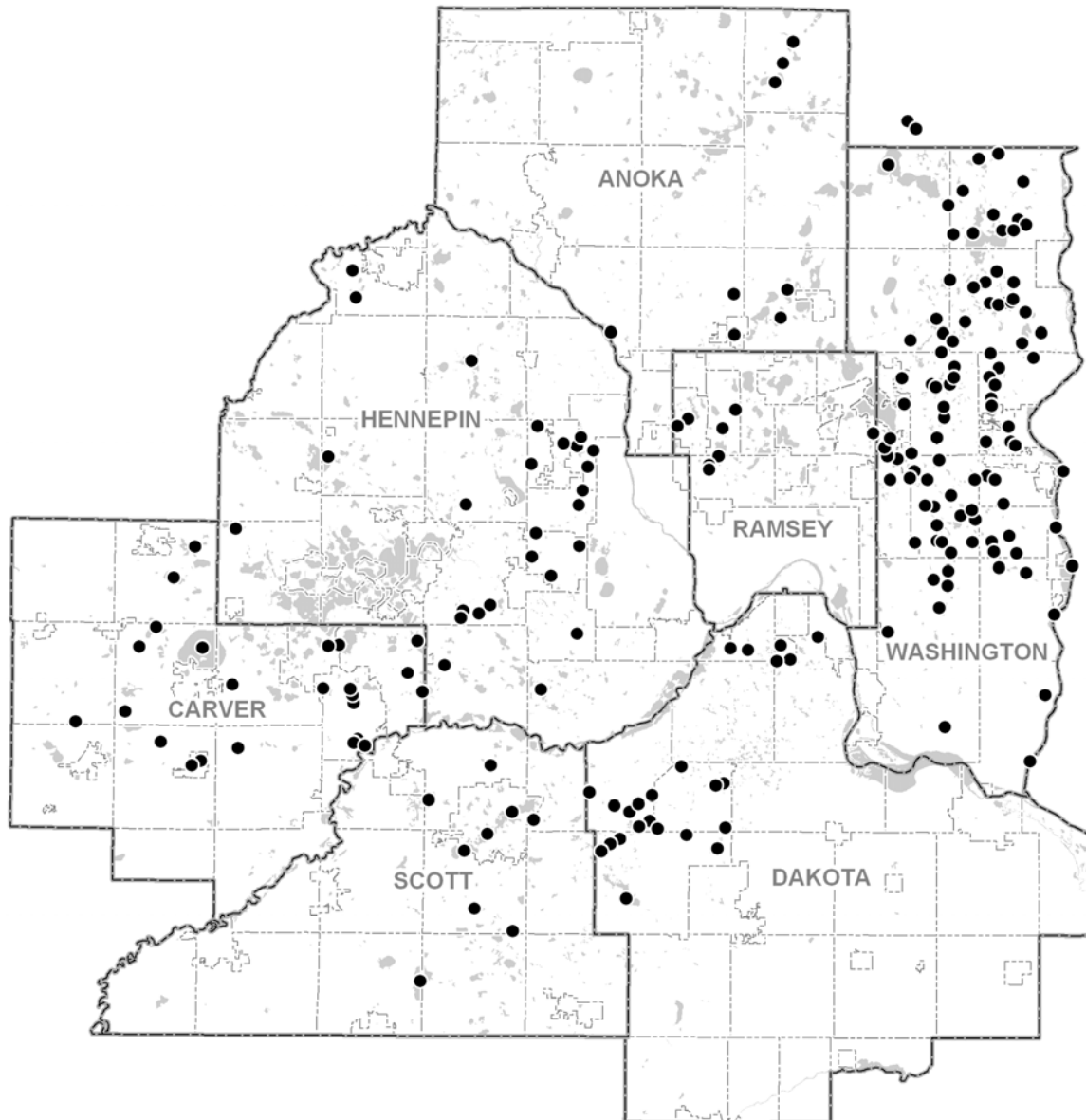


2008 Study of the Water Quality Of 192 Metropolitan Area Lakes



**By
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October 2009**

EXECUTIVE SUMMARY

This 2008 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 202 lake sites on 192 lakes monitored in 2008. This year's monitoring program included 16 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 impairments due to water quality, 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.

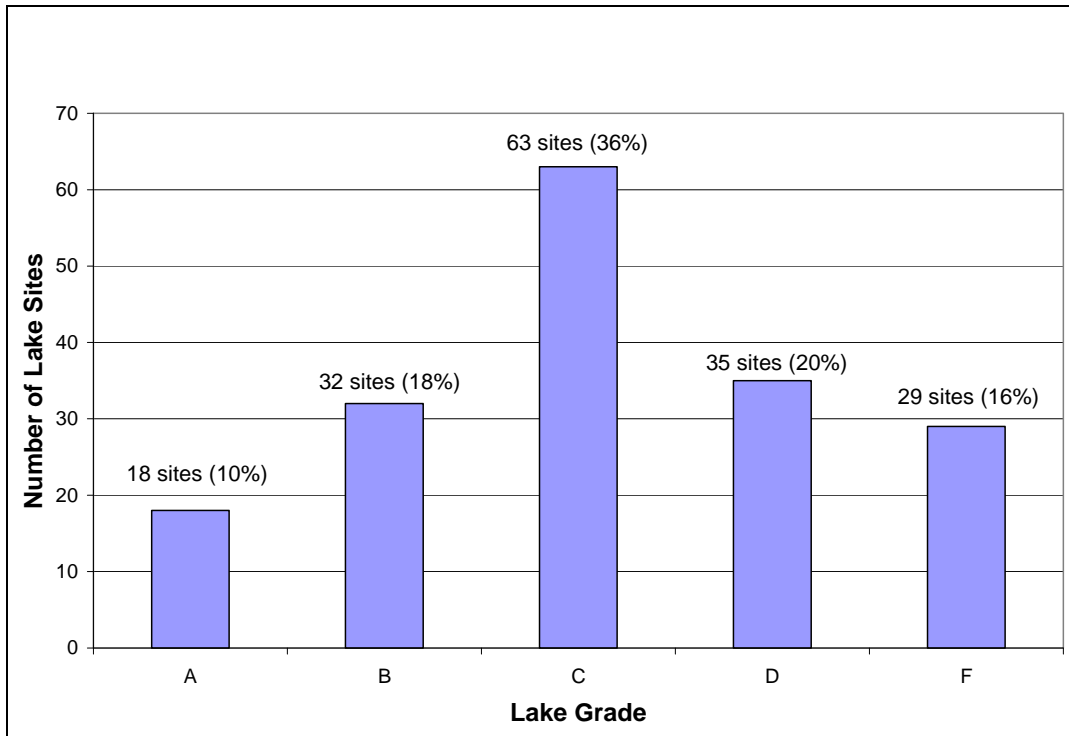
The year 2008 marked the sixteenth year that the Citizen-Assisted Monitoring Program (CAMP) was used to increase our knowledge of the water quality of area lakes. CAMP volunteers visited their assigned lake on a biweekly basis from mid April to mid October. The volunteers measured surface water temperature 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 2008, there were 35 sponsors who consisted of a mix of municipalities, watershed management organizations, watershed management districts, 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 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 2008 is shown in the following figure.

The greatest percentage of the lake sites received a lake grade of C. The water quality of these lakes is considered average as compared to other lakes in the TCMA. When comparing the percentage of above-average lakes, those receiving grades of A or B (28%), to below-average lakes, those receiving D or F (36%), more lakes were below average.

The 18 lake sites that received "A" lake grades include: Brickyard, Bush, Clear (May Township), Courthouse, DeMontreville, Elmo, Fireman's, Jane, Kingsley, Long (Mahtomedi), Mays, Olson, Orchard, St. Joe's, Sunnybrook, Sunset, Sylvan (Washington County), and Twin Lake south (Washington County).

The 29 lake sites receiving the lowest water quality grade "F" include: Ardmore, Bay Pond, Benton, Cobblecrest, Colby, Eagle (Carver County), Goose (Waconia), Goose [sites 1 & 2 (Washington County)], Hyde, Jonathan, Kramer, Long (Apple Valley), Lake Forest, Loon, Lynch, Meadow, Mergen's, Meuwissen, McKnight, Priebe, Rest Area Pond, Rose [sites 1 & 2 (Lake Elmo)], Rutz, South Oak, Swede, Twin [upper (Brooklyn Park)], and Winkler.



Lake Grades for the 2008 Monitoring Season

Since 1980, 349 TCMA lakes have been monitored through the METC's lake monitoring program. Since some of these lakes have multiple monitoring sites, a total of 379 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.

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:

16 years of service

Diane and Bob Coderre – Sunset Lake

15 years of service

Washington CD – multiple lakes

14 years of service

Bill Aamodt – Wilmes Lake

Carver Co. Env. Services – multiple lakes

13 years of service

City of Circle Pines – Golden Lake

John Ritter – Lake Alimagnet

Wargo Nature Center – George Watch

12 years of service

Anoka Co. Parks – multiple lakes

11 years of service

Glen Gramse – Keller Lake

Wally Shaver – Lac Lavon Lake

10 years of service

Philip Goodrich – Pike Lake

Lakeville – Valley and Lee lakes

John Ryski – Bavaria Lake

Westwood Nature Center – Westwood Lake

9 years of service

Dave Hanson – Sweeney Lake

8 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 Shouldice – Tamarack Lake

Sly Family – Downs Lake

Streff Family – South Rice Lake

Bob Videen – Parkers Lake

7 years of service

Bonnie Juran – Klawitter Lake

Al Kettlekamp – Long Lake

7 years of service (continued)

Kris Mann – Twin, upper

Tom Sletta – Cates Lake

6 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

5 years service

David Bess – Wood Lake

David Florenzano – Riley Lake

Wayne Hubin – Swede Lake

Bob Kistler – Valentine Lake

Sue Morgan & Linda Scott – St. Joe Lake

Diane Stauner – Meadow Lake

Shelly Strohmaier – Lotus Lake

Chuck Taylor – Jane Lake

Gordan Warner – Mitchell Lake

4 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

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

Stuart Rudd – Success Lake

3 years service

Dick Bancroft – Sunfish Lake

David Bluhm – White Rock Lake

Bruce Cornwall – Twin Lake

Jerry Edberg – Cedar 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

Mark Storck – Rose Lake

Gregg Thompson – Bush Lake

Dan Wallace – Sunset Pond

Joe Williamson – McMahon Lake

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- The MCES Laboratory Services Section, for laboratory analysis of the lake samples.
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INTRODUCTION

This 2008 report continues a series of annual lake reports from 1980 to present. Since 1980, 349 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 379 lake sites have been monitored. This report contains data from 202 lake sites on 192 lakes monitored in 2008. There were 16 lakes (20 lake sites) in the 2008 monitoring season that have not been previously monitored by the METC. 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. The data from the METC lake monitoring program are permanently stored in the U.S. EPA's national water quality data repository, STORET (STorage and RETrieval). METC lake monitoring data are readily available via the Metropolitan Council's Environmental Information Management System (EIMS), at: <http://es.metc.state.mn.us/eims/>.

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 1989c).

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.

CITIZEN-ASSISTED MONITORING PROGRAM (CAMP)

CAMP OVERVIEW

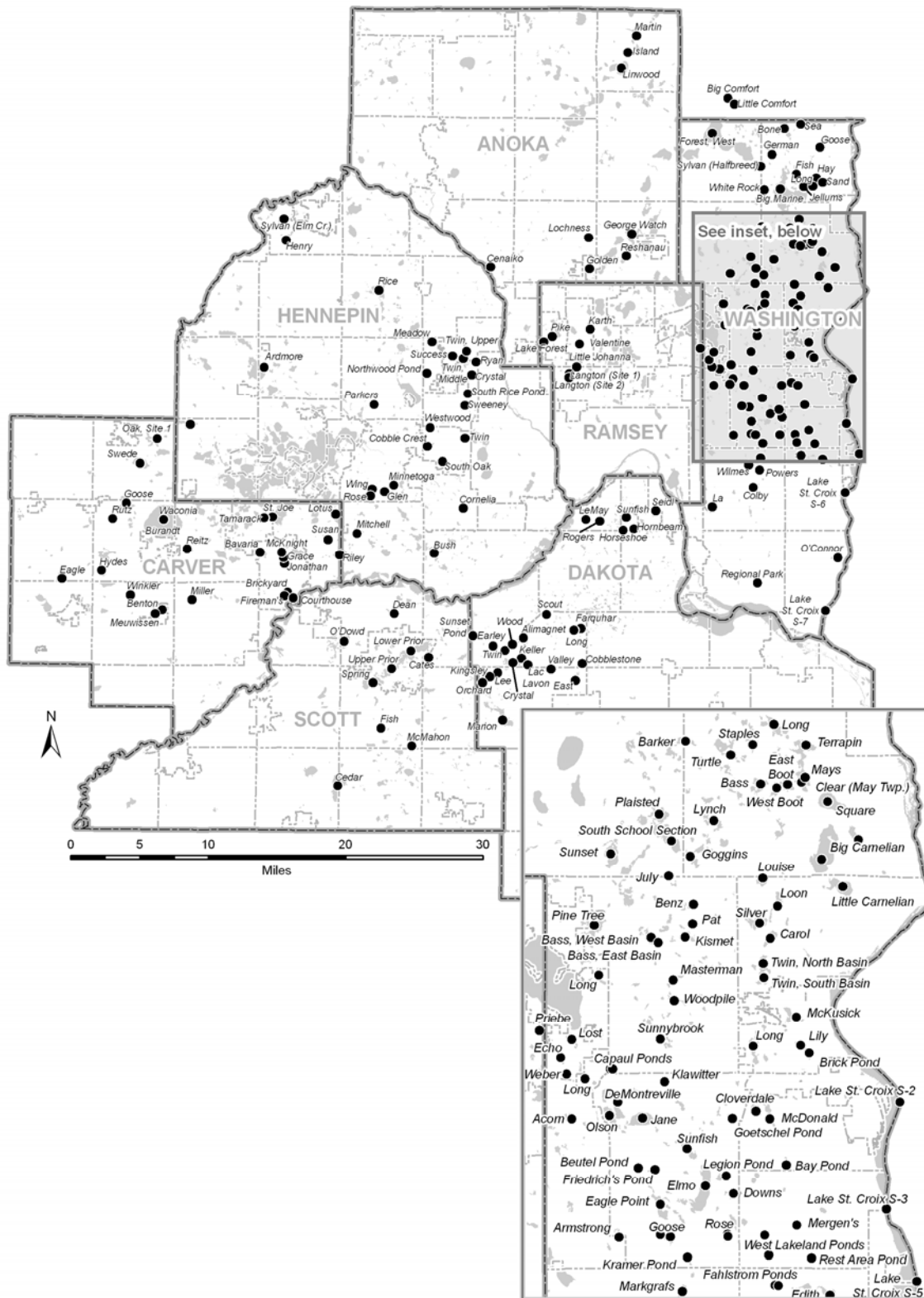
The year 2008 marked the sixteenth year of the CAMP. Figure 1 shows the location of the 2008 CAMP lakes. CAMP monitored 202 lake sites in 2008, including 20 lake sites (16 lakes) that have not been previously monitored by METC. CAMP is jointly funded by the METC and program participants such as WDs, 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 baseline data to help document water quality impacts 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 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 (Hartsoe and Osgood 1991). The pilot study and its results are included in the 1993 Annual Lake Report, and can be obtained by contacting Brian Johnson at (651) 602-8743 or brian.johnson@metc.state.mn.us.

