A

The lake received a lake grade of A for 2009, which is a return to better water quality in comparison to last year's B lake grade. The lake appears to be well represented by a lake grade of A on the basis of its historical database.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

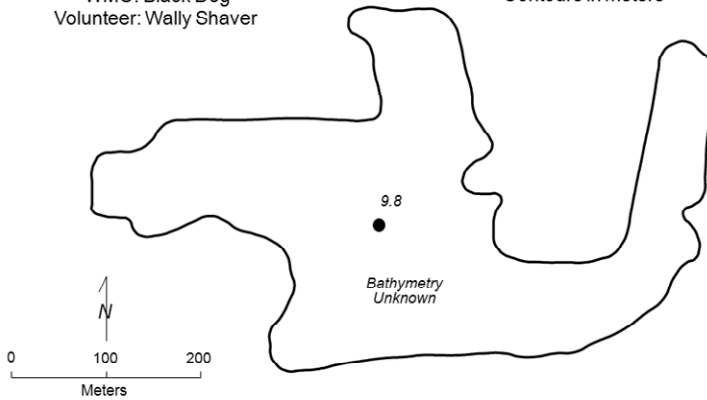


# Lac Lavon

Apple Valley/Burnsville, Dakota Co.

Lake ID: 190446-00  
 WMO: Black Dog  
 Volunteer: Wally Shaver

● Sampling site  
 Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	12.8				10	24		2.0	1	1
5/4	16.1				5.5	17		2.1	1	1
5/22	18.9				1.5	13		5.1	1	1
5/31	20.4				6.9	17		3.2	1	1
6/14	22.4				2.6	13		4.1	1	1
6/28	24.6				2.6	13		4.4	1	1
7/15	24.1				2.8	8		4.1	1	1
7/26	24.1				3.2	8		4.4	1	1
8/10	25.5				3.3	9		4.2	1	1
8/23	23.6				5.2	20		3.0	1	1
9/4	22.1				5.5	10		3.2	1	1
9/18	23.2				4.6	11		4.3	1	1
10/4	15.1				11	18		2.0	1	1
10/18	9.8				13	23		2.2	1	1

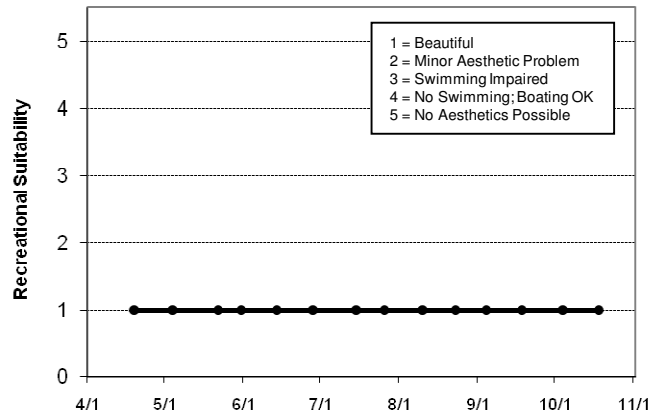
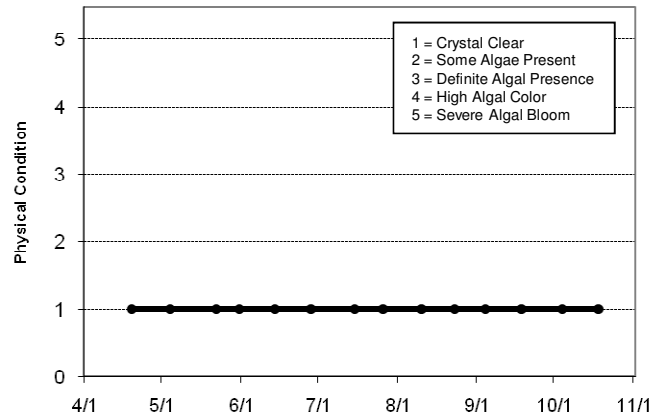
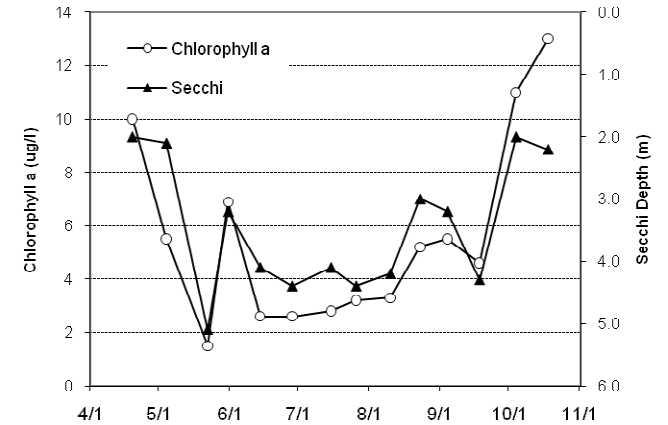
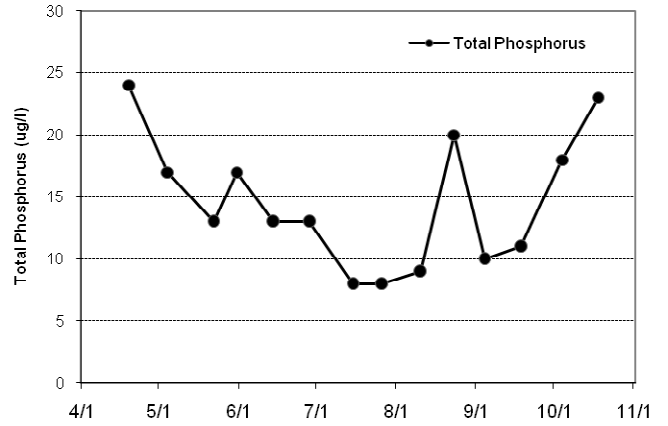
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth										A	A	A
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus						A	A	A	A	B	A	A
Chlorophyll a						A	A	A	A	A	A	A
Secchi Depth						A	A	A	A	A	A	A
<b>Lake Grade</b>						A	A	A	A	A	A	A

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	A	A	C	A
Chlorophyll a	A	A	A	A	A	A
Secchi Depth	A	A	A	A	A	A
<b>Lake Grade</b>	A	A	A	A	B	A

Source: Metropolitan Council and STORET data



## Langton Lake [north basin, site-1] (62-0049-01) Rice Creek Watershed District

Langton Lake is divided into two basins. This report discusses the monitoring results for Site 1. The entire 30-acre lake is located within the City of Roseville (Ramsey County). The maximum depth of the lake is 1.5 m (4.9 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	50.4	26.0	105.0	C
<b>CLA</b> (µg/l)	6.1	2.7	13.0	A
<b>Secchi</b> (m)	1.0	0.5	1.2	D
<b>TKN</b> (mg/l)	1.16	1.00	1.50	
			<i>Lake Grade</i>	C

The basin received a lake grade of C for 2008, which is similar to past years of lake grades. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

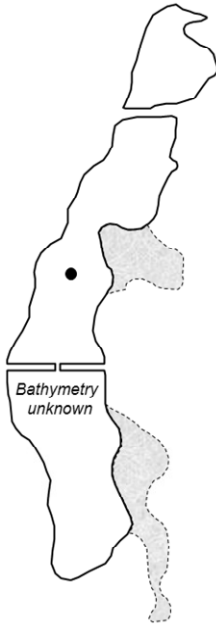
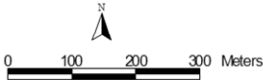
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Langton Lake, Site 1

## Roseville, Ramsey Co.

Lake ID: 620049-01  
 WD: Rice Creek  
 Volunteers: Tam & Dick McGehee

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	19.1				6.1	105		1.0	2	
5/16	18.5				5.1	44		1.2	3	
5/31	23.6				2.7	48		1.0	2	
6/14	26.3				5.5	56		1.0	3	
6/28	26.9				7.8	59		1.0		
7/6	25.2				5.6	34				
7/12	26.1				13	46		1.0		
7/26	26.9				11	62		1.0		
8/23	24.3				3.2	26		1.1		
9/6	22.9				3.3	41		1.1		
9/20	23.3				4.1	33		0.5		
10/4	10.7				3.8	20				
10/18	8.5				12	28				

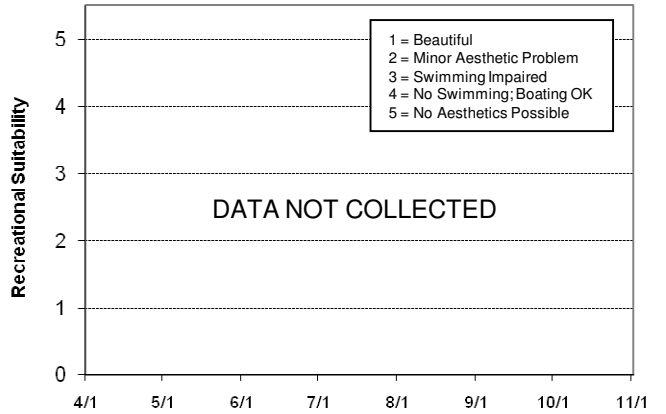
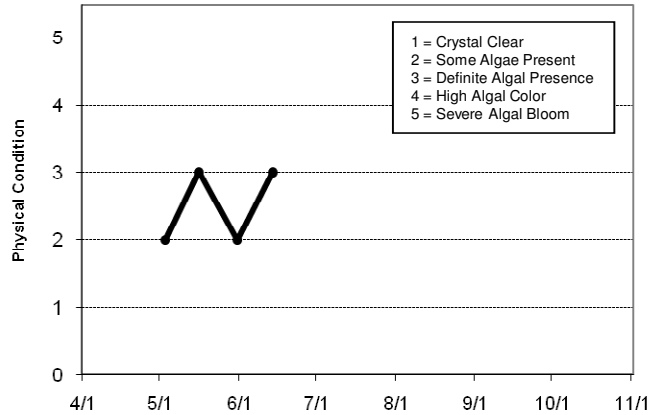
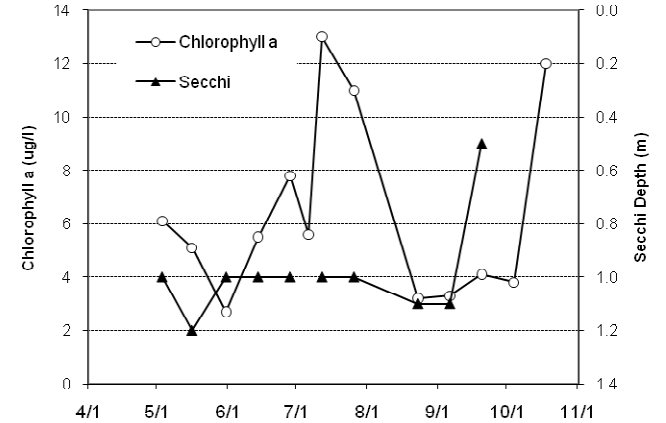
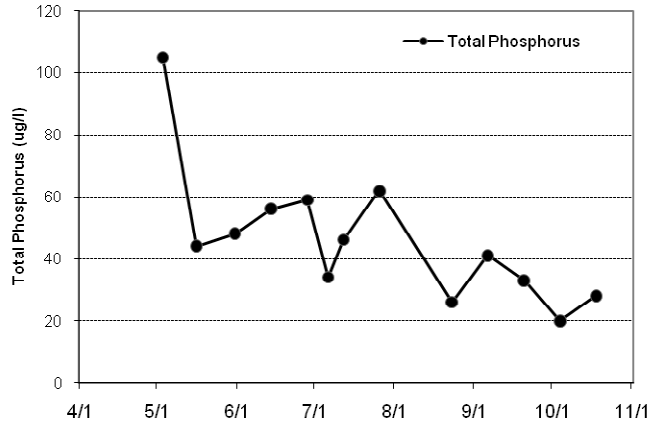
### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	C
Chlorophyll a	C	B	A	C	A	A
Secchi Depth	D	D	D	D	D	D
Lake Grade	C	C	C	C	C	C

Source: Metropolitan Council and STORET data



## Lee Lake (19-0029) City of Lakeville

Lee Lake is located in Lakeville (Dakota County). The lake has a surface area of 25 acres with a maximum depth of 5.2 m (17 ft). The lake is landlocked with no natural outlet.

An abundance of submerged aquatic vegetation (Curlyleaf pondweed) has been a continuing problem in the lake. Not only is it an aesthetic and recreational problem, but the decaying of plants in late-summer adds to concentrations of phosphorus in the water column.

Barley straw has been added to this lake in the past to study the potential inhibition of algal populations within the lake (McComas and Stuckert 2009a).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	18.8	12.0	28.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	4.3	1.0	8.9	A
<b>Secchi</b> (m)	3.6	1.7	5.1	A
<b>TKN</b> (mg/l)	0.72	0.56	1.10	
			<b>Lake Grade</b>	A

The lake received a lake grade of A for 2009, including A grades for each of the 3 water quality parameters. The year 2009 saw the best water quality in its historical water quality database.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) 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/>.

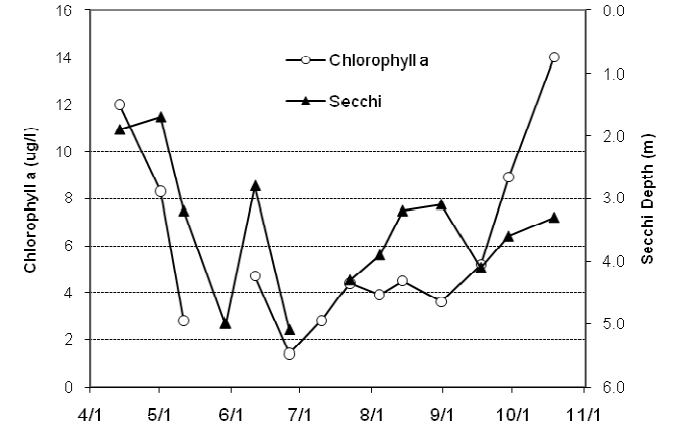
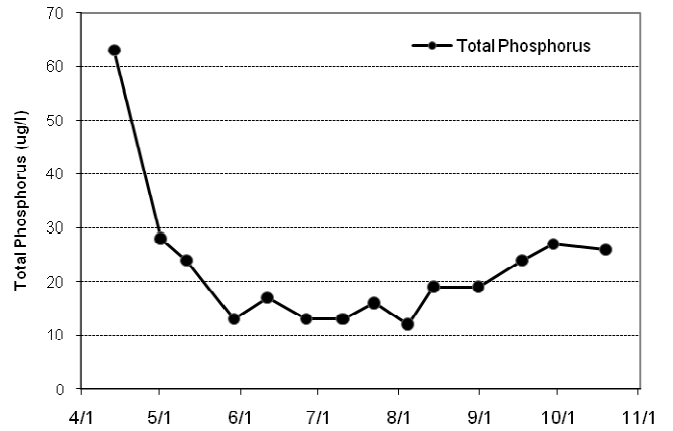
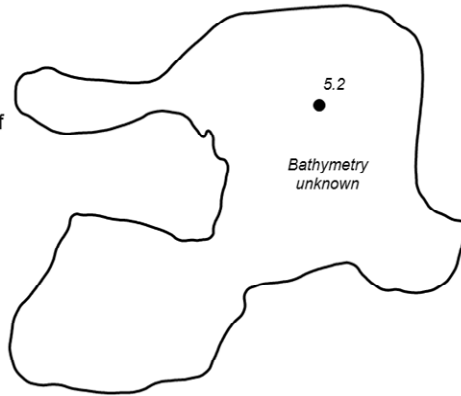
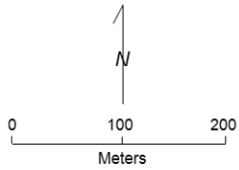
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Lee Lake Lakeville, Dakota Co.

Lake ID: 190029-00  
WMO: Black Dog

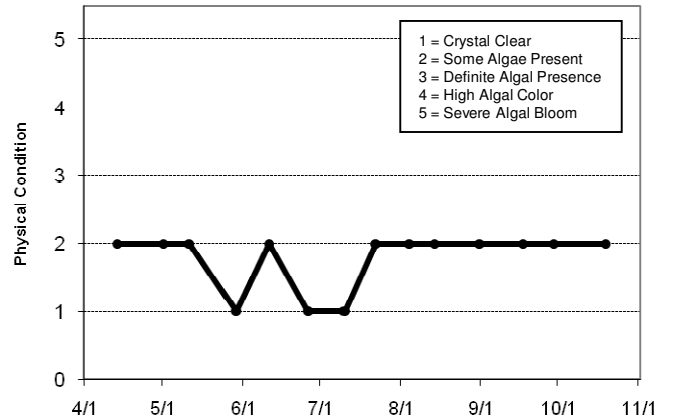
Volunteers: Lakeville City Staff

● Sampling site  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	11.4				12	63		1.9	2	1
5/1	14				8.3	28		1.7	2	2
5/11	16				2.8	24		3.2	2	1
5/29	20					13		5.0	1	1
6/11	18.9				4.7	17		2.8	2	2
6/26	27				1.4	13		5.1	1	1
7/10	25				2.8	13			1	1
7/22	23.5				4.4	16		4.3	2	1
8/4	24				3.9	12		3.9	2	1
8/14	28.5				4.5	19		3.2	2	1
8/31	23				3.6	19		3.1	2	1
9/17	24				5.2	24		4.1	2	1
9/29	18.7				8.9	27		3.6	2	1
10/19	7.9				14	26		3.3	2	1

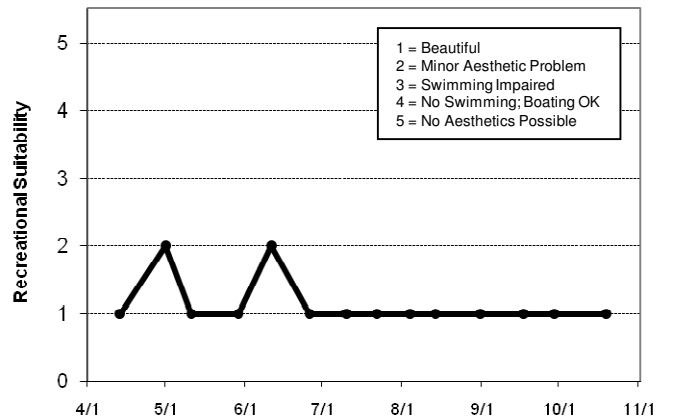


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	D	D	C	C	A
Chlorophyll a	C	B	B	C	B	A
Secchi Depth	D	C	C	C	C	A
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>A</b>



Source: Metropolitan Council and STORET data

## **Legion Pond (82-0462) Valley Branch Watershed District**

Legion Pond is located in the City of Lake Elmo (Washington County). The lake has a surface area of 16 acres. The watershed of the lake has an area of 224 acres, which results in a watershed-to-lake area ratio of 14:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2006 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	42.0	42.0	42.0	N/A
<b>CLA</b> (µg/l)	11.0	11.0	11.0	N/A
<b>Secchi</b> (m)	0.3	0.3	0.3	N/A
<b>TKN</b> (mg/l)	1.00	1.00	1.00	
			<b>Overall Grade</b>	N/A

There was an insufficient quantity of data to calculate grades for the lake in 2009. At least 5 monitoring events during the summer-time period (May – September) are needed. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Legion Pond

## Lake Elmo, Washington Co.

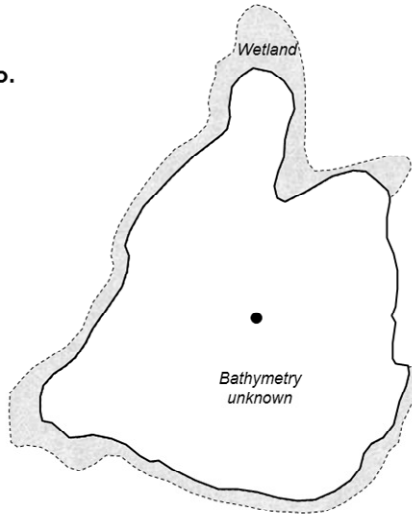
Lake ID: 820462-00

WD: Valley Branch

Volunteer: Washington

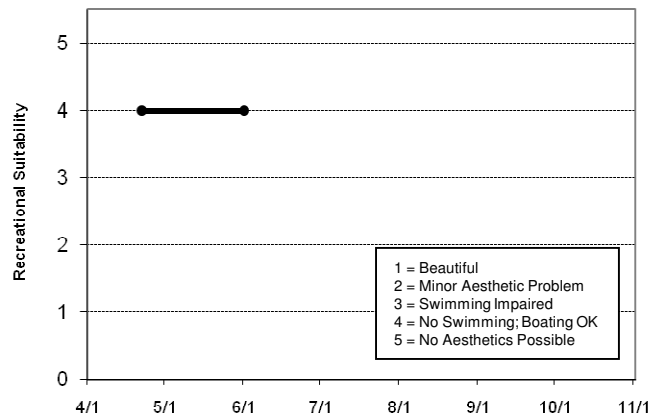
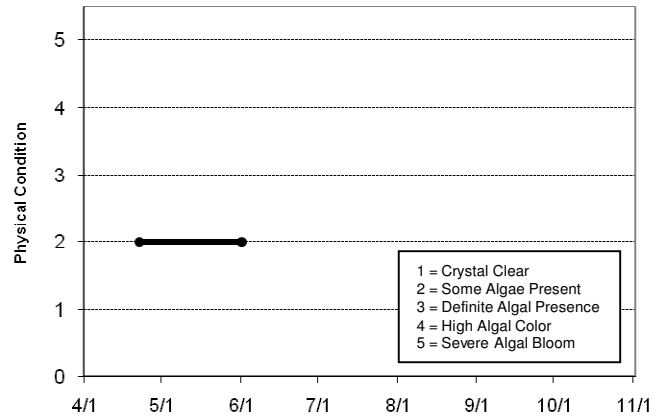
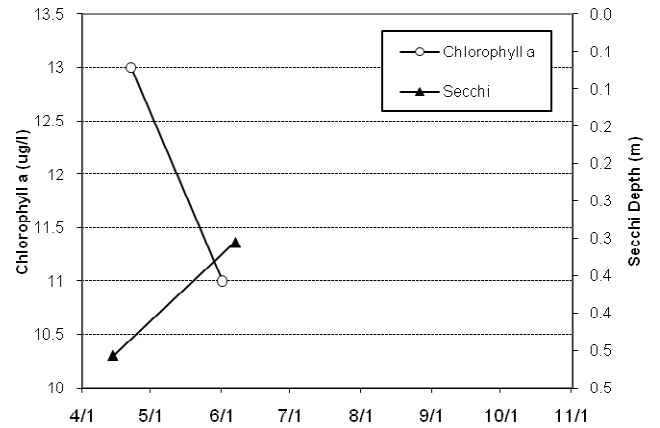
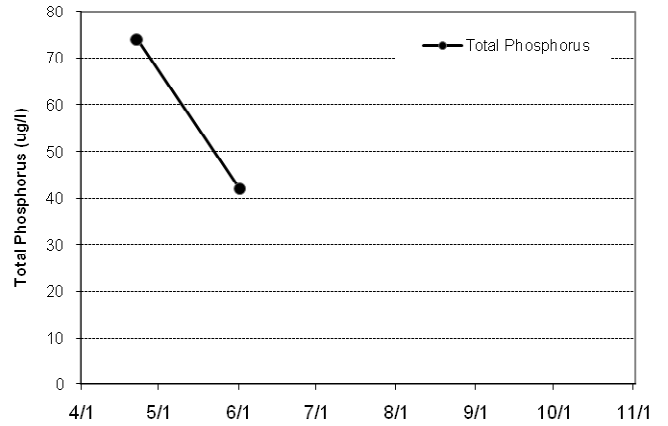
Conservation District

- Sampling site
- Contours in meters



### 2009 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
4/22	14.6		11.68		13	74		0.5	2	4
6/1	25.1		9.07		11	42		0.3	2	4



### 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												
Lake Grade												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D			F	
Chlorophyll a	C	C			D	
Secchi Depth	D	D			D	
Lake Grade	D	D			D	NA

Source: Metropolitan Council and STORET data

## **LeMay Lake (19-0082) Gun Club Lake Watershed Management Organization**

LeMay Lake is located in the City of Mendota Heights. It has a surface area of 34 acres and an average depth of 1.6 m (5.1 ft). The maximum depth is 4.0 m (13 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	50.6	34.0	66.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	9.8	4.2	21.0	A
<b>Secchi</b> (m)	1.4	0.8	2.9	C
<b>TKN</b> (mg/l)	1.38	1.00	1.90	
<b>Lake Grade</b>				<b>B</b>

The lake received a lake grade of B for 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

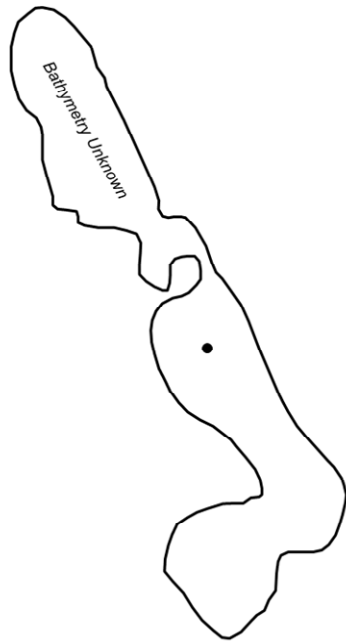
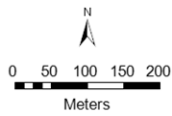
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



**LeMay Lake**  
Mendota Heights,  
Dakota Co.

Lake ID: 190082-00  
WMO: Gun Club Lake  
Volunteers: Mendota Heights  
City Staff

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/28	22.4				5.5	34		1.1	2	2
6/10	18.3				6.3	43		1.9	2	2
6/15	24.1				4.2	55		2.9	2	2
6/30	22.3				6.5	48		1.6	1	2
7/15	23.5				7	66		1.0	2	4
8/26	26.6				12	45		0.8	4	4
9/8	24.7				16	65		1.1	4	4
9/21	21				21	49		1.0	4	5
10/5	13.2				7	28		2.1	4	4

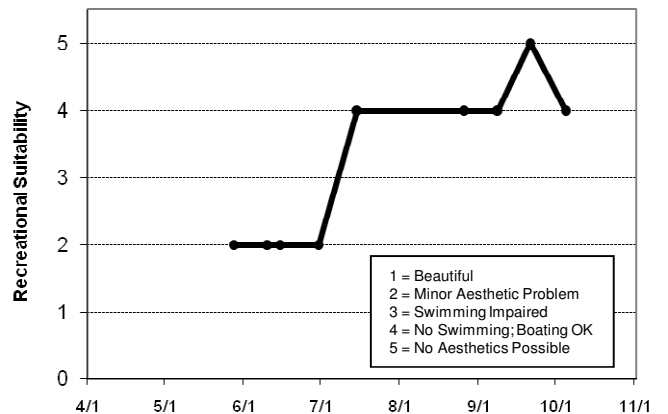
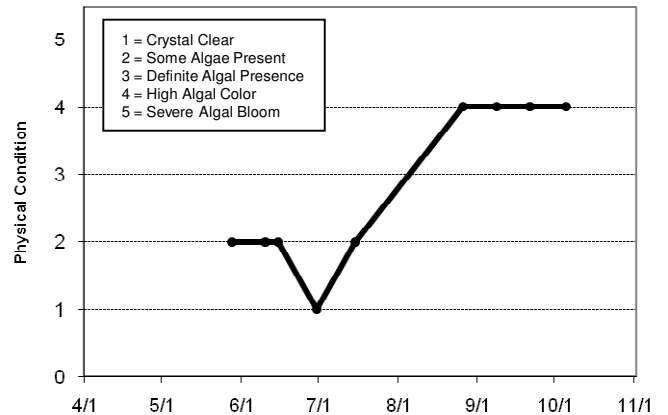
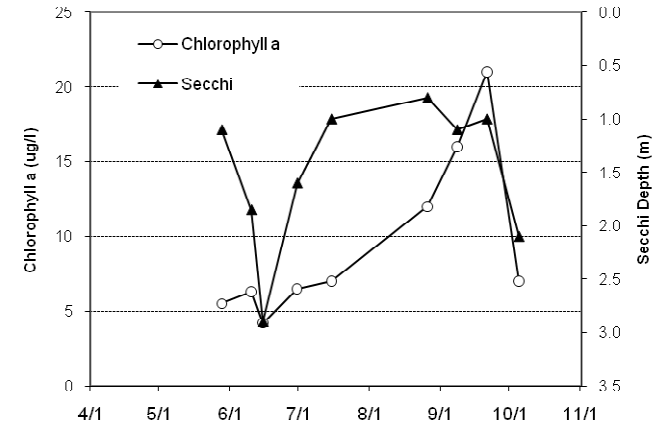
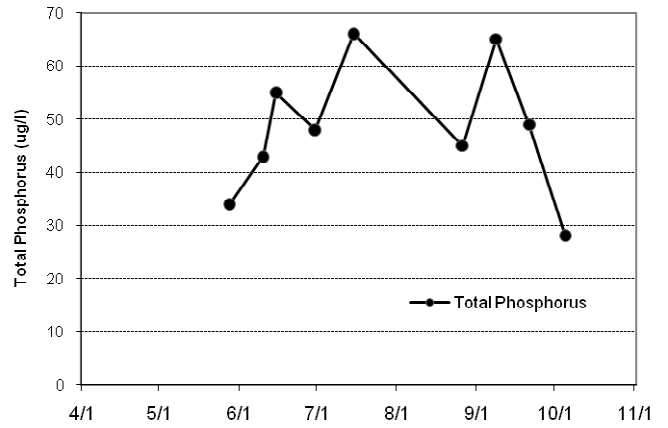
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth							F					
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus				C	B	C
Chlorophyll <i>a</i>				B	A	A
Secchi Depth				D	C	C
<b>Lake Grade</b>				C	B	B

Source: Metropolitan Council and STORET data



## Lily Lake (82-0023) City of Stillwater

Lily Lake is located in the City of Stillwater in Washington County. The lake has a surface area of 52 acres, and a maximum depth of 17.4 m (57 feet). It has public access located on the lake's northern shore, and a fishing pier on its southern shore.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	28.5	21.0	41.0	B
<b>CLA</b> ( $\mu\text{g/l}$ )	7.9	4.0	14.0	A
<b>Secchi</b> (m)	2.7	1.6	4.1	B
<b>TKN</b> (mg/l)	0.93	0.50	1.20	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009, which is the lake also received in 1995 and 2001. On the basis of the historical water quality database, the lake appears represented by a lake grade of C. However, there appears to be more variation in the historical CLA and Secchi depth grades.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

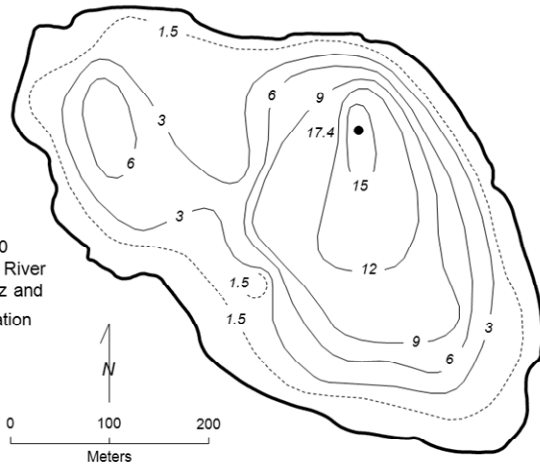
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Lily Lake Stillwater, Washington Co.

- Sampling site
- Contours in meters

Lake ID: 820023-00  
WMO: Middle St. Croix River  
Volunteers: Tom Koontz and  
Washington Conservation  
District



## 2009 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
4/13	9.4	3.9	14.52	2.88	30	50	608	1.5	2	3
5/3	13.8					27		2.1	2	2
5/11	15	4.1	9.14	0.03	6.7	41	428	2.6	3	3
5/31	19.4				4	21		4.1	2	2
6/10	17.7	4.2	8.59	0.05	4.3	28	346	3.7	2	2
7/1	21.5				7.6	24		2.1	3	2
7/6	23.4	4.4	8.62	0.05	5.1	32	409	3.2	2	3
8/4	23.4	4.5	8.52	0.05	7.8	29	544	2.7	2	3
8/9	25.8				14	23		1.6	3	3
8/30	22.6				6.1	26		2.2	2	2
8/31	21.3	4.8	5.55	0.03	9.4	33	735	3.2	2	3
9/29	17.5	4.8	5.93	0.03	14	29	627	2.1	2	2

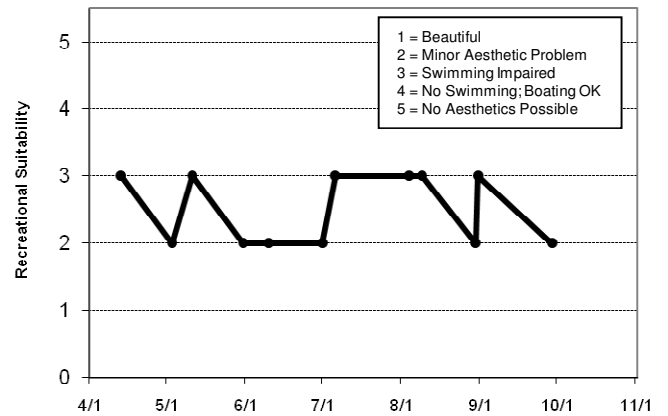
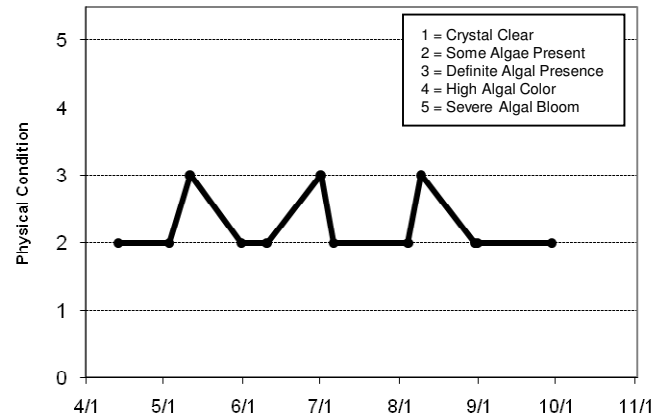
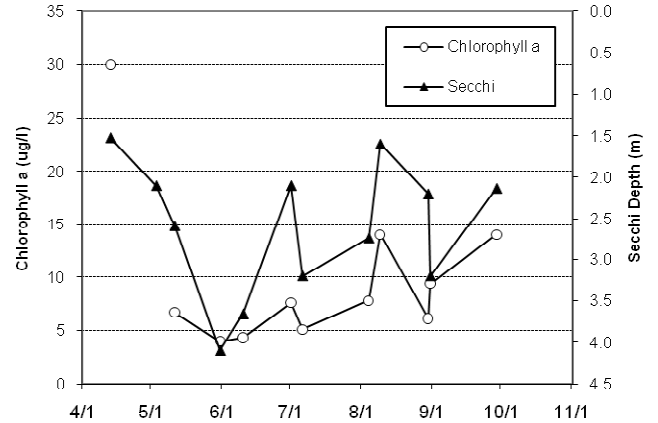
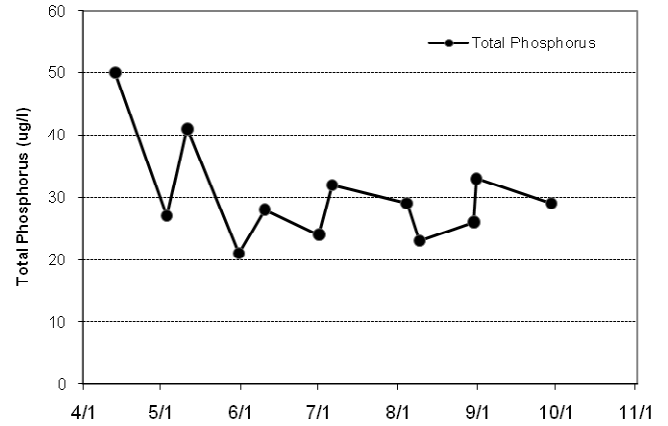
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus				C	C	C	C	C	C	C	C	C
Chlorophyll a				B	C	B	C	C	C	A	B	B
Secchi Depth		B		A	B	C	C	C	C	B	C	C
<b>Lake Grade</b>				<b>B</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	B
Chlorophyll a	B	B	C	C	C	A
Secchi Depth	C	C	C	C	C	B
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>

Source: Metropolitan Council and STORET data



### **Little Carnelian Lake (82-0014) Carnelian - Marine - St. Croix Watershed District**

Little Carnelian Lake is located in Stillwater Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007). The lake has a surface area of 162 acres.

On each sampling day the lake was monitored for secchi transparency and dissolved oxygen as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )				
<b>CLA</b> ( $\mu\text{g/l}$ )				
<b>Secchi</b> (m)	6.9	5.8	7.9	A
<b>TKN</b> (mg/l)				
			<i>Lake Grade</i>	

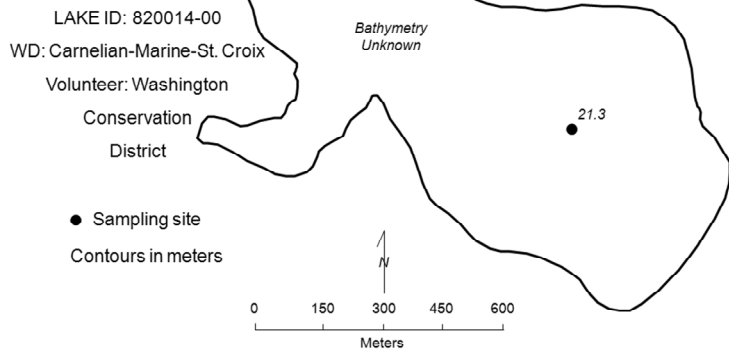
Similar to all past years of CAMP monitoring, the lake received a water clarity grade of A. TP and CLA were not monitored in 2008 so a lake grade cannot be determined. The historical water quality database indicates that the lake's water quality is well represented by a lake grade of A.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) 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](mailto:brian.johnson@metc.state.mn.us).

**Little Carnelian Lake**  
Stillwater Twp., Washington Co.



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°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	12.8	5.1	12.19	0.08				5.8	1	1
5/19	15.4	5.4	10.57	0.07				7.6	1	1
7/1	21	5.8	8.68	0.08				7.9	1	1
7/27	23.2	6.3	8.89	0.05				5.8	1	1
8/26	23.5	6.4	8.84	0.06				7.0	1	1
9/22	22.7	6.7	8.52	0.03				7.3	1	3
10/19	11.1	6.5	10.32	0.02				6.7	1	1

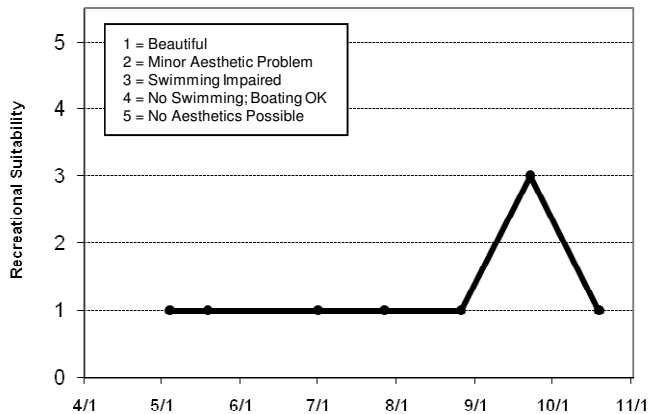
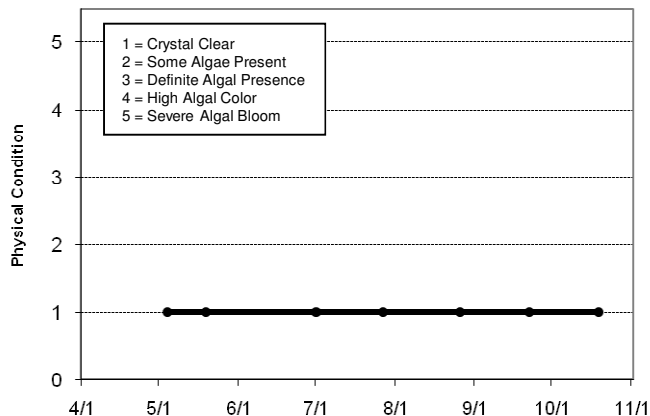
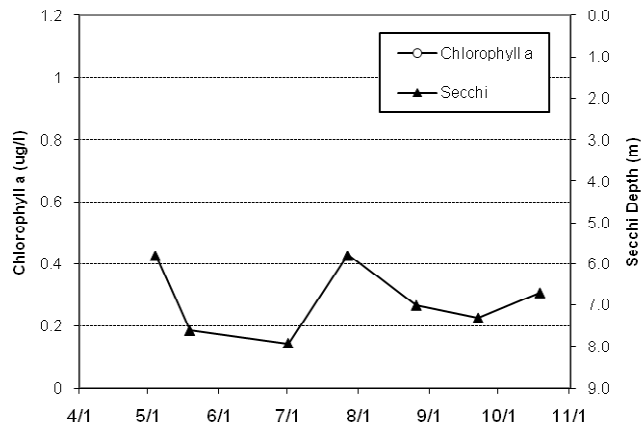
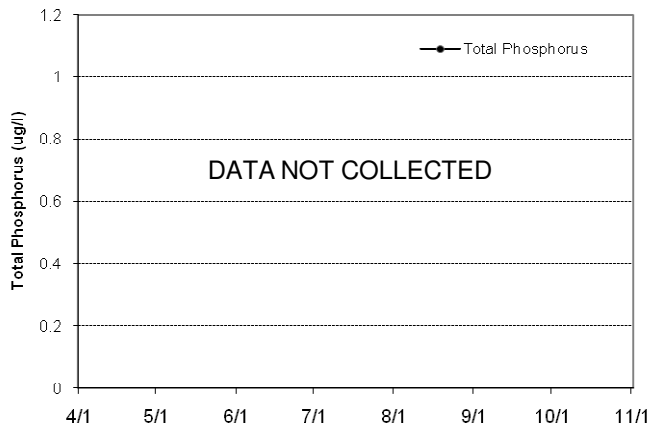
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												A
Chlorophyll a												A
Secchi Depth												A
<b>Lake Grade</b>												<b>A</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus	A				A	A			A	B	A	A
Chlorophyll a	A				A	A			A	A	A	A
Secchi Depth	A	A	A	A	A	A	A		A	A	A	A
<b>Lake Grade</b>	<b>A</b>				<b>A</b>	<b>A</b>			<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	A	A		
Chlorophyll a	A	A	A	A		
Secchi Depth	A	A	A	A	A	A
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>		

Source: Metropolitan Council and STORET data



### **Little Comfort Lake (13-0054) *Comfort Lake - Forest Lake Watershed District***

Little Comfort Lake is located near the City of Wyoming (Chisago County). The lake has a maximum depth of 17.0 m (56 feet).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	20.6	14.0	30.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	8.1	3.5	11.0	A
<b>Secchi</b> (m)	1.9	1.0	3.0	C
<b>TKN</b> (mg/l)	0.82	0.74	0.92	
<b>Lake Grade</b>				<b>B</b>

The lake received a lake grade of C for 2009. The TP grade of A was the best grade received for this parameter in the lake's water quality database.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) 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](mailto:brian.johnson@metc.state.mn.us).

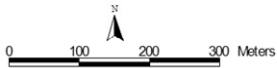
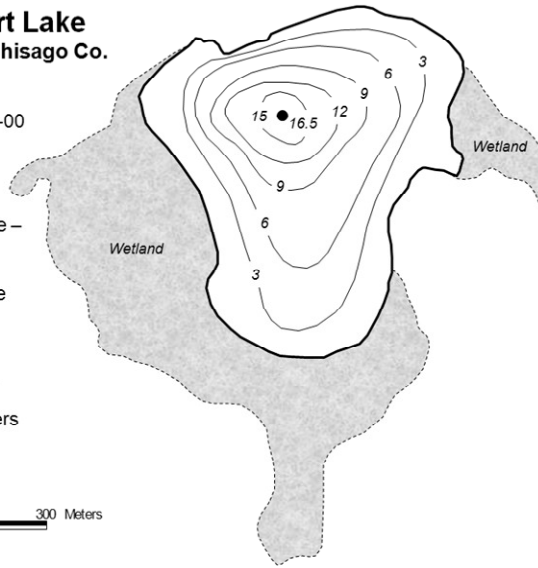
# Little Comfort Lake

City of Wyoming, Chisago Co.

LAKE ID: 130054-00

WD: Comfort Lake – Forest Lake  
Volunteer: Steve Schreiber

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/16	15.2				24	52		0.8	1	1
5/1	15.6				11	24		1.0	2	2
5/13	16				7.3	30		1.4	2	2
6/1	20.3				3.5	17		2.4	2	2
6/10	22.3				3.6	18		3.0	2	2
6/22	28.1				6.6	14		2.2	3	3
7/12					9.8	17		1.7	2	2
7/27					10	16		1.6	2	3
8/23					10	22		1.9	2	3
9/5	25.6				7.8	19		1.7	2	3
9/16	24				11	29		1.6	2	3
10/4	14.6				5.8	31		1.5	2	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												
<b>Lake Grade</b>												

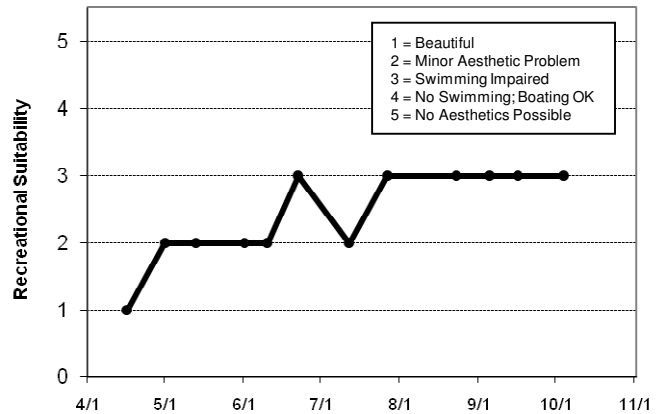
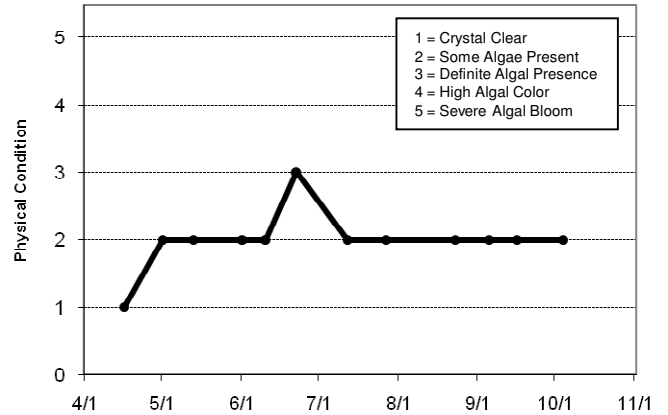
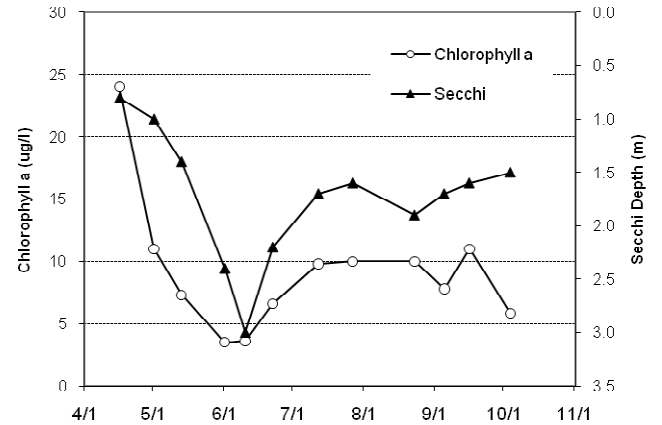
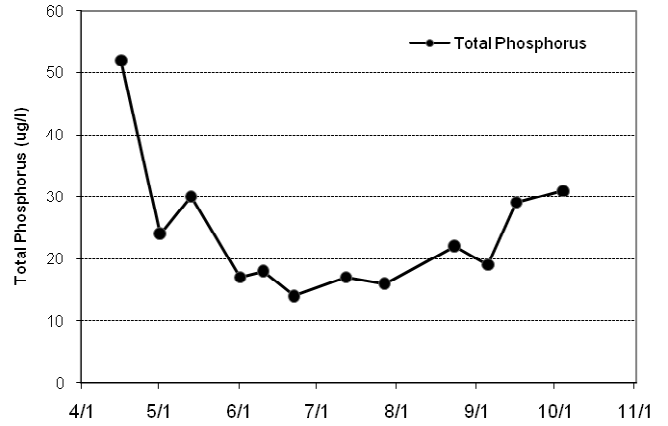
  

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a				C								
Secchi Depth				C								
<b>Lake Grade</b>				<b>C</b>								

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			D	C	C	A
Chlorophyll a			C	A	B	A
Secchi Depth			C	C	C	C
<b>Lake Grade</b>			<b>C</b>	<b>B</b>	<b>C</b>	<b>B</b>

Source: Metropolitan Council and STORET data



## Little Johanna Lake (62-0058) Rice Creek Watershed District

Little Johanna Lake is located on the boundary between the Cities of Arden Hills and Roseville (Ramsey County). The lake has a surface area of 18 acres and a maximum depth of 12.0 m (39 feet).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	50.2	18.0	97.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	18.7	1.7	52.0	B
<b>Secchi</b> (m)	1.5	0.7	2.8	C
<b>TKN</b> (mg/l)	1.14	0.65	1.70	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009, which is similar to the historical lake grades. The lake appears well represented by a lake grade of C. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

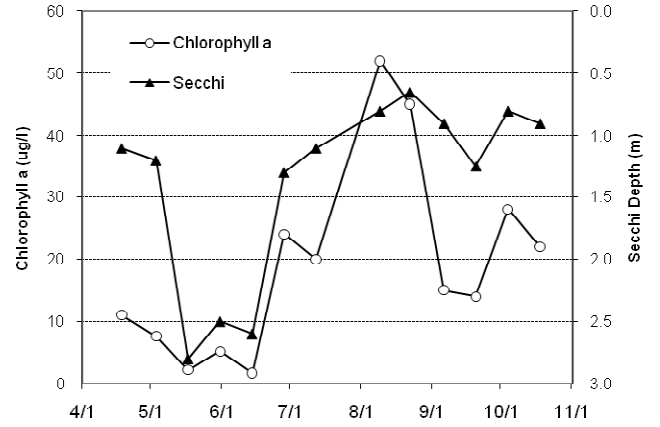
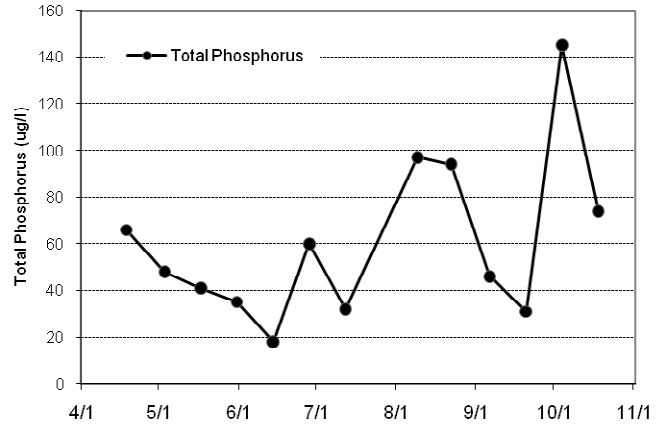
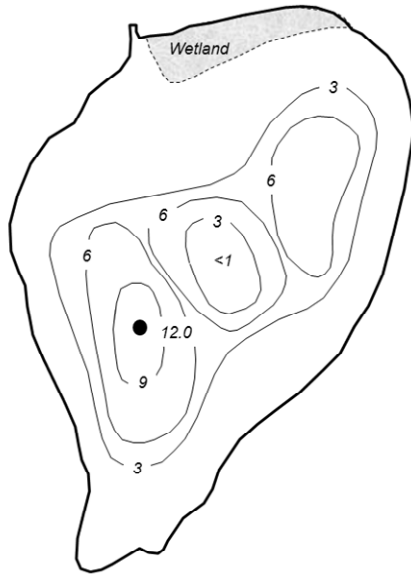
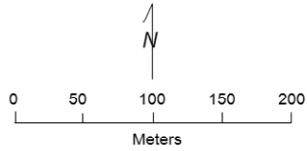


# Little Johanna Lake

Arden Hills/Roseville,  
Ramsey Co.

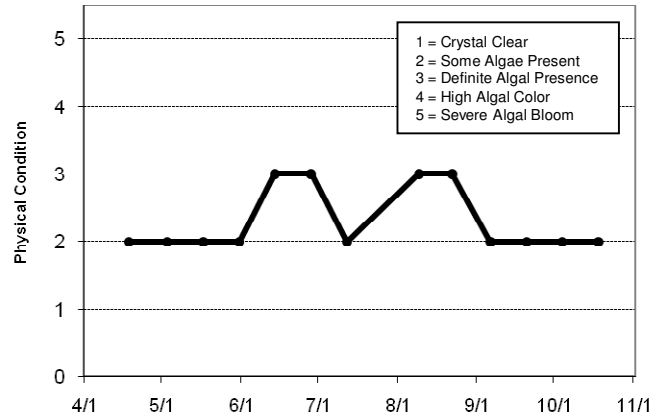
Lake ID: 620058-00  
WD: Rice Creek  
Volunteer: Fred Fox

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/18	18				11	66		1.1	2	2
5/3	17				7.6	48		1.2	2	3
5/17	17.7				2.2	41		2.8	2	2
5/31	21.1				5.2	35		2.5	2	3
6/14	24.3				1.7	18		2.6	3	3
6/28	25.7				24	60		1.3	3	4
7/12	25.4				20	32		1.1	2	3
8/9	24				52	97		0.8	3	3
8/22	24				45	94		0.7	3	4
9/6	23				15	46		0.9	2	3
9/20	23.4				14	31		1.3	2	3
10/4	12.5				28	145		0.8	2	2
10/18	8.1				22	74		0.9	2	2

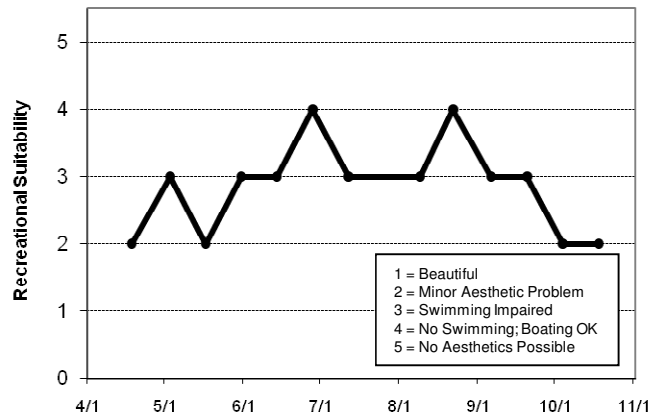


## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	D		C	C
Chlorophyll a	B	C	C		B	B
Secchi Depth	C	C	C		C	C
Lake Grade	C	C	C		C	C



Source: Metropolitan Council and STORET data

## Little Long Lake (27-0179-01) Pioneer Sarah Creek Watershed Management Commission

Little Long Lake is located in the City of Minnetrista (Hennepin County). It has a surface area of 108 acres. It has a maximum depth of 23.2 m (76 ft). The lake is a METC Priority Lake because of its outstanding water clarity (METC 2007). The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	15.9	4.0	68.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	3.1	1.7	4.2	A
<b>Secchi</b> (m)	4.4	3.0	5.5	A
<b>TKN</b> (mg/l)	0.63	0.43	1.70	
			<b>Lake Grade</b>	A

The lake received a lake grade of A for 2009, which is consistent with its historical water quality database. Additional years of monitoring are suggested for continuing to monitor this outstanding resource.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

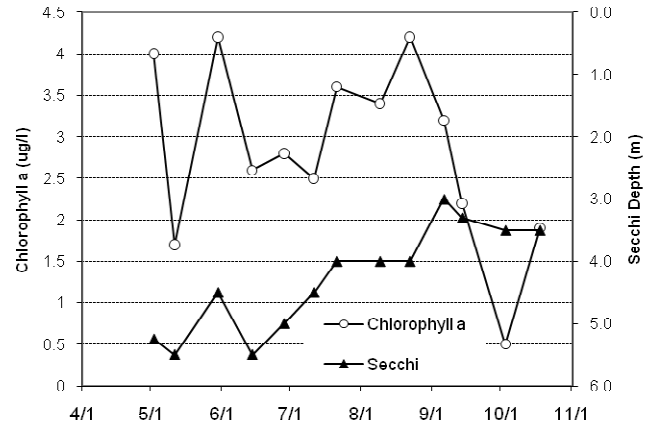
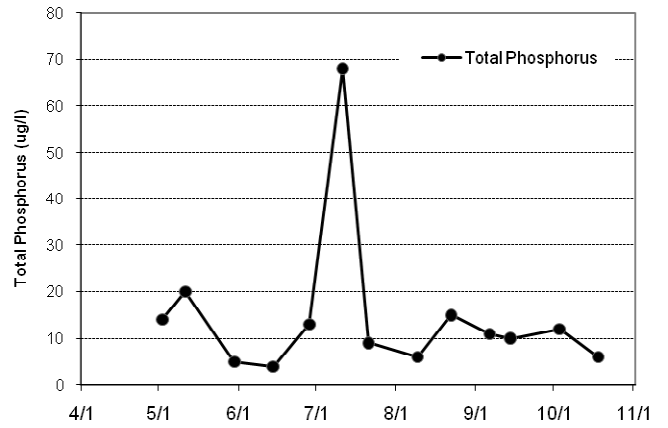
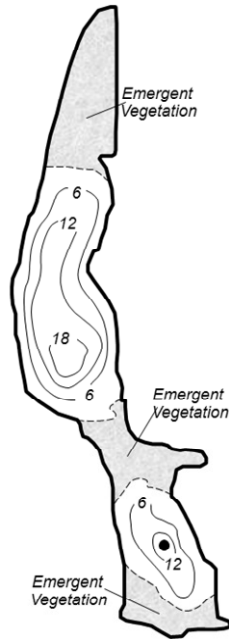
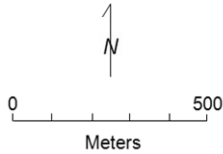
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake in 2005. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Little Long Lake Minnetrista, Hennepin Co.

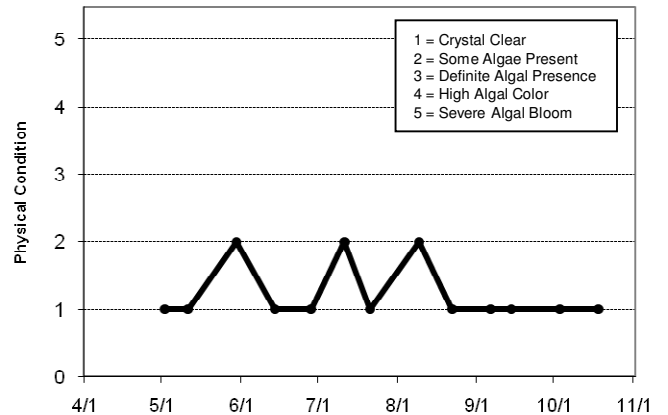
Lake ID: 270179-01  
WMO: Pioneer-Sarah Creek  
Volunteer: Garrett Genereux

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/2	13.3				4	14		5.3	1	1
5/11	15.7				1.7	20		5.5	1	1
5/30	17.8				4.2	5		4.5	2	1
6/14	23.7				2.6	4		5.5	1	1
6/28	25.5				2.8	13		5.0	1	1
7/11	24.8				2.5	68		4.5	2	1
7/21	22.7				3.6	9		4.0	1	1
8/9	25.5				3.4	6		4.0	2	1
8/22	23.9				4.2	15		4.0	1	1
9/6	22.5				3.2	11		3.0	1	1
9/14	24				2.2	10		3.3	1	1
10/3	15.9				0.5	12		3.5	1	1
10/18	10.9				1.9	6		3.5	1	1

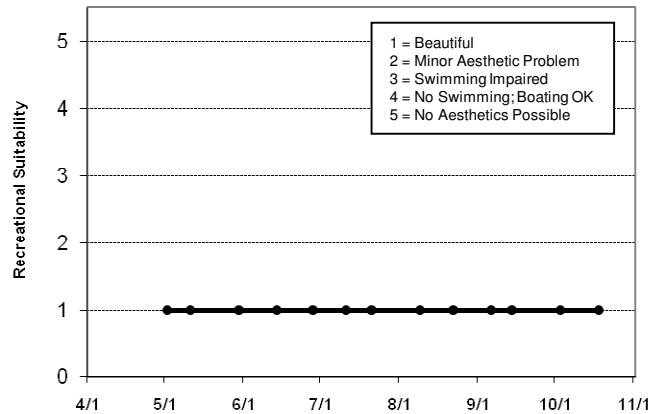


## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	A				A							
Chlorophyll a	A				A						A	
Secchi Depth	A				A						A	
<b>Lake Grade</b>	<b>A</b>				<b>A</b>							

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus							A		A		A	
Chlorophyll a							A		A		A	
Secchi Depth							A		A		A	
<b>Lake Grade</b>							<b>A</b>		<b>A</b>		<b>A</b>	

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		C	A	A	A	
Chlorophyll a		A	A	A	A	
Secchi Depth		A	A	A	A	
<b>Lake Grade</b>		<b>B</b>	<b>A</b>	<b>A</b>	<b>A</b>	



Source: Metropolitan Council and STORET data

## Lochness Lake (2-0585) Rice Creek Watershed District

Lochness Lake is located in the City of Blaine (Anoka County). It has a surface area of 5.3 acres. There is little known morphological data available for the lake other than it has a maximum depth of 4.9 m (16 ft). Because of the shallowness of the lake, the entire area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. Also the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	36.3	16.0	70.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	18.6	4.0	35.0	B
<b>Secchi</b> (m)	1.6	0.9	2.6	C
<b>TKN</b> (mg/l)	1.39	1.20	1.80	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009, which is a reduction in water quality compared to last year's lake grade of B. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake in 2005. 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/>.

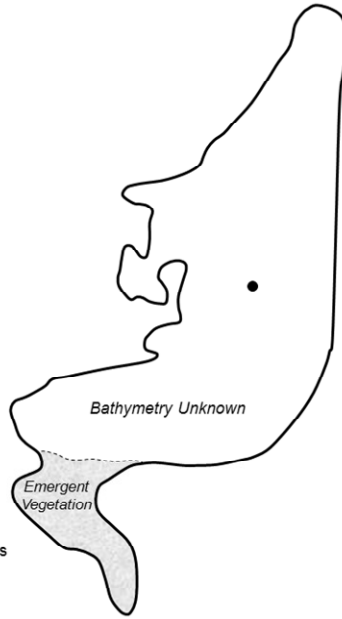
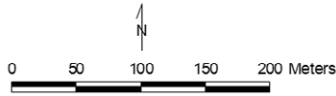
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Lochness Lake Blaine, Anoka Co.

Lake ID: 20585-00  
WD: Rice Creek

Volunteers: Jim & Tricia Hafner

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/17	13.8				3.6	19		2.5	2	4
4/28	12.6				6.5	22		2.4	2	4
5/15	16.6				4	18		2.6	2	4
5/29	18.9				4.5	18		2.5	2	4
6/11	17.8				6.2	16		2.2	2	4
7/10	24.1				16	25		2.0	3	4
7/24	23.6				29	32		3	4	4
8/10	24.8				35	70		1.0	4	4
8/21	21.2				31	50		0.9	3	4
9/4	20.8				25	52		0.9	4	4
9/17	22.2				17	46		1.0	4	4
10/1					11	37		1.5	3	5
10/16	7.3				9.3	34		2.0	2	4

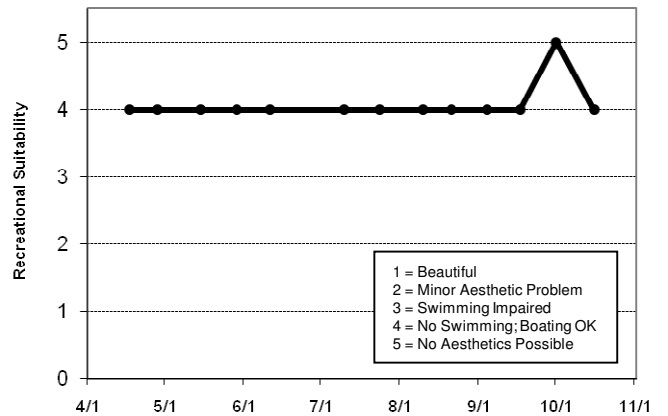
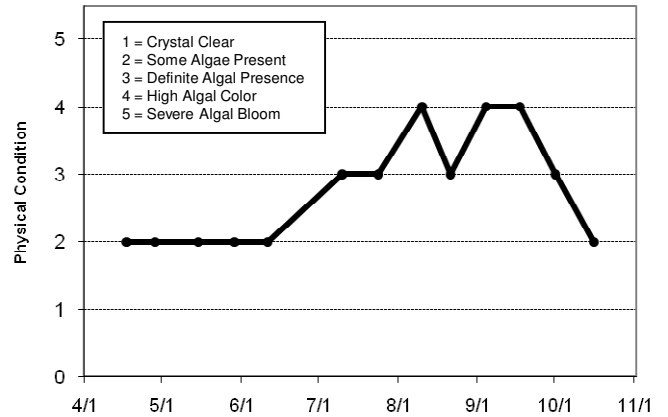
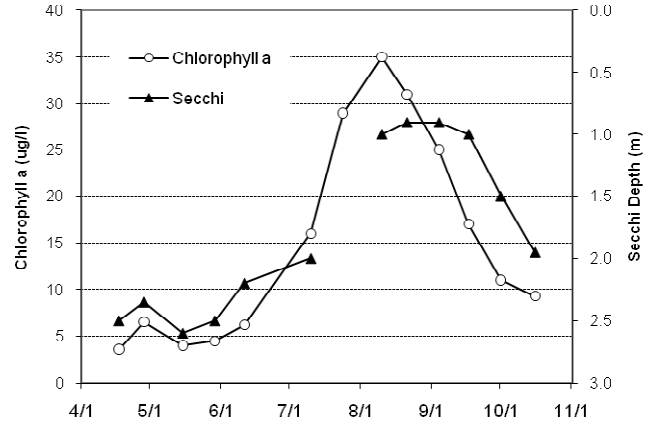
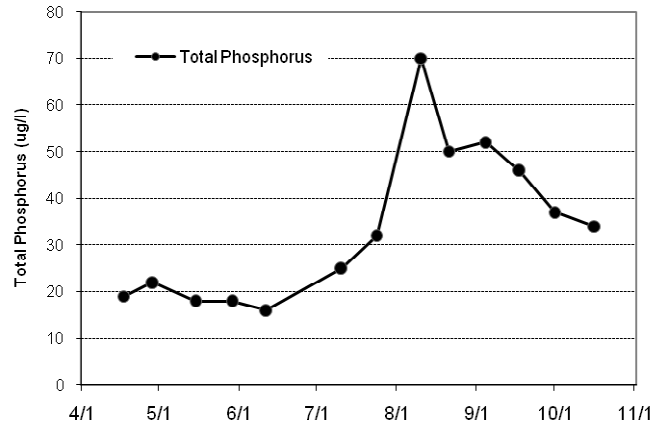
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus				A	B	C
Chlorophyll a				A	A	B
Secchi Depth				B	B	C
Lake Grade				A	B	C

Source: Metropolitan Council and STORET data



## Lone Lake (27-0094) City of Minnetonka

Lone Lake is located within the City of Minnetonka (Hennepin County). The maximum depth of the lake is 8.2 m (27 feet). The lake is characterized by two distinct basins, of which only one was monitored in 2009. This was the first year that the lake was part of the CAMP.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	31.3	19.0	43.0	B
<b>CLA</b> ( $\mu\text{g/l}$ )	5.1	2.6	12.0	A
<b>Secchi</b> (m)	2.6	2.0	3.2	B
<b>TKN</b> (mg/l)	0.60	0.34	0.72	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

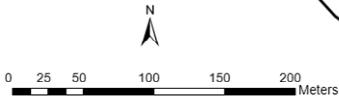
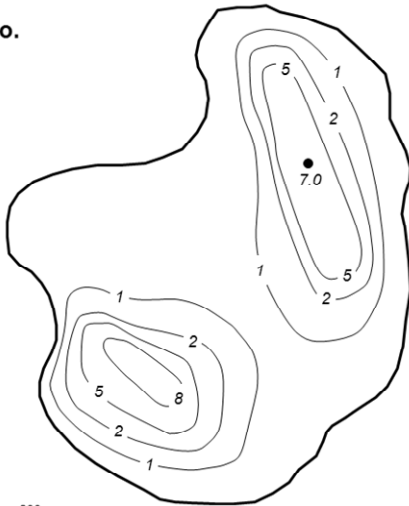
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 297-4916 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Lone Lake Minnetonka, Hennepin Co.

Lake ID: 270094-00  
WD: Nine Mile Creek  
Volunteer: Val Rukavina

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/20	12.5				5.4	26		2.4	1	1
4/26	11.9				4.6	21		3.0	1	4
4/27	12.3				4.9	20		3.0	1	1
5/2	15.5				2.6	19		3.0	1	
5/11	16.2				4	28		3.2	1	2
5/16	24.8				3.3	43		3.0	1	1
5/25	24.3				3.2	29		3.0	1	1
5/28	22.6				4.1	30		3.0	1	1
6/10	26.6				12	32		2.2	1	
6/15	21.6				8.8	36		2.2		2
6/26	29				5	35		2.4	1	2
7/12	26.2				5.5	39		2.1	1	5
9/4	24.8				4.2	24		2.3	2	
9/15	26.7				3.6	29		2.0	2	1
10/7	18.2				3.4	46		2.0	1	1

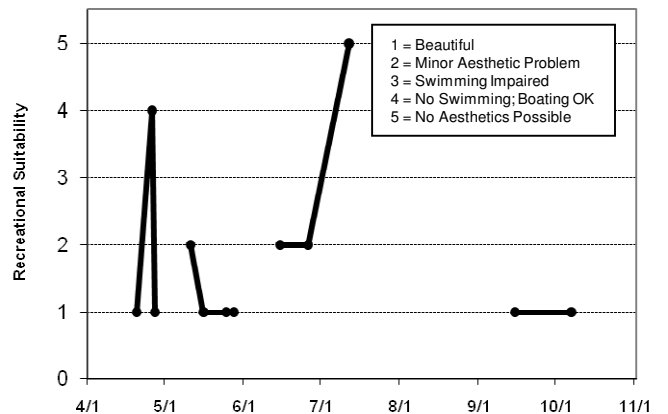
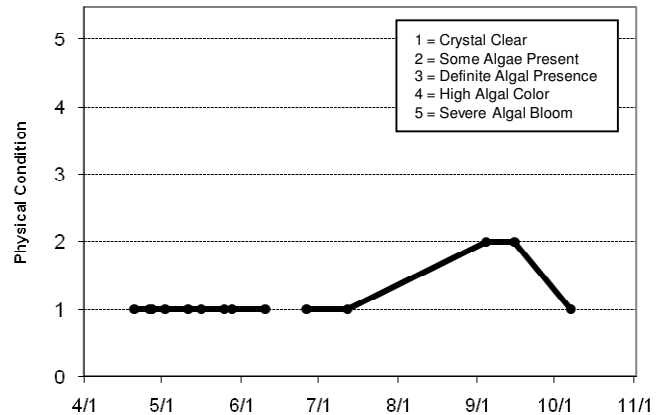
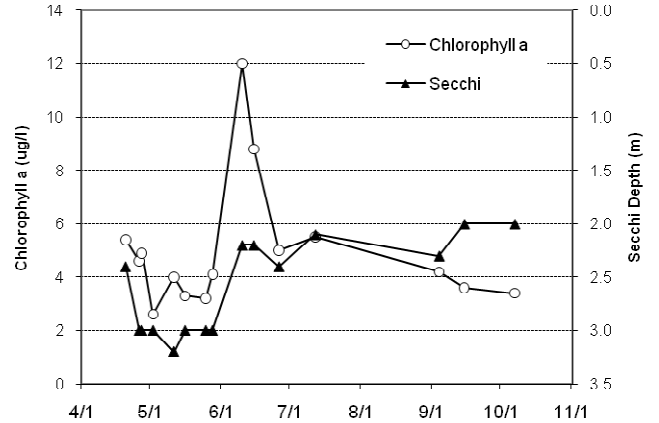
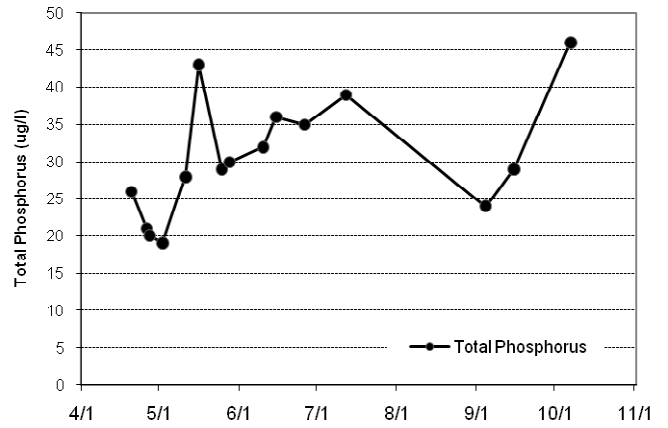
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						B
Chlorophyll a						A
Secchi Depth						B
Lake Grade						B

Source: Metropolitan Council and STORET data



## Long Lake [Apple Valley] (19-0022) City of Apple Valley

Long Lake, which has a surface area of roughly 36 acres, is located within the City of Apple Valley (Dakota County). The maximum depth of the lake is approximately 3.5 m (10 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	216.3	105.0	345.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	114.3	38.0	280.0	F
<b>Secchi</b> (m)	0.4	0.3	0.7	F
<b>TKN</b> (mg/l)	3.33	1.90	4.70	
<b>Lake Grade</b>				F

The lake received a lake grade of F for 2009, which is similar to those recorded in 2002-2008, and worse than the lake grade of D recorded in 1997. On the basis of the lake's historical water quality database, the water quality of the lake appears represented by a lake grade of F.

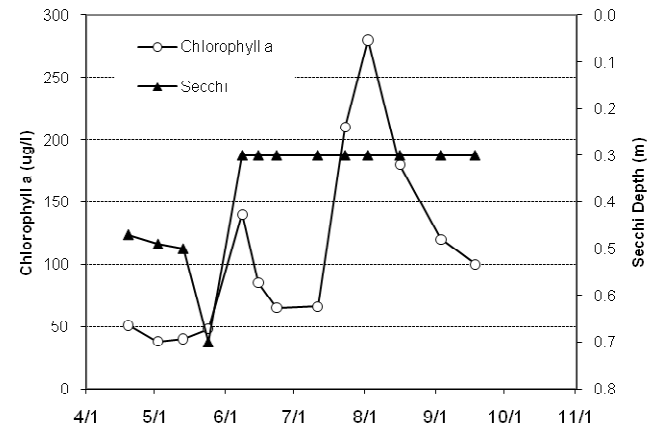
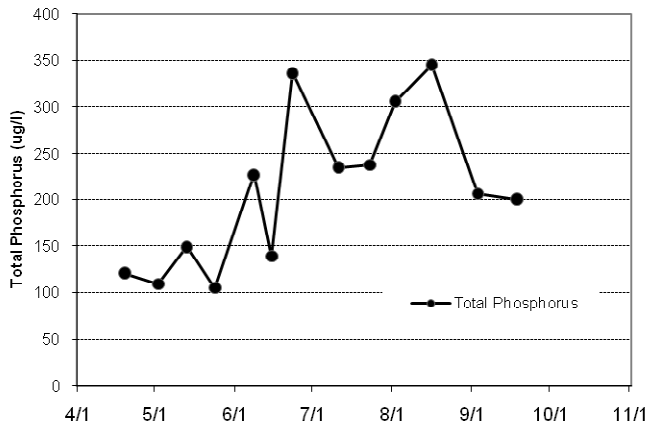
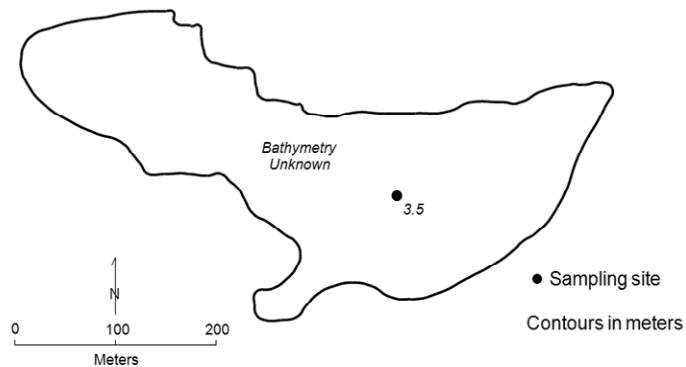
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



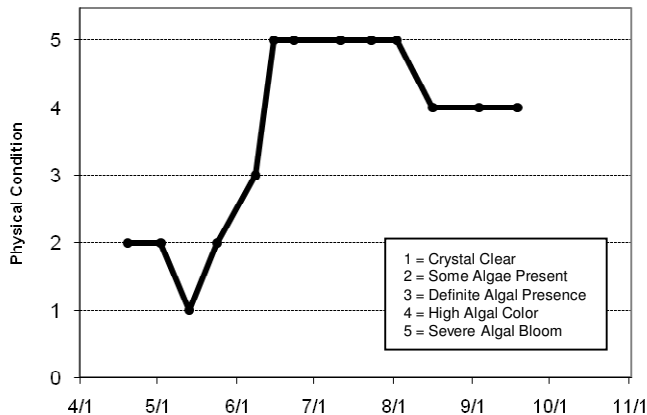
**Long Lake**  
Apple Valley, Dakota Co.

Lake ID: 190022-00  
WMO: Vermillion River  
Volunteers: Christy & Jake McGlocklin, Al Kettlekamp



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	14.9				51	121		0.5	2	4
5/2	14.6				38	109		0.5	2	4
5/13	17				40	149		0.5	1	4
5/24	25.5				48	105		0.7	2	4
6/8	14.5				140	227		0.3	3	4
6/15	23.2				85	139		0.3	5	5
6/23	29				65	336		0.3	5	5
7/11	26.3				66	235		0.3	5	5
7/23	24				210	238		0.3	5	5
8/2	24				280	306		0.3	5	5
8/16	23.9				180	345		0.3	4	5
9/3	23.9				120	206		0.3	4	5
9/18	26.2				100	200		0.3	4	5

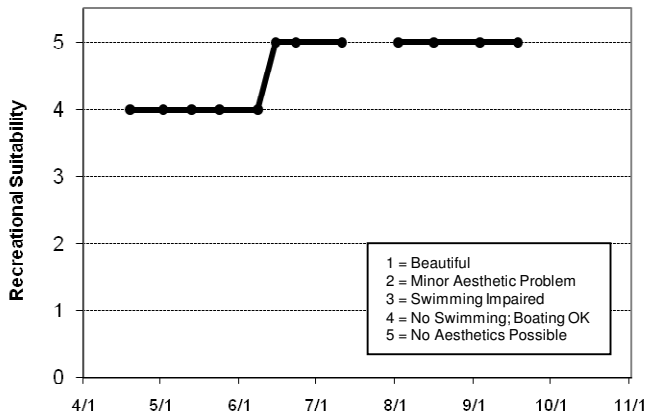


**Lake Water Quality Grades Based on Summertime Averages**

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus						D					F	F
Chlorophyll a						D					F	F
Secchi Depth						F					F	F
<b>Lake Grade</b>						<b>D</b>					<b>F</b>	<b>F</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	F	F	F	F	F	F
Chlorophyll a	F	F	F	F	F	F
Secchi Depth	F	F	F	F	F	F
<b>Lake Grade</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>



Source: Metropolitan Council and STORET data

## Long Lake [Mahtomedi] (82-0130) Rice Creek Watershed District

Long Lake is located within the City of Mahtomedi (Washington County). It has a surface area of 48 acres and a maximum depth of 7.7 m (25 feet). The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

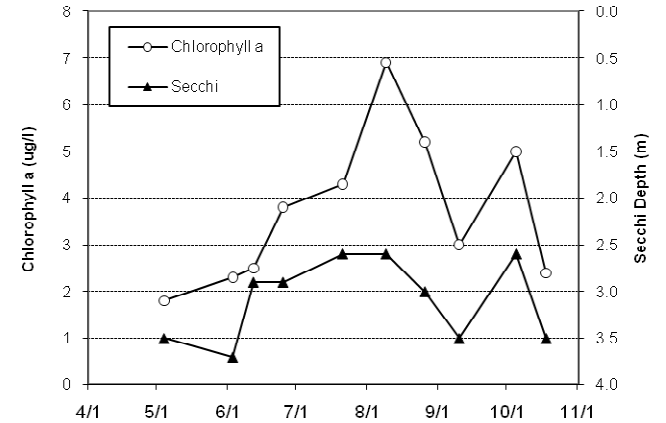
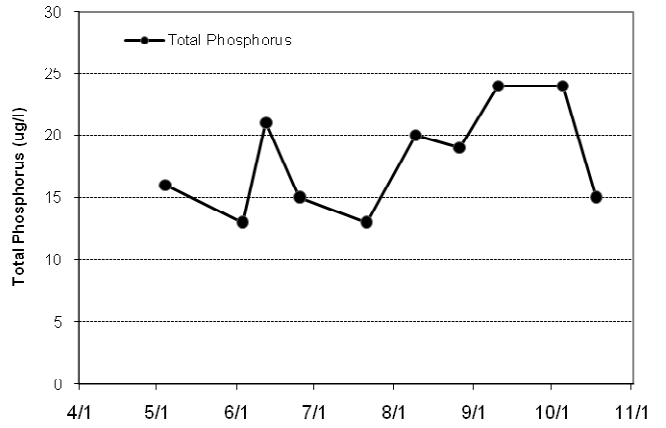
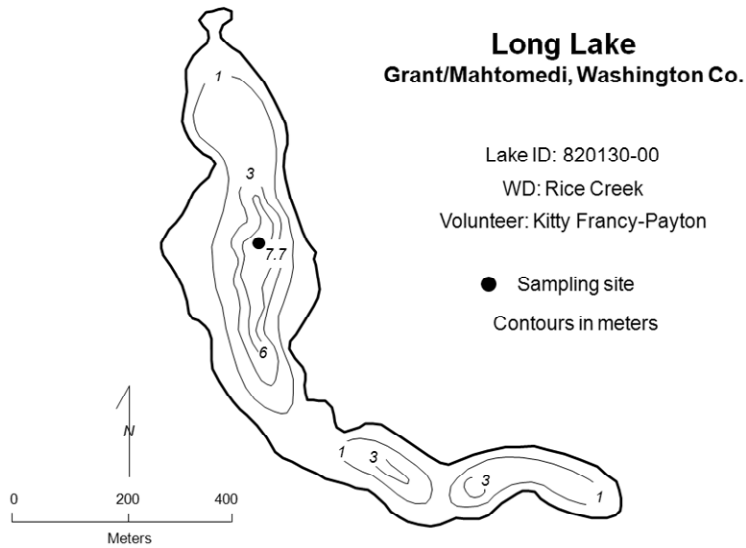
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	17.6	13.0	24.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	3.7	1.8	6.9	A
<b>Secchi</b> (m)	3.1	2.6	3.7	A
<b>TKN</b> (mg/l)	0.58	0.33	0.68	
<b>Lake Grade</b>				A

The lake received a lake grade of A for 2009, which is consistent with its historical database. Note that the Secchi depth grade of A was the best Secchi grade received according to the lake's water quality database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

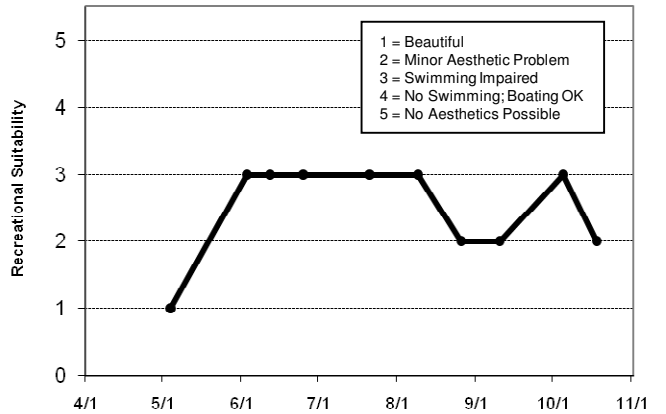
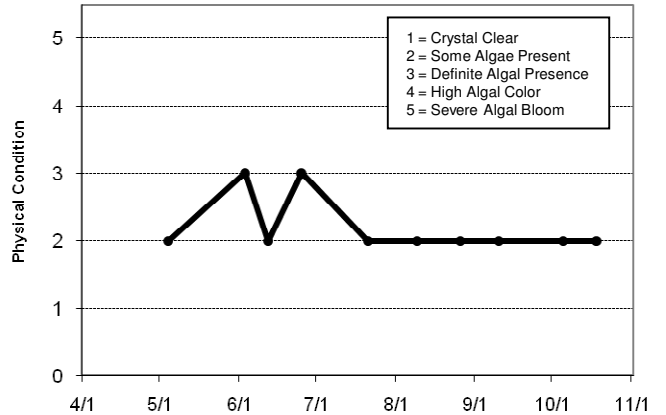
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake in 2005. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).



#### 2009 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	16				1.8	16		3.5	2	1
6/3	20.9				2.3	13		3.7	3	3
6/12	17.9				2.5	21		2.9	2	3
6/25	26.2				3.8	15		2.9	3	3
7/21	21.9				4.3	13		2.6	2	3
8/9	24.2				6.9	20		2.6	2	3
8/26	23.4				5.2	19		3.0	2	2
9/10	22.6				3	24		3.5	2	2
10/5	12.4				5	24		2.6	2	3
10/18	7.2				2.4	15		3.5	2	2



#### 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												
Lake Grade												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	C	B	C	A	A
Chlorophyll a	A	A	A	A	A	A
Secchi Depth	B	B	B	B	B	A
Lake Grade	A	B	B	B	A	A

Source: Metropolitan Council and STORET data

## Long Lake [May Township] (82-0030) *Marine on St. Croix WMO*

Long Lake is located in May Township (Washington County). It has a surface area of 88 acres. The maximum depth is 3.7 m (12 feet). The entire lake area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The lake does not maintain a thermocline which is a density gradient caused by changing water temperatures throughout the lake's water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	31.7	25.0	39.0	B
<b>CLA</b> ( $\mu\text{g/l}$ )	6.6	3.3	12.0	A
<b>Secchi</b> (m)	2.4	1.8	2.7	B
<b>TKN</b> (mg/l)	0.83	0.75	1.00	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009, which is consistent with the lake grades the lake has received over the past eight years. The lake's water quality is representative of a C+/B lake grade for the past decade.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

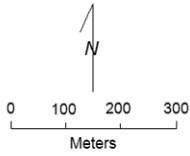
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

## Long Lake May Twp., Washington Co.

Lake ID: 820030-00  
WD: Carnelian-Marine-St. Croix  
Volunteer: Washington  
Conservation District

● Sampling station  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	10.8	9.5	10.75	8.87	6.4	25	25	2.6	2	2
5/11	16.6	14.5	8.91	0.14	5.7	34	34	2.7	2	2
6/9	17.6	16.8	7.87	0.09	3.3	29	29	2.5	2	3
7/6	25.7	20.4	10.63	0.16	3.7	25	25	2.7	2	3
8/3	22.4	21	7.25	0.37	6.2	29	29	1.8	2	3
9/1	20.3	19.2	5.12	0.04	12	34	34	2.4	2	2
9/29	15.7	15.9	5.1	0.04	8.8	39	39	2.0	2	2

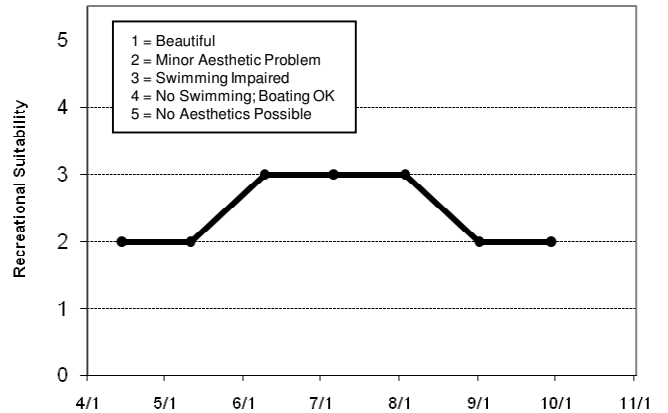
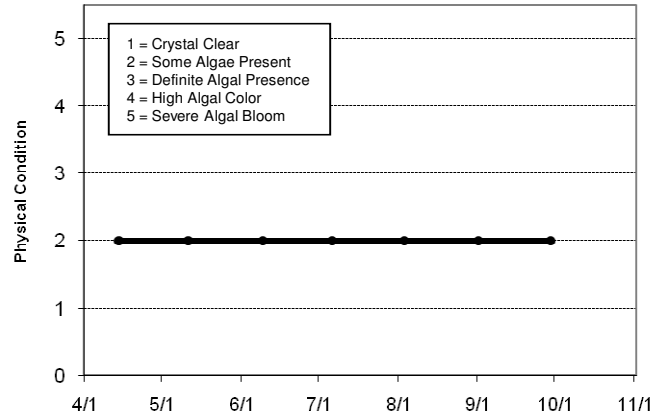
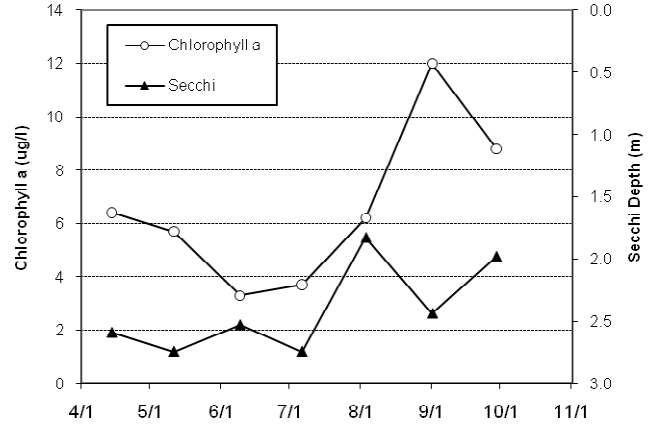
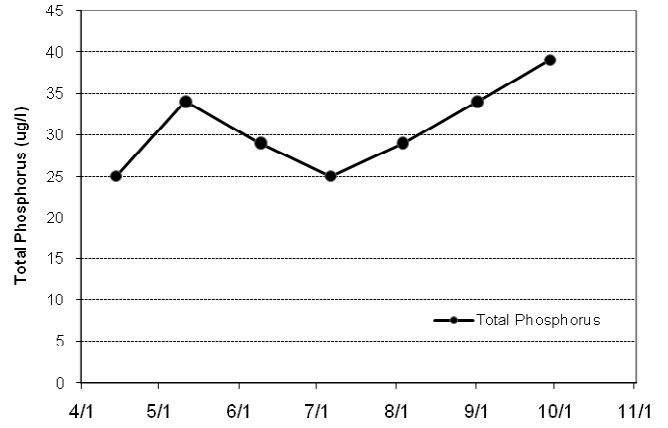
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus	C	C	C	C	C	C	C	C	C	C	C	C
Chlorophyll a	C	C	C	B	C	C	B	B	B	B	B	A
Secchi Depth	B	C	C	C	C	C	C	B	B	B	C	B
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	C	C	C	C	B
Chlorophyll a	A	B	A	B	A	A
Secchi Depth	B	B	B	C	B	B
<b>Lake Grade</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>B</b>	<b>B</b>

Source: Metropolitan Council and STORET data



## Long Lake [Pine Springs] (82-0118) Valley Branch Watershed District

Long Lake is located in Pine Springs Township (Washington County). It has a surface area of 62 acres. The mean and maximum depths of the lake are 3.6 m (12 feet) and 10.4 m (34 feet), respectively. The lake's surface area and watershed area of 2,060 acres translates to a 33:1 watershed-to-lake area ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	9.4	5.0	19.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	2.6	1.6	4.6	A
<b>Secchi</b> (m)	4.8	2.3	6.3	A
<b>TKN</b> (mg/l)	0.54	0.34	0.94	
			<b>Lake Grade</b>	A

The lake received a lake grade of A for 2009, which is the best grade on record for the lake. The good water quality year of 2009 follows an alum treatment that occurred in 2008. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

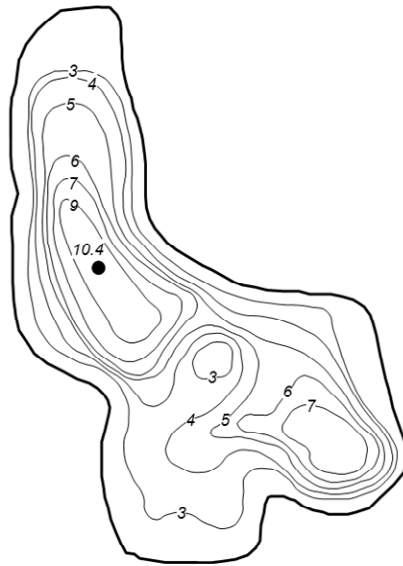
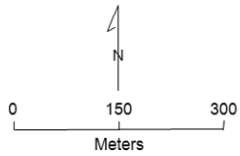
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Long Lake Pine Springs, Washington Co.

Lake ID: 820118-00  
WD: Valley Branch  
Volunteer: Bill Feely

● Sampling station  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	9.1				5.8	14		2.6	2	1
4/28	11.7				5.8	12		2.6	1	1
5/13	16.3				4.6	13		2.3	1	1
5/28	19.4				2.2	19		4.6	1	1
6/10	19				2.5	8		5.0	1	1
6/22	25.2				1.6	10		5.4	1	1
7/6	23.8				1.9	8		5.5	1	1
7/22	22.3				2.4	5		6.3	1	1
8/5	23.9				3.7	5		5.4	1	1
8/18	24.6				3.1	7		5.5	1	1
8/31	22.1				2.4	10		4.7	2	1
9/15	24.7				1.8	8		4.5	1	1
9/29	17.4				2.9	10		3.3	2	1
10/17	9.2				2.9	18		5.0	2	1

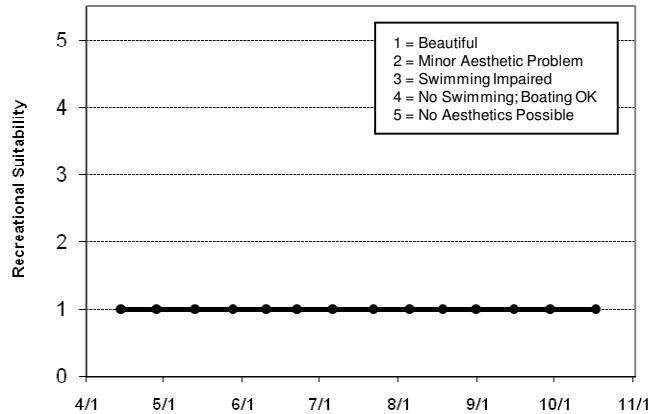
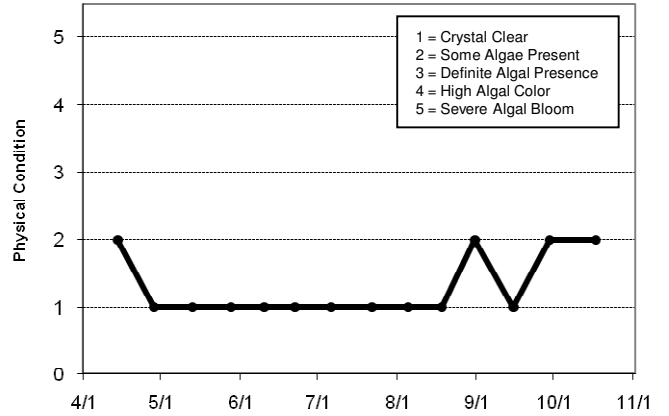
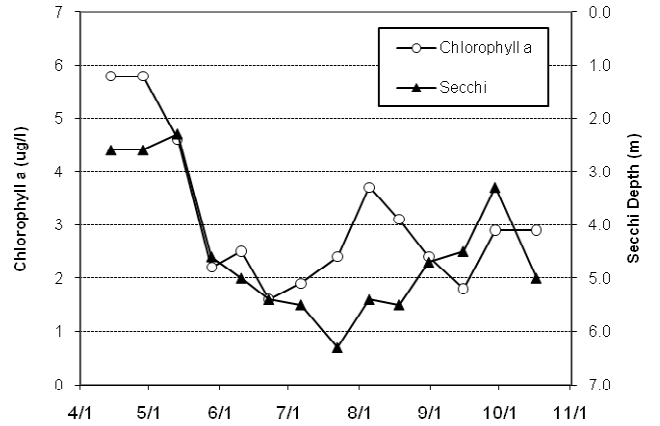
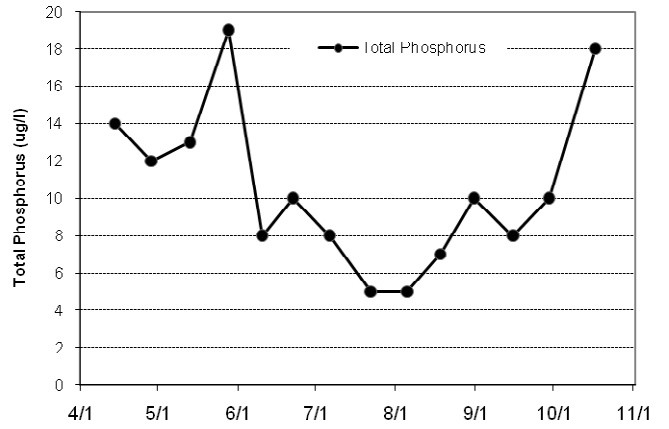
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus						C						
Chlorophyll a						B						
Secchi Depth						C						
<b>Lake Grade</b>						<b>C</b>						

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus		B										B
Chlorophyll a		B										A
Secchi Depth		C										B
<b>Lake Grade</b>		<b>B</b>										<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	B	B	A
Chlorophyll a	B	B	C	A	A	A
Secchi Depth	C	C	C	B	B	A
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>A</b>

Source: Metropolitan Council and STORET data



## Long Lake [Stillwater] (82-0021) Browns Creek Watershed District

Long Lake is located on the western boundary of the City of Stillwater (Washington County). It has a surface area of 96 acres, and its maximum depth is 6.7 m (22 feet). Approximately 95 percent of the surface area is considered littoral zone, which is the 0-15 feet depth zone dominated by aquatic vegetation. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	48.7	23.0	90.0	C
<b>CLA</b> (µg/l)	15.4	6.5	47.0	B
<b>Secchi</b> (m)	2.1	0.8	3.2	C
<b>TKN</b> (mg/l)	1.40	0.91	2.00	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009. On the basis of the historical water quality database, the lake's annual water clarity grades, prior to the C recorded in 2004, have been near constant Fs. The year 2009 was the second year that the lake received a B grade for CLA. This year's water quality continues the improving trend since 2004.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

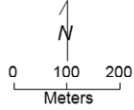
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



# Long Lake, Site 1 Stillwater, Washington Co.

Lake ID: 820021-00  
WD: Browns Creek  
Volunteer: Washington  
Conservation District

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	12.1	5.6	11.21	0.05	13	57		1.8	3	3
4/28	13.3	5.9	9.76	0.05	20	133		1.4	3	4
5/14	15	6.5	8.24	0.08	8.3	57		2.3	3	3
5/26	20.3	8.9	8.2	0.09	17	52		2.0	2	3
6/9	17	8.2	6.84	0.08	17	53		1.8	2	3
6/22	26.6	9.8	10.04	0.11	6.5	47		2.6	3	3
7/7	26.1	11.7	11.51	0.13	9.3	44		2.0	3	4
7/21	23.3	13.8	12.72	0.11	47	61		0.8	3	4
8/3	23.8	15.8	9	0.07	21	37		1.5	3	4
8/18	25	15.8	6.89	0.06	11	39		2.3	2	3
8/31	21.7	12.7	7.19	0.06	9	33		3.0	3	3
9/14	24.7	12.8	9.37	0.08	15	23		3.2	3	3
9/30	15.9	13.7	5.74	0.05	8.4	90		2.1	3	3
10/13	8.9	8.5	9.69	0.13	9.5	24		3.0	2	3

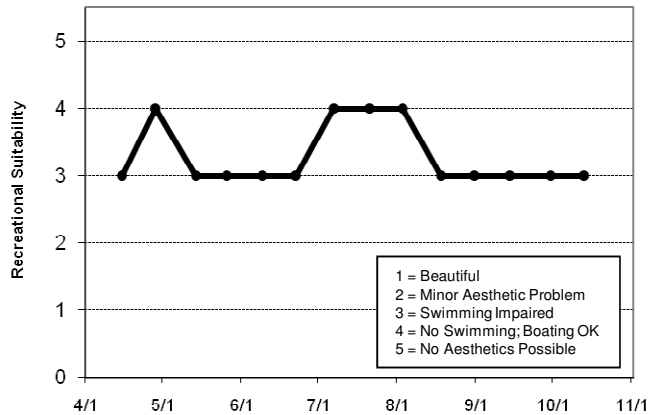
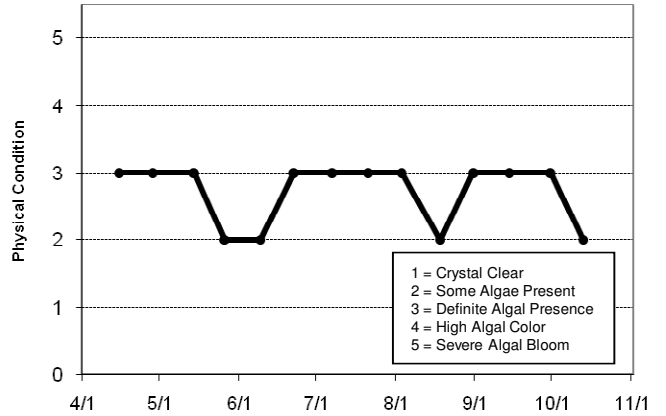
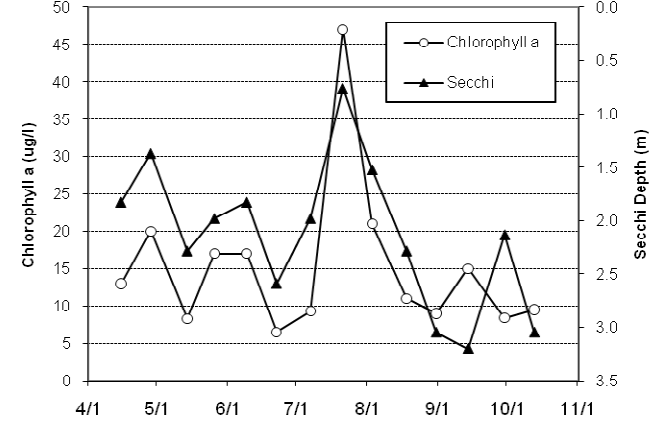
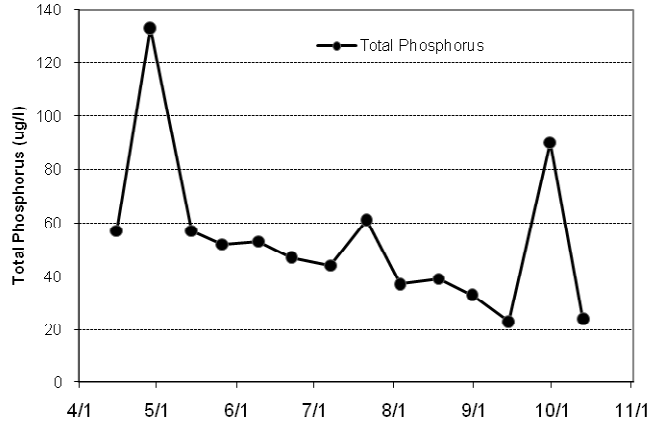
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus				D	D		D	D	F	F	D	D
Chlorophyll a				D	D		F	F	F	F	D	D
Secchi Depth	F	F	F	F	D		F	F	F	F	F	F
<b>Lake Grade</b>				<b>D</b>	<b>D</b>		<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>D</b>	<b>D</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	D	D	C	C	C
Chlorophyll a	C	D	C	C	B	B
Secchi Depth	C	D	D	D	C	C
<b>Lake Grade</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## Long Lake [Washington Co.] (82-0068) Carnelian - Marine - St. Croix Watershed District

Long Lake is located within City of Scandia (Washington County). The lake has a surface area of 35 acres. The maximum and mean depths are 2.1 m (6.9 ft) and 1.1 m (3.6 ft), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	74.2	51.0	117.0	D
<b>CLA</b> (µg/l)	42.8	6.8	130.0	C
<b>Secchi</b> (m)	1.2	0.5	1.8	D
<b>TKN</b> (mg/l)	1.84	0.98	3.30	
<b>Lake Grade</b>				D

The lake received a lake grade of D for 2009, which is similar to grades received about 5 years ago. The lake grades have fluctuated in the range of F to B to D since 1998, which is quite variable.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

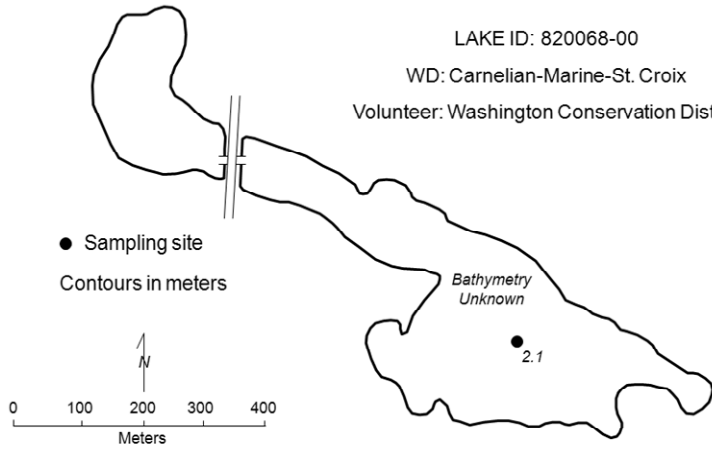
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Long Lake Scandia, Washington Co.

LAKE ID: 820068-00

WD: Carnelian-Marine-St. Croix

Volunteer: Washington Conservation District



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	13.6	13.5	10.96	0.11	10	47		1.8	2	2
5/27	18.8	18.8	6.83	0.05	6.8	62		1.8	2	2
6/23	26.7	23.6	7.64	0.12	32	83		1.1	3	4
7/20	24.8	19.3	13.79	0.09	130	117		0.5	3	4
8/18	23.1	23.2	6.07	0.09	26	58		1.1	3	4
9/15	23.2	23	7.89	0.09	19	51		1.4	3	4
10/14	6.5	6.5	9.91	9.85	3.4	41		1.5	1	1

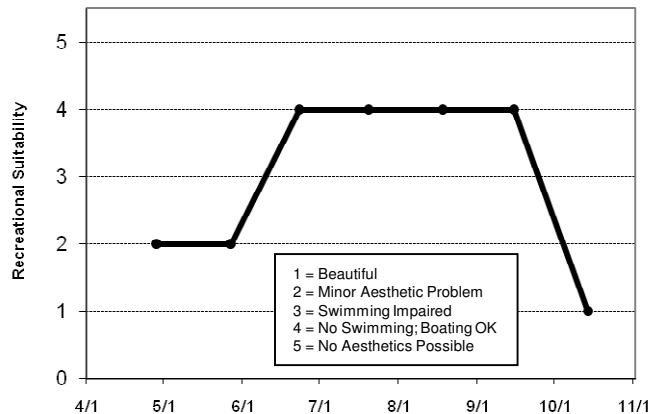
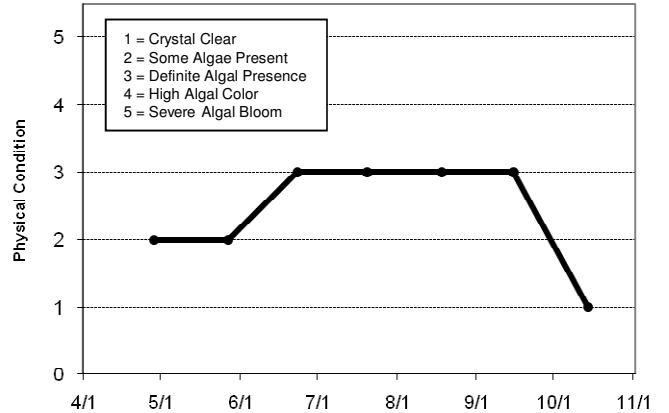
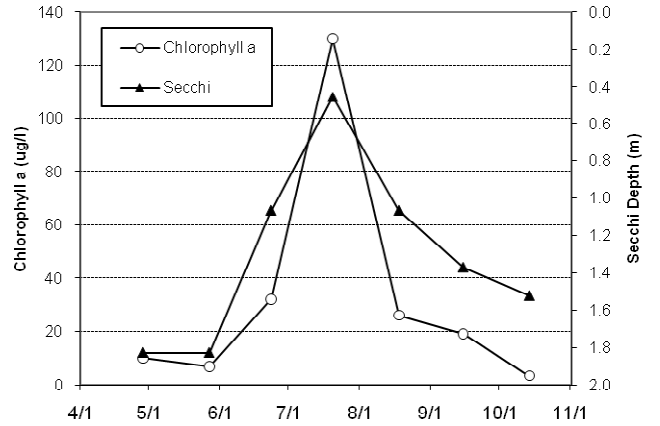
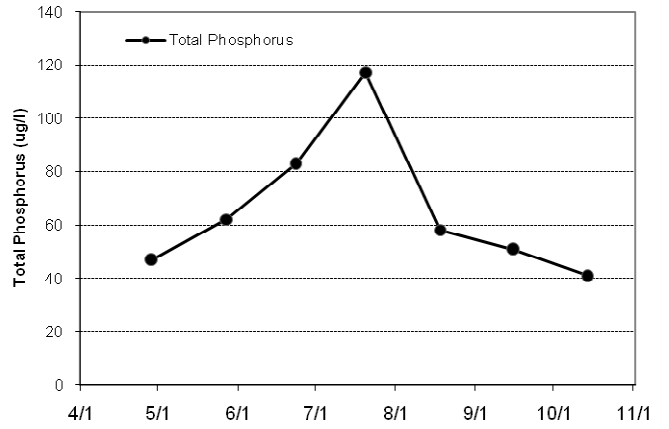
### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	D	C	C	D
Chlorophyll a	D	C	B	C	A	C
Secchi Depth	D	D	C	C	C	D
<b>Lake Grade</b>	<b>D</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>D</b>

Source: Metropolitan Council and STORET data



**Loon Lake (82-0015-02) Carnelian - Marine - St. Croix Watershed District**

Loon Lake is located in Stillwater Township (Washington County). The surface area of the lake is 64 acres. It has a mean and maximum depth of 2.4 m (eight feet) and 4.9 m (16 feet), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	161.6	116.0	229.0	F
<b>CLA</b> (µg/l)	111.6	60.0	230.0	F
<b>Secchi</b> (m)	0.5	0.2	0.9	F
<b>TKN</b> (mg/l)	3.40	2.60	4.50	
<b>Lake Grade</b>				F

The lake received a lake grade of F for 2009, which is similar to previous years’ lake grades. On the basis of the historical water quality database, this lake appears represented by a lake grade of F.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Loon Lake

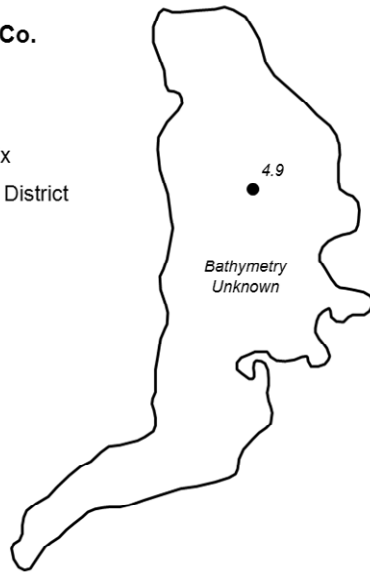
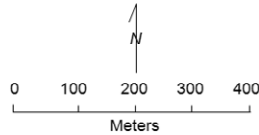
Stillwater Twp., Washington Co.

LAKE ID: 820015-02

WD: Carnelian-Marine-St. Croix

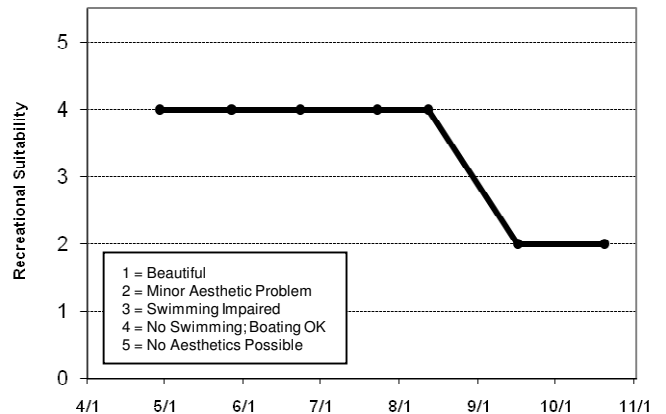
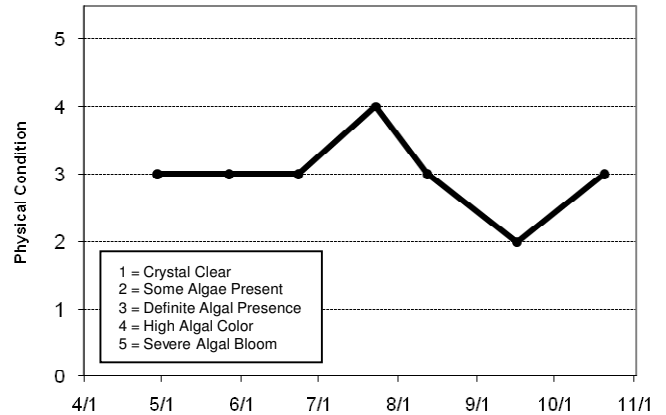
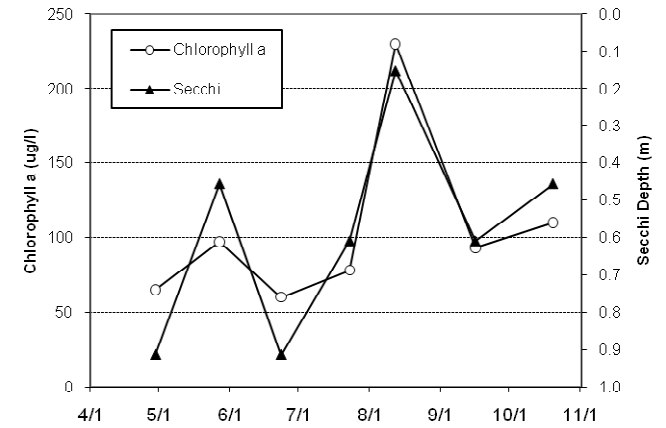
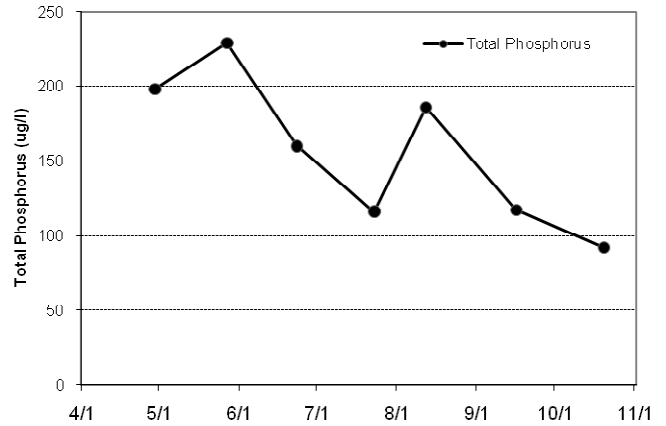
Volunteer: Washington Conservation District

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/29	13.5	12.4	10.89	0.11	65	198		0.9	3	4
5/27	18.7	17.3	6.14	0.09	97	229		0.5	3	4
6/23	28.2	15.9	9.7	0.05	60	160		0.9	3	4
7/23	24.2	18.6	11.97	0.07	78	116		0.6	4	4
8/12	24.6	21.4	12.3	0.05	230	186		0.2	3	4
9/16	22.5	19.5	6.73	0.1	93	117		0.6	2	2
10/20	8.7	8	11.11	4.6	110	92		0.5	3	2



## 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												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					F	F	F	F	D	D	D	D
Chlorophyll a					D	D	D	D	D	D	D	F
Secchi Depth					F	F	F	F	D	D	F	F
<b>Lake Grade</b>					<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>F</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	F	D	D	F
Chlorophyll a	F	F	F	F	F	F
Secchi Depth	F	F	F	F	F	F
<b>Lake Grade</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>

Source: Metropolitan Council and STORET data

## Lotus Lake (10-0006) City of Chanhassen

Lotus Lake is located within the City of Chanhassen (Carver County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a surface area of 246 acres. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	39.5	23.0	100.0	C
<b>CLA</b> (µg/l)	10.7	5.1	23.0	B
<b>Secchi</b> (m)	2.0	1.2	3.0	C
<b>TKN</b> (mg/l)	1.06	0.86	1.40	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009, which is consistent with previous years of lake grades, except for the D lake grade received in 2003. On the basis of the historical water quality database, the water quality of this lake appears represented well by a lake grade of C.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Lotus Lake Chanhasen, Carver Co.

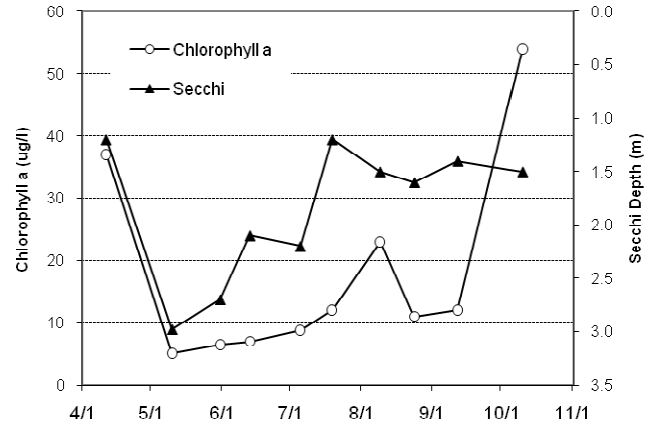
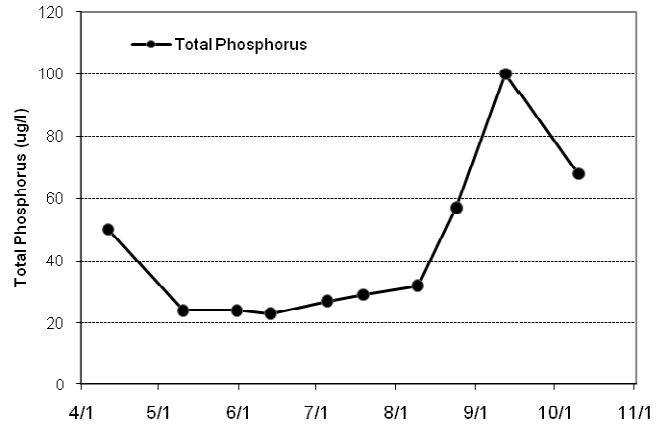
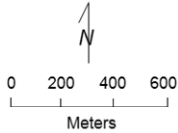
Lake ID: 100006-00

WD: Riley-Purgatory-Bluff Creek

Volunteer: Shelly Strohmaier

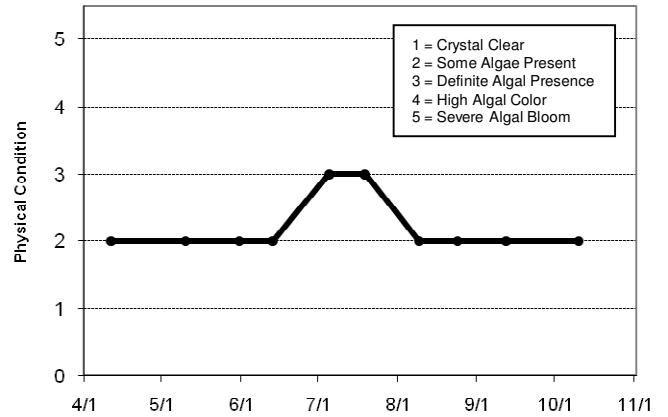
● Sampling site

Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/11	8.2				37	50		1.2	2	2
5/10	15.9				5.1	24		3.0	2	2
5/31	20.4				6.5	24		2.7	2	2
6/13	20.4				7	23		2.1	2	2
7/5	23.6				8.8	27		2.2	3	3
7/19	21.7				12	29		1.2	3	3
8/9	24.4				23	32		1.5	2	2
8/24	23.1				11	57		1.6	2	2
9/12	24				12	100		1.4	2	2
10/10					54	68		1.5	2	2

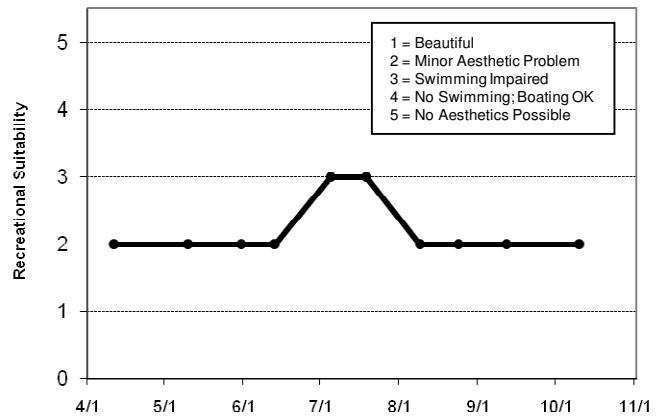


## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	C
Chlorophyll a	C	C	C	C	C	B
Secchi Depth	C	C	C	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>



Source: Metropolitan Council and STORET data

**Louise Lake (82-0025) Carnelian - Marine - St. Croix Watershed District**

Louise Lake is located in Stillwater Township (Washington County). The lake has a surface area of 48 acres. It has a maximum and mean depth of the lake are 3.7 m (12 ft) and 1.8 m (6 ft), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	179.8	105.0	272.0	F
<b>CLA</b> (µg/l)	84.2	3.5	260.0	F
<b>Secchi</b> (m)	1.3	0.2	2.1	C
<b>TKN</b> (mg/l)	2.60	1.70	4.00	
<b>Lake Grade</b>				D

The lake received a lake grade of D for 2009. The historical water quality database shows that the annual lake grades have varied from Cs to Ds. To better understand the lake’s water quality and where it may be heading, more data are needed.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

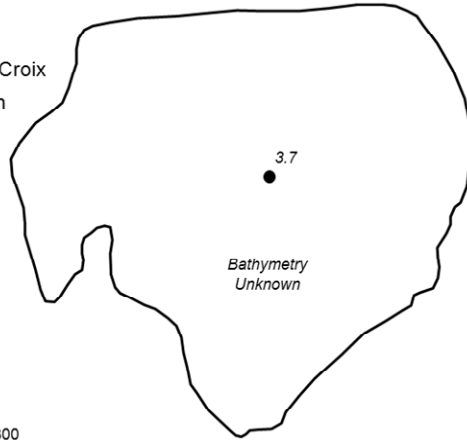
If you notice any errors in the lake’s data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



# Lake Louise

## Stillwater Twp., Washington Co.

LAKE ID: 820025-00  
 WD: Carnelian-Marine-St. Croix  
 Volunteer: Washington  
 Conservation District



● Sampling site  
 Contours in meters

### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/29	13	13.1	10.76	0.11	2.1	68		2.1	2	3
5/27	18.6	18.7	9.09	0.55	3.5	105		2.1	2	3
6/23	26.9	19.9	7.65	0.14	7.6	127		2.1	3	4
7/23	24.4	20.1	15.28	0.12	79	151		1.2	3	4
8/12	25.3	21.4	12.99	0.07	260	272		0.2	5	4
9/16	22.4	20.3	4.75	0.1	71	244		0.8	4	3
10/19	8.3	8.2	10.97	0.15	4.2	178		1.8	3	4

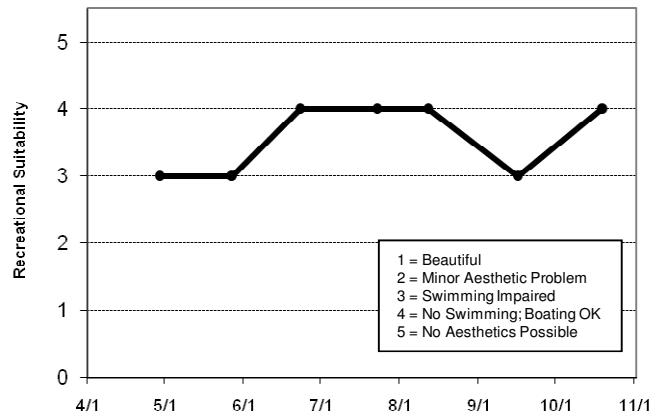
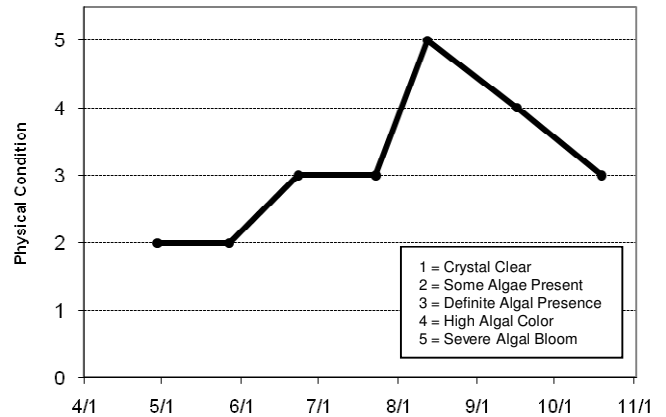
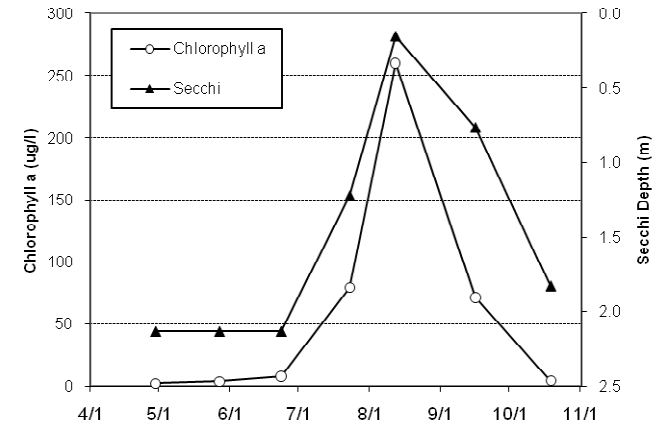
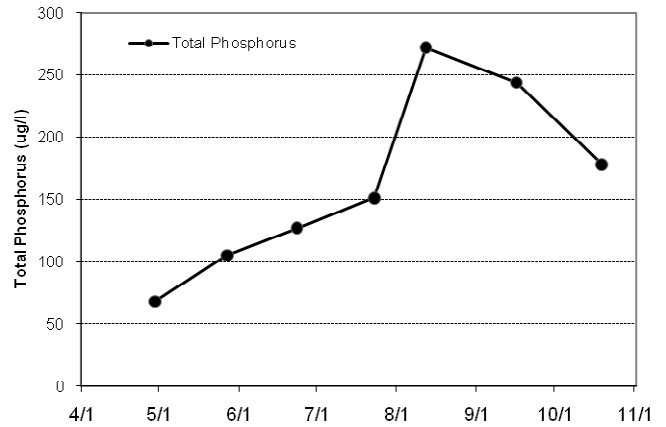
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					D	D	B	C	D	D	D	
Chlorophyll a					D	D	D	F	B	D	C	
Secchi Depth					B	C	C	C	C	D	D	B
<b>Lake Grade</b>					<b>C</b>	<b>D</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>D</b>	<b>D</b>	

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					D	F
Chlorophyll a					C	F
Secchi Depth	C	D	D	D	D	C
<b>Lake Grade</b>				<b>D</b>	<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



## Lucy Lake (10-0006) City of Chanhassen

Lucy Lake is located within the City of Chanhassen (Carver County). It has a surface area of 87 acres and a maximum depth of 6.4 m (21 ft). Ninety nine percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

This was the first year that the lake was part of the CAMP. Historical Secchi depth monitoring was done on the lake prior to 2009 by the MPCA's citizen volunteer program.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	44.9	27.0	73.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	23.5	7.9	49.0	C
<b>Secchi</b> (m)	1.5	0.6	3.0	C
<b>TKN</b> (mg/l)	1.65	1.20	2.00	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

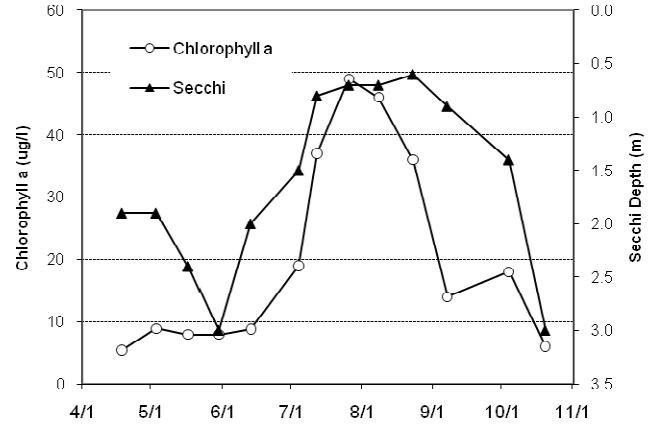
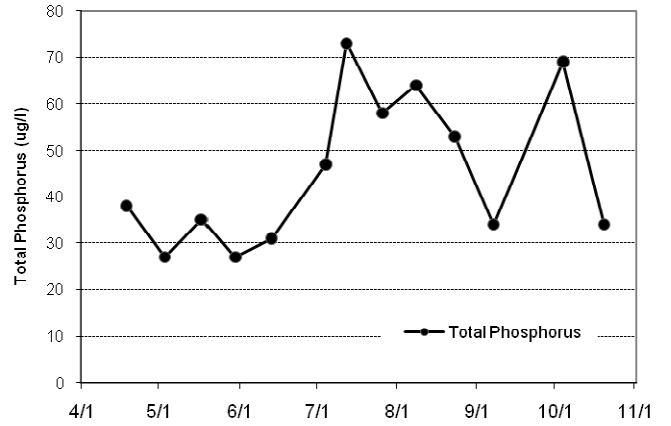
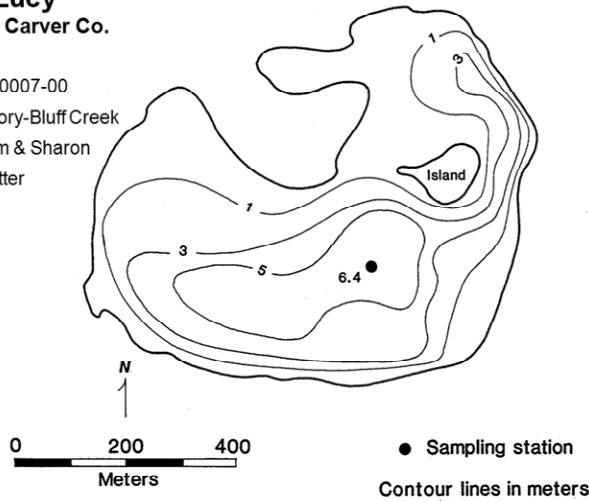
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

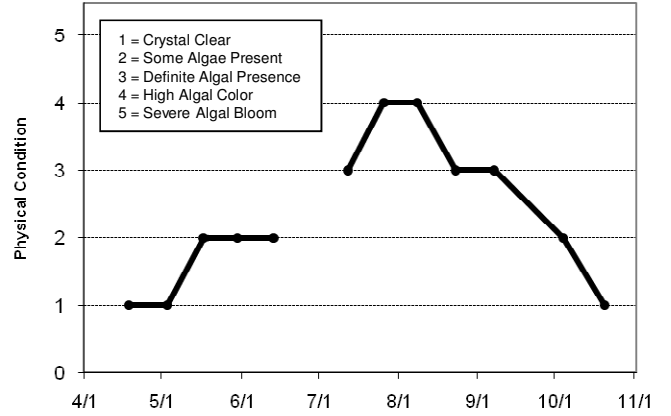
**Lake Lucy**  
Chanhasen, Carver Co.

Lake ID: 100007-00  
WD: Riley-Purgatory-Bluff Creek  
Volunteers: Tim & Sharon  
McCotter



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/18	16				5.4	38		1.9	1	1
5/3	15				8.9	27		1.9	1	1
5/17	15.2				7.9	35		2.4	2	
5/30	19.8				7.9	27		3.0	2	
6/13	19.9				8.8	31		2.0	2	2
7/4	23.4				19	47		1.5		
7/12	25.2				37	73		0.8	3	2
7/26	23				49	58		0.7	4	2
8/8	23.4				46	64		0.7	4	
8/23	23.1				36	53		0.6	3	
9/7	22.6				14	34		0.9	3	3
10/4	12.8				18	69		1.4	2	
10/20	8.6				6	34		3.0	1	1

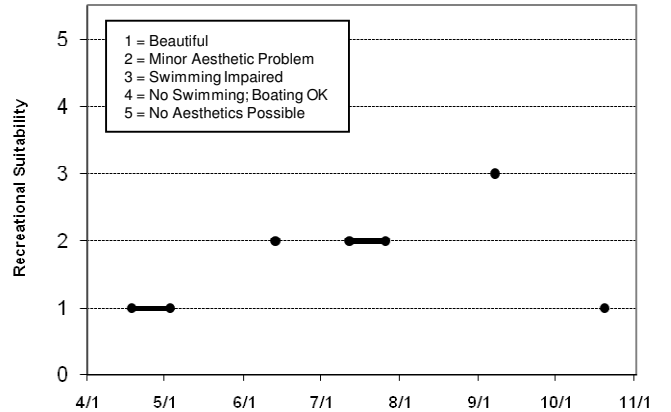


**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus						C						
Chlorophyll a						C						
Secchi Depth						C					C	C
<b>Lake Grade</b>						<b>C</b>						

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						C
Chlorophyll a						C
Secchi Depth	D	D	C	C	D	C
<b>Lake Grade</b>						<b>C</b>



Source: Metropolitan Council and STORET data

## Lynch Lake (82-0042) Browns Creek Watershed District

Lynch Lake is located in Washington County. It has a surface area of 43 acres. There is little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

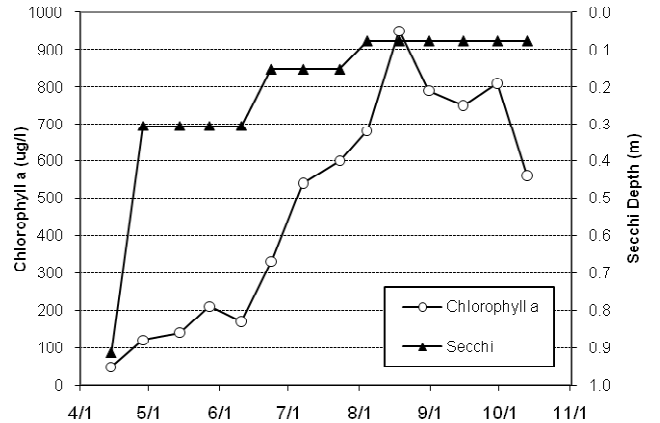
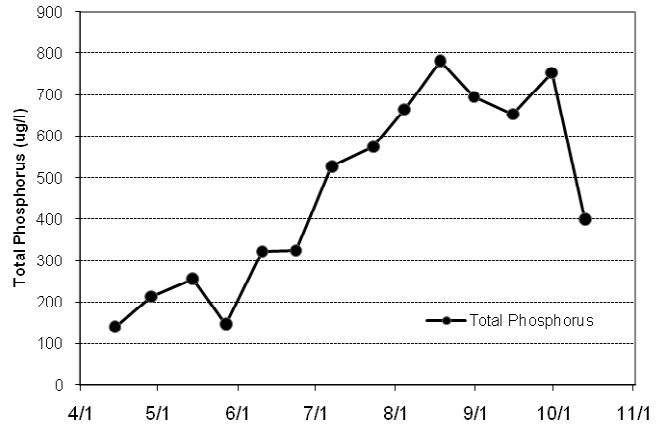
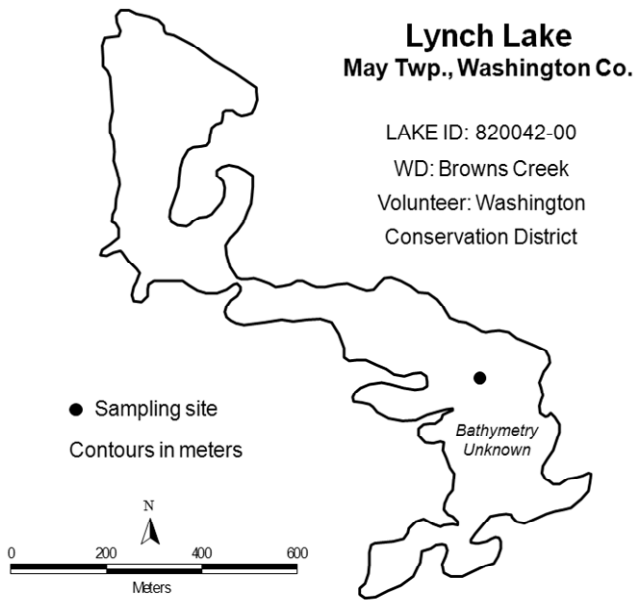
### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	517.7	147.0	781.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	542.7	140.0	950.0	F
<b>Secchi</b> (m)	0.2	0.1	0.3	F
<b>TKN</b> (mg/l)	10.03	3.00	15.00	
			<i>Lake Grade</i>	F

The lake received a lake grade of F for 2009. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

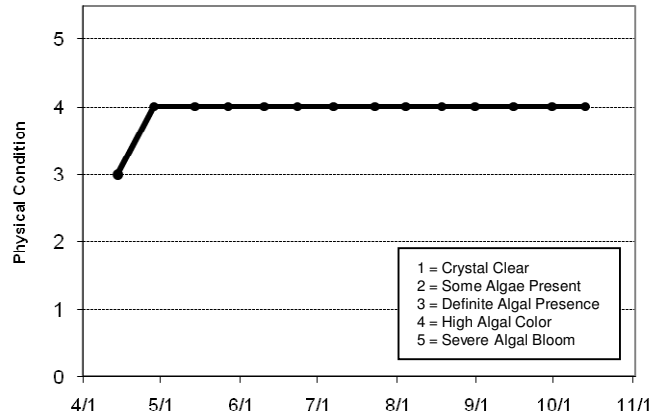
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



#### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	12.9	12.7	11.68	11.61	48	140		0.9	3	3
4/28	12	11.6	12.37	0.15	120	213		0.3	4	4
5/14	13.8	13.9	8.83	0.11	140	256		0.3	4	4
5/27	17.1	17	8.26	2.96	210	147		0.3	4	4
6/10	16	14.8	7.73	0.11	170	322		0.3	4	4
6/23	28.9	23.6	11.98	0.15	330	324		0.2	4	4
7/7	23.9	22.4	8.43	0.09	540	527		0.2	4	4
7/23	22.4	20.9	10.98	0.11	600	574		0.2	4	4
8/4	25	22.7	11.88	0.26	680	664		0.1	4	4
8/18	21.5	21.7	8.99	0.14	950	781		0.1	4	4
8/31	21.7		13.56		790	695		0.1	4	4
9/15	23.4	21.4	12.23	0.09	750	653		0.1	4	4
9/30	10.2		11.13		810	752		0.1	4	4
10/13	5.3	5.5	11.68	0.11	560	400		0.1	4	4

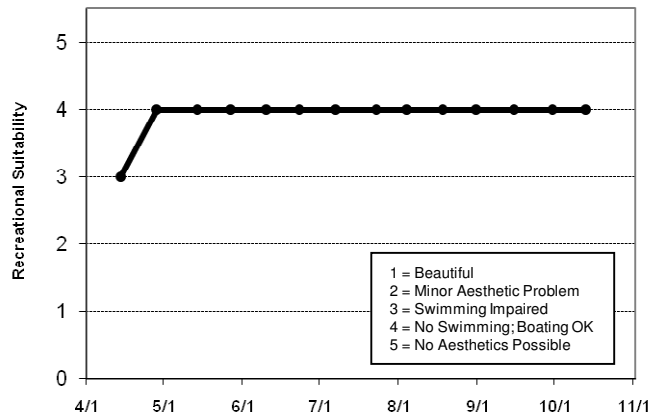


#### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			F	F	F	F
Chlorophyll a			F	F	F	F
Secchi Depth			F	F	F	F
Lake Grade			F	F	F	F



Source: Metropolitan Council and STORET data

**Magda Lake (27-00656) Shingle Creek Watershed Management Commission**

Magda Lake is located in the City of Brooklyn Park (Hennepin County). Little morphological data is available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	106.5	66.0	144.0	D
<b>CLA</b> (µg/l)	51.8	25.0	76.0	D
<b>Secchi</b> (m)	0.5	0.4	0.8	F
<b>TKN</b> (mg/l)	2.05	1.60	2.80	
			<b>Lake Grade</b>	D

The lake received a lake grade of D for 2009, which is consistent with its historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake’s water quality and determine potential water quality trends.

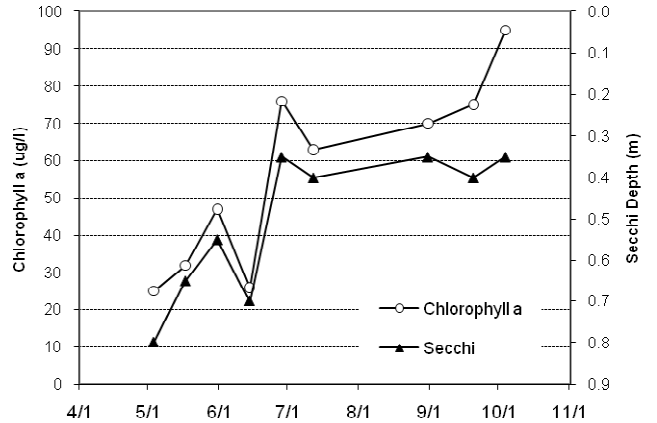
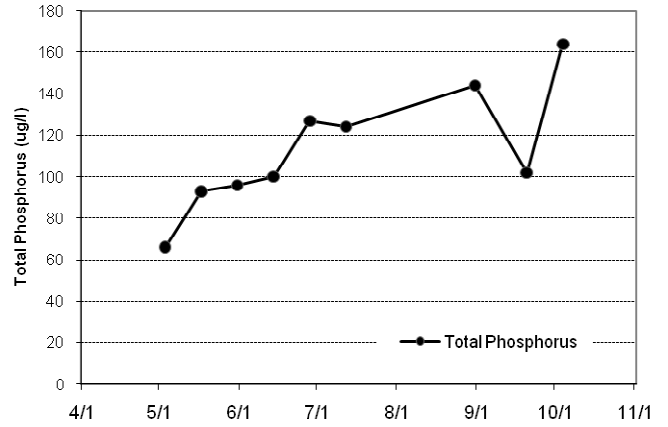
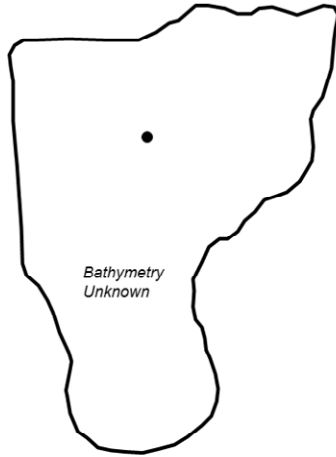
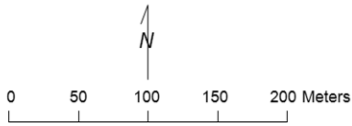
Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Lake Magda Brooklyn Park, Hennepin Co.

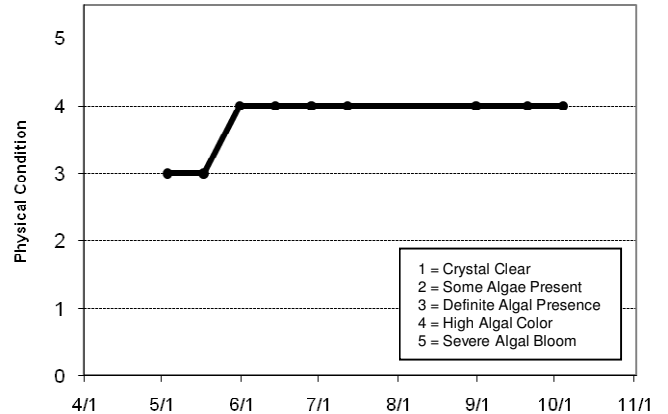
Lake ID: 270065-00  
WMO: Shingle Creek  
Volunteer: Carolyn Dindorf

● Sampling site  
Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	16.7				25	66		0.8	3	3
5/17	18.6				32	93		0.7	3	3
5/31	21.7				47	96		0.6	4	4
6/14	26.1				26	100		0.7	4	4
6/28	25.2				76	127		0.4	4	4
7/12	24.9				63	124		0.4	4	4
8/31	21				70	144		0.4	4	4
9/20	23				75	102		0.4	4	4
10/4	11				95	164		0.4	4	4

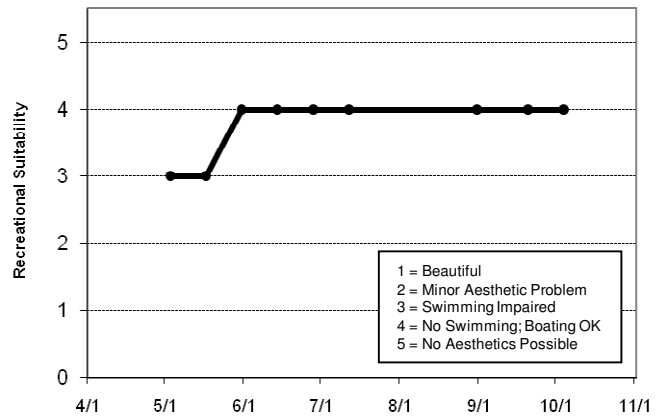


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			F			D
Chlorophyll a			F			D
Secchi Depth			F			F
<b>Lake Grade</b>			<b>F</b>			<b>D</b>



Source: Metropolitan Council and STORET data

## Marion Lake (19-0026) City of Lakeville

Marion Lake is located in the City of Lakeville (Dakota County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a surface area of approximately 560 acres, and has a maximum depth of 6.4 m (21 feet). The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*). The lake gets heavy use by area fishermen and other lake users during the winter and summer months.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	52.5	20.0	115.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	29.2	3.9	88.0	C
<b>Secchi</b> (m)	1.9	1.0	3.1	C
<b>TKN</b> (mg/l)	1.28	0.86	1.90	
			<b>Lake Grade</b>	C

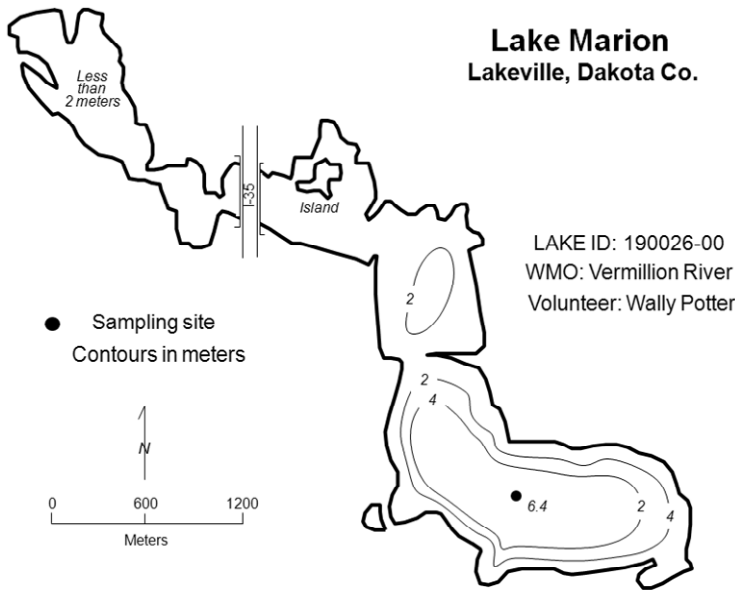
The lake received a lake grade of C for 2009, which is consistent with recent lake grades. On the basis of the historical water quality database, the surface water quality of the lake has varied from Bs to a D, with Cs being most common. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).





**2009 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
4/17	11.3				13	33		2.0	1	1
4/28	12.4				13	31		1.8	1	1
5/14	15.2				9.8	29		1.8	1	1
5/26	18.6				6	76		2.5	2	1
6/10	17.4				3.9	20		3.0	2	1
6/23	26.4				6.6	33		3.1	2	1
7/10	24.1				16	25		2.2	2	1
7/21	24.7				19	38		1.8	2	1
8/4	23.8				64	69		1.0	2	1
8/18	24.5				40	115		1.3	2	1
8/31	22.2				88	73		1.2	2	1
9/17	23.8				27	36		1.8	2	1
9/29	17.6				41	63		1.5	2	1
10/16	8.5				16	33		2.0	3	1

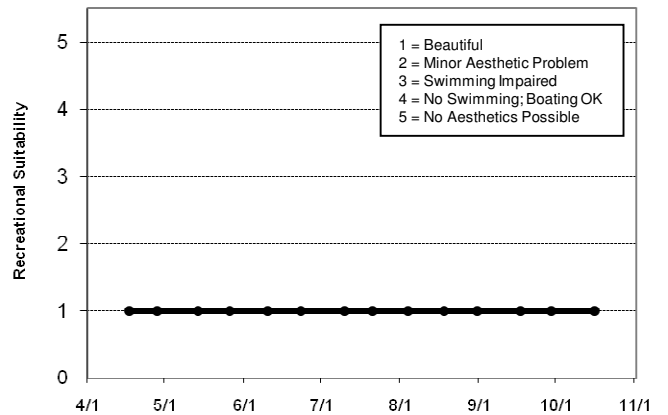
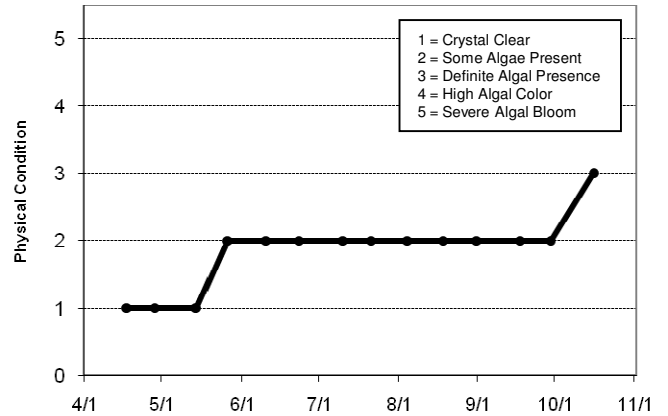
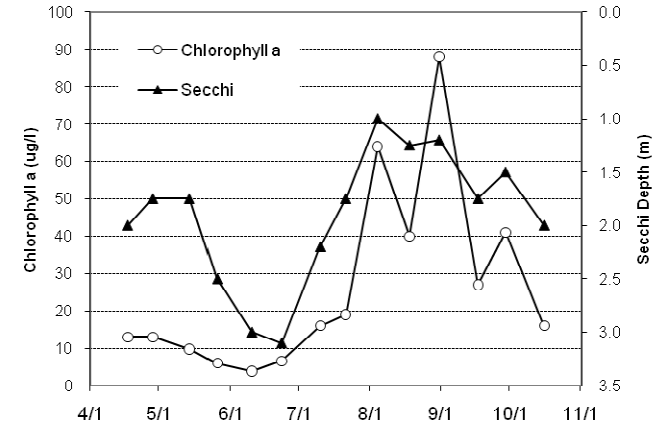
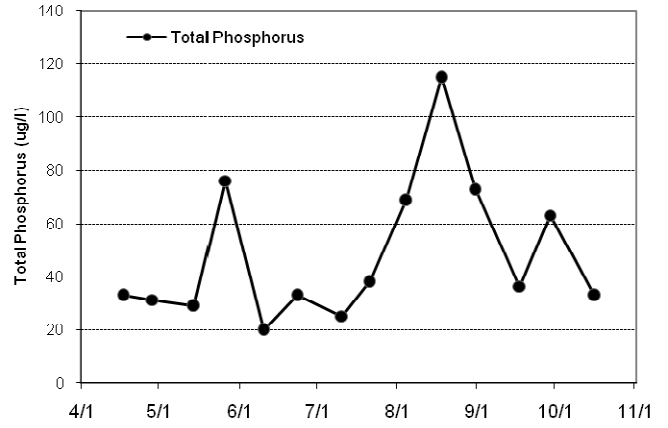
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	C	C	C					C		C		
Chlorophyll a	C	D	C					C		C		
Secchi Depth	C	D	B					C		C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>D</b>	<b>C</b>					<b>C</b>		<b>C</b>		

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus			B					B	B	B	C	B
Chlorophyll a			A					B	A	B	B	C
Secchi Depth			B					C	B	B	C	C
<b>Lake Grade</b>			<b>B</b>					<b>B</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	C
Chlorophyll a	C	C	C	C	C	C
Secchi Depth	C	C	C	C	B	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## Markgrafs Lake (82-0089) City of Woodbury

Markgrafs Lake is located within the City of Woodbury (Washington County). It has a surface area of approximately 46 acres, and a maximum depth of 2.4 m (8 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has a piped outlet on the southern end. Downstream from the outlet is a valve that can direct the overflow to either Powers or Wilmes lakes. The lake is used by the MDNR Fisheries as a rearing pond for walleyes.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	238.7	168.0	341.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	79.2	51.0	95.0	F
<b>Secchi</b> (m)	0.4	0.3	0.4	F
<b>TKN</b> (mg/l)	3.88	2.70	4.60	
			<b>Lake Grade</b>	F

The lake received a lake grade of F for 2009. Over the past decade, the lake grades have varied back and forth in the D and F range.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

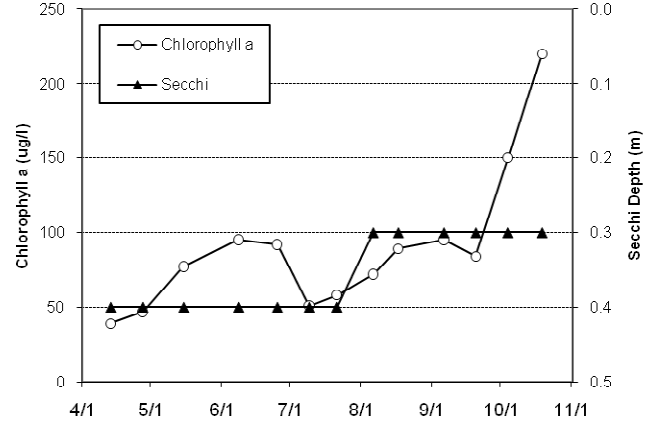
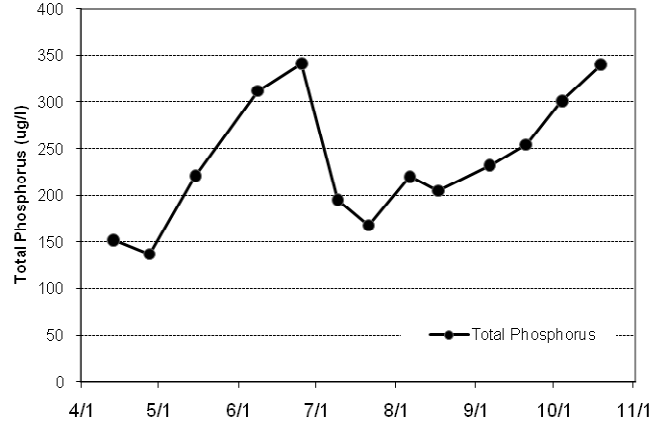
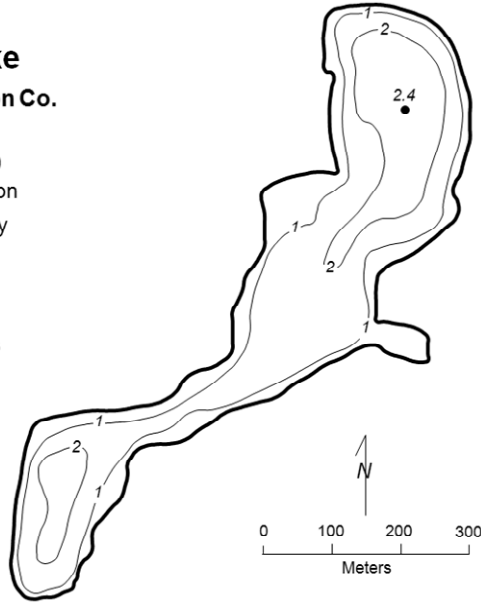
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Markgrafs Lake

Woodbury, Washington Co.

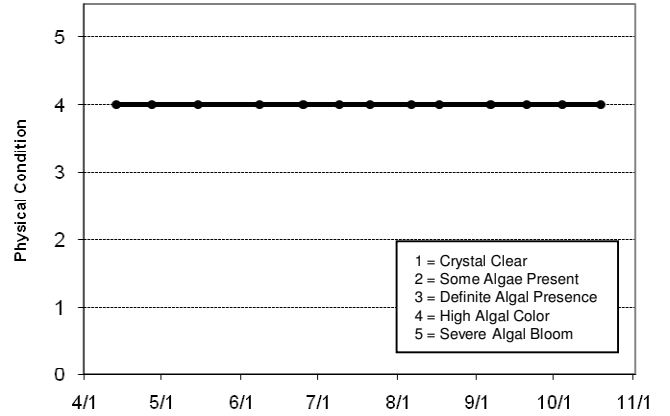
Lake ID: 820089-00  
 WD: South Washington  
 Volunteer: Terry Riley

- Sampling site
- Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	17.1				39	152		0.4	4	4
4/27	18.7				47	137		0.4	4	4
5/15	18.1				77	221		0.4	4	4
6/8	17.2				95	312		0.4	4	4
6/25	17				92	341		0.4	4	4
7/9	24.7				51	195		0.4	4	4
7/21	25.3				58	168		0.4	4	4
8/6	25.1				72	220		0.3	4	4
8/17	22.3				89	205		0.3	4	4
9/6	21.8				95	232		0.3	4	4
9/20	18.6				84	254		0.3	4	4
10/4	10.1				150	301		0.3	4	4
10/19	8.4				220	340		0.3	4	4

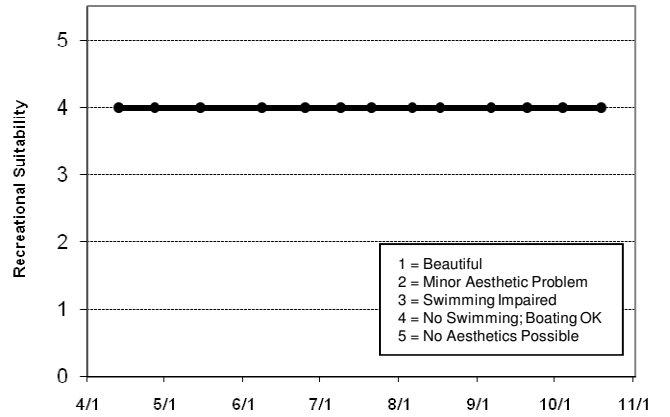


### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus		D	C	D	D	F	D	D	F	F	F	D
Chlorophyll a		C	B	B	C	F	C	C	C	C	C	C
Secchi Depth		D	C	C	D	F	D	C	D	F	F	D
<b>Lake Grade</b>		<b>D</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>F</b>	<b>D</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	F	D	D	F
Chlorophyll a	D	C	D	D	D	F
Secchi Depth	F	F	F	F	F	F
<b>Lake Grade</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>D</b>	<b>D</b>	<b>F</b>



Source: Metropolitan Council and STORET data

### **Masterman Lake (82-0126) Browns Creek Watershed District**

Masterman Lake is located in Grant Township (Washington County). It has a surface area of 45 acres. There is very little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

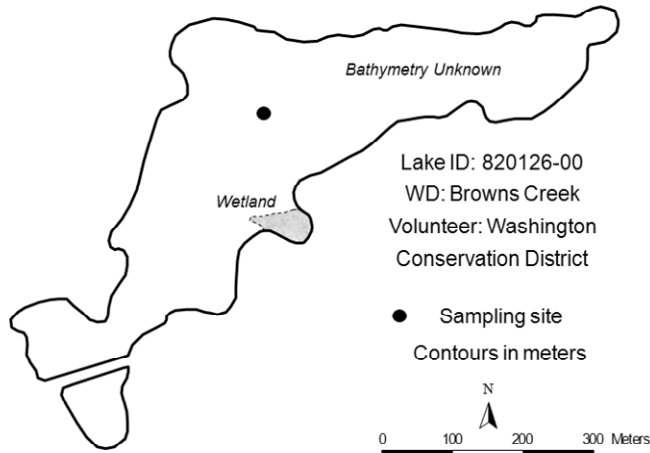
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	44.1	31.0	70.0	<b>C</b>
<b>CLA</b> ( $\mu\text{g/l}$ )	10.6	5.9	16.0	<b>B</b>
<b>Secchi</b> (m)	2.0	1.8	2.3	<b>C</b>
<b>TKN</b> (mg/l)	1.08	0.96	1.30	
			<b>Lake Grade</b>	<b>C</b>

The lake received a lake grade of C for 2009, which is similar to the lake grades received in the previous three years. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Masterman Lake Grant, Washington Co.



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	12.1	10.2	10.97	7.54	6.5	52		2.3	1	1
4/27	12.8	12.8	9.35	0.98	6.1	35		1.7	2	2
5/12	16.1	15.9	9.21	2.46	8.1	31		2.1	2	3
5/26	20.6	20.3	8.33	1.38	14	35		2.1	2	2
6/9	15.9	15.7	5.04	4.33	9.1	47		2.3	2	2
6/24	27.4	25.3	7.3	1.63	7.3	31		2.1	2	2
7/7	24.5	23.2	7.98	0.49	6.8	41		2.1	2	2
7/23	22.6	22.1	7.61	1.17	5.9	52		2.1	1	1
8/3	24.2	22.5	7.27	0.95	11	49		1.8	2	3
8/18	23.8	23.6	4.1	2.25	10	42		1.8	2	2
8/31	21.8	20.3	5.87	4.03	16	70		2.1	2	2
9/15	25.4	23.3	6.77	1.29	14	43		1.8	2	2
9/30	13.8	14	6.68	5.69	14	44		1.8	2	2
10/14	6.3	6.3	10.19	9.42	2.1	27		2.1	1	1

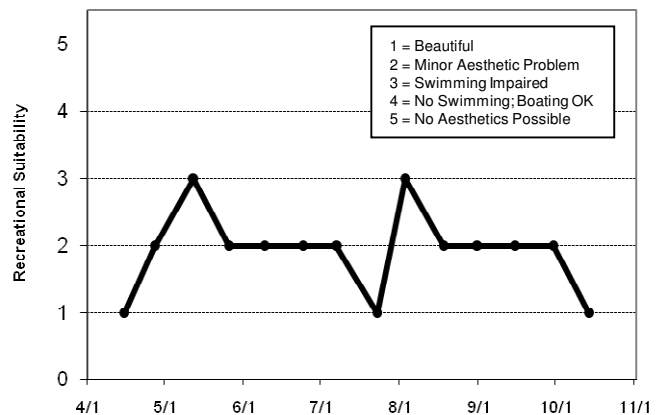
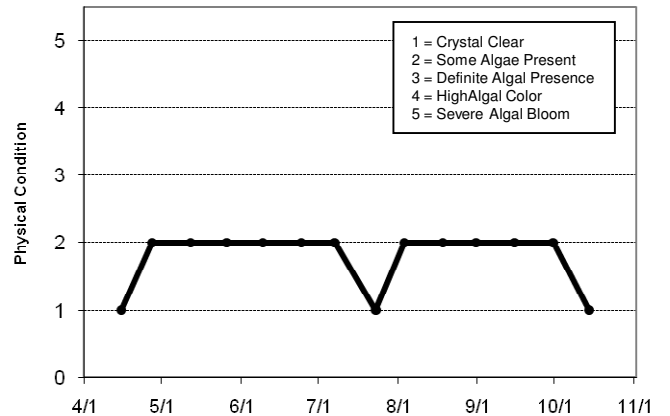
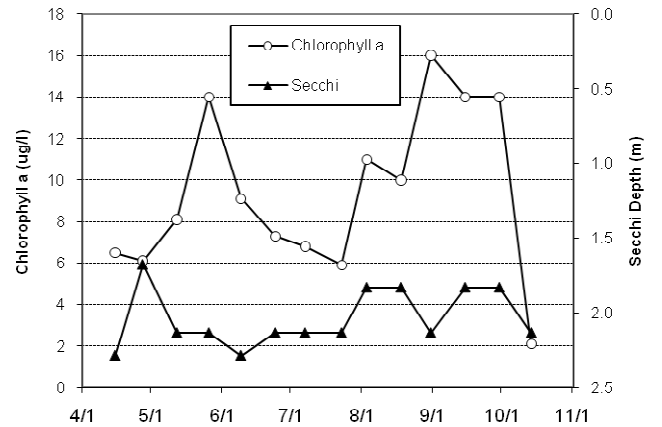
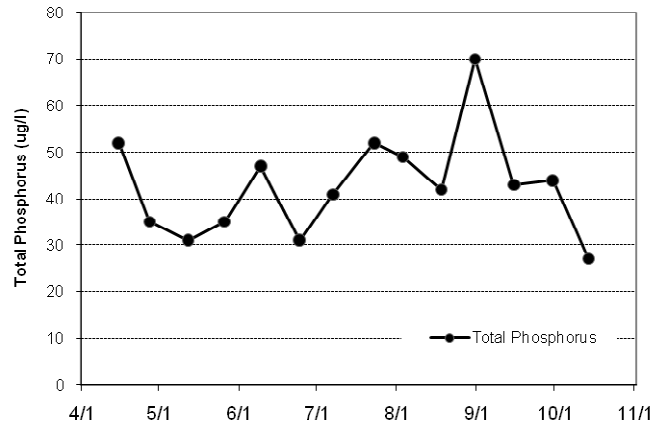
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						
Chlorophyll <i>a</i>			C	C	C	C
Secchi Depth			B	B	B	B
<b>Lake Grade</b>			C	C	C	C

Source: Metropolitan Council and STORET data



### **Mays Lake (82-0033) Carnelian-Marine Watershed District**

Mays Lake is located in Mays Township (Washington County). The lake has a surface area of 25 acres, and a maximum depth of 7.6 m (25 ft). Approximately 92 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. 2008 was the second year that Mays Lake was involved in the CAMP.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	17.7	8.0	38.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	2.8	1.4	5.0	A
<b>Secchi</b> (m)	5.8	4.8	6.3	A
<b>TKN</b> (mg/l)	0.63	0.51	0.80	
<b>Lake Grade</b>				A

The lake received a lake grade of A for 2009. This lake has the distinction as being the second best lake for water quality in the 2009 CAMP. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

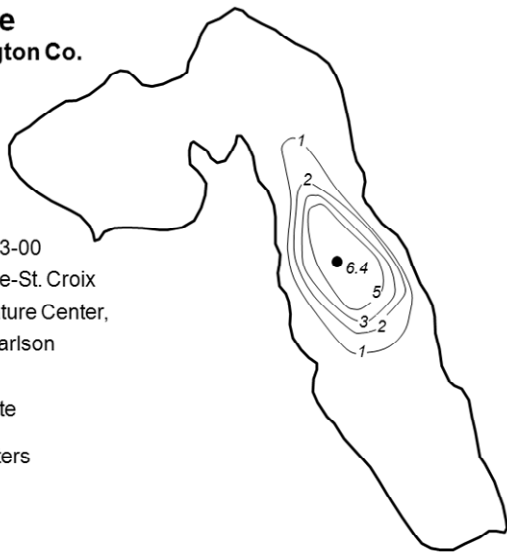
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Mays Lake

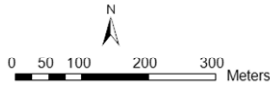
May Twp., Washington Co.



Lake ID: 820033-00  
 WD: Carnelian-Marine-St. Croix  
 Volunteers: Warner Nature Center,  
 Dan & Andrew Carlson

● Sampling site

Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	12.1				3	26		4.7	2	2
4/29	13.1				2.9	19		5.4	2	1
5/14	15.3				2.8	14		6.1	2	2
5/28	19.7				2.3	38		6.3	2	1
6/8	18				3.8	13		5.8	2	2
6/23	28.4				1.4	21		6.0	2	1
7/7	26.2				2.4	12		6.3	2	1
7/22	24.6				1.6	14		6.2	2	2
8/5	23.8				1.9	8		6.3	2	1
8/18	25.4				2.9	20		5.5	2	1
9/2	22.4				2.9	26		5.4	2	1
9/16	24.2				3.4	16		5.0	2	2
9/29	17.6				5	13		4.8	2	2
10/13	9.2				3.9	31		6.1	1	1

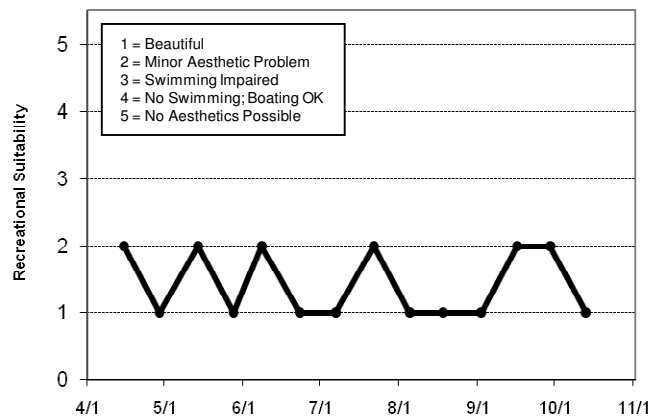
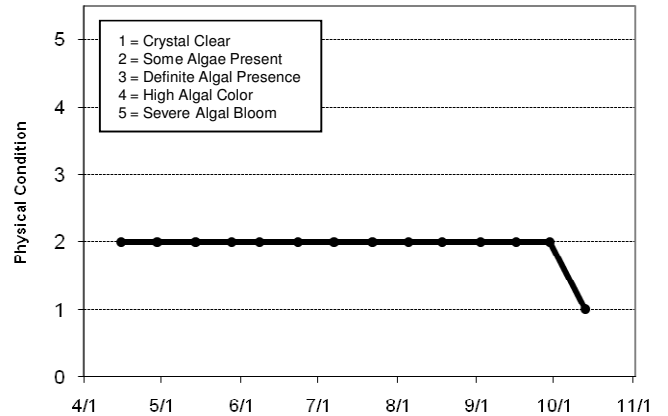
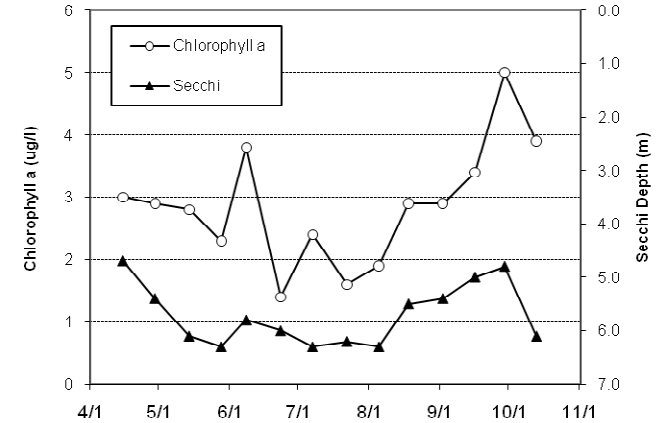
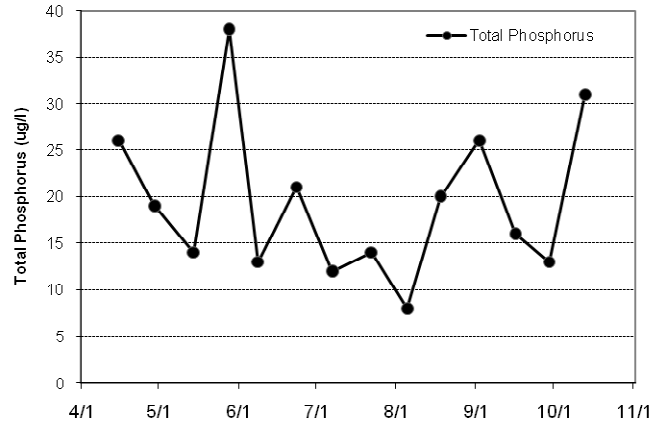
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					A	A
Chlorophyll a					A	A
Secchi Depth					A	A
<b>Lake Grade</b>					<b>A</b>	<b>A</b>

Source: Metropolitan Council and STORET data



## McDonald Lake (82-0010) Valley Branch Watershed District

McDonald Lake is a 54-acre land-locked (no outlet) lake located within Baytown Township (Washington County). The mean and maximum depth of the lake is 1.8 m (nearly 6 feet) and 3.7 m (roughly 12 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the next page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	50.2	40.0	59.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	18.0	4.9	37.0	B
<b>Secchi</b> (m)	1.8	1.1	2.9	C
<b>TKN</b> (mg/l)	1.04	0.88	1.30	
			<i>Lake Grade</i>	C

The lake's 2009 lake grade of C is consistent with its historical database. The lake's water quality seems well represented by a lake grade of C, with some variation from year to year.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



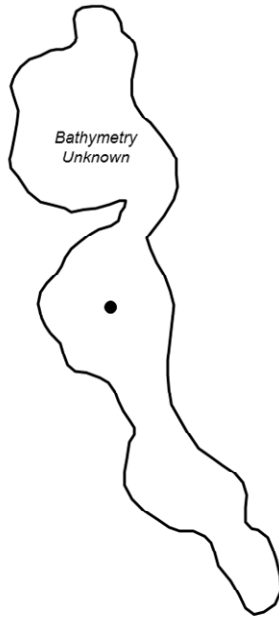
# McDonald Lake

Baytown Twp., Washington Co.