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 2008, 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 are submitted to METC staff and then analyzed at the Metropolitan Council Environmental Services laboratory in St. Paul, MN.

Figure 1 – 2008 CAMP Study Lakes



ACKNOWLEDGMENTS

The successful performance of the 2008 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 14 cities, 9 WDs, 8 WMOs, 2 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 2008 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 2008 volunteer monitoring program began in the winter months of 2007. 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 2008. 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.

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

- Chlorophyll hand pump, flask, and filters
- LCD thermometer
- Map of lake with sampling site(s)
- Sampling observation forms
- Sample jug
- Sample vials 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, and that they would use proper safety equipment and observe boat operating methods specified by the State of Minnesota.

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 methods they used were determined through a pilot study in 1991 that tested simplified methods for using volunteers to obtain credible water quality data (Anhorn 1994). 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 (the deep open-water area of the lake). Once at the monitoring location, an observation form for lake and meteorological conditions was completed. The form, shown in Figure 2, provides space to mention natural and cultural observations which may have influenced what was happening in the lake (i.e., heavy rains two days before monitoring), and an area to relate general perceptions of the lake's 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 milk jug. To begin, the volunteer pre-rinsed the jug three times with lake water. After rinsing, the jug was filled by submersing it upside down to forearm depth and turning it upright while still submersed. After filling the sample jug, volunteers obtained a temperature measurement and prepared the sample for analysis of TP, TKN, and CLA, as follows:

- **Temperature.** Surface water temperature was measured in the volunteer's sampling jug using a LCD 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).** Two samples, one each for TP and TKN, were decanted from the volunteer's jug in the field into their respective triple pre-rinsed, pre-labeled (including lake name, date, time, and parameter) 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-a (CLA).** CLA samples from the volunteer's jug were filtered in the field (*out of direct sunlight*) onto a 1 micrometer (µm) glass-fiber filter using a field filtration apparatus and a hand pump. Water from the sampling jug was measured and poured into the pump reservoir using a graduated cylinder. The pump reservoir holds approximately 250 ml. By squeezing the handle of the pump, the sample water was forced through the filter and the suspended planktonic algae became attached to the filter. The filtered water was then dumped back into the lake. If possible, this was repeated until a total of 1000 ml of sample water was allowed to pass through the filter. However, if the water sample was too green and the filter became clogged without allowing more water to pass through, the amount of water that did pass through the filter was calculated and recorded on the observation form. The filter was then removed from the filter holder with a tweezers, and placed in a Petri dish. The sample container was then labeled using the same methods as those for the TP and TKN sample vials (except the amount of water pumped through

the filter was also included on the label), wrapped in aluminum foil, 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. Results of the 1991 pilot study revealed that the volunteer monitoring and handling methods chosen for use in the CAMP program yield results comparable to routine methods used by the METC (Hartsoe and Osgood 1991).

For some CAMP lakes, more samples were collected in addition to the surface samples analyzed for TP, TKN, and chlorophyll. Sub-surface samples were collected from some lakes for analysis of TP and TKN. These sub-surface samples were usually collected near the bottom of the lake. For some select lakes, samples were also collected for analysis of other parameters such as ortho-phosphate and total iron. Dissolved oxygen and temperature profile measurements were also collected on some lakes by a few volunteers.

Figure 2: CAMP Monitoring Form (example)

Lake Name and ID #: _____

Site #: _____

Sampling Date: _____

Time: _____

Name(s) of Volunteer(s):

SECCHI DISK DEPTH: _____ meters

SURFACE TEMPERATURE: _____ °C

VOLUME OF FILTERED LAKE WATER (CLA) _____ ml

GENERAL OBSERVATIONS

(Circle)

*** Water Color**

Clear Yellow
Green Gray
Brown Blue-Green
Comment: _____

*** Odor of Water**

None Rotten Egg-like
Fishy Septic-like
Musty _____
Comment: _____

*** Wind Conditions**

Calm Strong
Breezy
Direction: _____

*** Water Surface**

Calm Moderate Waves
Ripple Whitecaps
Small Waves
Comment: _____

*** Cloud Cover**

0% 75%
25% 100%
50%

*** Lake Level**

Above Normal
Normal
Below Normal
Staff Gage Reading _____

*** Amount of Aquatic Plants**

None Moderate
Minimal Substantial
Slight

*** Air Temperature (F)**

< 40 81-90
41-60 > 90
61-80

*** Unusual Conditions in the
past week (storms, high
winds, temp. extremes):**

*** Physical Condition**

Crystal Clear (1)
Some Algae Present (2)
Definite Algae Present (3)
High Algal Color (4)
Severe Bloom (Odor, Scum) (5)

*** Suitability For Recreation**

Beautiful (1)
Minor Aesthetic Problem (2)
Swimming..Slightly Impaired (3)
No Swim..Boating OK (4)
No Aesthetics Possible (5)

Laboratory Analytical Methods

The routine chemical analyses of CAMP water samples were performed at the MCES laboratory, following U.S. EPA approved methods. Surface and subsurface water samples that were analyzed for TDP were filtered through a 0.45 µm membrane filter and analyzed for TP. Water samples analyzed for TP and TKN were digested with the sulfates of hydrogen, potassium and mercury (H₂SO₄, K₂SO₄ and HgSO₄). Following digestion, phosphorus was analyzed using a modified ascorbic acid reduction method (APHA 1992). Samples analyzed for TKN were chemically reduced the same way as the TP samples, and then were color-intensified with sodium nitroprusside and assayed for ammonia colorimetrically. TKN and TP in surface samples were periodically analyzed in duplicate to determine accuracy, in which case their average values were reported.

Chlorophyll was extracted from the filters by homogenization in 90 percent aqueous acetone. The optical density of the extract was measured spectrophotometrically at 630, 647, 664 and 750 nm. CLA was calculated from a trichromatic equation that corrects for turbidity (APHA 1992).

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; and
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. Results of the 2008 QC monitoring are discussed later in this section. 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 2008 CAMP QC data are provided in Appendix D. The results of the 2008 QC monitoring indicate good agreement between data from samples and measurements collected by the volunteer versus those collected by METC staff. Figures 3, 4, and 5 show the QC data for TP, CLA, and Secchi transparency, respectively. The linear regression for each parameter shows close agreement to a 1:1 relationship between data collected by the volunteers versus data collected by METC staff. The R^2 values for TP and Secchi transparency 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 $0.80 R^2$ value for the CLA QC data indicates that the linear relationship is not as strong as those for the other two parameters, but is still robust, nonetheless. CLA is a measure of the abundance of algae at the lake surface, and several factors can affect this algal abundance. These factors, which include diel vertical migration of algal populations, development of algal blooms, and wind conditions, can influence algal populations at the water surface on a time-scale of hours to days. 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 CLA data. Given the inherent variability associated with algal abundance within the time frame between volunteer- and METC staff-collected samples, an R^2 value of 0.80 is an acceptable value.

Figure 3. Total Phosphorus Quality Control Data 2008

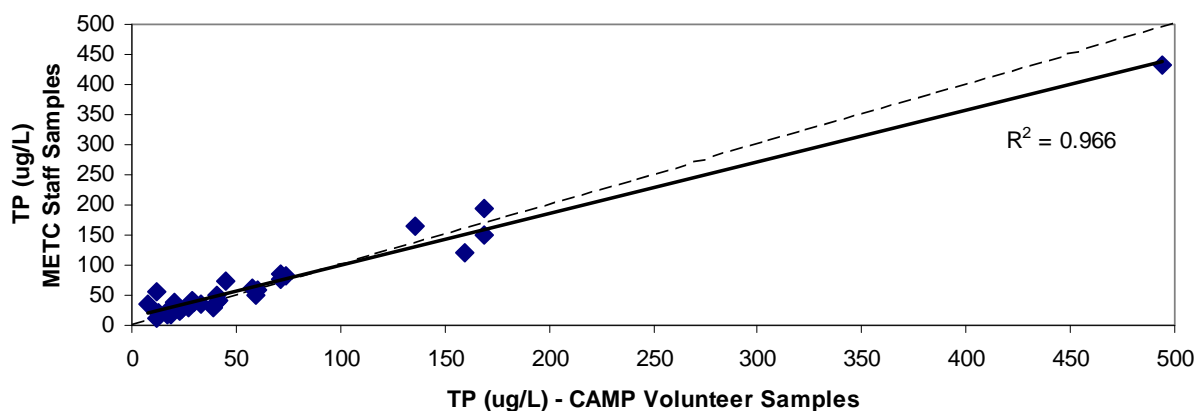


Figure 4. Chlorophyll-a Quality Control Data 2008

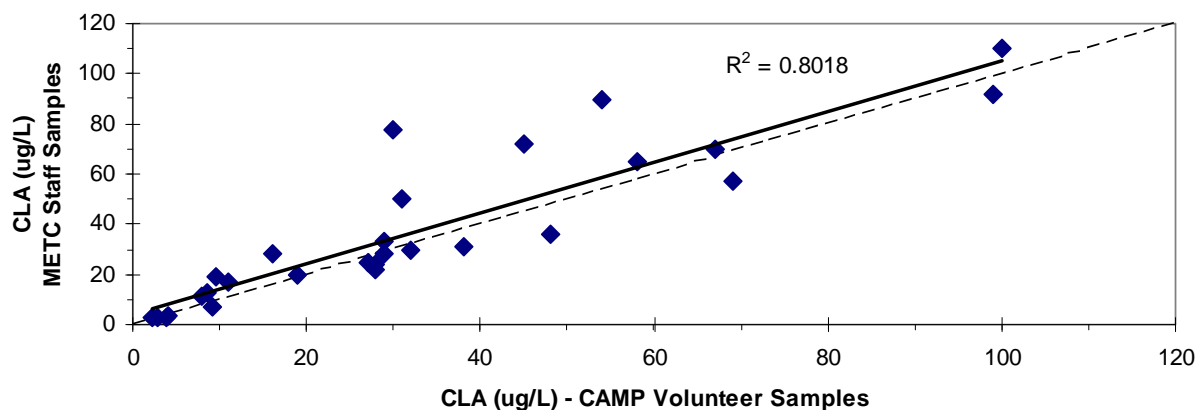
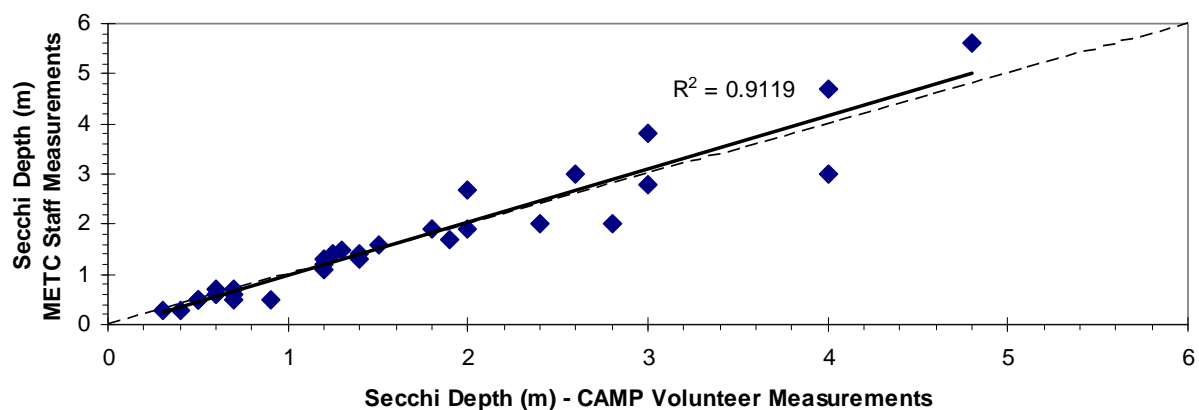


Figure 5. Secchi Transparency Quality Control Data 2008



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 area lakes. The grading curve represents percentile ranges for three water quality indicators: the summertime (May - September) average values for total phosphorus, chlorophyll-a, and Secchi transparency. These percentiles use ranked data from 120 lakes that were monitored from 1980 – 1988:

<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

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.

The three variables used in the grading system strongly relate to open-water nuisance-aspects of a lake (i.e. algal blooms), 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 1988b). 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 transparency 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 1988b).

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 transparency to the monitored lakes. For example, a lake having a mean summertime Secchi transparency of 1.7 m would receive a “C” grade for Secchi transparency. A grade of C is considered average for Twin Cities Metropolitan area 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.

2008 LAKE GRADES

Each 2008 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 2008 is shown in Figure 6.

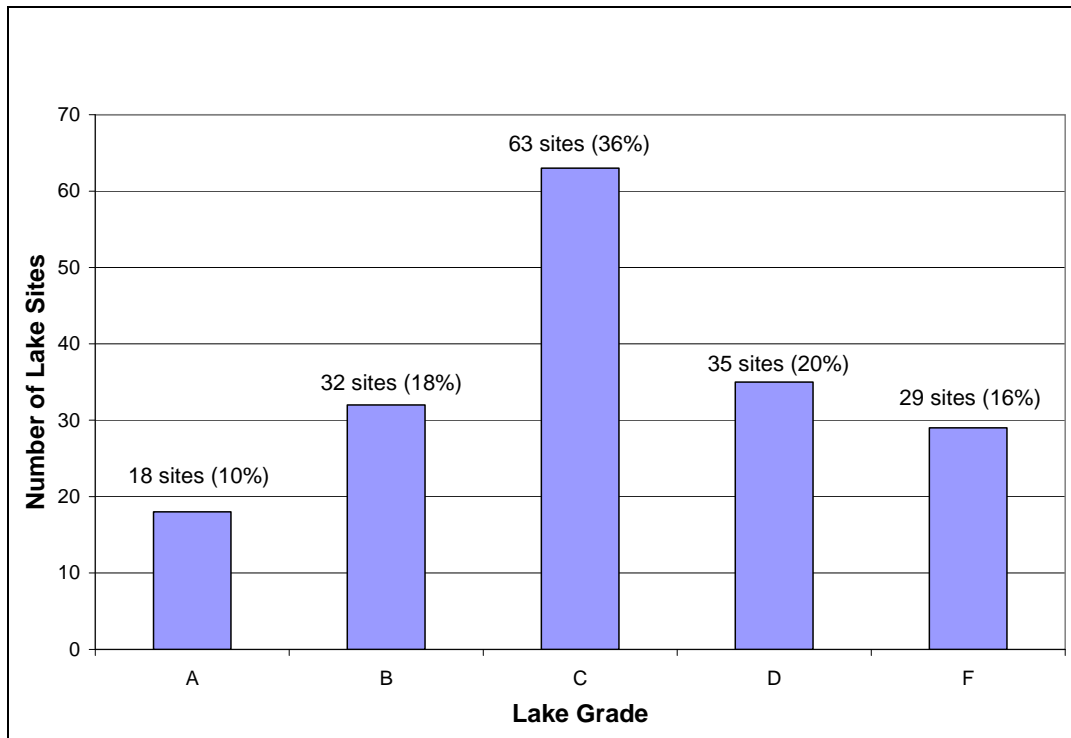


Figure 6. Distribution of 2008 Lake Grades

In 2008, the greatest percentage of the lake sites (36%) 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 below average (36% D and F lakes) than above average (28% A and B lakes).

The 18 lake sites that received A lake grades include: Brickyard, Bush, Clear (May Township), Courthouse, DeMontreville, Elmo, Fireman's, Jane, Kingsley, Long (Mahtomedi), Mays, Olson, Orchard, St. Joe's, Sunnybrook, Sunset, Sylvan (Washington County), and Twin Lake south (Washington County).

The 29 lake sites receiving the lowest water quality grade of F include: Ardmore, Bay Pond, Benton, Cobblecrest, Colby, Eagle (Carver County), Goose (Waconia), Goose [sites 1 & 2 (Washington County)], Hyde, Jonathan, Kramer, Long (Apple Valley), Lake Forest, Loon, Lynch, Meadow, Mergen's, Meuwissen, McKnight, Priebe, Rest Area Pond, Rose [sites 1 & 2 (Lake Elmo)], Rutz, South Oak, Swede, Twin [upper (Brooklyn Park)], and Winkler.

Similar to past years, there is no distinct pattern as to where lakes with specific water quality were located. As observed in the past, 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 of A and B were not area specific. They were located in six of the seven TCMA counties. Ramsey County had no A or B CAMP lakes in 2008. Lake sites receiving an A grade were found in four 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 recently conducted a statewide statistical trend analysis on lakes with extensive Secchi transparency databases. The analysis revealed that the majority of assessed lakes showed no statistically significant trends in water clarity (either negative or improving). However, more lakes showed an improving trend than a degrading trend (MPCA 2008). The MPCA's trend analysis included 76 CAMP lakes that were monitored in 2008. According to the MPCA's analysis, the following 2008 CAMP lakes showed a statistically significant trend in water clarity:

- 25 lakes showed an improving trend in water clarity: Armstrong (south bay), Big Carnelian, Big Marine, Colby, Courthouse, DeMontreville, Earley, Elmo, Halfbreed (Sylvan), Hay, Kismet, Langton (site 2), Little Carnelian, Long (May Township), Marion, Martin, McKusick, Olson, Pine Tree, Regional Park Lake, Silver (Stillwater), Sunset, Valentine, Waconia, and West Boot.
- 8 lakes showed a negative trend: Comfort (Big), Goggins, La, Markgrafs, Powers, Seidl, Square, Twin (middle, Crystal).

The MPCA's has released its draft 2010 Minnesota Impaired Waters Inventory. The draft 2010 inventory indicated that 89 of the 192 CAMP lakes monitored in 2008 were listed as impaired. Seventy eight lakes were listed as impaired for not meeting recreational use, and 32 lakes were listed as impaired for not meeting aquatic consumption use. Some lakes had 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 transparency). The aquatic consumption impairments were driven by contaminants in fish tissue, such as mercury, PCBs, and/or perfluorooctane sulfonate. 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 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.

2008 MONITORING RESULTS FOR INDIVIDUAL CAMP LAKES

The 2008 monitoring results for CAMP lakes are discussed on a lake-by-lake basis in the following pages. *The Handbook for the Citizen-Assisted Lake Monitoring Program* (Anhorn 2003) distributed at the volunteer training sessions provides an overview of limnology and lake ecology.

The results and subsequent analysis of the water quality of each lake includes a written section describing the lake's condition in 2008 and a separate lake information sheet. Each information sheet includes the 2008 water quality data, shown in both tabular and graphic form, as well as the historical lake grades.

Acorn Lake (82-0102) Valley Branch Watershed District

Acorn Lake is a 44-acre lake located within the City of Oakdale (Washington County). This lake is also called Mud Lake. The mean and maximum depths of the lake are 0.7 m (roughly 2.4 feet) and 3.0 m (10 feet), respectively. Because of the shallowness of the lake, its entire area is considered littoral (the shallow [0-15 foot depth] area dominated by aquatic vegetation), and it never maintains a thermocline (a density gradient due to changing water temperatures throughout the lake's water column) through the summer months. The lake's surface area and mean depth translate to a volume of roughly 101 ac-ft. There is no public access to the lake.

The lake's surface area and watershed size (296 acres) translate to a 7:1 watershed-to-lake size ratio. Generally the larger the ratio, the greater the potential stress on the lake from pollutants in watershed runoff.

This was the second year that Acorn Lake has been involved in CAMP. The 2006 and the 2008 CAMP data represent the only years of available nutrient 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 lake was monitored 6 times between late April and mid-October 2008. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	44.0	26.0	76.0	NA
CLA (µg/l)	28.5	4.7	53.0	NA
Secchi (m)	1.0	0.6	1.5	NA
TKN (mg/l)	1.48	1.00	1.80	
Lake Grade				NA

There was an insufficient quantity of data to calculate a lake grade for 2008. At least 5 dates spread throughout the summer monitoring season (May – September) are required to calculate a grade.

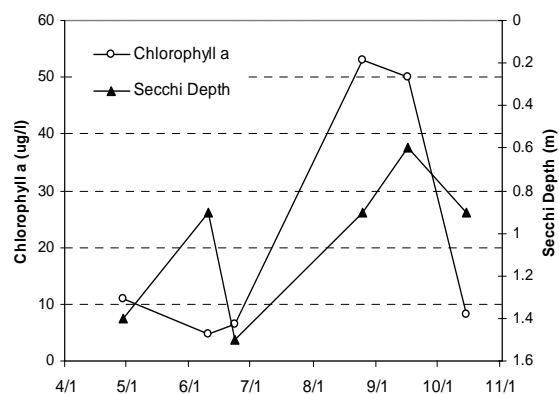
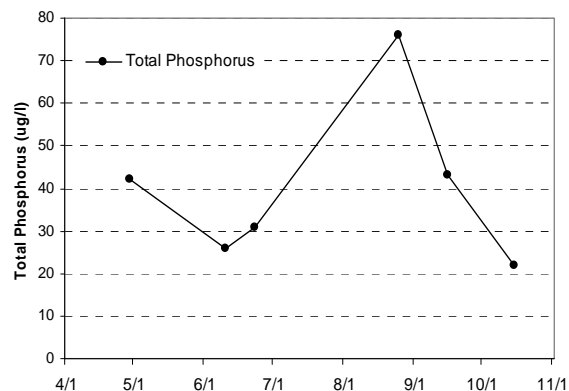
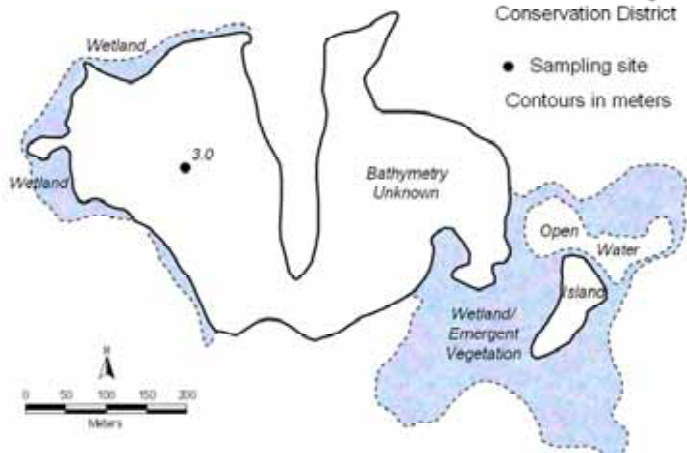
Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The summertime mean physical condition ranking was 2.0 on a 1 to 5 scale (2- "some algae present"). The mean suitability for recreation ranking was 4.0 on a 1 to 5 scale (4- "No swimming; boating ok").

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey of 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.

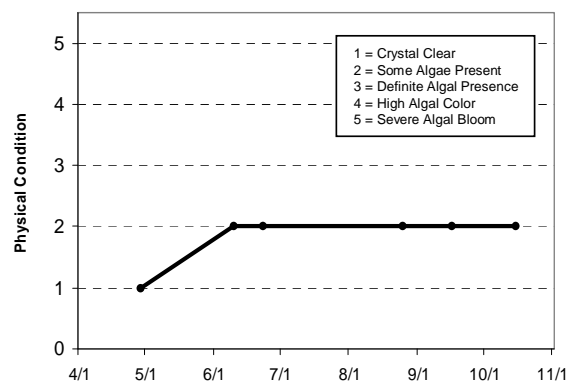
Acorn Lake Oakdale, Washington Co.

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



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/29	8.7	7.2	10.12	10.34	11	42		1.4	1	2
6/10	22.4	20.2	9.97	3.05	4.7	26		0.9	2	4
6/23	25.2	20.2	10.64	0.62	6.4	31		1.5	2	4
8/25	21.2	20.2	4.69	0.22	53	76		0.9	2	4
9/16	18.6	16.3	10.43	0.62	50	43		0.6	2	4
10/15	12.2	12	4.71	0.99	8.1	22		0.9	2	4



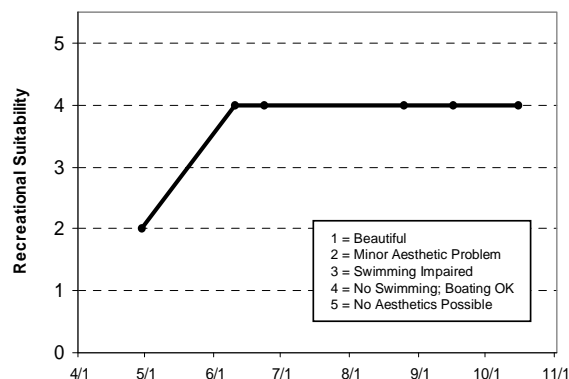
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Alimagnet Lake (19-0021) City of Apple Valley

Approximately half of Lake Alimagnet'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's shoreline is 3.2 miles. The lake has maximum and mean depths of 3.0 and 1.5 m (10 and five feet), respectively. Because the lake is relatively shallow, it does not develop and maintain a thermocline (a density gradient owed to changing water temperatures throughout the water column), and the entire lake is considered littoral, (the shallow [0-15 feet] area dominated by aquatic plants). The approximate lake volume is 545 acre-feet (ac-ft). 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.

The lake, which has been monitored through CAMP since 1995, was sampled 8 times between late-April and mid-August 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	95.6	56.0	136.0	D
CLA (µg/l)	59.3	19.0	190.0	D
Secchi (m)	0.7	0.5	0.9	F
TKN (mg/l)	2.57	1.80	3.60	
<i>Lake Grade</i>				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 (1999-2008 excluding 2006). The mean Secchi depth continues to provide this lake with a water clarity grade of F. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The summertime mean physical condition was 3.4 on a 1 to 5 scale (between 3- "definite algae present" and 4- "high algal color"). The mean suitability for recreation ranking was 3.0 on a 1 to 5 scale (3- "swimming slightly impaired").

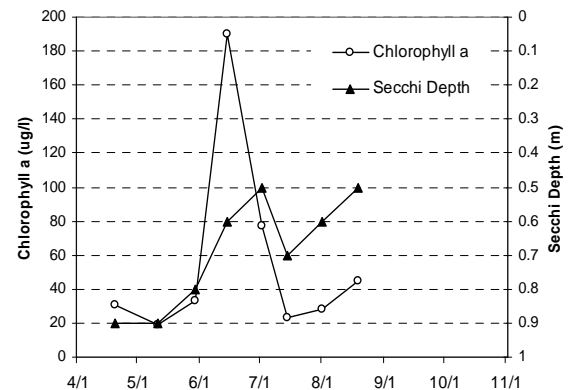
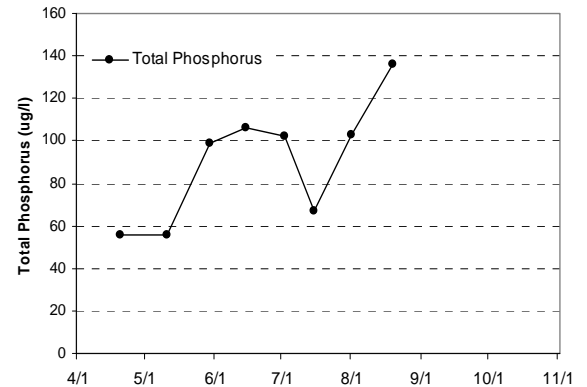
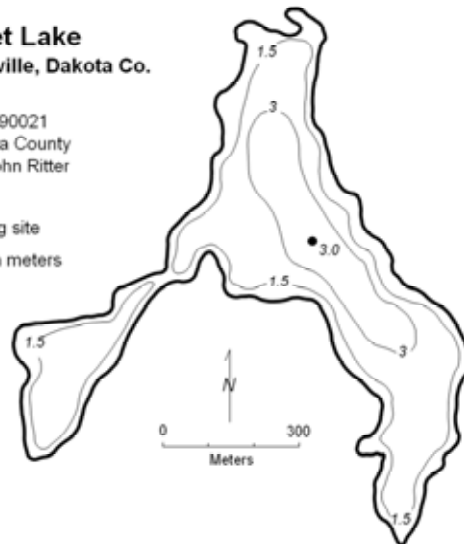
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Alimagnet Lake Apple Valley/Burnsville, Dakota Co.

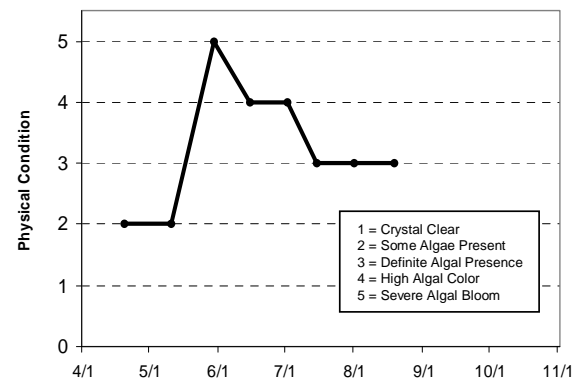
Lake ID: 190021
WMO: Dakota County
Volunteer: John Ritter

● Sampling site
Contours in meters



2008 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	6.7				31	56		0.9	2	3
5/11	13				19	56		0.9	2	2
5/30	17				33	99		0.8	5	4
6/15	20				190	106		0.6	4	3
7/2	25				77	102		0.5	4	3
7/15	28				23	67		0.7	3	3
8/1	27				28	103		0.6	3	3
8/19	25				45	136		0.5	3	3



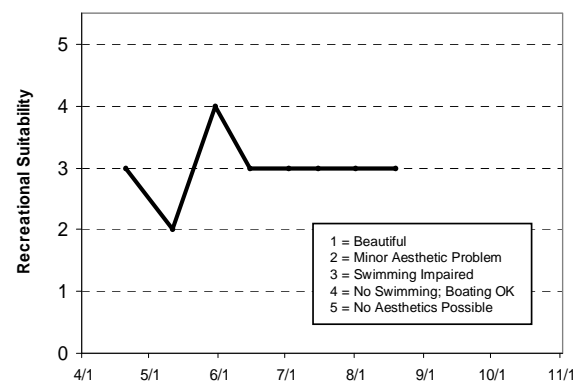
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade				C	D	C	C	D	D	D	D	D

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

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). Most of the lake is considered littoral (approximately 9 acres of depth 0-15 feet). The lake has an average depth of 2.4 m (7.7 feet) and a volume of 78.0 acre-feet. There is no public access to the lake. A search via STORET revealed historical Secchi depth data and CAMP data.