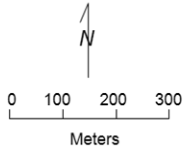
Lake ID: 820010-00

WD: Valley Branch

Primary Volunteer: Randy Hunt

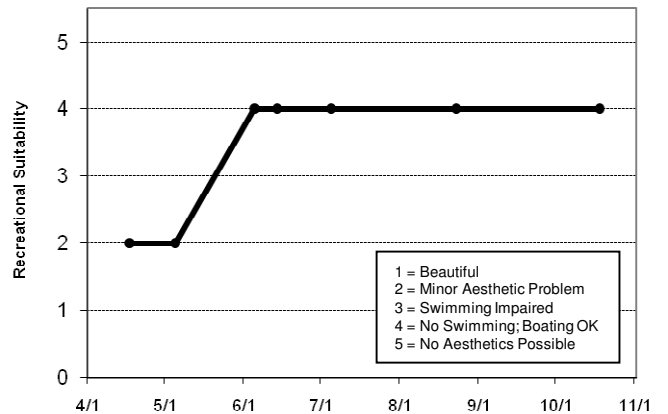
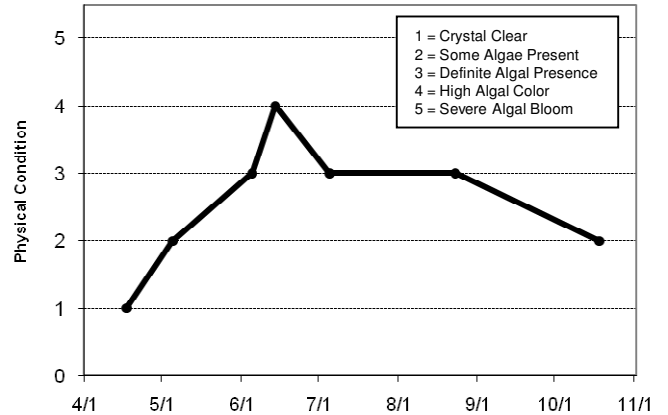
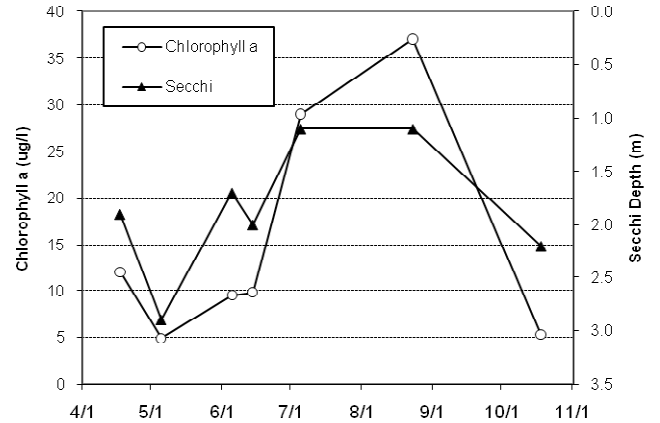
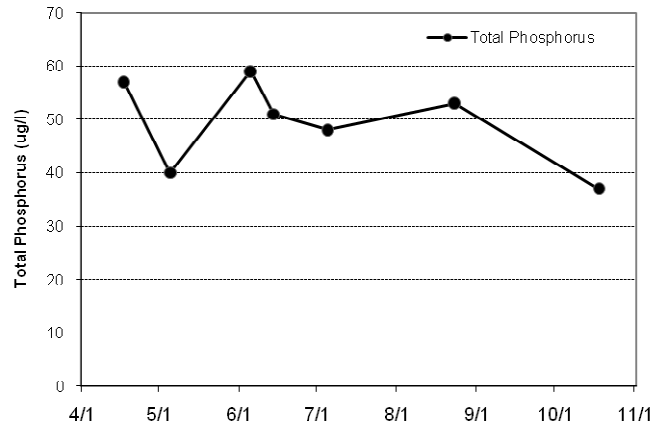


● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/17	13.8				12	57		1.9	1	2
5/5	16				4.9	40		2.9	2	2
6/5	18.5				9.5	59		1.7	3	4
6/14	25.1				9.8	51		2.0	4	4
7/5	24.5				29	48		1.1	3	4
8/23	23.8				37	53		1.1	3	4
10/18	7.8				5.3	37		2.2	2	4



## 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												
Lake Grade												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	C
Chlorophyll a	B	B	C	F	C	B
Secchi Depth	B	C	C	C	C	C
Lake Grade	B	C	C	D	C	C

Source: Metropolitan Council and STORET data

## McKnight Lake (10-0216) Carver County Environmental Services

McKnight Lake is a small lake located in Carver County. There is very little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	211.4	132.0	291.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	99.2	25.0	160.0	F
<b>Secchi</b> (m)	0.4	0.2	0.8	F
<b>TKN</b> (mg/l)	3.11	1.90	3.70	
			<b>Overall Grade</b>	F

The lake received a lake grade of F for 2009, which is similar to previous years' lake grades. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

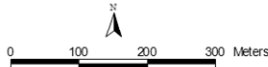
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# McKnight Lake Chaska, Carver Co.

Lake ID: 100216-00  
WMO: Hazeltine-Bavaria  
Volunteer: Carver Co.

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	10.66		14.8		120			0.5	3	3
4/28	13.3		11.4		94	177		0.4	3	3
5/14	17.33		7.12		35	132		0.8	3	4
5/26	20.31		7.09		25	133		0.7	3	4
6/10	16.7		11.34		74			0.4	3	4
6/25	26.2		14.7		110	191		0.4	4	4
7/8	24.02		14.1		97	214		0.3	4	4
7/22	21.76		10.65		140	274		0.3	4	4
8/5	23		9.45		100	291		0.2	4	5
8/20	21.95		4.9		160	234		0.3	4	4
9/1	21.35		10.6		140	236		0.3	4	4
9/15	24.55		12.7		130	209		0.3	4	4
9/30	15.5		6.32		80	200		0.3	3	3
10/19	8.37		9.43		56	144		0.5	4	4

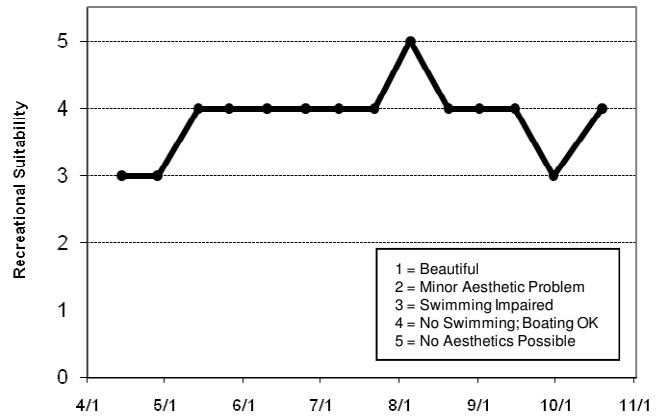
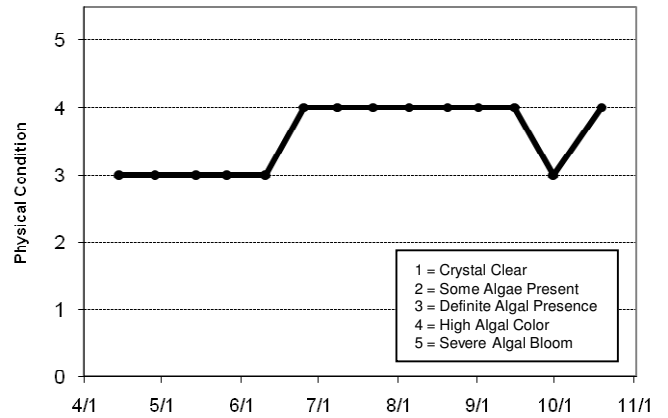
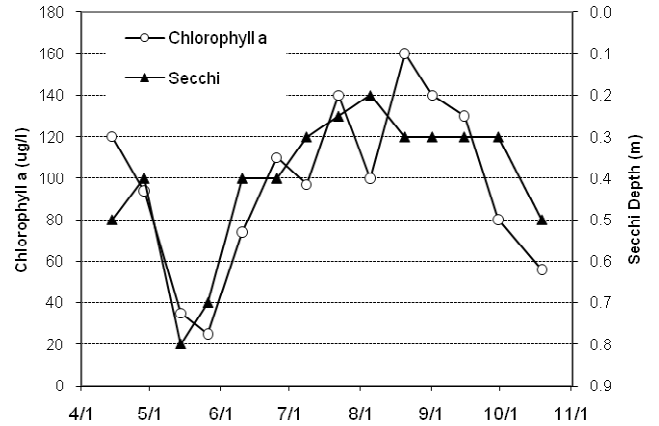
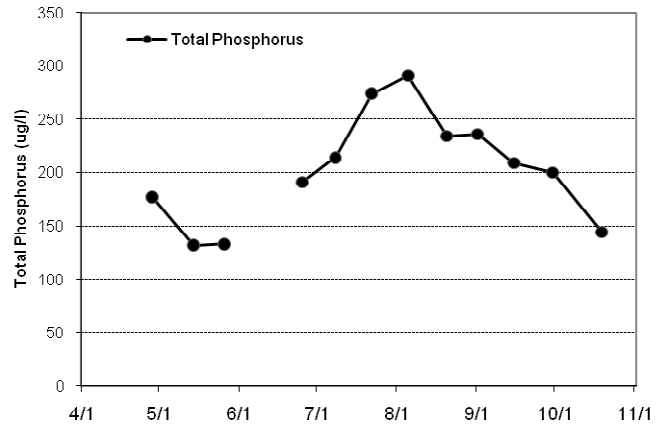
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			F	F	F	F
Chlorophyll a			D	F	F	F
Secchi Depth			F	F	F	F
Lake Grade			F	F	F	F

Source: Metropolitan Council and STORET data



**McKusick Lake (82-0020) Middle St. Croix Watershed Management Organization**

Lake McKusick is located in the City of Stillwater (Washington County). The lake has surface area of 46 acres, and a maximum depth of 4.7 m (15 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

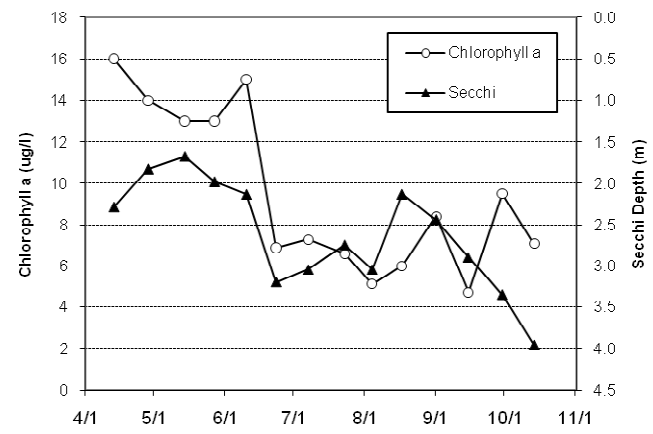
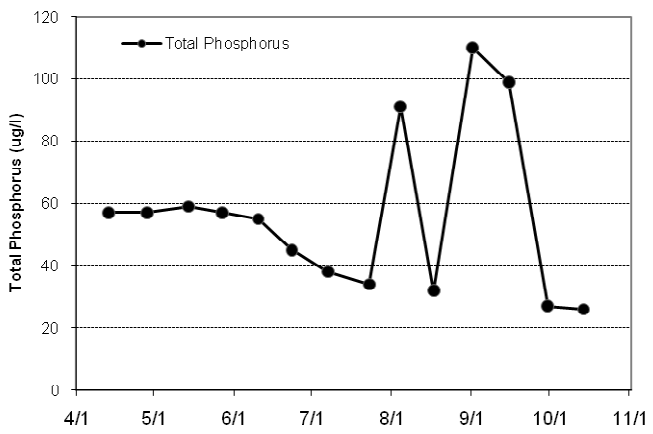
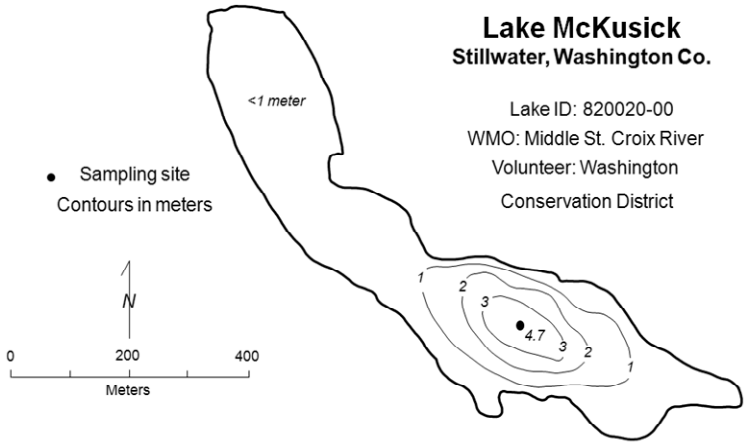
**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	58.8	27.0	110.0	C
<b>CLA</b> (µg/l)	8.7	4.7	15.0	A
<b>Secchi</b> (m)	2.6	1.7	3.4	B
<b>TKN</b> (mg/l)	1.17	0.93	1.70	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009, which is similar to lake grades received in some past years. The lake grades over the past 15 years have varied from C to D range. The historical water quality database suggests that the lake has been represented by a lake grade of C or B for the past 10 years. The lake has not received a D lake grade since 1999.

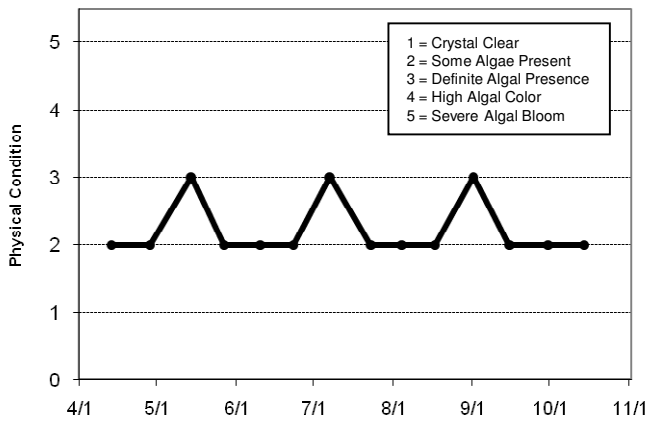
Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	11.9	7.7	10.39	0.19	16	57		2.3	2	2
4/28	13.7	12	10.73	0.11	14	57		1.8	2	3
5/14	14.6	14.3	8.46	0.13	13	59		1.7	3	3
5/27	18.6	14.6	9.65	0.11	13	57		2.0	2	4
6/10	17	15.2	8.95	0.2	15	55		2.1	2	2
6/23	27.4	15.9	8.59	0.11	6.9	45		3.2	2	3
7/7	25.2	18.9	11.92	0.11	7.3	38		3.0	3	4
7/23	23.7	19.3	10.83	0.17	6.6	34		2.7	2	3
8/4	24.3	20.8	9.97	0.11	5.1	91		3.0	2	3
8/17	26	20.9	7.61	0.05	6	32		2.1	2	3
9/1	20.6	19	9.26	2.69	8.4	110		2.4	3	3
9/15	23.2	19.1	10.17	0.08	4.7	99		2.9	2	3
9/30	14.4	14.4	9.66	0.08	9.5	27		3.4	2	3
10/14	6.7	6.7	12.89	0.11	7.1	26		4.0	2	2

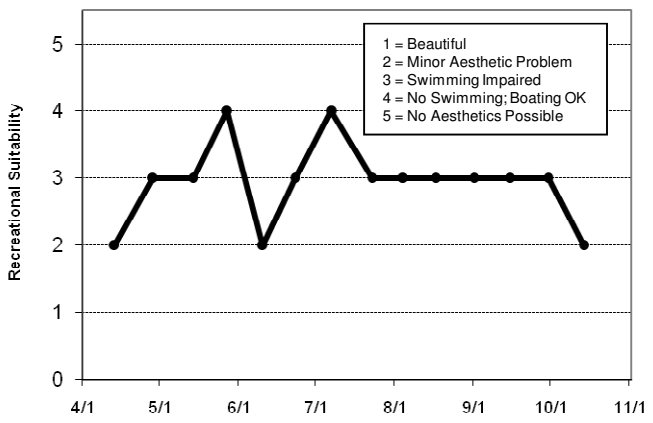


**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	C
Chlorophyll a	A	B	B	B	B	A
Secchi Depth	B	C	C	C	C	B
<b>Lake Grade</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>



Source: Metropolitan Council and STORET data

## McMahon Lake (70-0050) Scott County Watershed Management Organization

McMahon Lake, also known as Carl's Lake, is located in Spring Lake Township (Scott County). The lake has a surface area of 110 acres and a maximum depth of 4.5 m (14 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	57.5	6.0	140.0	C
<b>CLA</b> (µg/l)	36.1	3.2	80.0	C
<b>Secchi</b> (m)	1.1	0.3	2.0	D
<b>TKN</b> (mg/l)	1.56	0.50	3.20	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009, which is similar to the lake grade received in 2007. The lake historically has been characterized as a D lake. But recent monitoring has shown improvements to the C grade on occasion. Continued monitoring is suggested to determine if there are trends in the lake's water quality.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

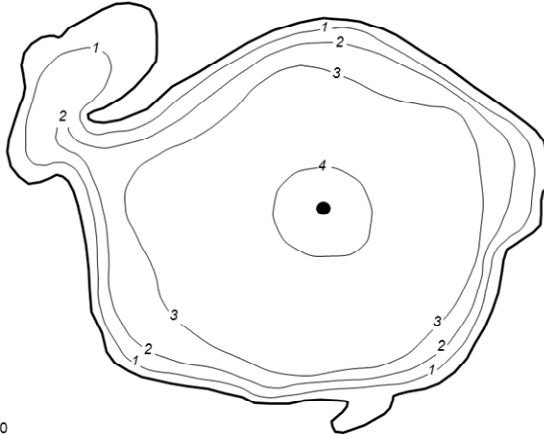
# McMahon Lake

Spring Lake Twp.,  
Scott Co.

Lake ID: 700050-00  
WMO: Sand Creek

Volunteers:  
Joe & Diane  
Williamson

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/24	13.9				7.1	29		1.7	1	1
5/4					3.2	72		2.0	1	1
5/28	18.8				7.5	35		1.7	2	1
6/17	21				15	39		1.9	1	1
7/6	25				22	44		0.9	3	1
7/21	21				43	6		0.7	2	1
8/6	25.3				80	140		0.3	2	2
8/31	21.3				51	60		0.8	3	2
9/15	26				67	64		0.7	2	2
10/18	8.5				10	38		1.4	2	1

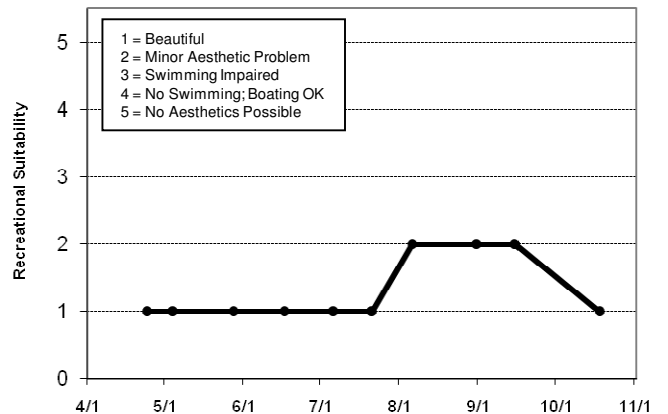
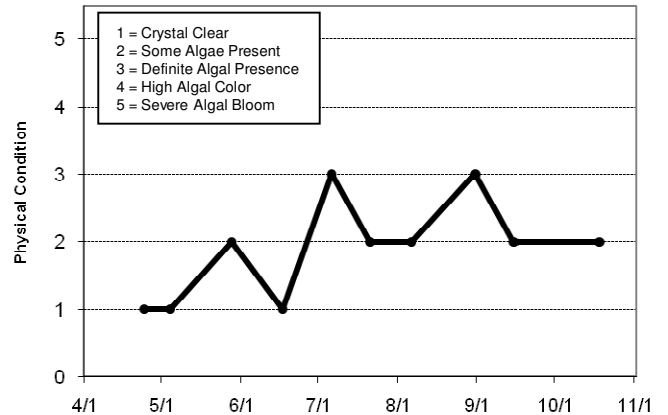
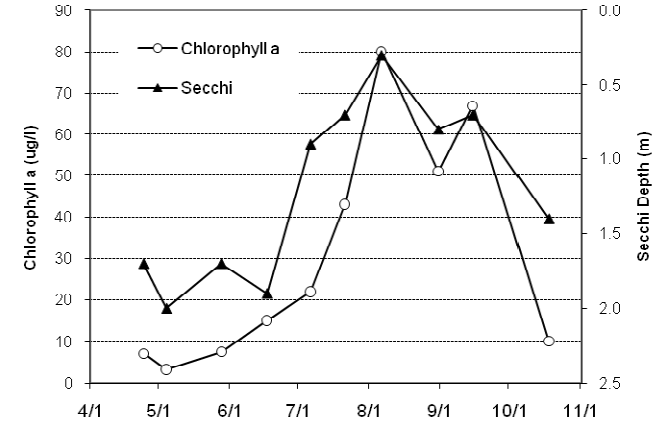
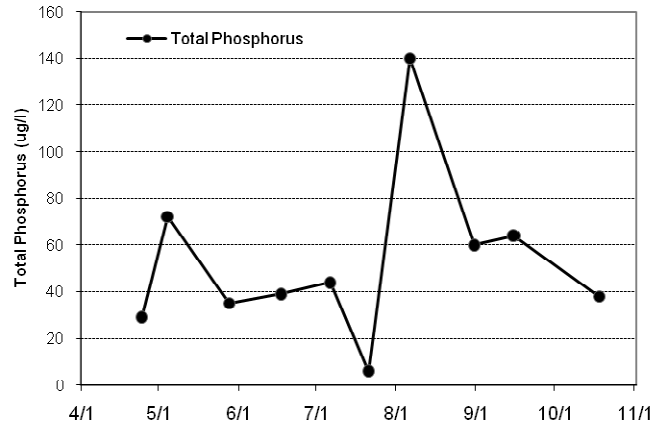
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus		F				D						
Chlorophyll a		F				D						
Secchi Depth		C				D						
<b>Lake Grade</b>		<b>D</b>				<b>D</b>						

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		D	C	C	D	C
Chlorophyll a		F	D	C	C	C
Secchi Depth		D	D	D	D	D
<b>Lake Grade</b>		<b>D</b>	<b>D</b>	<b>C</b>	<b>D</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## **Mergen's Pond (82-0482) Washington Conservation District**

Mergen's Pond is located in the West Lakeland Township (Washington County). The lake has a surface area of 12 acres. The maximum depth of the lake is 1.3 m (4.3 ft). Because of the shallowness of the lake, the entire area is considered littoral zone which is the area of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake's surface area and watershed area of 1,383 acres translate to a watershed-to-lake area ratio of 115, which is very large. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored just once in 2009. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

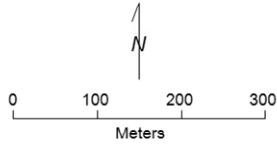
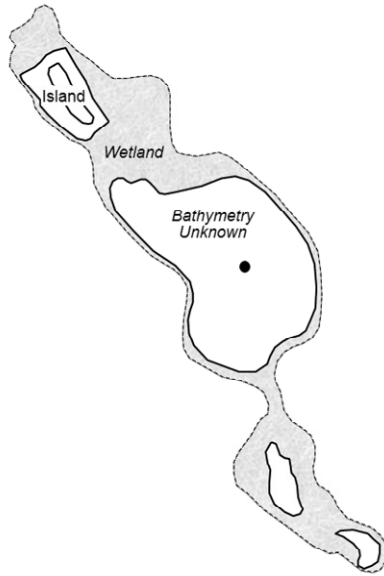
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



# Mergens' Pond West Lakeland Twp., Washington Co.

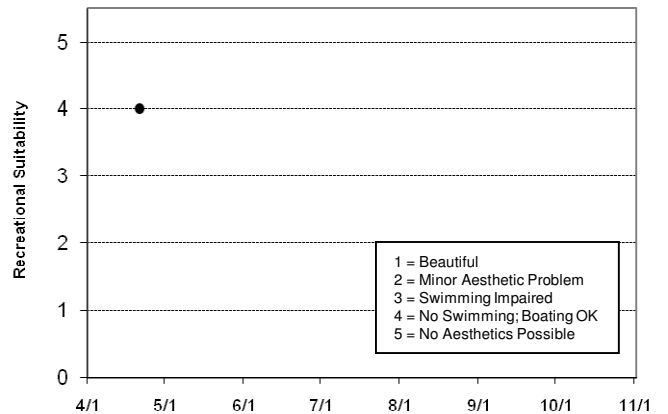
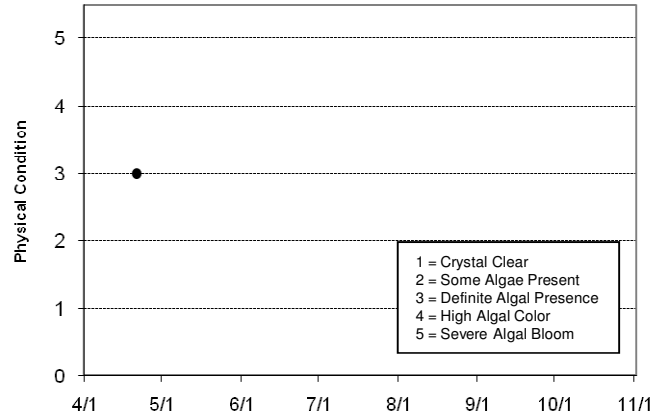
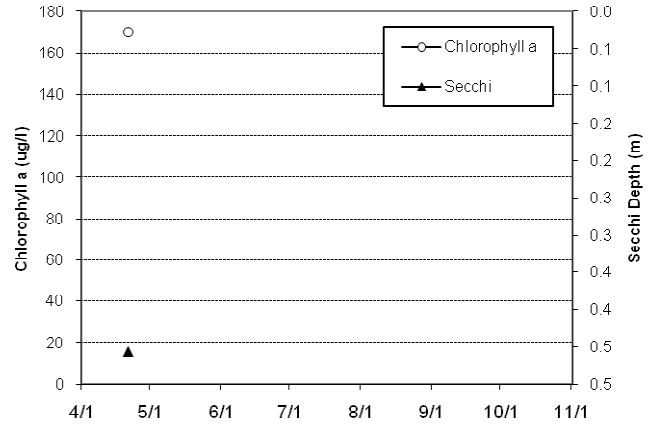
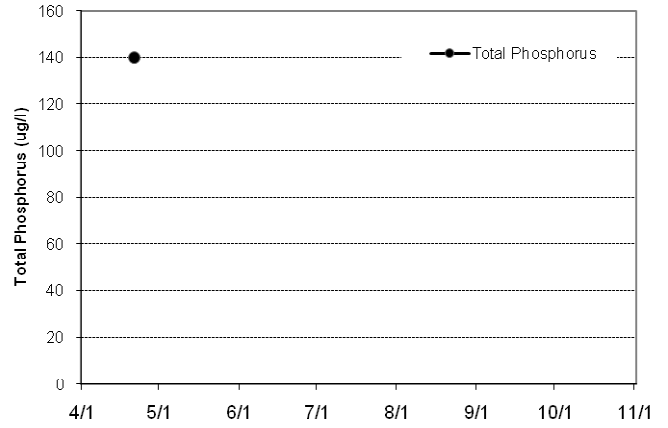
Lake ID: 820482-00  
WD: Valley Branch  
Volunteer: Washington  
Conservation District

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	8.2	9.2	11.38	0.14	170	140		0.5	3	4



## 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												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	NA	D			F	
Chlorophyll a	NA	B			F	
Secchi Depth	NA	D			F	
<b>Lake Grade</b>		<b>C</b>			<b>F</b>	<b>NA</b>

Source: Metropolitan Council and STORET data

## Miller Lake (10-0029) Carver County Environmental Services

Miller Lake is located within Dahlgren Township (Carver County). It has a surface area of 145 acres. The mean and maximum depths of the lake are 3.1 m (10 feet) and 4.3 m (roughly 14 feet), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

The lake has a 16,701-acre immediate watershed, which translates to a large watershed-to-lake area ratio of 115:1 (Carver County Planning 1999). The larger the ratio the greater the potential stress put on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	237.2	85.0	408.0	F
<b>CLA</b> (µg/l)	100.0	17.0	260.0	F
<b>Secchi</b> (m)	0.5	0.1	1.2	F
<b>TKN</b> (mg/l)	2.70	1.00	4.80	
			<b>Lake Grade</b>	F

The lake received a lake grade of F for 2009, which is consistent with its historical database. The historical lake grades typically fall in the range of D to F.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

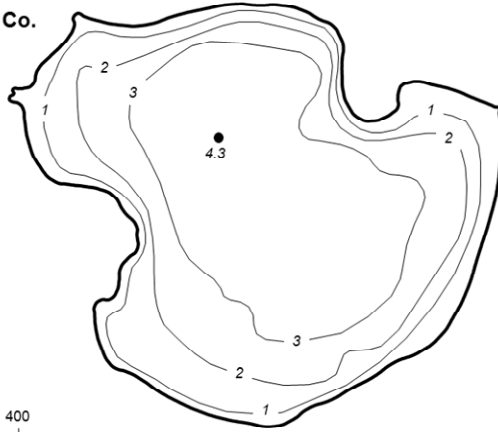
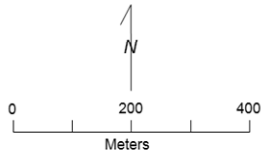
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Miller Lake

Dahlgren Twp., Carver Co.

Lake ID: 100029-00  
 WMO: Carver Creek  
 Volunteer: Carver Co.

● Sampling site  
 Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	9.08		11.33		100	223		0.6	3	3
4/28	12.02		13.26		94	206		0.4	3	3
5/13	15.75		11.02		54	128		0.1	2	2
5/26	19.25		11.6		45	85		0.8	4	4
6/9	17.17		8.5		36	298		0.5	4	4
6/23	28.4		22.43		130	157		0.7	4	4
7/8	24.1		16.91		260	232		0.3	4	4
7/22	22.22		13.35		91	238		0.3	4	4
8/4	23.8		13.83		200	396		0.2	4	4
8/18	23.11		11.93		130	408		0.4	3	3
9/1	20.5		17.11		68	220		0.6	4	4
9/15	24.05		14.15		17	160		1.2	3	3
9/30	15.57		11.27		69	287		0.5	3	3
10/19	6.98		10.47		17	174		1.1	3	3

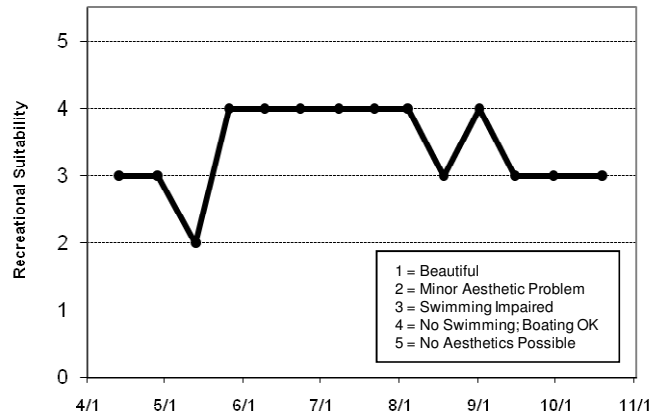
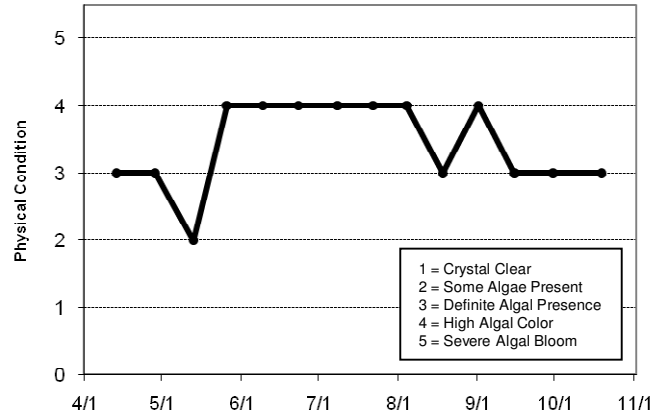
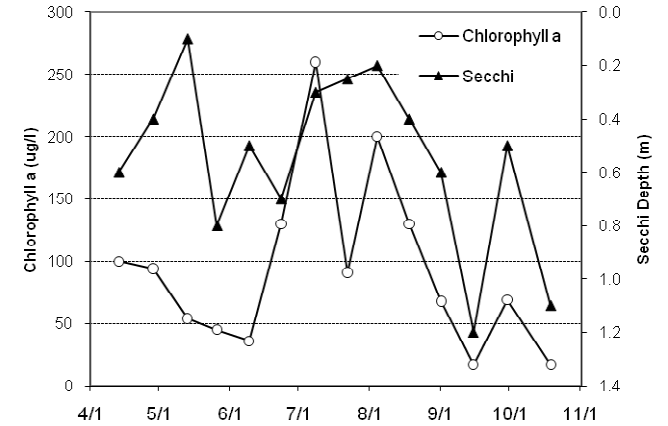
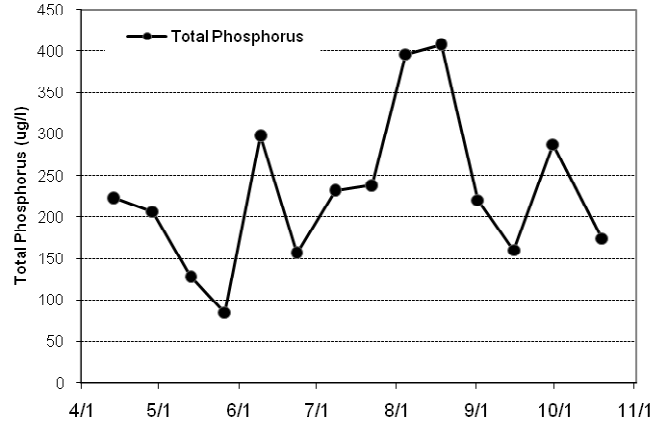
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	F	D	F	F	F	F
Chlorophyll a	D	D	D	F	D	F
Secchi Depth	F	D	F	F	D	F
<b>Lake Grade</b>	<b>F</b>	<b>D</b>	<b>F</b>	<b>F</b>	<b>D</b>	<b>F</b>

Source: Metropolitan Council and STORET data



## Mitchell Lake (27-0070) City of Eden Prairie

Mitchell Lake is located in the City of Eden Prairie (Hennepin County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a surface area of 112 acres. The maximum depth of the lake is 5.8 m (19 feet). Approximately 97 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a substantial thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The Minnesota DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	48.5	22.0	80.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	22.1	3.9	70.0	C
<b>Secchi</b> (m)	1.8	0.5	3.5	C
<b>TKN</b> (mg/l)	1.53	1.00	2.00	
			<b>Lake Grade</b>	C

The lake received a lake grade of C which is consistent with its historical database. The lake's water quality seems represented by lake grades between C and D. The CLA grade returned to a C grade from the B grade it received last year. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

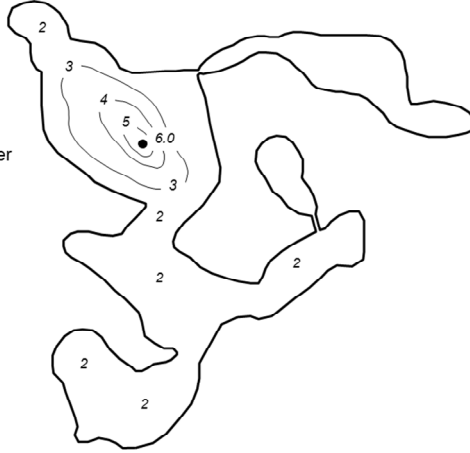
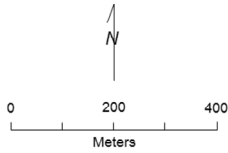
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

**Lake Mitchell**  
Eden Prairie, Hennepin Co.

Lake ID: 270070-00  
WD: Riley-Purgatory-Bluff Creek  
Volunteers: Fran & Gordon Warner

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	9.8				10	42		1.8	1	1
5/3	15.7				6.1	22		2.3	1	1
5/11	15.5				6.6	24		2.5	1	1
5/31	20.8				6	26		2.6	1	1
6/8	18.5				8	29		3.5	1	1
6/22	28.5				3.9	29		3.1	3	1
7/12	24.1				14	44		1.6	2	1
7/26	25.1				36	71		1.0	2	1
8/4	25.5				30	59		1.1	1	1
8/17	25.5				70	80		0.5	1	1
9/2	22.5				49	71		0.6	1	1
9/14	27.2				13	78		0.5	1	1
10/4	13.3				32	82		0.9	1	1
10/12	9.7				34	69		1.0	1	4

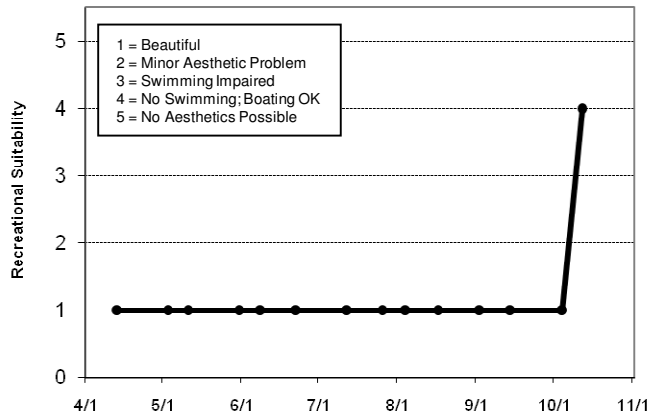
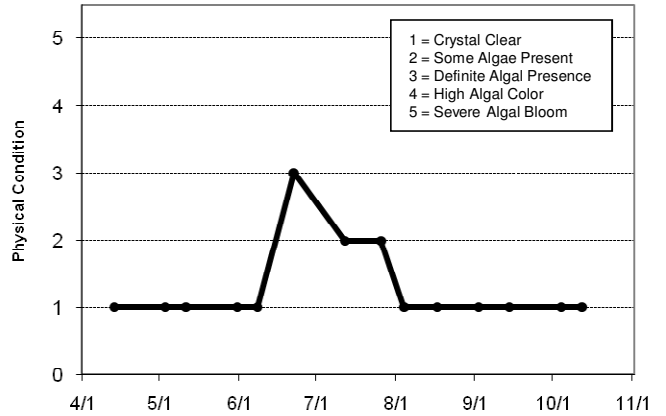
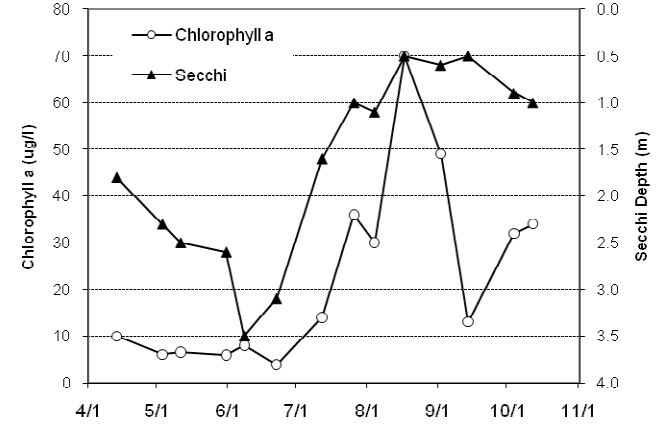
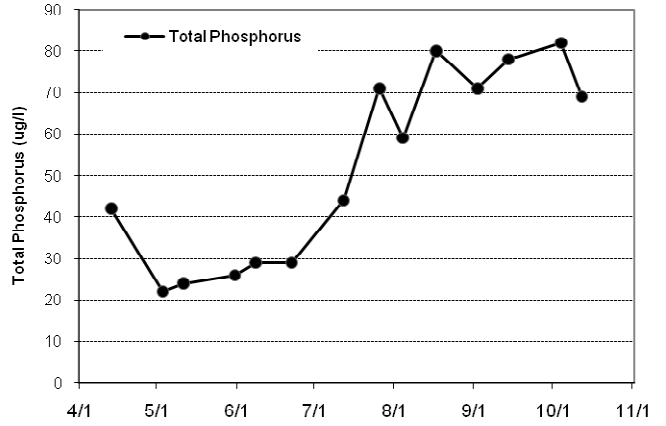
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	D	D	C	C	C
Chlorophyll a	C	C	C	C	B	C
Secchi Depth	C	C	D	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## **Normandale Lake (27-1045) *Nine Mile Creek Watershed District***

Normandale Lake is located in the City of Bloomington (Hennepin County). The lake is considered a METC Priority Lake for its high regional recreational value (METC 2007). It has a surface area of 103 acres. The maximum depth of the lake is 3.7 m (12 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	41.2	22.0	71.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	4.9	2.7	6.4	A
<b>Secchi</b> (m)	2.4	2.0	3.3	B
<b>TKN</b> (mg/l)	0.90	0.55	1.30	
			<b>Lake Grade</b>	B

The lake received a lake grade of B in 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

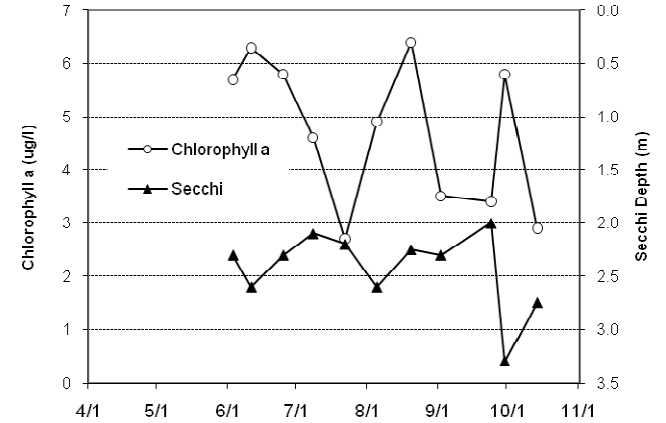
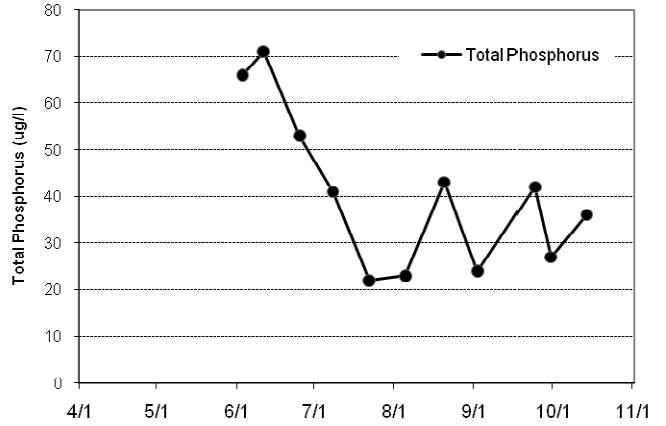
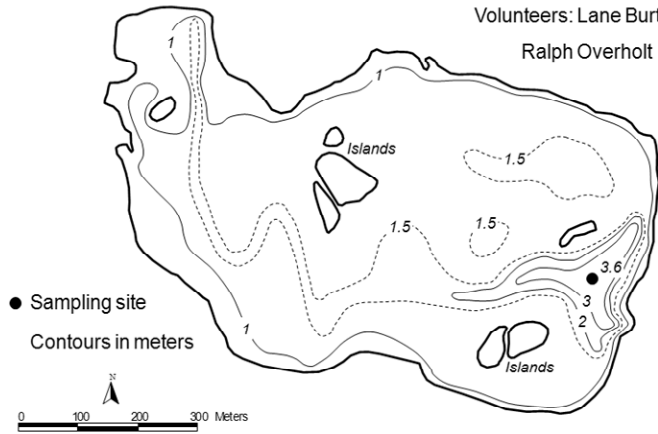
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Normandale Lake (Nordmyr Lake)

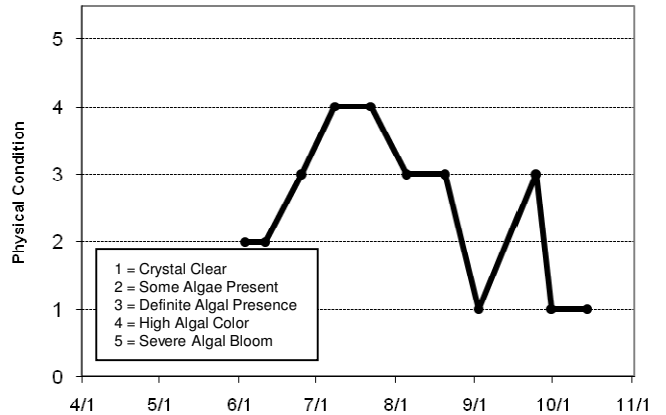
Bloomington, Hennepin Co.

LAKE ID: 271045-00  
 WD: Nine Mile Creek  
 Volunteers: Lane Burton & Ralph Overholt



### 2009 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
6/3	23.2				5.7	66		2.3	2	4
6/11	19.5				6.3	71		2.6	2	4
6/25	28.3				5.8	53		2.3	3	4
7/8	25.5				4.6	41		2.1	4	4
7/22	24.8				2.7	22		2.2	4	4
8/5	25.2				4.9	23		2.6	3	4
8/20	22.1				6.4	43		2.3	3	4
9/2	22.3				3.5	24		2.3	1	4
9/24	22.2				3.4	42		2.0	3	4
9/30	15				5.8	27		3.3	1	4
10/14	7				2.9	36		2.8	1	4

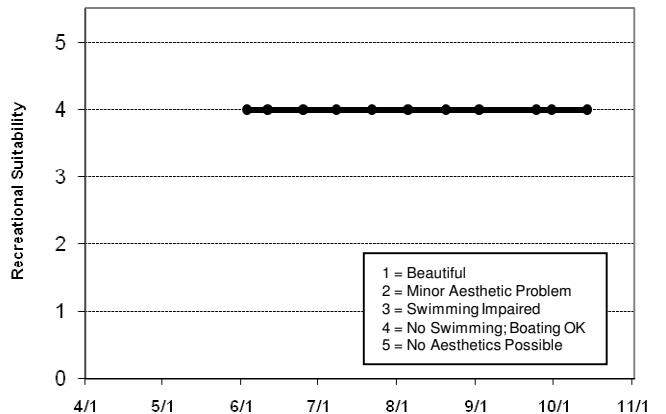


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		C	C			C
Chlorophyll a		B	A			A
Secchi Depth		D	C			B
Lake Grade		C	B			B



Source: Metropolitan Council and STORET data

**North Twin Lake (82-0018) Carnelian - Marine - St. Croix Watershed District**

North Twin Lake is located in Stillwater Township (Washington County). It has a surface area of 69 acres. The maximum and mean depths of the lake are 1.8 m (5.9 ft) and 0.9 m (2.9 ft), respectively. The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for secchi transparency, temperature, dissolved oxygen, and the perceived physical condition and recreational suitability. The data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>Secchi (m)</b>	1.0	0.8	1.2	D

Only secchi depth, temperature, and dissolved oxygen were monitored in 2008. Therefore no lake grade can determined for this year. This was the third year in a row where the lake received a Secchi grade of D, which is worse than the B Secchi grades it was receiving in the late 1990s.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



# North Twin Lake

## Stillwater Twp., Washington Co.

LAKE ID: 820018-00

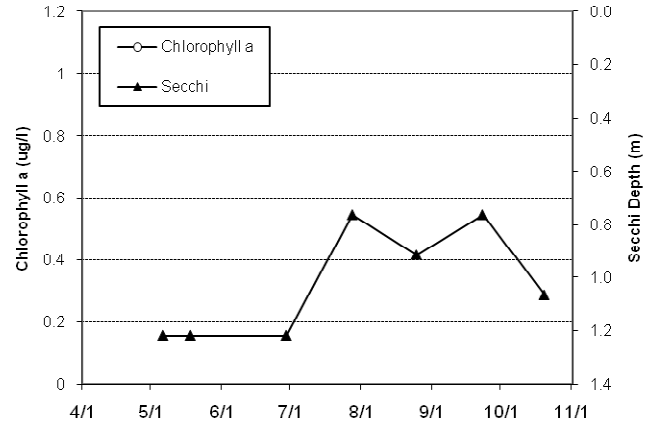
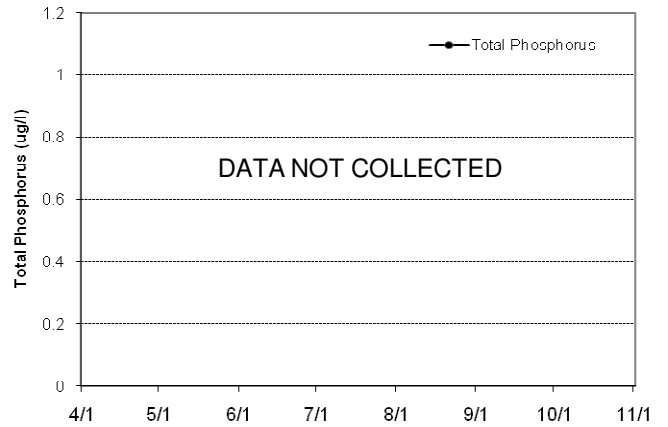
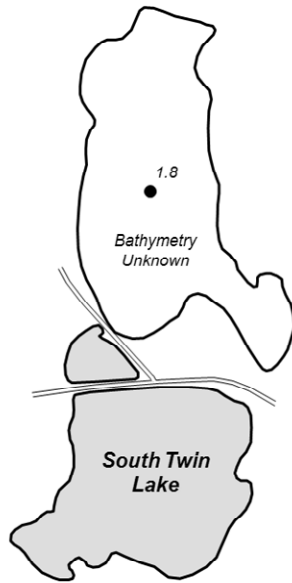
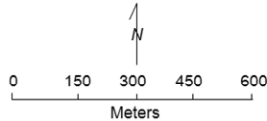
WD: Carnelian-Marine-St. Croix

Volunteer: Washington

Conservation District

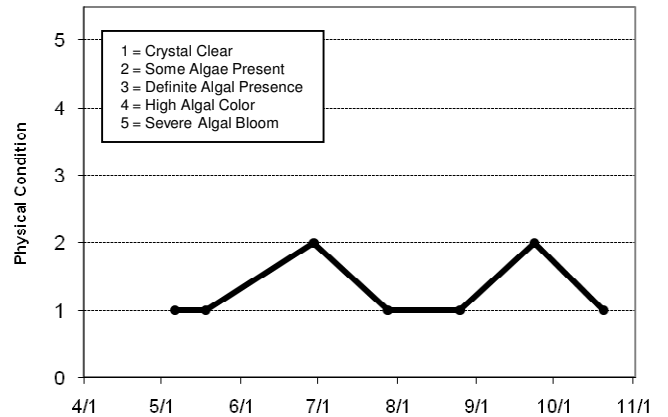
● Sampling site

Contours in meters



### 2009 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
5/6	16.7	16.6	9.21	9.73				1.2	1	1
5/18	15.4	15.4	10.4	9.42				1.2	1	1
6/29	21.3	21.3	7.19	6.75				1.2	2	1
7/28	23.4	22.4	8.91	0.99				0.8	1	1
8/25	21.9	21.4	7.89	2.11				0.9	1	1
9/23	20.3	20.3	5.22	4.5				0.8	2	3
10/20	9.1	8.8	13.71	12.42				1.1	1	2

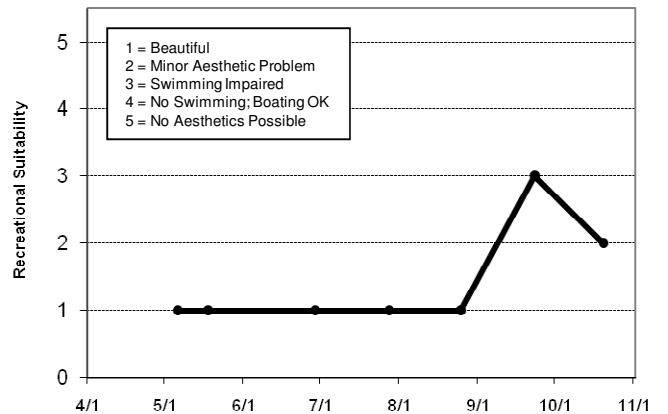


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	B	C	C		
Chlorophyll a	A	A	A	A		
Secchi Depth	C	D	C	D	D	D
Lake Grade	B	B	B	C		



Source: Metropolitan Council and STORET data

**Northwood Lake (27-0627) Bassett Creek Watershed Management Organization**

Northwood Lake is a 15-acre lake located within the City of New Hope (Hennepin County). The mean and maximum depths of the lake are 0.8 m (2.5 ft) and 1.5 m (4.9 ft), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake’s 1,341-acre immediate watershed translates to a large watershed-to-lake area ratio of 89:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

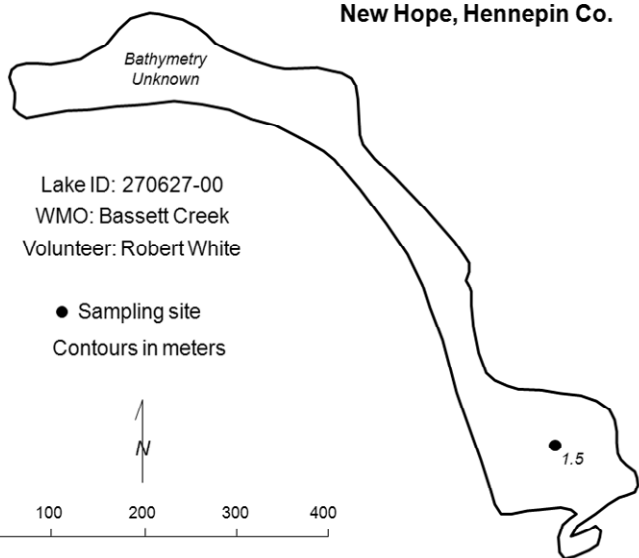
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	259.4	145.0	382.0	F
<b>CLA</b> (µg/l)	13.1	5.0	25.0	B
<b>Secchi</b> (m)	1.0	0.9	1.2	D
<b>TKN</b> (mg/l)	1.22	0.74	2.00	
			<b>Lake Grade</b>	D

The lake received a lake grade of D in 2009 which is consistent to its historical database. Over the past 9 years, the lake grades appear to vary in the D and C range. Continued monitoring is suggested to build the water quality database for enhancing the ability to detect potential trends in water quality.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

## Northwood Pond New Hope, Hennepin Co.



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	18				19	106		0.9	2	4
5/15	20.2				25	158		0.9	2	4
6/1	20.3				16	145		1.0	2	4
6/16					9.7	219		1.0	2	4
7/2	22.8				5	315		1.2	3	4
7/18	19.2				5.7	382			4	5
8/4	26.1				13	290		1.1	4	5
8/28	25.5					185		1.1	5	5
9/10	23				17	381		1.0	5	5
10/10	9.1				4.2	82		1.1	2	5
10/23	6.3				25	95		1.2	2	5

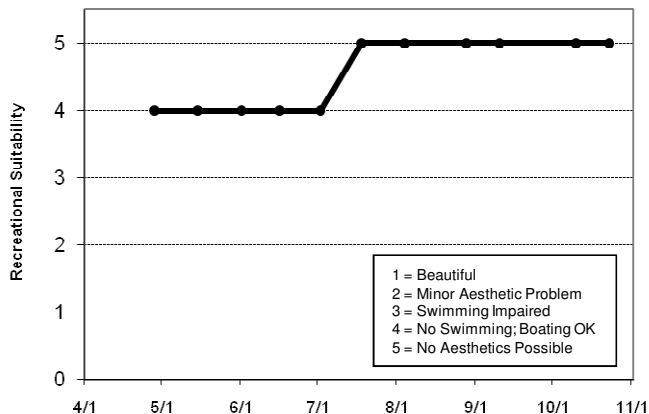
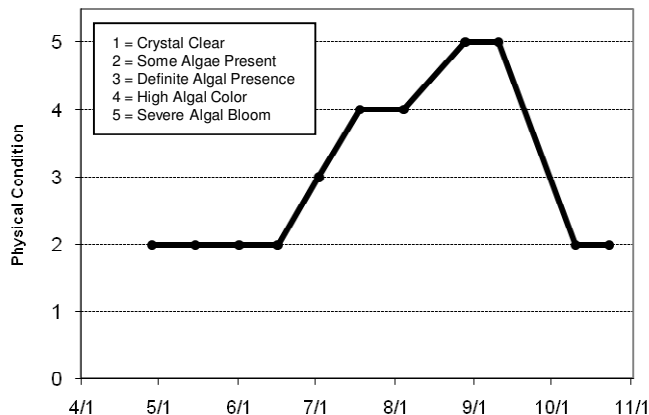
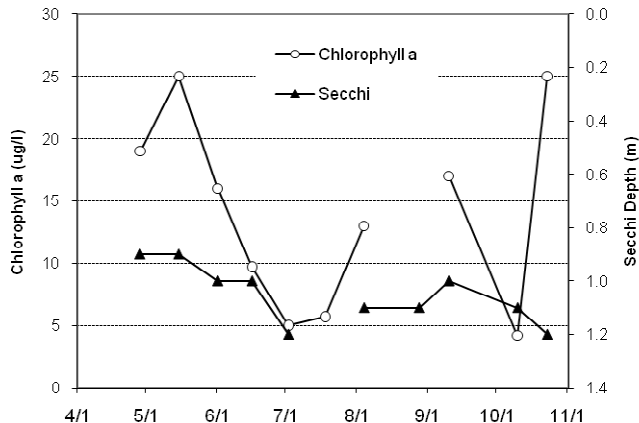
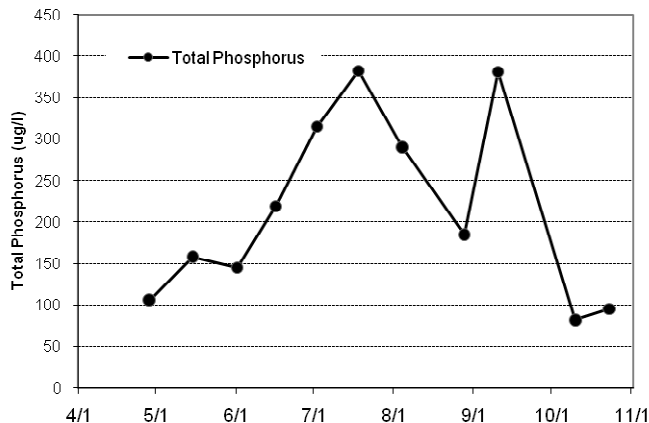
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll <i>a</i>												
Secchi Depth												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus									F	F	D	F
Chlorophyll <i>a</i>									B	C	B	C
Secchi Depth									D	D	D	D
<b>Lake Grade</b>									<b>D</b>	<b>D</b>	<b>C</b>	<b>D</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	F	F	D	F
Chlorophyll <i>a</i>	B	B	B	C	C	B
Secchi Depth	D	D	D	D	D	D
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



**O'Connor Lake (82-0002) Lower St. Croix Valley Watershed Management Organization**

O'Connor Lake is a 38-acre lake located within Denmark Township (Washington County). There is little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	82.3	33.0	134.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	50.1	5.7	110.0	D
<b>Secchi</b> (m)	1.0	0.3	1.7	D
<b>TKN</b> (mg/l)	1.24	0.91	1.70	
<b>Lake Grade</b>				D

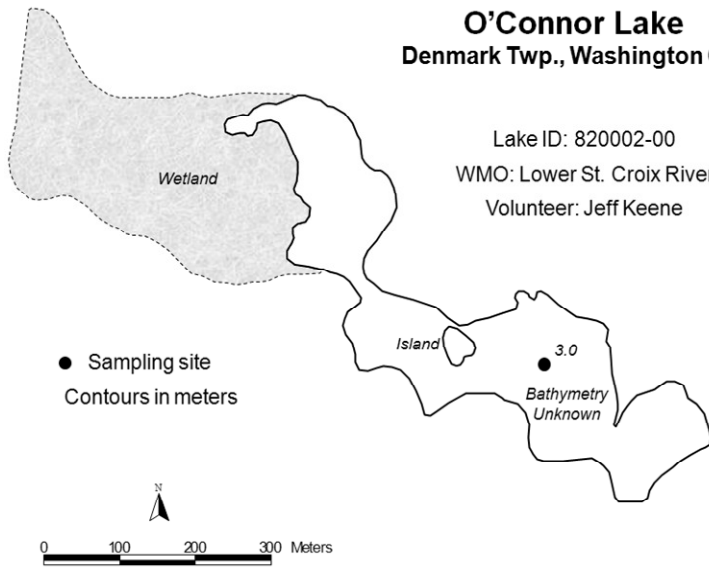
The lake received a lake grade of D for 2009, which is the worst grade received in its limited monitoring history. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# O'Connor Lake Denmark Twp., Washington Co.

Lake ID: 820002-00  
WMO: Lower St. Croix River  
Volunteer: Jeff Keene



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	13.2				25	63			2	4
5/17	17.4				18	86		1.1	2	4
5/31	23.2				32	55		0.8	3	4
6/12	21.9				16	46		0.7	4	4
6/25	30.7				5.7	33		1.7	4	4
7/16	25.3				37	42		1.4	4	4
8/9	25.2				110	128		1.3	4	4
8/25	22.3				91	134		0.3	3	4
9/13	24.5				91	134		0.5	3	4
10/16	7.1				8.8	29		0.8	3	4

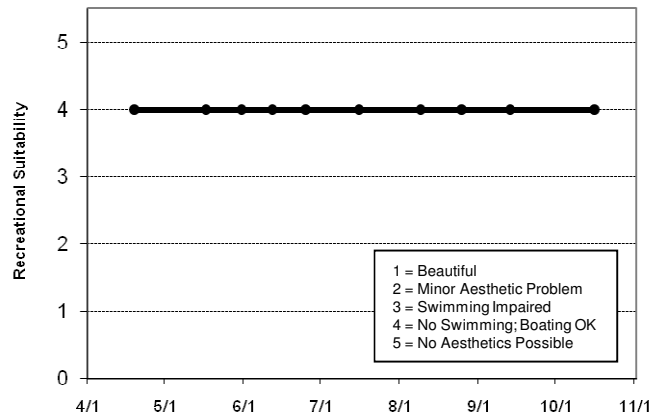
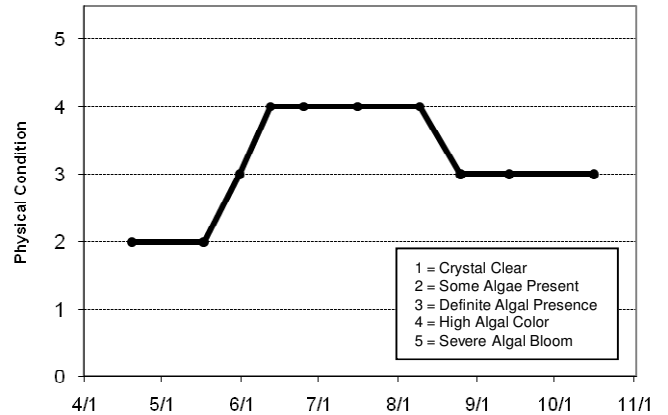
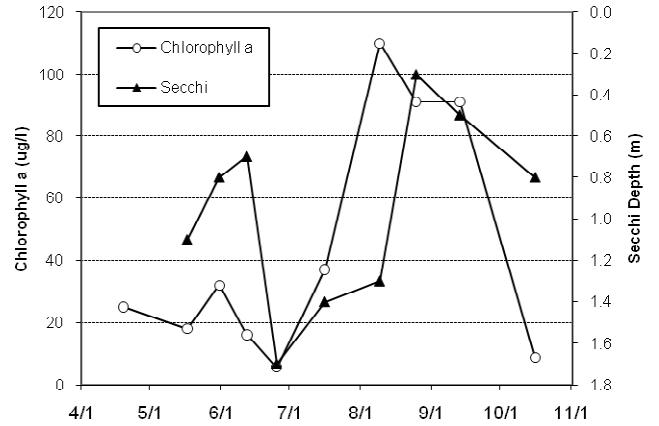
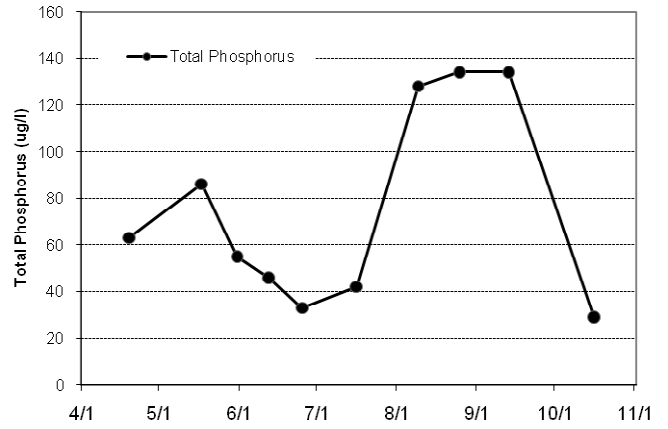
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	D	
Chlorophyll a	B	A	A	B	D	
Secchi Depth	C	C	F	C	D	
Lake Grade	C	B	C	C	D	

Source: Metropolitan Council and STORET data



## O'Dowd Lake (70-0095) City of Shakopee

O'Dowd Lake is located in both Louisville Township and the City of Shakopee (Scott County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake's surface area is 258 acres and has a maximum depth of 6.7 m (roughly 22 feet). Approximately 63 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	36.7	11.0	69.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	25.4	2.6	51.0	C
<b>Secchi</b> (m)	1.6	0.7	3.0	C
<b>TKN</b> (mg/l)	1.29	0.77	1.80	
			<b>Lake Grade</b>	C

The lake received a lake grade of C for 2009. The lake's water quality seems to be represented by a lake grade of C with the occasional D. Continued monitoring is suggested to increase the ability to detect potential water quality trends.

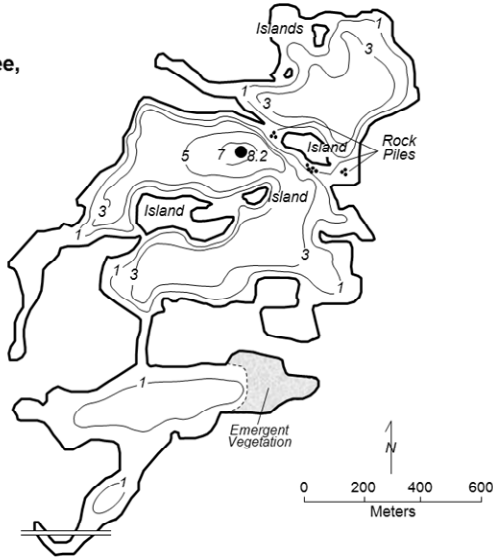
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**O'Dowd Lake**  
Louisville Twp./Shakopee,  
Scott Co.

LAKE ID: 700095-00  
WMO: Shakopee Basin  
Volunteers: Sandy & Mike  
Boyce



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	11.1				3.5	14		3.4	2	1
5/3	14.4				4.6	11		2.6	1	1
5/17	16.9				2.6	17		2.4	1	1
5/25	19.7				4.3	18		2.4	1	1
6/14	22				6.6	15		2.7	2	2
6/22	27				3.1	20		3.0	2	2
7/12	25.2				15	39		1.5	2	
7/26	23.9				30	36		0.9	3	2
8/9	25.1				51	57		0.9	3	2
8/21	22				44	69		0.9	2	2
9/3	22.8				50	46		0.8	2	2
9/15	25.2				45	48		0.7	3	3
9/28	20.2				49	64		0.7	2	2
10/17	9				16	21		2.0	2	2

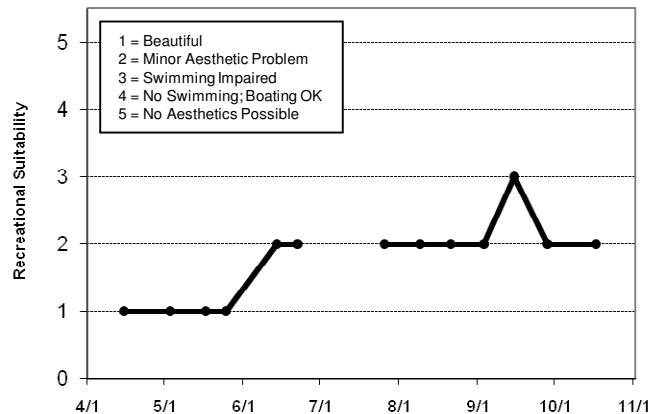
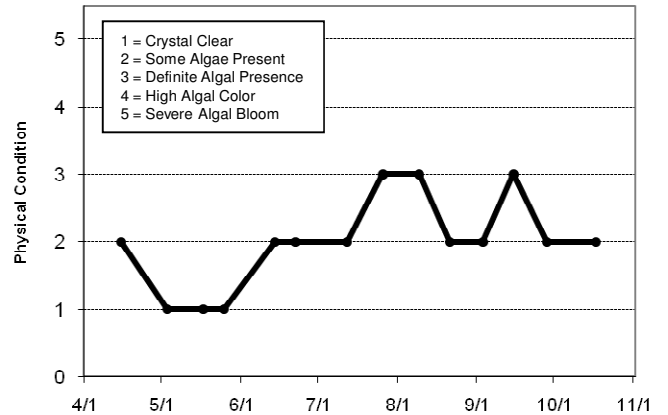
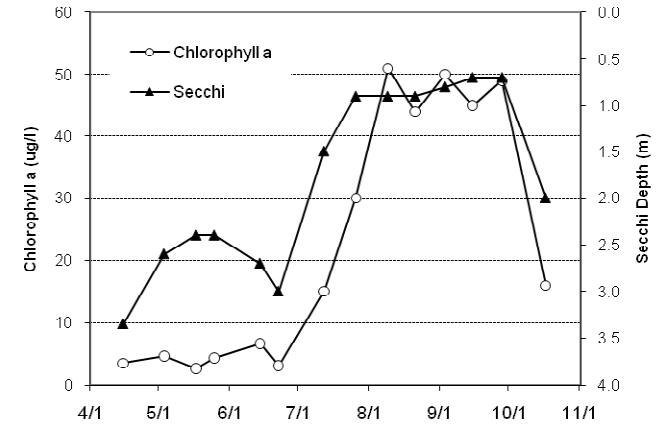
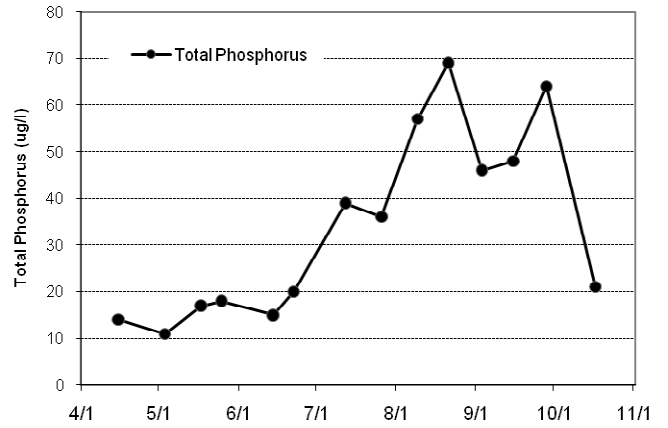
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus						C						
Chlorophyll a						C						
Secchi Depth						C						
<b>Lake Grade</b>						<b>C</b>						

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		C	D	C	C	C
Chlorophyll a		D	C	D	C	C
Secchi Depth		C	D	C	C	C
<b>Lake Grade</b>		<b>C</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## **Olson Lake (82-0103) Valley Branch Watershed District**

Olson Lake is located in the City of Lake Elmo (Washington County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007). The lake has a surface area of 89 acres and a mean and maximum depth of 2.1 (6.9 feet) and 4.5 m (14.8 feet). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	18.7	11.0	28.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	5.3	1.8	9.7	A
<b>Secchi</b> (m)	3.2	2.5	3.6	A
<b>TKN</b> (mg/l)	0.78	0.60	1.00	
<b>Lake Grade</b>				A

The historical water quality database for the lake indicates that the lake grades have improved since the 1980's. The lake received a lake grade of C in 1984, as well as receiving Secchi grades of C in 1984-1986, and 1988-1990. Lake Grades of B were received in 1991, 1993, and 1995. More recently, the lake has recorded lake grades of an A in 2000 and 2003-2004, before falling back to a lake grade of B in 2005 - 2007. This year's and last year's lake grades of A are evidence of the continued improvement in water quality.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

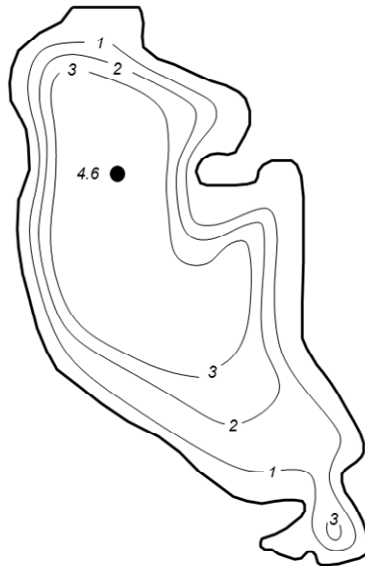
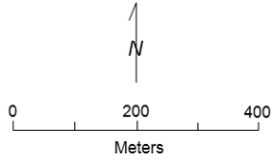


# Lake Olson

## Lake Elmo, Washington Co.

Lake ID: 820103-00  
 WD: Valley Branch  
 Volunteer: Bob Meier

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	12.7				4.7	15		3.6	1	1
5/3	14.6				1.8	20		3.6	1	1
5/17	18.7				3	17		3.2	1	1
6/1	21.7				2.2	28		3.5	2	1
6/14	22.5				5.8	17		3.5	1	1
6/28	22.5				4.3	13		3.5	2	1
7/16	23.2				6.6	19		3.0	2	1
8/5	24.3				5.2	11		3.0	2	2
8/23	23.5				8	19		2.5	2	2
9/6	23.1				6.4	18		3.5	2	2
9/20	23.5				9.7	25		2.5	2	2
10/7	12.8				9.3	18		2.8	2	1
10/18	7.6					23		3.0	1	1

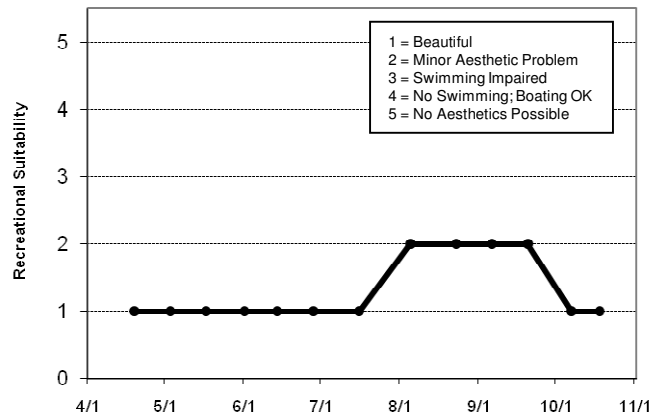
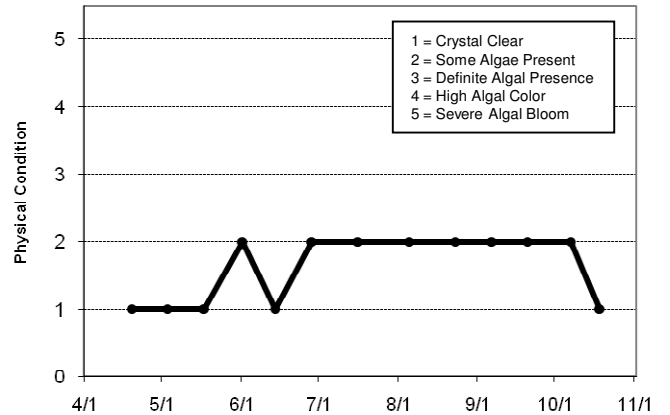
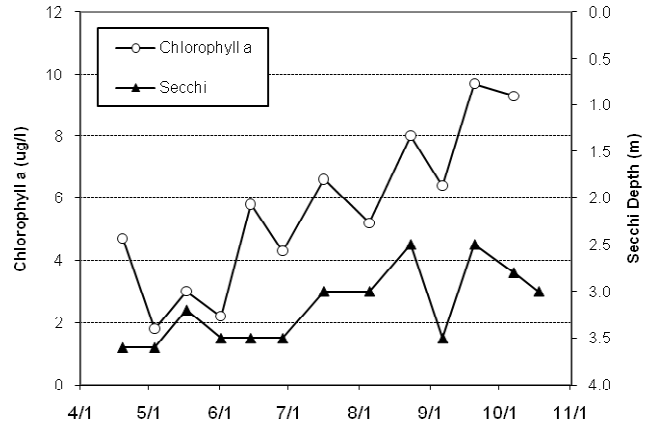
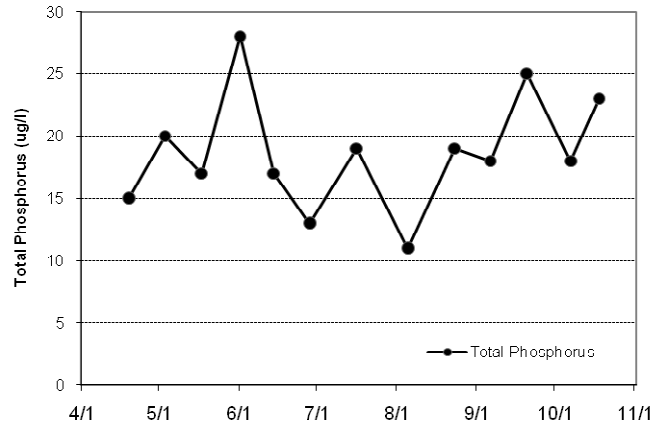
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus					C							B
Chlorophyll a					C							B
Secchi Depth					C	C	C		C	C	C	B
<b>Lake Grade</b>					<b>C</b>							<b>B</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus	B		C						A			A
Chlorophyll a	A		B						A			B
Secchi Depth	B		B						A			A
<b>Lake Grade</b>	<b>B</b>		<b>B</b>						<b>A</b>			<b>A</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	B	C	B	A	A
Chlorophyll a	A	B	B	A	A	A
Secchi Depth	A	B	B	B	B	A
<b>Lake Grade</b>	<b>A</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>A</b>	<b>A</b>

Source: Metropolitan Council and STORET data



## **Orchard Lake (19-0031) Black Dog Lake Watershed Management Organization**

Orchard Lake is located in the City of Lakeville (Dakota County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a surface area of 250 acres.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	15.2	9.0	19.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	3.6	1.7	7.9	A
<b>Secchi</b> (m)	3.7	2.8	5.1	A
<b>TKN</b> (mg/l)	0.76	0.63	1.00	
<b>Lake Grade</b>				A

The lake received a lake grade of A for 2009, which is the second time that the lake received an A grade. Continued monitoring is suggested to determine if the water quality of 2008 and 2009 are indicators of a potential improving water quality trend.

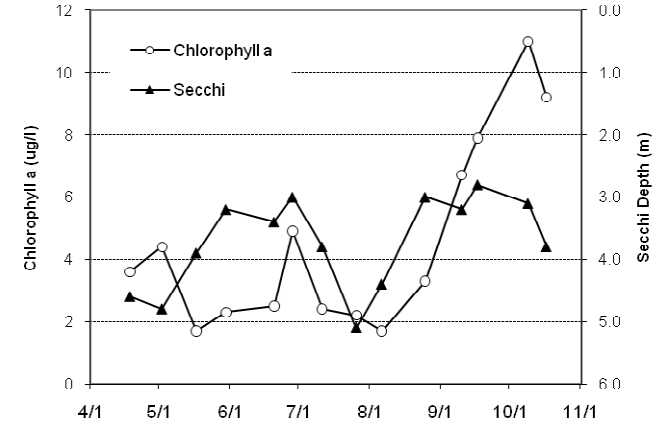
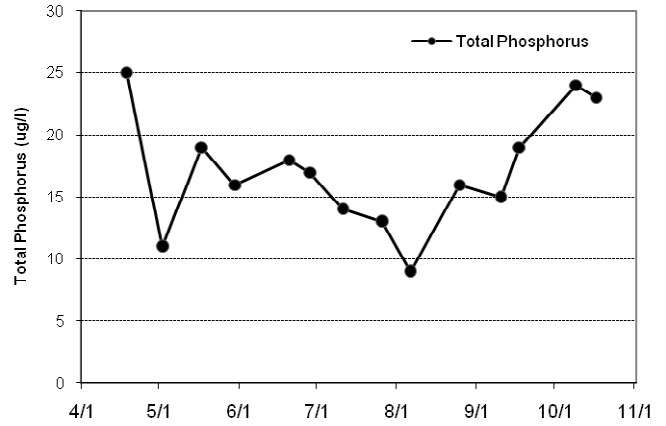
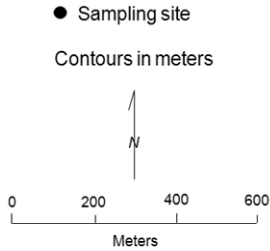
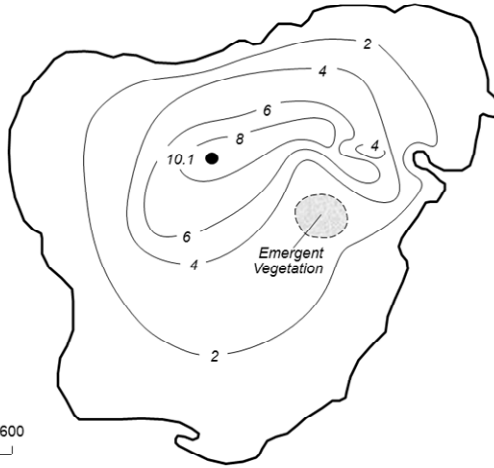
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

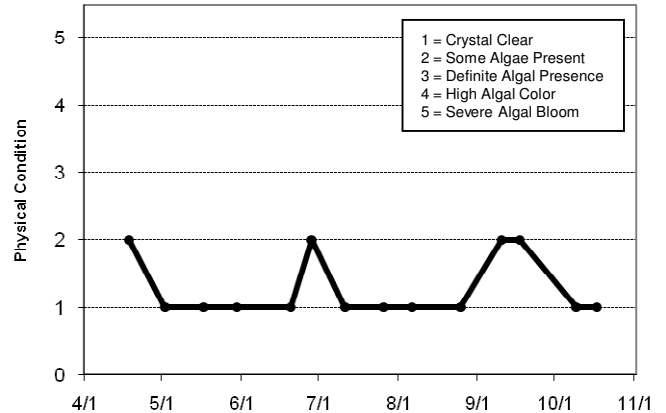
# Orchard Lake Lakeville, Dakota Co.