Ardmore Lake was monitored 11 times between mid-April and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	179.1	33.0	316.0	F
CLA (µg/l)	90.1	13.0	190.0	F
Secchi (m)	0.4	0.2	0.6	F
TKN (mg/l)	3.77	2.20	5.20	
Lake Grade				F

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

Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page. The summertime mean physical condition was 2.5 on a 1 to 5 scale (between 2- "some algae present" and 3- "definite algae present"). The mean suitability for recreation ranking was 2.1 on a 1 to 5 scale (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

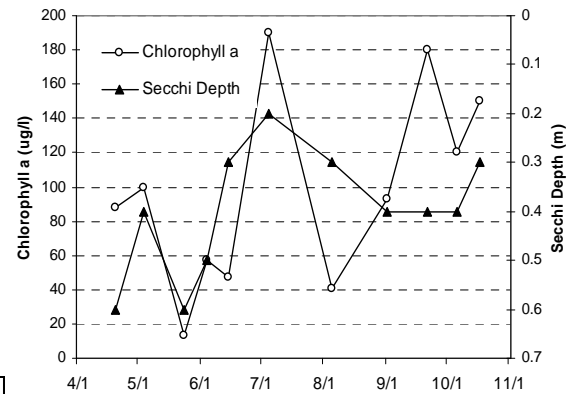
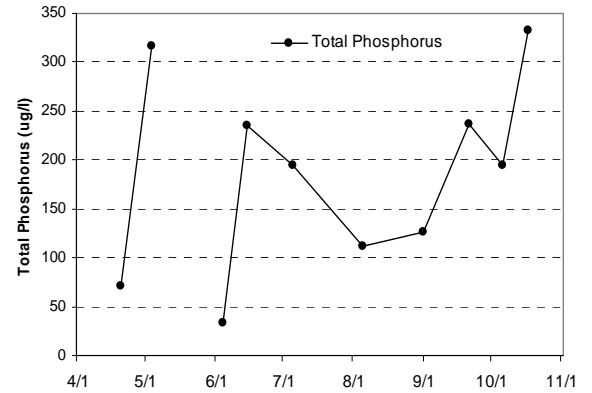
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Ardmore Lake Medina, Hennepin Co.

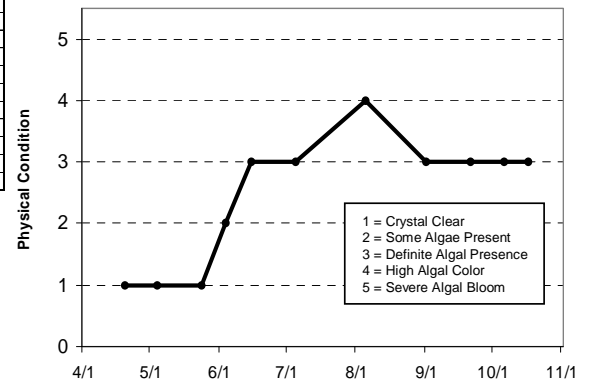
Lake ID: 270153
WMO: Pioneer-Sarah Creek
Volunteer: Greg Durand

● Sampling site
Contours in meters



2008 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	9.1				88	71		0.6	1	2
5/4	13.9				100	316		0.4	1	1
5/24	20.2				13			0.6	1	1
6/4	20.7				57	33		0.5	2	2
6/15	24				47	235		0.3	3	3
7/5	27.1				190	195		0.2	3	3
8/5	28.5				41	112		0.3	4	3
9/1	25				93	126		0.4	3	2
9/21	22				180	237		0.4	3	2
10/6	15.1				120	195		0.4	3	3
10/17	11.9				150	333		0.3	3	3



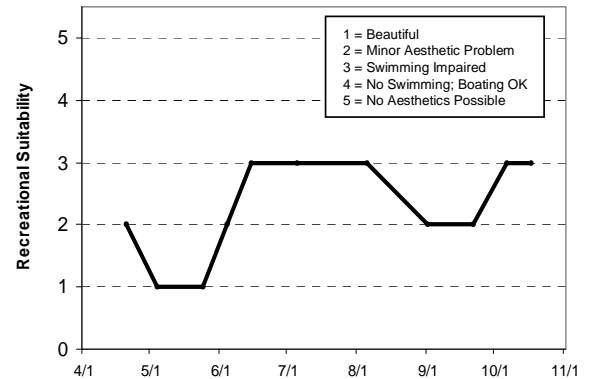
Lake Water Quality Grades Based on Summertime Averages

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

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
Total Phosphorus				F	F
Chlorophyll a				F	F
Secchi Depth				F	F
Lake Grade				F	F

Source: Metropolitan Council and STORET data



Armstrong Lake (82-0116) South Washington Watershed District

Armstrong Lake has been annually monitored through CAMP since 1998. There is very little physical information available on the lake or the lake's watershed. Located partially within the cities of Lake Elmo and Oakdale (Washington County), the 39-acre lake has a mean and maximum depth of 1.0 m (3.2 feet) and 1.5 m (roughly 5 feet), respectively. Because of the shallowness of the lake, its entire area is considered littoral (the shallow [0-15 foot depth] area dominated by aquatic vegetation), and it never maintains a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column) through the summer months. The lake's surface area and mean depth translate to a volume of roughly 128 ac-ft. There is no public access to the lake.

Armstrong Lake was monitored 7 times between early-May and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	59.7	24.0	165.0	C
CLA (µg/l)	4.4	2.0	6.5	A
Secchi (m)	1.1	0.8	1.4	D
TKN (mg/l)	1.70	1.10	3.10	
Lake Grade				C

The 2008 water quality lake grade was a return to similar and relatively better water quality conditions last observed in 2004 and 2005. Although the summer-time average water clarity remains in the D category, as it has been since 2000, the average summer-time concentrations of CLA and TP improved in 2008. The lake water quality over the past decade has fluctuated between C and D, with a C being more frequent. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

By comparing 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. In most cases, the three should be fairly comparable. One possible explanation for these observations may be that the majority of the lake's TP comes from either re-suspended lake sediments or the intrusion of sediment laden runoff to the lake, which in turn lessens the clarity of the water and inhibits algal growth.

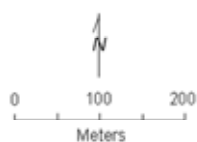
Throughout the monitoring period, the volunteers' opinions of the lake's physical condition were ranked on a 1-to-5 scale, as indicated on the following page. The mean physical condition ranking was 2.7 (ranking between 2- "some algae present" and 3- "definite algae present"). The volunteer did not record the recreational suitability ranking.

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.

Armstrong Lake Lake Elmo/Oakdale, Washington Co.

LAKE ID: 820116
WD: South Washington
Volunteer: Todd Heruth

● Sampling site
Contours in meters



2008 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	14.9				2	24		1.4	1	
6/1	23.8				4.5	165		1.2	2	
6/29	23.9				5.3	44		1.2	3	
7/24	26.8				6.5	45		1	3	
8/25	23.9				2.6	40		0.8	4	
9/21	21				5.2	40		1.2	3	
10/19	10.1				4	25		1.2	2	

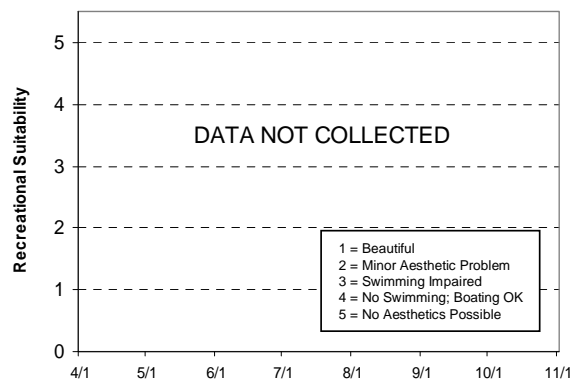
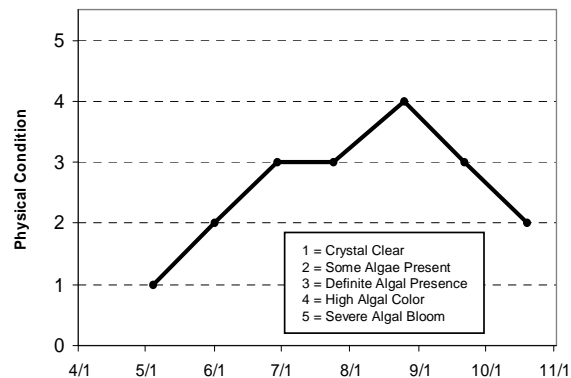
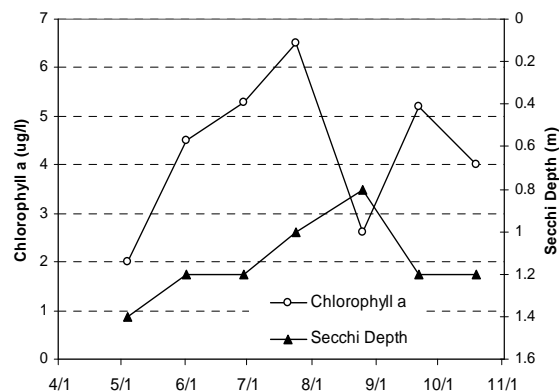
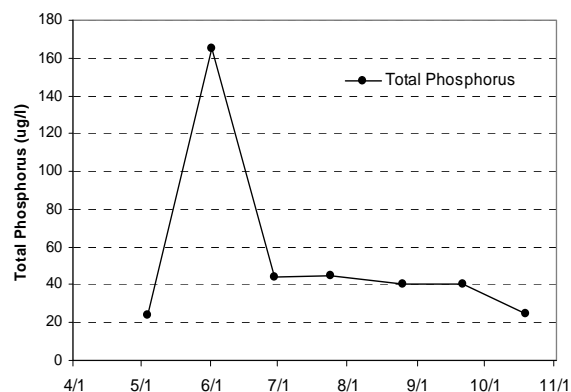
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Barker Lake (82-0076) Carnelian - Marine Watershed District

Barker Lake is a 45-acre lake located within May Township (Washington County). The mean and maximum depth of the lake is 4.4 m (14 feet) and 9.0 m (roughly 29 feet), respectively. 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). Additionally, the surface area and mean depth of the lake result in a calculated volume of 648 ac-ft.). The lake has an 823-acre watershed and a rather large watershed-to-lake area ratio of 19:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 7 times from early-May to September 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	108.6	66.0	148.0	D
CLA (µg/l)	55.9	4.5	100.0	D
Secchi (m)	1.2	0.6	2.3	D
TKN (mg/l)	2.19	1.00	3.70	
Lake Grade				D

The 2008 water quality lake grade was a D. All three parameters were also a D. The 2008 CAMP monitoring season was the worse water quality condition for this lake since it was first enrolled in the CAMP in 1997. Continued monitoring is suggested to determine if the 2008 water quality was an anomaly or a possible indicator of worsening water quality conditions.

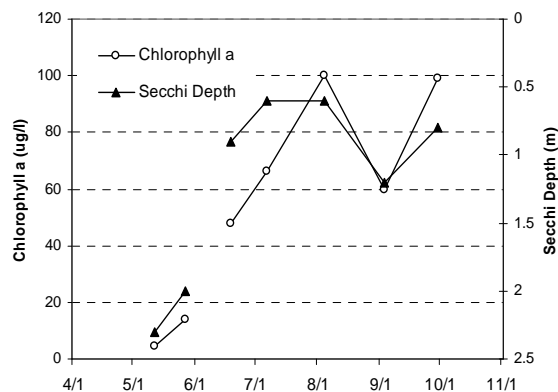
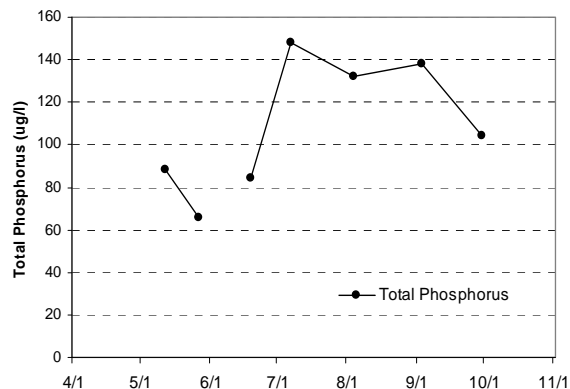
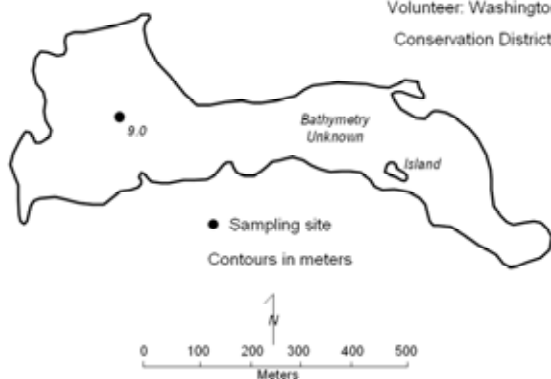
Throughout the monitoring period, the volunteers' opinions of the lake's physical condition were ranked on a 1-to-5 scale, as indicated on the following page. The average user perception rankings, on a 1-to-5 scale, were 3.1 for physical condition (between 3- "definite algae present" and 4- "high algal color"), and 3.6 for recreational suitability (between 3- "swimming slightly impaired" and 4- "no swimming, boating ok").

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.

Barker Lake

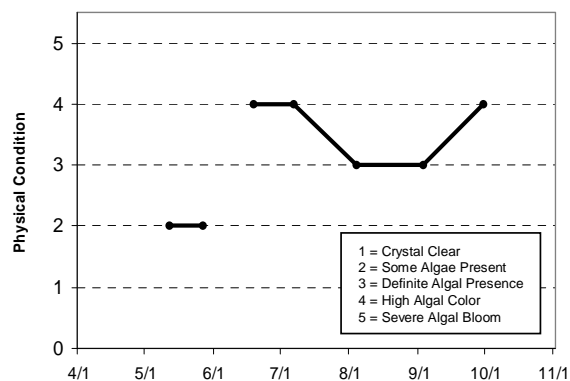
Hugo, May Twp., Washington Co.

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



2008 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
5/12	13.5	8.5	8.6	0.32	4.5	88		2.3	2	2
5/27	16.3	8.5	8.16	0.17	14	66		2	2	3
6/19	24.8	9.1	13.18	0.18	48	84		0.9	4	4
7/7	27	9.7	10.46	0.39	66	148		0.6	4	4
8/4	24.9	9.1	7.45	0.22	100	132		0.6	3	4
9/3	22	9.4	6.34	0.18	60	138		1.2	3	4
9/30	17.1	9.7	7.24	0.21	99	104		0.8	4	4



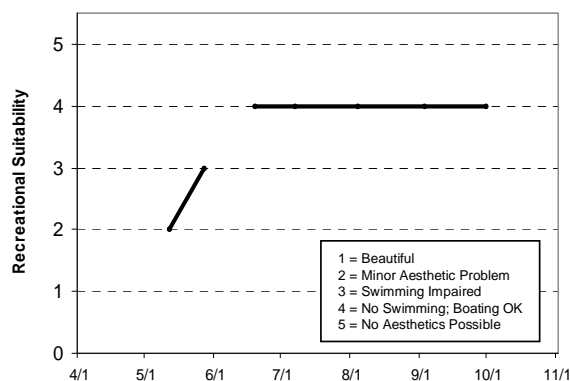
Lake Water Quality Grades Based on Summertime Averages

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						C	D	D	C	D		
Chlorophyll a						C	C	D	B	C		
Secchi Depth						D	C	C	C	C	C	C
Lake Grade						C	C	D	C	C		

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

Source: Metropolitan Council and STORET data



Bass Lake (82-0035) Carnelian - Marine 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). 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 was monitored 7 times between May and October 2008. 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.

2008 summer (May-September) data summary

Parameter	Mean	Minimum	Maximum	Grade
Secchi (m)	2.4	1.7	3.0	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 volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-5-scale. The user perception rankings are shown on the lake's associated information sheet on the following page. The mean summertime physical condition was ranked 2.1 on a (between 2- "some algae present" and 3- "definite algae present"). The mean suitability for recreation ranking, also on a 1-to-5 scale, was 2.4 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

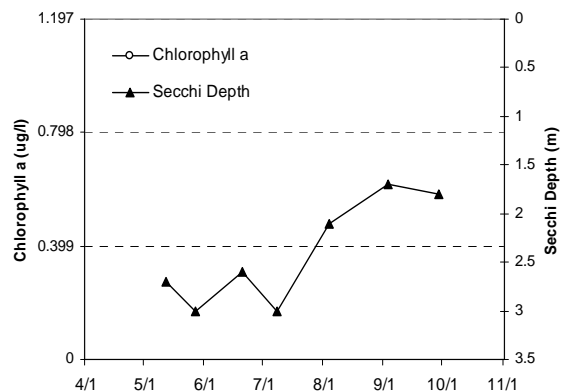
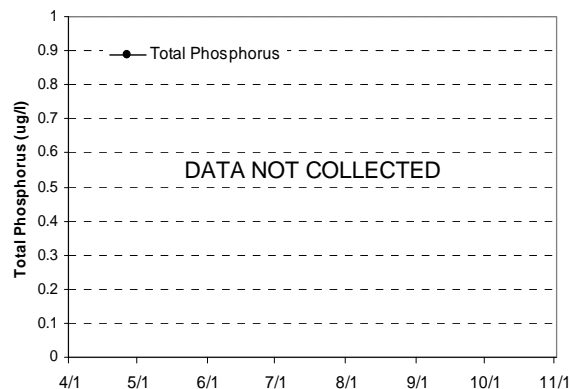
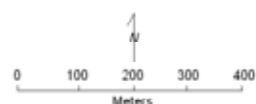
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Bass Lake May Twp., Washington Co.

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

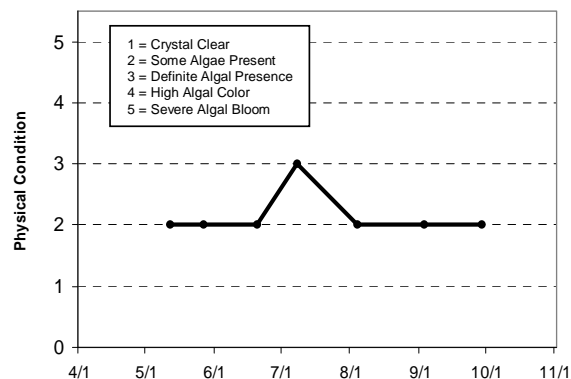
● Sampling site

Contours in meters



2008 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
5/12	14.5	10.7	8.8	1.53				2.7	2	3
5/27	16.9	13.5	7.59	0.19				3	2	2
6/20	23.9	17.9	9.9	0.17				2.6	2	3
7/8	25.5	18.5	8.45	0.27				3	3	2
8/4	24.5	20	4.35	0.18				2.1	2	3
9/3	22.6	19.7	5.09	0.14				1.7	2	2
9/29	18.5	18	5.29	0.25				1.8	2	2



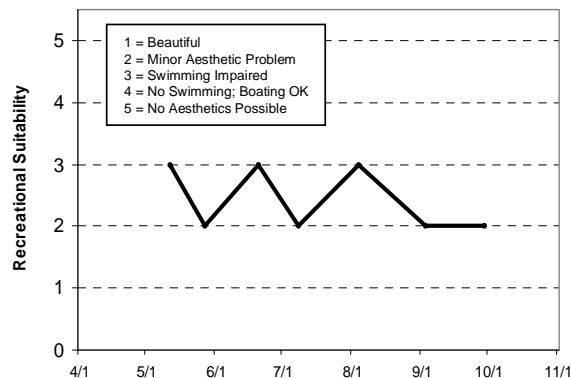
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Bass Lake (west) was monitored seven times between May and September 2008. 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.

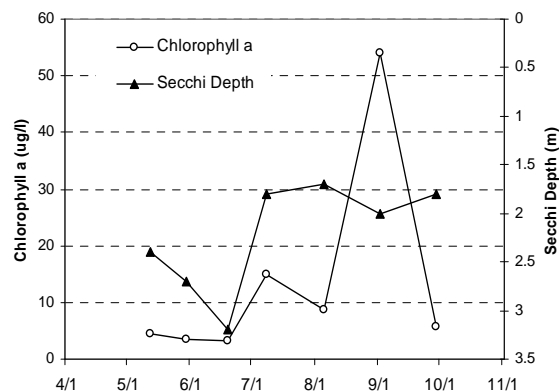
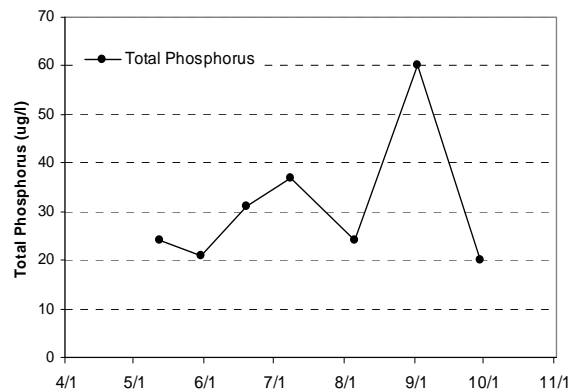
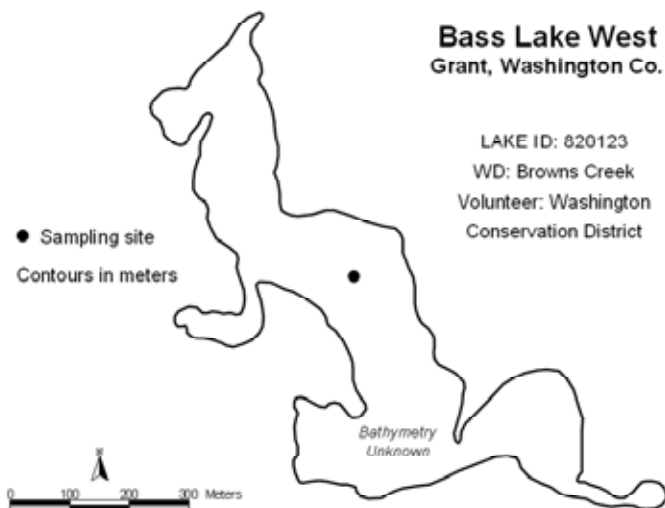
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	31.0	20.0	60.0	B
CLA (µg/l)	13.5	3.2	54.0	B
Secchi (m)	2.2	1.7	3.2	B
TKN (mg/l)	0.96	0.66	1.50	
Lake Grade				B

The lake received a water quality lake grade of B for 2008 which is similar to the lake grade received in 2007 but worse than the lake grade of A received in 2006. Given that there are only 3 years of water quality data available, additional monitoring is necessary to determine water quality trends.

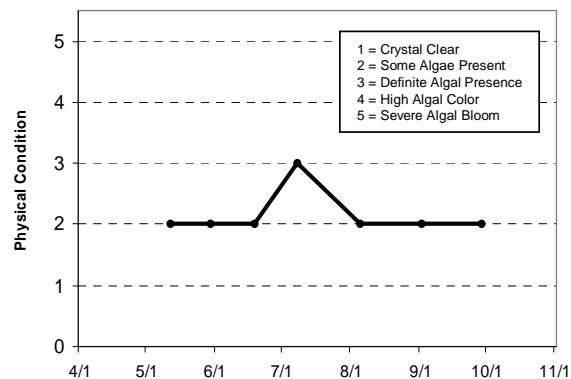
Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 3.0 for physical condition (3- "definite algae present"), and 3.0 for recreational suitability (3- "swimming slightly impaired").

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.



2008 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
5/12	14.7	13.1	10.16	4.45	4.5	24		2.4	2	3
5/30	17	15.9	8.01	4.29	3.4	21		2.7	2	2
6/19	23.1	8.9	8.75	0.26	3.2	31		3.2	2	2
7/8	25.4	21.6	7.92	0.25	15	37		1.8	3	2
8/5	26.2	24.7	5.51	0.83	8.8	24		1.7	2	3
9/2	23.9	22.2	6.71	0.47	54	60		2	2	3
9/29	18.7	17.9	6.01	3.49	5.8	20		1.8	2	3



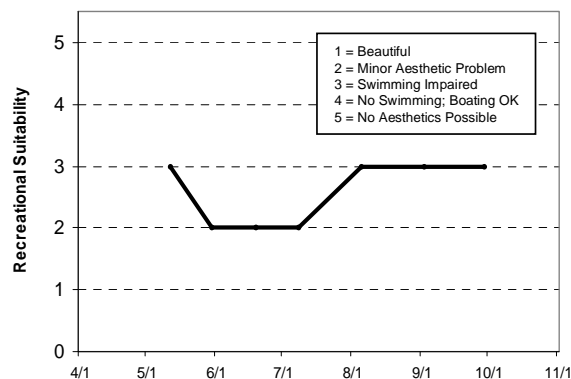
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus			B	B	B
Chlorophyll a			A	A	B
Secchi Depth			A	B	B
Lake Grade			A	B	B

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.

Bass Lake (east) was monitored 7 times between early-May and mid-October 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	57.4	32.0	110.0	C
CLA (µg/l)	37.3	4.6	130.0	C
Secchi (m)	1.9	0.8	3.8	C
TKN (mg/l)	1.64	0.75	3.00	
<i>Lake Grade</i>				C

The lake received a water quality lake grade of C for 2008. The mean summer-time CLA was greater in 2008 than in 2006 and 2007; it was approximately 3 times greater in 2008. The elevated mean was driven by higher CLA concentrations in early August. Given that there are only 3 years of water quality data available, additional monitoring is necessary to determine water quality trends.

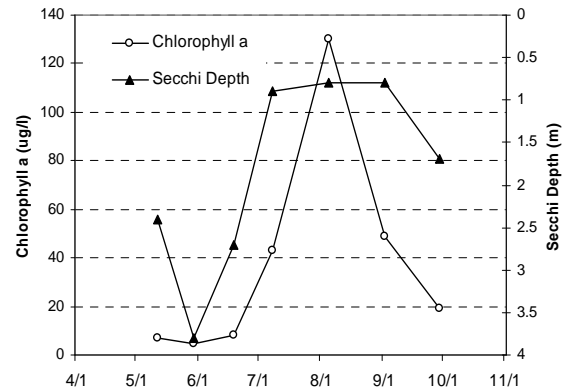
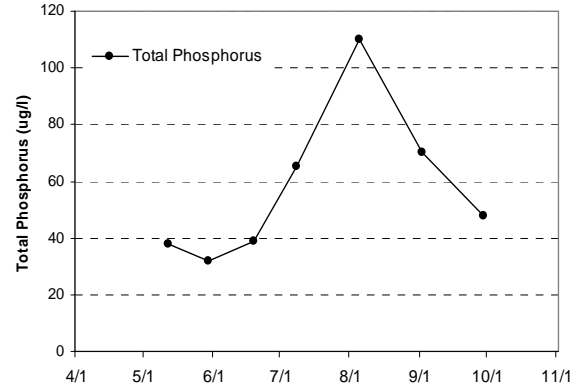
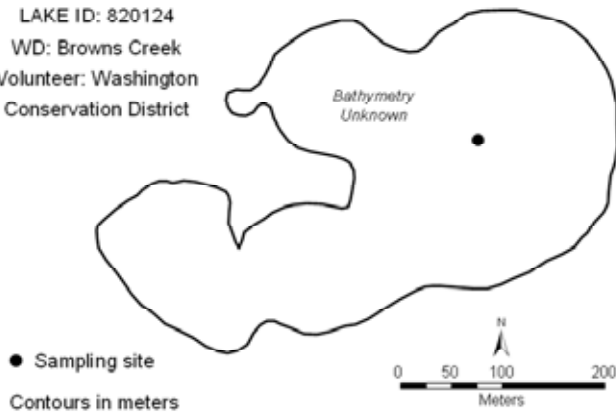
Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 3.0 for physical condition (3- "definite algae present"), and 3.3 for recreational suitability (between 3- "swimming slightly impaired" and 4-no swimming; boating ok").

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.

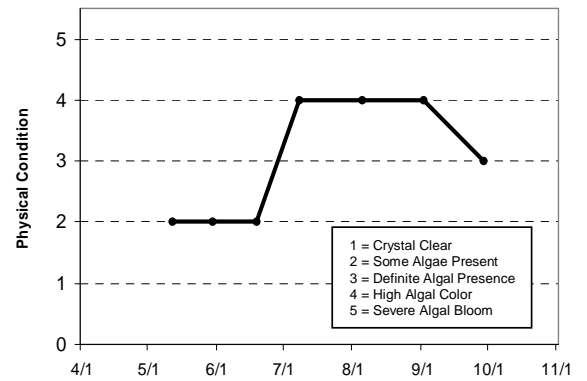
Bass Lake East Grant, Washington Co.

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



2008 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
5/12	16	15.4	9.51	7.66	7	38		2.4	2	2
5/30	17.9	17.1	7.65	0.62	4.6	32		3.8	2	2
6/19	24.1	22.4	9.25	8.38	8.4	39		2.7	2	2
7/8	26.1	22.1	8.29	0.22	43	65		0.9	4	4
8/5	26.7	21.1	7.06	0.14	130	110		0.8	4	4
9/2	24.6	21.5	8.84	0.37	49	70		0.8	4	4
9/29	19	16.9	6.36	0.19	19	48		1.7	3	3



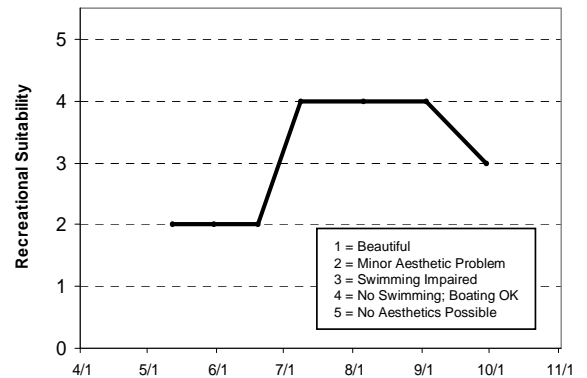
Lake Water Quality Grades Based on Summertime Averages

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

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). The lake is considered a “Priority Lake” in the metropolitan area because of its multi-recreational uses. The 200-acre lake has a mean and maximum depth of 5.6 m (18.4 feet) and 18.3 m (60 feet), respectively. The lake’s surface area and mean depth translates to an approximate lake volume of 3,674 ac-ft. The lake has a 711-acre immediate watershed, which translates to a watershed-to-lake area ratio of 3.5:1. The larger the ratio the greater the potential stress put on the lake from surface runoff. Roughly 65 percent of the lake is considered littoral, the shallow (0-15 foot depth) area dominated by aquatic vegetation. The DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

While 2008 was the 13th year that Bavaria has been involved in CAMP, the lake has been monitored by Council staff in the past and has recently been involved in the MPCA’s volunteer Secchi transparency program (included in the lake’s report card grading system on the following page). Additionally, Lake Bavaria was included within the MPCA’s Lake Assessment Program (LAP) in 2001. Through this program additional data, besides in-lake data through CAMP, was collected to help complete a more comprehensive study on the lake.