LAKE ID: 190031-00  
WMO: Black Dog  
Volunteer:  
Tom Goodwin



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/18	13.7				3.6	25		4.6	2	1
5/2	13.5				4.4	11		4.8	1	1
5/17	17.1				1.7	19		3.9	1	1
5/30	20.5				2.3	16		3.2	1	1
6/20	25.3				2.5	18		3.4	1	1
6/28	25.3				4.9	17		3.0	2	1
7/11	25.5				2.4	14		3.8	1	1
7/26	24				2.2	13		5.1	1	1
8/6	25.7				1.7	9		4.4	1	1
8/25	24.1				3.3	16		3.0	1	1
9/10	24				6.7	15		3.2	2	1
9/17	25.3				7.9	19		2.8	2	1
10/9	12.8				11	24		3.1	1	1
10/17	9.5				9.2	23		3.8	1	1

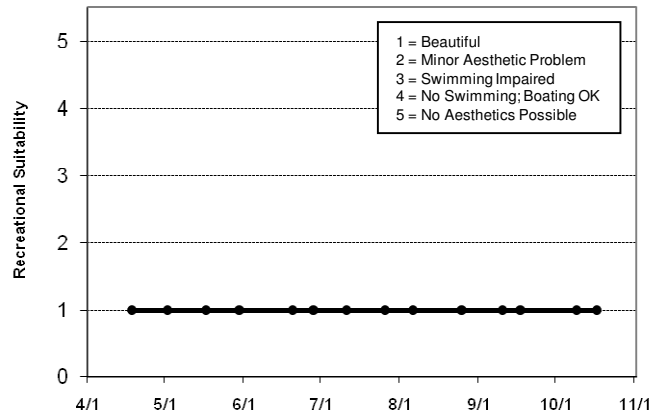


### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	C	B	B								B	
Chlorophyll a	B	B	B								B	
Secchi Depth	C	B	B					C	C	C	D	C
<b>Lake Grade</b>	<b>C</b>	<b>B</b>	<b>B</b>								<b>B</b>	

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus		C					C	C	C	B		C
Chlorophyll a		B					C	C	C	B		C
Secchi Depth		C					C	C	C	B		C
<b>Lake Grade</b>		<b>C</b>					<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>		<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	B	C	C	A	A
Chlorophyll a	B	B	B	C	B	A
Secchi Depth	B	B	B	C	A	A
<b>Lake Grade</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>A</b>	<b>A</b>



Source: Metropolitan Council and STORET data

## **Parkers Lake (27-0107) Bassett Creek Watershed Management Organization**

Parkers Lake is located in the City of Plymouth (Hennepin County). It has a surface area of 97 acres. The mean and maximum depths of the lake are 3.7 m (12 ft) and 11.3 m (37 ft), respectively. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*). The lake is listed as impaired by the MPCA for mercury content in fish.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	33.4	15.0	110.0	C
<b>CLA</b> (µg/l)	6.8	1.3	17.0	A
<b>Secchi</b> (m)	2.7	1.0	4.3	B
<b>TKN</b> (mg/l)	1.05	0.61	1.80	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009, which is similar to some previous years' annual lake grades. The lake has received lake grades varying from C to A to B over the past 29 years as indicated by the historical water quality database, but the lake has not experienced a C lake grade since 1999. The lake has received only A and B lake grades from 2000 through 2009. Continued monitoring is suggested to determine potential trends in the lake's water quality.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

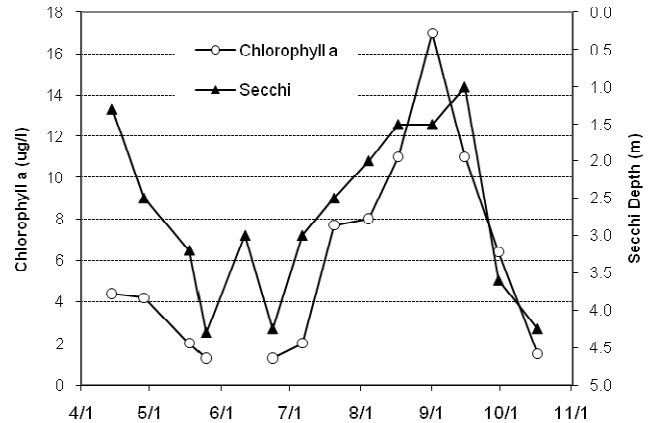
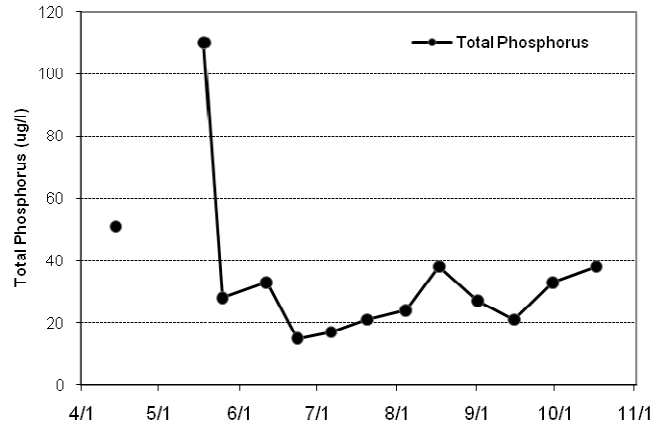
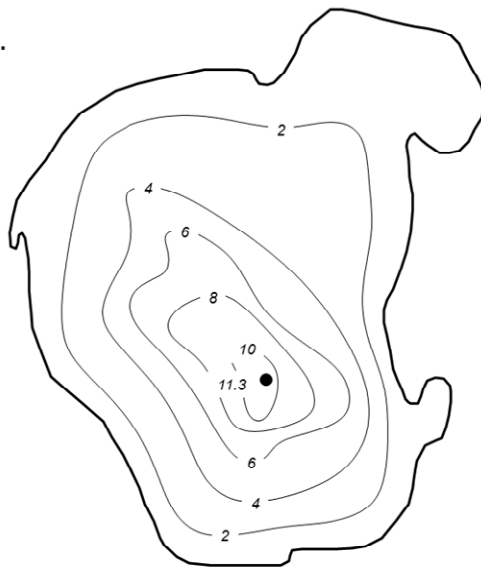
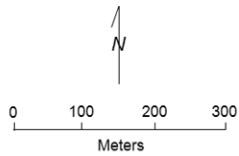
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

**Parkers Lake**  
Plymouth, Hennepin Co.

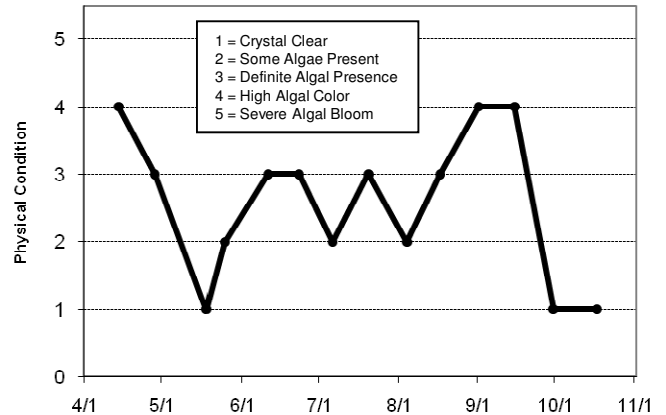
Lake ID: 270107-00  
WMO: Bassett Creek  
Volunteer: Bob Videen

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	12				4.4	51		1.3	4	5
4/28	14				4.2			2.5	3	3
5/18	18				2	110		3.2	1	1
5/25	21				1.3	28		4.3	2	2
6/11	19							3.0	3	2
6/23	27				1.3	15		4.3	3	3
7/6	24				2	17		3.0	2	2
7/20	22				7.7	21		2.5	3	2
8/4	24				8	24		2.0	2	2
8/17	26				11	38		1.5	3	3
9/1	22				17	27		1.5	4	4
9/15	26				11	21		1.0	4	4
9/30	18				6.4	33		3.6	1	2
10/17	11				1.5	38		4.3	1	2

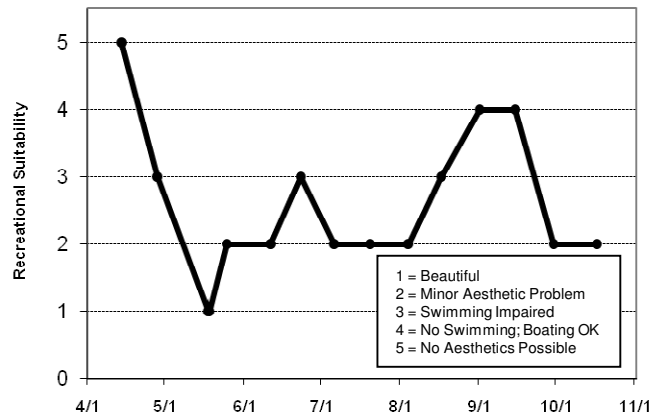


**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												B
Secchi Depth												B
<b>Lake Grade</b>												<b>C</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus				C				C	A		A	B
Chlorophyll a				B				B	A		A	B
Secchi Depth				C				C	B		A	B
<b>Lake Grade</b>				<b>C</b>				<b>C</b>	<b>A</b>		<b>A</b>	<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	C	C	B	B	C
Chlorophyll a	A	B	A	A	A	A
Secchi Depth	C	B	A	B	B	B
<b>Lake Grade</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>



Source: Metropolitan Council and STORET data

## Pat Lake (82-0125) Browns Creek Watershed District

Pat Lake is a small 13-acre lake located in Washington County. There is little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	41.3	23.0	87.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	10.2	4.4	20.0	B
<b>Secchi</b> (m)	1.5	1.2	1.7	C
<b>TKN</b> (mg/l)	0.95	0.75	1.10	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009. There are only 4 monitoring seasons of data, so there are insufficient quantities of data to determine trends. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

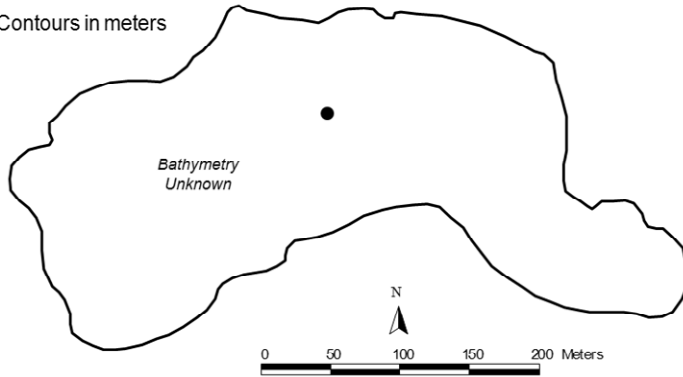
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

**Pat Lake**  
Grant, Washington Co.

Lake ID: 820125-00  
WD: Browns Creek  
Volunteer: Washington Conservation District

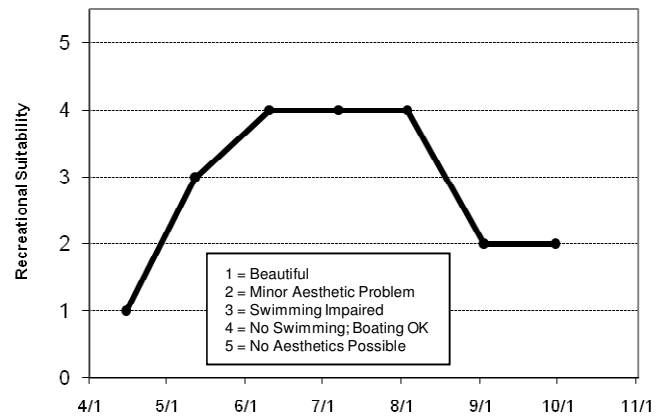
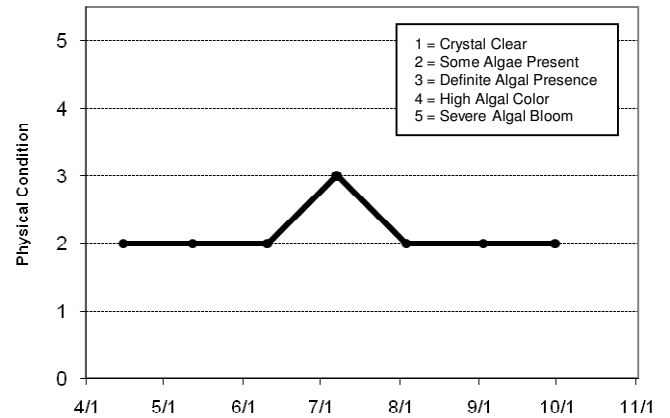
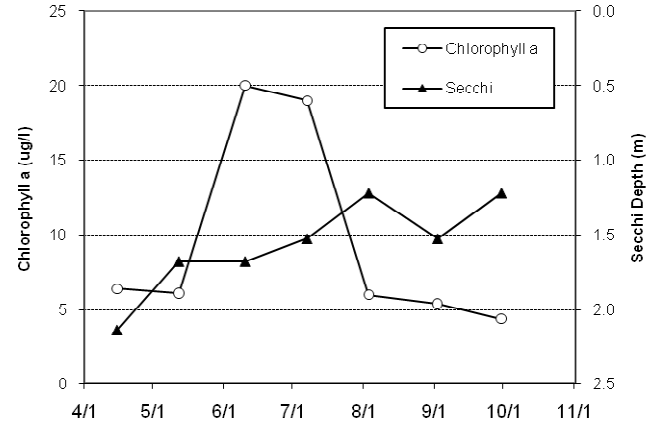
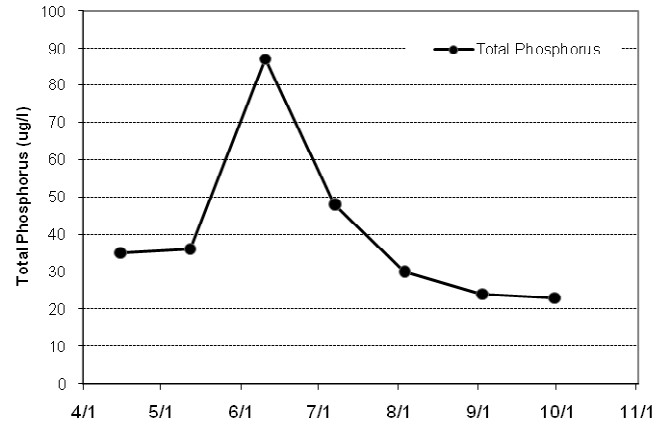
● Sampling site

Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	12.5	12.3	10.87	9.62	6.4	35		2.1	2	1
5/12	15.7	15.5	9.88	1.29	6.1	36		1.7	2	3
6/10	16.5	16	9.04	0.71	20	87		1.7	2	4
7/7	25.3	22.1	11.31	0.82	19	48		1.5	3	4
8/3	24.5	21.8	10.08	0.57	6	30		1.2	2	4
9/2	20.1	20	9.11	0.99	5.4	24		1.5	2	2
9/30	12.1	12.4	10.41	2.89	4.4	23		1.2	2	2



**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1991
Total Phosphorus											
Chlorophyll a											
Secchi Depth											
<b>Lake Grade</b>											

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						
Chlorophyll a		C	A	B	B	
Secchi Depth		C	C	C	C	
<b>Lake Grade</b>		<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>	

Source: Metropolitan Council and STORET data

### **Penn Lake (27-0004) Nine Mile Creek Watershed District**

Penn Lake is located in the City of Bloomington (Hennepin County). It has a maximum depth of 2.1 m (7.0 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

This was the first year that the lake was involved in the CAMP. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	262.9	108.0	634.0	F
<b>CLA</b> (µg/l)	122.5	45.0	310.0	F
<b>Secchi</b> (m)	0.2	0.1	0.5	F
<b>TKN</b> (mg/l)	3.79	1.40	9.60	
<b>Lake Grade</b>				F

The lake received a lake grade of F in 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

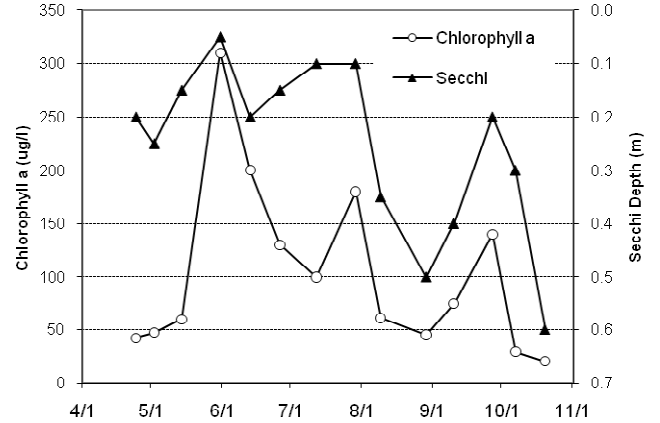
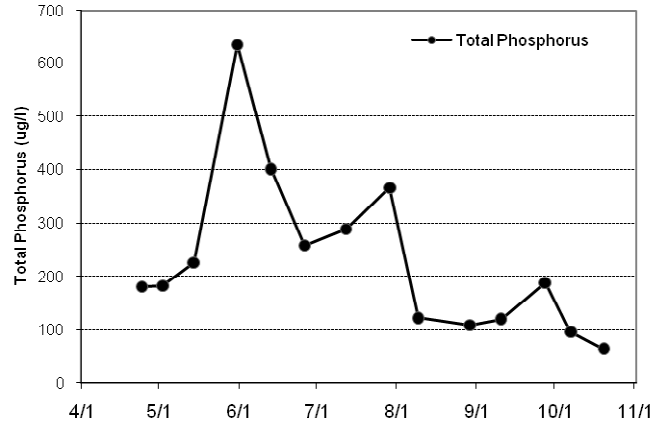
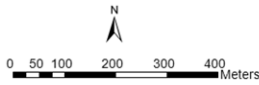
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



**Penn Lake,  
Maple Grove/  
Plymouth, Hennepin Co.**

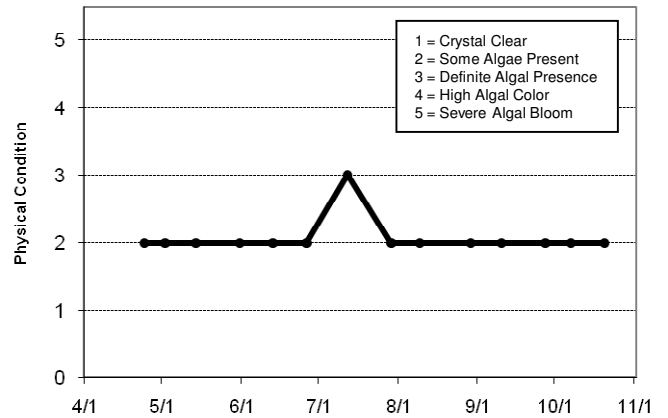
Lake ID: 270004-00  
WD: Nine Mile Creek  
Volunteers: Dan McManmion &  
Tony Agnon

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/24					42	180		0.2	2	5
5/2	16.2				47	182		0.3	2	5
5/14	19.7				60	225		0.2	2	5
5/31					310	634		0.1	2	5
6/13	28.3				200	401		0.2	2	5
6/26	31.3				130	258		0.2	2	5
7/12	30				100	288		0.1	3	5
7/29	24				180	366		0.1	2	5
8/9	27.1				61	122		0.4	2	4
8/29	22				45	108		0.5	2	4
9/10	26.4				75	120		0.4	2	4
9/27	19				140	188		0.2	2	5
10/7	12				29	96		0.3	2	4
10/20	10				20	64		0.6	2	4

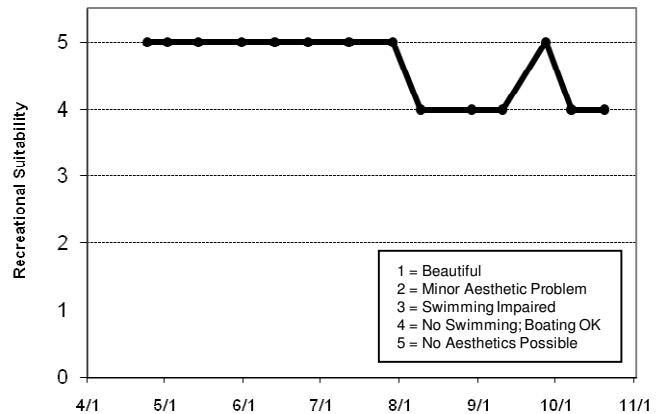


**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						F
Chlorophyll a						F
Secchi Depth		F				F
Lake Grade						F



Source: Metropolitan Council and STORET data

**Peter Lake (27-0147-02) Pioneer Sarah Creek Watershed Management Commission**

Peter Lake is located in the City of Medina (Hennepin County). It has a maximum depth of 20.7 m (68 ft). This was the first year that the lake was part of the CAMP.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	35.2	18.0	59.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	13.3	1.3	28.0	B
<b>Secchi</b> (m)	3.9	2.3	6.4	A
<b>TKN</b> (mg/l)	1.27	0.98	1.70	
<b>Lake Grade</b>				B

The lake received a lake grade of B in 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

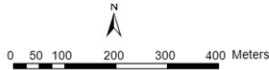
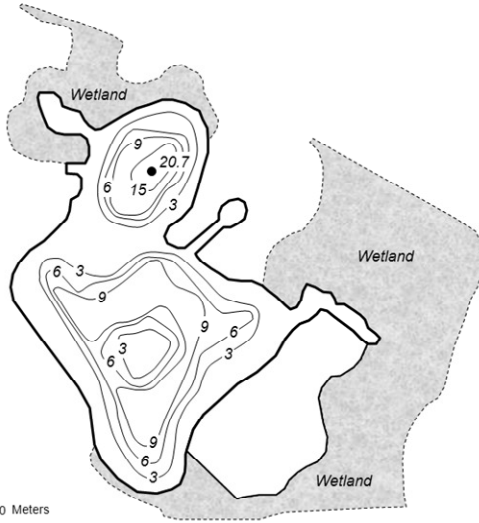
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

**Peter Lake,  
Medina, Hennepin Co.**

Lake ID: 270147-02  
WMO: Pioneer-Sarah Cr.  
Volunteers:  
Tim & Rita Lambrecht

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	14.6				6.7	44		2.5	2	1
5/17	17.1				1.3	21		6.4	2	1
5/31	20				3.7	29		5.5	2	1
6/14	24				21	34		4.5	3	1
6/29	22.4				10	33		3.4	1	1
7/12	25.6				27	59		2.3	2	1
7/27	25.3				28	49		3.0	1	1
8/10	26.1				23	35		2.5	1	1
8/24	22.6				8.4	41		4.7	1	1
9/12	23.2				4.9	18		4.0	1	1
9/26	21.5				12	24		3.7	1	1
10/9	11.7				6.9	19		4.7	1	1
10/18	9.1				8	21		4.7	1	1

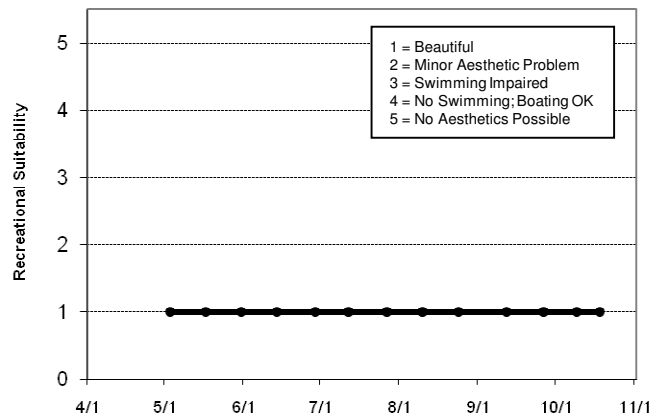
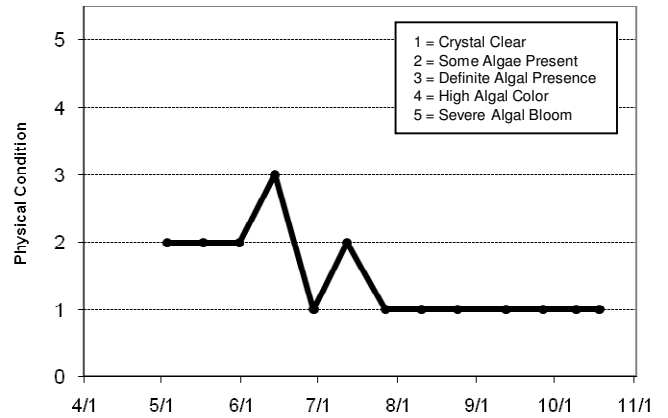
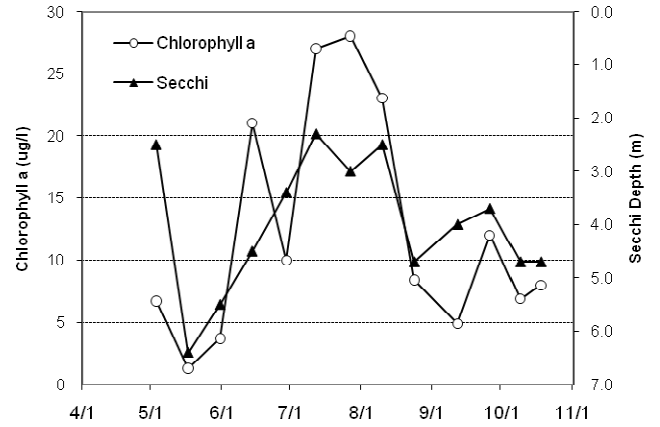
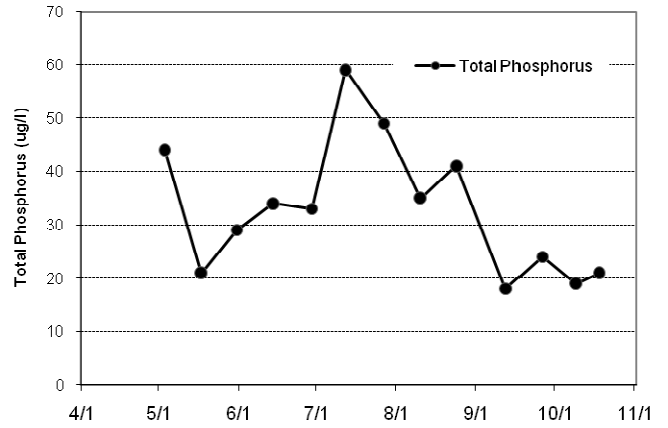
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>	C											

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth	B		B		A		C					
<b>Lake Grade</b>	C											

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						C
Chlorophyll a						B
Secchi Depth						A
<b>Lake Grade</b>	B					

Source: Metropolitan Council and STORET data



**Pike Lake (27-0111-02) Shingle Creek Watershed Mangement Commission**

Pike Lake is located in the Cities of Maple Grove and Plymouth (Hennepin County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a maximum depth of 6.7 m (22 feet). Most of the lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	70.6	40.0	115.0	D
<b>CLA</b> (µg/l)	33.5	13.0	49.0	C
<b>Secchi</b> (m)	1.1	0.7	1.6	D
<b>TKN</b> (mg/l)	1.58	1.30	1.90	
<b>Lake Grade</b>				D

The lake received a lake grade of C in 2009, which is consistent with its historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake’s water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

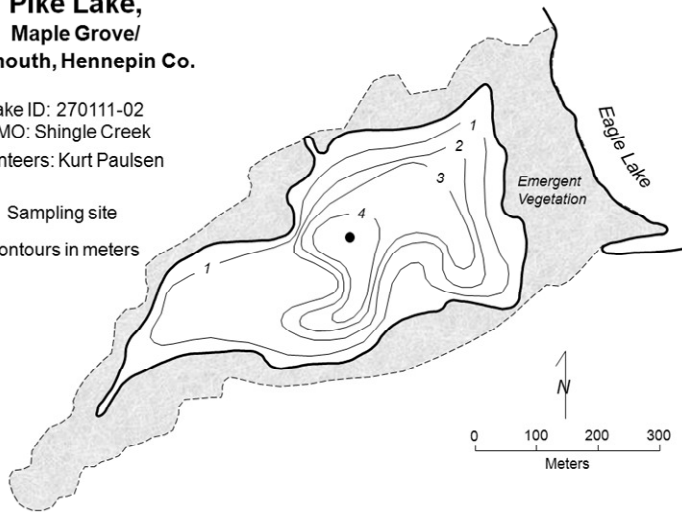
If you notice any errors in the lake’s data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

**Pike Lake,  
Maple Grove/  
Plymouth, Hennepin Co.**

Lake ID: 270111-02  
WMO: Shingle Creek  
Volunteers: Kurt Paulsen

● Sampling site

Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/31	20.5				13	40		1.6	3	4
6/14	20.1				47	115		1.5	3	4
7/12	24.5				23	63		1.1	3	4
7/26	24.2				48	71		0.8	4	4
8/9	26.2				49	71		0.7	4	4
8/23	21				41	75		0.8	4	4
9/2	21				17	72		1.2	4	4
9/20	23.5				30	58		0.9	5	4

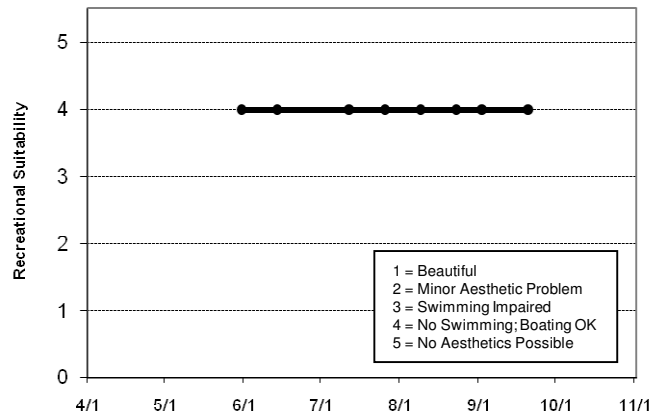
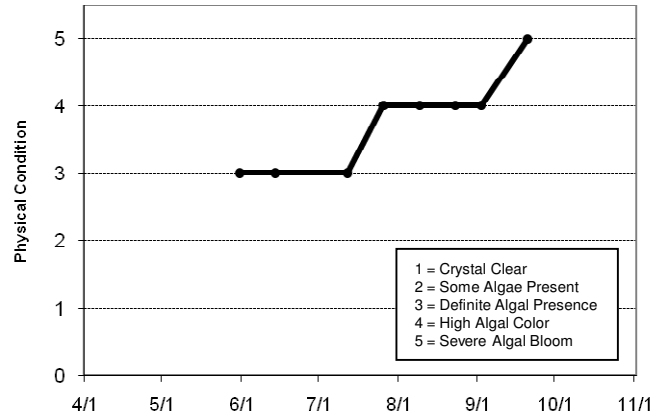
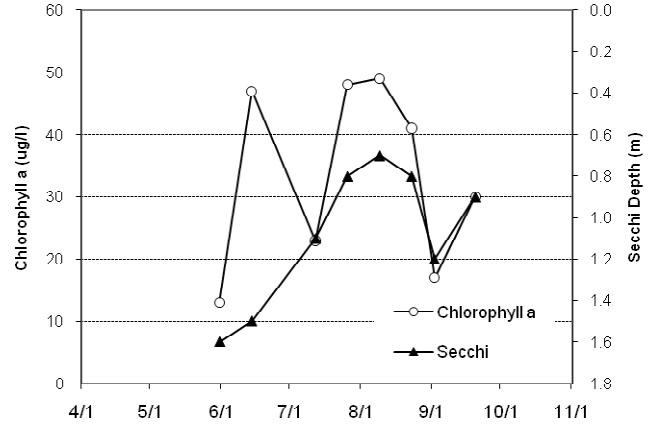
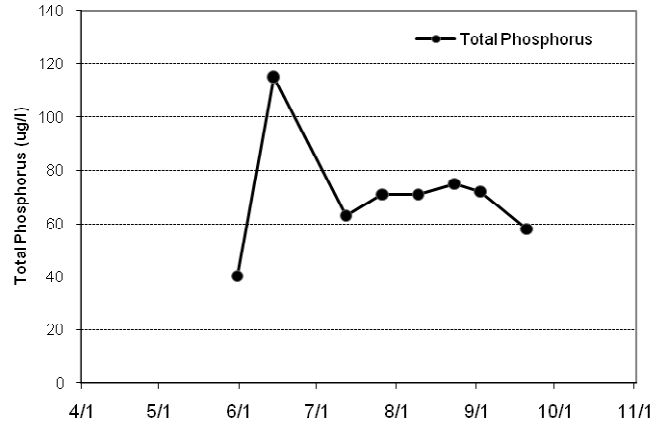
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus				C	D	
Chlorophyll a				B	C	
Secchi Depth				D	D	
<b>Lake Grade</b>				<b>C</b>	<b>D</b>	

Source: Metropolitan Council and STORET data



### **Pine Tree Lake (82-0122) Rice Creek Watershed District**

Pine Tree Lake, located on the eastern edge of the City of Dellwood (Washington County), covers an area of 174 acres. It has a maximum depth of 7.9 m (26 feet), and a mean depth of 3.0 m (10 feet).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	19.6	11.0	29.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	4.3	1.7	7.7	A
<b>Secchi</b> (m)	3.1	2.1	4.0	A
<b>TKN</b> (mg/l)	0.76	0.57	0.94	
<b>Lake Grade</b>				A

The lake received a lake grade of A in 2009, which is the best grade it has received in METC monitoring history. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

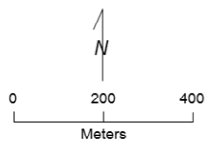
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

**Pine Tree Lake**  
Dellwood/Grant,  
Washington Co.

Lake ID: 820122-00  
WD: Rice Creek  
Volunteer: Gene Berwald

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/17	17.1				3.1	21		4.0	1	1
5/31	19.6				2.8	11		3.0	2	2
6/14	24.2				6.1	29		2.6	1	2
6/28	25				6.9	23		2.1	2	2
7/12	25				6	18		2.5	2	1
7/26	25.3				3.4	25		3.0	2	2
8/8	24.3				7.7	19		3.0	2	2
8/24	23.3				1.7	16		3.1	2	3
9/7	24.3				2.2	20		4.0	1	2
9/20	23.4				2.9	14		4.0	2	2
10/4	12.4				3.1	20		4.0	1	4
10/17	6.6				4	14		3.5	1	2

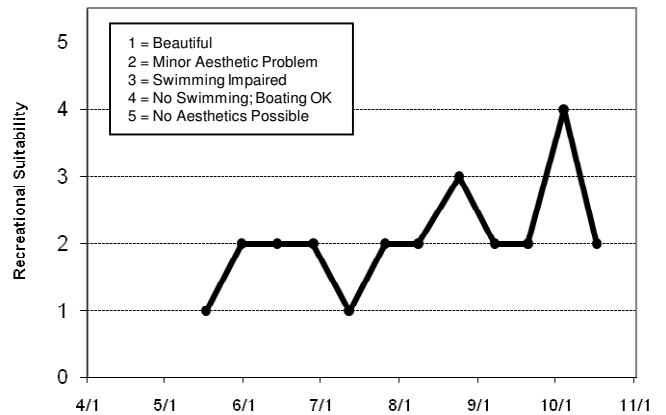
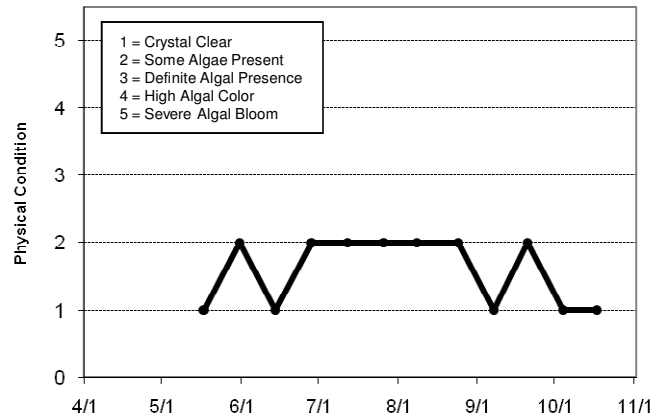
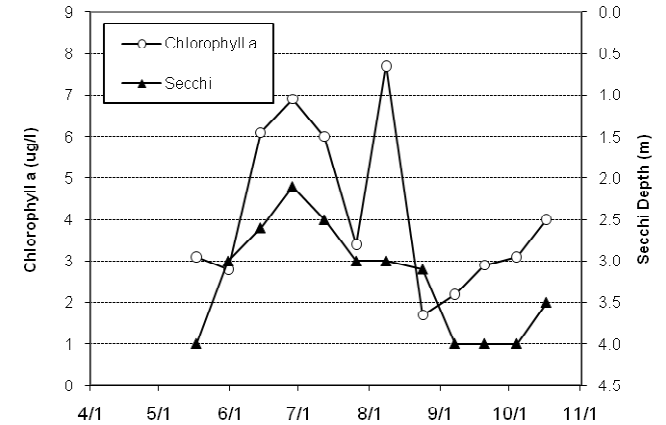
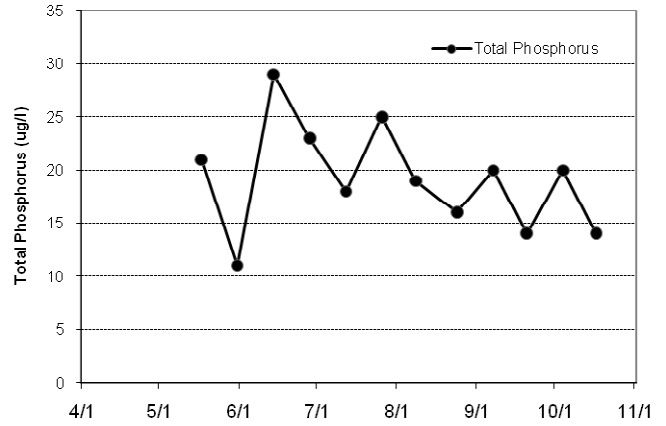
**Lake Water Quality Grades Based on Summertime Averages**

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus	B	B	C	C	B	B	B	C	C	C	C	C
Chlorophyll a	A	A	C	B	A	B	B	A	A	B	C	C
Secchi Depth	C	B	C	C	B	C	C	A	B	C	C	C
<b>Lake Grade</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	B	C	B	B	A
Chlorophyll a	A	B	A	A	B	A
Secchi Depth	B	B	B	B	B	A
<b>Lake Grade</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>A</b>

Source: Metropolitan Council and STORET data



## **Plaisted Lake (82-0148) Washington Conservation District**

Plaisted Lake is located in the City of Hugo (Washington County). Little morphological data is available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	74.2	24.0	131.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	40.8	4.1	97.0	C
<b>Secchi</b> (m)	1.2	0.5	2.4	C
<b>TKN</b> (mg/l)	2.03	1.20	2.80	
			<i>Lake Grade</i>	C

The lake received a lake grade of C in 2009. Continued monitoring is necessary to build the water quality database for this lake.

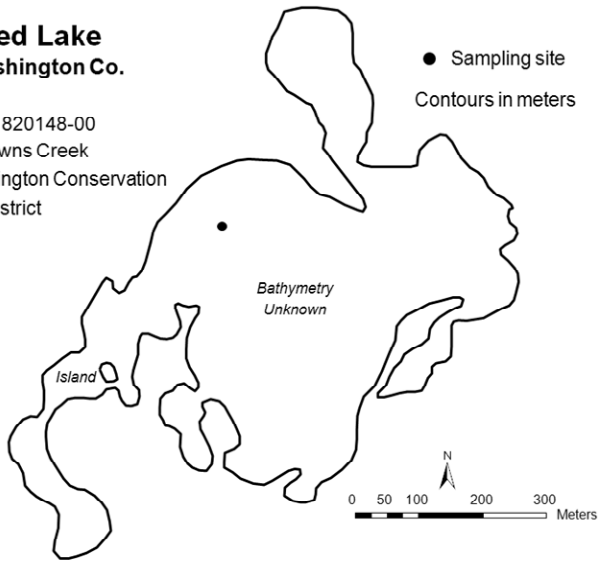
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



# Plaisted Lake Hugo, Washington Co.

Lake ID: 820148-00  
WD: Browns Creek  
Volunteer: Washington Conservation District



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	12.3	11.1	11.7	2.5	5.3	38		3.0	2	1
5/14	15.1	15.2	10.27	0.13	5.8	24		2.4	2	2
6/10	17.1	16.3	7.42	0.11	4.1	65		2.4	2	3
7/7	24.2	20	13.77	0.06	97	131		0.6	3	4
8/4	25.3	21.1	10.82	0.08	57	87		0.5	3	4
9/1	22.2	19.9	9.45	3.48	44	79		0.6	4	4
9/30	14.2	14.5	8.3	0.11	37	59		0.9	3	4

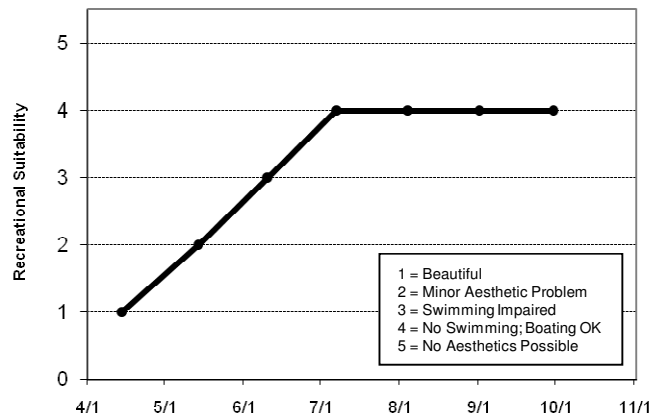
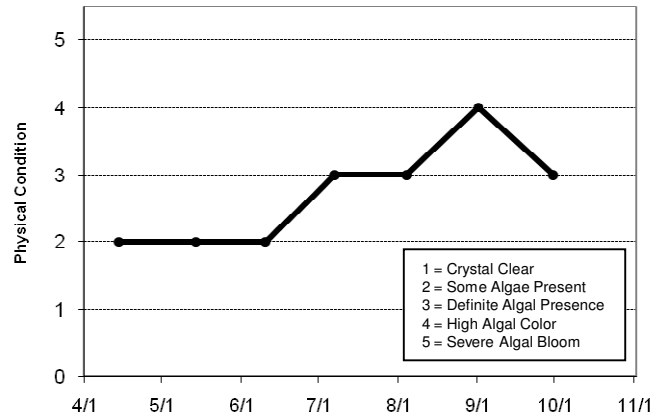
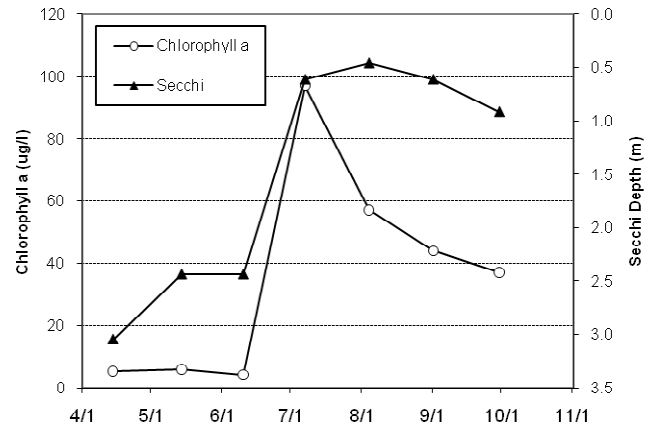
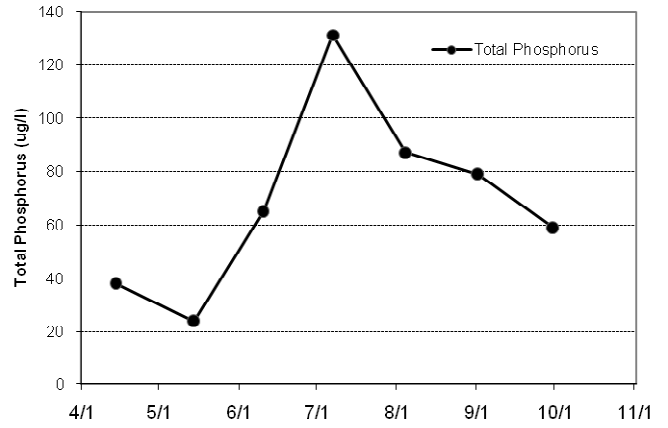
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					D	D
Chlorophyll a					C	C
Secchi Depth					C	C
<b>Lake Grade</b>					C	C

Source: Metropolitan Council and STORET data



## **Powers Lake (82-0092) City of Woodbury**

Powers Lake is located within the City of Woodbury (Washington County). It has a surface area of approximately 57 acres and a maximum depth of 12.5 m (41.0 feet). The lake has no surface outlet. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

The area of the lake's watershed is 1,238 acres. The lake's watershed-to-lake area ratio is 22:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

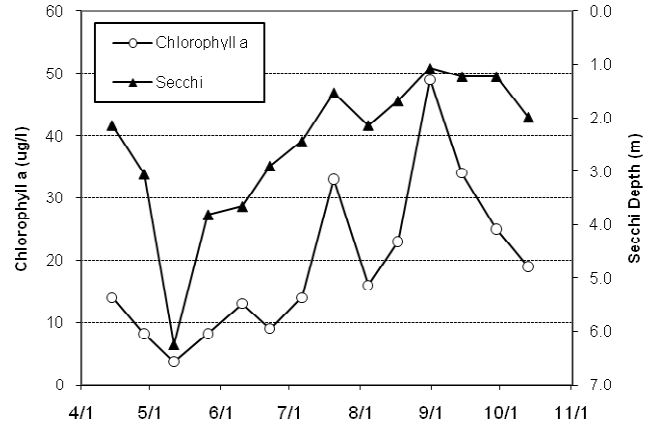
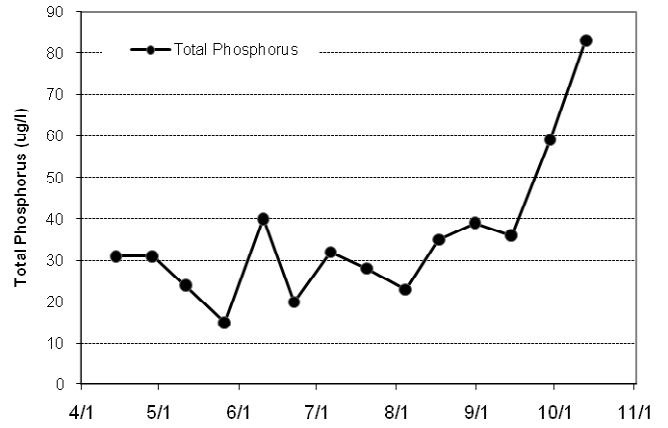
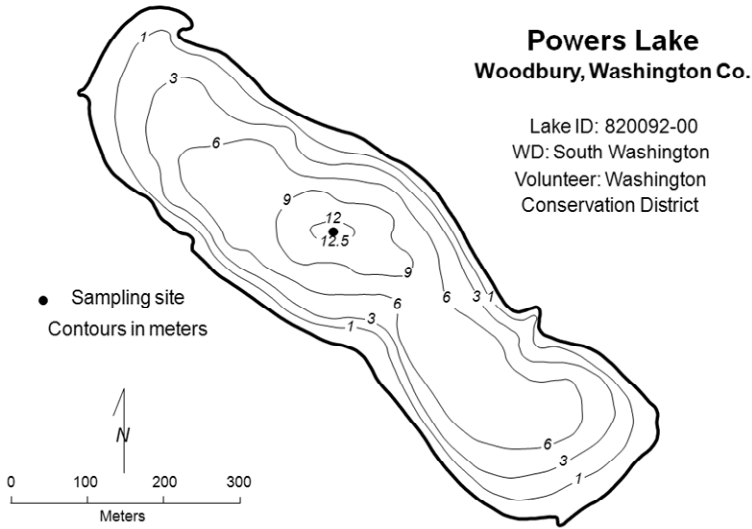
<b>Parameter</b>	<b>Mean</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Grade</b>
<b>TP</b> (µg/l)	31.9	15.0	59.0	<b>B</b>
<b>CLA</b> (µg/l)	20.7	3.7	49.0	<b>C</b>
<b>Secchi</b> (m)	2.5	1.1	6.2	<b>B</b>
<b>TKN</b> (mg/l)	1.15	0.91	1.50	
<b>Lake Grade</b>				<b>B</b>

The lake received a lake grade of B for 2009 and in 2008. These grades are an improvement over recent years' lake grades. The water quality observed in 2008 and 2009 is characteristic of the better water quality observed in the early-mid 2000s and the 1990's. Continued monitoring is suggested to determine if the improvement in water quality observed in 2008 and 2009 is evidence of the beginning of a potential trend.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

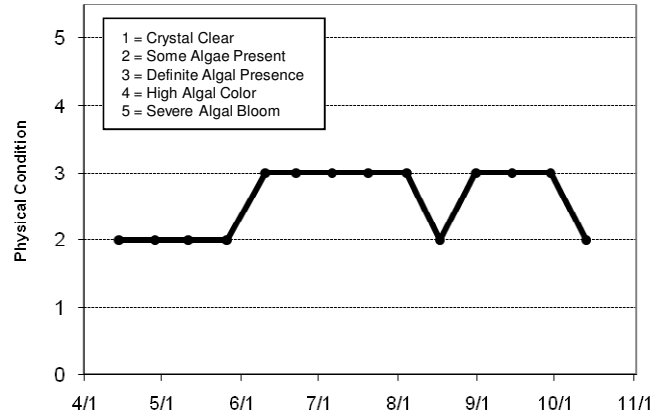
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	8.8				14	31	166	2.1	2	2
4/28	11.4	6.1	11.33	0.03	8.2	31	404	3.0	2	3
5/11	14.8	6.7	9.75	0.03	3.7	24	406	6.2	2	2
5/26	19	7.2	9.69	0.05	8.2	15	823	3.8	2	3
6/10	17.6	7.5	9.28	0.05	13	40	931	3.7	3	3
6/22	24.8	8.2	9.64	0.06	9	20	975	2.9	3	3
7/6	23.3	8.3	10.29	0.04	14	32	743	2.4	3	4
7/20	21.3	9	9.64	0.04	33	28	941	1.5	3	4
8/4	22.8	9.6	7.9	0.04	16	23	695	2.1	3	3
8/17	24.6	10	9.58	0.03	23	35	882	1.7	2	3
8/31	21.5	10	7.62	0.03	49	39	1030	1.1	3	4
9/14	24.2	9.9	11.04	0.04	34	36	1040	1.2	3	4
9/29	17.7	10.1	4.96	0.02	25	59	1070	1.2	3	3
10/13	10.6	10.1	6.2	0.04	19	83	72	2.0	2	3

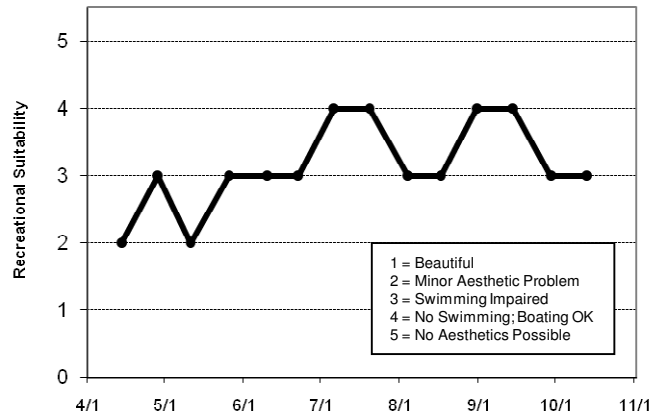


**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	B	B
Chlorophyll a	C	C	C	B	B	C
Secchi Depth	C	C	C	C	B	B
Lake Grade	C	C	C	C	B	B



Source: Metropolitan Council and STORET data

### **Priebe Lake (62-0036) Rice Creek Watershed District**

Priebe Lake is located in the City of White Bear Lake (Ramsey County). The maximum depth of the lake is 1.5 m (5.0 ft). Other morphological data is unavailable for the lake. The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	143.1	91.0	194.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	73.0	28.0	150.0	D
<b>Secchi</b> (m)	0.4	0.3	0.6	F
<b>TKN</b> (mg/l)	2.96	1.80	3.90	
<b>Lake Grade</b>				D

The lake received a lake grade of D for 2009. Continued monitoring is necessary to build the water quality database for this lake. The Secchi grade of F for 2009 is the same as the secchi grades received for previous monitoring seasons dating back to 1989.

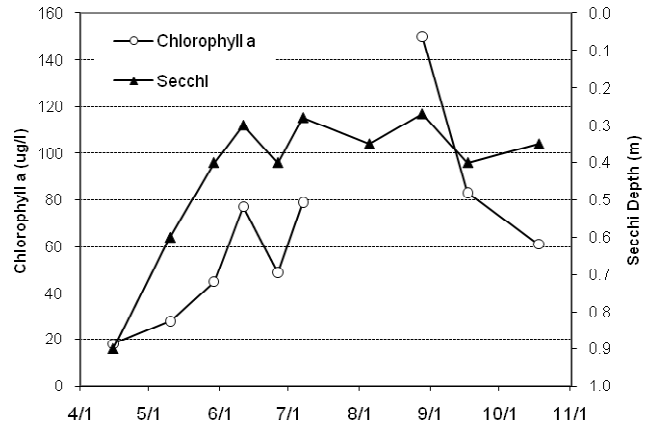
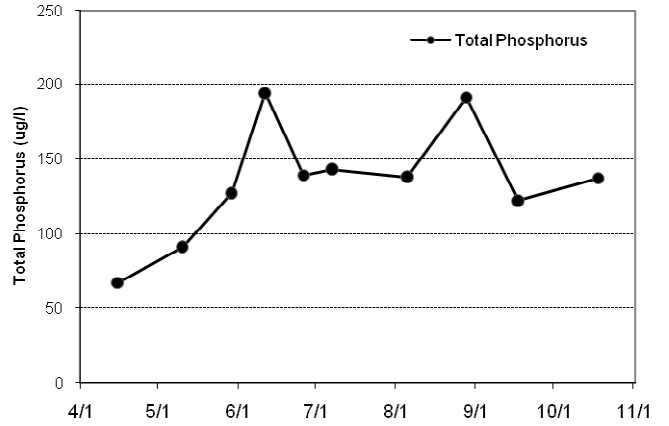
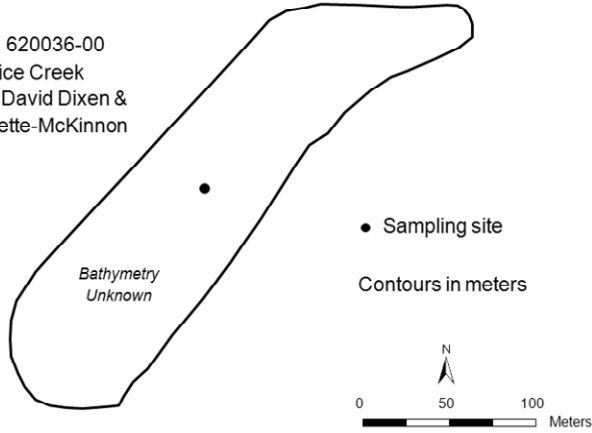
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Priebe Lake

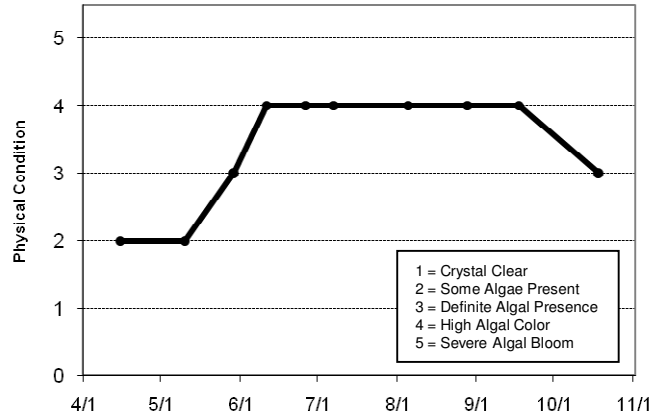
## White Bear Lake, Ramsey Co.

Lake ID: 620036-00  
 WD: Rice Creek  
 Volunteers: David Dixen &  
 Dawn Schuette-McKinnon



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	17.2				18	67		0.9	2	2
5/10	15.9				28	91		0.6	2	2
5/29	23.5				45	127		0.4	3	4
6/11	17.7				77	194		0.3	4	4
6/26	30.6				49	139		0.4	4	
7/7	28				79	143		0.3	4	4
8/5	27.8					138		0.4	4	4
8/28	25				150	191		0.3	4	4
9/17	27.1				83	122		0.4	4	4
10/18	9.6				61	137		0.4	3	4

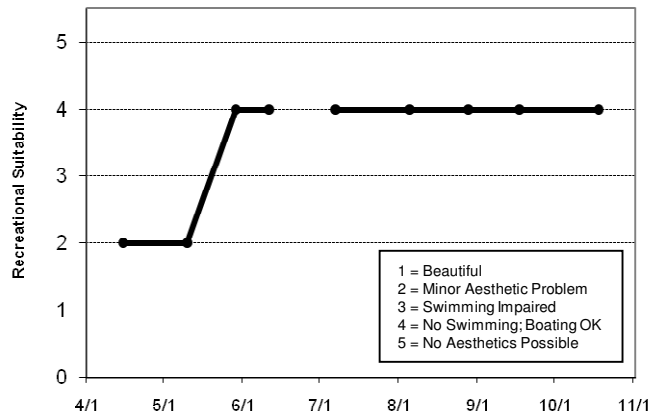


### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth										F	F	F
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth						F	F	F				
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					D	D
Chlorophyll a					F	D
Secchi Depth					F	F
<b>Lake Grade</b>					<b>F</b>	<b>D</b>



Source: Metropolitan Council and STORET data

## **Prior Lake [lower basin, site 1] (70-0026) Prior Lake - Spring Lake Watershed District**

Prior Lake (lower basin) is located in the City of Prior Lake (Scott County). The lower basin is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lower basin has a surface area of 957 acres. The maximum and mean depths of the basin are 18.3 and 4.1 m (60 and 13 feet), respectively. The lower basin has one inlet, which is the outlet from the upper basin of Prior Lake. The lower basin has one outlet. The outlet structure, located at the southwestern portion of the basin, was installed to regulate surface water elevations.

The MN DNR has designated the lower basin as being infested with Eurasian water milfoil (*Myriophyllum spicatum*) and Zebra mussels (*Dreissena spp.*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<b>Parameter</b>	<b>Mean</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Grade</b>
<b>TP</b> (µg/l)	23.0	14.0	70.0	B
<b>CLA</b> (µg/l)	8.9	2.6	20.0	A
<b>Secchi</b> (m)	3.4	1.5	5.7	A
<b>TKN</b> (mg/l)	1.01	0.79	1.90	
<b>Lake Grade</b>				A

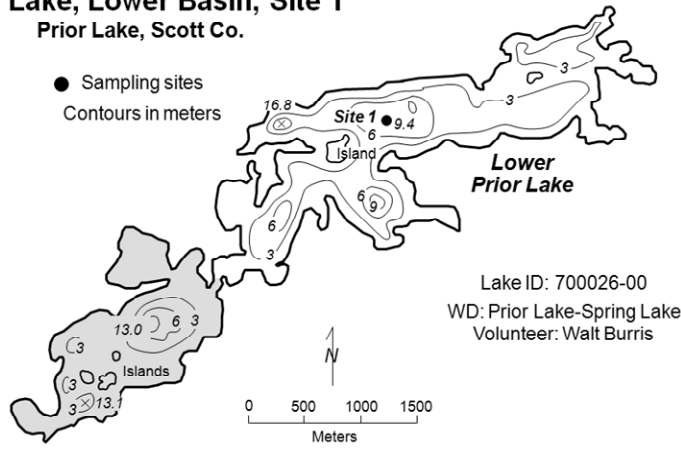
The lower basin received a lake grade of A for 2009. The historical lake grades appear to vary from A's to C's. With such variation, it is difficult to discern trends in the basin's water quality. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Prior Lake, Lower Basin, Site 1**  
Prior Lake, Scott Co.



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	11.4				12	29		1.9	2	2
5/3	12.8				2.6	14		5.3	1	1
5/11	15.3				5.3	19		4.2	1	1
5/28	20				4	18		3.5	2	1
6/10	17.9				7.7	19		3.0	2	1
6/25	26.5				2.7	15		5.1	1	1
7/8	23.7				3.4	14		5.7	1	1
7/27	24.1				5.5	18		3.5	2	1
8/5	23.8				9.1	22		2.9	2	1
8/22	22				14	19		2.3	3	2
9/1	22.1				15	25		2.0	2	2
9/14	24.1				18	23		1.5	3	2
9/28	18.4				20	70		1.6	3	2
10/13	10.3				28	51		2.0	3	2

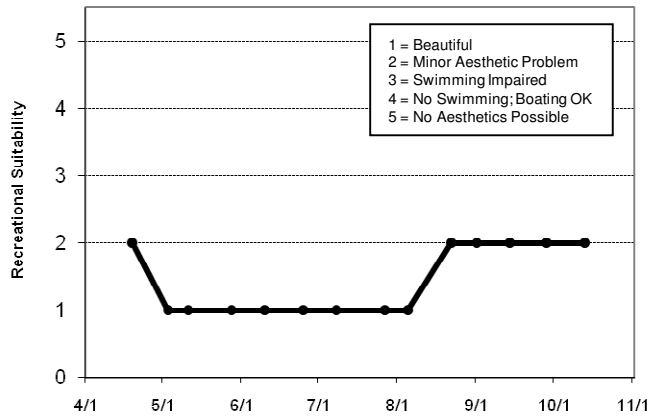
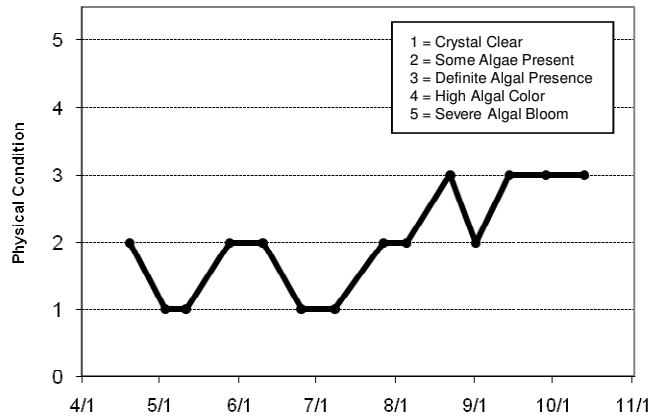
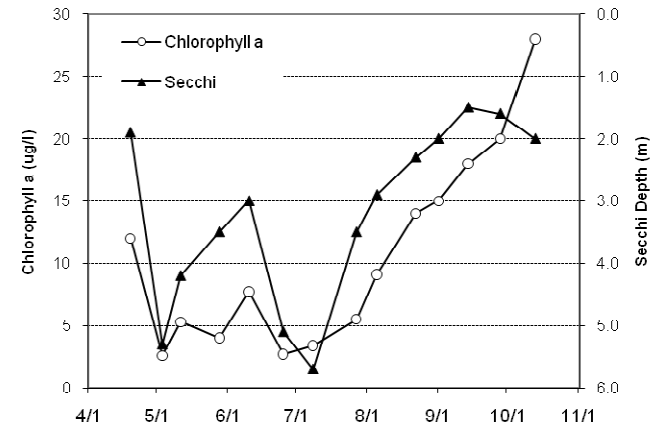
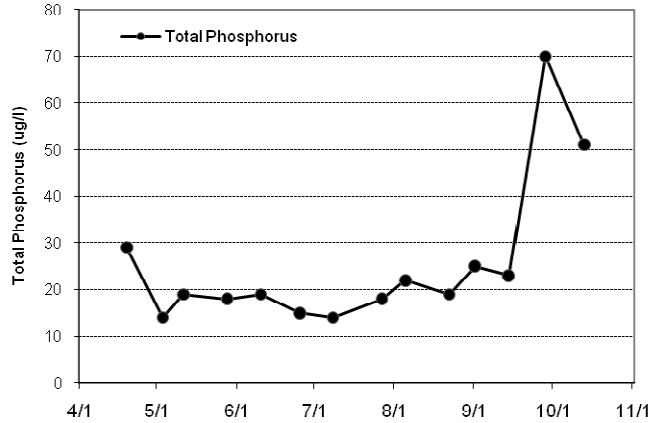
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	
Total Phosphorus	C	A			B								C	
Chlorophyll a	B				B					A	B		B	
Secchi Depth	C	C	B	C	B	C	B	C	C	B	B	C	C	
Lake Grade	C				B									C

Year	1993	1994	1995	1996	1997	1998 Site 1	1998 Site 2	1999 Site 1	1999 Site 2	2000 Site 1	2000 Site 2	2001 Site 1	2001 Site 2
Total Phosphorus				C	A	A	B	A	C	B	B	A	B
Chlorophyll a				A	A	B	C	A	B	B	B	B	C
Secchi Depth	B	B	B	B	B	C	C	B	C	B	C	B	C
Lake Grade	B				A	B	C	A	C	B	B	B	C

Year	2002 Site 1	2002 Site 2	2003 Site 1	2004 Site 1	2005 Site 1	2006 Site 1	2007 Site 1	2008 Site 1	2009 Site 1
Total Phosphorus	B	C	C	B	A	C	A	A	B
Chlorophyll a	B	C	A	B	A	B	B	B	A
Secchi Depth	B	C	A	B	A	B	B	B	A
Lake Grade	B	C	B	B	A	B	B	B	A

Source: Metropolitan Council and STORET data



## **Prior Lake [upper basin, site-1] (70-0072) Prior Lake - Spring Lake Watershed District**

Prior Lake (upper basin) is located in the City of Prior Lake (Scott County). The upper basin is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The upper basin has a surface area of 386 acres. The maximum and mean depths of the upper basin of Prior Lake are 15.2 and 3.1 m (50 and 10 feet), respectively. The upper basin of Prior Lake has two natural inlets, inflow from Spring Lake and the inlet from Rice and Crystal Lake drainage.

The MN DNR has designated the upper basin as being infested with Eurasian water milfoil (*Myriophyllum spicatum*) and Zebra mussels (*Dreissena spp.*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<b>Parameter</b>	<b>Mean</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Grade</b>
<b>TP</b> ( $\mu\text{g/l}$ )	41.9	23.0	71.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	21.7	2.6	62.0	C
<b>Secchi</b> (m)	2.3	0.6	5.0	B
<b>TKN</b> (mg/l)	1.38	0.99	2.00	
			<b>Lake Grade</b>	C

The upper basin received a lake grade of C for 2009. Historical data for the upper basin indicate that the water quality of the basin has varied between lake grades of C and D. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

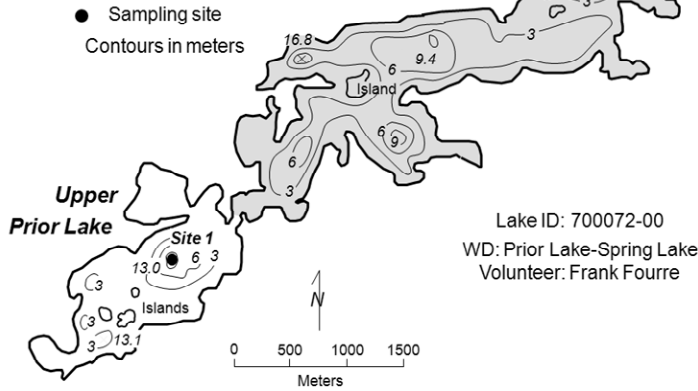
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).



# Prior Lake, Upper Basin, Site 1

## Prior Lake, Scott Co.



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/18	13.8				2.5	39		5.0	1	1
5/5	14.4				2.6	40		5.0	1	1
5/13	15				5	47		4.5	1	1
5/27	18.6				9.2	24		3.0	1	1
6/10	17.3				12	31		2.6	2	2
6/24	25.8				8.3	23		3.0	2	2
7/8	24.2				9	32		2.2	2	2
7/22	23				9.8	30		1.8	2	2
8/5	23.3				24	36		1.5	3	2
8/19	23.9				41	57		1.2	2	2
9/1	21.8				46	64		1.1	3	2
9/16	22.6				62	48		0.6	3	3
9/30	17				32	71		1.2	2	2
10/14	9.4				27	89		1.6	2	2

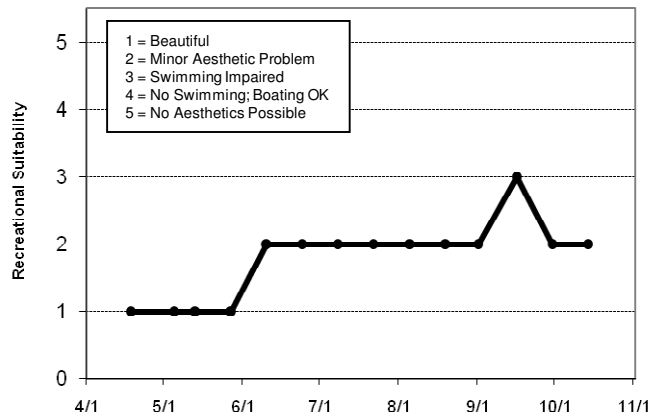
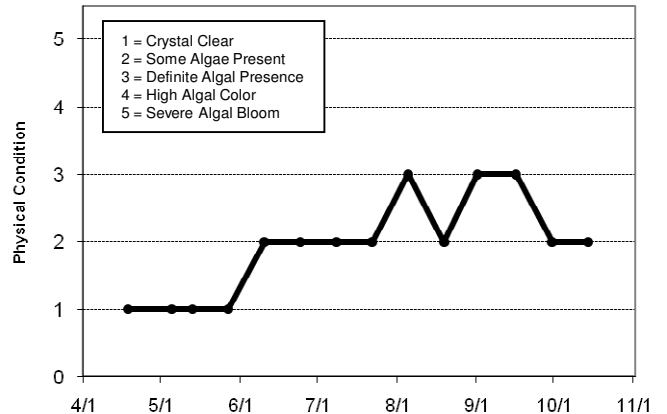
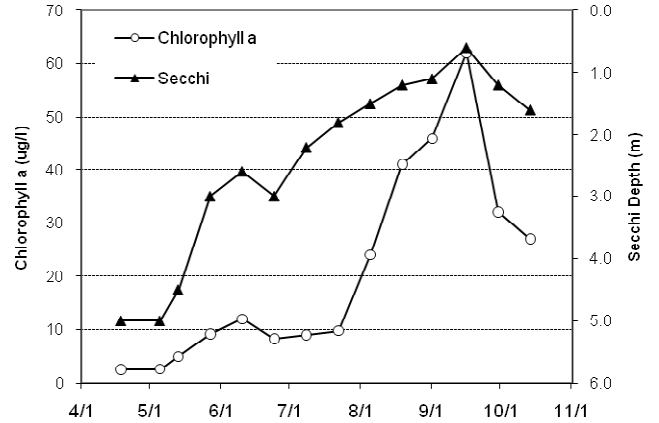
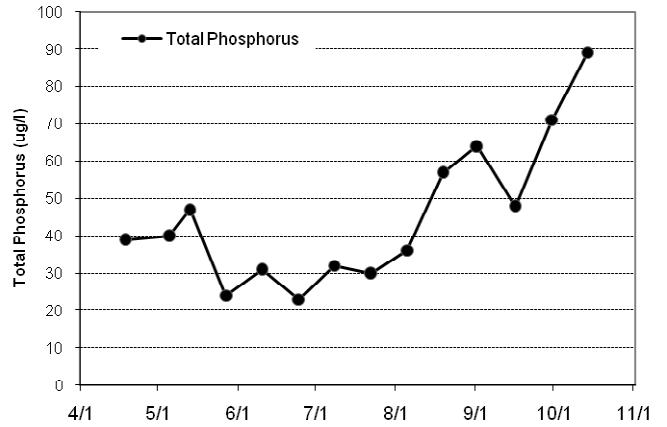
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total Phosphorus	C	C			D						D		
Chlorophyll a	D	D			D						C	C	
Secchi Depth	D	C	D	F	D	D	D	F	F	D	D	C	D
<b>Lake Grade</b>	<b>D</b>	<b>D</b>			<b>D</b>						<b>D</b>		

Year	1993	1994	1995	1996	1997	1998 Site 1	1998 Site 2	1999 Site 1	1999 Site 2	2000 Site 1	2000 Site 2	2001 Site 1	2001 Site 2
Total Phosphorus				C	C	C		D		D		D	
Chlorophyll a				C	C	D		D		D		F	
Secchi Depth	D	D	C	C	D	D		D		C		C	D
<b>Lake Grade</b>				<b>C</b>	<b>C</b>	<b>D</b>		<b>D</b>		<b>D</b>		<b>D</b>	

Year	2002 Site 1	2002 Site 2	2003 Site 1	2004 Site 1	2005 Site 1	2006 Site 1	2007 Site 1	2008 Site 1	2009 Site 1
Total Phosphorus	D	D	C	D	C	D	C	C	C
Chlorophyll a	D	D	D	D	C	D	D	D	C
Secchi Depth	D	D	C	D	C	C	D	D	B
<b>Lake Grade</b>	<b>D</b>	<b>D</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## Regional Park Lake (82-0087) South Washington Watershed District

Regional Park Lake is a 16-acre lake located within the City of Cottage Grove (Washington County). The maximum depth of the lake is 5.8 m. Most of the area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The watershed-to-lake size ratio is 38:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	48.2	31.0	74.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	14.8	10.0	24.0	B
<b>Secchi</b> (m)	2.7	2.3	2.9	B
<b>TKN</b> (mg/l)	0.88	0.67	1.40	
			<b>Lake Grade</b>	B

The lake received a lake grade of B for 2009, which is the best lake grade the lake has received since CAMP monitoring began in 1998. This year marks continued improvement in water clarity in comparison to the clarity during late 1990s and early 2000s. Additional years of monitoring are suggested for determining if this trend continues.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

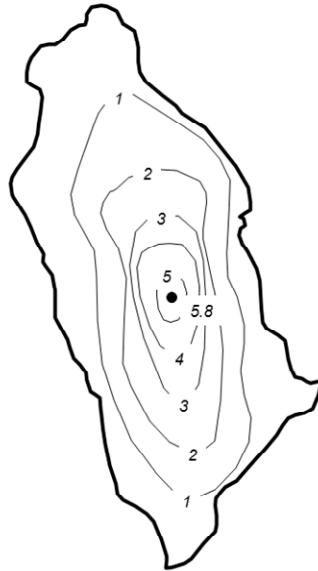
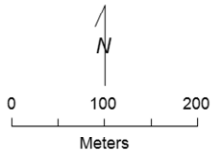
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Regional Park Lake Cottage Grove, Washington Co.

Lake ID: 820087-00  
WD: South Washington  
Volunteer: Washington  
Conservation District

● Sampling site  
Contours in meters



### 2009 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
4/27	12.9	7.1	10.35	0.06	31	81		1.5	3	4
5/26	20.2	9.9	8.8	0.09	16	31		2.9	2	3
6/22	24.2	11.6	10.9	0.11	24	74		2.6	2	3
7/20	21.4	13.7	9.27	0.1	10	33		2.9	2	3
8/17	25.4	16.7	7.19	0.03	11	58		2.3	2	3
9/14	23.4	15.2	9.06	0.07	13	45		2.6	3	3
10/13	8.5	8.5	10.77	0.12	26	44		2.4	2	2

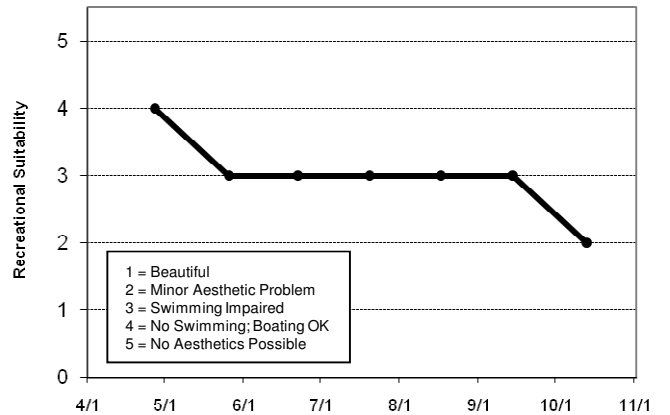
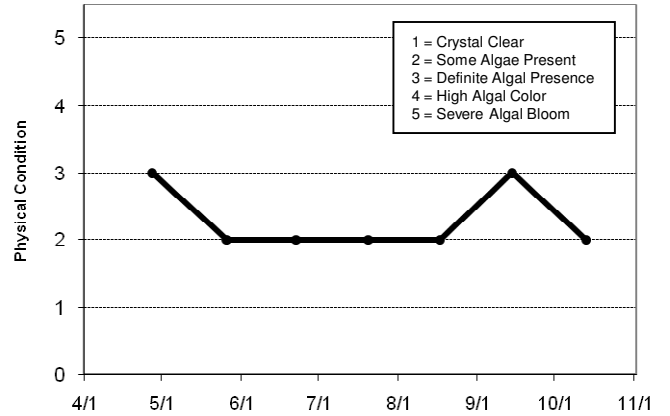
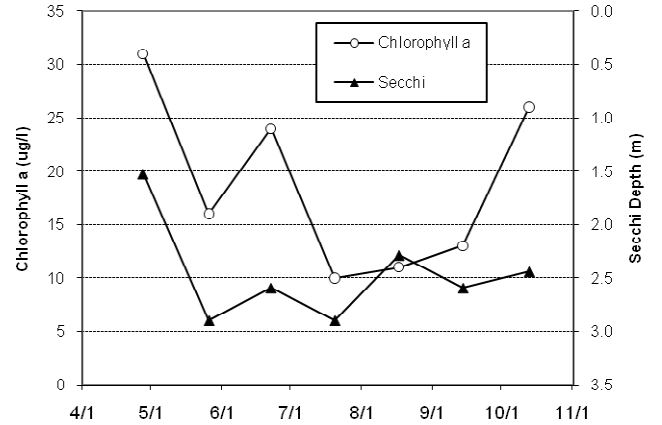
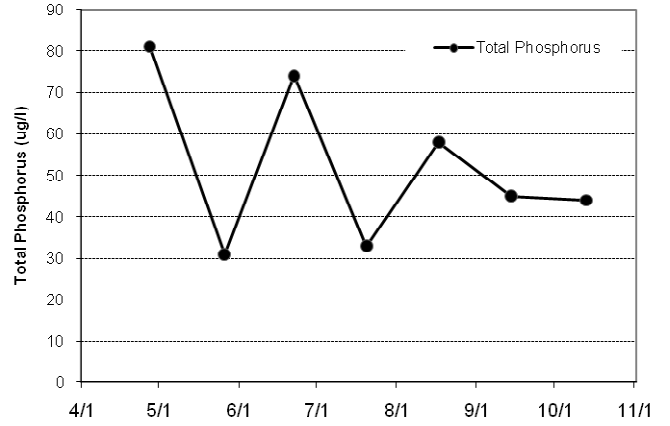
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll <u>a</u>												
Secchi Depth												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus							F	C	D	D	D	D
Chlorophyll <u>a</u>							B	B	C	C	D	C
Secchi Depth							F	D	F	F	F	F
<b>Lake Grade</b>							<b>D</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	D	C	D	C
Chlorophyll <u>a</u>	C	C	C	C	B	C
Secchi Depth	D	C	C	C	C	B
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>

Source: Metropolitan Council and STORET data



## Reitz Lake (10-0052) Carver County Environmental Services

Reitz Lake is located in Laketown Township (Carver County). The lake has a surface area of 79 acres and a watershed area of 3,711 acres, which gives a large watershed-to-lake area ratio of 47:1. The larger the ratio the greater the potential stress put on the lake from surface runoff. The DNR has designated the lake as being infested with Eurasian Water Milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	50.5	25.0	90.0	C
<b>CLA</b> (µg/l)	15.4	5.0	30.0	B
<b>Secchi</b> (m)	1.8	1.0	3.5	C
<b>TKN</b> (mg/l)	1.46	0.99	1.90	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009, which is similar to lake grades received in previous years. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

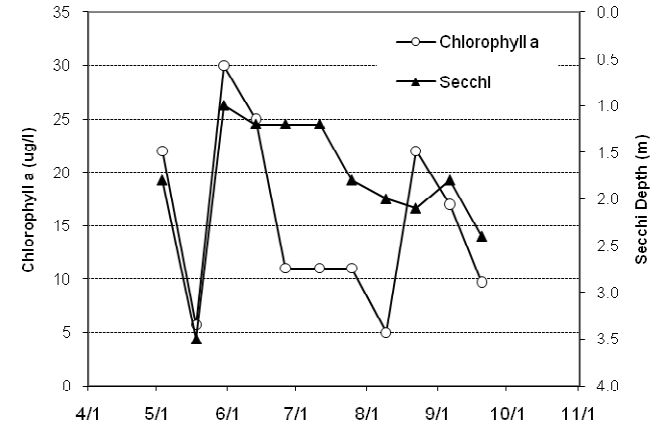
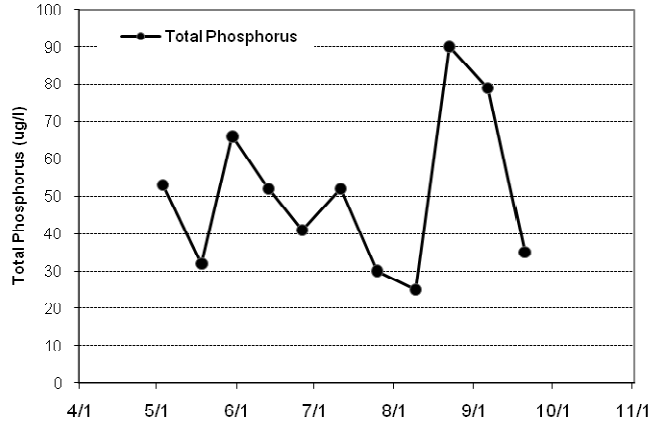
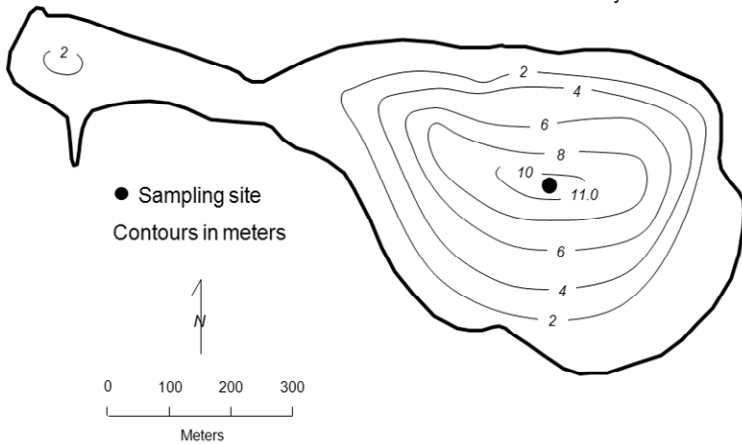
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

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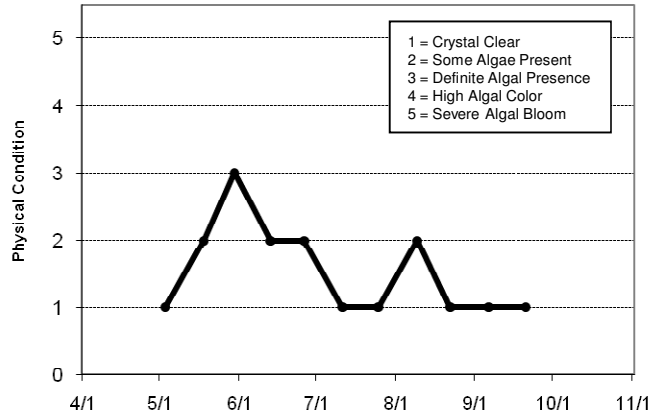
**Reitz Lake**  
Laketown Twp., Carver Co.

Lake ID: 100052-00  
WMO: Carver Creek  
Volunteers: Mark & Lynn McMullen



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	13				22	53		1.8	1	1
5/18	16.7				5.7	32		3.5	2	1
5/30	20				30	66		1.0	3	3
6/13	22				25	52		1.2	2	1
6/26	28				11	41		1.2	2	1
7/11					11	52		1.2	1	1
7/25	23				11	30		1.8	1	1
8/9	26				5	25		2.0	2	1
8/22	22				22	90		2.1	1	1
9/6	23				17	79		1.8	1	1
9/20	23				9.7	35		2.4	1	1
6/20	26				25	249		1.8	3	3

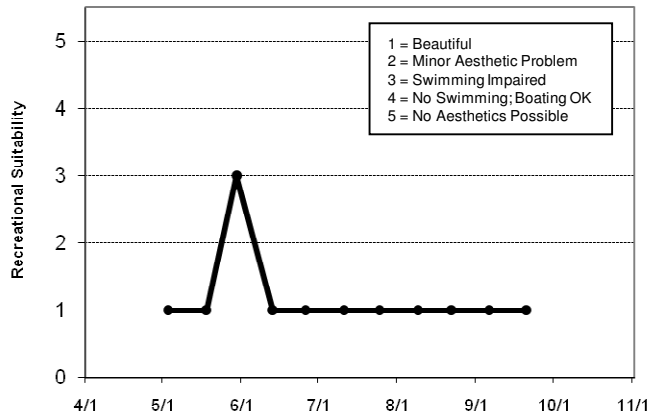


**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus						D						D
Chlorophyll a						F						D
Secchi Depth						D						C
<b>Lake Grade</b>						<b>D</b>						<b>D</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus								C	C	D	D	D
Chlorophyll a								B	C	D	C	D
Secchi Depth								C	C	F	C	B
<b>Lake Grade</b>								<b>C</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	D	C	C	C
Chlorophyll a	C	C	C	A	B	B
Secchi Depth	C	C	C	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>



Source: Metropolitan Council and STORET data

## **Reshanau Lake (02-0009) Rice Creek Watershed District**

Reshanau Lake is located in the City of Lino Lakes (Anoka County). The 336-acre lake has a mean and maximum depth of 3.2 m (10.5 feet) and 4.9 m (16 feet). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	83.6	62.0	134.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	35.0	11.0	59.0	C
<b>Secchi</b> (m)	0.4	0.3	0.5	F
<b>TKN</b> (mg/l)	1.87	1.40	2.50	
<b>Lake Grade</b>				D

The lake received a lake grade of D for 2009, which is similar to the lake grades received in the previous two years. Continued monitoring is recommended to continue to build the water quality database for this lake.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

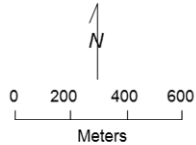
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Reshanau Lake

## Lino Lakes, Anoka Co.

Lake ID: 20009-00  
 WD: Rice Creek  
 Volunteer: Lori Fredlund

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
6/25	27				13	69		0.5	5	4
7/8	26.2				51	62		0.4	4	4
7/20	26				31	76		0.4	5	4
8/7	26.4				43	80		0.4	5	4
8/22	22.6				59	134		0.3	4	2
9/6	24				37	73		0.5	3	3
9/16	25.2				11	91		0.5	2	2
10/4	20				23	47		0.6	2	2
10/12	7.4				14	71		0.6	2	2

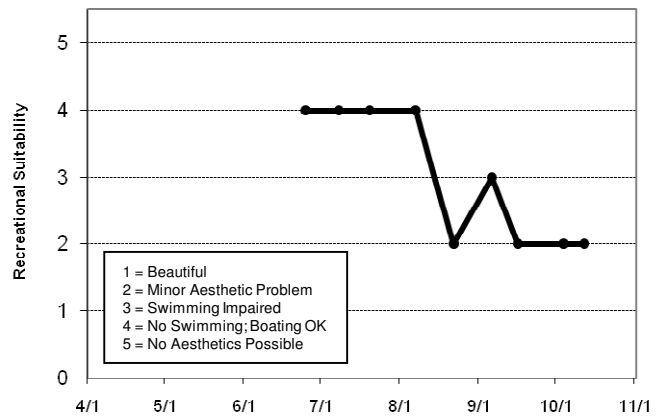
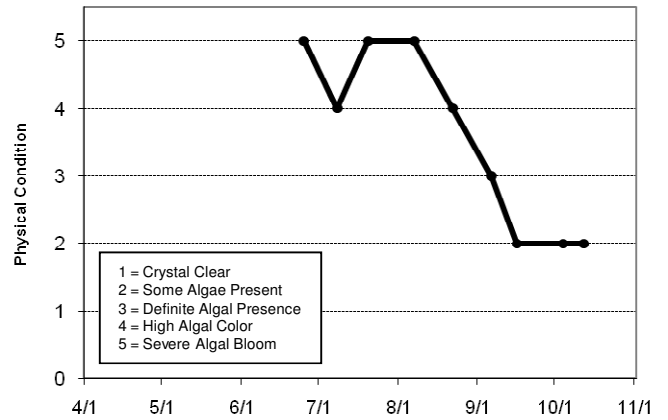
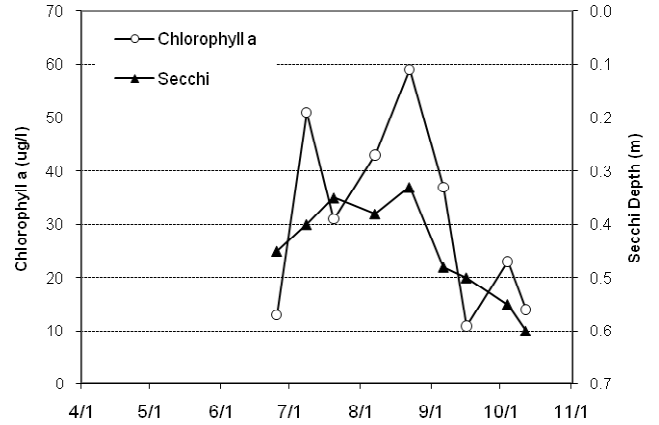
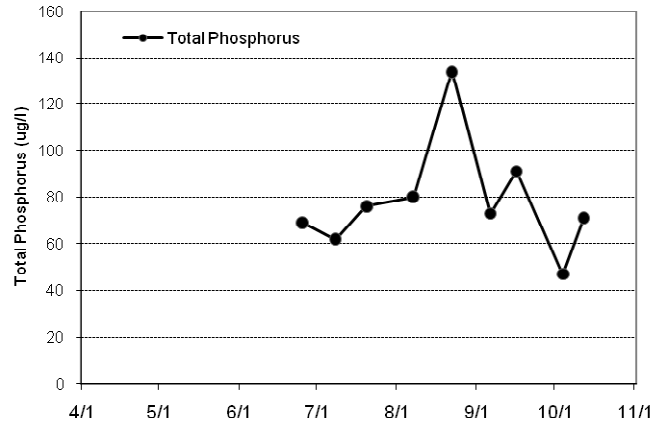
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			D	D	D	D
Chlorophyll a			C	C	D	C
Secchi Depth			F	F	F	F
<b>Lake Grade</b>			<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



### **Rest Area Pond (82-0514) - Valley Branch Watershed District**

Rest Area Pond is a 12.6-acre lake located within West Lakeland Township (Washington County). There is little morphological information for the pond. The pond's surface area and watershed area (17,781 acres) translates to a large 157:1 watershed-to-pond area ratio. Generally the larger the ratio, the greater the potential stress on the pond from surface runoff.

On each sampling day the pond was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the pond's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	293.0	126.0	630.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	121.1	12.0	400.0	F
<b>Secchi</b> (m)	0.4	0.1	0.9	F
<b>TKN</b> (mg/l)	3.34	1.50	6.00	
<b>Lake Grade</b>				F

The pond received a lake grade of F for 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

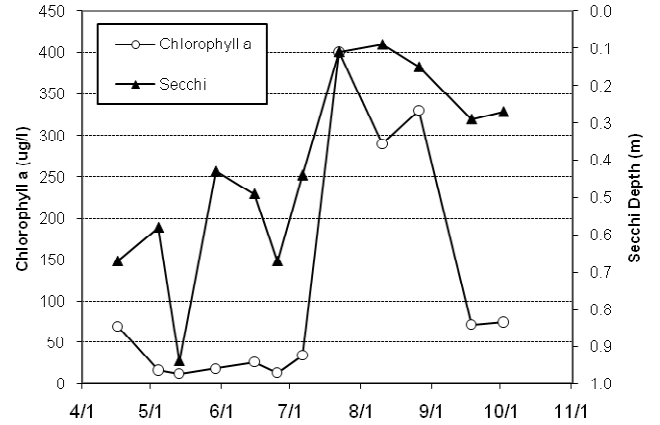
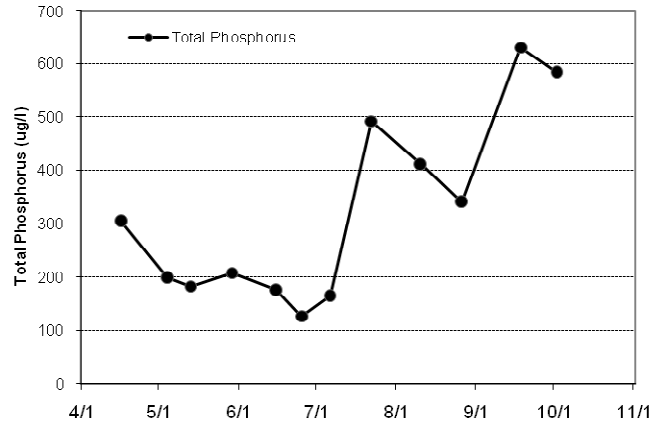
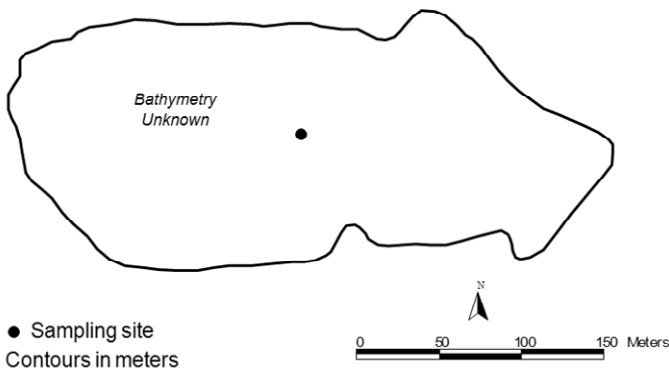
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page (although limited in data).