Lake Bavaria was monitored 14 times between May and October 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	35.8	20.0	85.0	C
CLA (µg/l)	15.2	6.4	28.0	B
Secchi (m)	1.7	1.2	2.5	C
TKN (mg/l)	1.22	0.74	1.60	
Lake Grade				C

The lake received a water quality lake grade of C for 2008 which is on the low end of water quality for this particular lake. Available data for Bavaria Lake reveal that the lake water quality has fluctuated from C to B to A to B to C to B and back to C. A trend analysis conducted by the MPCA on the lake’s Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

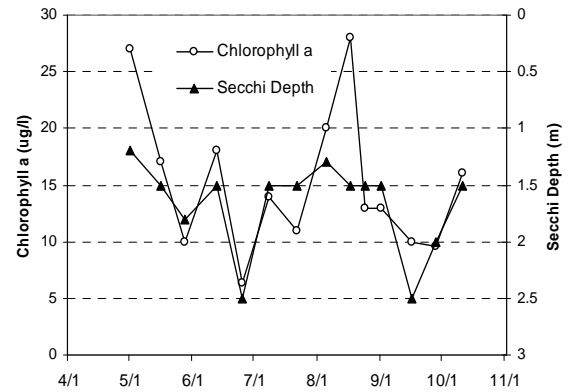
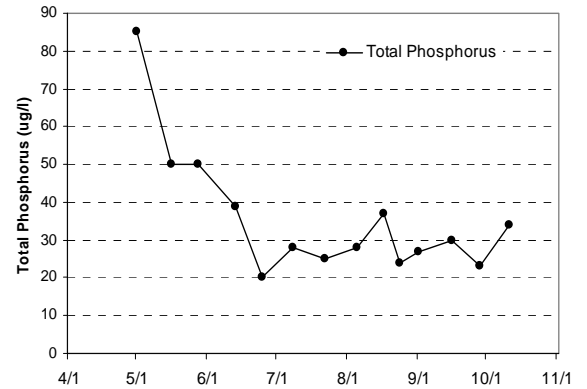
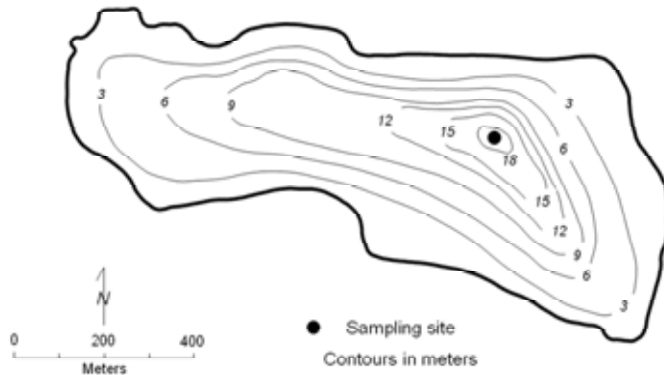
Throughout the monitoring period, the volunteers’ opinions of the lake’s physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake’s associated information sheet on the following page. The mean physical condition ranking was 2.6 (between 2- “some algae present and 3- “definite algae present”), while the mean recreational suitability ranking for the lake was 2.8 (between 2- “minor aesthetic problem” and 3-“Swimming Impaired”).

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.

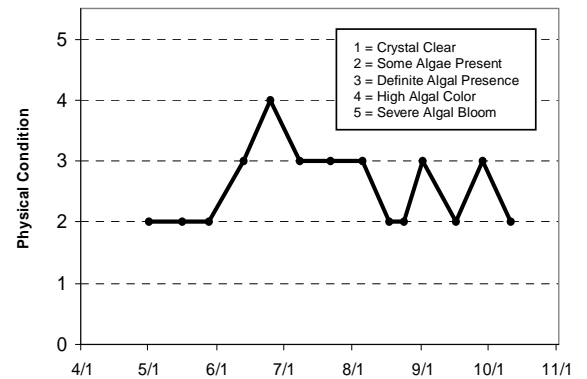
Lake Bavaria
Chaska/Laketown Twp., Carver Co.

LAKE ID: 100019
WMO: Carver County
Volunteer: John Ryski



2008 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	7.38		12.89		27	85		1.2	2	4
5/16	14				17	50		1.5	2	2
5/28	15				10	50		1.8	2	2
6/13	17				18	39		1.5	3	3
6/25	22				6.4	20		2.5	4	4
7/8	23				14	28		1.5	3	3
7/22	24				11	25		1.5	3	3
8/5	24				20	28		1.3	3	3
8/17	23				28	37		1.5	2	2
8/24	22				13	24		1.5	2	3
9/1	22				13	27		1.5	3	2
9/16	16				10	30		2.5	2	3
9/28	16				9.6	23		2	3	3
10/11	14				16	34		1.5	2	3



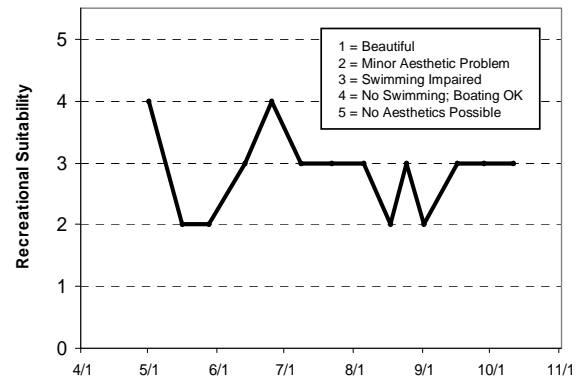
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus				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	C
Chlorophyll 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

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

Source: Metropolitan Council and STORET data



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

Bay Pond Lake is a 10-acre landlocked lake located within Baytown Township (Washington County). The mean and maximum depth of the lake is approximately 1.0 m (roughly 3.3 feet). Because of the shallowness of the lake, its entire area is considered littoral (the shallow [0-15 foot depth] area dominated by aquatic vegetation), and it never maintains a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column) through the summer months. There is no public access to the lake. The lake's surface area and watershed size (849 acres) translates to a 9:1 watershed-to-lake size ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

The 2006 CAMP data represent the first year availability of nutrient data. The lake was monitored 11 times between May and October 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	312.4	71.0	529.0	F
CLA (µg/l)	205.5	6.2	580.0	F
Secchi (m)	0.5	0.2	1.1	F
TKN (mg/l)	3.74	0.92	7.30	
Lake Grade				F

The lake received a lake grade of F for 2008 and in the previous two years. Since there are only 3 years of data, there are insufficient data to determine water quality trends. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings, were 3.1 for physical condition (3- "definite algae present"), and 3.4 for recreational suitability (between 3- "swimming slightly impaired" and 4- "no swimming; boating OK").

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.

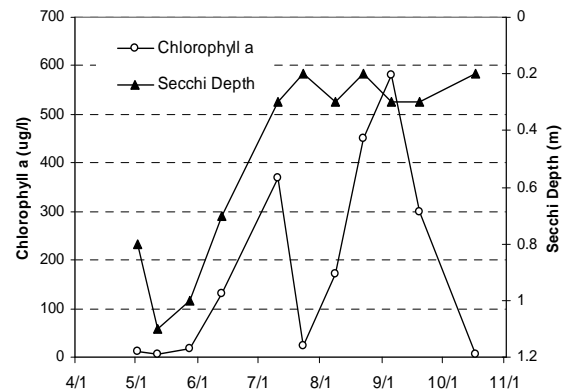
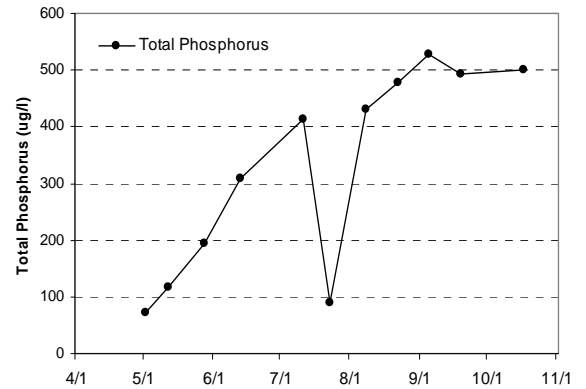
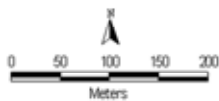
Bay Pond (Bay Lake) Baytown Twp., Washington Co.

LAKE ID: 820011

WD: Valley Branch

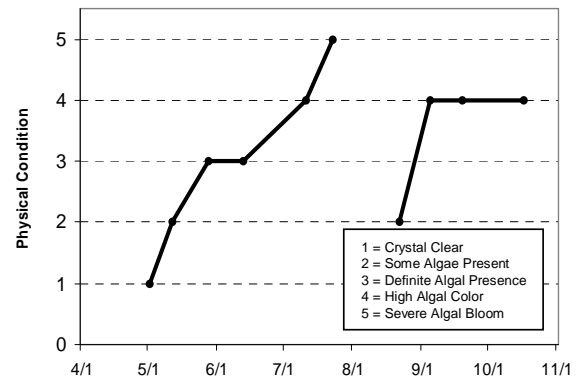
Volunteer: Folz, Freeman, Erickson, Inc.

● Sampling site
Contours in meters



2008 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	14.7				11	71		0.8	1	1
5/12	16				6.2	118		1.1	2	1
5/28	17.1				16	194		1	3	4
6/13	21.1				130	309		0.7	3	4
7/11	23.1				370	414		0.3	4	4
7/23	26.2				22	89		0.2	5	5
8/8	22.6				170	431		0.3		
8/22	25.3				450	477		0.2	2	4
9/5	16.3				580	529		0.3	4	4
9/19	22.8				300	492		0.3	4	4
10/17	10.7				5.1	501		0.2	4	4



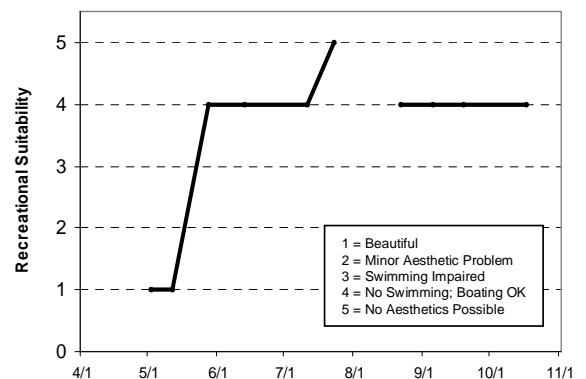
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Benton Lake (10-0069) Carver County Environmental Services

Benton Lake is a 115-acre lake 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 322-acre immediate watershed, which translates to 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). A 1999 water quality report on water resources in Carver County estimates land use for the watershed at: 19 percent residential, 55 percent agricultural, 16 percent commercial/industrial, and 10 percent open/undeveloped (Carver County Planning 1999).

The lake was monitored 14 times between mid-April and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	209.7	90.0	426.0	F
CLA (µg/l)	201.9	70.0	530.0	F
Secchi (m)	0.3	0.1	0.5	F
TKN (mg/l)	8.35	3.50	19.00	
Lake Grade				F

The lake received a lake grade of F for 2008, similar to lake grades received for the years 1999-2001, 2003, and 2007. The lake's water quality appears to be best represented by a lake grade of F.

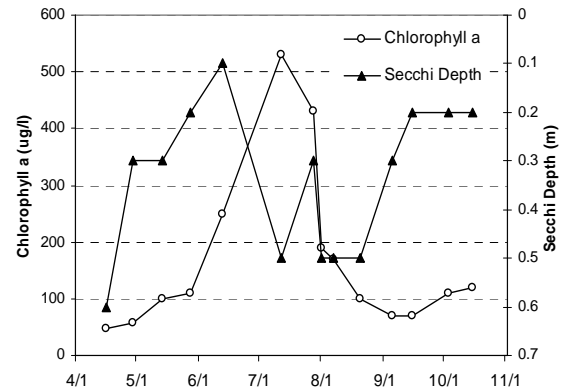
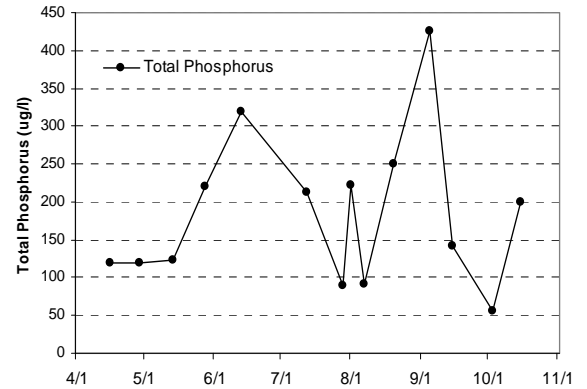
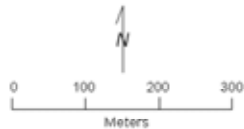
Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake's associated information sheet on the following page. The average user perception rankings, on a 1-to-5 scale, were 4.3 for physical condition (between 4- "high algal color" and 5-"severe algal bloom"), and 4.4 for recreational suitability (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.

Lake Benton Cologne, Carver Co.

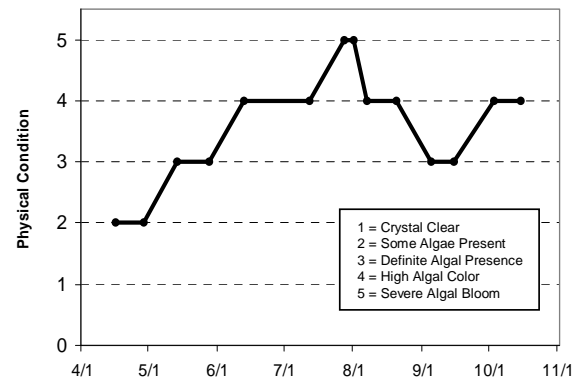
Lake ID: 100069
WMO: Carver County
Volunteer: Don Smith

● Sampling site
Contours in meters



2008 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					48	120		0.6	2	4
4/29	8				58	119		0.3	2	4
5/14	16				99	124		0.3	3	5
5/28	15				110	220		0.2	3	5
6/13	19				250	319		0.1	4	5
7/12	22				530	212		0.5	4	5
7/28	21				430	90		0.3	5	5
8/1	22				190	222		0.5	5	5
8/7	27				170	92		0.5	4	5
8/20	27				100	250		0.5	4	5
9/5	18				70	426		0.3	3	5
9/15	17				70	142		0.2	3	5
10/3	14				110	56		0.2	4	4
10/15	10				120	200		0.2	4	5



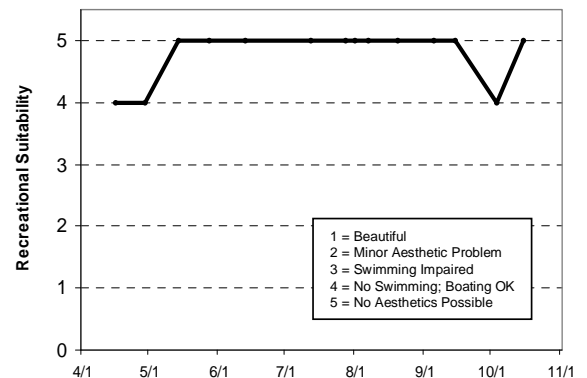
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008
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



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 (9 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 lake was monitored 14 times during the monitoring period. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	85.3	64.0	120.0	D
CLA (µg/l)	18.3	4.9	42.0	B
Secchi (m)	1.6	0.8	2.3	C
TKN (mg/l)	1.70	1.30	2.30	
Lake Grade				C