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](mailto:brian.johnson@metc.state.mn.us).



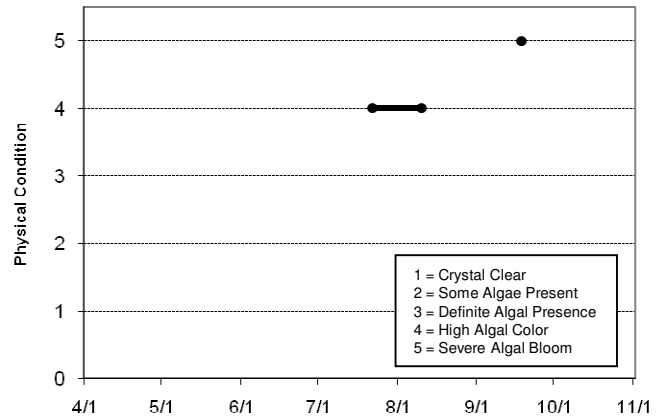
**Rest Area Pond**  
West Lakeland Twp.,  
Washington Co.

Lake ID: 820514-00  
WD: Valley Branch  
Volunteers: MnDOT Staff



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/16	12.7				70	305		0.7		
5/4	14.6				16	199		0.6		
5/13	17.9				12	182		0.9		
5/29	20.2				18	207		0.4		
6/15	24				26	176		0.5		
6/25	29.1				13	126		0.7		
7/6	27.1				34	165		0.4		
7/22	22				400	492		0.1	4	
8/10	27.3				290	412		0.1	4	
8/26	22.4				330	341		0.2		
9/18	22				72	630		0.3	5	
10/2	12.6				75	584		0.3		

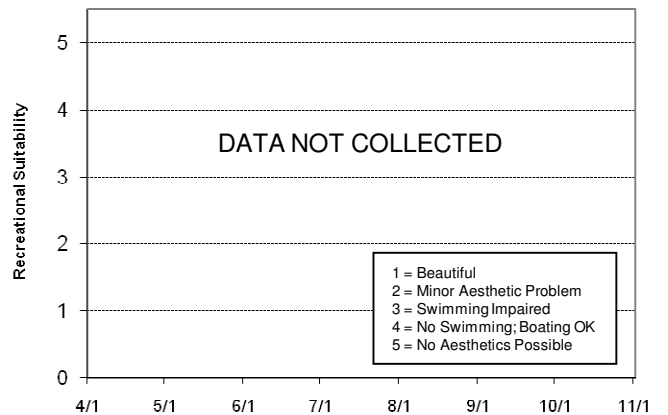


**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						
Chlorophyll a		D	F	F	F	F
Secchi Depth		D	C	F	F	F
Lake Grade		D	D	F	F	F



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. The maximum depth is 3.4 m (11 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

This was the third 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 years 2007 – 2009 are the only years of known data collection for nutrients and chlorophyll-a.

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.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	380.1	102.0	750.0	F
<b>CLA</b> (µg/l)	138.1	19.0	500.0	F
<b>Secchi</b> (m)	1.0	0.3	1.8	D
<b>TKN</b> (mg/l)	2.52	1.50	5.20	
			<i>Lake Grade</i>	F

The lake received a lake grade of F for 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

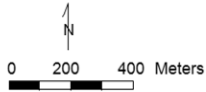
**Rice Lake**  
Maple Grove, Hennepin Co.

Lake ID: 270116-01  
WMO: Elm Creek

Volunteer: George Schneider



● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	14				19	102		0.8	2	2
5/17	17				110	164		0.8	3	3
5/31	25				98	138		0.8	3	3
6/20	26				25	249		1.8	3	3
7/4	26				91	338		0.8	3	3
7/20	23				500	632		0.3	4	4
8/9	26				370	750		0.4	4	4
8/23	23				78	529		1.5	4	4
9/7	23				56	333		1.5	3	3
9/20	24				34	566		1.4	3	3
10/4	13				73	324		1.8	3	3
10/18	7				12	231		2.2	2	2

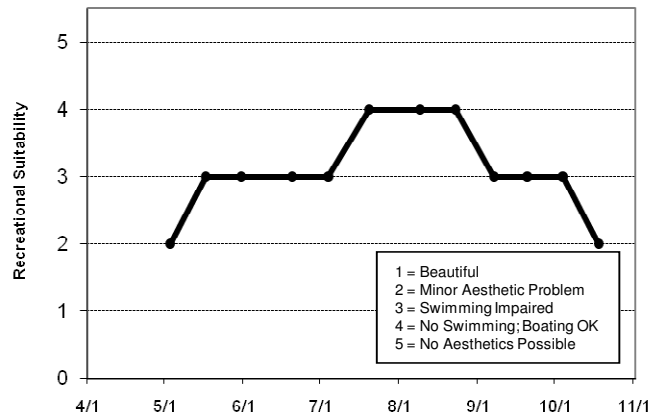
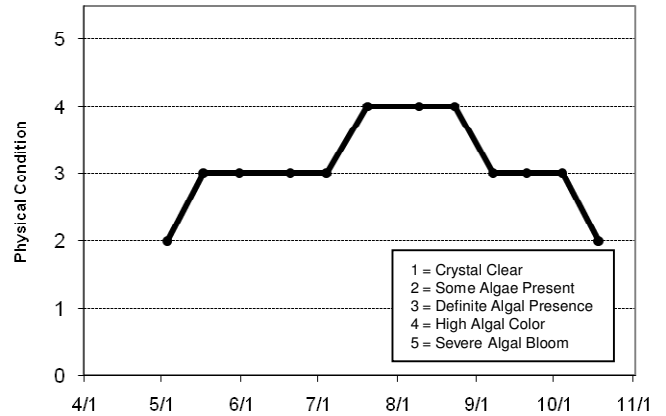
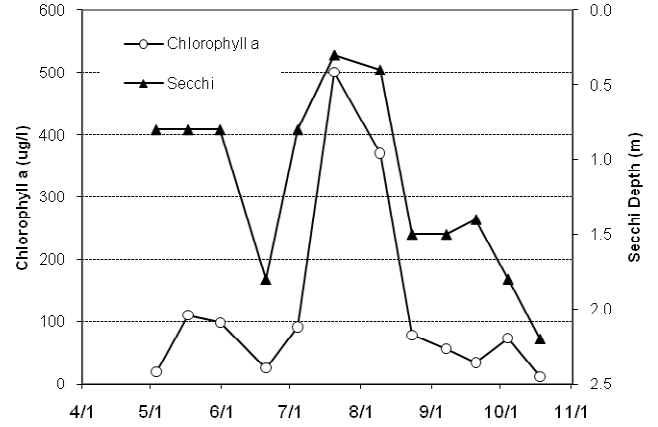
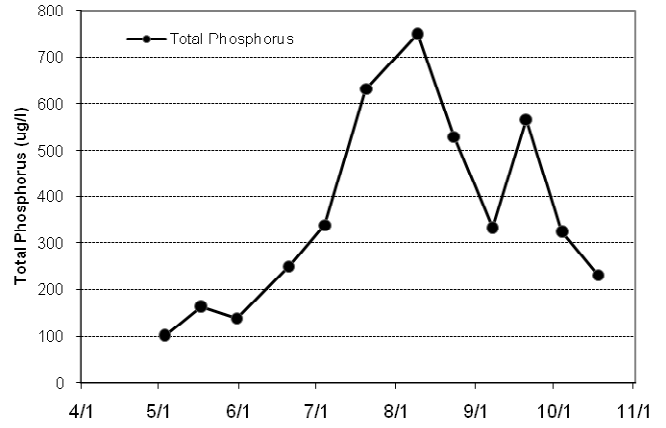
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus				F	F	F
Chlorophyll a				F	D	F
Secchi Depth	C	D	D	F	C	D
<b>Lake Grade</b>				F	D	F

Source: Metropolitan Council and STORET data



## Riley Lake (10-0002) City of Chanhassen

Riley Lake is located with the cities of Chanhassen and Eden Prairie (Carver and Hennepin counties). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a surface area of 297 acres. The maximum and mean depths are 15.0 m and 6.6 m, respectively. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*). The lake is listed as impaired by the MPCA for mercury content in fish.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	38.4	25.0	61.0	C
<b>CLA</b> (µg/l)	18.7	9.4	30.0	B
<b>Secchi</b> (m)	1.8	1.2	3.2	C
<b>TKN</b> (mg/l)	1.39	1.10	2.00	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009, which is consistent with most years of monitoring dating back to 1980. The lake appears to be characterized as a C lake grade.

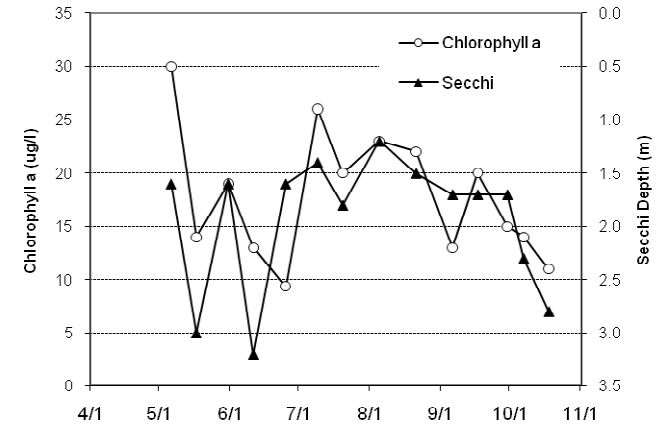
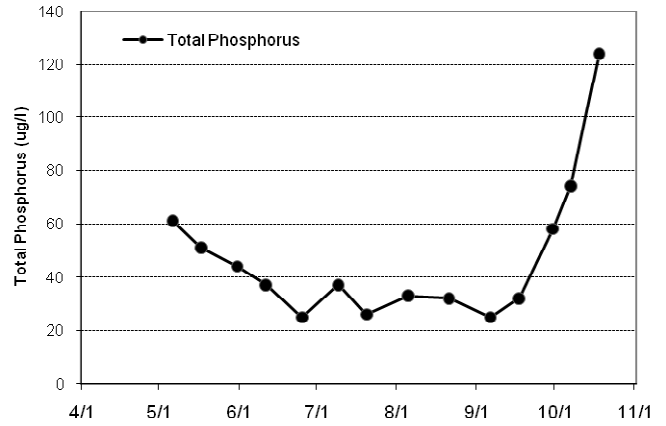
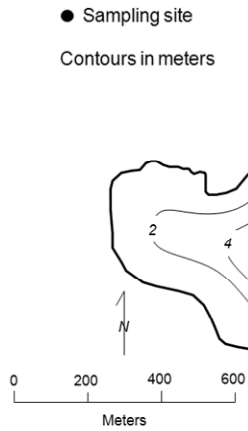
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

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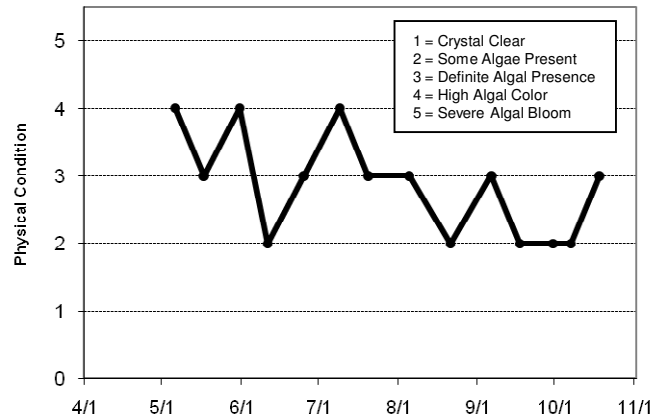
**Lake Riley**  
Eden Prairie, Hennepin Co./  
Chanhassen, Carver Co.

LAKE ID: 100002-00  
WD: Riley-Purgatory-  
Bluff Creek  
Volunteer: David Florenzano



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/6	14.8				30	61		1.6	4	2
5/17	15.3				14	51		3.0	3	3
5/31	20.2				19	44		1.6	4	3
6/11	18.6				13	37		3.2	2	2
6/25	27				9.4	25		1.6	3	2
7/9	22.3				26	37		1.4	4	3
7/20	21.1				20	26		1.8	3	3
8/5	23.9				23	33		1.2	3	2
8/21	20.6				22	32		1.5	2	2
9/6	22.9				13	25		1.7	3	2
9/17	22.9				20	32		1.7	2	1
9/30	17.6				15	58		1.7	2	2
10/7	13.4				14	74		2.3	2	2
10/18	9.8				11	124		2.8	3	2

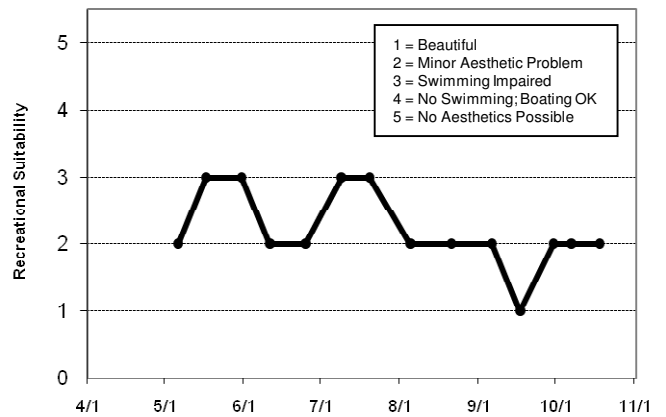


**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	C	B	C	C	C	C	C	C			C	C
Chlorophyll a	C	C	C	C	C	C	C	C	D		C	C
Secchi Depth	C	C	C	C	C	C	C	C	C	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>		<b>C</b>	<b>C</b>

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	B	C	C
Chlorophyll a	C	C	B	B	B	B
Secchi Depth	B	C	B	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>C</b>



Source: Metropolitan Council and STORET data

## **Rogers Lake (19-0080) – Lower Mississippi River Watershed Management Organization**

Rogers Lake lies within the City of Mendota Heights. The lake has a surface area of 94 acres and a maximum depth of 2.4 m (7.9 ft). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	39.9	28.0	68.0	C
<b>CLA</b> (µg/l)	8.5	4.2	12.0	A
<b>Secchi</b> (m)	1.3	1.0	1.5	C
<b>TKN</b> (mg/l)	1.32	0.86	1.90	
<b>Lake Grade</b>				<b>B</b>

The lake received a lake grade of B for 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

The water clarity grade of C does not correlate well with the chlorophyll-a grade of A. A possible explanation may be that the water clarity may be affected by higher levels of total suspended solids from surface runoff from the surrounding urbanized watershed. It is possible for higher suspended solids loadings to decrease water clarity which would decrease light penetration thereby inhibiting algal growth.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

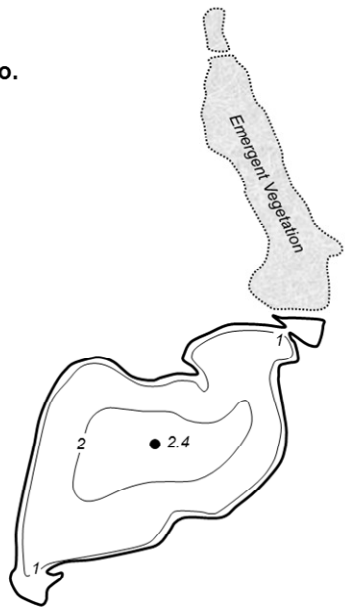
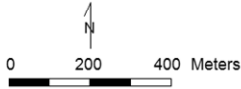
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Rogers Lake

## Mendota Heights, Dakota Co.

Lake ID: 190080-00  
 WMO: Lower Mississippi River  
 Volunteer: Doug Hennes

● Sampling site  
 Contours in meters



### 2009 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
5/31	18.9				4.2	68		1.4	1	1
6/14	23.9				6.3	30		1.3	2	2
6/28	24.6				8.5	52		1.3	1	1
7/12	26.8				12	38		1.3	1	1
7/26	24.5				10	36		1.2	2	1
8/3	24.3				7.4	30		1.0	2	1
8/23	23.5				8.9	31		1.5	1	2
9/6	24.2				8.1	28		1.5	1	1
9/20	23.9				11	46		1.4	1	1
10/4	12.1				5.3	78		1.6	1	1
10/18	9				3.6	15		1.7	1	1

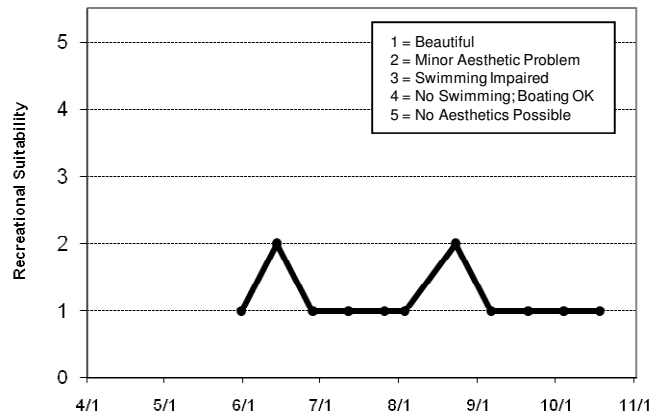
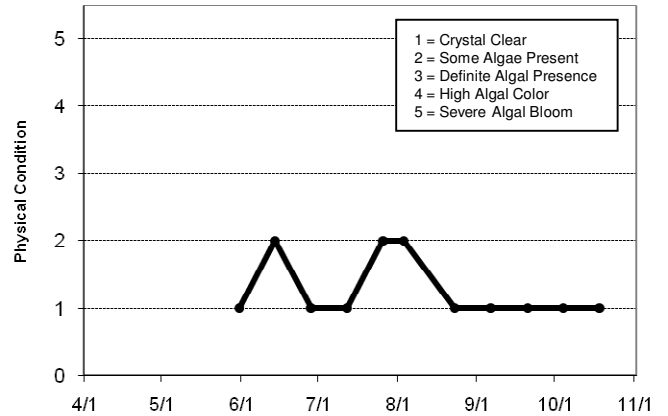
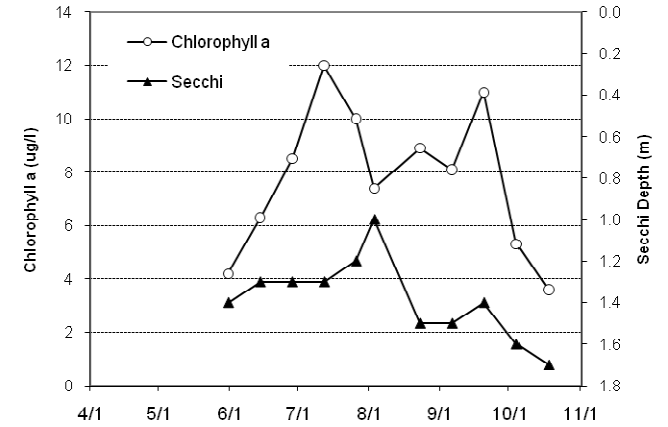
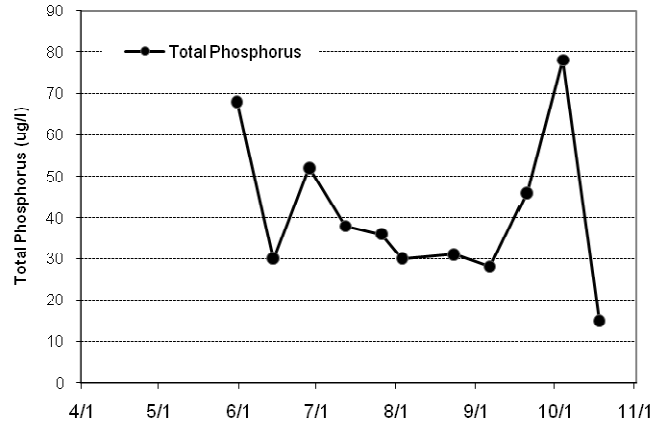
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus				C	B	C
Chlorophyll a				A	A	A
Secchi Depth				D	C	C
<b>Lake Grade</b>				<b>C</b>	<b>B</b>	<b>B</b>

Source: Metropolitan Council and STORET data



**Rose Lake [Site 1, north basin] (82-0012) Washington Conservation District**

Rose Lake is a small lake located in the City of Lake Elmo (Washington County). There are little known morphological data available for the lake.

On each sampling day Site 1 was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	267.2	212.0	310.0	F
<b>CLA</b> (µg/l)	160.4	92.0	250.0	F
<b>Secchi</b> (m)	0.2	0.1	0.3	F
<b>TKN</b> (mg/l)	4.72	3.80	5.00	
<b>Lake Grade</b>				F

Site 1 received a lake grade of F for 2009. Additional monitoring is suggested to continue to build the water quality database.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



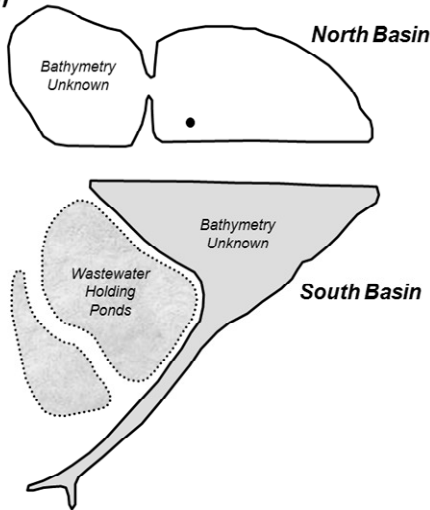
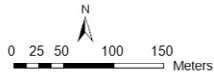
# Rose Lake (North Basin)

## Lake Elmo, Washington Co.

Lake ID: 820112-00  
 WD: Valley Branch  
 Volunteer: Washington  
 Conservation District

● Sampling site

Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	12.8	8.4	12.55	0.11	220	110		0.5	3	4
6/1	24.3	17.3	12.02	0.11	92	212		0.3	4	4
6/16	22.8	15.5	12.55	0.02	130	310		0.3	4	4
7/13	27.5	18.2	12.69	0.09	150	249		0.3	4	4
8/11	23.7	18.2	10.33	0.06	180	287		0.2	3	4
9/8	20.6	17.8	13.31	0.13	250	278		0.1	4	4
10/7	11	9.6	11.99	0.13	220	338		0.2	4	4

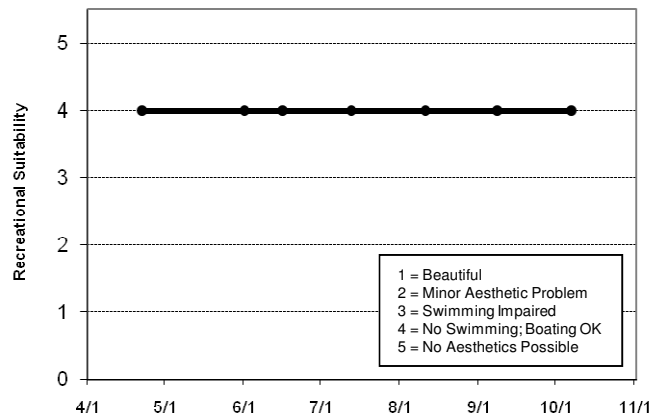
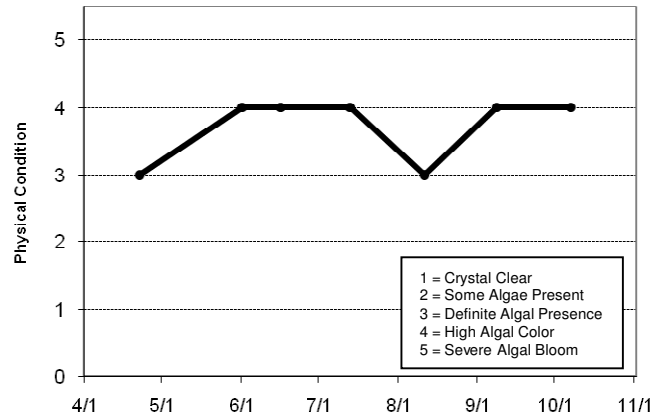
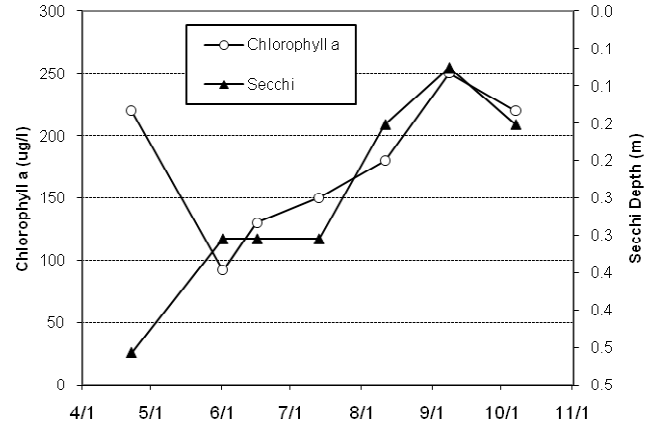
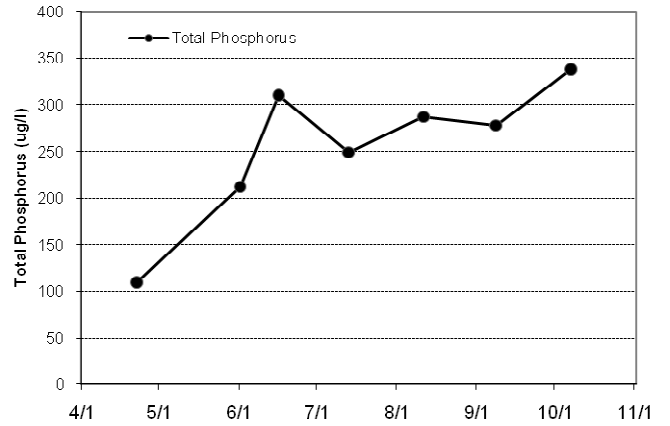
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					D	F
Chlorophyll a					F	F
Secchi Depth					F	F
<b>Lake Grade</b>					F	F

Source: Metropolitan Council and STORET data



## Rose Lake [Site 2, south basin] (82-0012) Washington Conservation District

Rose Lake is a small lake located in the City of Lake Elmo (Washington County). There are little known morphological data available for the lake.

On each sampling day Site 2 was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	272.8	185.0	408.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	137.6	88.0	200.0	F
<b>Secchi</b> (m)	0.2	0.2	0.3	F
<b>TKN</b> (mg/l)	3.74	2.80	4.60	
<b>Lake Grade</b>				F

Site 2 received a lake grade of F for 2009. Additional monitoring is suggested to continue to build the water quality database.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

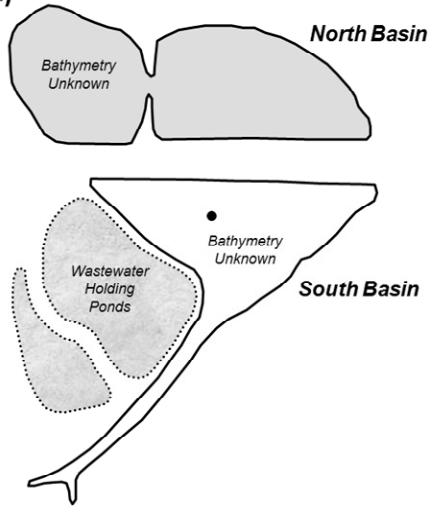
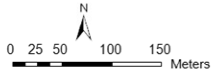
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

**Rose Lake (South Basin)**  
Lake Elmo, Washington Co.

Lake ID: 820112-00  
WD: Valley Branch  
Volunteer: Washington  
Conservation District

● Sampling site

Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	11.5	6.6	12.01	0.11	250	181		0.6	3	4
6/1	21.5	13.5	12.01	0.07	88	329		0.3	4	4
6/16	23.3	15.1	16.35	0.07	140	408		0.2	4	4
7/13	26.6	14.4	14.32	0.04	200	212		0.2	4	4
8/11	24.6	16	11.07	0.06	130	185		0.2	3	4
9/8	21.5	16.9	11.12	0.06	130	230		0.2	4	4
10/7	11.2	10.5	11.3	0.23	130	222		0.3	3	4

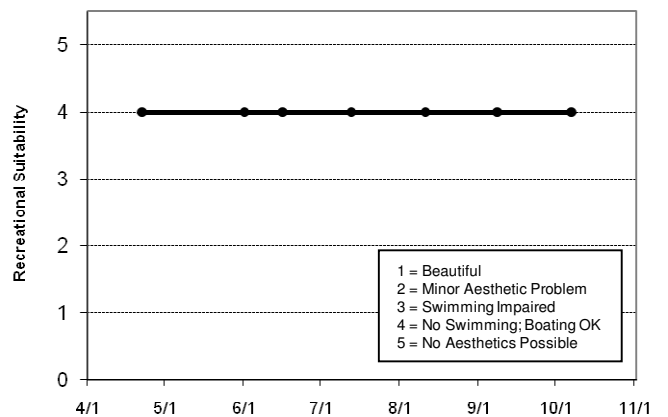
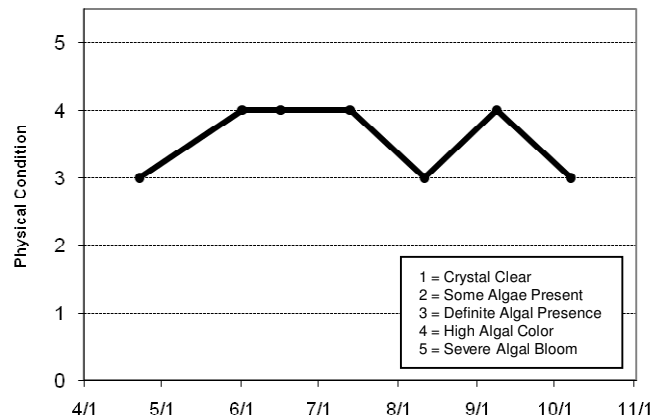
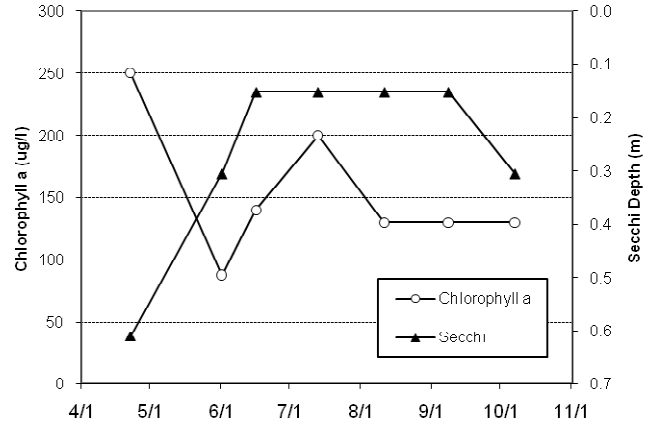
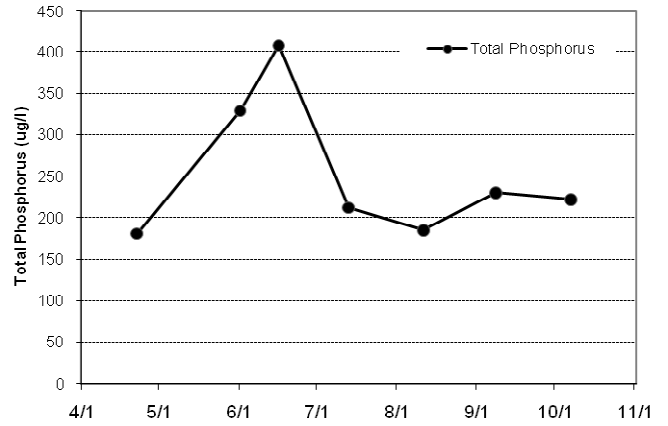
**Lake Water Quality Grades Based on Summertime Averages**

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					D	F
Chlorophyll a					F	F
Secchi Depth					F	F
<b>Lake Grade</b>					F	F

Source: Metropolitan Council and STORET data



## **Rutz Lake (10-0080) Carver County Environmental Services**

Rutz Lake is a 61-acre lake located within Waconia Township (Carver County). The maximum depth of the lake is 4.0 m (roughly 13 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	179.3	132.0	253.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	69.5	28.0	140.0	D
<b>Secchi</b> (m)	0.6	0.5	0.7	F
<b>TKN</b> (mg/l)	2.88	2.50	3.40	
<b>Lake Grade</b>				D

The lake received a lake grade of F for 2009, which is consistent with its limited water quality database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

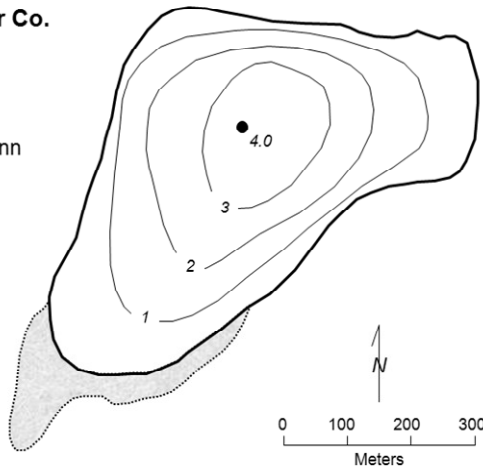
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Rutz Lake

Waconia Twp., Carver Co.

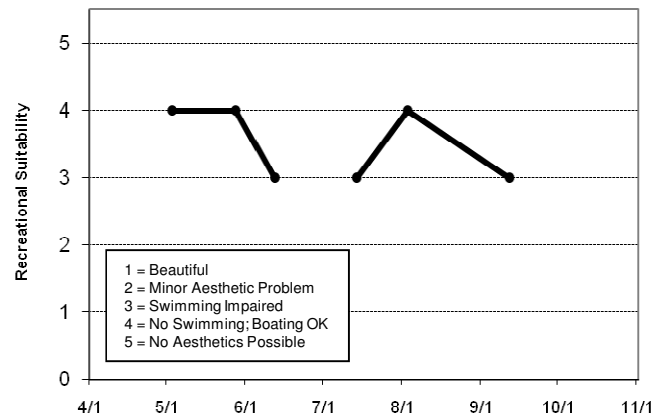
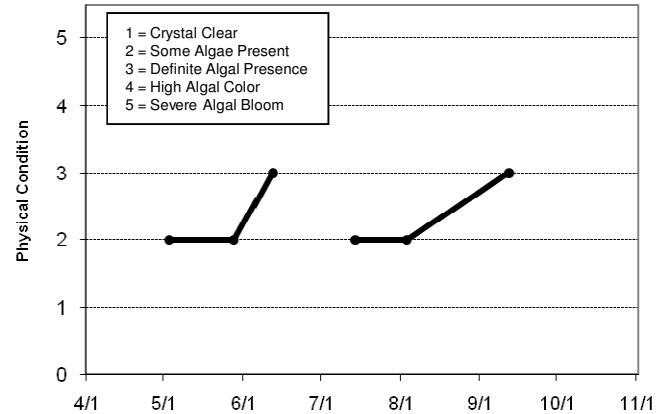
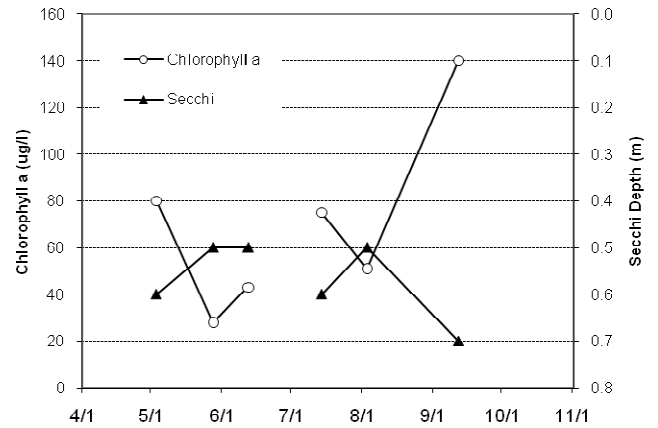
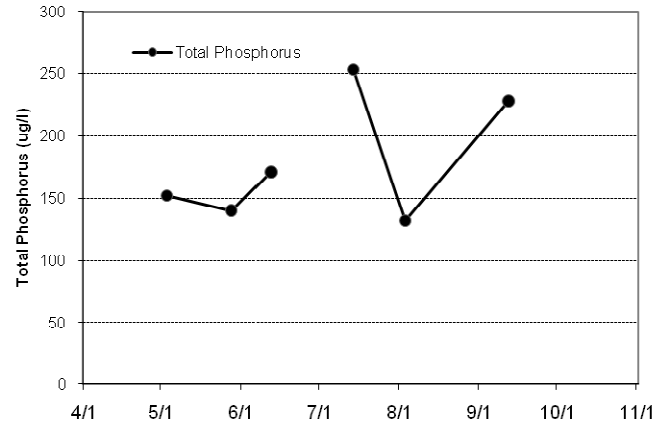
Lake ID: 100080-00  
 WMO: Carver Creek  
 Volunteer: Marty Ziermann

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	13				80	152		0.6	2	4
5/28	20.7				28	140		0.5	2	4
6/12	20.4				43	171		0.5	3	3
6/12										
7/14										
7/14	23.8				75	253		0.6	2	3
8/3	24.3				51	132		0.5	2	4
9/12	30.2				140	228		0.7	3	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												
<b>Lake Grade</b>												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		F	F	F	F	F
Chlorophyll a		D	F	D	D	D
Secchi Depth		D	D	F	F	F
<b>Lake Grade</b>		<b>D</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>

Source: Metropolitan Council and STORET data

**Sand Lake (82-0067) Carnelian - Marine - St. Croix Watershed District**

Sand Lake is a 46-acre lake located within City of Scandia (Washington County). The lake has a surface area of 46 acres.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	37.2	19.0	82.0	C
<b>CLA</b> (µg/l)	10.9	3.4	28.0	B
<b>Secchi</b> (m)	3.1	1.4	4.3	A
<b>TKN</b> (mg/l)	0.95	0.78	1.10	
			<b>Lake Grade</b>	B

The lake received a lake grade of B for 2009. The lake appears to be characterized as a C lake, though it occasionally has received B lake grades. A finding of note is the better water clarity observed in 2009. The lake received a Secchi grade of A for the first time according to its historical water quality database.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

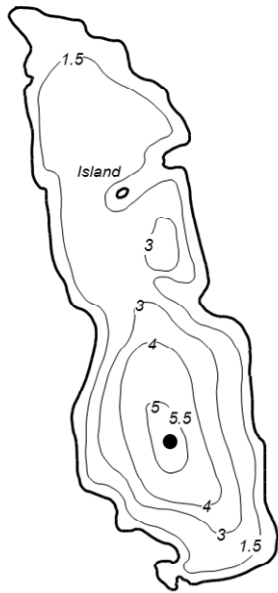
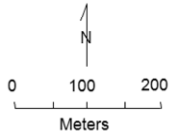
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Sand Lake Scandia, Washington Co.

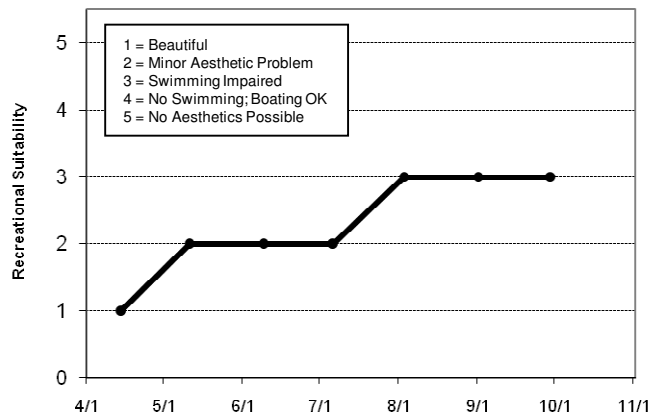
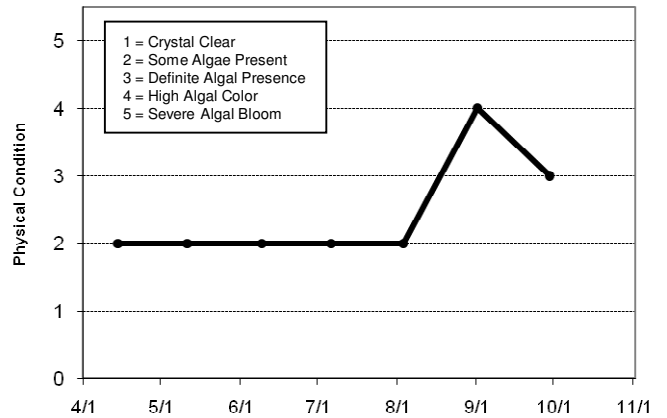
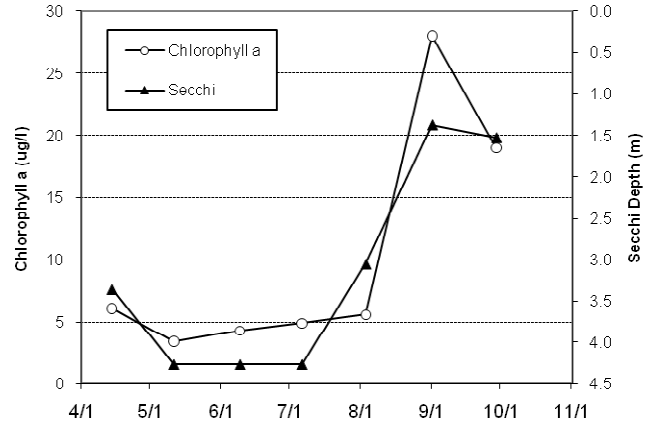
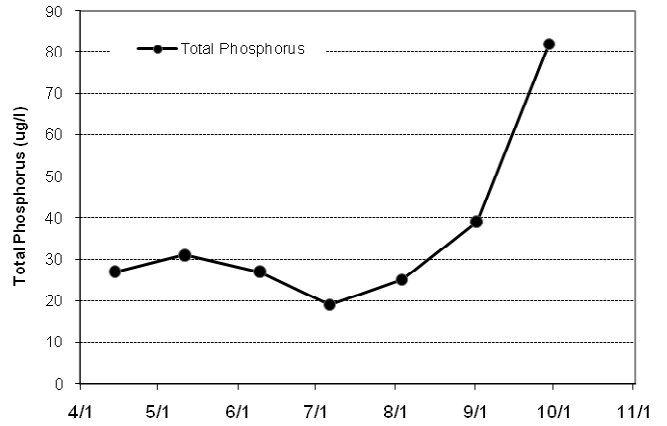
Lake ID: 820067-00  
 WD: Carnelian-Marine-St. Croix  
 Volunteer: Washington  
 Conservation District

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	10.1	8.2	10.67	9.52	6.1	27		3.4	2	1
5/11	16.3	14.4	8.72	6.63	3.4	31		4.3	2	2
6/9	18.6	16.8	7.62	0.11	4.3	27		4.3	2	2
7/6	25.1	20.1	8.55	0.11	4.9	19		4.3	2	2
8/3	22.8	21.3	7.72	0.11	5.6	25		3.0	2	3
9/1	20.4	20.2	9.13	0.03	28	39		1.4	4	3
9/29	16.5	15.9	6.76	0.42	19	82		1.5	3	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												
<b>Lake Grade</b>												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	C	C	B	C	C
Chlorophyll a	B	C	B	B	C	B
Secchi Depth	C	C	C	B	C	A
<b>Lake Grade</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>B</b>

Source: Metropolitan Council and STORET data

**School Lake (13-0057) Comfort Lake Forest Lake Watershed District**

School Lake is located in Wyoming Township (Chisago County). There are few morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

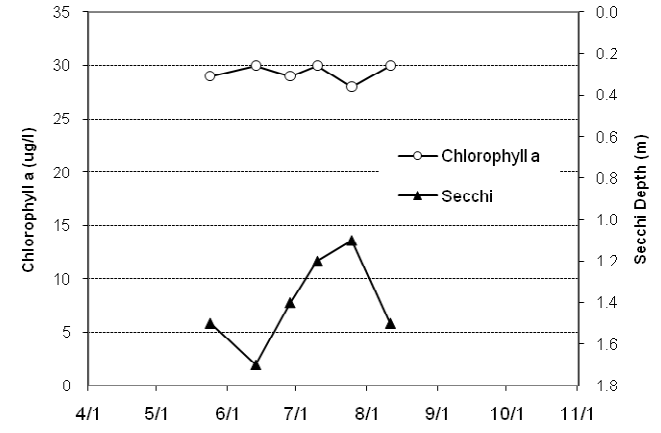
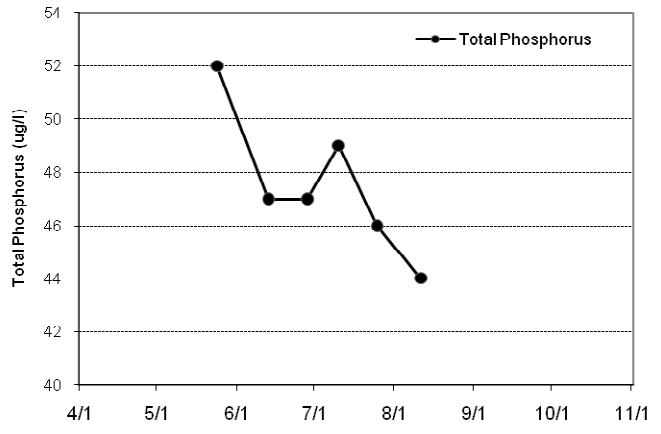
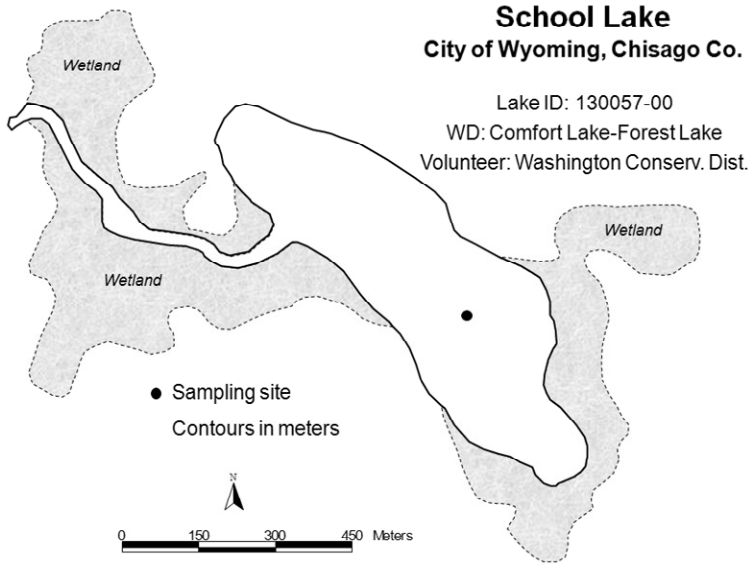
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	47.5	44.0	52.0	C
<b>CLA</b> (µg/l)	29.3	28.0	30.0	C
<b>Secchi</b> (m)	1.4	1.1	1.7	C
<b>TKN</b> (mg/l)	0.90	0.82	0.98	
<b>Lake Grade</b>				C

The lake received a lake grade of C in 2009, which is consistent with its limited historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake’s water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

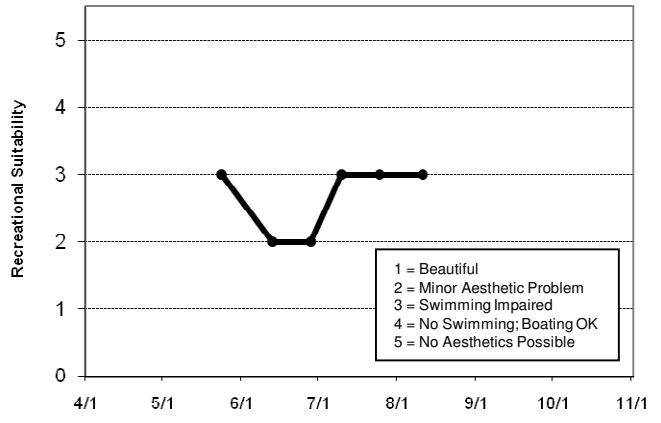
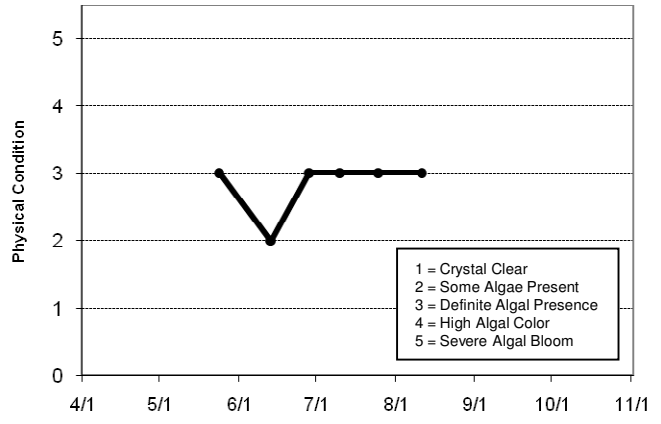
If you notice any errors in the lake’s data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).





#### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/24	15.7				29	52		1.5	3	3
6/13	21				30	47		1.7	2	2
6/28	23.1				29	47		1.4	3	2
7/10	23.5				30	49		1.2	3	3
7/25	23.8				28	46		1.1	3	3
8/11	24				30	44		1.5	3	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												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		C	D	C		C
Chlorophyll a		C	C	C		C
Secchi Depth		C	C	C		C
<b>Lake Grade</b>		<b>C</b>	<b>C</b>	<b>C</b>		<b>C</b>

Source: Metropolitan Council and STORET data

## Scout Lake (19-0198) City of Apple Valley

Scout Lake is a small lake located in Apple Valley. Little information is available on the morphology of the lake. The maximum depth of the lake is 2.9 m (9.5 feet). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	125.7	52.0	508.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	36.3	13.0	67.0	C
<b>Secchi</b> (m)	0.8	0.5	1.2	D
<b>TKN</b> (mg/l)	2.16	1.60	4.00	
<b>Lake Grade</b>				D

The lake received a lake grade of D for 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 1.7 (between 1- "crystal clear" and 2- "some algae present"). The average recreational suitability ranking was 1.5 (between 1- "beautiful" and 2- "minor aesthetic problem").

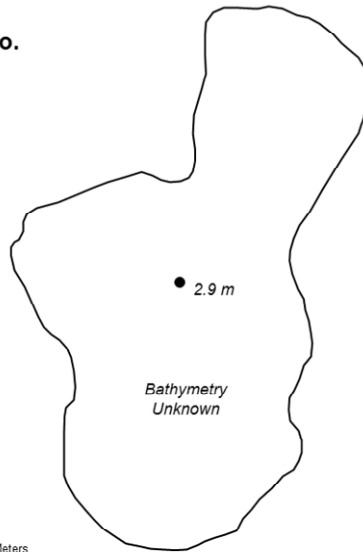
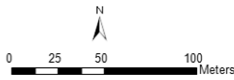
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Scout Lake

Apple Valley, Dakota Co.

Lake ID: 190198-00  
 WMO: Vermillion River  
 Volunteer: Dan Stanek

● Sampling site  
 Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/17	18				12	60		1.2		1
4/30	14.8				15	68		1.3		
5/14	18.3				13	59		1.2	1	1
5/29	22.8				18	61		1.2	2	2
6/14	24				27	94		0.8		
6/25	31.3				29	73		0.8	3	
7/8	26.4				50	71		0.6	3	
7/25	23.9				32	67		0.6		
8/8	25.6				67	78		0.5	2	
8/23	23.1				41	52		0.8	2	
9/5	23.1				35	508		0.8		
9/20	19.2				51	194		0.7		
10/4	13				33	113		1.0		
10/14	8.2				47	60		1.0		

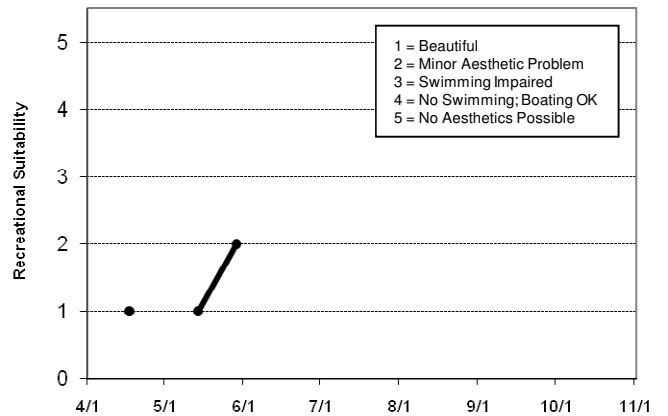
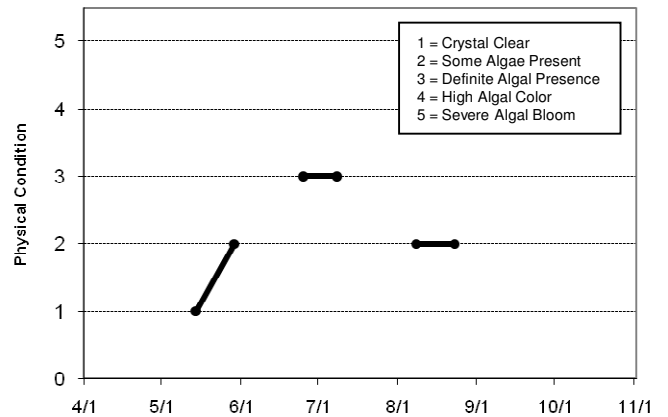
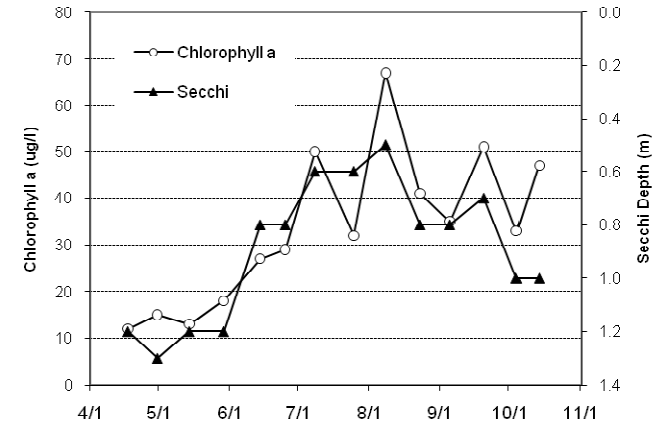
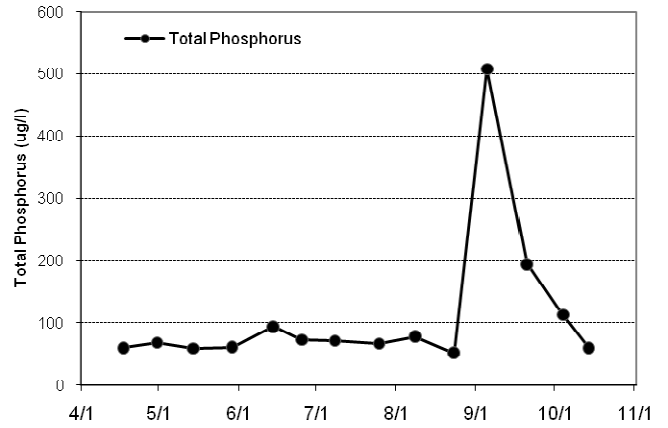
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus				D	C	D
Chlorophyll a				C	C	C
Secchi Depth				F	C	D
Lake Grade				D	C	D

Source: Metropolitan Council and STORET data



**Sea Lake (82-0053) Forest Lake – Comfort Lake Watershed District**

Sea Lake is a small lake located in Scandia (Washington County). Little information is available on the morphology of the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	121.9	73.0	230.0	D
<b>CLA</b> (µg/l)	45.9	24.0	100.0	C
<b>Secchi</b> (m)	0.6	0.5	0.8	F
<b>TKN</b> (mg/l)	1.73	1.60	2.10	
<b>Lake Grade</b>				D

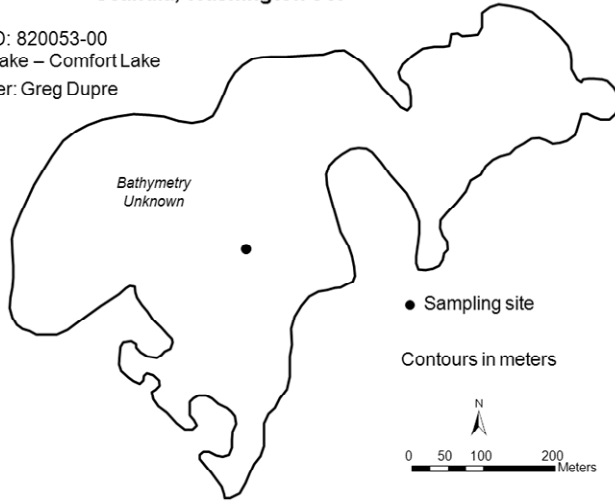
The lake received a lake grade of D for 2009. The Secchi grade of F does not correlate well with the CLA grade of C. A possible explanation may be that the water clarity may be affected by higher levels of total suspended solids from surface runoff. It is possible for higher suspend solids loadings to decrease water clarity which would decrease light penetration thereby inhibiting algal growth. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake’s water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

## Sea Lake Scandia, Washington Co.

Lake ID: 820053-00  
 WD: Forest Lake – Comfort Lake  
 Volunteer: Greg Dupre



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
6/11	21				32	97		0.7	2	4
6/25	28.8				24	143		0.8	2	4
7/7	27.1				32	73		0.7	2	4
7/23	26.8				28	74		0.7	2	4
8/16	25.4				100	230		0.5	3	4
9/1	21.5				64	131		0.5	3	4
9/14	25.3				41	105		0.6	3	4

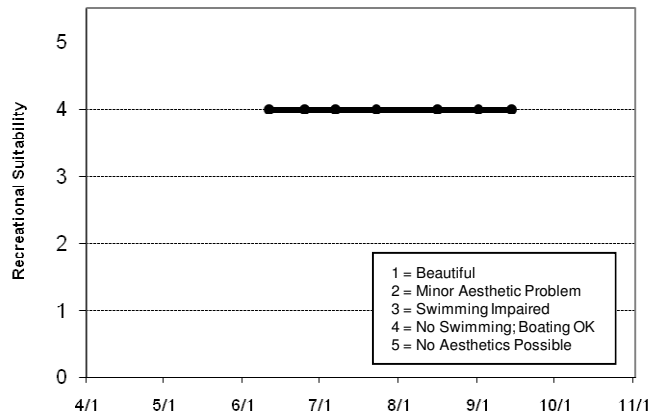
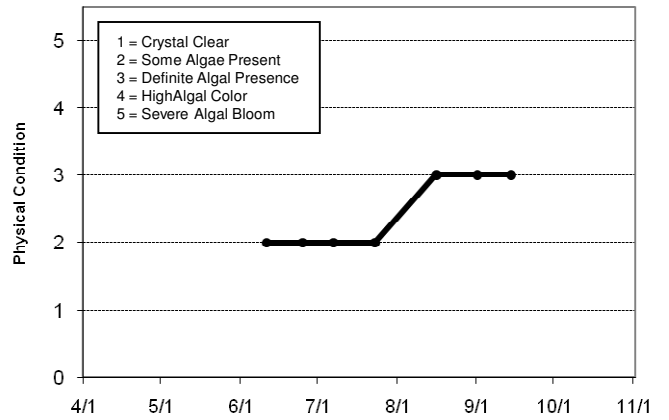
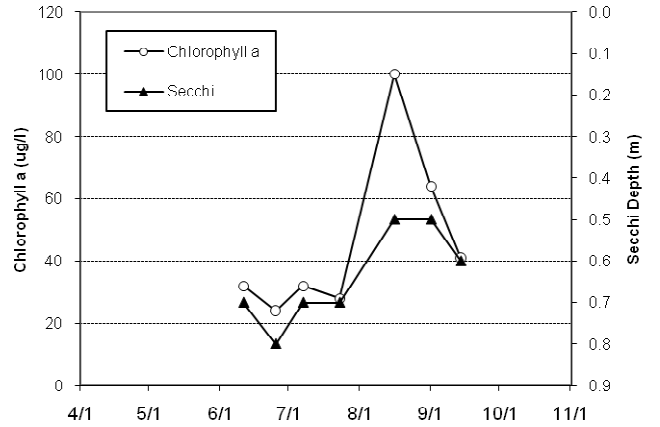
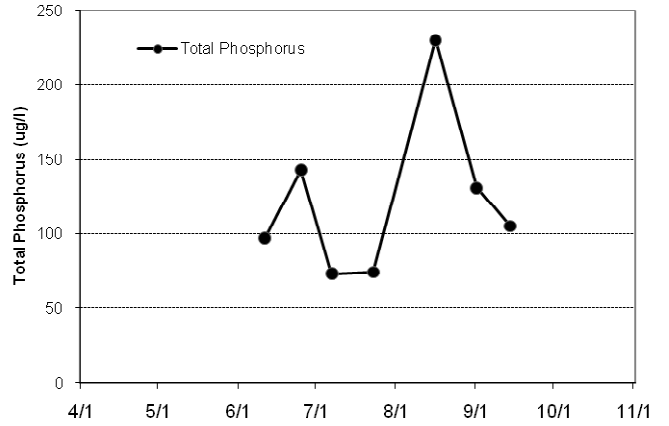
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					C	D
Chlorophyll a					B	C
Secchi Depth					D	F
<b>Lake Grade</b>					C	D

Source: Metropolitan Council and STORET data



**Seidl's Lake (19-0095) Cities of *Inver Grove Heights and South St. Paul***

Seidl's Lake is a 14-acre lake located in the City of Inver Grove Heights (Dakota County) which receives inflow from five inlets. The maximum depth of the lake is approximately 5.0 m (17 feet). There are little known morphological data available.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	50.0	48.0	52.0	N/A
<b>CLA</b> ( $\mu\text{g/l}$ )	17.0	17.0	17.0	N/A
<b>Secchi</b> (m)	1.0	1.0	1.0	N/A
<b>TKN</b> (mg/l)	1.65	1.60	1.70	
			<b>Lake Grade</b>	N/A

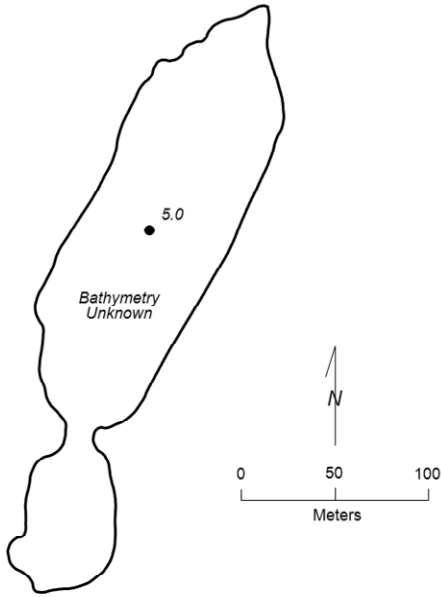
No lake grade or parameter grades were issued this year because of too few monitoring events. At least 5 monitoring events during the summer-time period are required to determine grades.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Seidl Lake**  
Inver Grove Heights,  
Dakota Co.

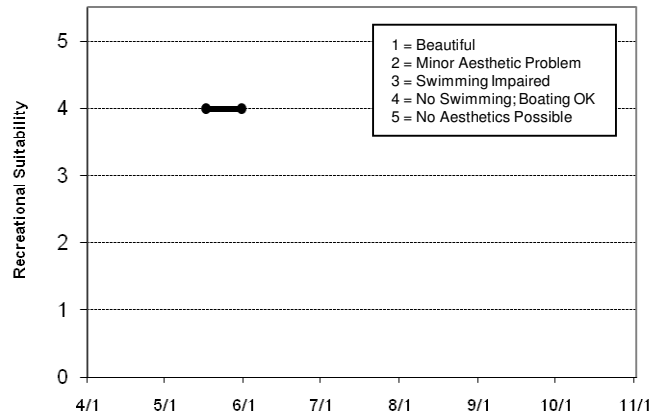
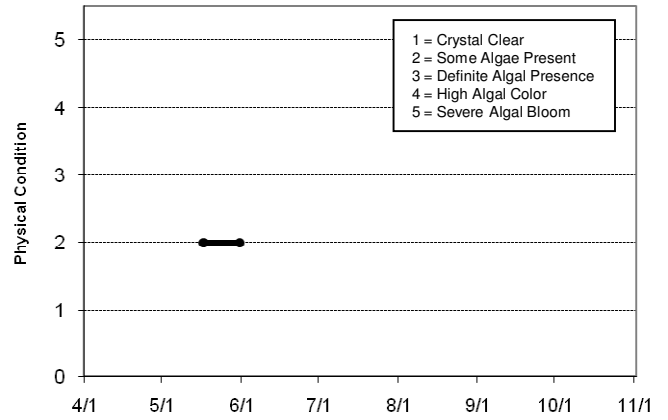
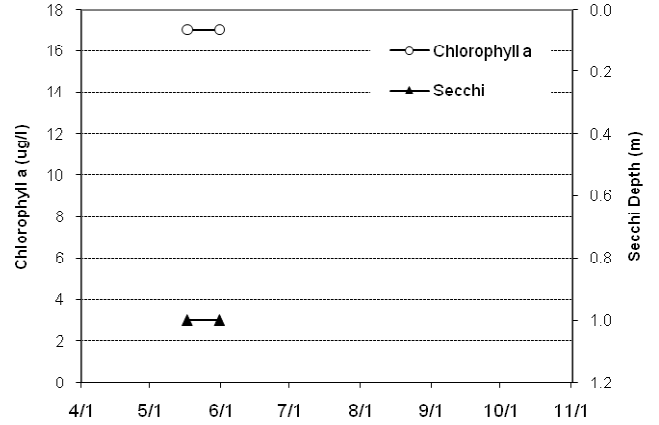
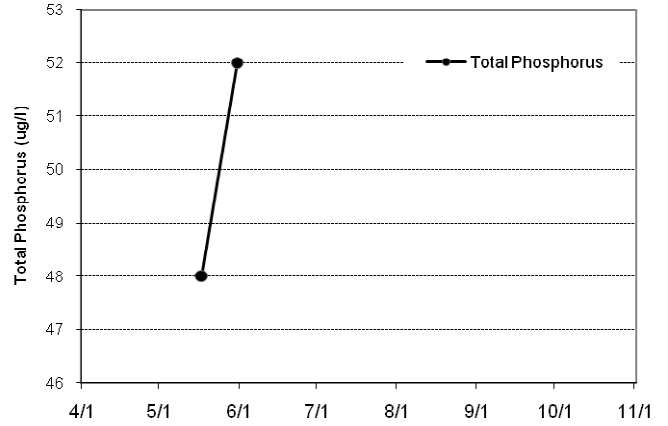
Lake ID: 190095-00  
WMO: Lower Mississippi River  
Volunteer: Randy Bjorklund



- Sampling site
- Contours in meters

**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/17	21.5				17	48		1.0	2	4
5/31	22.9				17	52		1.0	2	4



Lake Water Quality Grades Based on Summertime Averages												
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												C
Chlorophyll a												C
Secchi Depth												D
<b>Lake Grade</b>												<b>C</b>
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus				C	C	C	C	D	C	C	D	C
Chlorophyll a				A	B	B	C	C	C	C	C	B
Secchi Depth		D	D	B	B	C	D	D	C	C	D	D
<b>Lake Grade</b>				<b>B</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>C</b>
Year	2004	2005	2006	2007	2008	2009						
Total Phosphorus	D	C	D	D								
Chlorophyll a	B	C	C	C								
Secchi Depth	C	D	F	F								
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>D</b>		<b>NA</b>						

Source: Metropolitan Council and STORET data

## Shady Oak Lake (27-0089-02) City of Minnetonka

Shady Oak Lake is located in the City of Minnetonka (Hennepin County). It has a maximum depth of 10.7 m (35 feet). The lake has 3 distinct basins. The monitoring for 2009 occurred in the middle basin, which is also the deepest basin. This was the first year the lake was enrolled in the CAMP.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	14.9	8.0	21.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	3.3	1.0	7.3	A
<b>Secchi</b> (m)	4.0	3.5	4.8	A
<b>TKN</b> (mg/l)	0.59	0.36	0.70	
<b>Lake Grade</b>				A

The lake received a lake grade of A in 2009. The lake received the distinction of being the 9<sup>th</sup> best water quality lake in 2009 for the METC lake monitoring program. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

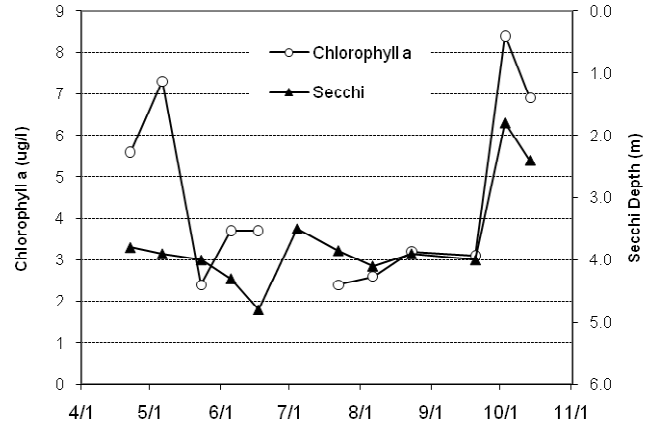
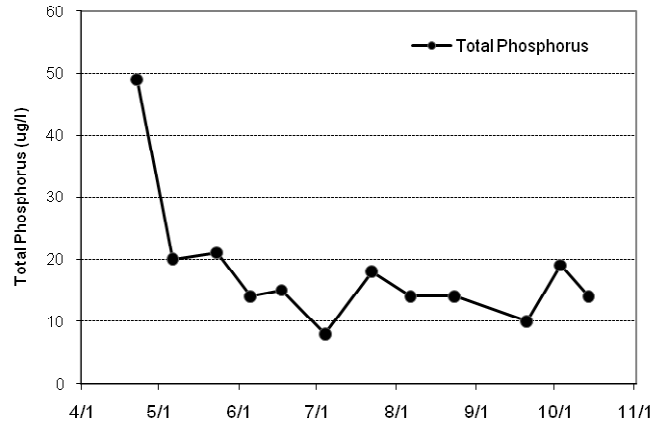
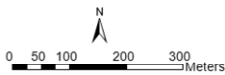


# Shady Oak Lake

## Minnetonka, Hennepin Co.

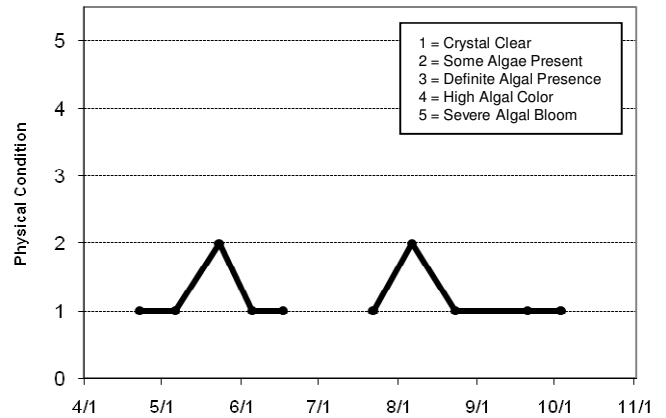
Lake ID: 270089-02  
 WD: Nine Mile Creek  
 Volunteer: Nina Norum

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	12.6				5.6	49		3.8	1	1
5/6	18				7.3	20		3.9	1	1
5/23	21.7				2.4	21		4.0	2	1
6/5	22.2				3.7	14		4.3	1	1
6/17	21				3.7	15		4.8	1	1
7/4	24.8						8	3.5		
7/22	24.7				2.4	18		3.9	1	1
8/6	25.5				2.6	14		4.1	2	1
8/23	23.9				3.2	14		3.9	1	1
9/20	23.6				3.1	10		4.0	1	1
10/3	15.1				8.4	19		1.8	1	1
10/14	10.4				6.9	14		2.4		



### Lake Water Quality Grades Based on Summertime Averages

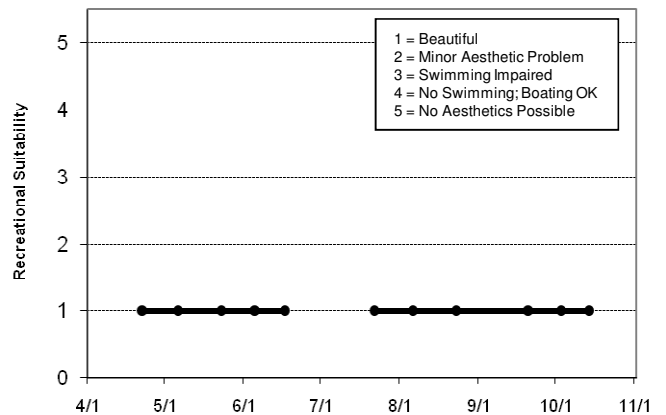
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth					A	A						
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						A
Chlorophyll a						A
Secchi Depth						A
<b>Lake Grade</b>						A



Source: Metropolitan Council and STORET data

**Silver Lake [Washington County] (82-0016) Carnelian - Marine - St. Croix Watershed District**

Silver Lake is a 98-acre lake located within Stillwater Township (Washington County). The maximum and mean depths of the lake are 3.4 m (11 ft) and 1.7 m (5.6 ft), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

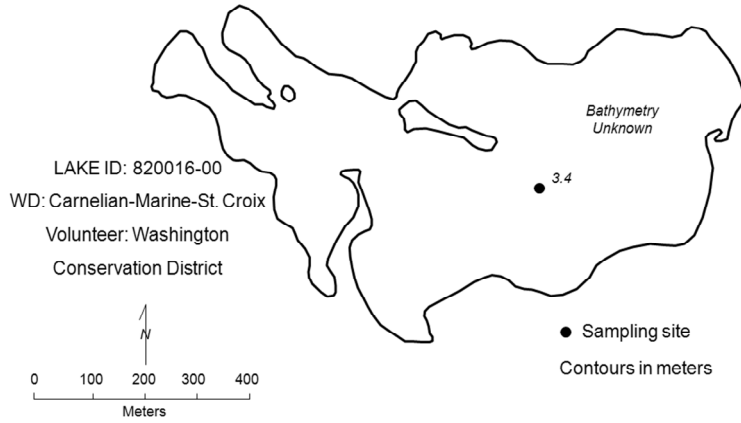
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	36.5	29.0	48.0	C
<b>CLA</b> (µg/l)	9.7	4.1	24.0	A
<b>Secchi</b> (m)	1.8	1.4	2.3	C
<b>TKN</b> (mg/l)	0.97	0.76	1.20	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009. The water quality database shows that the lake has varied in range from B to D grades since 1996. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Silver Lake**  
Stillwater Twp., Washington Co.



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/6	15	15.9	10.78	7.96	6.1	29		2.3	2	2
5/19	17.7	15.2	11.61	1.76	24	48		1.7	2	3
6/30	20.9	20.8	7.42	0.56	9.9	34		1.8	2	2
7/29	22.8	22.3	9.26	1.25	4.1	39		1.8	2	2
8/25	22.5	19.8	8.89	0.28	7.1	31		1.5	2	2
9/23	21.1	20.6	4.62	0.27	6.8	38		1.4	2	2
10/20	8.5	8.4	12.73	10.74	2.3	22		2.0	1	2

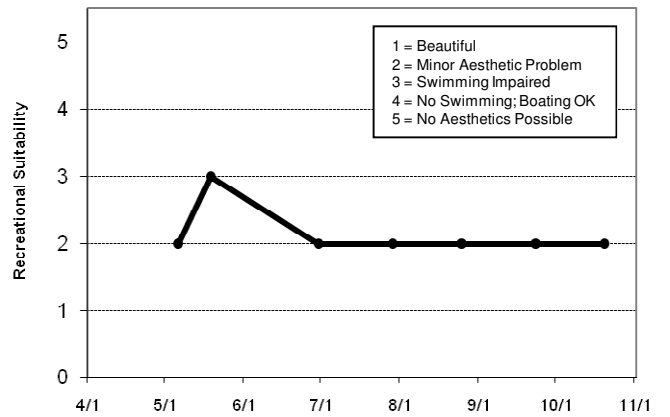
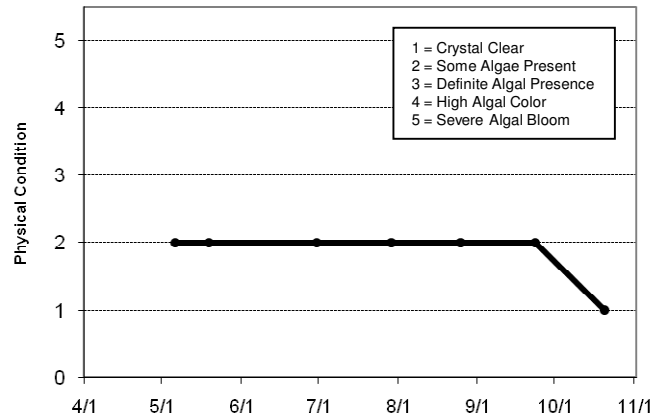
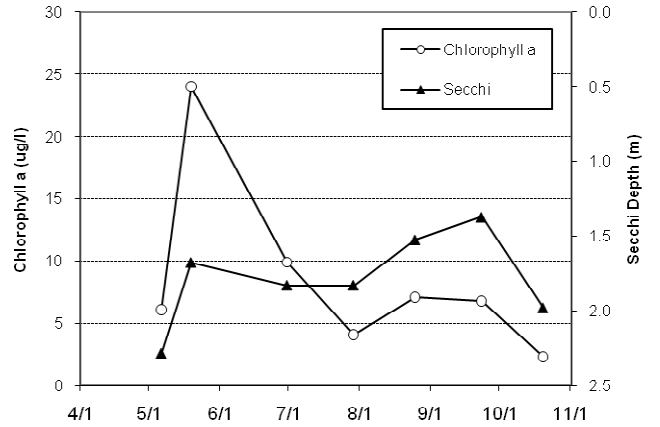
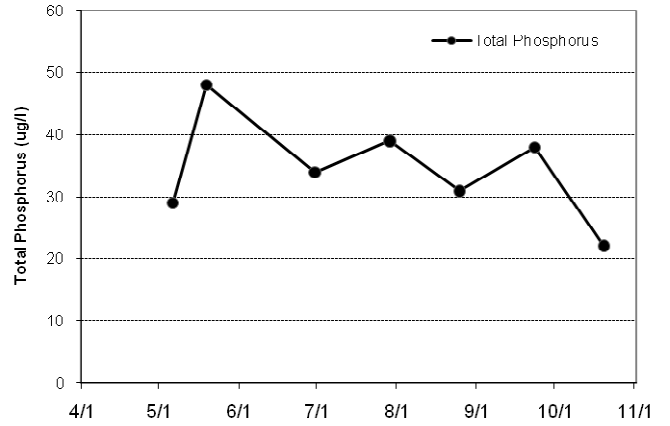
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	C	C	C	C	C
Chlorophyll a	A	A	B	B	B	A
Secchi Depth	B	B	C	C	C	C
<b>Lake Grade</b>	<b>B</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>

Source: Metropolitan Council and STORET data



## South Oak Lake (27-0661) City of St. Louis Park

South Oak is a small shallow lake located within City of St. Louis Park (Hennepin County). There is little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	36.0	17.0	82.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	25.8	2.2	86.0	C
<b>Secchi</b> (m)		> 1.2	> 1.5	*
<b>TKN</b> (mg/l)	0.92	0.56	1.60	
			<b>Lake Grade</b>	N/A*

\* See discussion below.

The summer-time mean Secchi depth was not calculated because the Secchi disk was visible on the lake bottom for each monitoring event. Therefore a lake grade could not be determined.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

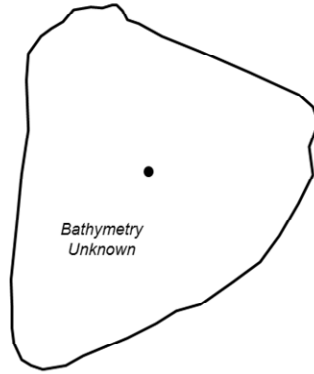
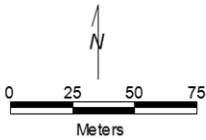
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# South Oak Lake

St. Louis Park, Hennepin Co.

Lake ID: 270661-00  
 WD: Minnehaha Creek  
 Volunteer: David Boraas

● Sampling site  
 Contours in meters



### 2009 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
5/29	19.5				2.2	18		1.2+	5	5
6/12	17.4				6.7	17		1.5+	5	5
7/11	22.1				9.7	27		1.3+	5	5
7/27	23.1				86	52		1.2+	5	5
8/9	19.7				42	82		1.3+	5	5
9/29	15.2				8	20		1.3+	5	5
10/18	6.7				4.5	22		1.2+	5	5

+ Indicates that the Secchi Disk was visible on the lake bottom

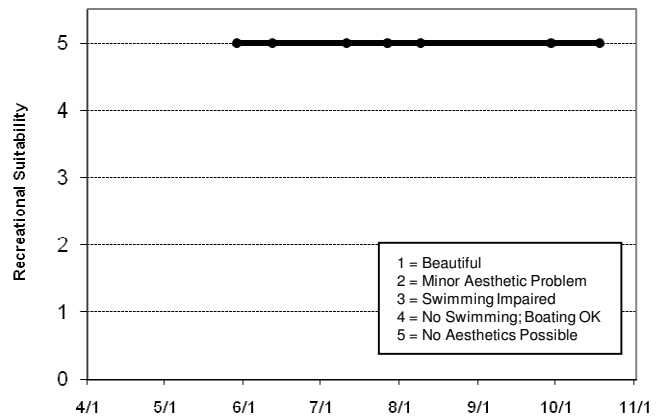
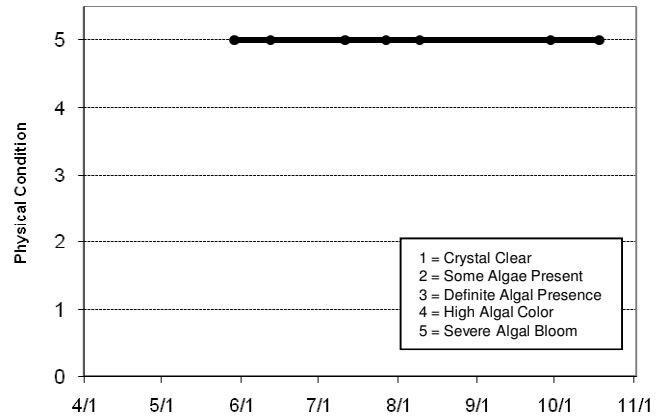
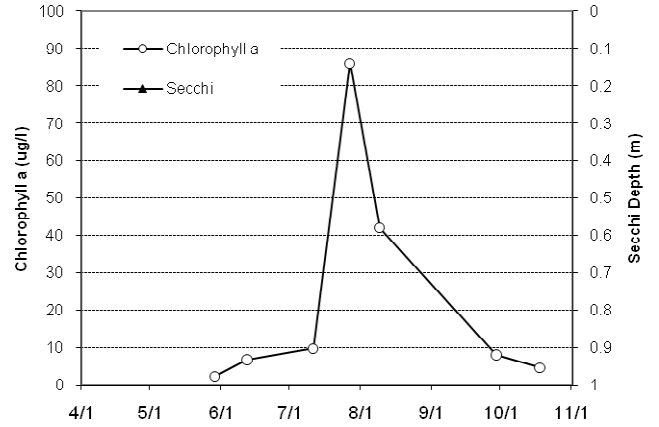
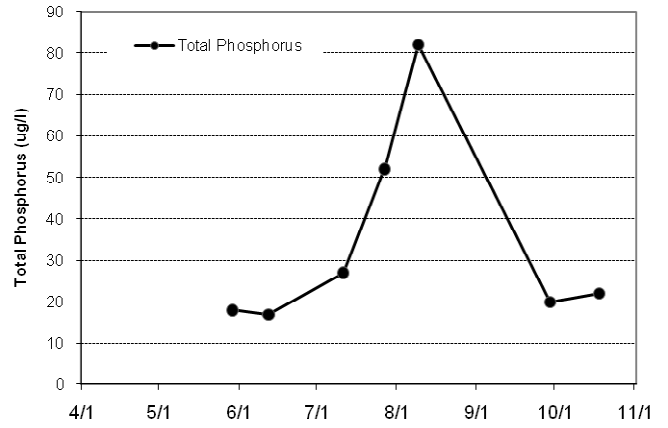
### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			D	F	F	C
Chlorophyll a			C	F	F	C
Secchi Depth			D	F	F	C*
<b>Lake Grade</b>			<b>D</b>	<b>F</b>	<b>F</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## South School Section Lake (82-0151) Browns Creek Watershed District

South School Section Lake is located in southeastern Hugo Township in Washington County. The 125-acre lake has a maximum depth of 8.0 m (26 feet).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	36.2	21.0	53.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	11.1	3.2	19.0	B
<b>Secchi</b> (m)	2.6	1.4	4.6	B
<b>TKN</b> (mg/l)	1.02	0.86	1.30	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009, which is the best lake grade received yet on the basis of its historical water quality database. Otherwise, the lake has consistently received C lake grades during monitoring years since 1995.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

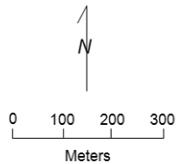
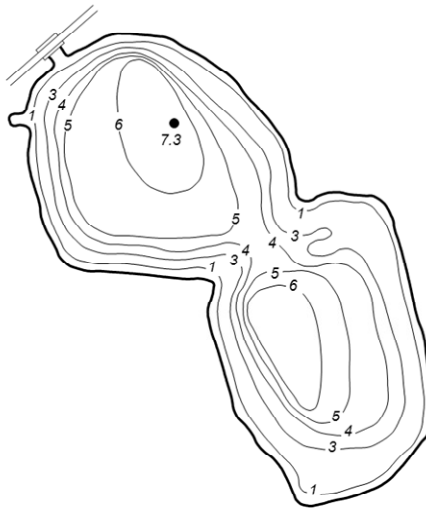
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# South School Section Lake, Hugo, Washington Co.

Lake ID: 820151-00  
 WD: Browns Creek  
 Volunteer: Washington Conservation District

● Sampling site  
 Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	7.9	7.8	11.54	10.75	3.6	35	74	2.7	2	2
4/28	11.6	11.5	9.85	0.09	3.7	32	30	3.8	2	2
5/11	14.3	14.1	8.58	0.24	3.2	27	25	4.6	2	2
5/26	18.7	18.6	7.81	7.79	3.9	21	18	3.5	2	3
6/10	17.2	16.7	8.45	7.86	9.3	33	24	3.2	3	3
6/22	23.6	17.9	9.32	0.15	4.5	35	42	3.8	2	3
7/6	22.9	20.3	9.69	0.1	7.8	34	57	2.9	3	3
7/20	20.5	19.7	8.86	0.14	15	45	44	1.7	3	3
8/4	22.5	21.2	8.94	0.11	13	38	39	1.4	3	3
8/17	24.1	21.5	7.65	0.06	16	34	65	1.8	2	3
8/31	20.5	20.4	5.52	0.12	14	46	51	1.8	2	3
9/14	23	20.6	9.98	0.09	16	32	93	1.8	3	4
9/29	16.6	16.6	6.46	0.11	19	53	42	1.7	3	3
10/13	8.1	8.2	10.51	0.11	10	51	32	2.9	2	3

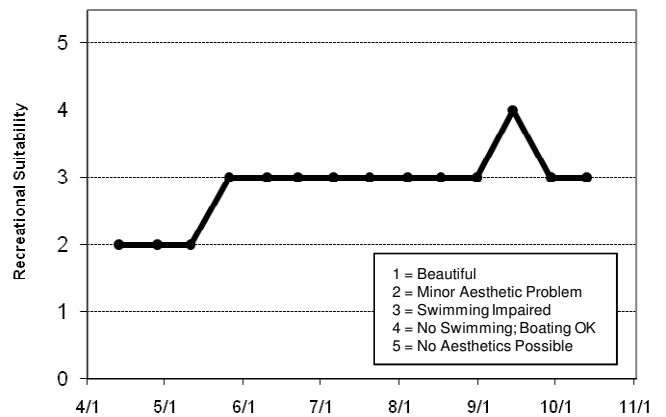
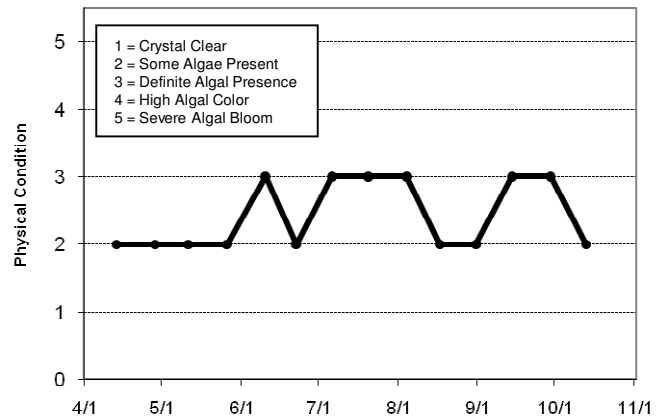
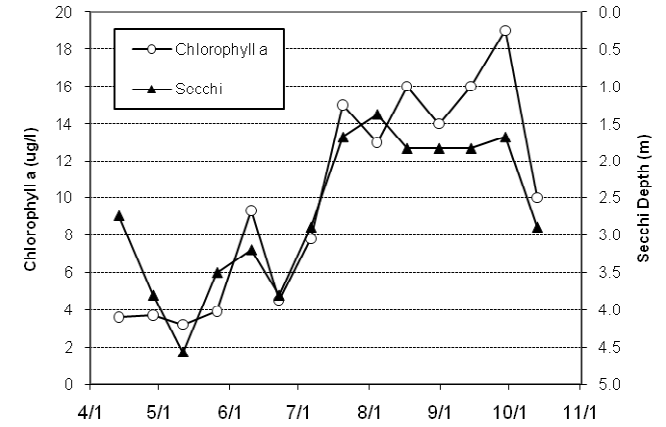
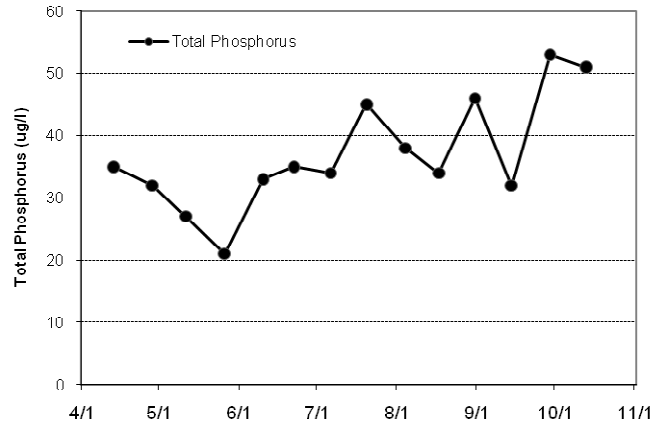
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	C
Chlorophyll a	C	C	C	C	B	B
Secchi Depth	B	C	C	C	C	B
<b>Lake Grade</b>	C	C	C	C	C	B

Source: Metropolitan Council and STORET data



**South Twin Lake (82-0019) Carnelian - Marine - St. Croix Watershed District**

South Twin Lake is a 54-acre lake located within Stillwater Township (Washington County). The maximum and mean depths of the lake are 4.0 m (13 ft) and 2.0 m (6.5 ft), respectively. The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	65.3	47.0	79.0	C
<b>CLA</b> (µg/l)	19.7	8.3	45.0	B
<b>Secchi</b> (m)	1.7	0.9	2.7	C
<b>TKN</b> (mg/l)	1.80	1.40	2.00	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009. The lake has received various lake grades within the C to F range. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



# South Twin Lake

Stillwater Twp., Washington Co.

LAKE ID: 820019-00

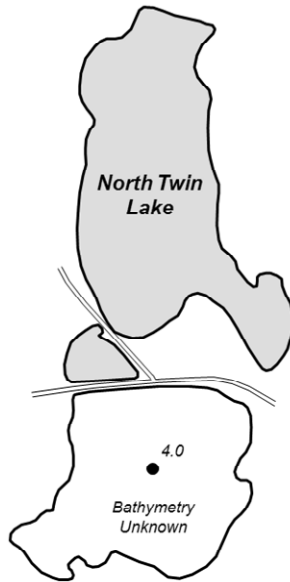
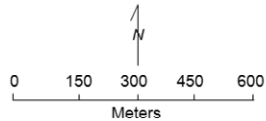
WD: Carnelian-Marine-St. Croix

Volunteer: Washington

Conservation District

● Sampling site

Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/6	15.9	15.3	10.1	0.9	8.3	58		2.7	2	2
5/19	17.2	16	10.71	0.1	11	73		1.8	3	4
6/29	22.9	22.8	6.09	0.03	14	62		1.8	3	4
7/28	23.6	21.8	9.63	0.11	24	79		1.2	3	4
8/25	23	21.1	9.75	0.13	45	73		0.9	3	4
9/23	21.7	21.6	7.55	1.51	16	47		1.5	2	3
10/20	8.3	8.3	13.57	13.66	4.6	39		2.4	2	2

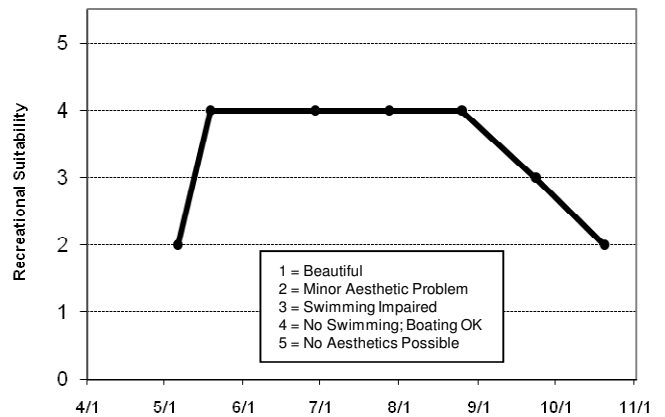
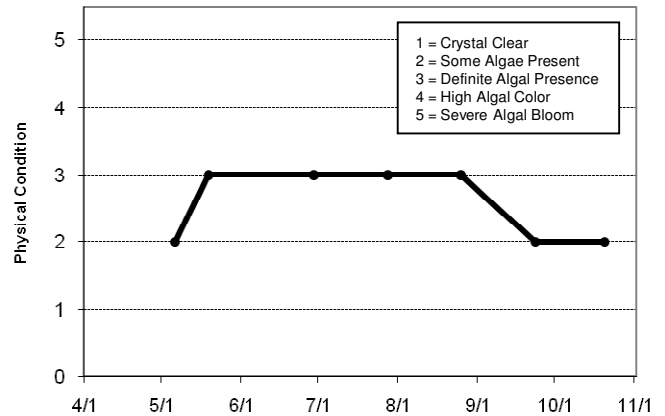
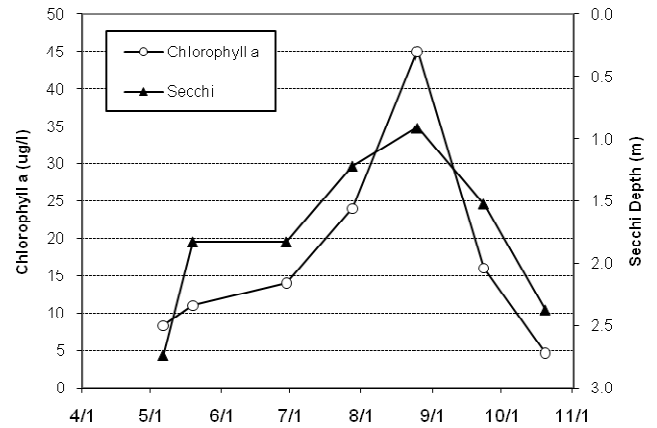
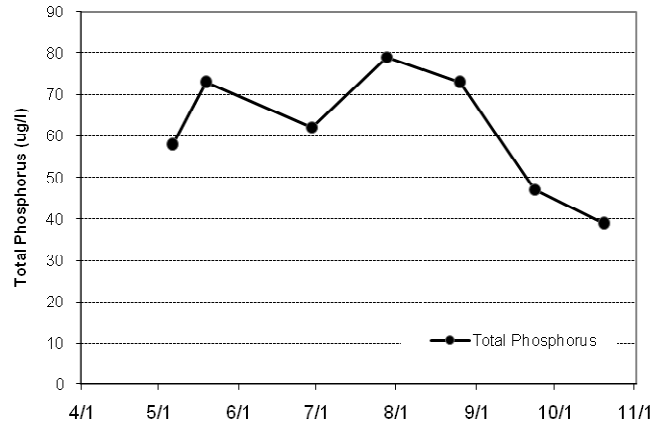
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll <u>a</u>												
Secchi Depth												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					C	C	D	D	C	D		
Chlorophyll <u>a</u>					D	D	D	F	C	D		
Secchi Depth					D	D	F	F	D	F	D	C
<b>Lake Grade</b>					<b>D</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>C</b>	<b>D</b>		

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	D	D	D	C
Chlorophyll <u>a</u>	B	C	C	C	C	B
Secchi Depth	C	C	D	D	D	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## Spring Lake (70-0054) Prior Lake - Spring Lake Watershed District

Spring Lake is located in Spring Lake Township (Scott County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a surface area of 630 acres. The maximum and mean depths of the lake are 11.3 and 5.6 m (37 and 18 feet), respectively.

In an attempt to improve the lake's water quality, a ferric chloride ( $\text{FeCl}_3$ ) addition system was constructed at the outlet of the Highway 13 wetland in 1998. Continuous operation started in 1999. The system was designed to enhance phosphorus (P) removal from the discharge of the wetland prior to entering the lake. The system consists of a dosing station at the outlet of the wetland, followed by a settling basin. The dosing station meters  $\text{FeCl}_3$  into the wetland outlet. The  $\text{FeCl}_3$  dissociates into free iron (Fe) where it combines with P to form an insoluble Fe-P complex called floc. The desiltation basin then provides an area where the floc can settle out and be removed. The watershed district continues to monitor the effectiveness of the system.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	79.7	41.0	120.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	29.4	13.0	76.0	C
<b>Secchi</b> (m)	1.1	0.6	2.2	D
<b>TKN</b> (mg/l)	1.77	1.50	2.20	
			<b>Lake Grade</b>	D

The lake received a lake grade of D in 2009. The lake grades have varied from Cs to Ds since 1980. Continued monitoring is suggested to provide water quality data for supporting the PLSLWD's efforts in managing Spring Lake.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

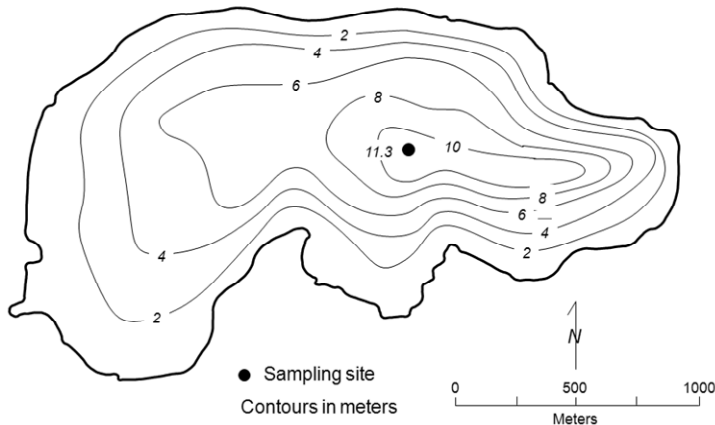
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Spring Lake

Prior Lake/Spring Lake Twp., Scott Co.

Lake ID: 700054-00  
 WD: Prior Lake-Spring Lake  
 Volunteer: Jim Weninger



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/17	15.6				29	60		1.3	1	1
6/3	21.1					48		1.3	2	1
6/15	22.2				14	41		2.2		
7/4	23.3				32	74		1.2	2	1
7/12	25.8				17	72		1.2	2	1
7/26	23.7				15	120		0.7	2	2
8/6	22				13	111		1.0	2	1
8/23	23.3				22	109		0.6	2	2
9/9	22.5				76	101		0.6	2	2
9/23	22				47	61		0.7	2	1

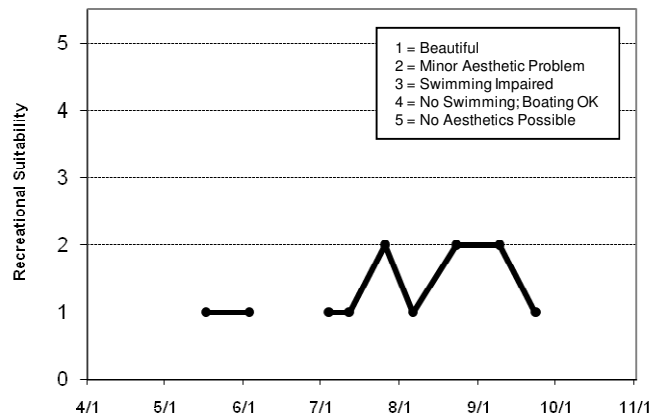
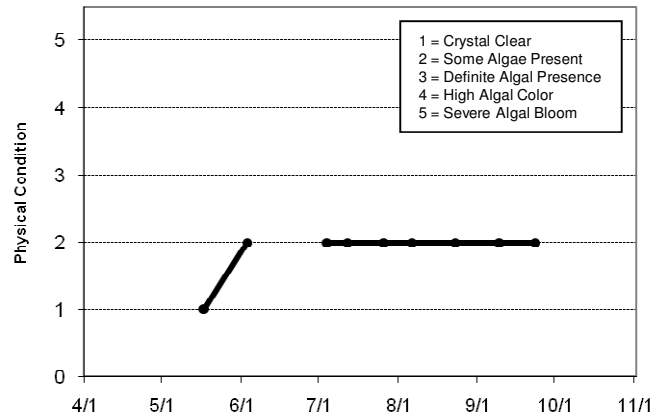
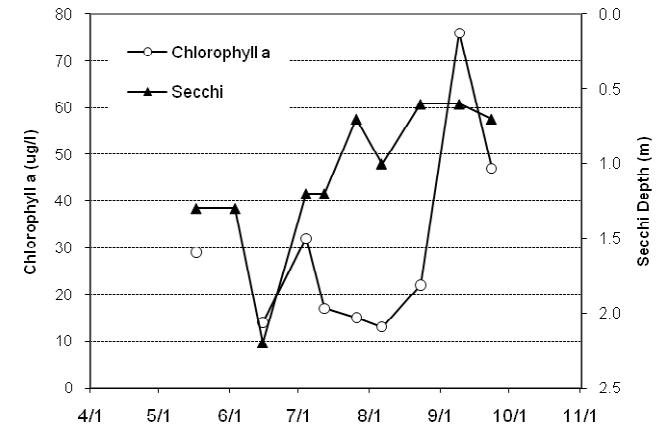
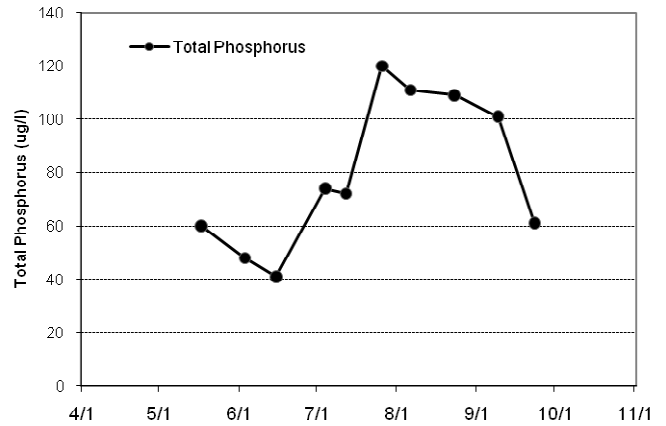
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	F	D	D		D							
Chlorophyll a	C	C	C		D						C	
Secchi Depth	C	B	C	C	C	D	D	D	D	C	B	D
<b>Lake Grade</b>	<b>D</b>	<b>C</b>	<b>C</b>		<b>D</b>							

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	D	C	C	D
Chlorophyll a	D	C	C	D	D	C
Secchi Depth	D	C	C	D	D	D
<b>Lake Grade</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



**Square Lake (82-0046) Carnelian - Marine - St. Croix Watershed District**

Square Lake is located in May Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value and exceptional water clarity (METC 2007). The lake has a surface area of 193 acres, and a maximum and mean depth of 20.7 and 9.0 m, respectively. The lake has a trout fishery (MDNR 1996).

On each sampling day the lake was monitored for secchi transparency, perceived physical condition, and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>Secchi (m)</b>	6.6	5.3	7.6	A

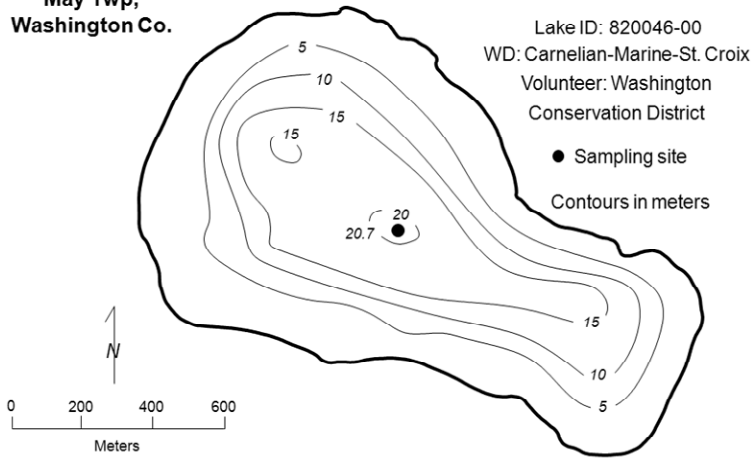
The lake continues to receive an A grade for water clarity.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Square Lake**  
May Twp,  
Washington Co.



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°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	12.3	5.2	11.81	0.01				7.6	2	1
5/19	15.4	5.7	11.53	0.05				5.3	1	1
7/1	21.2	6.3	8.38	0.06				7.2	2	1
7/27	22.4	6.4	9.17	0.04				5.3	1	1
8/26	22.9	6.6	9.01	0.04				6.9	2	1
9/22	22.6	6.7	8.6	0.03				7.0	1	1
10/19	10.5	6.9	10.12	0.04				5.5	1	1

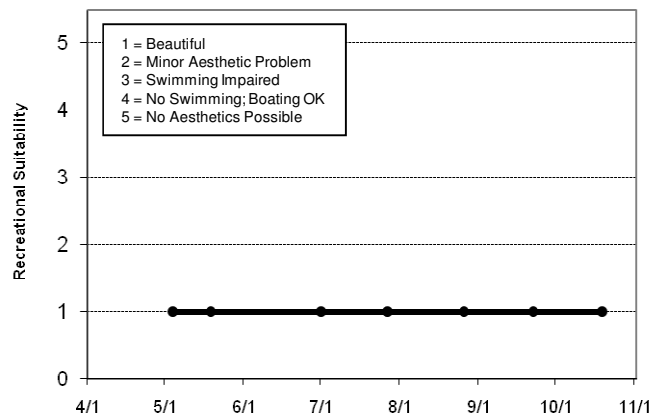
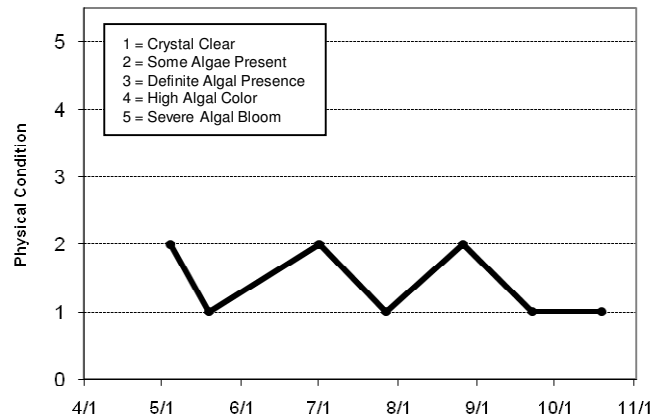
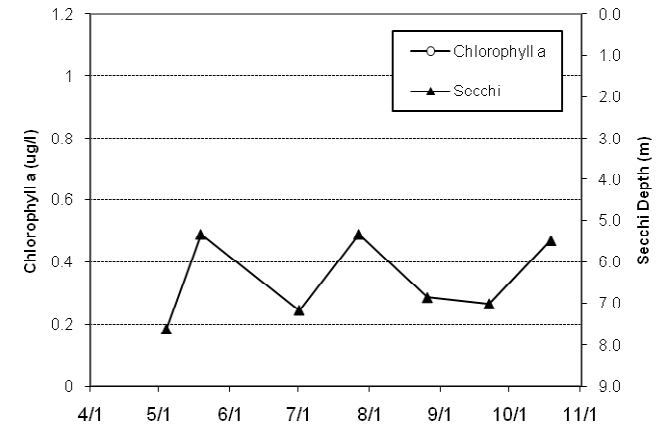
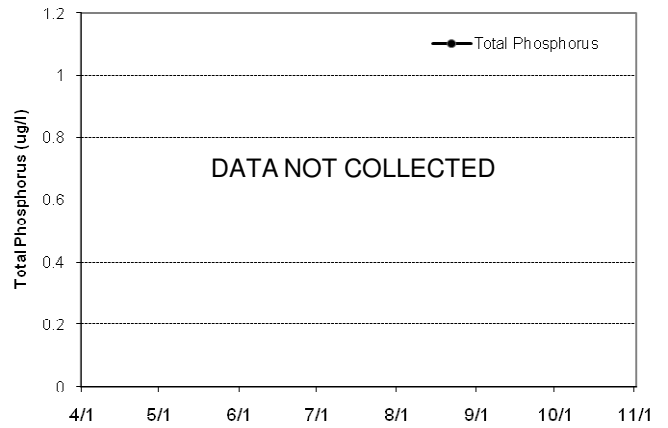
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	B	A	A	A	A	A				A		
Chlorophyll a	A	A	A	A	A	A				A		
Secchi Depth	A	A	A	A	A	A	A	A	A	A	A	
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>				<b>A</b>		

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus		A	A	A	A	A	A	A	A	A	A	A
Chlorophyll a		A	A	A	A	A	A	A	A	A	A	A
Secchi Depth		A	A	A	A	A	A	A	A	A	A	A
<b>Lake Grade</b>		<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	A	A		
Chlorophyll a	A	A	A	A		
Secchi Depth	A	A	A	A	A	A
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>		

Source: Metropolitan Council and STORET data



## St. Croix Lake [Whole Lake] (82-0001) St. Croix Basin Planning Team

Lake St. Croix is divided into four distinct pools: Bayport Pool, Troy Beach Pool, Black Bass Pool, and Kinnickinnic Pool. There were six monitoring sites amongst the four pools in 2009. The results will be discussed for the entire lake, as well as individually for each of the six sites.

Lake St. Croix (approximately 8,600 acres) is considered by the MDNR to extend from Stillwater, Minnesota to Prescott, Wisconsin, a distance of approximately 23 miles. Morphometry information of each of the pools is shown in the table below.

### Lake St. Croix Morphometry

<i>Pool Name</i>	<i>Length (miles)</i>	<i>Area (ac)</i>	<i>Volume (ac-ft)</i>	<i>Mean depth range (dry vs. wet years) (meters)</i>
<b>Bayport Pool</b>	6.0	2,800	62,500	6.2-7.3
<b>Troy Beach Pool</b>	6.0	3,100	107,800	9.9-11.0
<b>Black Bass Pool</b>	7.0	1,300	59,600	12.9-14.0
<b>Kinnickinnic Pool</b>	5.0	1,400	46,274	9.2-10.3

(USGS 2002)

The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*) and Zebra mussels (*Dreissena spp.*).

The year 2009 was the fifth year in which any of the Lake St. Croix sites have been formally involved in CAMP. Prior to 2005, a citizen-monitoring program conducted by the St. Croix Basin Team produced water quality data for the following sites during the 1999 – 2002 period: Bayport Pool- Site 2; Troy Beach Pool-Site 3; Troy Beach Pool-Site 5; and Black Bass Pool-Site 6. Kinnickinnic Pool-Site 7 was monitored during the 2000-2001. All data are available in STORET.

On each sampling day, each lake site was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the site's perceived physical condition and recreational suitability. The monitoring data are summarized in tables and figures on the following pages for each lake site. The following table shows the summer data summarized with respect to the whole lake.

### 2009 summer (May-September) whole lake data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	28	2.0	68	B
<b>CLA</b> (µg/l)	23	5.0	87	C
<b>Secchi</b> (m)	1.8	0.6	3.4	C
<b>TKN</b> (mg/l)	0.70	0.37	1.50	
			<b>Lake Grade</b>	C

The whole lake received a lake grade of C for 2009, which is consistent with the lake's historical database.

**Lake water quality grades based on the whole lakes summer means**

<i>Year</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>
<b>Total Phosphorus</b>	D	D	C	C			C	C	C	C	B
<b>Chlorophyll <u>a</u></b>	B	C	C	C			B	B	C	B	C
<b>Secchi Depth</b>	C	C	C	C			C	C	C	C	C
<b>Overall</b>	C	C	C	C			C	C	C	C	C

Source: Metropolitan Council and STORET data

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR 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](mailto:brian.johnson@metc.state.mn.us).

**St. Croix Lake [Bayport Pool-Site 1] (82-0001) St. Croix Basin Planning Team**

Lake St. Croix [Bayport Pool-Site 1] was monitored 8 times in 2009. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	42.0	32.0	68.0	C
<b>CLA</b> (µg/l)	35	5.0	87	C
<b>Secchi</b> (m)	1.5	0.8	3.0	C
<b>TKN</b> (mg/l)	0.85	0.61	1.50	
			<b>Lake Grade</b>	C

The pool received a lake grade of C for 2009, which is the first year the lake site was enrolled in the CAMP. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

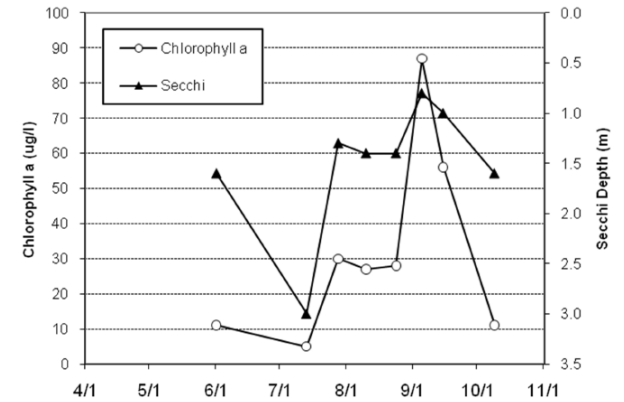
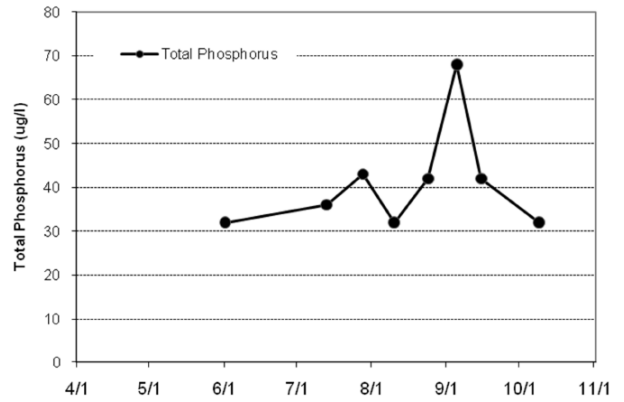
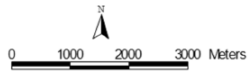


# Lake St. Croix, Bayport Pool, Site 1 Minnesota/Wisconsin

Lake ID: 820001-01

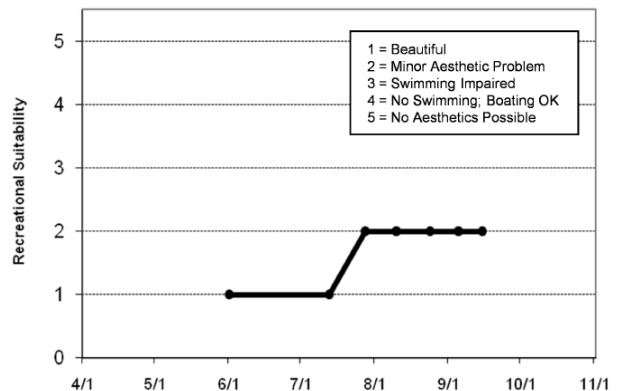
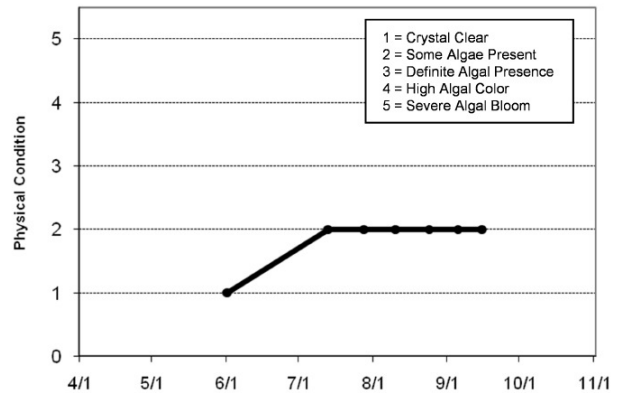
Volunteers: Jim and Roberta Harper

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (ug/L)	Surf TP (ug/L)	Bot TP (ug/L)	Secchi (m)	PC	RS
6/1/09	21.0				11	32		1.6	1	1
7/13/09	24.3				5.0	36		3.0	2	1
7/28/09	23.8				30	43		1.3	2	2
8/10/09	25.4				27	32		1.4	2	2
8/24/09	23.3				28	42		1.4	2	2
9/5/09	24.3				87	68		0.8	2	2
9/15/09	25.1				56	42		1.0	2	2
10/9/09	11.2				11	32		1.6		



## 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												
Lake Grade												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						C
Chlorophyll a						C
Secchi Depth						C
Lake Grade						C

Source: Metropolitan Council and STORET data

## St. Croix Lake [Bayport Pool-Site 2] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Bayport Pool-Site 2] was monitored 12 times in 2009. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	38.0	23.0	62.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	21	6.9	46	C
<b>Secchi</b> (m)	1.8	1.0	2.6	C
<b>TKN</b> (mg/l)	0.74	0.50	1.10	
			<i>Lake Grade</i>	C

The pool received a lake grade of C for 2009, which is similar to lake grades received in the past. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

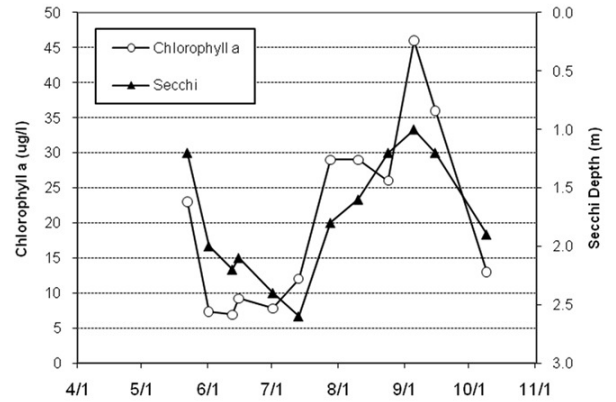
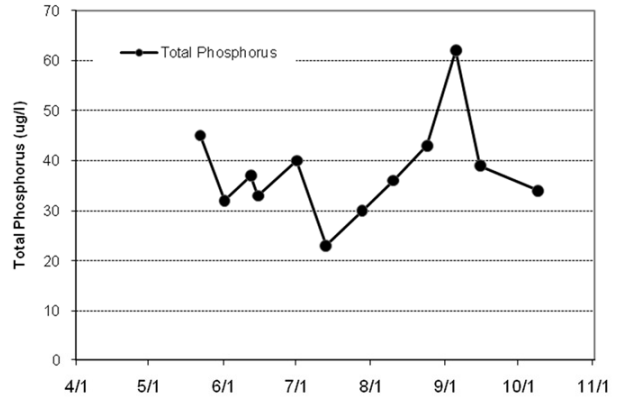
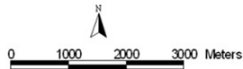
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Lake St. Croix, Bayport Pool, Site 2 Minnesota/Wisconsin

Lake ID: 820001-02

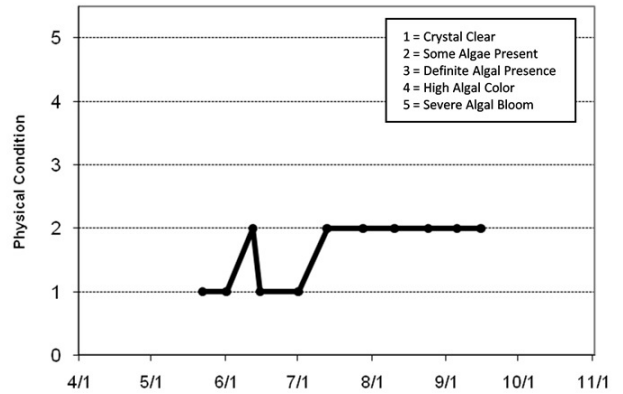
Volunteers: Jim and Roberta Harper

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/22/09	21.6				23	45	1.2	1	1	
6/1/09	25.1				7.3	32	2.0	1	1	
6/12/09	23.4				6.9	37	2.2	2	1	
6/15/09	22.8				9.2	33	2.1	1	1	
7/1/09	23.1				7.8	40	2.4	1	1	
7/13/09	25.8				12	23	2.6	2	2	
7/28/09	24.6				29	30	1.8	2	1	
8/10/09	26.5				29	36	1.6	2	2	
8/24/09	24.4				26	43	1.2	2	2	
9/5/09	27.6				46	62	1.0	2	2	
9/15/09	26.9				36	39	1.2	2	2	
10/9/09	17.4				13	34	1.9			



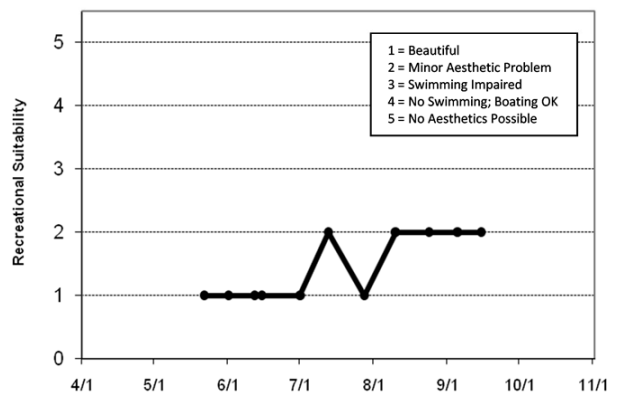
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	C
Chlorophyll a	C	C	C	C	B	C
Secchi Depth	C	C	C	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data



## St. Croix Lake [Troy Beach Pool-Site 3] (82-0001) St. Croix Basin Planning Team

Lake St. Croix [Troy Beach Pool-Site 3] was monitored 11 times in 2009. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	30.0	17.0	64.0	<b>B</b>
<b>CLA</b> ( $\mu\text{g/l}$ )	22	10	46	<b>C</b>
<b>Secchi</b> (m)	1.7	1.0	2.6	<b>C</b>
<b>TKN</b> (mg/l)	0.56	0.37	0.87	
<b>Lake Grade</b>				<b>C</b>

The site received a lake grade of C for 2009, which is consistent with its historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

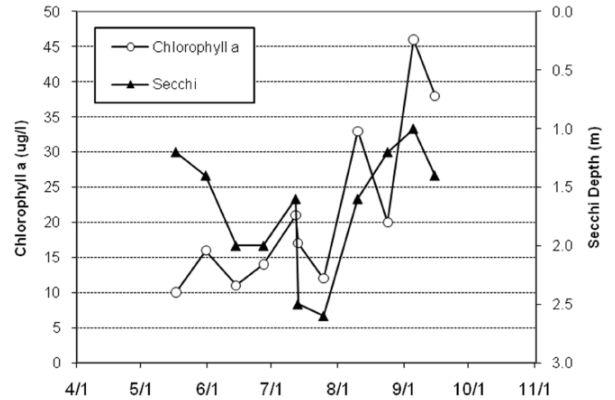
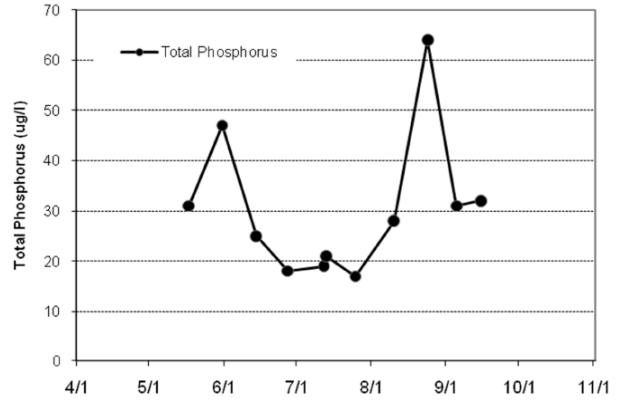
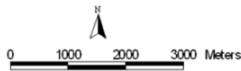
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Lake St. Croix, Troy Beach Pool, Site 3 Minnesota/Wisconsin

Lake ID: 820001-03

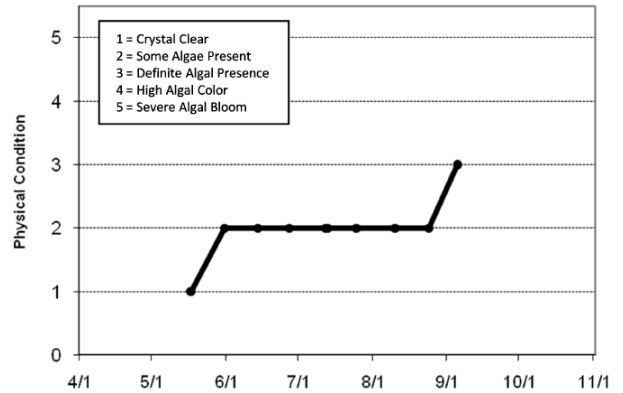
Volunteers: Cecilia and Harry Martin

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/17/09	16.7				10	31		1.2	1	1
5/31/09	19.3				16	47		1.4	2	1
6/14/09	20.5				11	25		2.0	2	1
6/27/09	25.3				14	18		2.0	2	2
7/12/09	25.4				21	19		1.6	2	2
7/13/09	24.7				17	21		2.5	2	2
7/25/09	22.7				12	17		2.6	2	2
8/10/09	26.5				33	28		1.6	2	2
8/24/09	20.8				20	64		1.2	2	3
9/5/09	21.5				46	31		1.0	3	4
9/15/09	24				38	32		1.4		

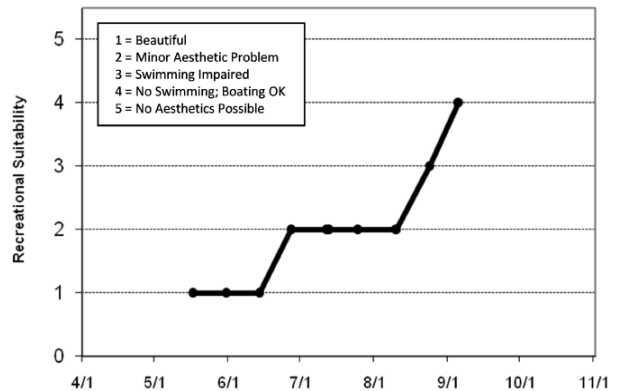


## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	C	C	C	B
Chlorophyll a	B	B	C	B	B	C
Secchi Depth	C	C	C	C	C	C
Lake Grade	C	C	C	C	C	C



Source: Metropolitan Council and STORET data

**St. Croix Lake [Troy Beach Pool-Site 5] (82-0001) St. Croix Basin Planning Team**

Lake St. Croix [Troy Beach Pool-Site 5] was monitored 13 times in 2009. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	25.0	14.0	44.0	<b>B</b>
<b>CLA</b> (µg/l)	24	5.9	54	<b>C</b>
<b>Secchi</b> (m)	1.8	0.6	3.4	<b>C</b>
<b>TKN</b> (mg/l)	0.70	0.48	1.20	
			<b>Lake Grade</b>	<b>C</b>

The site received a lake grade of C, which is consistent with its historical water quality database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

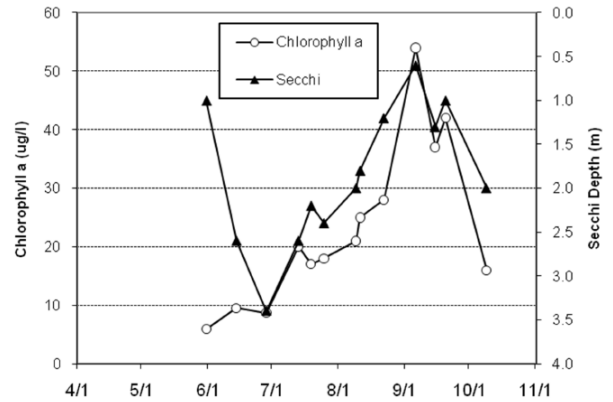
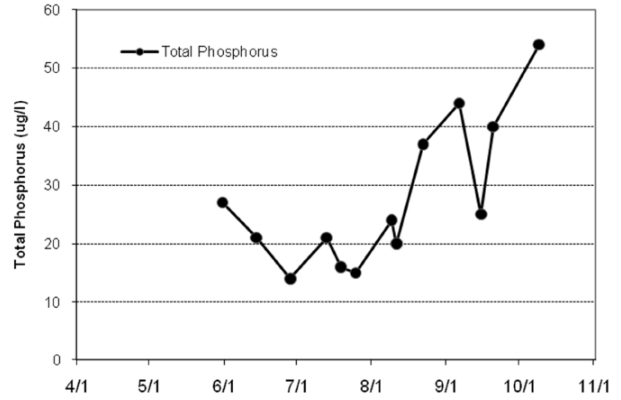
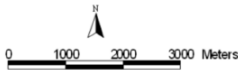
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Lake St. Croix, Troy Beach Pool, Site 5 Minnesota/Wisconsin

Lake ID: 820001-05

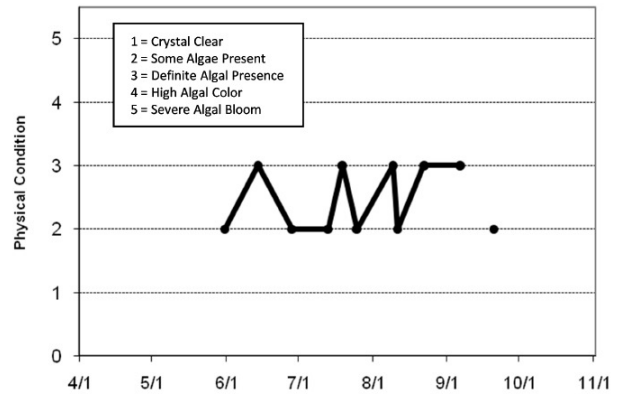
Volunteers: Richard and Sheryl Lindholm

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/31/09	19.4				5.9	27		1.0	2	
6/14/09	22.1				9.5	21		2.6	3	2
6/28/09	25.4				8.7	14		3.4	2	2
7/13/09	24.9				20	21		2.6	2	2
7/19/09	23.2				17	16		2.2	3	3
7/25/09	23.3				18	15		2.4	2	2
8/9/09	24.4				21	24		2.0	3	3
8/11/09	26.3				25	20		1.8	2	2
8/22/09	23.6				28	37		1.2	3	3
9/6/09	23.6				54	44		0.6	3	3
9/15/09	24.8				37	25		1.3		
9/20/09	23.9				42	40		1.0	2	2
10/9/09	15.7				16	54		2.0		

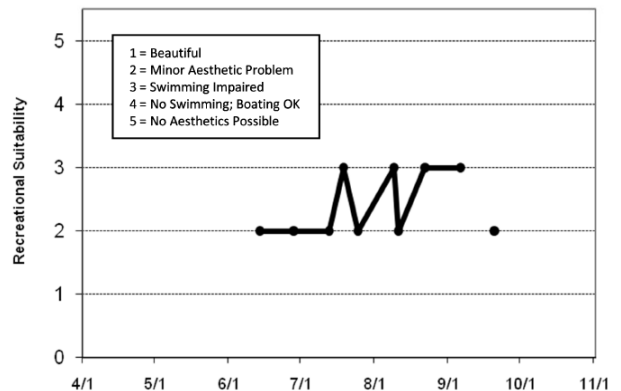


## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		C	C	C	C	B
Chlorophyll a		C	B	C	B	C
Secchi Depth		C	C	C	C	C
Lake Grade		C	C	C	C	C



Source: Metropolitan Council and STORET data

## St. Croix Lake [Black Bass Pool-Site 6] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Black Bass Pool-Site 6] was monitored 14 times in 2009. On each sampling day the lake was monitored for TP, CLA, TKN, and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data and graphs appear on the next page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	19.0	2.0	37.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	19.8	6.0	36	B
<b>Secchi</b> (m)	1.9	1.2	2.4	C
<b>TKN</b> (mg/l)	0.69	0.38	0.92	
<i>Lake Grade</i>				B

The site received a lake grade of B for 2009, which is highest lake grade received by this lake site according to its historical water quality database. The driver of this improvement was a decrease in the summer-time mean TP concentration in comparison to previous years' TP concentrations. This year's TP grade was an A, which is in contrast to the C grades received in the past. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

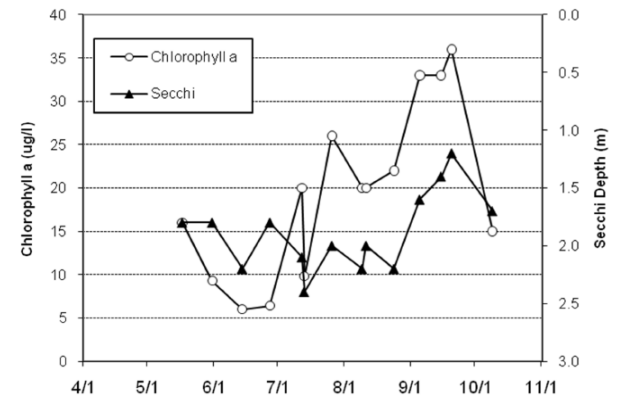
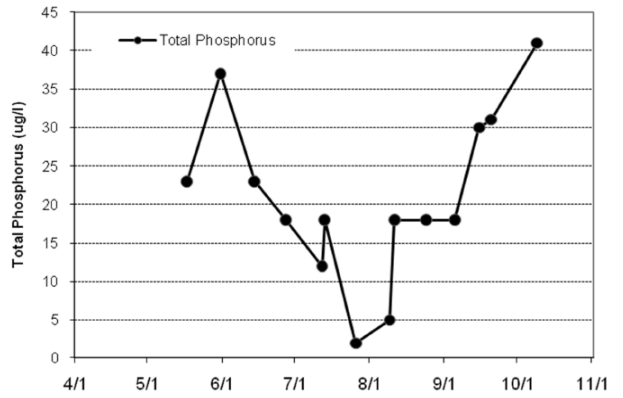
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



## Lake St. Croix, Black Bass Pool, Site 6 Minnesota/Wisconsin

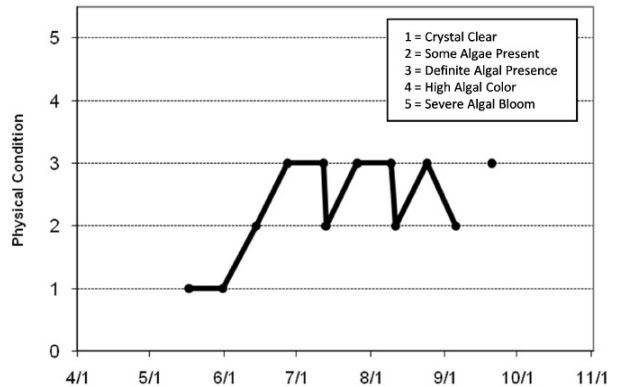
Lake ID: 820001-06  
Volunteer: Rick Meierotto

● Sampling site  
Contours in meters



### 2009 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
5/17/09	16.4				16	23		1.8	1	1
5/31/09	19.5				9.3	37		1.8	1	2
6/14/09	20.9				6	23		2.2	2	2
6/27/09	26.4				6.4	18		1.8	3	3
7/12/09	23.7				20	12		2.1	3	3
7/13/09	25.9				9.8	18		2.4	2	2
7/26/09	23.2				26	2		2.0	3	3
8/9/09	25.6				20	5		2.2	3	3
8/11/09	26.4				20	18		2.0	2	2
8/24/09	22.9				22	18		2.2	3	2
9/5/09	21.6				33	18		1.6	2	2
9/15/09	26.1				33	30		1.4		
9/20/09	23.2				36	31		1.2	3	3
10/9/09	16.2				15	41		1.7		

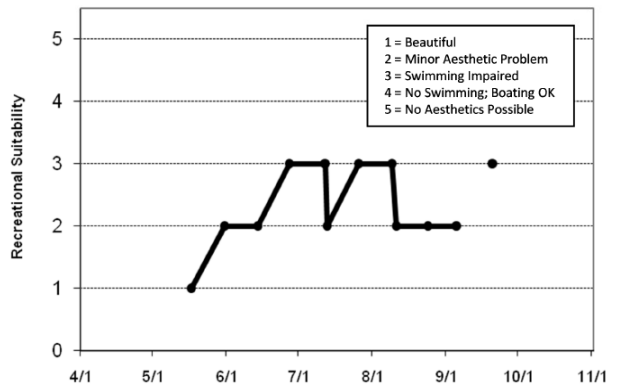


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		C	C	C	C	A
Chlorophyll a		B	B	C	B	B
Secchi Depth		C	C	C	C	C
Lake Grade		C	C	C	C	B



Source: Metropolitan Council and STORET data

## St. Croix Lake [Kinnickinnic Pool-Site 7] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Kinnickinnic Pool-Site 7] was monitored 11 times in 2009. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	20.0	14.0	28.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	18	5.0	28	B
<b>Secchi</b> (m)	2.1	1.6	3.0	C
<b>TKN</b> (mg/l)	0.70	0.57	1.10	
			<i>Lake Grade</i>	B

The site received a lake grade of B and a TP grade of A for 2009. The TP grade this year was the highest grade received for this lake site according to its historical water quality database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

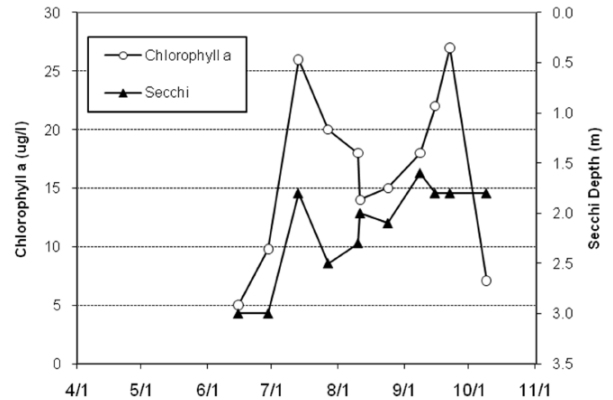
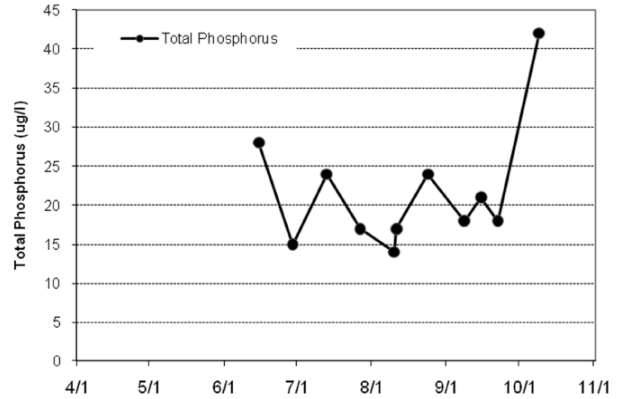
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Lake St. Croix, Kinnickinnic Pool, Site 7 Minnesota/Wisconsin

Lake ID: 820001-07

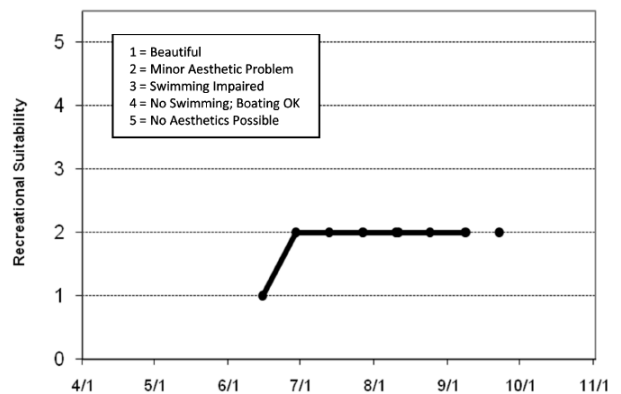
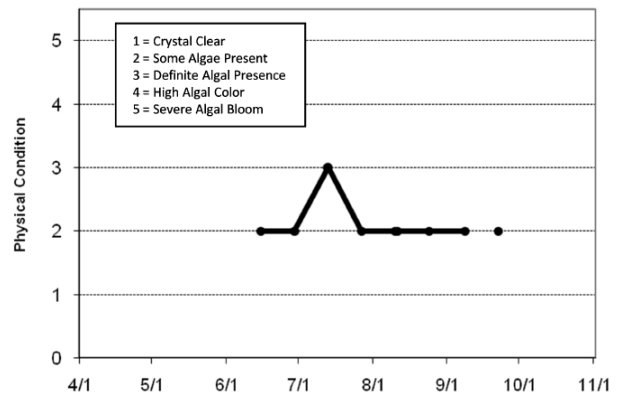
Volunteer: Carpenter Nature Center

● Sampling site  
Contours in meters



## 2009 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
6/15/09	21.4				5	28		3.0	2	1
6/29/09	24.4				9.8	15		3.0	2	2
7/13/09	26.1				26	24		1.8	3	2
7/27/09	24.1				20	17		2.5	2	2
8/10/09	24.9				18	14		2.3	2	2
8/11/09	27.7				14	17		2.0	2	2
8/24/09	23.8				15	24		2.1	2	2
9/8/09	24.3				18	18		1.6	2	2
9/15/09	25.9				22	21		1.8		
9/22/09	22.4				27	18		1.8	2	2
10/9/09	16.9				7.1	42		1.8		



## 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												
Lake Grade												

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	B	B	B	C	A
Chlorophyll a	B	B	B	B	B	B
Secchi Depth	C	C	C	C	C	C
Lake Grade	B	B	B	B	C	B

Source: Metropolitan Council and STORET data

## St. Joe Lake (10-0011) City of Chanhassen

St. Joe Lake is a 14-acre lake located within the City of Chanhassen (Carver County). It has a maximum depth of 15.9 m (52 ft).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	38.0	11.0	123.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	3.6	2.9	4.8	A
<b>Secchi</b> (m)	3.3	2.8	4.0	A
<b>TKN</b> (mg/l)	0.89	0.85	0.98	
<b>Lake Grade</b>				<b>B</b>

The lake received a lake grade of B for 2009, which is consistent with its historical water quality database. The lake has varied in the A to B lake grade range. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# St. Joe's Lake

## Chanhassen, Carver Co.

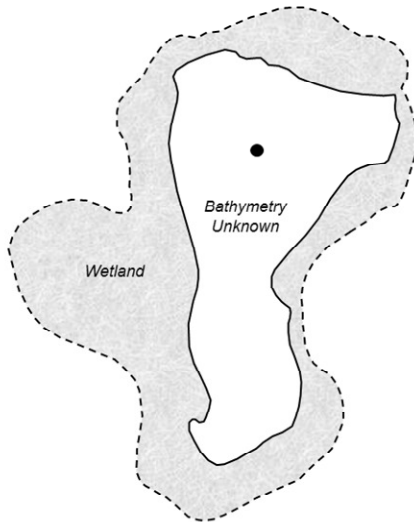
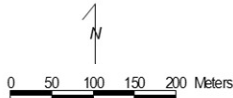
LAKE ID: 100011-00

WD: Minnehaha Creek

Volunteers: Sue Morgan and  
Linda Scott

● Sampling site

Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/17	15.4				3.4	20		3.4	2	1
5/31	20.3				2.9	15		4.0	2	1
6/14	24.4				3.4	11		3.0	2	1
6/28	24.5				3.7	123		3.3	2	1
7/12	24.7				4.8	21		2.8	3	

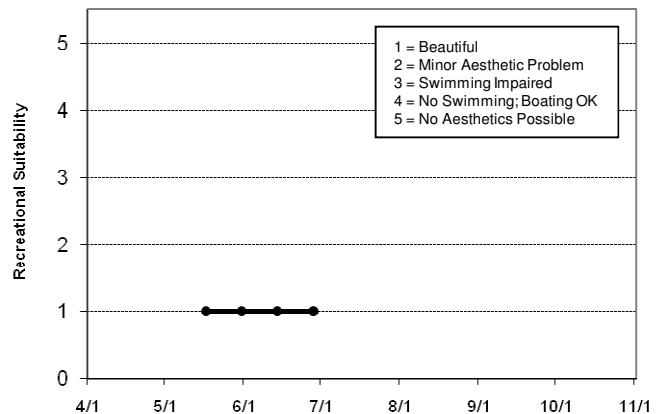
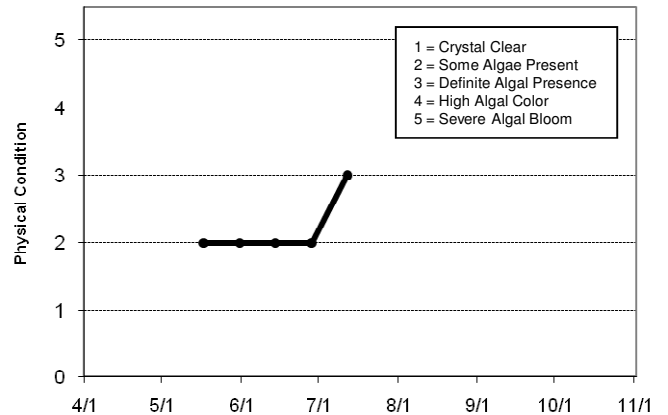
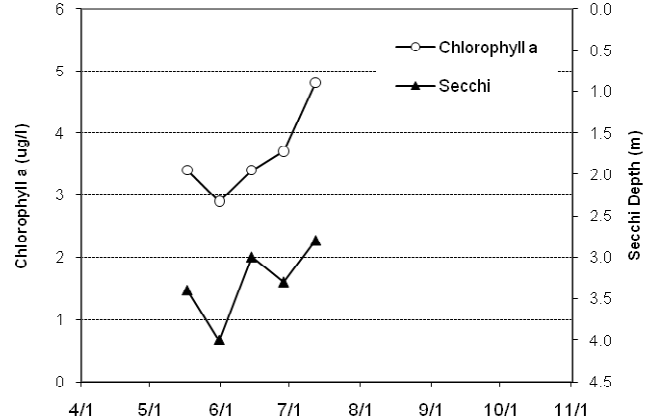
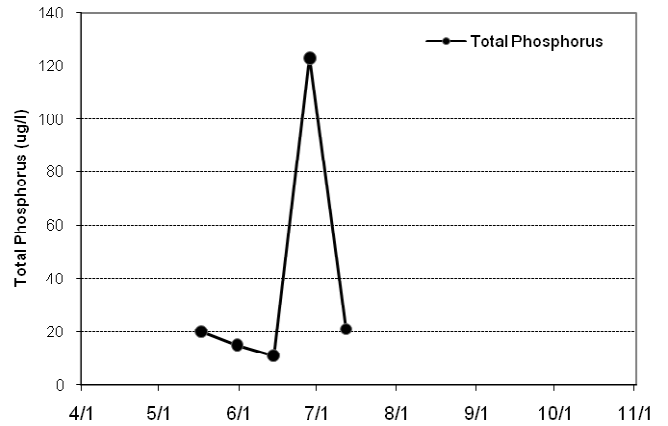
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth				C			B					
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	C	A	A	C
Chlorophyll a	A	A	A	A	A	A
Secchi Depth	B	A	B	A	B	A
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>B</b>

Source: Metropolitan Council and STORET data



**Staples Lake (82-0028) Carnelian - Marine - St. Croix Watershed District**

Staples Lake is a 24-acre lake located within May Township (Washington County). The maximum and mean depths of the lake are 4.3 m (14 feet) and 2.1 m (6.9 ft), respectively. The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>Secchi (m)</b>	2.6	2.4	3.0	B

The lake received a Secchi depth grade of B for 2009, which is consistent with the historical database.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

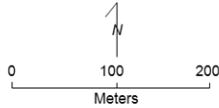
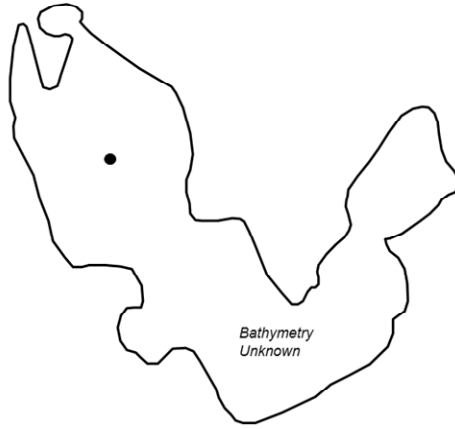
**Staples Lake**  
May Twp., Washington Co.

LAKE ID: 820028-00

WD: Carnelian-Marine-St. Croix

Volunteer: Washington  
Conservation District

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/6	17	12.9	9.63	0.06				3.0	1	1
5/18	16	15.5	9.52	7.4				2.4	2	3
6/29	23.5	20.9	6.52	0.19				2.4	2	1
7/28	23	21.2	7.26	0.25				2.6	2	2
8/24	22.1	20.6	7.4	0.53				2.6	2	2
9/23	21.7	20.9	5.84	0.23				2.4	2	3
10/20	8.7	8.4	10.67	3.23				2.6	1	2

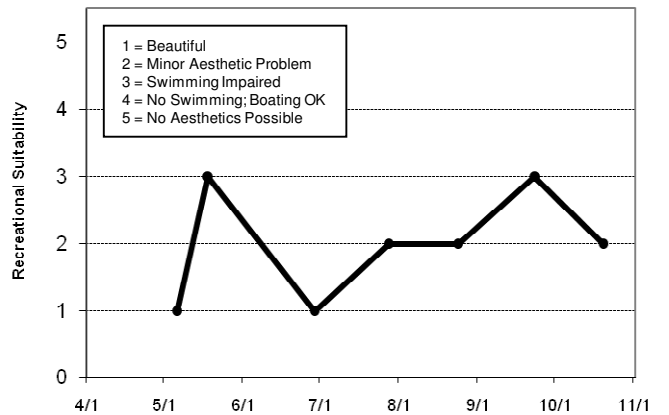
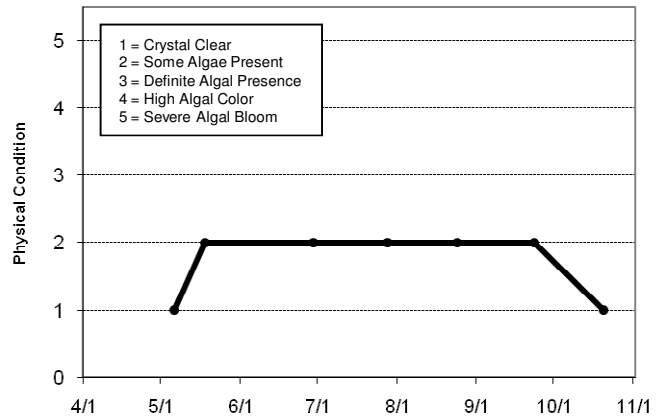
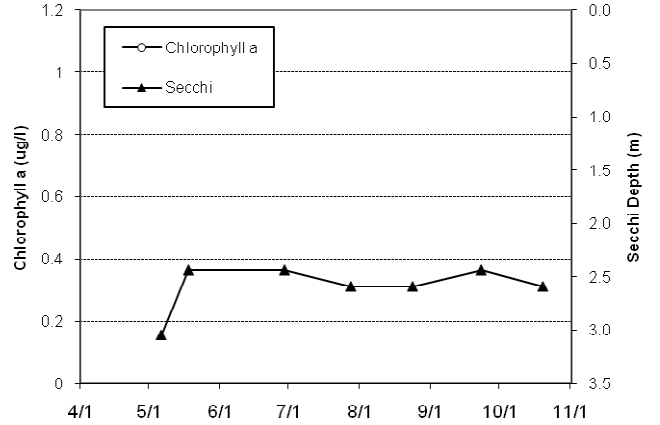
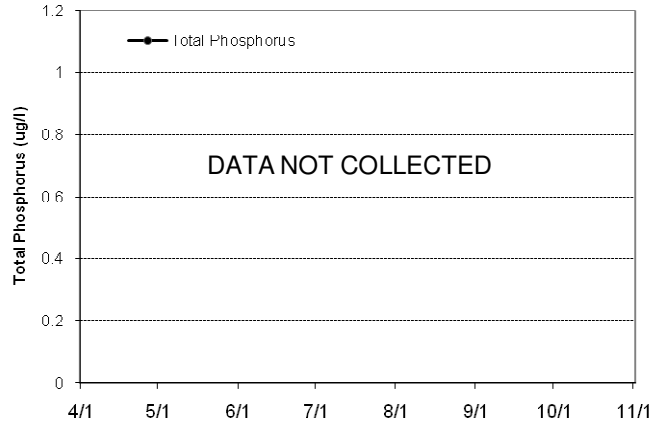
**Lake Water Quality Grades Based on Summertime Averages**

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus						B	A	A	C	B		
Chlorophyll a						C	B	B	B	B		
Secchi Depth						B	B	B	B	B	B	C
<b>Lake Grade</b>						<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>		

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	A	C	B		
Chlorophyll a	A	A	A	A		
Secchi Depth	B	B	A	B	B	B
<b>Lake Grade</b>	<b>B</b>	<b>A</b>	<b>B</b>	<b>B</b>		

Source: Metropolitan Council and STORET data



**Sunfish Lake [Sunfish Lake] (19-0050) City of Sunfish Lake**

Sunfish Lake is located in the City of Sunfish Lake (Dakota County). The lake has a surface area of 49 acres and a maximum depth of 9.8 m (32 ft).

During each sampling event the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), and total kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake’s perceived physical condition and recreational suitability.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	24.6	12.0	36.0	<b>B</b>
<b>CLA</b> (µg/l)	13.3	1.6	43.0	<b>B</b>
<b>Secchi</b> (m)	2.6	1.1	5.5	<b>B</b>
<b>TKN</b> (mg/l)	0.78	0.58	1.00	
<b>Lake Grade</b>				<b>B</b>

The lake received a lake grade of B for 2009, which is the best lake grade yet received in its limited monitoring history. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake’s water quality and determine potential water quality trends.

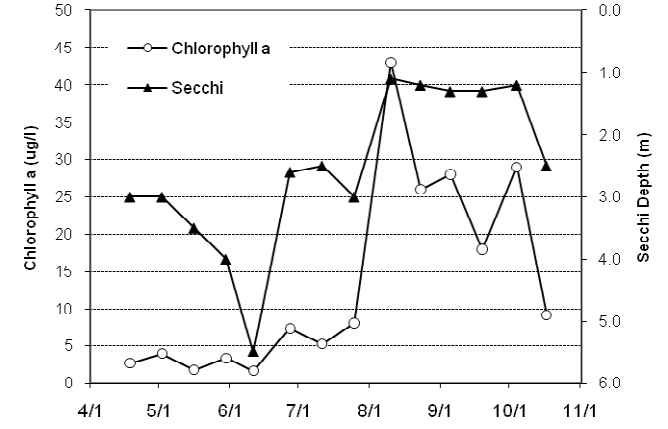
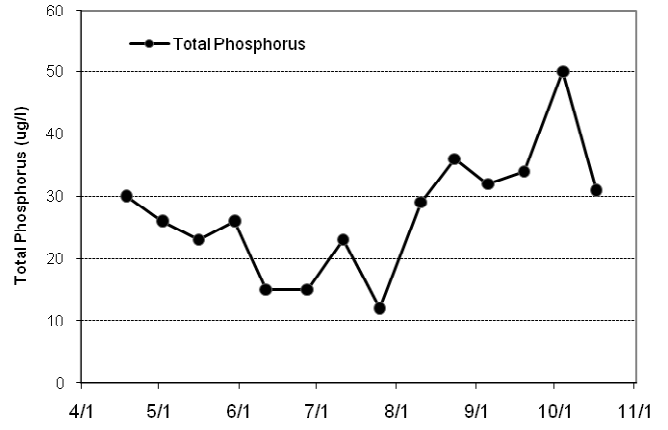
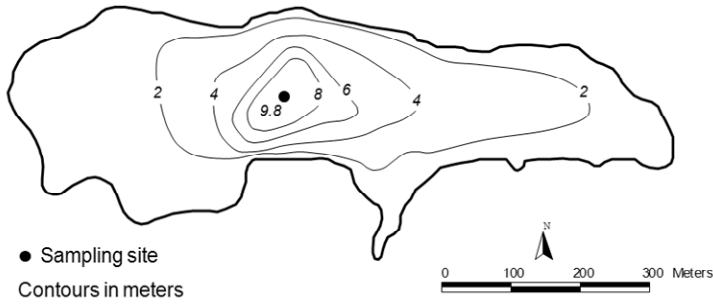
Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



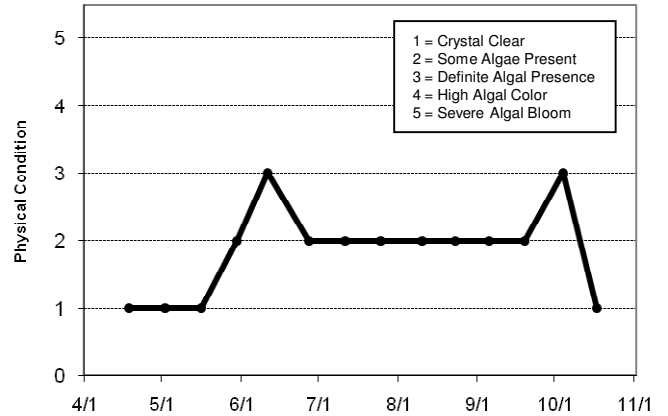
**Sunfish Lake**  
Sunfish Lake, Dakota Co.

Lake ID: 190050-00  
WMO: Lower Mississippi River  
Volunteer: Dick Bancroft



**2009 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
4/18	15.2				2.6	30		3.0	1	1
5/2	16.3				3.9	26		3.0	1	1
5/16	15.5				1.7	23		3.5	1	1
5/30	19.8				3.3	26		4.0	2	1
6/11	18.4				1.6	15		5.5	3	3
6/27	26.2				7.3	15		2.6	2	3
7/11	24.6				5.2	23		2.5	2	3
7/25	23.6				8.1	12		3.0	2	1
8/10	24.9				43	29		1.1	2	1
8/23	22.6				26	36		1.2	2	1
9/5	22.7				28	32		1.3	2	1
9/19	24.1				18	34		1.3	2	1
10/4	12.7				29	50		1.2	3	1
10/17	8.6				9.2	31		2.5	1	1

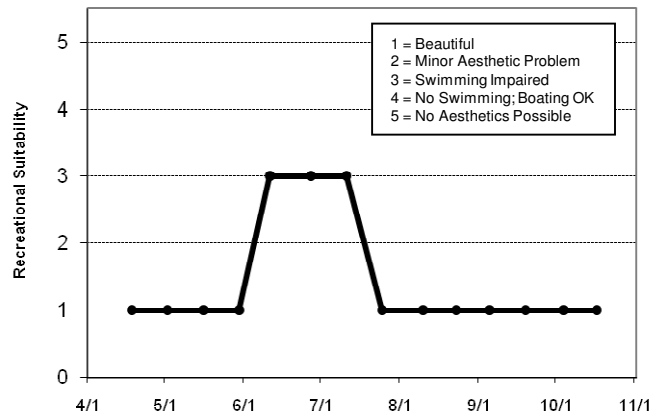


**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth					C	C	C					C
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			C	C	C	B
Chlorophyll a			C	C	C	B
Secchi Depth			D	C	C	B
<b>Lake Grade</b>			C	C	C	B



Source: Metropolitan Council and STORET data

## Sunnybrook Lake (82-0133) Valley Branch Watershed District

Sunnybrook Lake is a 16-acre lake located within Grant Township (Washington County). The maximum and mean depths of the lake are 6.1 and 2.0 m (20.0 and 6.5 feet), respectively. The majority of the lake's area is considered littoral zone (the area of aquatic vegetation dominance). The lake has a 630-acre immediate watershed, which translates to a watershed-to-lake area ratio of 39:1. The larger the ratio the greater the potential stress put on the lake from surface runoff.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	18.0	10.0	23.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	7.1	1.9	19.0	A
<b>Secchi</b> (m)	2.8	1.6	3.9	B
<b>TKN</b> (mg/l)	0.77	0.66	0.88	
<b>Lake Grade</b>				A

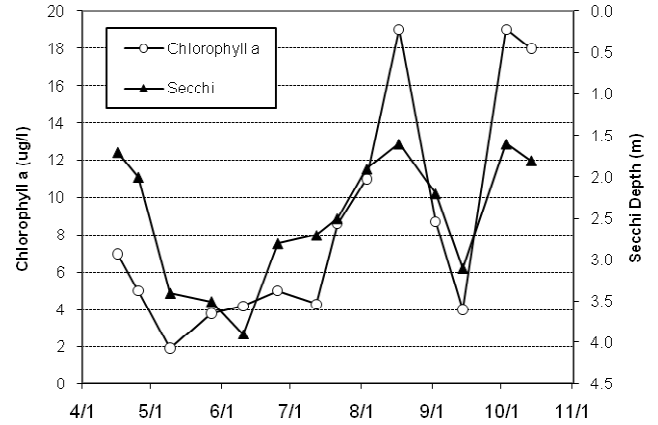
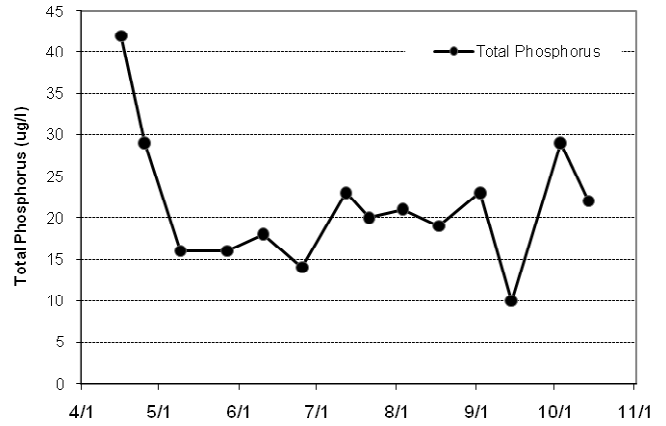
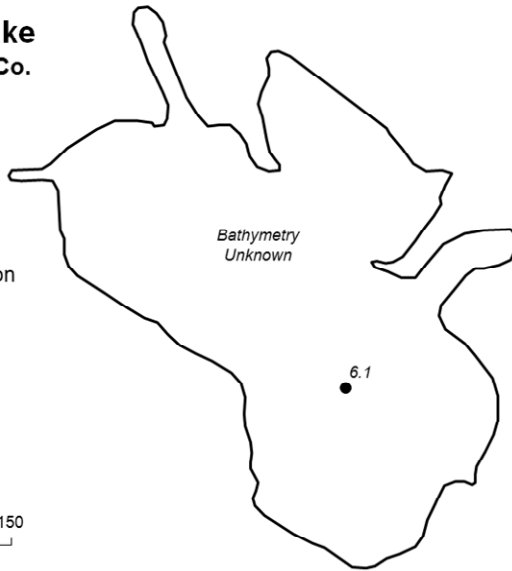
The lake received a lake grade of A for 2009, which is the second time it received such a lake grade. Last year it also received a lake grade of A. The total phosphorus concentrations were generally lower in 2008 and 2009 in comparison to previous years. Additional monitoring is suggested to provide data for evaluating potential trends in water quality.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

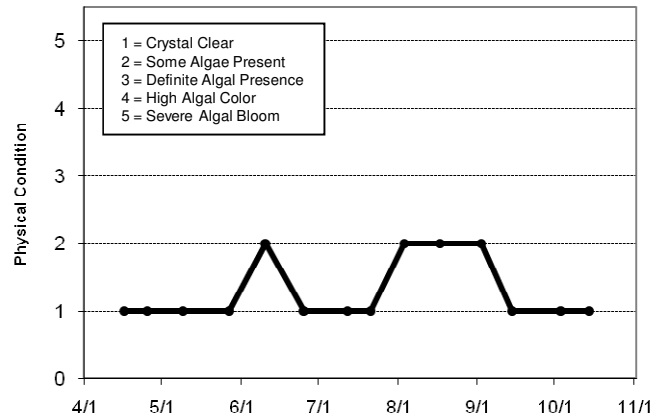
# Sunnybrook Lake Grant, Washington Co.

Lake ID: 820133-00  
WD: Valley Branch  
Volunteer: Arnie Johnson



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/16	13.9				7	42		1.7	1	1
4/25	13.9				5	29		2.0	1	1
5/9	16.2				1.9	16		3.4	1	1
5/27	18.8				3.8	16		3.5	1	1
6/10	17.8				4.2	18		3.9	2	1
6/25	27.3				5	14		2.8	1	1
7/12	24.4				4.3	23		2.7	1	1
7/21	22.1				8.6	20		2.5	1	1
8/3	23.2				11	21		1.9	2	2
8/17	24.7				19	19		1.6	2	2
9/2	21.8				8.7	23		2.2	2	1
9/14	23.8				4	10		3.1	1	1
10/3	13.7				19	29		1.6	1	1
10/14	8.4				18	22		1.8	1	1

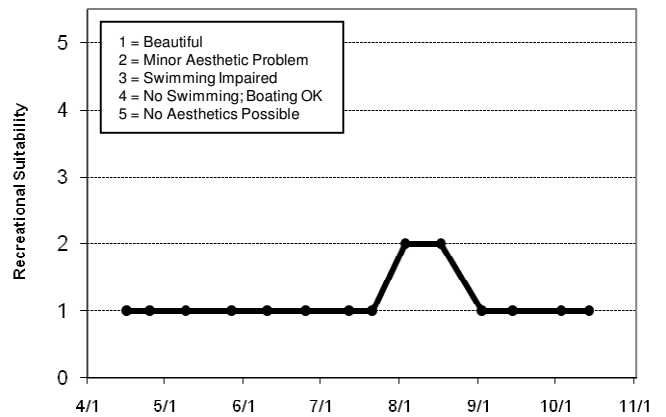


## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	C	B	B	A	A
Chlorophyll a	A	B	A	A	A	A
Secchi Depth	B	B	B	B	B	B
Lake Grade	B	B	B	B	A	A



Source: Metropolitan Council and STORET data

## Sunset Lake (82-0153) Rice Creek Watershed District

Sunset Lake is located in the southern portion of the City of Hugo (Washington County). It has a surface area of 124 acres and a maximum depth of 5.2 m (17 ft). Nearly the entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

Sunset Lake has been involved in CAMP since 1993. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	16.1	10.0	21.0	A
<b>CLA</b> (µg/l)	3.1	2.3	4.4	A
<b>Secchi</b> (m)	3.0	2.1	3.5	B
<b>TKN</b> (mg/l)	0.76	0.48	1.30	
			<b>Lake Grade</b>	A

The lake received a lake grade of A for 2009, which is consistent with grades received over the past decade. According to the historical water quality database, the water quality of the lake has improved over the past 25 years, as demonstrated by the shift from mostly C lake grades received in the period 1993-1999 to A lake grades in the period 2001-2009. Furthermore, Secchi depths were measured throughout the mid- to late-1980's as part of the MPCA's volunteer program. Secchi grades in the 1980s were in the C to D range.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

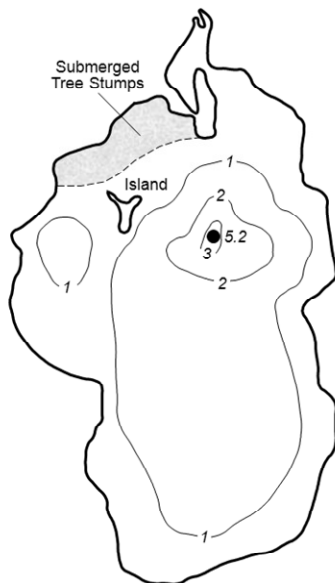
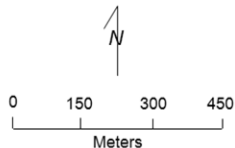
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Sunset Lake

## Hugo, Washington Co.

Lake ID: 820153-00  
 WD: Rice Creek  
 Volunteer:  
 Dianne Coderre

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	15.5				2.9	20		3.5	1	1
5/24	22.6				2.3	21		3.0	1	
6/10	19.2				2.8	12		3.0	2	
6/27	26.8				2.9	10		3.5	1	
7/6	25.8				4.4	18		3.0	2	4
7/31	24.1				3.5	13		2.8	2	
8/30	22.3				3.1	19		2.1	2	4

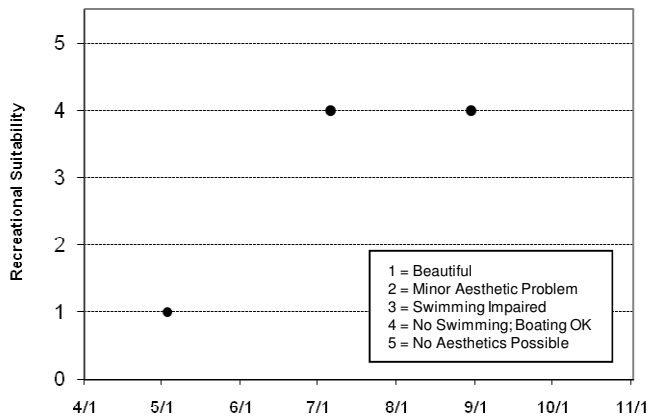
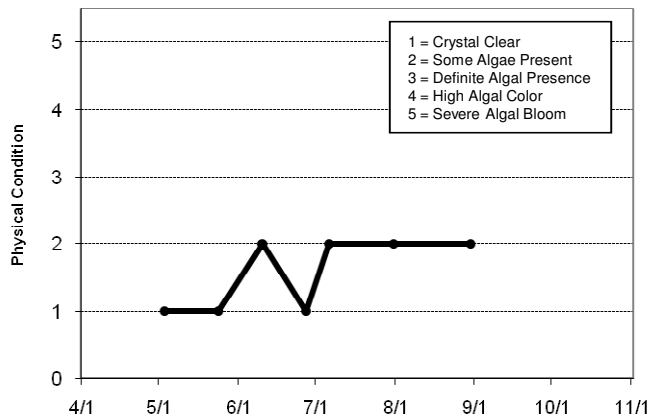
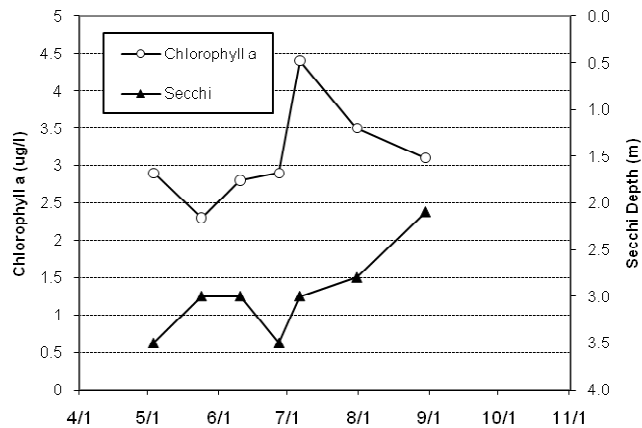
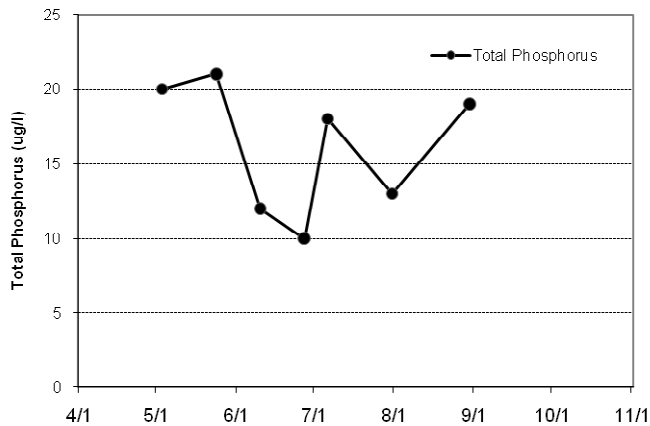
### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus	C	B	C	C	C	C	C	C	B	A	A	A
Chlorophyll a	B	B	B	C	C	B	B	A	A	A	A	A
Secchi Depth	C	B	C	B	C	C	C	C	B	A	A	A
<b>Lake Grade</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>A</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	A	A	A	A
Chlorophyll a	A	A	A	A	A	A
Secchi Depth	A	A	A	B	A	B
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>

Source: Metropolitan Council and STORET data



## Sunset Pond (19-0451) Black Dog Watershed Management Commission

Sunset Pond, a 60-acre man-made lake, is located in the City of Burnsville (Dakota County). It has been involved in CAMP since 1994 (with an omission in 1999). The pond has a normal maximum depth of 3.7 m (12 ft). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The pond collects drainage from a portion of the cities of Burnsville's and Savage's stormwater conveyance systems, including outflow from Crystal and Earley lakes. Because the lake was created to detain stormwater, the pond can experience extreme bounce in its water level during runoff conditions. The pond has been designated by the MN DNR as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	62.7	35.0	87.0	C
<b>CLA</b> (µg/l)	9.2	4.1	19.0	A
<b>Secchi</b> (m)	1.9	1.5	2.2	C
<b>TKN</b> (mg/l)	0.93	0.60	1.20	
			<b>Lake Grade</b>	B

The pond received a lake grade of B for 2009. The pond experiences variability in its water quality as demonstrated by the variation in the historical lake grades. The lake typically receives a B or C lake grade. The Secchi grade of C does not correlate well with the CLA grade of A. One possible explanation for this incongruity may be that the water clarity may be affected by higher levels of total suspended solids from surface runoff via the surrounding urbanized watershed. In this scenario, higher loadings of suspended solids could cause a decrease in water clarity which would decrease light penetration, thereby inhibiting algal growth. In other words, the algal population may be light-limited rather than nutrient-limited.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

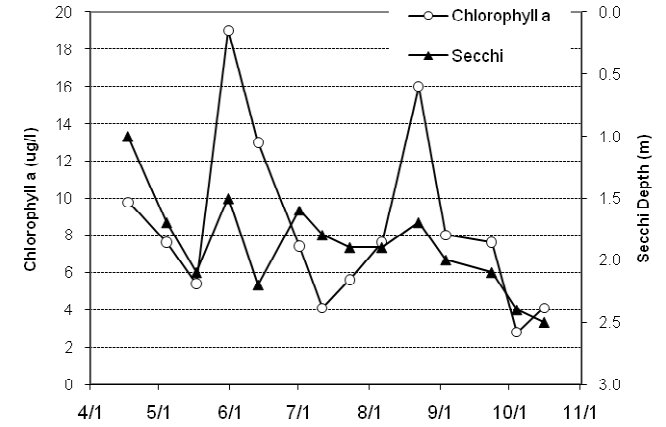
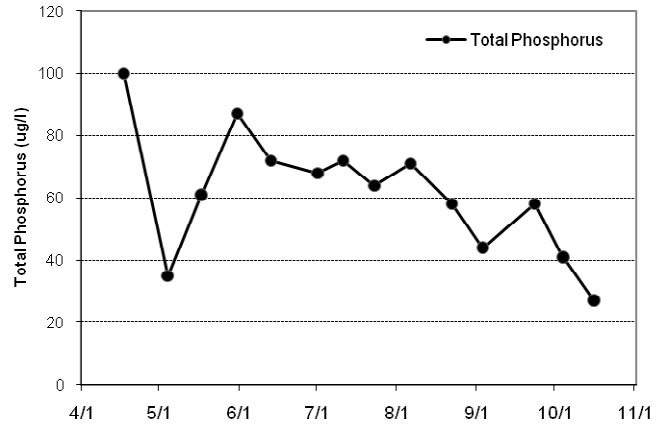
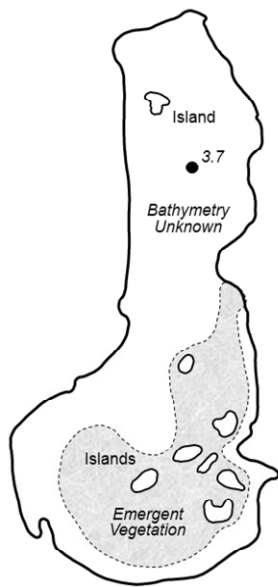
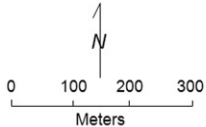
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Sunset Pond

Burnsville, Dakota Co.