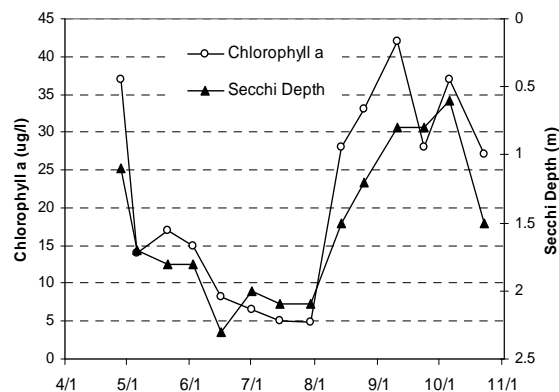
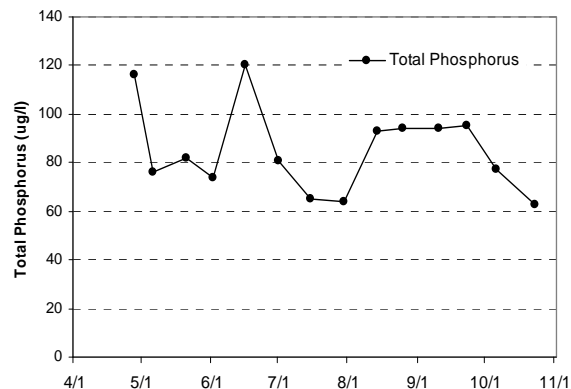
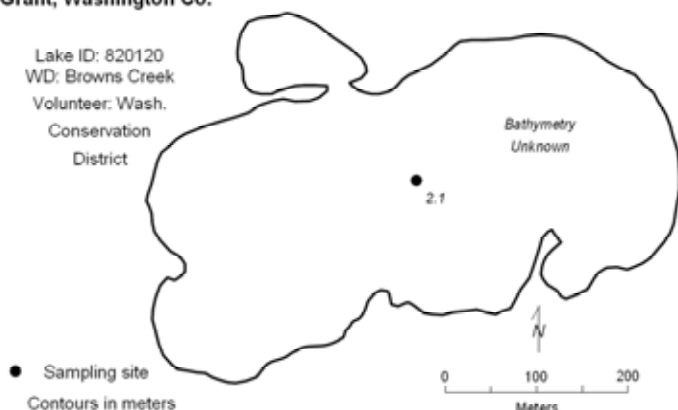
The lake received a lake grade of C in 2008 which was a significant improvement from previous monitoring years which received either an F or D lake grade. The summer-time means, maximums, and minimums for all four water quality parameters were indicative of better water quality for 2008 than in 2005 – 2007. Furthermore, mean summer-time water clarity was better for 2008 than 1998. 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) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 2.8 for physical condition (between 2- "Some algae present" and 3- "definite algae present"), and 3.6 for recreational suitability (between 3- "swimming slightly impaired" and 4- "No Swimming/Boating OK").

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.

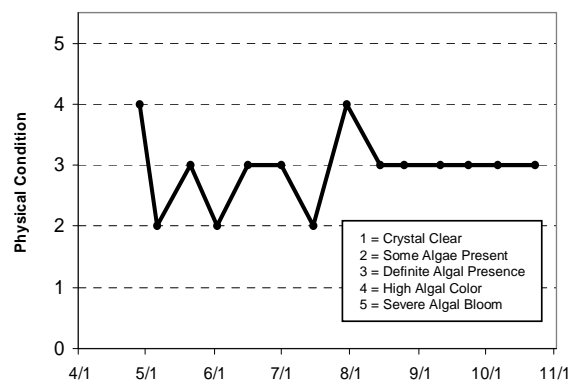
Benz Lake Grant, Washington Co.

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



2008 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	8.4	8.3	11.09	10.76	37	116		1.1	4	2
5/6	15.3	12.5	10.35	0.76	14	76		1.7	2	3
5/21	17.6	16.2	8.71	0.27	17	82		1.8	3	4
6/2	21.5	19.1	8.03	7.78	15	74		1.8	2	3
6/16	22.3	21.5	7.54	7.49	8.2	120		2.3	3	4
7/1	26.2	24.8	10.91	2.24	6.6	81		2	3	4
7/15	24.9	23.9	8.46	0.67	5.1	65		2.1	2	3
7/30	28.8	26.8	8.27	0.48	4.9	64		2.1	4	4
8/14	24.7	24.2	5.7	1.11	28	93		1.5	3	3
8/25	24.7	23	8.04	0.15	33	94		1.2	3	4
9/10	18.5	18.5	8.91	0.18	42	94		0.8	3	4
9/23	20.8	20.7	6.88	0.35	28	95		0.8	3	4
10/6	14.5	14.7	12.3	0.31	37	77		0.6	3	3
10/23	9.7	9.9	9.75	0.59	27	63		1.5	3	3



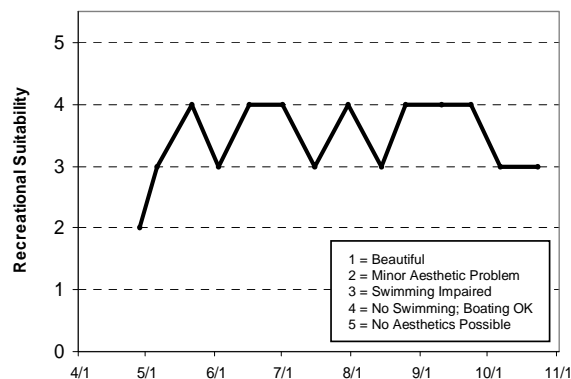
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Beutel Pond (82-0399) Valley Branch Watershed District

Beutel Pond is located in Lake Elmo. The bathymetry of the lake is unknown other than that the maximum depth is 1.1 m (3.5 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. A search through the STORET system provided no historical water quality data.

Beutel Pond was monitored 7 times during the monitoring period. 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.

2008 summer (May-September) data summary

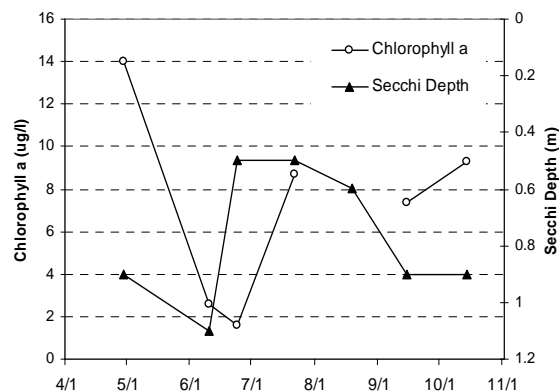
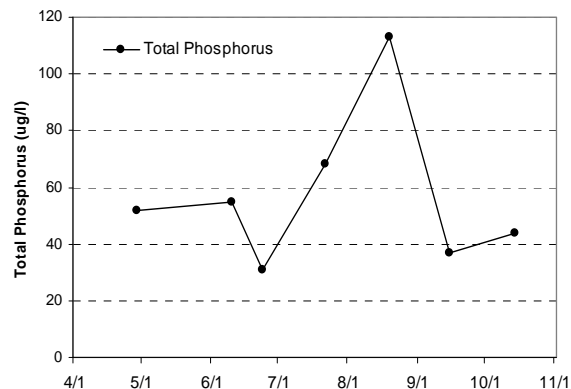
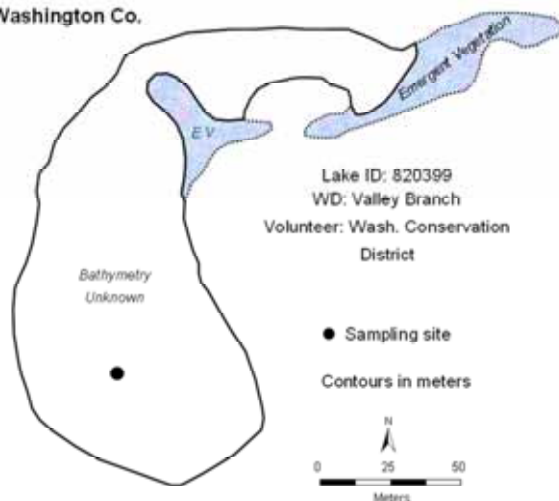
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	60.8	31.0	113.0	C
CLA (µg/l)	5.1	1.6	8.7	NA
Secchi (m)	0.7	0.5	1.1	D
TKN (mg/l)	1.82	1.10	2.70	
Lake Grade				NA

There were insufficient data to calculate a grade for CLA (at least 5 data points for the summer-time period are required). Therefore a lake grade was not determined either. 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) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 2.8 for physical condition (between 2- "Some algae present" and 3- "definite algae present"), and 3.6 for recreational suitability (between 3- "swimming slightly impaired" and 4- "No Swimming/Boating OK").

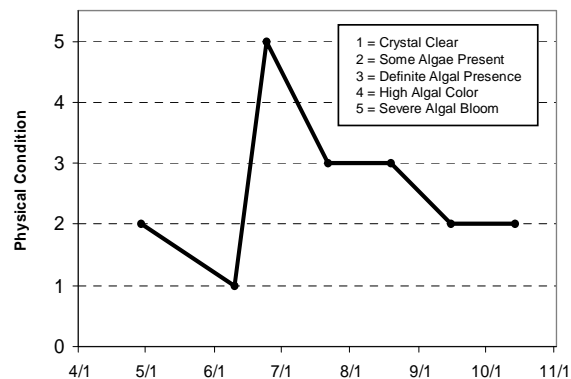
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Beutel Pond Lake Elmo, Washington Co.



2008 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	6.4	5.6	12.6	8.56	14	52		0.9	2	2
6/10	20.4	20.3	5.16	5.53	2.6	55		1.1	1	2
6/24	24.3	23.4	6.9	0.53	1.6	31		0.5	5	4
7/22	23.3	21.5	3.76	0.21	8.7	68		0.5	3	4
8/19	27.9	21.2	8.35	0.23		113		0.6	3	4
9/15	17	15.9	5.91	0.67	7.4	37		0.9	2	4
10/14	12.6	12.7	8.43	8.1	9.3	44		0.9	2	4



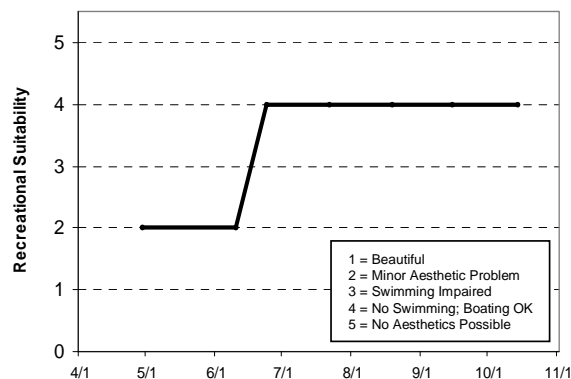
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Big Carnelian Lake (82-0049) *Carnelian - Marine 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. The lake covers an area of 455 acres and has a maximum and mean depth of 20 m (roughly 66 feet) and 9.8 m (32 feet). Roughly 28 percent of the lake's area is considered littoral, the shallow (0-15 foot depth) area dominated by aquatic vegetation. The approximate volume of the lake is 14,560 acre-feet (ac-ft). The lake's watershed of 1,900 acres translates to a rather small watershed-to-lake size ratio of 4:1. The larger the ratio the greater the potential stress put on the lake from surface.

Big Carnelian Lake was monitored 6 times between early-May and late-October 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
Secchi (m)	3.3	2.1	5.5	A

The lake received a grade of A for water clarity for 2008, which is consistent with the historical database. A lake grade was not determined because total phosphorus and chlorophyll-a were not monitored in 2008. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The resulting user perception rankings are shown on the information sheet. The mean physical condition ranking was 1.6 (between 1- "crystal clear" and 2- "some algae present"), while the mean recreational suitability ranking was 1.6 (between 1- "beautiful" and 2- "minor aesthetic problem").

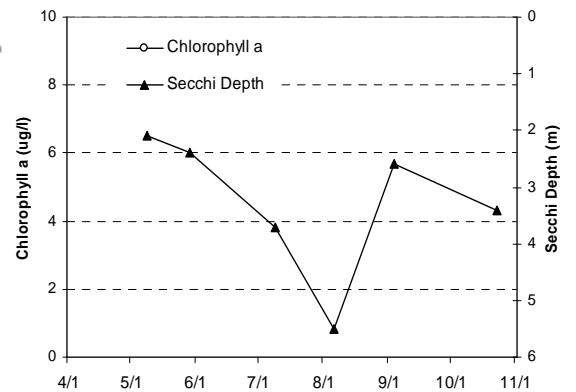
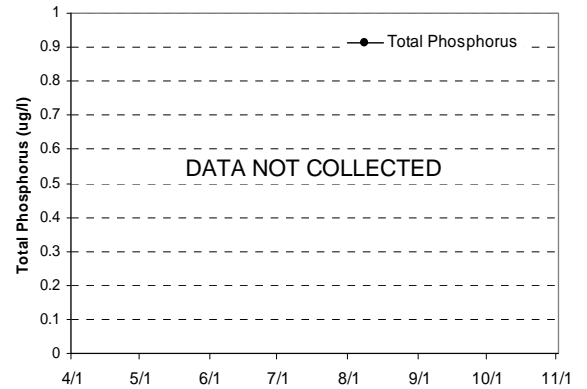
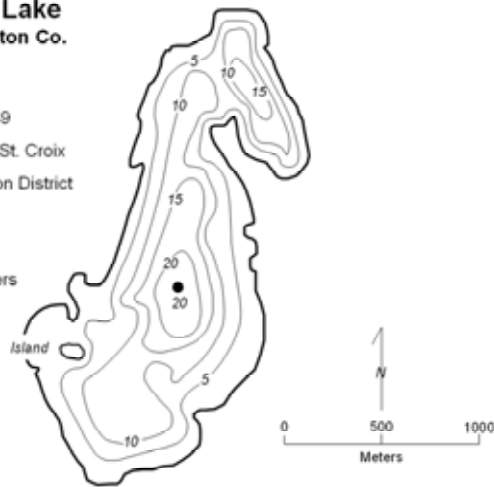
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Big Carnelian Lake May Twp., Washington Co.

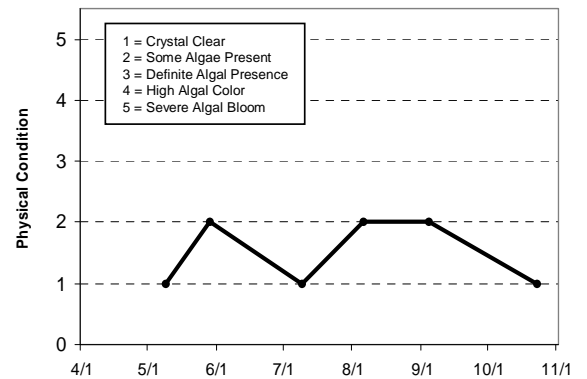
LAKE ID: 820049
WD: Carnelian-Marine-St. Croix
Washington Conservation District

● Sampling site
Contours in meters



2008 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
5/9	11.3	6.9	12.5	0.48				2.1	1	1
5/29	16.6	7.4	11.1	0.14				2.4	2	3
7/9	24.7	7.6	8.26	0.35				3.7	1	1
8/6	25.8	7.6	7.31	0.22				5.5	2	1
9/4	22.2	0.16	7.01	7.6				2.6	2	2
10/23	12.5	7.9	7.57	0.32				3.4	1	1



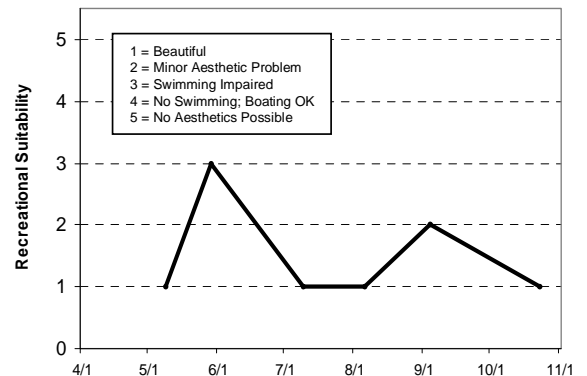
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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). Roughly 41 percent of the lake's area is considered littoral, the shallow (0-15 foot) depth area dominated by aquatic vegetation. An in-depth lake assessment was undertaken on the lake by the MPCA in 1994, and a lake and watershed diagnostic/feasibility study was completed by Blue Water Science in the early-2000's.