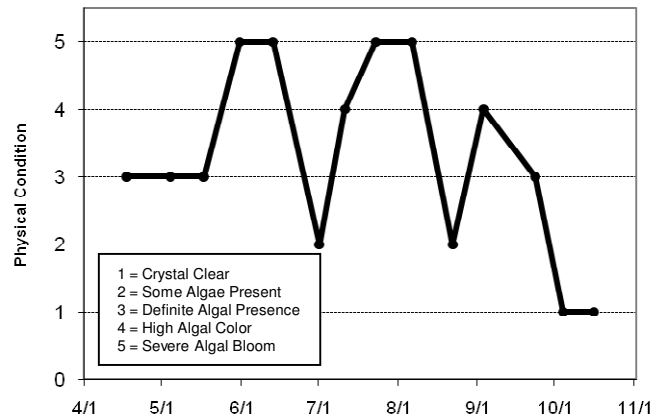
Lake ID: 190451-00  
 WMO: Black Dog  
 Volunteer: Dan Wallace

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/17	18.8				9.8	100	1.0	3	2	
5/4	15.1				7.6	35	1.7	3	4	
5/17	14.4				5.4	61	2.1	3	4	
5/31	20				19	87	1.5	5	4	
6/13	17.7				13	72	2.2	5	4	
7/1	21.3				7.4	68	1.6	2	2	
7/11	26.2				4.1	72	1.8	4	4	
7/23	25.6				5.6	64	1.9	5	5	
8/6	26.2				7.6	71	1.9	5	5	
8/22	20.2				16	58	1.7	2	2	
9/3	22.4				8	44	2.0	4	4	
9/23	22.1				7.6	58	2.1	3	4	
10/4	11				2.8	41	2.4	1	2	
10/16	6.7				4.1	27	2.5	1	2	

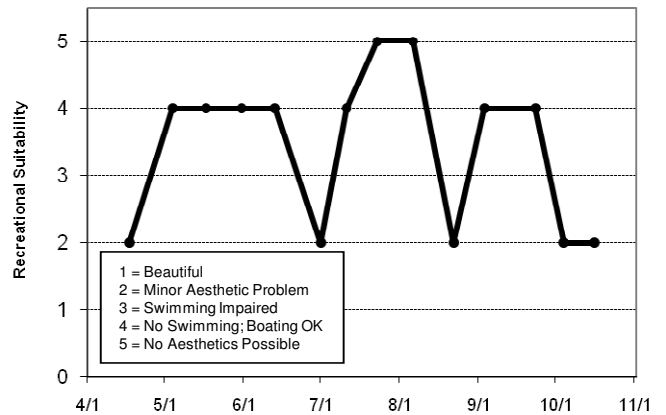


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	D	C	C	C	C
Chlorophyll a	A	B	A	A	A	A
Secchi Depth	B	C	C	C	C	C
Lake Grade	B	C	B	B	B	B



Source: Metropolitan Council and STORET data

## Susan Lake (10-0013) City of Chanhassen

Susan Lake, located in the City of Chanhassen (Carver County), covers an area of 93 acres and has a maximum depth of 5.2 m (17 feet). Approximately 81 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

Susan Lake is involved in a study on the common carp (*Cyprinus carpio*), which is an invasive, non-native fish species, originally from central Asia. The study is being lead by Dr. Peter Sorensen of the the University of Minnesota. The purpose of the study is to develop an integrated management plan for the Riley chain-of-lakes (including Susan Lake) so as to improve the water quality of the lake chain. The activity and feeding behavior of the common carp can wreak havoc on the water quality and ecology of lakes by causing a litany of problems including reduced water clarity, decreased abundance of rooted aquatic vegetation, increase in algal populations, resuspension of sediment, increased internal loading of phosphorus, and negative changes in native fish populations. The long-term goal of the study is to develop a carp management strategy that can be applied to other lakes beyond the study lakes. For more information on this project, please refer to Dr. Sorensen's website at: <http://fwcb.cfans.umn.edu/sorensen/research/index.html>

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	91.2	33.0	180.0	D
<b>CLA</b> (µg/l)	43.2	7.4	76.0	C
<b>Secchi</b> (m)	1.3	0.5	3.0	C
<b>TKN</b> (mg/l)	1.82	1.20	3.40	
			<b>Lake Grade</b>	C

The lake received a lake grade of C for 2009, which is consistent with its limited historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

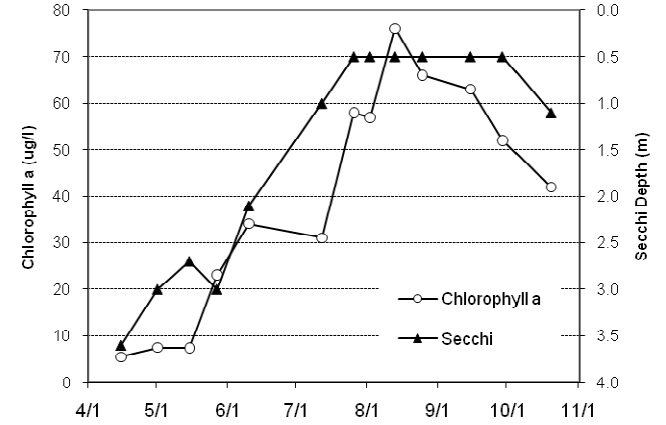
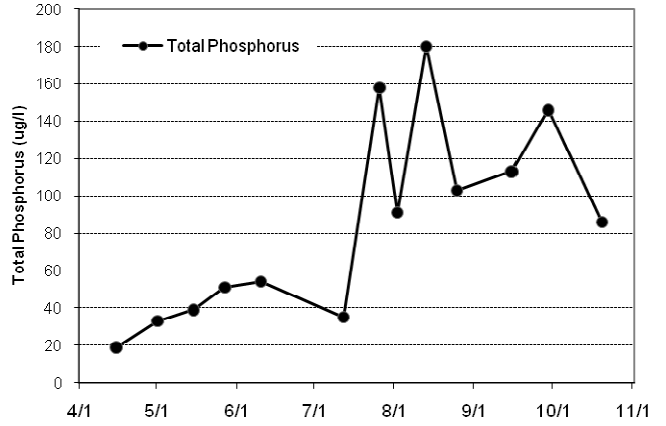
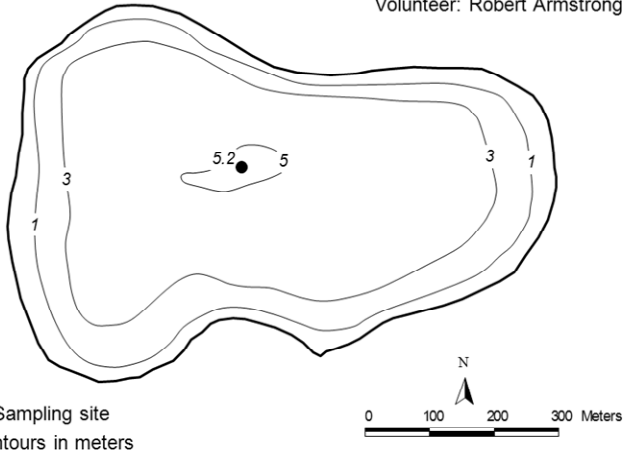
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# Lake Susan

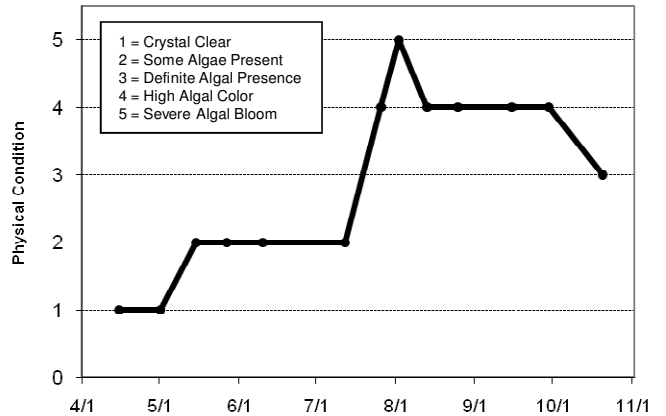
Chanhassen, Carver Co.

Lake ID: 100013-00  
 WD: Riley-Purgatory-Bluff Creek  
 Volunteer: Robert Armstrong



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	4.2				5.5	19		3.6	1	1
5/1	7.1				7.5	33		3.0	1	1
5/15	9.5				7.4	39		2.7	2	1
5/27	15				23	51		3.0	2	2
6/10	20.6				34	54		2.1	2	2
7/12	25.9				31	35		1.0	2	2
7/26	22.7				58	158		0.5	4	4
8/2	23.7				57	91		0.5	5	4
8/13	25.6				76	180		0.5	4	4
8/25	22.3				66	103		0.5	4	3
9/15	22.1				63	113		0.5	4	4
9/29	17.2				52	146		0.5	4	4
10/20	9.1				42	86		1.1	3	4

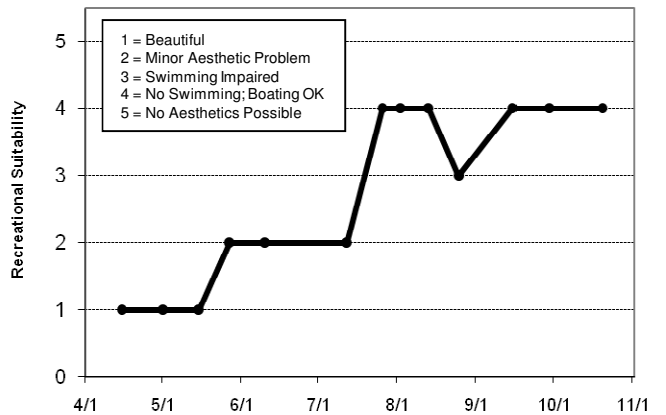


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			D	C	F	D
Chlorophyll a			C	C	D	C
Secchi Depth			C	C	D	C
Lake Grade			C	C	D	C



Source: Metropolitan Council and STORET data

## Swede Lake (10-0095) Carver County Environmental Services

Swede Lake is a 376-acre lake located in Watertown Township (Carver County) with a maximum depth of approximately 4.0 m (13.1 feet). Because of the shallowness of the lake, its entire surface area is considered littoral (the shallow [0-15 foot depth] area dominated by aquatic vegetation). The MN DNR has designated the lake as being infested with Eurasian Water Milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	391.7	139.0	799.0	F
<b>CLA</b> (µg/l)	158.5	19.0	460.0	F
<b>Secchi</b> (m)	0.4	0.2	0.6	F
<b>TKN</b> (mg/l)	4.92	2.60	7.50	
<b>Lake Grade</b>				F

The lake received a lake grade of F for 2009. The lake receives typically F lake grades with the occasional D grade. The lake's water quality seems well represented by a lake grade of F with occasional variation.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

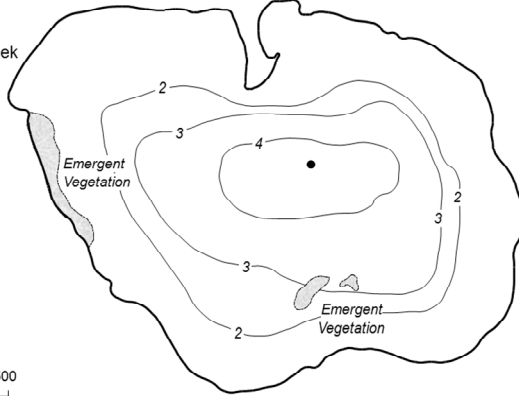
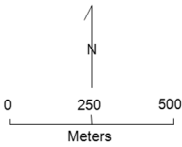
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

**Swede Lake**  
Watertown Twp., Carver Co.

Lake ID: 100095-00  
WMO: Pioneer-Sarah Creek  
Volunteer:  
Wayne Hubin

● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	14				13	121		0.9	2	4
5/1	13				19	188		0.6	2	4
5/11	16				46	139		0.6	2	4
5/28	22				62	165		0.6	2	4
6/9	20				70	192		0.4	3	4
6/23	27				37	222		0.3	3	4
7/9	24				160	395		0.2	4	4
7/24	25				120	363		0.3	5	4
8/3	24				290	616		0.3	4	4
8/18	23				310	533		0.3	3	4
9/4	24				460	799		0.2	3	4
9/17	30				170	697		0.3	5	5
10/4	13				190	541		0.3	3	4
10/12	10				160	460		0.5	3	4

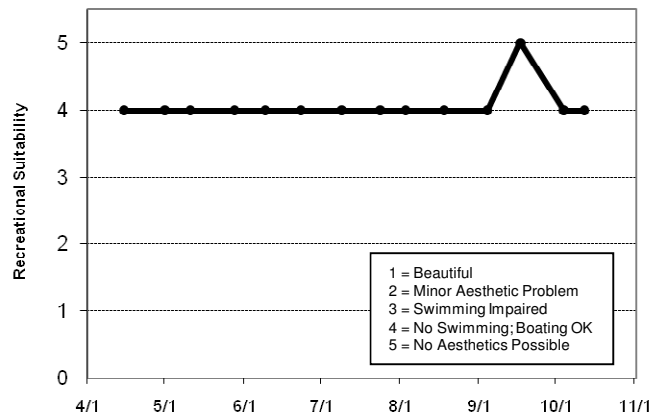
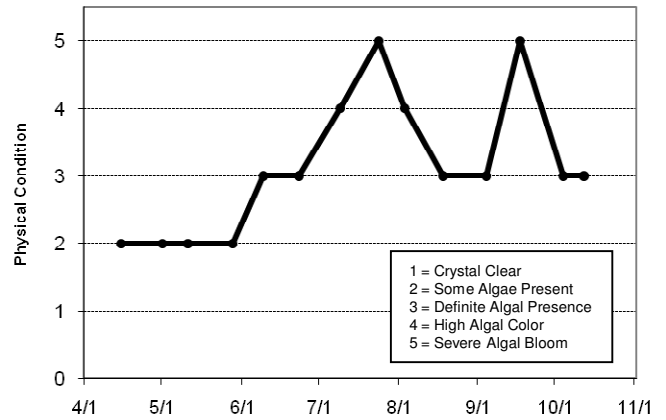
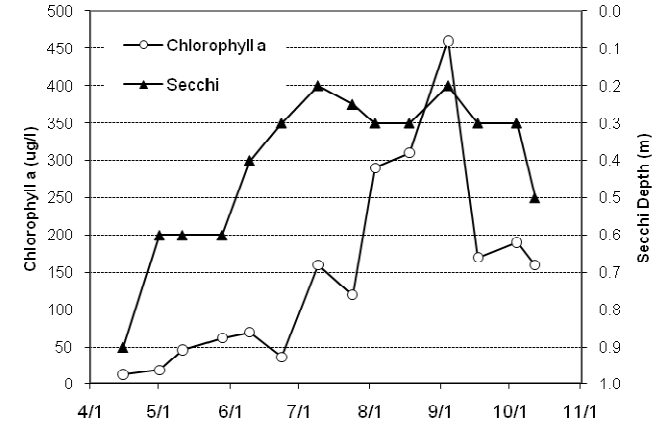
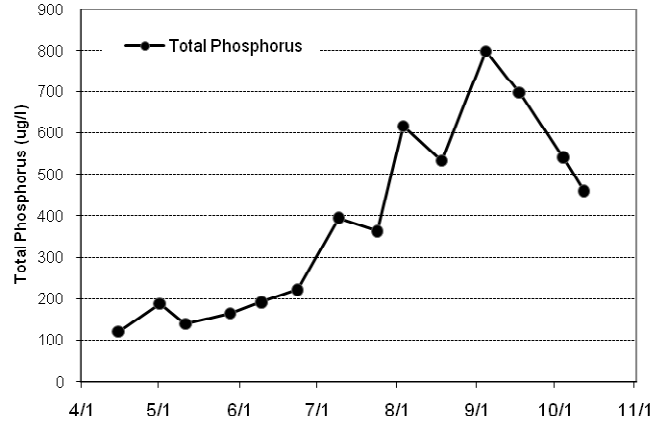
**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	F	F	F	F	F	F
Chlorophyll a	D	D	F	F	F	F
Secchi Depth	F	D	F	F	F	F
<b>Lake Grade</b>	<b>F</b>	<b>D</b>	<b>F</b>	<b>F</b>	<b>F</b>	<b>F</b>

Source: Metropolitan Council and STORET data



## Sweeney Lake (27-0035) Bassett Creek Watershed Management Organization

Sweeney Lake is located in the City of Golden Valley (Hennepin County). The lake has a surface area of 66 acres and mean and maximum depths of 3.6 m (12 ft) and 8.0 m (26 ft), respectively. The lake's surface area and a watershed area of 2,400 acres give a large watershed-to-lake area ratio of 36:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The Sweeney Lake branch of Bassett Creek flows into the lake on the south end and discharges at the north end over a dam. Sweeney Lake is connected to Twin Lake during periods of high water levels by a channel. The surface elevations of the two lakes are about the same.

The lake has a hypolimnetic aeration system which generally operates year round. The aeration system keeps the lake well mixed, so it does not develop a thermocline when the system is operational. A thermocline is a density gradient caused by changing water temperatures throughout the water column.

The aeration system was turned off during the monitoring seasons of 2007 and 2008 as part of a total maximum daily load (TMDL) study. The TMDL study was initiated in response to the lake being listed as impaired in 2004 by the Minnesota Pollution Control Agency. The impaired listing is due to excessive nutrients.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	58.3	32.0	182.0	C
<b>CLA</b> (µg/l)	23.9	4.2	75.0	C
<b>Secchi</b> (m)	1.3	0.9	2.5	C
<b>TKN</b> (mg/l)	1.04	0.84	1.80	
			<i>Lake Grade</i>	C

The lake received a lake grade of C for 2009 which is consistent with its historical database. Over the period of the monitoring database, the water quality of the lake seems represented by a lake grade of C. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

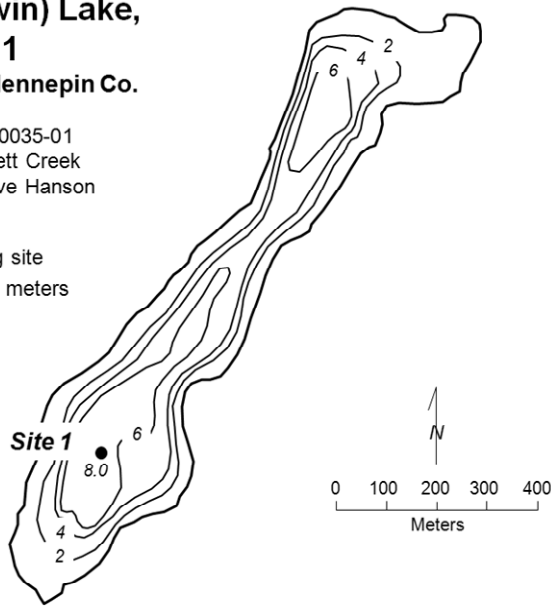
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Sweeney (Twin) Lake, Site 1

## Golden Valley, Hennepin Co.

Lake ID: 270035-01  
 WMO: Bassett Creek  
 Volunteer: Dave Hanson

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/27	14.7			13.6	11.4	12	46	1.4	1	1
5/7	15.9			9.4	8.1	4.2	32	2.5	1	1
5/19	18	17.5	13.1	13.6	9.5	34		1.6	1	1
6/1	20.3	19.8	11.7	11.09	13	38		1.3	1	1
6/15	21.7	18.3	11.9	6.1	19	57		1.1	1	1
6/24	25.6	22.1	11.37	4.8	31	49		1.3	2	2
7/5	24.8	22.4	10.12	3	21	54		1.2	3	3
7/23	24.9	22.3	11.9	4	75	182		1.2	3	3
8/4	24.9	22.8	10.23	3.3	17	54		1.1	3	3
8/27	24.5	22.3	10.53	3.4	30	41		0.9	2	2
9/10	23.1	22	9	5.3	24	51		1.1	2	2
9/18	24.9	22.4	8.92	5.18	19	49		1.2	3	3
10/7	14	13.3	7.6	7.29	23	54		1.0	2	2

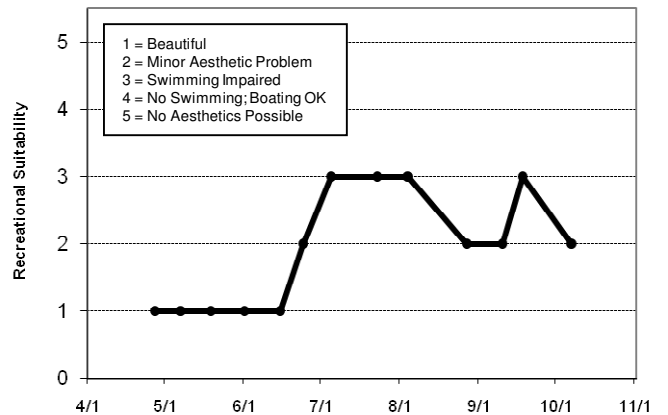
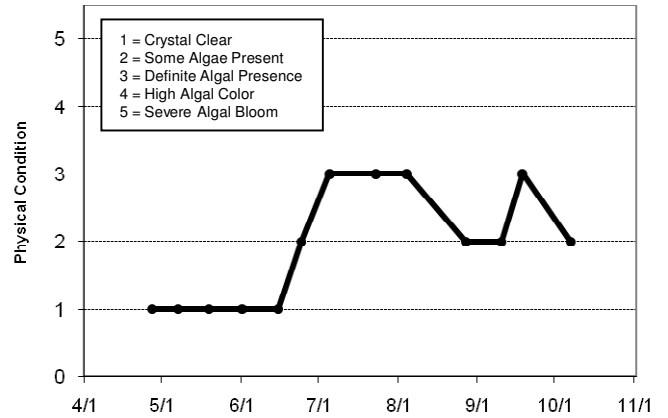
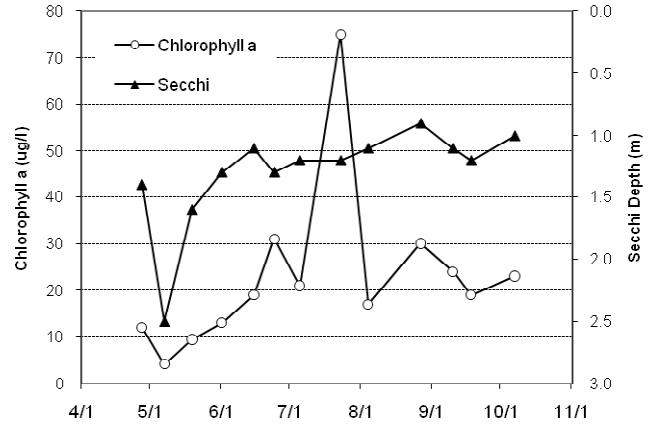
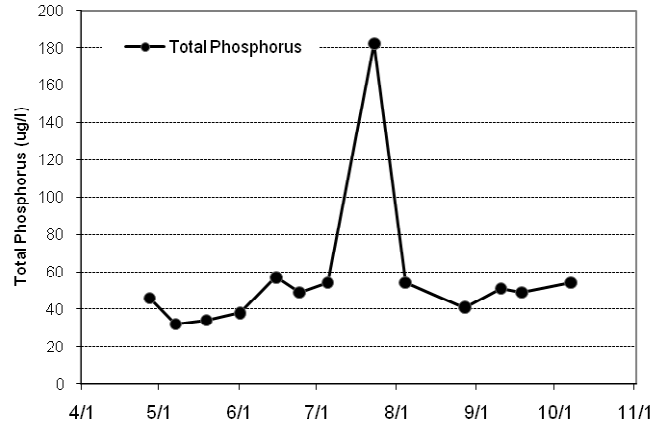
### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total Phosphorus													
Chlorophyll a													
Secchi Depth													
Lake Grade													

Year	1993	1994	1995	1996	1997	1998	1999	2000 Site 1	2000 Site 2	2001 Site 1	2001 Site 2	2002 Site 1	2002 Site 2
Total Phosphorus								C	C	C	C	C	NA
Chlorophyll a								C	C	B	C	B	NA
Secchi Depth								D	D	C	C	C	NA
Lake Grade								C	C	C	C	C	NA

Year	2003 Site 1	2004 Site 1	2005 Site 1	2006 Site 1	2007 Site 1	2008 Site 1	2009 Site 1
Total Phosphorus	C	C	C	D	C	C	C
Chlorophyll a	B	B	C	C	B	B	C
Secchi Depth	C	C	C	D	D	C	C
Lake Grade	C	C	C	D	C	C	C

Source: Metropolitan Council and STORET data



## **Sylvan Lake [Half Breed Lake] (82-0080) Comfort Lake-Forest Lake Watershed District**

Sylvan Lake (also known as Half Breed Lake) is a 75-acre lake located in Forest Lake Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	15.3	7.0	23.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	2.7	1.7	3.6	A
<b>Secchi</b> (m)	5.0	4.2	5.5	A
<b>TKN</b> (mg/l)	0.64	0.55	0.81	
<b>Lake Grade</b>				A

The lake received a lake grade of A for 2009, which is consistent with its historical water quality database. The historic water quality database indicates that the lake has maintained its high quality over the past 20+ years.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

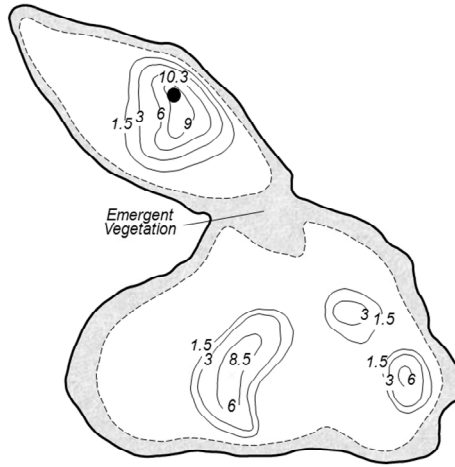
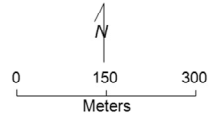
**Sylvan Lake**  
(Halfbreed Lake)  
Forest Lake/Scandia,  
Washington Co.

LAKE ID: 820080-00

WD: Comfort Lake - Forest Lake

Volunteer: Curt Sparks

- Sampling station
- Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/27	14.2				2.2	11		4.5	1	1
5/4	15.3				1.7	22		5.3	1	1
5/18	15.6				1.8	23		5.4	1	1
5/22	20.2				2.6	13		5.5	1	1
6/22	27.1				2.3	10		4.6	1	1
7/7	26				2.7	13		4.4	1	1
7/21	22.5				3.5	17		4.2	1	1
8/10	24.8				3	7		5.0	1	1
9/10	21.6				3.6	17		5.4	1	1

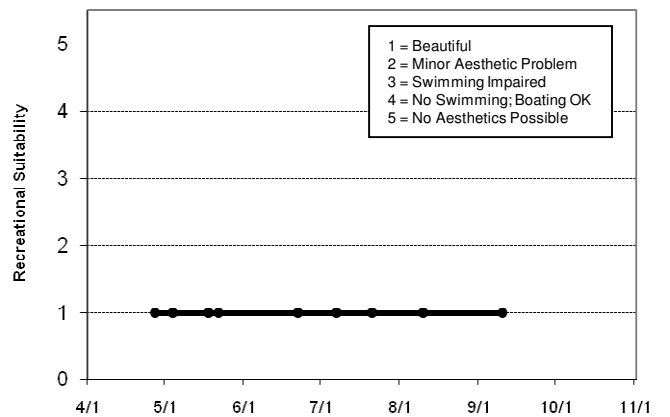
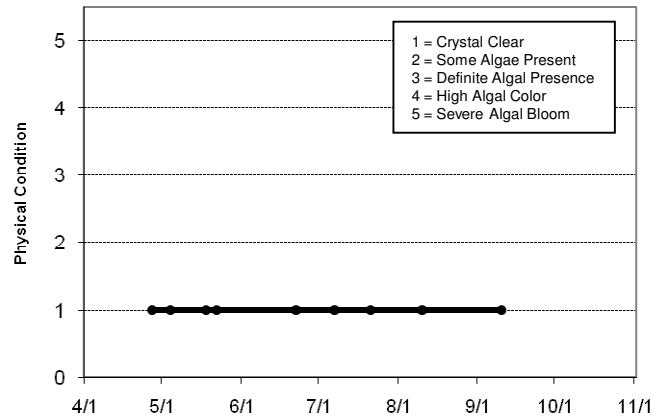
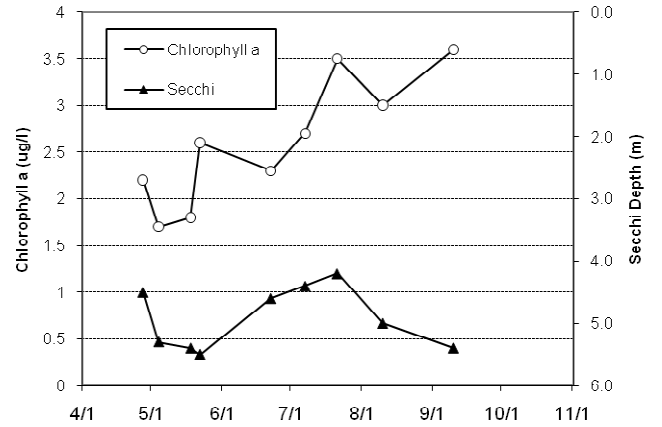
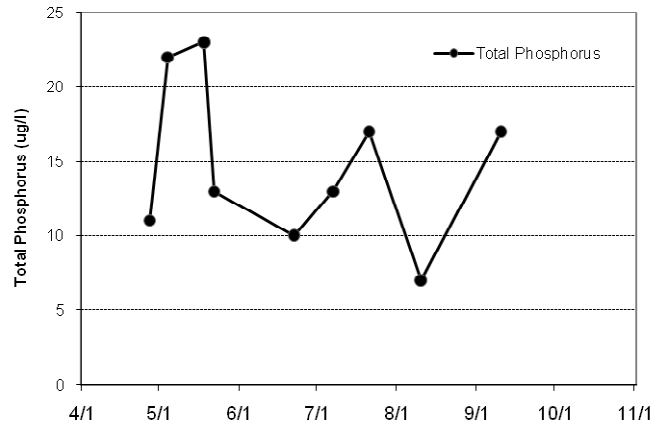
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	B	A					C	B	A	A	A	A
Chlorophyll a							B	A	A	A	A	A
Secchi Depth	A	A	A	A	A	A	A	A	A	A	A	A
<b>Lake Grade</b>							<b>B</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus		A			A		A	A	A	A	A	A
Chlorophyll a		A			A		A	A	A	A	A	A
Secchi Depth	A	A			A		A	A	A	A	A	A
<b>Lake Grade</b>		<b>A</b>			<b>A</b>		<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A		A	A	A
Chlorophyll a	A	A		A	A	A
Secchi Depth	A	A		A	A	A
<b>Lake Grade</b>	<b>A</b>	<b>A</b>		<b>A</b>	<b>A</b>	<b>A</b>

Source: Metropolitan Council and STORET data



### **Tamarack Lake (10-0010) Minnehaha Creek Watershed District**

Tamarack Lake is located in the City of Victoria (Carver County). The lake has a surface area of 24 acres. It has a maximum depth of approximately 20 m (66 ft). Approximately 41 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	28.7	19.0	37.0	B
<b>CLA</b> ( $\mu\text{g/l}$ )	10.9	1.1	18.0	B
<b>Secchi</b> (m)	2.7	1.4	5.5	B
<b>TKN</b> (mg/l)	1.20	1.10	1.30	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009, which is consistent with its historical water quality database. The lake grades for the lake have varied in the range of B and C. Further monitoring is suggested to continue to build the water quality database for increasing the power to detect water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

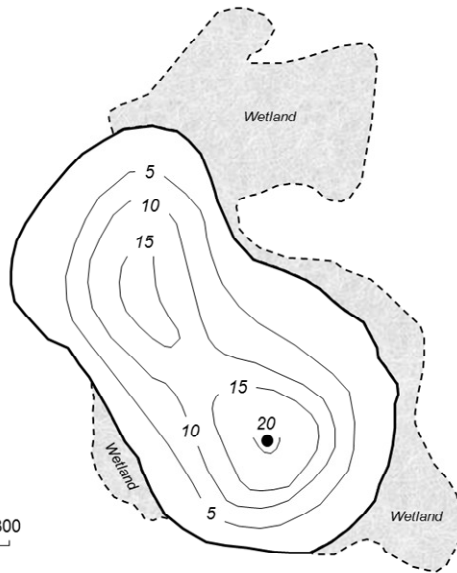
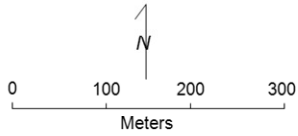
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# Tamarack Lake Victoria, Carver Co.

Lake ID: 100010-00  
WD: Minnehaha Creek  
Volunteer: Mike Shouldice

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	13.4				9	36			1	1
5/3	15.7				1.1	29		5.5	1	1
5/17	22.2				3.9	26		4.0	3	1
5/31	18.4				9.1	32		2.5	2	1
6/13	19.8				11	25		4.0	2	1
6/28	24.1				11	30		1.4	3	1
7/12	25.3				17	36		1.4	3	2
7/26	24.6				12	28		2.0	3	1
8/8	23.6				17	19		1.8	3	1
8/23	23.3				18	37		1.6	3	1
9/7	23				10	24		2.3	3	1
9/26	19.4				10	30		3.0	1	1
10/12	9.4				12	26		3.0	2	1

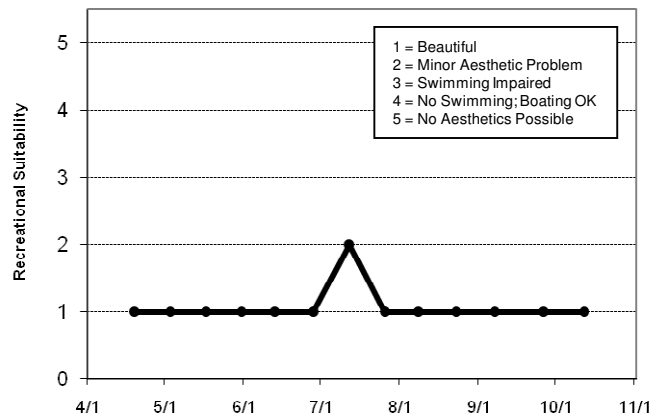
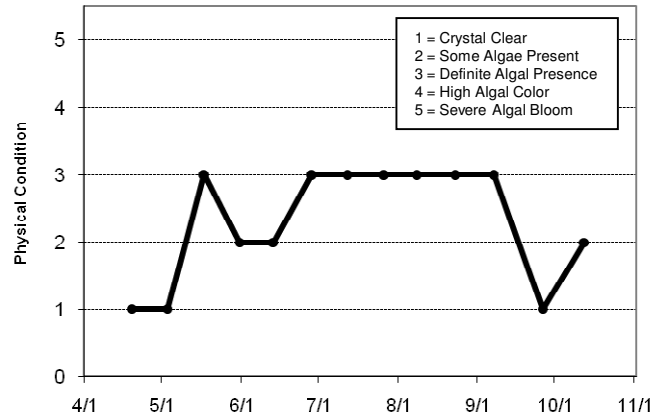
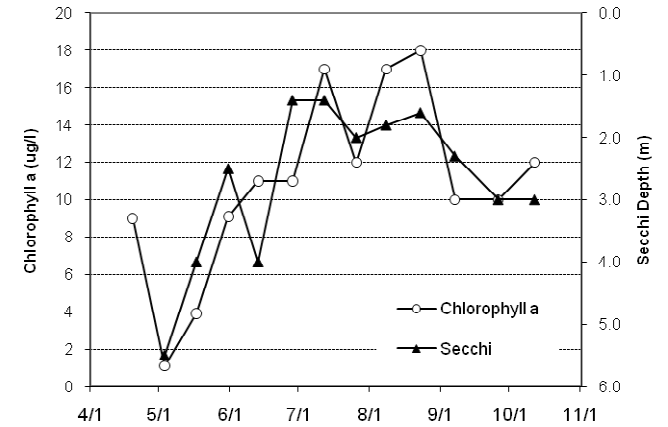
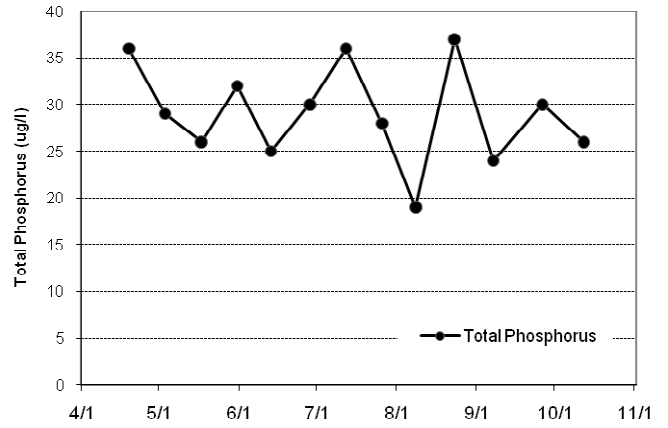
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus									C	B	B	C
Chlorophyll a									C	A	B	B
Secchi Depth					A				C	B	C	C
<b>Lake Grade</b>									<b>C</b>	<b>B</b>	<b>B</b>	<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	D	C	D	B	B	B
Chlorophyll a	C	C	C	B	A	B
Secchi Depth	C	C	C	B	B	B
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>B</b>	<b>B</b>

Source: Metropolitan Council and STORET data



## **Terrapin Lake (82-0031) Carnelian - Marine - St. Croix Watershed District**

Terrapin Lake is located in May Township (Washington County). It has a surface area of 86 acres and a maximum depth of 4.6 m (15 ft). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>Secchi (m)</b>	3.2	2.4	3.8	A

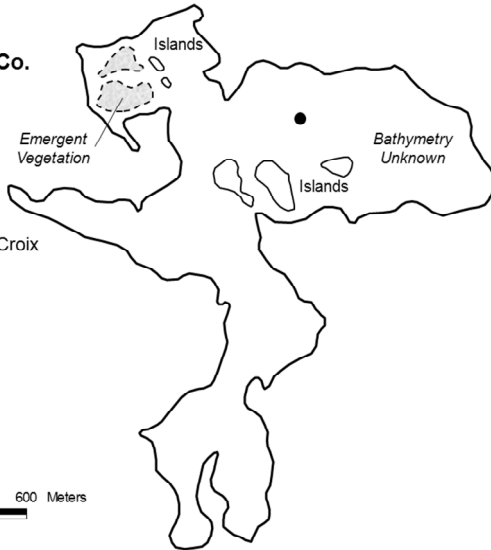
The lake received a secchi grade of A for 2009, which is consistent with the historical water quality database. No lake grade was given for the lake this year because total phosphorus and chlorophyll were not monitored. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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# Terrapin Lake May Twp., Washington Co.



LAKE ID: 820031-00

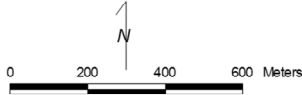
WD: Carnelian-Marine-St. Croix

Volunteer: Washington

Conservation District

● Sampling site

Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/5	15.6	13.7	11.05	0.11				3.7	1	1
5/21	19.3	16.5	10.13	0.26				3.8	1	1
6/30	22.3	21.7	8.22	0.19				3.0	1	1
7/28	23	21.6	9.3	0.99				3.0	2	1
8/24	22.5	20.7	6.86	0.3				2.4	2	1
9/21	22.6	21.4	8.4	0.08				3.2	2	2
10/20	8.8	8.4	11.57	5.75				2.6	1	1

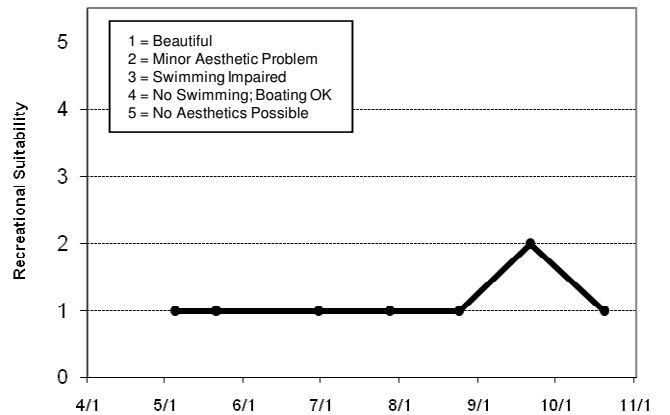
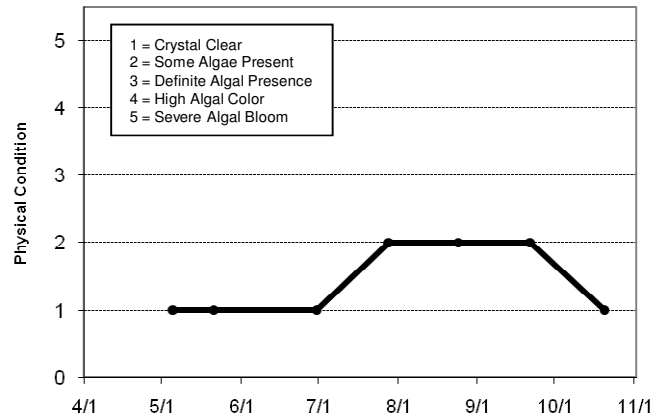
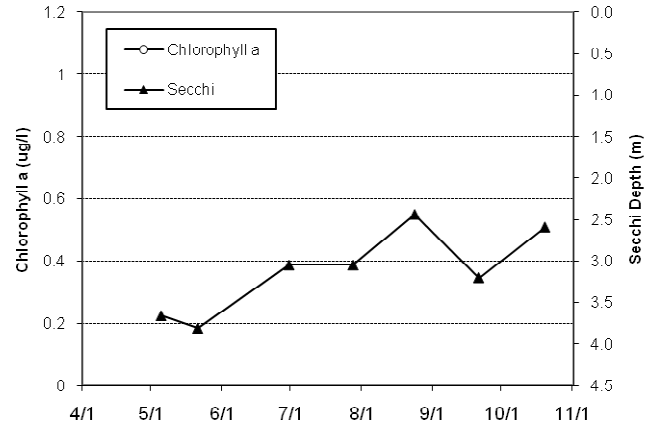
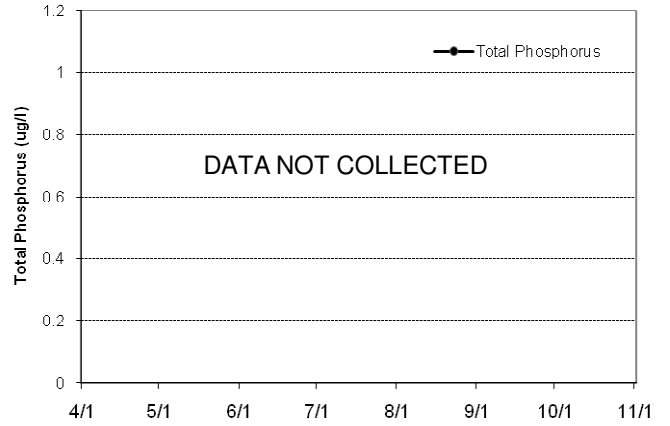
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	A	C	B		
Chlorophyll a	A	A	A	A		
Secchi Depth	A	A	A	B	A	A
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>B</b>	<b>B</b>		

Source: Metropolitan Council and STORET data



### **Turtle Lake (82-0036) Carnelian - Marine - St. Croix Watershed District**

Turtle Lake is located in May Township (Washington County). The lake has a surface area of 44 acres, and has maximum and mean depths of 2.4 m (7.9 ft) and 1.2 m (3.9 ft), respectively. The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

#### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>Secchi (m)</b>	1.2	1.1	1.4	C

The lake received a Secchi grade of C for 2009, which is consistent with the historical water quality database for the monitoring years since 1999. No lake grade was given for the lake this year because total phosphorus and chlorophyll were not monitored.

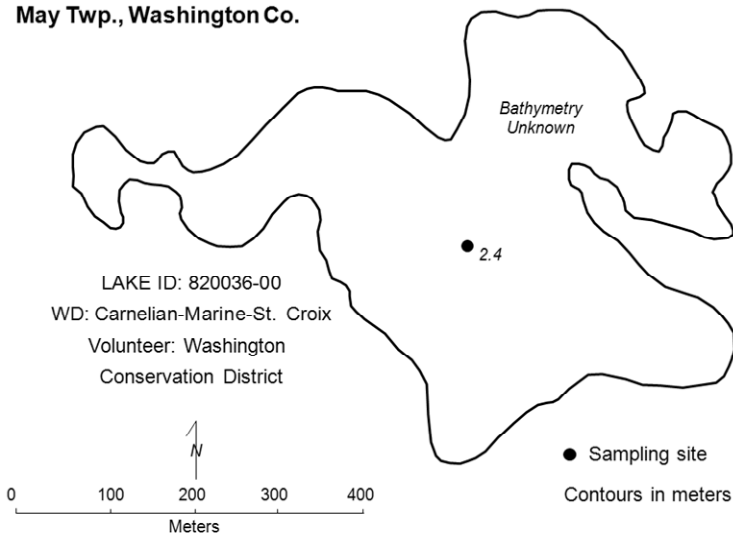
Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Turtle Lake

May Twp., Washington Co.



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/5	15.6	15.7	11.24	10.68				1.1	2	2
5/19	19.4	18.9	12.56	13.13				1.4	3	4
6/30	18.5	18.6	6.76	6.75				1.2	3	4
7/30	21.2	21.1	8.12	4.23				1.2	3	4
8/26	21.4	21.1	8.35	0.15				1.2	2	4
9/21	21.9	21.7	10.5	10.42				1.2	2	4
10/20	8.8	8.8	12.23	11.72				0.9	1	4

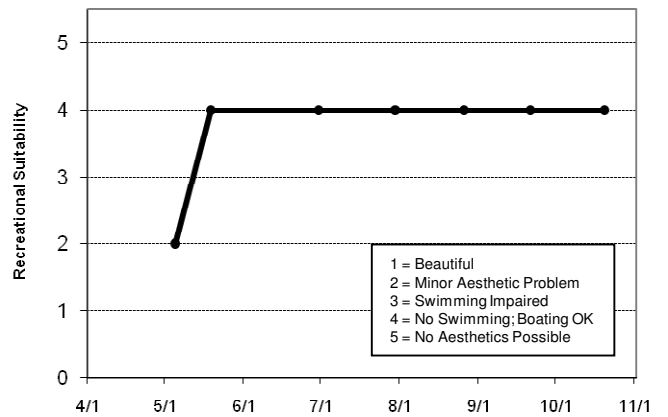
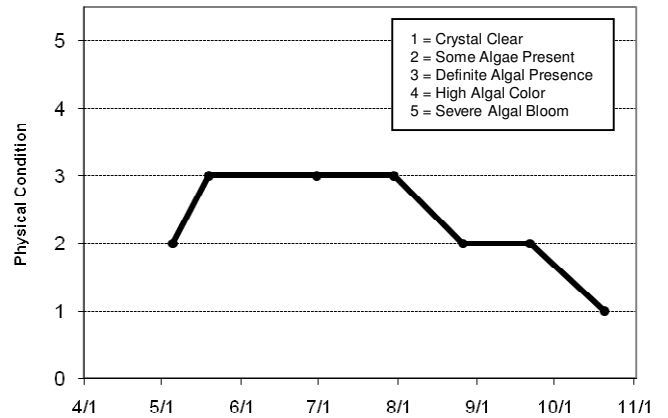
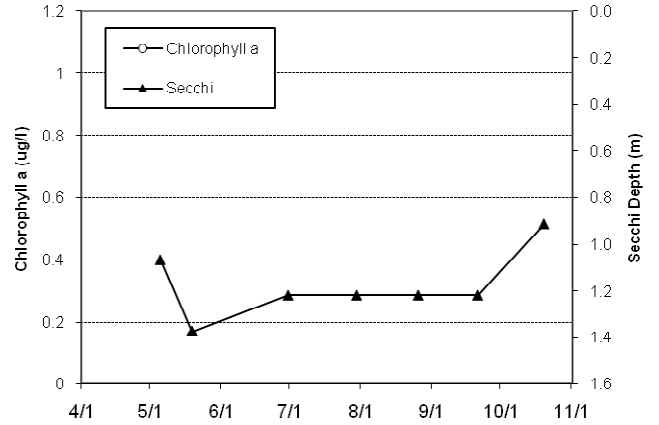
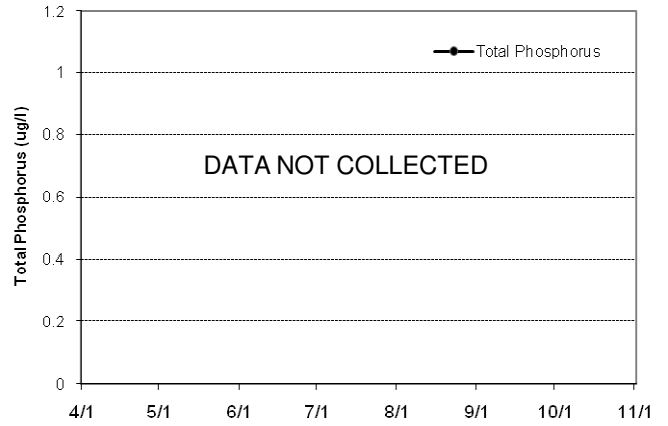
## Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1987	1988	1989	1990	1991
Total Phosphorus											F
Chlorophyll a											F
Secchi Depth											F
<b>Lake Grade</b>											<b>F</b>

Year	1992	1993	1994	1995	1996	1997	1999	2000	2001	2002	2003
Total Phosphorus	F				C	C	B	D	C		D
Chlorophyll a	F				D	D	C	B	B		B
Secchi Depth	F	D	C	D	D	D	C	C	C	C	C
<b>Lake Grade</b>	<b>F</b>				<b>D</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						
Chlorophyll a						
Secchi Depth	C	C	C	C	C	C
<b>Lake Grade</b>						

Source: Metropolitan Council and STORET data



## **Twin Lake [Burnsville] (19-0028) Black Dog Watershed Management Commission**

Twin Lake is an 11-acre lake located in the City of Burnsville (Dakota County). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has been designated by the MN DNR as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	40.0	21.0	104.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	11.0	4.2	22.0	B
<b>Secchi</b> (m)	1.9	1.2	2.5	C
<b>TKN</b> (mg/l)	0.92	0.64	1.40	
<b>Lake Grade</b>				C

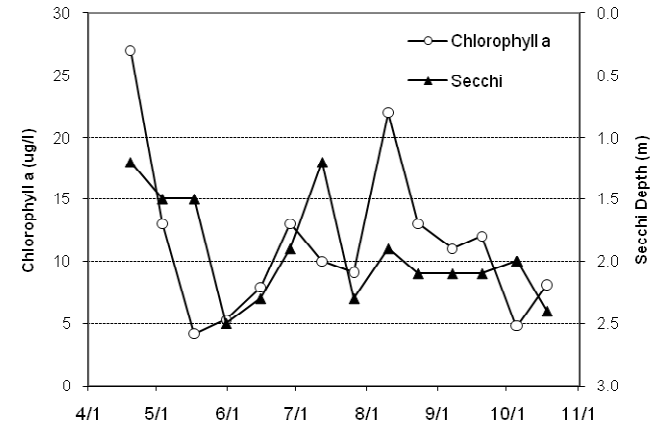
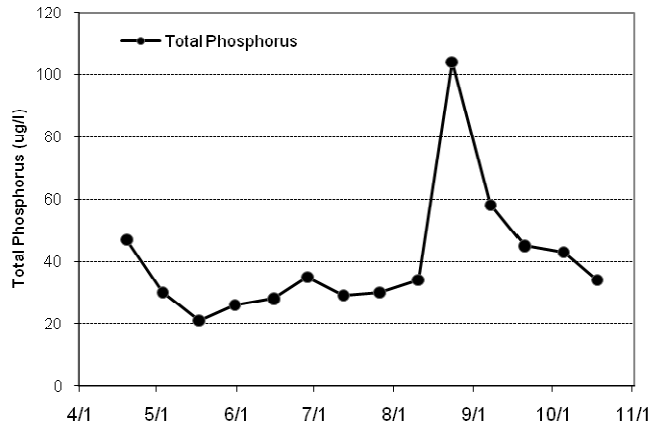
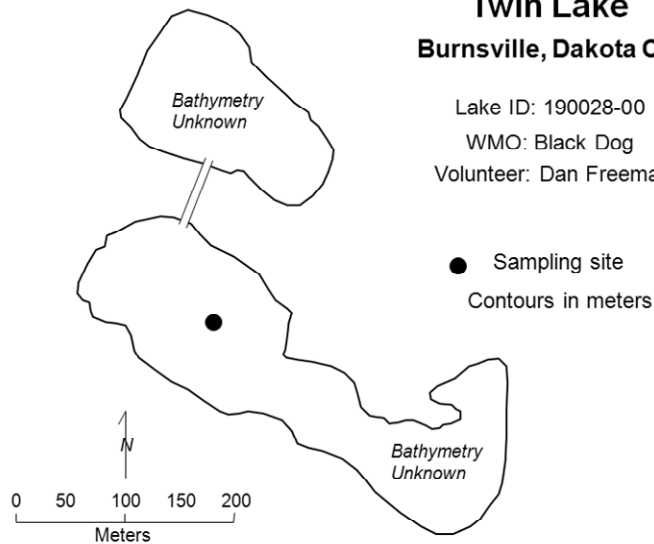
The lake received a lake grade of C for 2009. The lake grades received in the past have varied in the B and C range. Since 2005 CLA grades have varied widely from an A in 2005, to a C in 2006, back to an A in 2007, to Bs in 2008 and 2009. The water clarity grades have remained a C since 2001.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

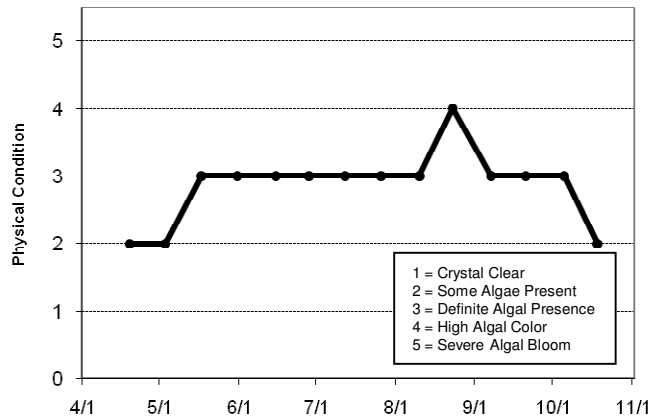
## Twin Lake Burnsville, Dakota Co.

Lake ID: 190028-00  
WMO: Black Dog  
Volunteer: Dan Freeman



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	15.3				27	47		1.2	2	4
5/3	15.4				13	30		1.5	2	4
5/17	19				4.2	21		1.5	3	4
5/31	22.7				5.3	26		2.5	3	4
6/15	22				7.9	28		2.3	3	4
6/28	25.8				13	35		1.9	3	4
7/12	26.8				10	29		1.2	3	4
7/26	26.8				9.1	30		2.3	3	4
8/10	23.6				22	34		1.9	3	4
8/23	24				13	104		2.1	4	4
9/7	24				11	58		2.1	3	
9/20	23.3				12	45		2.1	3	4
10/5	11.8				4.8	43		2.0	3	4
10/18	8.5				8.1	34		2.4	2	4

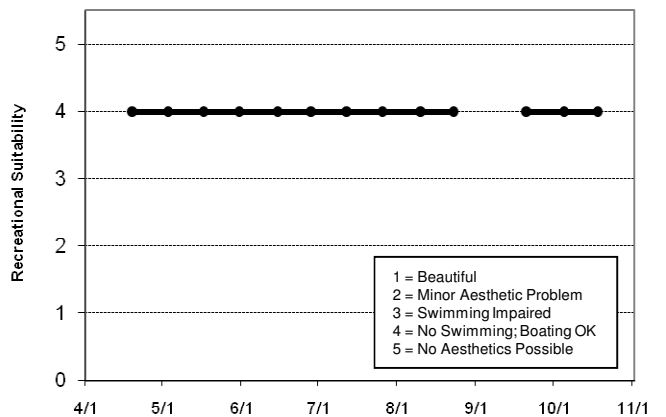


### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus									D	C	C	C
Chlorophyll a									B	A	A	A
Secchi Depth									D	C	C	C
<b>Lake Grade</b>									<b>C</b>	<b>B</b>	<b>B</b>	<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		C	D	C	C	C
Chlorophyll a		A	C	A	B	B
Secchi Depth		C	C	C	C	C
<b>Lake Grade</b>		<b>B</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>



Source: Metropolitan Council and STORET data

## **Twin Lake [St. Louis Park] (27-0656) City of St. Louis Park**

Twin Lake is a small shallow lake located within the city of St. Louis Park (Hennepin County). Bathymetric information is unknown for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	166.2	73.0	292.0	F
<b>CLA</b> ( $\mu\text{g/l}$ )	79.9	14.0	230.0	F
<b>Secchi</b> (m)	0.6	0.4	0.9	F
<b>TKN</b> (mg/l)	1.63	1.20	2.20	
<b>Lake Grade</b>				F

The lake received a lake grade of F for 2009. Water clarity (secchi) remains poor with a grade of F. The CLA grades have reduced from a B grade in 2002, to C grades in 2003, 2005, and 2006, and then to D grades in 2007 and 2008. Furthermore, water clarity grades in 2002-2004 were Ds, but since then water clarity grades degressed to Fs. These observations seem to indicate that the water quality for Twin Lake has degraded since 2002. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

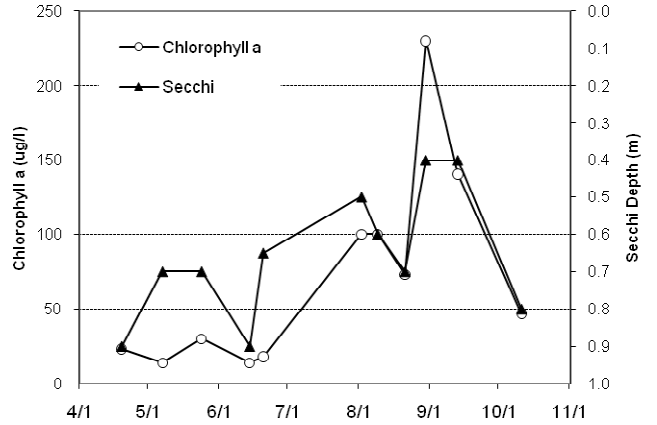
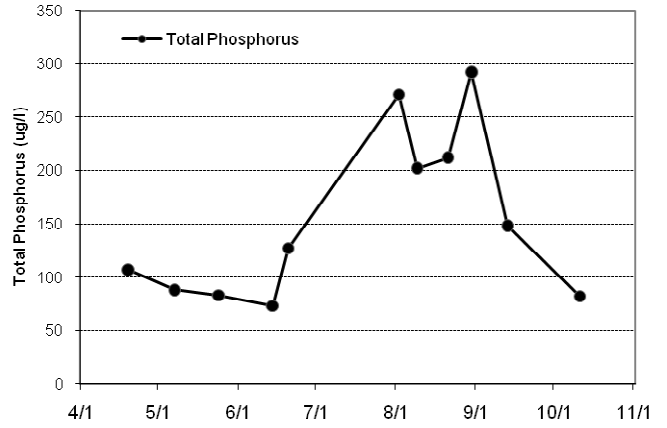
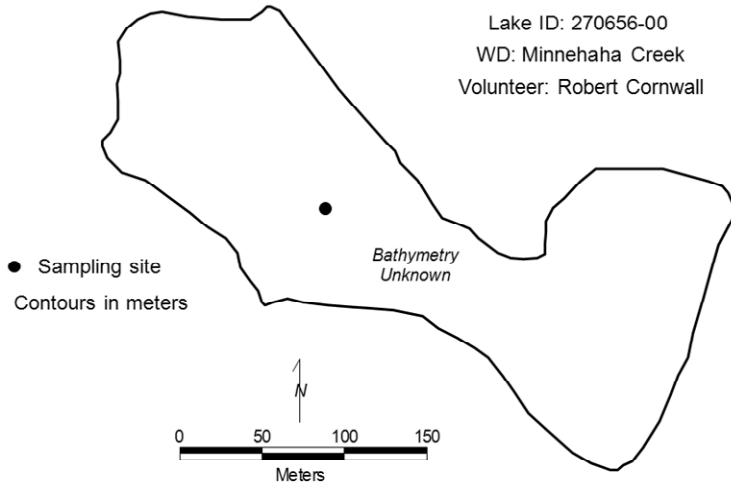
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).



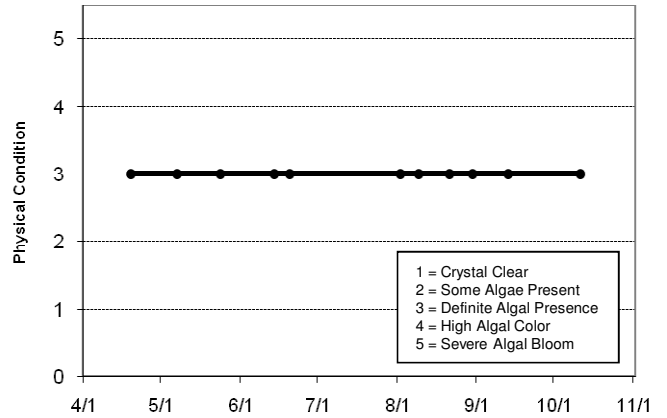
## Twin Lake St. Louis Park, Hennepin Co.

Lake ID: 270656-00  
WD: Minnehaha Creek  
Volunteer: Robert Cornwall



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	15.2				23	107		0.9	3	4
5/7	21.1				14	88		0.7	3	4
5/24	20.2				30	83		0.7	3	4
6/14	22.1				14	73		0.9	3	4
6/20	27.6				18	127		0.7	3	4
8/2	25.5				100	271		0.5	3	4
8/9	27				100	202		0.6	3	
8/21	21				73	212		0.7	3	4
8/30	20.8				230	292		0.4	3	4
9/13	28.3				140	148		0.4	3	4
10/11	8.2				47	82		0.8	3	4

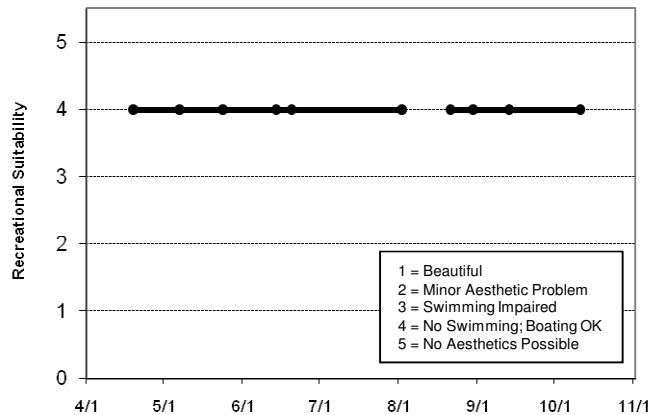


### Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus											F	F
Chlorophyll a											B	C
Secchi Depth											D	D
<b>Lake Grade</b>											<b>D</b>	<b>D</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	F	F	D	F	D	F
Chlorophyll a	D	C	C	D	D	F
Secchi Depth	D	F	F	F	F	F
<b>Lake Grade</b>	<b>D</b>	<b>D</b>	<b>D</b>	<b>F</b>	<b>D</b>	<b>F</b>



Source: Metropolitan Council and STORET data

## **Twin Lake [south basin] (82-0048) May Township**

Twin Lake is located in May Township (Washington County). The lake is considered a METC Priority Lake for its exceptional water clarity (METC 2007). The south basin has a maximum depth of 10 m (33 ft). Other bathymetric information is unknown for this lake. The lake's inflow receives water from Square Lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

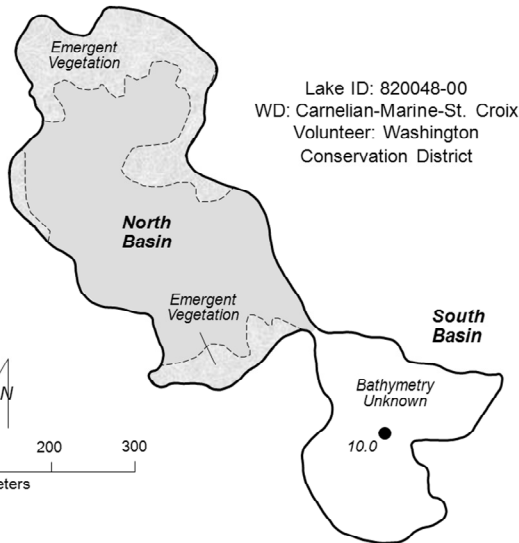
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	20.2	8.0	31.0	A
<b>CLA</b> ( $\mu\text{g/l}$ )	4.3	1.6	6.1	A
<b>Secchi</b> (m)	4.8	3.4	6.1	A
<b>TKN</b> (mg/l)	0.62	0.50	0.84	
			<b>Lake Grade</b>	A

The lake received a lake grade of A for 2009, which is consistent with its limited historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

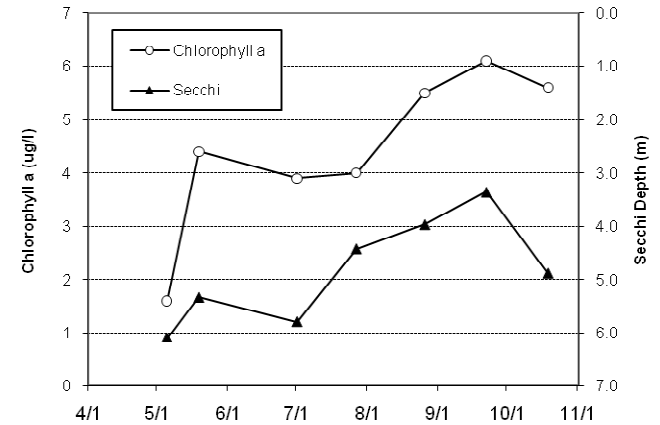
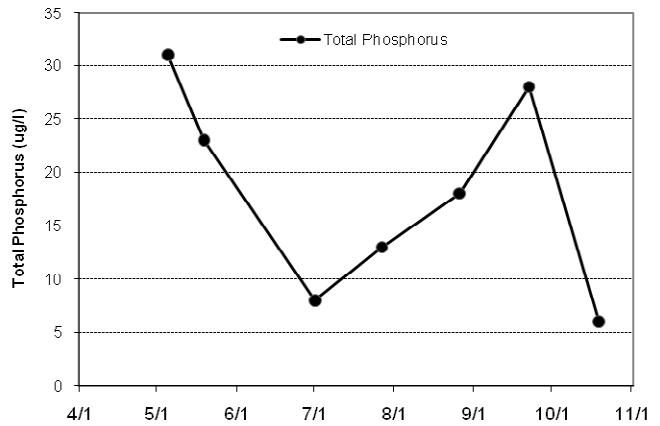
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

**Twin Lake,  
South Basin,  
May Twp,  
Washington Co.**

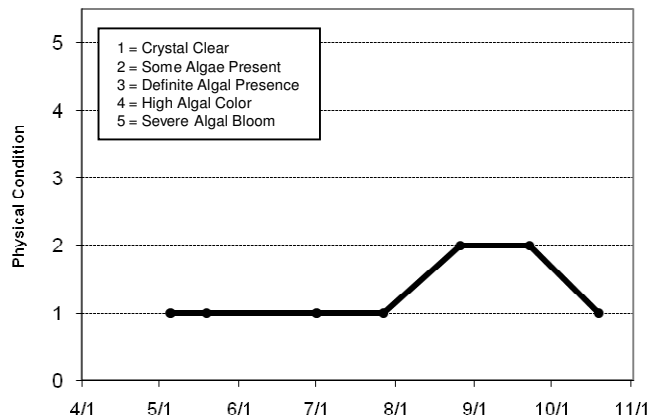


● Sampling site  
Contours in meters



**2009 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
5/5	15	6.3	10.38	0.22	1.6	31		6.1	1	1
5/19	17.1	7.4	10.59	0.11	4.4	23		5.3	1	1
7/1	22.2	9.3	8.81	0.15	3.9	8		5.8	1	1
7/27	23.8	11.1	9.24	0.18	4	13		4.4	1	1
8/26	23.7	11.6	8.9	0.07	5.5	18		4.0	2	2
9/22	22.8	12	9.15	0.05	6.1	28		3.4	2	2
10/19	10.2	10	10.14	0.11	5.6	6		4.9	1	1

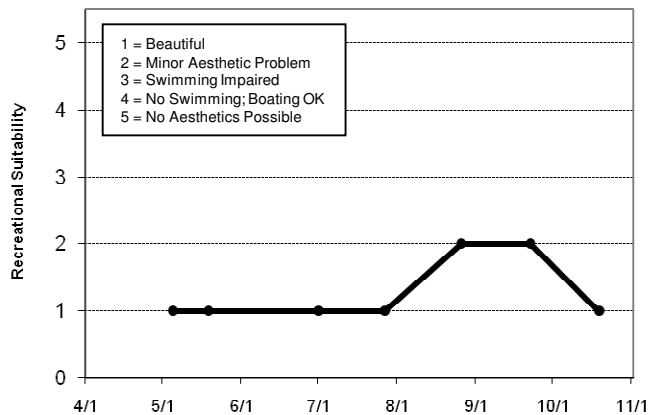


**Lake Water Quality Grades Based on Summertime Averages**

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus						A	A					
Chlorophyll a						A	A					
Secchi Depth						A	A					
<b>Lake Grade</b>						<b>A</b>	<b>A</b>					

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					A	A
Chlorophyll a					A	A
Secchi Depth					A	A
<b>Lake Grade</b>					<b>A</b>	<b>A</b>



Source: Metropolitan Council and STORET data

## Valley Lake (19-0348) City of Lakeville

Valley Lake is located in the City of Lakeville (Dakota County). The surface area of the lake is 8 acres, and it has a maximum depth of 3.2 m (10 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

The lake has been involved in a project in which barley straw or crushed corn was added to the lake in an attempt to inhibit algal populations. CAMP data were used to evaluate the effectiveness of these additions. Refer to McComas and Stuckert (2009b) for details on the project.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	57.0	32.0	88.0	C
<b>CLA</b> (µg/l)	6.5	2.0	15.0	A
<b>Secchi</b> (m)	2.3	1.7	3.3	B
<b>TKN</b> (mg/l)	0.95	0.79	1.20	
			<b>Lake Grade</b>	B

The lake received a lake grade of B for 2009, which is consistent with the lake's historical water quality database. The lake grades have varied in the range of B to D for the past 15 years.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

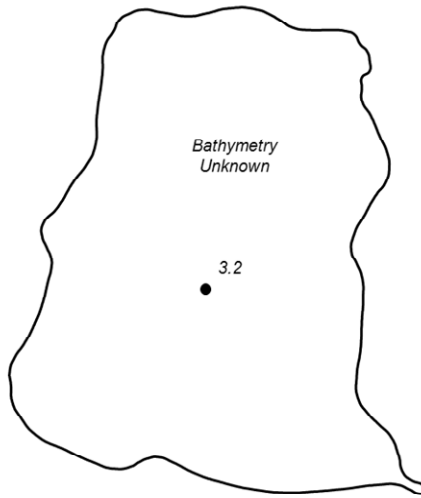
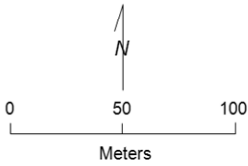
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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](mailto:brian.johnson@metc.state.mn.us).

# Valley Lake Lakeville, Dakota Co.

Lake ID: 190348-00  
WMO: Vermillion River  
Volunteers: Lakeville  
City Staff

● Sampling site  
Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	11				7.3	40		1.5	2	1
5/1	14				15	38		1.7	2	2
5/11	15				5.4	32		2.0	2	1
5/27	19.7				10	51		1.9	1	2
6/11					7.8	43		2.0	2	2
6/26	27				2	43		3.1	2	2
7/10	25				5.9	72		3.3	2	3
7/22	23				7	73		2.0	3	3
8/4	26				6.7	79		2.2	3	3
8/14	25.4				7.6	88		2.5	2	2
8/31	22.8				4.7	53		2.5	3	3
9/17	22.8				2.7	54		2.5	2	3
9/29	17.7				2.6	58		2.3	3	4
10/19	6.3				2.6	34		2.5	2	3

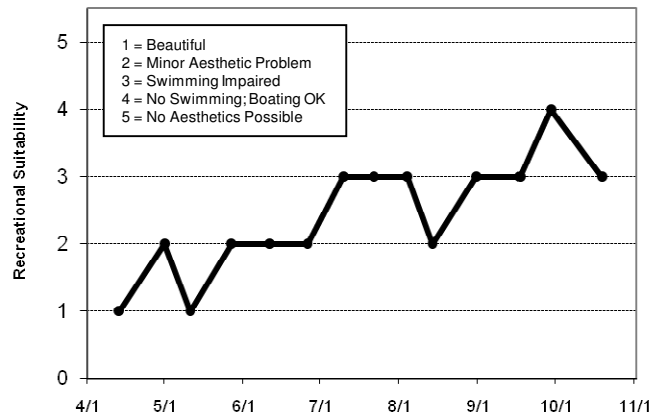
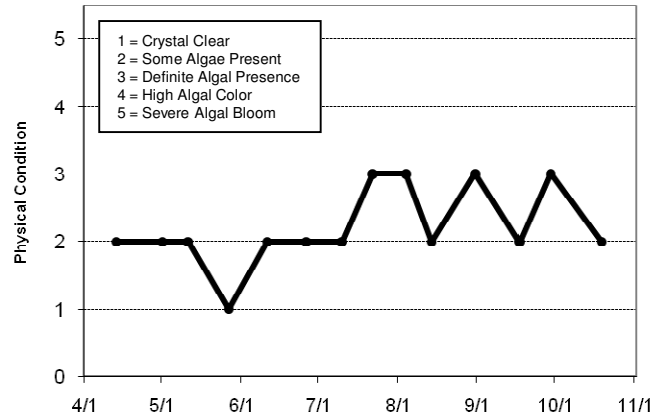
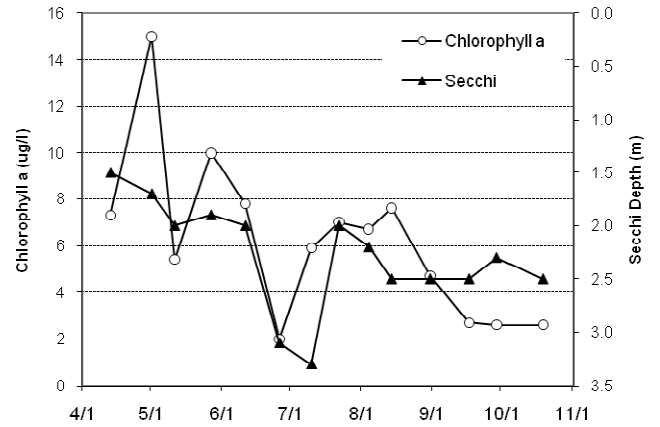
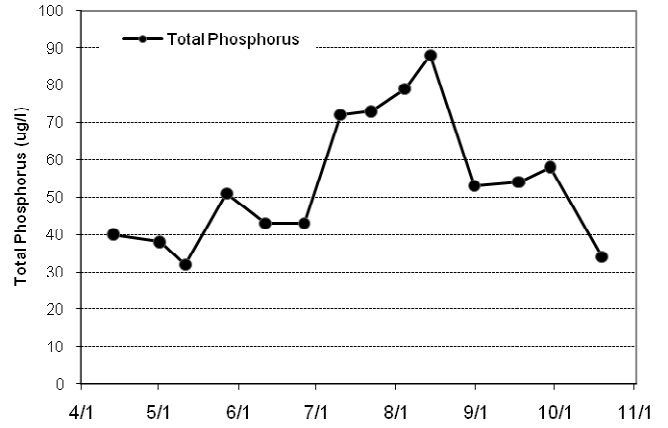
## Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus				D	D	C			C	C	C	C
Chlorophyll a				C	C	C			C	B	A	A
Secchi Depth				D	D	D			D	C	C	B
<b>Lake Grade</b>				<b>D</b>	<b>D</b>	<b>C</b>			<b>C</b>	<b>B</b>	<b>B</b>	<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	D	D	C	C
Chlorophyll a	C	C	D	C	C	A
Secchi Depth	C	C	D	C	C	B
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>B</b>

Source: Metropolitan Council and STORET data



## Waconia Lake (10-0059) Carver County Environmental Services

Lake Waconia is located near the City of Waconia (Carver County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake is one of the largest bodies of water in the region with a surface area of approximately 3,000 acres. It has mean and maximum depths of 4.0 m and 11.3 m (13 ft and 47 ft), respectively. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> (µg/l)	45.8	14.0	222.0	C
<b>CLA</b> (µg/l)	8.3	2.3	16.0	A
<b>Secchi</b> (m)	3.5	2.0	6.0	A
<b>TKN</b> (mg/l)	0.81	0.50	1.20	
<b>Lake Grade</b>				<b>B</b>

The lake received a lake grade of B for 2009, which is consistent with its historical database. The lake grades fluctuate from year to year, but generally the lake receives either a B or C lake grade. Secchi depths were measured via the MPCA's Citizen Lake Monitoring Program in the 1970s.

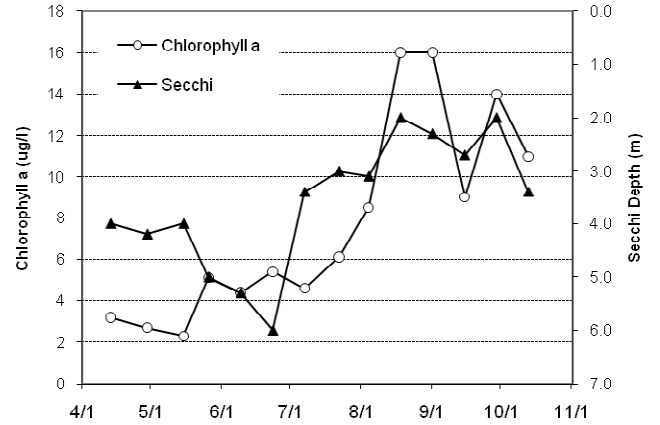
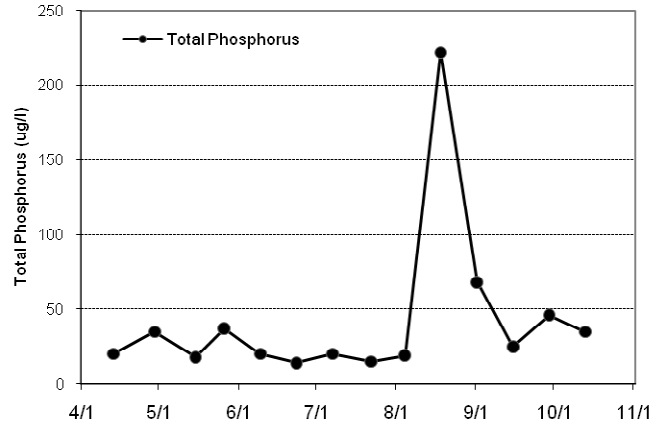
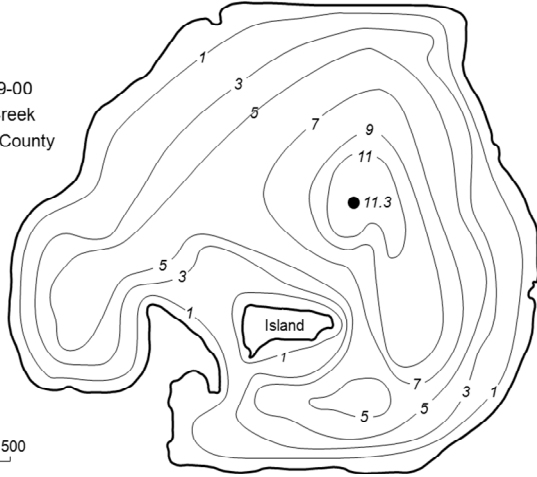
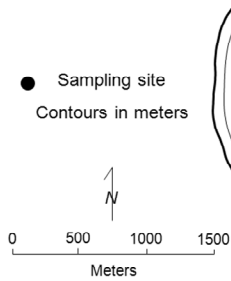
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

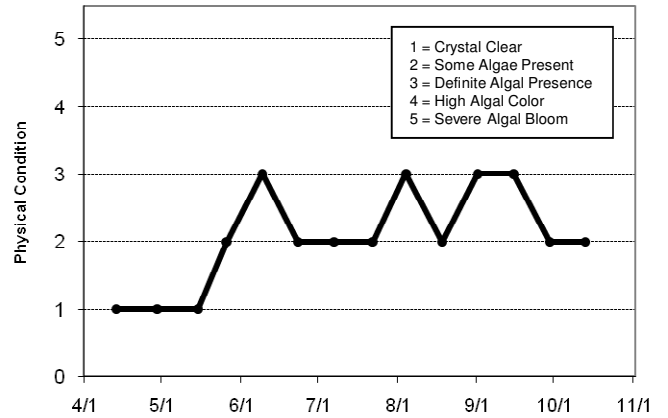
**Lake Waconia**  
Laketown Twp./Waconia Twp.,  
Carver Co.

Lake ID: 100059-00  
WMO: Carver Creek  
Volunteer: Carver County



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	6.49		8.95		3.2	20		4.0	1	1
4/29	10.9		11.16		2.7	35		4.2	1	1
5/15	14.65		9.32		2.3	18		4.0	1	1
5/26	17.55		10.24		5.1	37		5.0	2	2
6/9	17.22		8.8		4.4	20		5.3	3	3
6/23	24.9		10.15		5.4	14		6.0	2	2
7/7	24.7		14.8		4.6	20		3.4	2	2
7/22	22.66		12.51		6.1	15		3.0	2	2
8/4	22.09		8.67		8.5	19		3.1	3	3
8/18	23.71		8.72		16	222		2.0	2	2
9/1	21.41		10.33		16	68		2.3	3	3
9/15	23.12		12.72		9	25		2.7	3	2
9/29	18.16		9		14	46		2.0	2	2
10/13	9.59		12.5		11	35		3.4	2	2

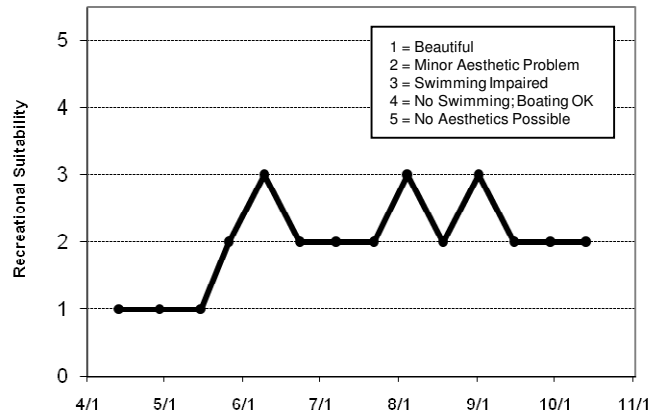


**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	B	B	C	C	C	C
Chlorophyll a	B	B	C	B	C	A
Secchi Depth	C	A	B	C	B	A
Lake Grade	B	B	C	C	C	B



Source: Metropolitan Council and STORET data

## **Weber Pond (82-0119) Valley Branch Watershed District**

Weber Pond is located in the City of Mahtomedi (Washington County). It has a surface area of 7.5 acres and a maximum depth of 2.0 m (6.5 ft). Other bathymetric information is unknown. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

### **2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	30.8	22.0	40.0	B
<b>CLA</b> ( $\mu\text{g/l}$ )	5.7	2.7	12.0	A
<b>Secchi</b> (m)	1.1	0.8	1.4	D
<b>TKN</b> (mg/l)	1.24	0.89	1.50	
<b>Lake Grade</b>				B

The lake received a lake grade of B for 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

The water clarity grade of D does not correlate well with the CLA grade of A. A possible explanation may be that the water clarity may be affected by higher levels of total suspended solids from surface runoff from storm sewers and the surrounding suburban watershed. It may be that higher loadings of suspended solids have decreased water clarity which would decrease light penetration thereby inhibiting algal growth.

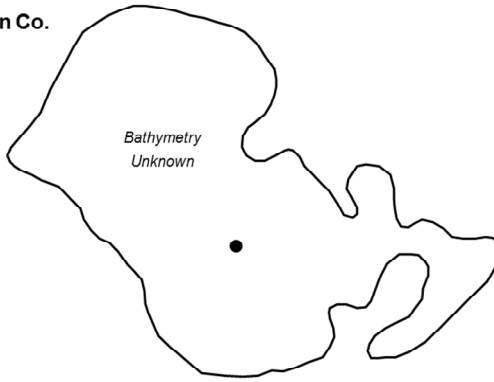
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

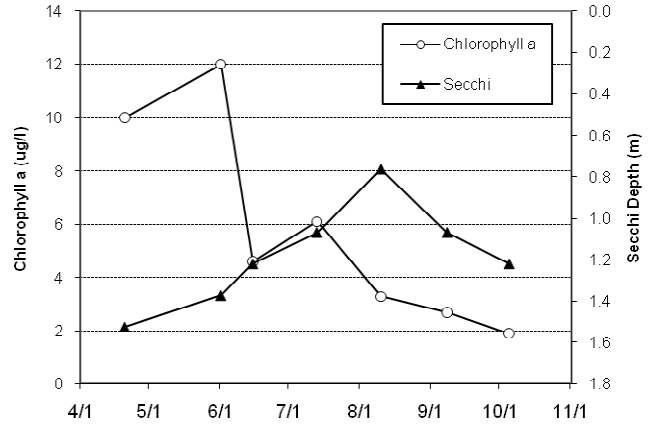
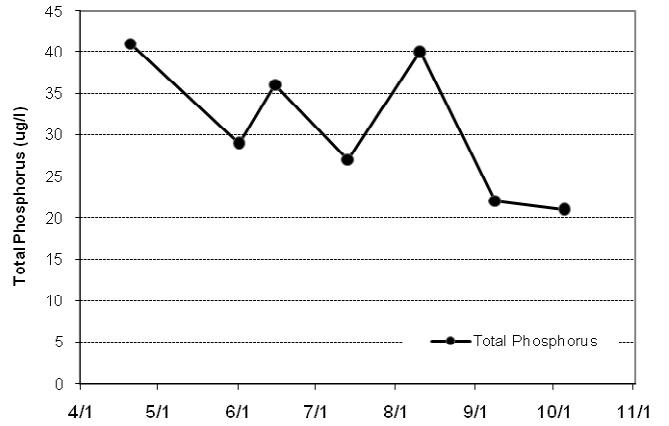


**Weber Pond**  
Mahtomedi, Washington Co.

Lake ID: 820119-00  
WD: Valley Branch  
Volunteer: Washington  
Conserv. Dist.

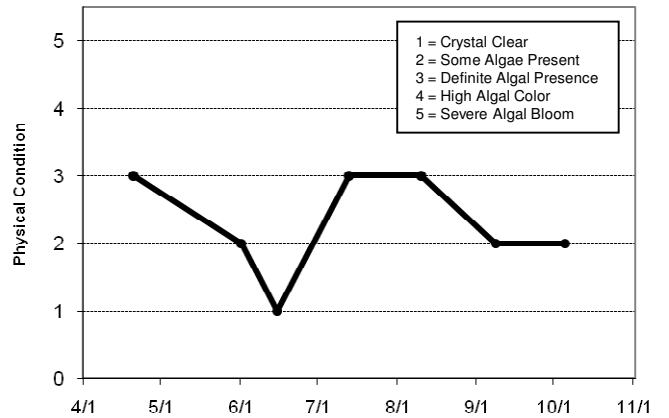


● Sampling site  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/20	12.9	13.1	6.95	1.25	10	41		1.5	3	4
6/1	19.8	18.1	9.68	0.29	12	29		1.4	2	4
6/15	24.1	17.6	11.92	0.09	4.6	36		1.2	1	2
7/13	23.3	22	8.72	0.18	6.1	27		1.1	3	4
8/10	25	19.7	9.77	0.14	3.3	40		0.8	3	4
9/8	20.5	17.8	8.24	0.08	2.7	22		1.1	2	4
10/5	10.3	10.8	9.77	0.11	1.9	21		1.2	2	4

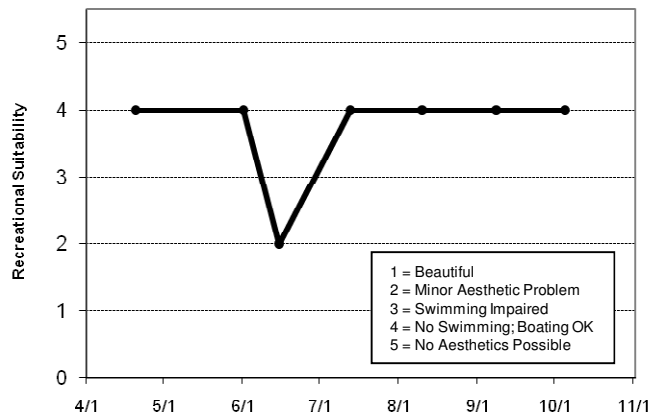


**Lake Water Quality Grades Based on Summertime Averages**

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus						
Chlorophyll a			D	A	A	B
Secchi Depth			D	D	D	D
Lake Grade			C			B



Source: Metropolitan Council and STORET data

**West Boot Lake (82-0044) Carnelian - Marine - St. Croix Watershed District**

West Boot Lake is located in May Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007). The 110-acre lake has mean and maximum depths of 5.9 m (19 ft) and 11.9 m (39 ft), respectively. The lake’s 209-acre immediate watershed translates to a relatively small 2:1 watershed-to-lake area ratio. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

**2009 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>Secchi (m)</b>	4.3	3.0	6.2	A

The Secchi depth grade of A for 2009 is consistent with the A grades received since 1999. A lake grade was not given this year because total phosphorus and CLA samples were not collected in 2009.

Throughout the monitoring period, the volunteer’s opinions of the lake’s physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

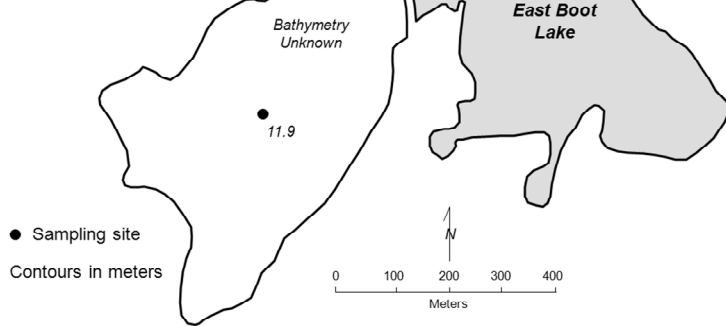
**West Boot Lake**  
May Twp., Washington Co.

LAKE ID: 820044-00

WD: Carnelian-Marine-St. Croix

Volunteer: Washington

Conservation District



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°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	15.3	4.8	10.4	0				4.3	3	2
5/19	17.9	4.8	10.56	0.08				6.2	1	1
7/1	21.2	5.1	7.02	0.07				3.8	2	1
7/29	23.3	5.5	8.23	0.07				3.0	2	1
8/25	22.1	5.5	6.14	0.05				4.4	1	1
9/21	22.1	5.5	6.06	0.06				4.0	2	2
10/20	8.8	6.4	9.58	0.06				2.4	2	2

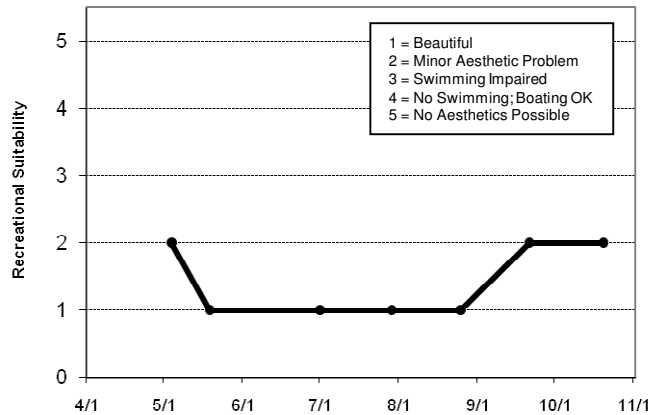
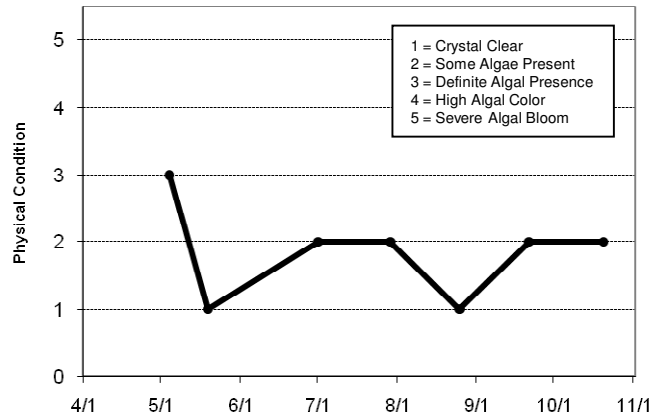
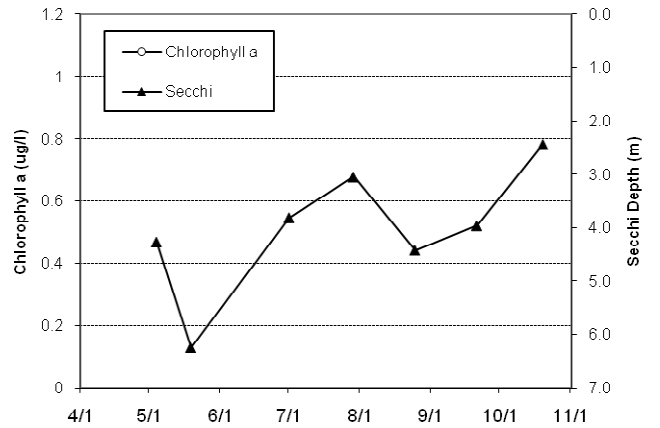
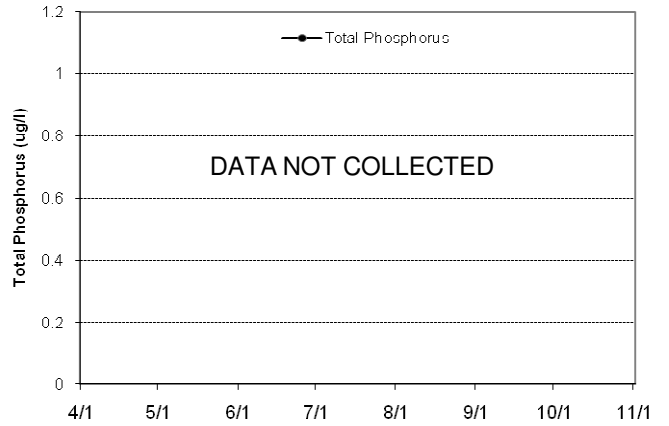
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												C
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					B	C	A	A	A	A	A	B
Chlorophyll a					A	B	C	A	A	A	A	A
Secchi Depth					B	C	B	A	A	A	A	A
<b>Lake Grade</b>					<b>B</b>	<b>C</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	A	A	A	B		
Chlorophyll a	A	A	A	A		
Secchi Depth	A	A	A	A	A	A
<b>Lake Grade</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>		

Source: Metropolitan Council and STORET data



## West Lakeland Storage Site [north basin] (82-0119) Valley Branch Watershed District

The West Lakeland Storage Site is located in West Lakeland Township (Washington County). The storage site consists of three basins: north, middle, and south. The north basin has a maximum depth of 5.8 m (19 ft). Other bathymetric information for the basin is unknown. Most of the area of the basin is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	56.2	31.0	80.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	26.1	8.0	57.0	C
<b>Secchi</b> (m)	1.6	0.3	2.7	C
<b>TKN</b> (mg/l)	1.44	1.20	1.90	
<b>Lake Grade</b>				C

The north basin received a lake grade of C for 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# West Lakeland Storage Site (North Basin)

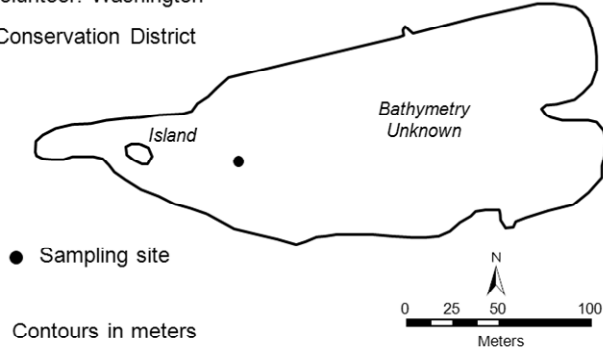
West Lakeland Twp., Washington Co.

LAKE ID: 820488-00

WD: Valley Branch

Volunteer: Washington

Conservation District



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	12.3	5.8	12.43	0.11	28	112		1.2	2	4
6/2	20.9	18.6	9.68	1.44	9.4	41		2.7	3	4
6/16	22.8	17.3	10.17	0.1	8	31		2.7	2	2
7/13	27.4	21.9	8.79	0.09	18	56		0.9	3	4
8/10	28.1	20.8	12.99	0.07	57	80		0.3	4	4
9/9	22.7	19.7	11.2	0.08	38	73		1.1	3	4
10/7	12.4	11.1	13.49	0.13	81	66		0.8	3	4

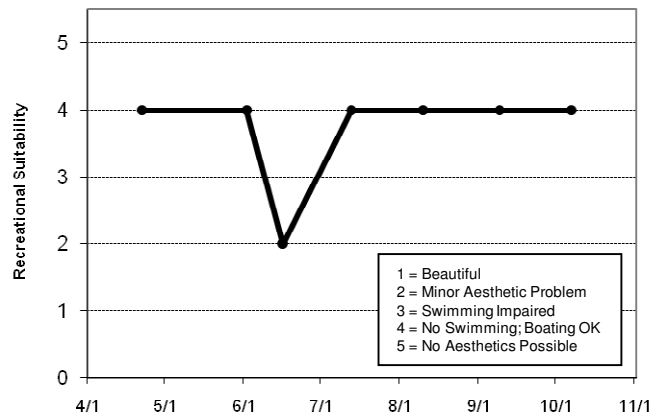
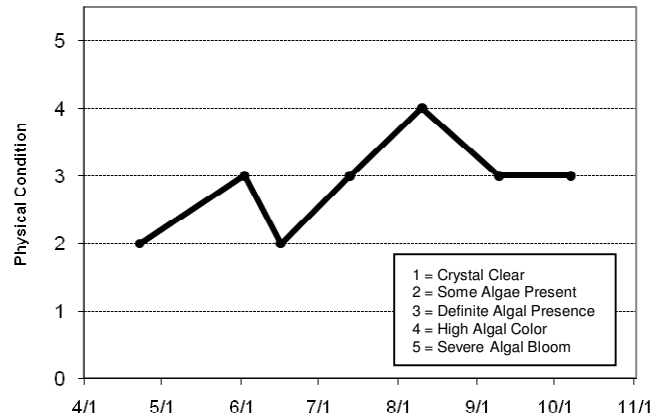
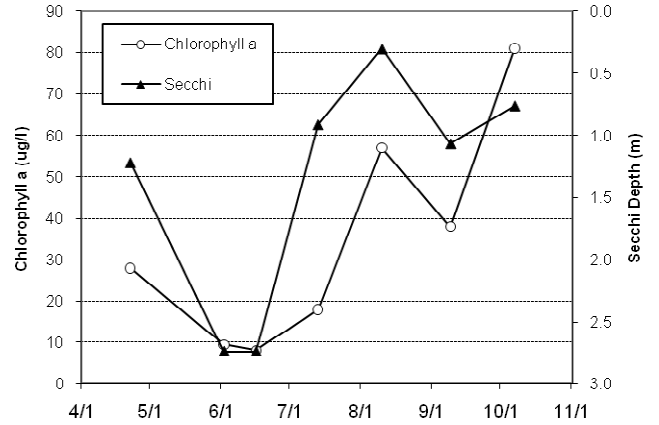
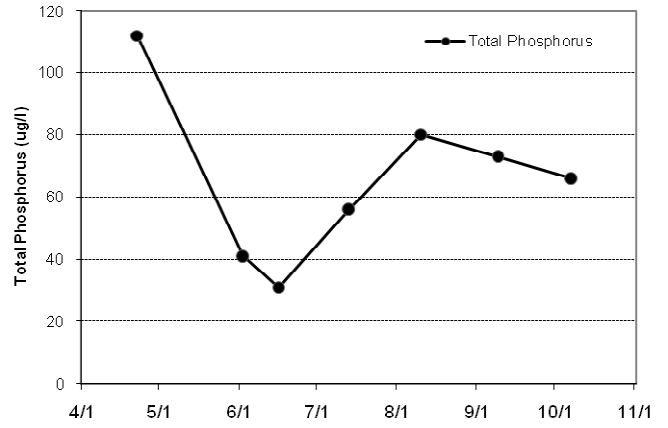
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus					C	C
Chlorophyll a					B	C
Secchi Depth					C	C
Lake Grade					C	C

Source: Metropolitan Council and STORET data



## **Westwood Lake (27-0711) Bassett Creek Watershed Management Organization**

Westwood Lake is located in the City of St. Louis Park (Hennepin County). The lake has a surface area of 41 acres and a maximum depth of 2.0 m (6.6 ft). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### **2005 summer (May-September) data summary**

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	40.5	20.0	61.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	10.4	3.3	27.0	B
<b>Secchi</b> (m)	1.0	0.7	1.3	D
<b>TKN</b> (mg/l)	1.57	1.10	2.00	
<b>Lake Grade</b>				C

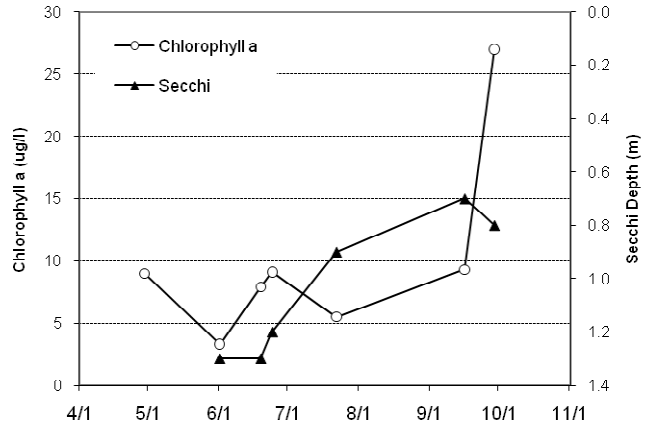
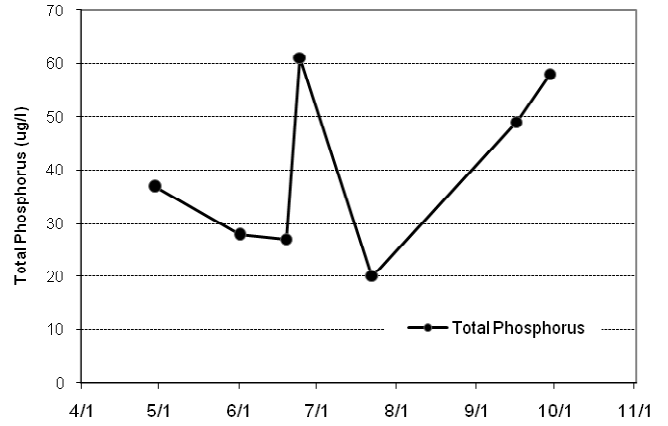
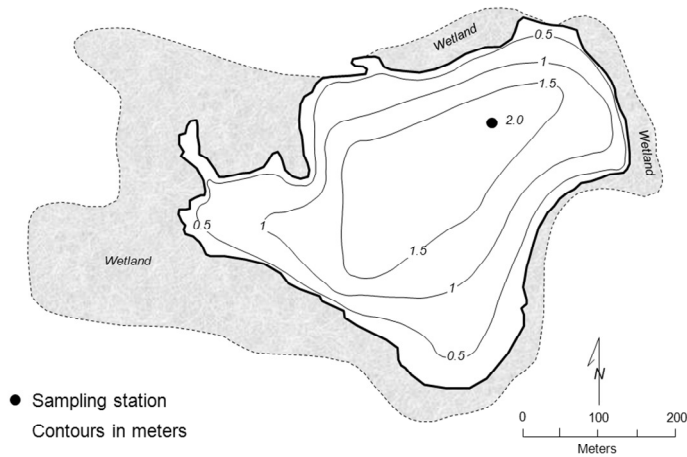
The lake received a lake grade of C in 2009, which is consistent with its historical database. The lake grades have varied mainly in the Cs and Bs. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

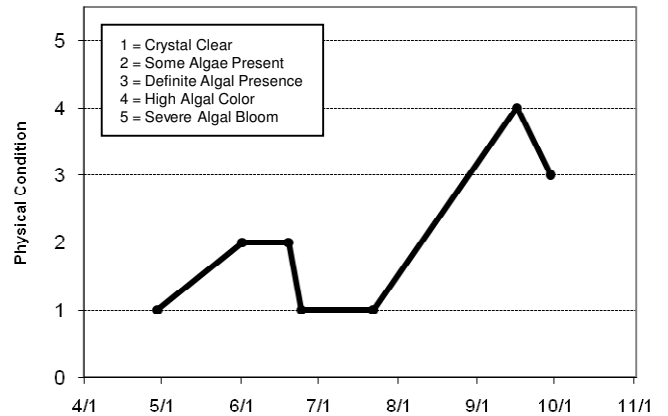
Lake ID: 270711-00  
 WMO: Bassett Creek  
 Volunteer: The Westwood Nature Center

### Westwood Lake, St. Louis Park, Hennepin Co.



#### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/29	13.2				9	37			1	1
6/1	22.5				3.3	28		1.3	2	2
6/19	26.1				7.9	27		1.3	2	4
6/24	26.8				9.1	61		1.2	1	4
7/22	24.7				5.5	20		0.9	1	4
9/16	23				9.3	49		0.7	4	3
9/29	14.2				27	58		0.8	3	4

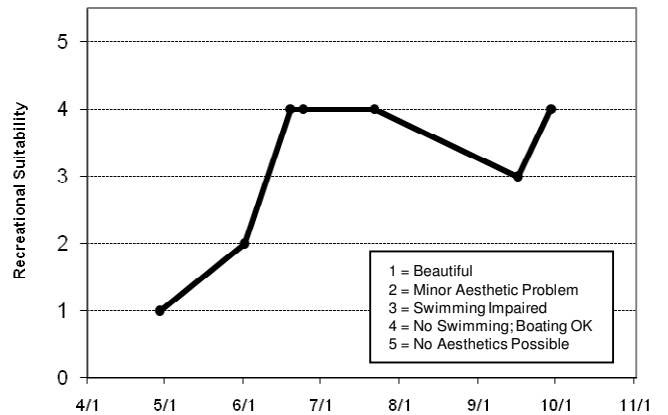


#### Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus			F									
Chlorophyll a			C									
Secchi Depth			D									
<b>Lake Grade</b>			<b>D</b>									

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus									B	B	C	C
Chlorophyll a			C						B	C	B	A
Secchi Depth			C						C	C	C	C
<b>Lake Grade</b>			<b>C</b>						<b>B</b>	<b>C</b>	<b>C</b>	<b>B</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	D	D	C	B	C
Chlorophyll a	A	C	B	B	A	B
Secchi Depth	C	C	C	C	D	D
<b>Lake Grade</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>	<b>C</b>



Source: Metropolitan Council and STORET data

## White Rock Lake (82-0072) Rice Creek Watershed District

White Rock Lake is a 65-acre lake located in Washington County. There is no other known morphological data for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	99.3	70.0	129.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	30.2	5.2	51.0	C
<b>Secchi</b> (m)	0.8	0.6	1.5	D
<b>TKN</b> (mg/l)	2.41	1.80	3.00	
<b>Lake Grade</b>				D

The lake received a lake grade of D in 2009, which is consistent with its limited historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

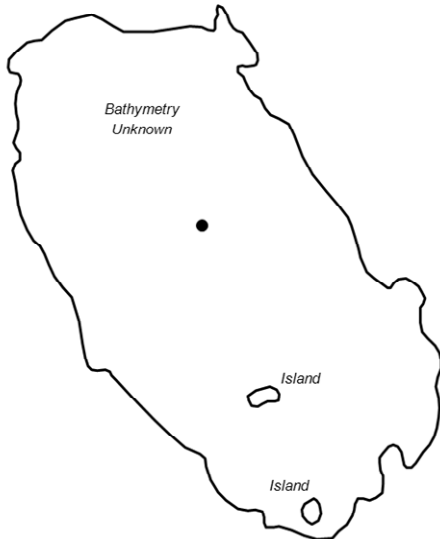
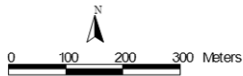
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).



**White Rock Lake,  
New Scandia Twp.,  
Washington Co.**

Lake ID: 820072-00  
WD: Rice Creek  
Volunteer: David Bluhm

● Sampling station  
Contours in meters



**2009 Data**

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	11.1				11	56		1.4	1	1
4/28	14.1				14	85		1.1	2	2
5/16	16.1				18	93		0.7	1	2
5/28	13.6				26	82		0.8	2	2
6/9	17.4				26	110		0.7	3	2
6/23	23.4				15	81		1.1	2	2
7/7	25.1				9	116		1.1	1	1
7/23	26				5.2	123		1.5	1	1
7/25	23.2				23	83		0.8	2	2
8/8	23.1				43	91		0.7	2	2
8/18	25.3				51	129		0.6	2	2
9/5	23.6				51	94		0.6	2	2
9/15	29.1				51	70		0.7	3	3
9/29	14.9				44	120		0.6	3	3
10/12	7.2				11	62		1.3	1	1

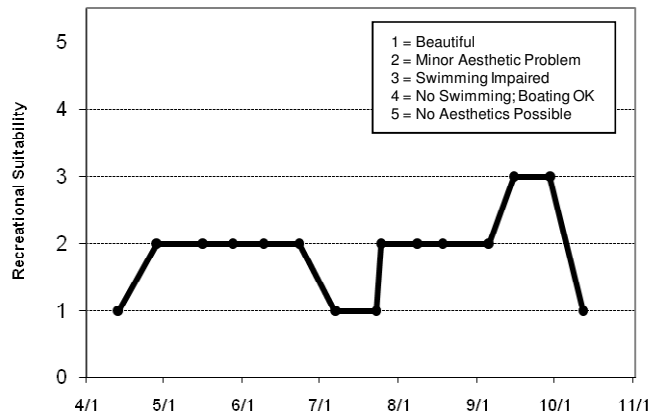
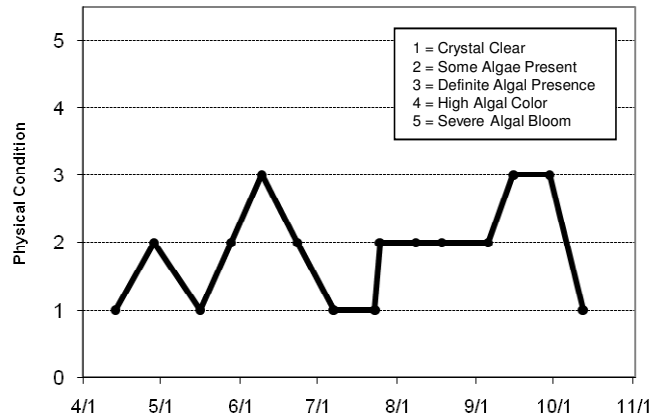
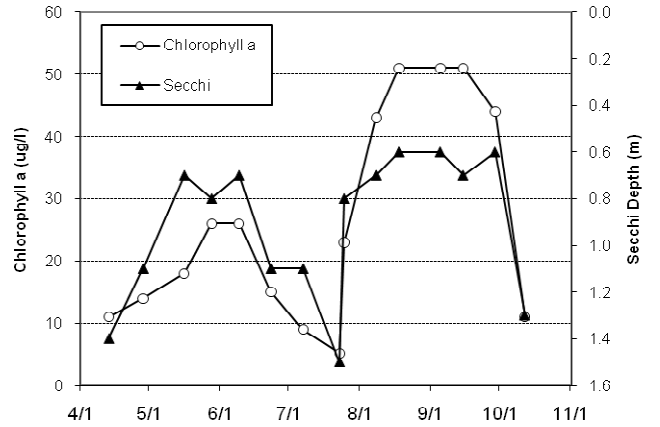
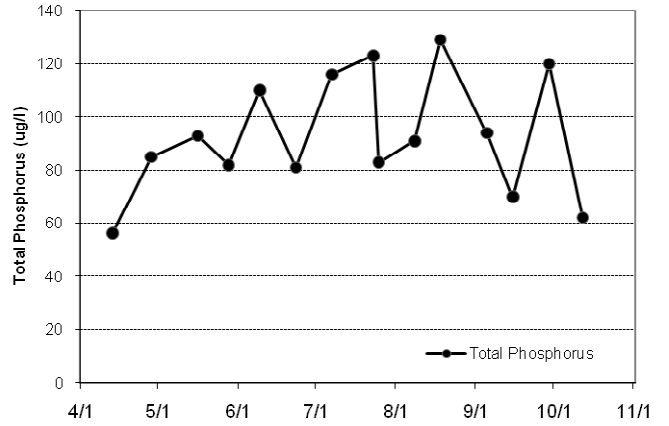
**Lake Water Quality Grades Based on Summertime Averages**

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1991
Total Phosphorus											
Chlorophyll a											
Secchi Depth											
<b>Lake Grade</b>											

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
<b>Lake Grade</b>												

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			D	D	D	D
Chlorophyll a			C	C	C	C
Secchi Depth			F	F	D	D
<b>Lake Grade</b>			<b>D</b>	<b>D</b>	<b>D</b>	<b>D</b>

Source: Metropolitan Council and STORET data



## Wilmes Lake (82-0090) City of Woodbury

Wilmes Lake is located in the City of Woodbury (Washington County). The lake has a surface area of 41 acres and a maximum depth of 5.5 m (18 feet). The lake has a watershed area of 2,247 acres which gives a large watershed-to-lake area ratio of 55:1. The larger the ratio, the greater the potential stress on the lake quality from surface runoff. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	64.8	52.0	80.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	20.6	9.4	28.0	C
<b>Secchi</b> (m)	1.5	1.1	2.6	C
<b>TKN</b> (mg/l)	1.26	1.10	1.50	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009, which is consistent with its historical water quality database. The water quality of the lake varies between a lake grade of C and D

The 1994 and 1995 CAMP monitoring was performed in the northern basin of Wilmes Lake, while the 1996-2009 monitoring was performed in the lake's south basin. Comparisons between the 1994-1995 data and the 1996-2009 data should not be made because they are from different basins.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

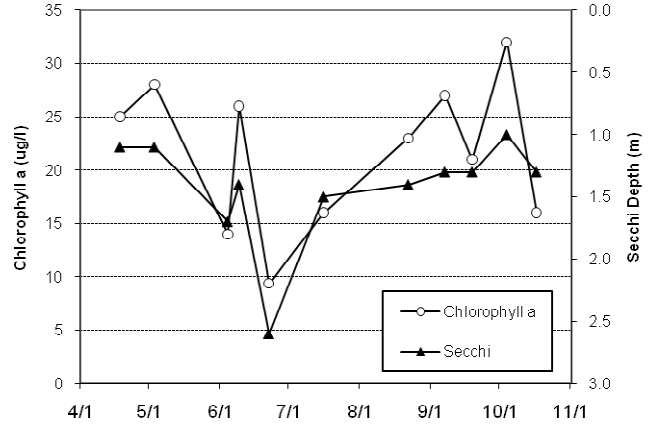
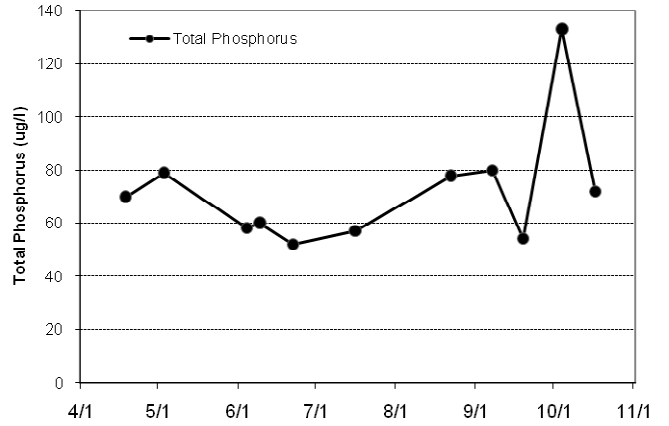
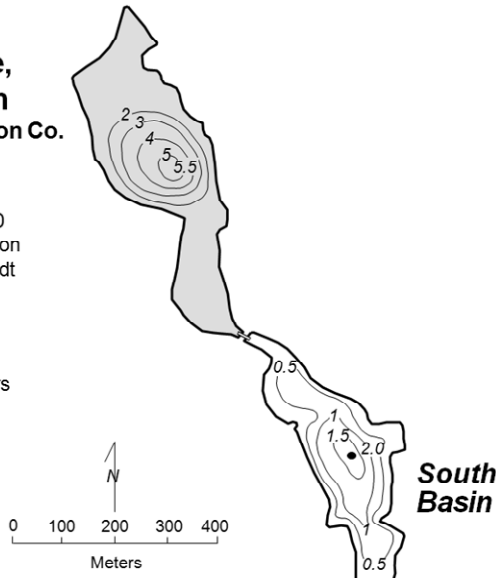
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or [brian.johnson@metc.state.mn.us](mailto:brian.johnson@metc.state.mn.us).

# Wilmes Lake, South Basin

Woodbury, Washington Co.

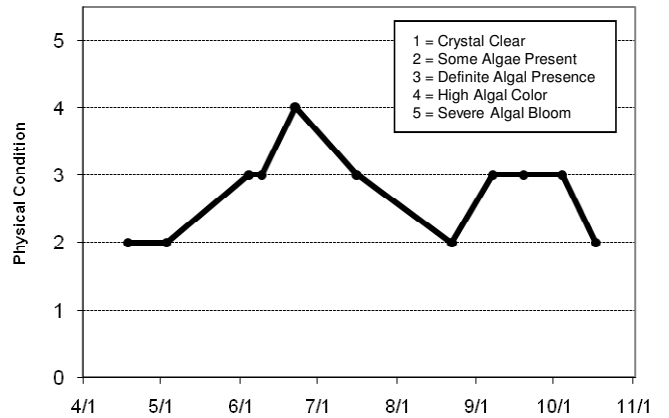
Lake ID: 820090-00  
 WD: South Washington  
 Volunteer: Bill Aamodt

● Sampling site  
 Contours in meters



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/18	16				25	70		1.1	2	2
5/3	15.9				28	79		1.1	2	2
6/4	24.2				14	58		1.7	3	2
6/9	18.4				26	60		1.4	3	2
6/22	28.1				9.4	52		2.6	4	3
7/16	23.9				16	57		1.5	3	2
8/22	23.9				23	78		1.4	2	2
9/7	23				27	80		1.3	3	3
9/19	24.5				21	54		1.3	3	3
10/4	14.6				32	133		1.0	3	3
10/17	10.1				16	72		1.3	2	2

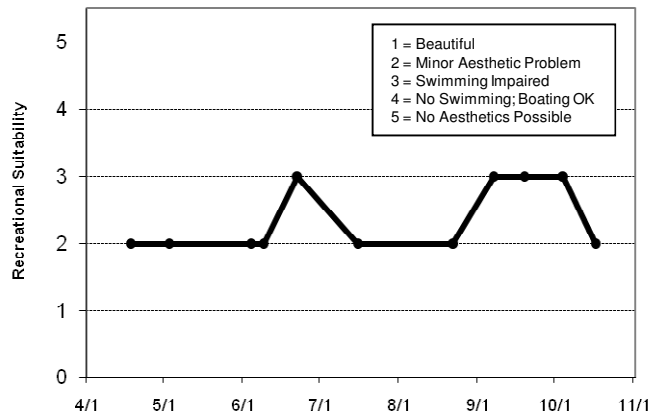


### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	D	D	D	C	C
Chlorophyll a	C	C	C	C	C	C
Secchi Depth	C	D	C	C	D	C
<b>Lake Grade</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>



Source: Metropolitan Council and STORET data

## Wing Lake (27-0091) *Nine Mile Creek Watershed District*

Wing Lake is located within the City of Minnetonka (Hennepin County). It has a surface area of 11 acres. There is little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	119.9	53.0	236.0	D
<b>CLA</b> ( $\mu\text{g/l}$ )	46.7	15.0	190.0	C
<b>Secchi</b> (m)	0.7	0.5	1.2	D
<b>TKN</b> (mg/l)	1.78	1.30	2.60	
<b>Lake Grade</b>				D

The lake received a lake grade of D for 2009, which is consistent with its limited historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

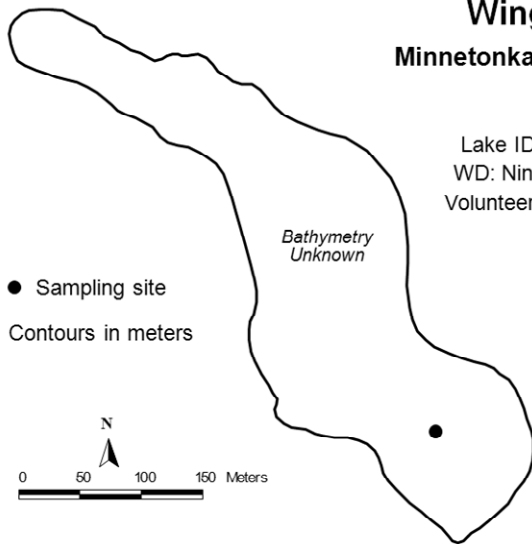
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

# Wing Lake

## Minnetonka, Hennepin Co.

Lake ID: 270091-00  
 WD: Nine Mile Creek  
 Volunteer: John Burton



### 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	17.8				15	81		0.8	2	4
5/17	18				29	130		0.6	3	4
5/28	22.8				40	109		0.5	3	4
6/13	22				17	53		1.2	3	4
6/28	24				27	80		0.9	3	5
7/13	24				21	132		0.6	4	5
8/23	23				190	236		0.6	3	5
9/6	22				53	138		0.7	3	5
9/24	22				28	120		0.7	3	5

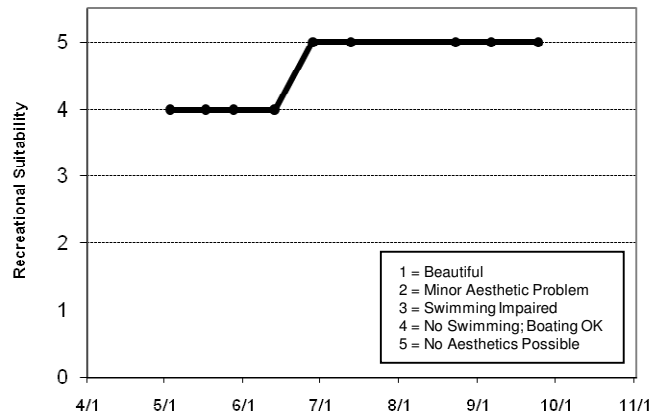
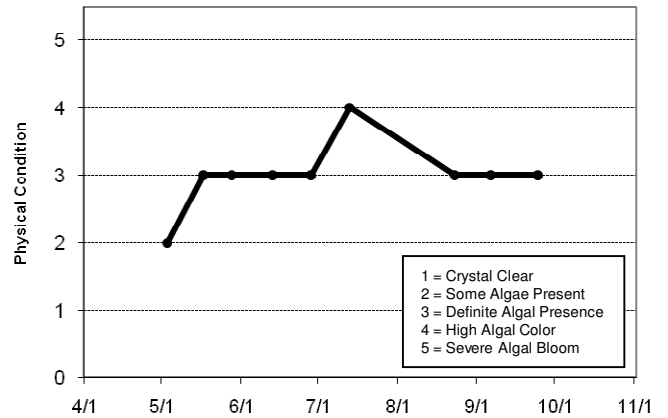
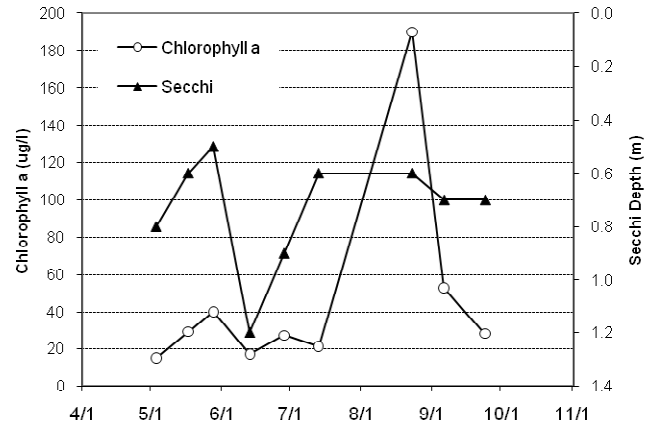
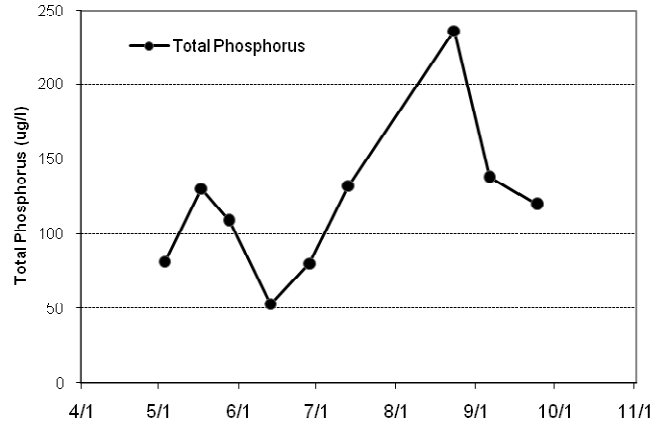
### Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			D	D	D	D
Chlorophyll a		C	C	C	C	C
Secchi Depth		D	D	D	D	D
Lake Grade		D	D	D	D	D

Source: Metropolitan Council and STORET data



## Wood Lake (19-0024) Black Dog Watershed Management Commission

Wood Lake is located in the City of Burnsville (Dakota County). The lake has a surface area of 9 acres. The maximum depth of the lake is 4.5 m (14.8 feet). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	35.3	20.0	50.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	15.2	6.0	45.0	B
<b>Secchi</b> (m)	1.9	0.8	2.8	C
<b>TKN</b> (mg/l)	1.24	0.75	1.50	
<b>Lake Grade</b>				C

The lake received a lake grade of C for 2009, which is consistent with its historical database. The lake appears to be represented by a lake grade of C.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/>.

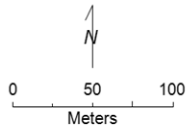
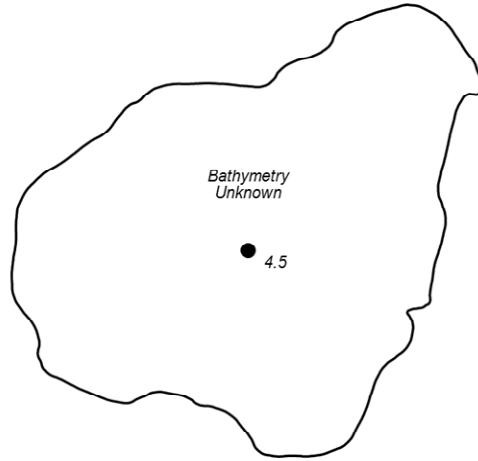
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# Wood Pond

Burnsville, Dakota Co.

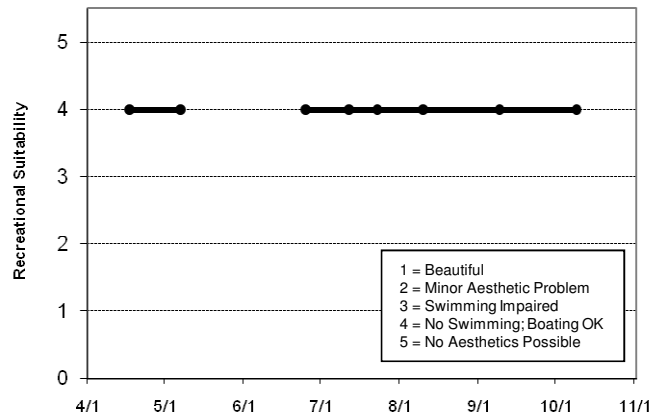
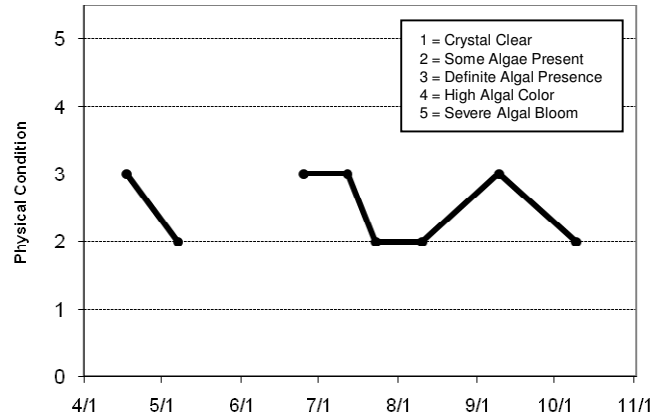
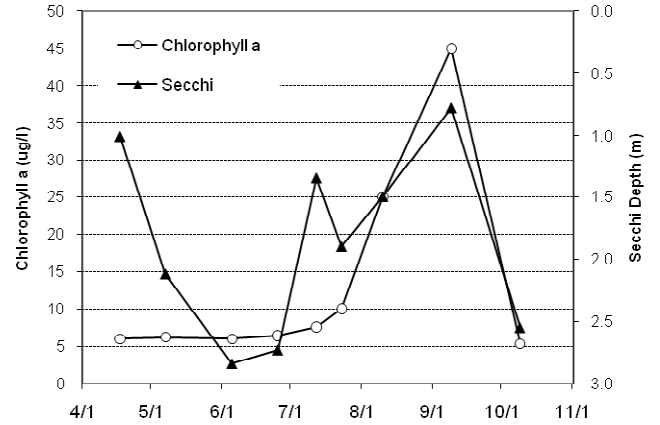
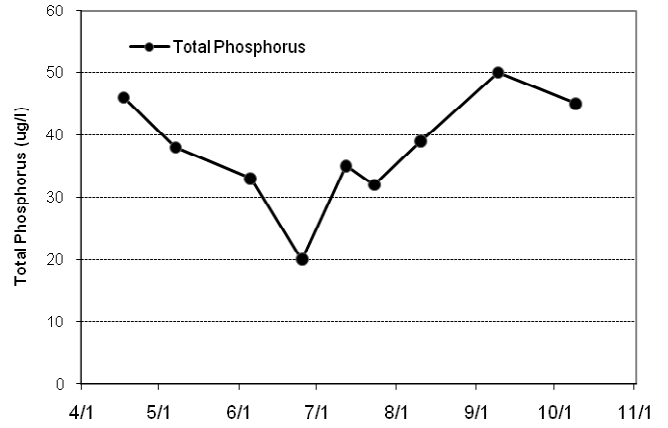
Lake ID: 190024-00  
 WMO: Black Dog  
 Volunteers: Dave Bess,  
 Betsy Oehlke &  
 Nikol Biermaier

● Sampling site  
 Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/17	14.8				6	46	1.0	3	4	
5/7	17.7				6.2	38	2.1	2	4	
6/5	21.6				6	33	2.8			
6/25	27				6.4	20	2.7	3	4	
7/12	25.1				7.6	35	1.4	3	4	
7/23	23.4				10	32	1.9	2	4	
8/10	25.6				25	39	1.5	2	4	
9/9	23.1				45	50	0.8	3	4	
10/9	12.5				5.3	45	2.6	2	4	



## 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												
<b>Lake Grade</b>												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					C	C	B	C	C	C	C	C
Chlorophyll a					B	B	B	B	B	C	C	B
Secchi Depth					C	C	C	C	C	C	C	C
<b>Lake Grade</b>					<b>C</b>	<b>C</b>	<b>B</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus	C	C	D	C	C	C
Chlorophyll a	B	C	C	B	B	B
Secchi Depth	C	C	C	C	C	C
<b>Lake Grade</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>C</b>

Source: Metropolitan Council and STORET data

## Woodpile Lake (82-0132) Browns Creek Watershed District

Woodpile Lake is located in Washington County. It has a surface area of 19 acres. The maximum depth of the lake is 8.2 m (27 ft).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

### 2009 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
<b>TP</b> ( $\mu\text{g/l}$ )	38.7	28.0	63.0	C
<b>CLA</b> ( $\mu\text{g/l}$ )	13.6	5.6	32.0	B
<b>Secchi</b> (m)	2.5	1.1	4.0	B
<b>TKN</b> (mg/l)	1.10	0.86	1.50	
<b>Lake Grade</b>				<b>B</b>

The lake received a lake grade of B for 2009, which is consistent with its limited historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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](mailto:brian.johnson@metc.state.mn.us).

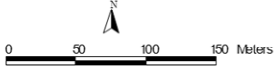
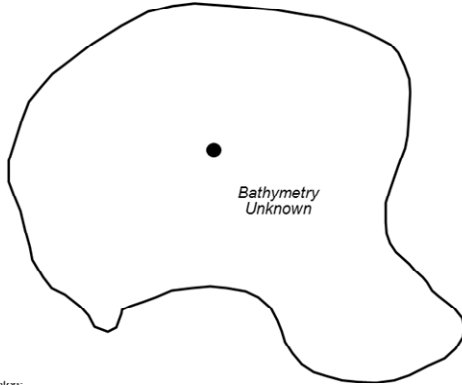


# Woodpile Lake

Grant, Washington Co.

Lake ID: 820132-00  
 WD: Browns Creek  
 Volunteer: Washington  
 Conservation District

● Sampling site  
 Contours in meters



## 2009 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	10.3	6.6			9.4	44		1.8	3	3
4/27	12.6	5.9	10.79	0.09	4.9	39		3.7	2	2
5/12	15.5	6.3	11.16	0.14	6.3	28		4.0	2	3
5/26	20	7.7	9.77	0.08	14	45		3.0	3	3
6/9	16.8	7.6	6.24	0.07	9.4	45		3.4	3	3
6/22	28.5	8.2	10.98	0.09	7.4	38		2.9	3	4
7/7	23.9	8.3	11.08	0.08	9.8	32		2.4	3	4
7/23	22.1	8.6	11.88	0.09	32	63		1.1	3	4
8/3	23.9	9	9.67	0.05	27	40		1.2	3	4
8/18	23.7	9.3	6.01	0.05	18	32		1.8	3	4
9/2	20.4	9.3	8.05	0.06	9.6	37		2.4	3	4
9/15	24.1	9.5	7.61	0.07	5.6	31		3.8	3	3
9/30	15.6	9.7	6.09	0.11	10	35		1.8	2	3
10/14	8	8	7.89	0.11	7	47		3.4	2	3

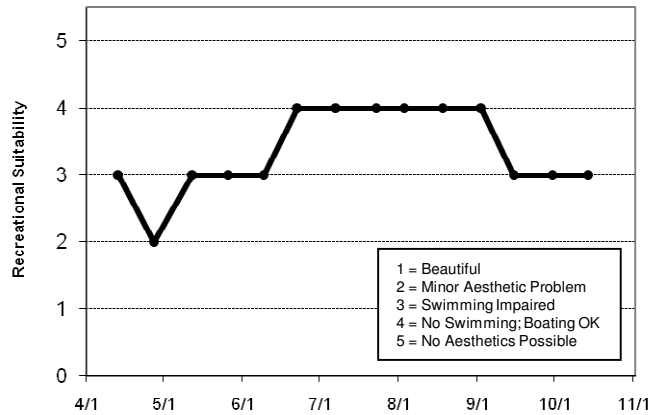
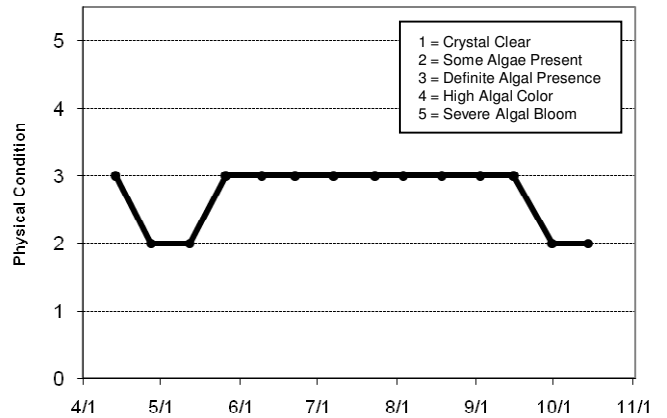
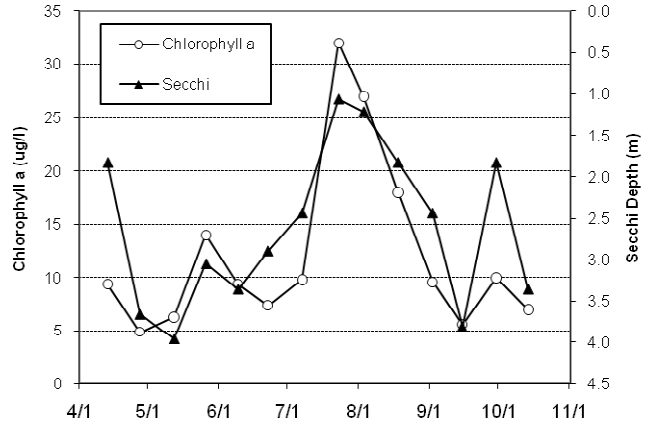
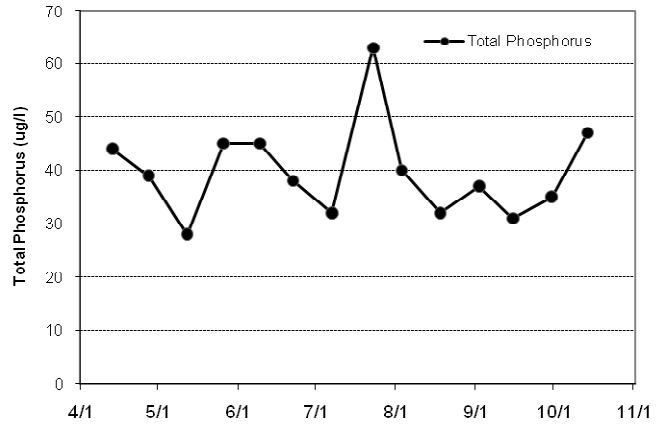
## Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
Total Phosphorus			D	C	C	C
Chlorophyll a			B	B	C	B
Secchi Depth			C	B	C	B
Lake Grade			C	B	C	B

Source: Metropolitan Council and STORET data





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**APPENDIX A**

**Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2009**

(Numbers indicate monitoring events per year. A "v" indicates monitoring performed by volunteers.)

Lake	DNR ID	Location	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09		
La Lake	82009700															v13	v11	v13	v11	v10	v10	v8	v6	v5	v6	v3	v13	v12	v14	v 11	v 12			
Lac Lavon Lake	19044600																		v11	v10	v10	v9	v2	v7	v12	v12	v12	v12	v13	v 12	v 14			
Laddie Lake	2007200		4													v13	v14	v12					v13	v13	v14	v10								
Lake Forest	82018700																													v 12	v 11			
Lake Minnetonka	27013302	lower	4	5																														
Lake Minnetonka	27013305	upper	2	5																														
Langdon Lake	27018200						5																											
Langton Lake	62004901	site 1																								v14	v7	v13	v 13	v 13				
Langton Lake	62004902	site 2																								v14	v13	v13	v 13					
Langton Lake	62020400	north basin																								v14								
Lee Lake	19002900																v14	v15	v14	v13			v12	v13	v11	v9	v15	v9	v14	v14	v 13	v 14		
Legion Pond	82046200																										v14	v10		v 7	v 2			
Lemay Lake	19008200																												v11	v 11	v 9			
Libbs Lake	27008500																									v10								
Lily Lake	82002300																v15	v14	v14	v15	v13	v14	v14	v14	v7	v7	v7	v7	v 14	v 12				
Linwood Lake	2002600		4	5		7						13				13			13											v 13				
Lippert Lake	10010400																						v1											
Little Carnelian Lake	82001400																						v14	v7	v14	v14	v14	v14	v7	v7	v 7	v 7		
Little Comfort Lake	13005400																											v14	v13	v 12	v 12			
Little Johanna Lake	62005800																						v12	v16	v15	v8	v6	v3		v 14	v 13			
Little Long Lake	27017901		4			5						13								13			13		13			v11	v2		v 13			
Lochness Lake	2058500																												v12	v 11	v 13			
Lone Lake	27009400																														v 15			
Long Lake	10001600	Carver Co.																				v2		v13		v5								
Long Lake	19002200	Apple Valley																									v11	v13	v12	v15	v14	v13	v 14	v 13
Long Lake	27016000	Orono					5																											
Long Lake	62006700	north site [New Brighton]						5																										
Long Lake	62006700	south site [New Brighton]						5																										
Long Lake	82002100	north basin [Stillwater]															v14	v7		v14	v13	v14	v14	v14	v14	v14	v14	v14	v14	v 14	v 14			
Long Lake	82002100	middle basin [Stillwater]																														v 4		
Long Lake	82002100	south basin [Stillwater]																														v 4		
Long Lake	82003000	May Township														v14	v14	v14	v13	v14		v14	v14	v14	v14	v14	v7	v7	v7	v 7	v 7			
Long Lake	82006800	Scandia																						v5	v14	v7	v7	v7	v7	v7	v 8	v 6		









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(Numbers indicate monitoring events per year. A "v" indicates monitoring performed by volunteers.)

Lake	DNR ID	Location	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09					
Staples Lake	82002800																						v14	v5	v7	v7	v7	v7	v7	v7	v7	v7					
Staring Lake	27007800		4					5										13					13		13		13		13								
Stieger Lake	10004500						12					13																									
Success Lake	27063400																		v10								v11			v11		v10					
Sucker Lake	62002800							5																													
Sullivan Lake	2008000															v14	v14	v15		v15	v14	v13	v11	v11	v12	v12											
Sunfish Lake	19005000	Sunfish Lake																										v13	v13	v13	v14						
Sunfish Lake	82010700	Lake Elmo																					v10					v13	v11		v7						
Sunnybrook Lake	82013300																						v14		v13	v10	v12	v10	v16	v14	v14	v14	v14				
Sunset Lake	82015300						5									v14	v14	v12	v13	v16	v12	v10	v13	v13	v18	v20	v15	v17	v12	v10	v9	v7					
Sunset Pond	19045100															v14	v14	v14	v12	v10			v13	v11	v10	v12	v11		v14	v14	v14	v14					
Susan Lake	10001300																											v7	v11	v12	v13						
Swan Lake	10008200																																				
Swede Lake	10009500		2																13						13	v14	v16	v13	v14	v14	v13	v14	v14				
Sweeney Lake	27003501																							v11	v9												
Sweeney Lake	27003501																							v11	v9	v14	v13	v14	v11	v10	v15	v12	v13				
Sylvan Lake	27017100	Hennepin Co.																														v10					
Sylvan Lake	82008000	Washington Co.														v7		v14		v15	v14	v14	v14	v14	v14	v14	v14	v14	v14	v14	v11	v9	v9				
Tamarack Lake	10001000																							v10	v11	v12	v11	v11	v13	v14	v11	v13					
Tanners Lake	82011500		2								20					v14	v13	v12	v14																		
Terrapin Lake	82003100																										v7	v7	v7	v7	v7	v7					
Thole Lake	70012001						5										13			13			13		13			13	v14				2				
Thomas Lake	19006700		2																																		
Tiger Lake	10010800																																				
Turtle Lake	62006100	Ramsey Co.	4	5		5																															
Turtle Lake	82003600	Washington Co.																						v5	v5	v7	v7	v7	v7	v7	v7	v7	v7	v7			
Twin Lake	19002800	Burnsville																						v6		v13	v11	v6	v2	v11	v8	v8	v14	v14			
Twin Lake	27004201	upper [Br. Center]											12		v14			11		v15		v11			v13		v14		v13			v12					
Twin Lake	27004202	middle [Crystal]						5					12					13	v11		v13	13			v13		v8					v13					
Twin Lake	27004203	lower [Robbinsdale]											12		v14			13		v5			13			v13		v8									
Twin Lake	27065600	St. Louis Park																								v12	v14	v14	v11	v14	v10	v10	v11				
Twin Lake	82004800	south [May Twnshp]																														v14	v7				
Prior Lake - Upper	70007200	Site 1	4	5		5							13											13	v15	v14	v13	v9	v14	v12	v13	v10	v9	v9	v5	v11	v14



**APPENDIX B**  
**Lake Characteristics**

Lake Name & DNR ID#	Surface Area (ac)	Watershed Area (ac)	Watershed to Surface Area Ratio	Max Depth (m)	Mean Depth (m)	Volume (ac-ft)	% Littoral	# Inlets	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
Acorn 82-102	44	296	6.7	3	0.7	101	100	0	N			
Alimagnet 19-21	109	1,094	10.0	3	1.5	545	100	12	N	C	3.2	
Ardmore 27-0153	10.1			6.1	2.4	78						
Armstrong 82-116-02	39			1.5	1	128	100		N	N		
Barker 82-76	45	823	18.3	9	4.4	648			Y	N		
Bass (Hennepin) 27-98	194	3,100	16.0	9.4	3.1	1,979	82		Y	N	2.3	
Bass (St. Louis Park) 27-15	95											
Bass (Washington) 82-35	81			4.3			100		N	N		
Bass, east (Wash) 82-123							100		N	N		
Bass, west (Wash) 82-124							100		N	N		
Bavaria 10-19	200	711	3.6	18.3	5.6	3,674	40		Y	Y		Centrarchid
Bay Pond 82-11	10.2	849	83.2	1.1								
Benton 10-69	115	322	2.8	2			100		N	N		
Benz 82-120	36						100		N	N		
Big Carnelian 82-49	455	1,900	4.2	20	9.8	14,560	28		Y	Y		
Big Comfort 13-53	219			14.3			41		Y	Y		
Big Marine 82-52	1,706	2,659	1.6	15.2	7.6	42,527	67		Y	Y		
Birch 13-42	65											
Bone 82-54	212	5,177	24.4	9.8	3.7	2,820	59	3	Y	Y		
Brickyard 10-225	17			13.1			35		Y	N		
Burandt 10-84	93			7.3			72		Y	N		



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Bush 27-47	172			8.5			64		Y	Y		
Campbell 10-127	72			2			100		N	N		
Carol 82-17	63	375	6.0	1.8	0.9	186	100		N	N		
Cates 70-18	27			4			100		N	N		
Cedar (Scott) 70-91	742	11,104	15.0	4.7	2.1	5,194	100		N	Y		
Cedar Island 27-119	80	800	10.0	2.1	1.4	368	100		N	N		
Cenaiko 2-654	29			9.1			40		Y	N	0.6	Stocked w/Trout - Fishing Pier
Clear 82-163	400			8.5	3.7	4,800	67		Y	Y	3.9	Walleye
Clear (Lk. Elmo) 82-99												
Cloverdale 82-9	45	819	18.2	8.5	3	450	86		Y	N		
Cobblecrest 27-53	10									N		
Cobblestone 19-456												
Cody 66-61	256			3.7	2.4	78						
Colby 82-94	71	8,088	113.9	3.4			100		N	N		
Cornelia 27-28										N		
Courthouse 10-5	10			17.4			30		Y	N	0.6	Stocked w/Trout
Cowley 27-169												
Crystal (Burnsville) 19-27	292	2,001	6.9	11.3	3.1	2,920	72		Y	Y		Panfish - Fishing Pier
Crystal (Robbinsdale) 27-34	76	1,272	16.7	10.4	3.7	917	68		Y	Y	1.4	Centrarchid - Fishing Pier
Dean 70-74	128						100		N	N		
DeMontreville 82-101	160	1,108	6.9	7.3	2.4	1,280	90		Y	Y		

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Downs 82-110	35	2,400	68.6	2.1	1.5	175	100		N	N		
Eagle (Carver) 10-121	233	1,050	4.5	4	1.2	920	100		N	Y		Natural Environment
Eagle (Maple Grove) 27-111	291	3,220	11.1	10.4	3.8	3,667	68		Y	Y	3.2	Centrarchid
Eagle Point 82-109	120	11,502	95.9	1.8	1	360	100		N	N		
Earley 19-33	29	1,629	56.2							N		
East 19-349	40											
East Boot 82-34	47	93	2.0	8.2	0.9	282	84		Y	Y		
Echo 82-135	41	194	4.7	1.8	0.8	107	100		N	N		
Edina 27-29				1			100		N	N		
Edith 82-4	81	1,576	19.5	13					Y			
Elmo 82-106	284	1,191	4.2	41.7			22		Y			
Farquar 19-23	63	353	5.6	3	1.4	290	100		N	N		
Fireman's 10-226	8			7			88		Y			
Fish (Grant) 82-137	21			10.4			67		Y			
Fish (Scott) 70-69	171	660	3.9	8.5	4.4	2,468	43		Y	Y		Centrarchid
Fish (Washington) 82-64	72	683	9.5	3	1.5	360	100		N	N		
Forest 82-159	2,249	4,285	1.9	11.5	3.4	24,986	68	14	Y	Y		
French 27-127	352	870	2.5	1					N	Y		
Friedrich's 82-108	14.5	360	24.8									
Gaystock 10-31	105			5			100		N	N		
George Watch 2-5	528			2	1.5	2,587	100		N	Y		



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Hydes 10-88	215	430	2.0	5.5	3	2,150	88		Y	Y		
Island 2-22	67			6.7			87		Y	N		
Jane 82-104	155	1,402	9.0	12	3.7	1,860	72		Y	Y		
Jellum's 82-5202	72	333	4.6	4.9	2.4	569	100		N	N		
Jonathon 10-217												
July 82-318												
Karth 62-0072												
Keller (Burnsville) 19-25	60			2.5	1.5	300	100		N	N		
Kingsley 19-30	44	193	4.4	4			100		N	N	1.7	
Kismet 82-333										N		
Klawitter 82-368	4.5	168	37.3				100					
La 82-97	35			3.5			100		N	N	1.3	
Lac Lavon 19-446	69	306	4.4	9.8			26		Y	N	2.3	Stocked w/Trout - Fishing Pier
Langton 62-49	30	257	8.6	1.5	1.2	120	100		N			
Lee 19-29	25	324	13.0	5.2			100		N	N	1	
Legion Pond 82-462	16	224	14.0									
LeMay 27-85	34			4	1.6	173						
Libbs 27-85	23			2.1			100		N	N		
Lily 82-23	52			17.4			73		Y	Y		Centrarchid - Fishing Pier
Little Carnelian 82-14	162	565	3.5	21.3	10.7	5,686			Y	N	1.7	
Little Comfort 13-54	36			17			44		Y	N		

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Little Johanna 62-58	35			12			67		N	N		
Little Long 27-179	108			23.2			49		Y	Y		
Lochness 2-0584	5.3			4.9								
Lone 27-94												
Long (Apple Valley) 19-22	36			3.5			100		N	N		
Long (Mahtomedi) 82-130	48			7.7			92		Y	N		
Long (May) 82-30	88			3.7			100		N	Y		
Long (Pine Springs) 82-118	62	2,060	33.2	10.4	3.6	744	55		Y	N		
Long (Stillwater) 82-21	71			6.7			96		N	N		
Long (Wash) 82-68	35	381	10.9	2.1	1.1	126	100		N	N		
Loon 82-15	64	407	6.4	4.9	2.4	206	100		N	N		
Lost 82-134	9.1			7.9			82					
Lotus 10-6	246	1,033	4.2	8.8	4.3	3,500	74		Y	Y		
Louise 82-25	48	616	12.8	3.7	1.8	283	100		N	N		
Lynch 82-42	43											
MacDonald Pond 82-62	12			2.7			100		N	N		
Magda 27-65	15											
Maple Marsh 82-38	38	148	3.9	3.4	1.7	212	100		N	N		
Maria 10-58	169			1			100		Y	N		
Marion 19-26	560			6.4			81		Y	Y		
Markgrafs 82-89	46	413	9.0	2.4			100		N	N	2.6	Rearing

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Markley 70-21	27			3.7			100		N	N		
Masterman 82-126	45											
McDonald 82-10	54	1,051	19.5	3.7	1.8	324	100		N	N		
McKnight 10-216												
McKusick 82-20	46			4.7			100		N	N	1.6	
McMahon 70-50	110			4.5			100		N	Y		
Meadow 27-57	11	121	11.0	1.2			100		N	N	0.7	
Mergen's 82-482	12	1,383	115.3	1.3			100		N	N		
Miller 10-29	145	16,701	115.2	4.3	3.1	1,479	100		N	N		
Minnetoga 27-88	14.4			8.2	3.9	183						
Mitchell 27-70	112			5.8			97		N	Y		
Moody 13-23	35			14.6			63		Y	N		
Mud 82-26-02	62	899	14.5	2.1	1.1	224	100		N	N		
Normandale 21-1045	103			3.7			100		N			
North Twin 82-18	69	187	2.7	1.8	0.9	207	100		N	N		
Northwood 27-627	15	1,341	89.4	1.5	0.8	41	100		N	N		
O'Connor 82-2	38									N		
O'Dowd 70-95	258			6.7			91		Y	Y		
Oak 10-93	339			3.4			100		N	N		
Olson 82-103	89	200	2.2	4.5	2.1	623	100		N	Y		
Oneka 82-140	381			2.1	1.2	1,524	100		N	N		Wildlife

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Orchard 19-31	250	2,012	8.0	10	3	2,500	75		Y	Y		Centrarchid
Pamela 27-675	18			1.5			100		N	N		
Parkers 27-107	97	950	9.8	11.3	3.7	1,164	70		Y	Y		
Pat 82-125	13											
Peltier 2-4	174	68,082	391.3	4.9	2.1	3,255	100		N	Y		Gamefish
Penn 27-4												
Pepin 40-28	326			3.4	1.1	1,150				Y		
Peter 27-147												
Pike (Maple Grove) 27-111	59	919	15.6	11.9	2	395	95		Y	Y	1.5	Centrarchid
Pike (Ramsey) 62-69	35			4.9	2.1	252	100		N	N		Gamefish
Pike (Scott) 70-76	57	1,991	34.9	2.7			100		N	N		
Pine Tree 82-122	174			7.9	3	1,740	91		Y	N		Centrarchid
Powers 82-92	57	1,238	21.7	12.5			57	2	Y	N	1.8	Centrarchid
Prior (Lower) 70-26	827	19,560	23.7	18.3	4.1	11,120	46	1	Y	Y		Centrarchid
Prior (Upper) 70-72	340	16,460	48.4	15.2	3.1	3,460	93	2	Y	Y		Centrarchid
Region Park 82-87	16	600	37.5	5.8			100		N	N		
Reitz 10-52	79	3,711	47.0	11	4	1,027	58		Y	Y		
Reshnanau 2-9												
Rest Area 82-0514	12.6	17,781	1411.2									
Rice 27-116	252			3.4	1.9	1,570				Y		
Riley 10-2	297	4,796	16.1	15	6.6	6,429	34		Y	Y	2.9	

**APPENDIX B  
Lake Characteristics**

Lake Name & DNR ID#	Surface Area (ac)	Watershed Area (ac)	Watershed to Surface Area Ratio	Max Depth (m)	Mean Depth (m)	Volume (ac-ft)	% Littoral	# Inlets	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
Rogers 19-80	94			2.4	1.3	393				Y		
Rose 27-92	17											
Ryan 27-58	20	5,510	275.5	10.7	64.8	312	56		Y	N	0.6	
S. School Section 82-151	125			8			41					
Sanborn 40-27				1.2	0.9					Y		
Sand 82-67	46			5.5	2.4	368	46	2		N	1.8	
Schmidt 27-102	37	190	5.1	9.1	1.5	207	92		Y	N	1.6	
School 13-57	48											
Schroeder Pond 82-301				3			100		N	N		
Schutz 10-18	105	943	9.0	15	6	2,100	27		Y	N		
Scout 19-198				2.9								
Seidl's 19-95	14	415	29.6	5			100	5	N	N		Rearing
Shady Oak 27-89												
Shaver 27-86	11									N		
Shields 82-162	27			8.2			85		Y	N	0.8	
Silver 82-16	98	455	4.6	3.4	1.7	549	100		N	N		
Silver (Ramsey) 62-1	72			5.5			99			Y		
South Oak 27-661										N		
South Rice 27-645	3.2	63	19.7	2.5	0.5	5	100		N	N		
South Twin 82-19	54	63	1.2	4	2	356	100		N	N		
Spring (Scott) 70-54	630	13,500	21.4	11.3	5.6	11,500	50	2	Y	Y	5	



**APPENDIX B**  
**Lake Characteristics**

Lake Name & DNR ID#	Surface Area (ac)	Watershed Area (ac)	Watershed to Surface Area Ratio	Max Depth (m)	Mean Depth (m)	Volume (ac-ft)	% Littoral	# Inlets	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
Square 82-46	193	782	4.1	20.7	9	5,694	65	5	Y	Y	2.2	Stocked w/Trout
St. Croix 82-1	8,600	4,918,790	572.0	23.8					Y	Y		
St. Joe 10-11	14			15.9			46		Y	Y		
Staples 82-28	24	127	5.3	4.3	2.1	165	100		N	N		
Success 27-634												
Sunfish 19-50	49											
Sunfish 82-107	50	526	10.5							N		
Sunnybrook 82-133	16	630	39.4	6.1	2	104			Y	N		
Sunset 82-153	124			5.2			100		N	N	2.3	Gamefish
Sunset Pond 19-451	60			3.7			100		N	N	1.9	
Susan 10-13	93			5.2			81			Y		
Swede 10-95	376			4			100		N	Y		
Sweeney 27-35	66	2,400	36.4	8	3.6	790	52		Y	N		Panfish
Tamarack 10-10	24			20			41		Y	N		
Terrapin 82-31	86			4.6			100		N	N		
Thole 70-120	105			3.7			100		N	Y		
Turtle 82-36	44	699	15.9	2.4	1.2	172	100		N	N		
Twin (Burnsville) 19-28	11						100					
Twin (Lower) (Rob) 27-42	46	5,322	115.7	6.7	2.3	340	83		Y	Y	1.2	Centrarchid
Twin (Middle) (Cry) 27-42	69	4,053	58.7	14	4.9	918	57		Y	Y	1.4	Centrarchid
Twin (St. Louis Pk) 27-656										N		



**APPENDIX C**  
**2009 CAMP Volunteers**

<b>Sponsor</b>	<b>LAKE</b>	<b>DNR ID</b>	<b>Volunteer(s)</b>
Anoka County Parks	Cenaiko	2065400	Melonie Shipman
Anoka County Parks	George	2009100	Andy Nelson
Anoka County Parks	Island	2002200	Andy Nelson
Apple Valley, City of	Cobblestone	19045600	Jeff Sluiter
Apple Valley, City of	Farquar	19002300	Jeff Christianson
Apple Valley, City of	Long	19002200	Christy McGlocklin, Jake McGlocklin, Al Kettelkamp
Apple Valley, City of	Scout	19019800	Dan Stanek
Basset Creek WMO	Northwood	27062700	Robert White
Basset Creek WMO	Parkers	27010700	Bob Videen
Basset Creek WMO	Sweeney	27003501	Dave Hanson
Basset Creek WMO	Westwood	27071100	Westwood Nature Center
Black Dog WMO	Crystal	19002700	Carroll Arnett, PhD
Black Dog WMO	Keller	19002500	Glenn Gramse
Black Dog WMO	Kingsley	19003000	Lakeville staff
Black Dog WMO	Lac Lavon	19044600	Wally Shaver
Black Dog WMO	Orchard	19003100	Tom Goodwin
Black Dog WMO	Sunset Pond	19045100	Dan Wallace
Burnsville, City of	Aligmagnet	19002100	John Ritter
Burnsville, City of	Earley	19003300	Jeff Thayer
Burnsville, City of	Twin Lake south	19002800	Dan Freeman
Burnsville, City of	Wood Pond	19002400	Dave Bess, Betsy Oehlke, Nikol Biermaier
Carver County	Bavaria	10001900	John Ryski
Carver County	Benton	10006900	Jacob Steinbauer, Don Smith
Carver County	Brickyard	10022500	Carver County
Carver County	Burandt	10008400	Dan Durkin
Carver County	Courthouse	10000500	Washington Conservation District
Carver County	Eagle	10012100	Carver County
Carver County	Firemans	10022600	Carver County
Carver County	Goose	10008900	Carver County
Carver County	Grace	10021800	Carver County
Carver County	Hazeltine	10001400	Washington Conservation District
Carver County	Hydes	10008800	Carver County
Carver County	Jonathan	10021700	Carver County
Carver County	McKnight	10021600	Carver County
Carver County	Miller	10002900	Carver County
Carver County	Reitz	10005200	Mark McMullen, Lynne McMullen
Carver County	Rutz	10008000	Marty Ziermann
Carver County	Swede	10009500	Wayne Hubin
Carver County	Waconia	10005900	Carver County

**APPENDIX C**  
**2009 CAMP Volunteers**

<b>Sponsor</b>	<b>LAKE</b>	<b>DNR ID</b>	<b>Volunteer(s)</b>
Chanhassen, City of	Lotus	10000600	Shelley Strohmaier
Chanhassen, City of	Lucy	10000700	Tim McCotter, Sharon McCotter
Chanhassen, City of	Riley	10000200	David Florenzano
Chanhassen, City of	St. Joe	10001100	Sue Morgan, Linda Scott
Chanhassen, City of	Susan	10001300	Robert Armstrong
Comfort Lake - Forest Lake WD	Bone	82005400	Jon Hafner, Don Jack
Comfort Lake - Forest Lake WD	Comfort	13005300	Wally Ostlie
Comfort Lake - Forest Lake WD	Forest Lake West	82015900	Steve Schmaltz, Jack Beckman, Carrie Beckman
Comfort Lake - Forest Lake WD	Little Comfort	13005400	Steve Schreiber
Comfort Lake - Forest Lake WD	School	13005700	Comfort Lake - Forest Lake Watershed District
Comfort Lake - Forest Lake WD	Sylvan	82008000	Curt Sparks
Eden Prairie, City of	Mitchell	27007000	Gordon Warner, Fran Warner
Elm Creek WMC	Cowley	27016900	Lori Ende
Elm Creek WMC	Henry	27017500	George Christ, Pam Christ
Elm Creek WMC	Rice	27011601	George Schneider
Lakeville, City of	Lee	19002900	Lakeville staff
Lakeville, City of	Marion	19002601	Wally Potter
Lakeville, City of	Valley	19034800	Lakeville staff
Mahtomedi, City of	Lost	82013400	Martha Popp
Mendota Heights, City of	Lemay	19008200	Mendota Heights staff
Mendota Heights, City of	Rogers	19008000	Doug Hennes
Minnehaha Creek WD	Tamarack	10001000	Mike Shouldice
Minnetonka, City of	Lone	27009400	Val Rukavina
Minnetonka, City of	Shady Oak	27008900	Nina Norum
Nine Mile Creek WD	Bush	27004700	Gregg Thompson
Nine Mile Creek WD	Cornelia	27002800	Jon Moon, Heidi Dorfmeister
Nine Mile Creek WD	Normandale	27104500	Lane Burton, Ralph Overholt
Nine Mile Creek WD	Penn (lower)	27000400	Dan McManmion, Tony Agnon
Nine Mile Creek WD	Wing	27009100	John Burton
Pioneer-Sarah WMC	Ardmore	27015300	Greg Durand
Pioneer-Sarah WMC	Little Long	27017901	Garrett Genereux
Pioneer-Sarah WMC	Peter (north basin)	27014702	Tim Lambrecht, Rita Lambrecht
Prior Lake - Spring Lake WD	Cates	70001800	Tom Sletta
Prior Lake - Spring Lake WD	Fish	70006900	Steve Pierson

**APPENDIX C**  
**2009 CAMP Volunteers**

<b>Sponsor</b>	<b>LAKE</b>	<b>DNR ID</b>	<b>Volunteer(s)</b>
Prior Lake - Spring Lake WD	Prior, lower	70002600	Walt Burriss
Prior Lake - Spring Lake WD	Prior, upper	70007200	Frank Fourre
Prior Lake - Spring Lake WD	Spring	70005400	Jim Weninger
Rice Cr WD	George Watch	2000500	Wargo Nature Ctr.
Rice Cr WD	Golden	2004500	David Phipps
Rice Cr WD	Karth	62007200	Gary Gerding, Shongtao Dai
Rice Cr WD	Lake Forest	62018700	Bruce Adelsman
Rice Cr WD	Langton	62004901	Tam McGehee, Dick McGehee
Rice Cr WD	Little Johanna	62005800	Fred Fox
Rice Cr WD	Lochness	2058500	Jim Hafner, Tricia Hafner
Rice Cr WD	Long	82013000	Kitty Francy-Payton
Rice Cr WD	Pine Tree	82012200	Gene Berwald
Rice Cr WD	Priebe	62003600	David Dixen, Dawn Schuette-McKinnon
Rice Cr WD	Reshanau	2000900	Lori Fredlund
Rice Cr WD	Sunset	82015300	Dianne Coderre
Rice Cr WD	White Rock	82007200	David Bluhm
Scott County	Cedar	70009100	Jerry Edberg
Scott County	McMahon	70000500	Joe Williamson, Diane Williamson
Shakopee, City of	Dean	70007400	Andy Voit, Andrew Voit, Alyssa Voit
Shakopee, City of	O'Dowd	70009500	Sandy Boyce, Mike Boyce
Shingle Creek WMC	Bass	27009800	Marvin Groth
Shingle Creek WMC	Cedar Island	27011900	Steven Lane
Shingle Creek WMC	Eagle	27011101	Larry McGough
Shingle Creek WMC	Magda	27006500	Carolyn Dindorf
Shingle Creek WMC	Pike	27011102	Kurt Paulsen
South St. Paul, City of	Seidl	19009500	Randy Bjorklund
St. Croix Basin Planning Team	St. Croix, site 1	82000100	Jim & Roberta Harper
St. Croix Basin Planning Team	St. Croix, site 2	82000100	Jim & Roberta Harper
St. Croix Basin Planning Team	St. Croix, site 3	82000100	Cecilia & Harry Martin
St. Croix Basin Planning Team	St. Croix, site 5	82000100	Richard & Sheryl Lindholm
St. Croix Basin Planning Team	St. Croix, site 6	82000100	Rick Meierotto
St. Croix Basin Planning Team	St. Croix, site 7	82000100	Carpenter Nature Center
St. Louis Park, City of	Cobblecrest	27005300	Jim Kellogg
St. Louis Park, City of	South Oak	27066100	David Boraas
St. Louis Park, City of	Twin	27065600	Robert Cornwall
Sunfish Lake, City of	Hornbeam	19004700	Dave Johnson
Sunfish Lake, City of	Horseshoe	19005100	Jim Nayas
Sunfish Lake, City of	Sunfish	82010700	Dick Bancroft

**APPENDIX C**  
**2009 CAMP Volunteers**

<u>Sponsor</u>	<u>LAKE</u>	<u>DNR ID</u>	<u>Volunteer(s)</u>
Valley Branch WD	Cloverdale	82000900	Dr. Kevin Bjork
Valley Branch WD	DeMontreville	82010100	Steve Iverson
Valley Branch WD	Downs	82011000	Wesley Sly family
Valley Branch WD	Eagle Point	82010900	Bob Schumacher
Valley Branch WD	Echo	82013500	Jim Serley
Valley Branch WD	Edith	82000400	Joe Reithmeyer
Valley Branch WD	Elmo	82010600	Scott Knudson, Terry Bouthilet
Valley Branch WD	Jane	82010400	Chuck Taylor
Valley Branch WD	Klawitter Pond	82036800	Bonnie Juran, Pat Barrett
Valley Branch WD	Long	82011800	Bill Feely
Valley Branch WD	McDonald	82001000	Randy Hunt
Valley Branch WD	Olson	82010300	Bob Meier
Valley Branch WD	Rest Area Pond	NA	MN DOT staff
Valley Branch WD	Sunnybrook	82013300	Arnie Johnson
Washington CD	Acorn	82010200	Washington Conservation District
Washington CD	Armstrong	82011600	Todd Heruth, Brandon Heruth
Washington CD	Barker	82007600	Washington Conservation District
Washington CD	Bass	82003500	Washington Conservation District
Washington CD	Bass East	82012400	Washington Conservation District
Washington CD	Bass West	82012300	Washington Conservation District
Washington CD	Bay Lake	82001100	Washington Conservation District
Washington CD	Benz	82012000	Washington Conservation District
Washington CD	Beutel Pond	82039900	Washington Conservation District
Washington CD	Big Carnelian	82004900	Washington Conservation District
Washington CD	Big Marine	82005200	Washington Conservation District
Washington CD	Brick Pond	82030800	Washington Conservation District
Washington CD	Capaul's Pond	82036500	Washington Conservation District
Washington CD	Carol	82001700	Washington Conservation District
Washington CD	Clear	82009900	Washington Conservation District
Washington CD	Clear	82004500	Warner Nature Center, Dan Carlson, Andrew Carlson
Washington CD	East Boot	82003400	Washington Conservation District
Washington CD	Edith	82000400	Washington Conservation District
Washington CD	Fahlstrom Pond	82000500	Washington Conservation District
Washington CD	Fish	82006400	Washington Conservation District
Washington CD	Friedrich's Pond	82010800	Washington Conservation District
Washington CD	German	82005600	Washington Conservation District
Washington CD	Goetschel Pond	82031300	Washington Conservation District
Washington CD	Goggins	82007700	Washington Conservation District
Washington CD	Goose	82005900	Washington Conservation District
Washington CD	Goose	82011301	Washington Conservation District
Washington CD	Hay	82006500	Washington Conservation District
Washington CD	Heims	13005600	Brad Finely, Boy Scouts
Washington CD	Horseshoe	82007400	Washington Conservation District
Washington CD	Jellum's	82005202	Washington Conservation District

**APPENDIX C**  
**2009 CAMP Volunteers**

<b>Sponsor</b>	<b>LAKE</b>	<b>DNR ID</b>	<b>Volunteer(s)</b>
Washington CD	July	82031800	Washington Conservation District
Washington CD	Kismet	82033400	Washington Conservation District
Washington CD	Kramer Pond	82011700	Washington Conservation District
Washington CD	Legion Pond	82046200	Washington Conservation District
Washington CD	Lily	82002300	Tom Koontz
Washington CD	Little Carnelian	82001400	Washington Conservation District
Washington CD	Long	82003000	Washington Conservation District
Washington CD	Long	82002100	Washington Conservation District
Washington CD	Long Lake	82006800	Washington Conservation District
Washington CD	Loon	82001502	Washington Conservation District
Washington CD	Louise	82002500	Washington Conservation District
Washington CD	Lynch	82004200	Washington Conservation District
Washington CD	Masterman	82012600	Washington Conservation District
Washington CD	Mays	82003300	Warner Nature Center, Dan Carlson, Andrew Carlson
Washington CD	McKusick	82002000	Washington Conservation District
Washington CD	Mergens Pond	82048200	Washington Conservation District
Washington CD	North Twin	82001800	Washington Conservation District
Washington CD	O'Connor	82000200	Jeff Keene
Washington CD	Pat Lake	82012500	Washington Conservation District
Washington CD	Plaisted	82014800	Washington Conservation District
Washington CD	Regional Park Lake	82008700	Washington Conservation District
Washington CD	Rose Lake	82011200	Washington Conservation District
Washington CD	Sand	82006700	Washington Conservation District
Washington CD	Sea Lake	82005300	Greg Dupre
Washington CD	Silver	82001600	Washington Conservation District
Washington CD	South School Section	82015100	Washington Conservation District
Washington CD	South Twin	82001900	Washington Conservation District
Washington CD	Square	82004600	Washington Conservation District
Washington CD	Staples	82002800	Washington Conservation District
Washington CD	Terrapin	82003100	Washington Conservation District
Washington CD	Turtle	82003600	Washington Conservation District
Washington CD	Twin	82004800	Washington Conservation District
Washington CD	Weber Pond	82011900	Washington Conservation District
Washington CD	West Boot	82004400	Washington Conservation District
Washington CD	West Lakeland Storage Site	82048800	Washington Conservation District
Washington CD	Woodpile	82013200	Washington Conservation District
Woodbury, City of	Colby	82009400	Annie Gustafson
Woodbury, City of	La	82009700	Tim Weber
Woodbury, City of	Markgrafs	82008900	Terry Riley
Woodbury, City of	Powers	82009200	Washington Conservation District
Woodbury, City of	Wilmes	82009000	Bill Aamodt

**Appendix D**  
**CAMP Quality Control Data 2009**

<b>Lake Name</b>	<b>DNR ID#</b>	<b>Date</b>	<b>TP ug/L</b>	<b>CLA ug/L</b>	<b>Secchi Depth m</b>
Bavaria Lake	10001900	9/29/2009	36	17	1.6
Cedar Lake	70009100	7/27/2009	242	87	0.8
Crystal Lake	19002700	10/19/2009	22	12	3.3
Demontreville Lake	82010100	6/24/2009	16	4.3	5.2
Eagle Lake	10012100	9/30/2009	153	96	0.4
Elmo Lake	82010600	8/5/2009	24	2.6	3.8
Goose Lake	10008900	9/30/2009	127	150	0.35
Hydes Lake	10008800	9/30/2009	239	17	2.7
Marion Lake	19002601	9/17/2009	44	27	1.7
McMahon Lake	70005000	10/19/2009	51	27	1.3
O'dowd Lake	70009500	7/27/2009	46	34	0.9
Olson Lake	82010300	6/24/2009	19	5.9	4.0
Orchard Lake	19003100	9/17/2009	22	5.9	3.1
Lower Prior Lake	70002600	7/27/2009	29	4.8	3.3
Upper Prior Lake	70007200	7/27/2009	42	16	1.5
Riley Lake	10000200	10/13/2009	118	14	1.7
Susan Lake	10001300	9/29/2009	140	67	0.6
Waconia Lake	10005900	9/30/2009	36	14	2.5