Big Comfort Lake was monitored 14 times between early May and late September 2008. 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.

2008 summer (May-September) data summary

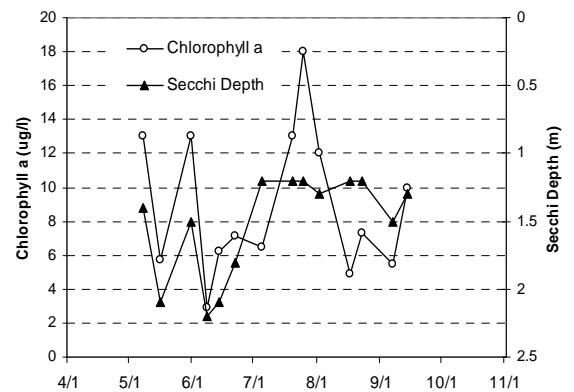
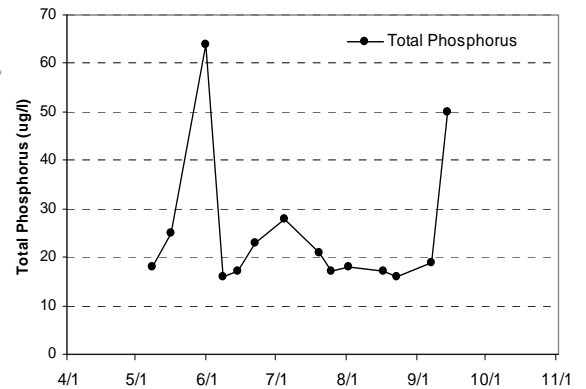
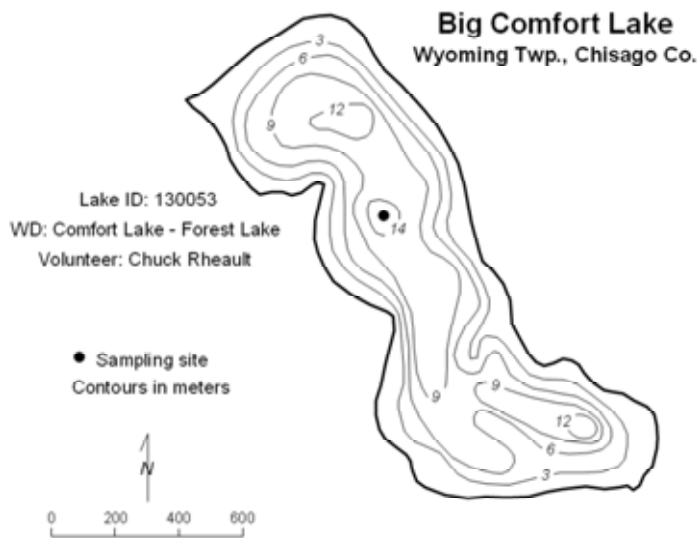
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	24.9	16.0	64.0	B
CLA (µg/l)	8.9	2.9	18.0	A
Secchi (m)	1.5	1.2	2.2	C
TKN (mg/l)	1.29	0.86	2.30	
Lake Grade				B

The lake received a lake grade of B for 2008. The 2008 lake grade appears to be better than most previous years because of its lower mean summer-time concentrations of CLA and TP. The water quality of 2007 still appears to be the best year so far, because of greater summer-time mean water clarity, lower summer-time mean TP concentrations, and the second lowest summer-time mean CLA concentration. The lowest summer-time mean CLA concentration observed was in 2008. The lake typically receives a grade of C for Secchi depth. However, a trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant strong declining trend in water clarity (MPCA 2008). 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) ranked their opinions of the lake's recreational conditions on a 1-to-5 scale. The resulting user perception rankings are shown on the information sheet. The mean recreational suitability ranking was 1.0 (1- "beautiful"). No observations were given by the volunteer for physical condition perceptions.

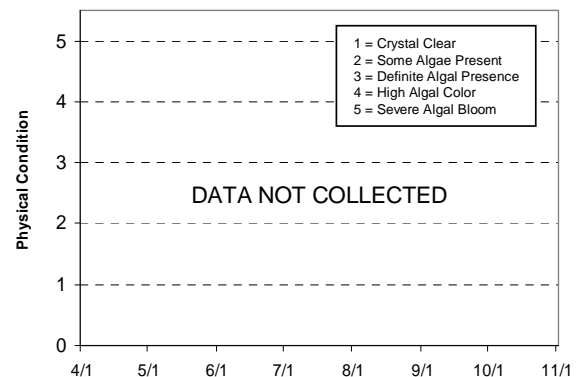
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 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
5/8	13.3				13	18		1.4		
5/16	15.4				5.7	25		2.1		
5/31	17.1				13	64		1.5		
6/8					2.9	16		2.2		1
6/14	21.5				6.2	17		2.1		
6/22	22.4				7.1	23		1.8		
7/5	24.4				6.5	28		1.2		
7/20	25.2				13	21		1.2		
7/25	26.7				18	17		1.2		
8/2	26.3				12	18		1.3		1
8/17	25				4.9	17		1.2		
8/23	23.9				7.3	16		1.2		
9/7	20.5				5.5	19		1.5		
9/14	18.4				10	50		1.3		



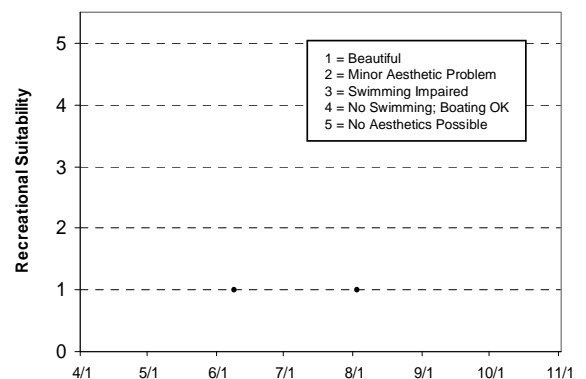
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					
Chlorophyll a					
Secchi Depth					
Lake Grade					

Source: Metropolitan Council and STORET data



Big Marine Lake (82-0052) Carnelian - Marine 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. The lake covers an area of 1,706 acres and has a maximum and mean depth of 15.2 m (roughly 50 feet) and 7.6 m (25 feet). Roughly 67 percent of the lake's area is considered littoral, the shallow (0-15 foot depth) area dominated by aquatic vegetation. The approximate volume of the lake is 42,527 acre-feet (ac-ft). The lake's watershed of 2,659 acres translates to a small watershed-to-lake size ratio of 1.5:1. 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*).

Big Marine Lake was monitored seven times between early May and late October 2008. 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.

2008 summer (May-September) data summary

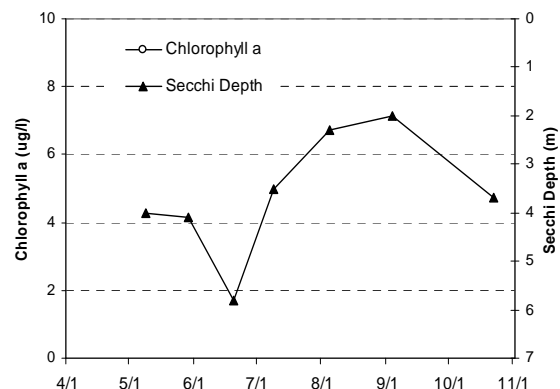
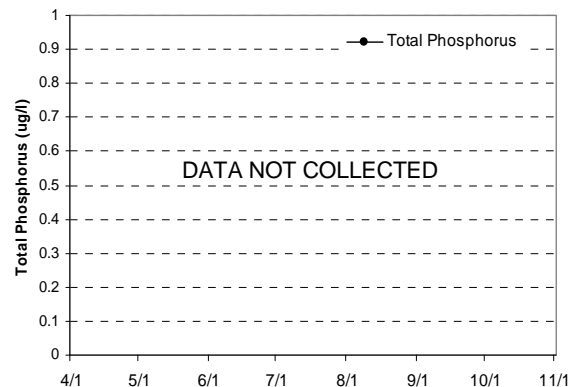
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
Secchi (m)	3.6	2.0	5.8	A

The lake received a letter grade of A for water clarity which is consistent with the historical data. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The resulting user perception rankings are shown on the information sheet. The mean physical condition ranking was 2.2 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability ranking was 2.0 (2- "minor aesthetic problem").

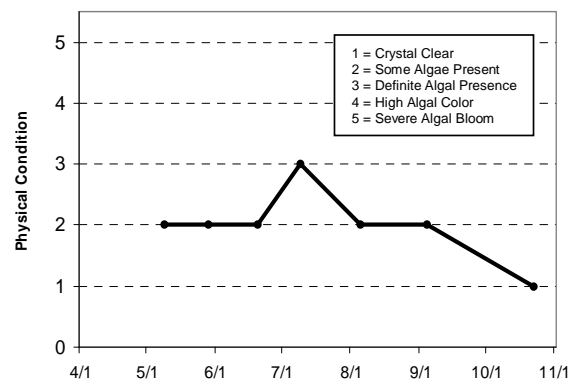
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 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
5/9	12.1	9.7	11.35	0.44				4	2	2
5/29	15.8	13.2	9.61	0.12				4.1	2	2
6/20	22.1	15.3	9.19	0.99				5.8	2	1
7/9	23.9	13.9	7.29	0.31				3.5	3	2
8/5	25.2	14.5	5.94	0.17				2.3	2	3
9/4	21.6	14.5	6.73	0.17				2	2	2
10/22	12	12	9.21	0.49				3.7	1	1



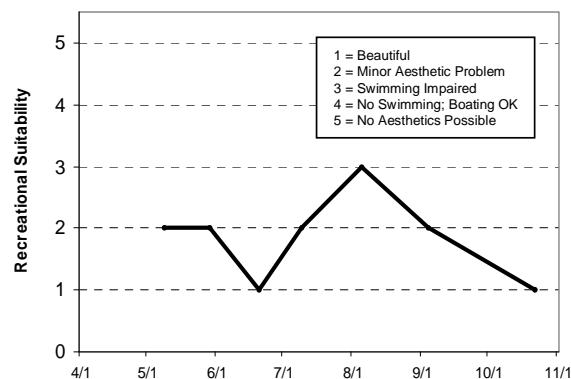
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



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

Bone Lake is located in New Scandia Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value. The lake has a surface area of 212 acres. It receives flow through three inlets. The lake has a public access on its northwestern side and has a maximum and mean depth of 9.8 m and 3.7 m (32 and 12 feet), respectively. The approximate lake volume of Bone Lake is 2,820 ac-ft. Roughly 59 percent of the lake is considered littoral zone, that is, the area of aquatic plant dominance. The lake's 5,177-acre watershed translates to a rather large watershed-to-lake size 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*).

The lake was monitored 15 times between mid May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	41.1	25.0	87.0	C
CLA (µg/l)	19.7	6.8	40.0	B
Secchi (m)	1.8	1.0	3.4	C
TKN (mg/l)	1.54	1.10	2.60	
Lake Grade				C

The lake received a lake grade of C for 2008 which is consistent with the historical database. The lake appears to be represented best by a lake grade of C. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

Throughout the summer, the volunteer(s) ranked the lake's perceived physical and recreational conditions on a 1-to-5 scale (see lake information sheet). The mean rankings were 2.4 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 2.2 for recreational suitability (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

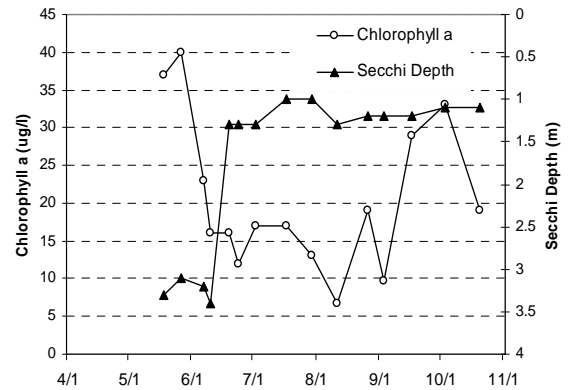
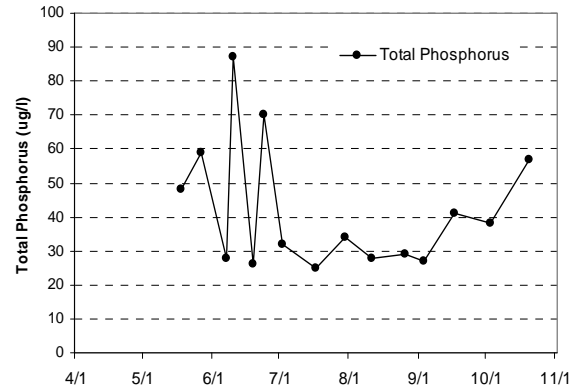
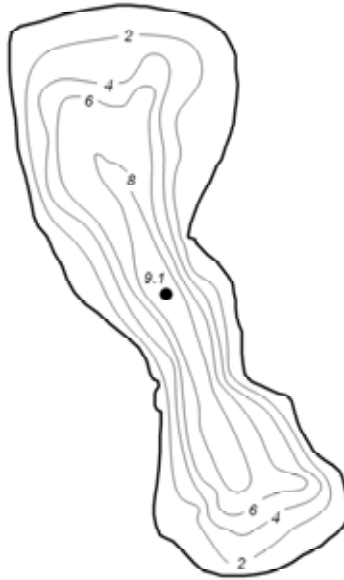
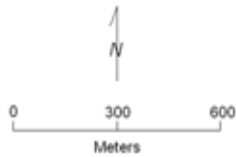
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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Bone Lake Scandia, Washington Co.

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

● Sampling site
Contours in meters



2008 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
5/18	16				37	48		3.3	3	2
5/27	19				40	59		3.1	3	2
6/7	21				23	28		3.2	2	2
6/10	22				16	87		3.4	2	2
6/19	25.7				16	26		1.3	2	2
6/24	25.8				12	70		1.3		
7/2	24.8				17	32		1.3	2	2
7/17	26.9				17	25		1	2	2
7/30	27.8				13	34		1	2	2
8/11	25.7				6.8	28		1.3	2	2
8/26	24				19	29		1.2	2	2
9/3	22.9				9.7	27		1.2		
9/17	21				29	41		1.2	4	4
10/3	17.5				33	38		1.1	4	4
10/20	14.7				19	57		1.1	3	3

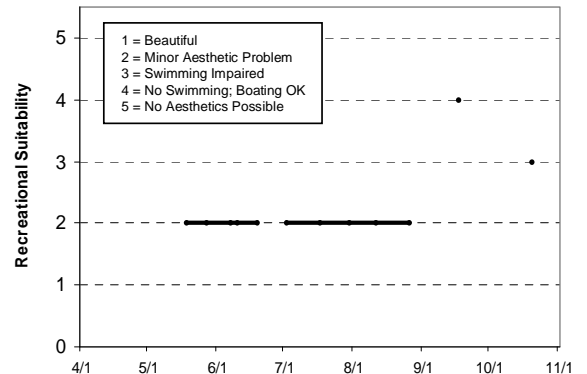
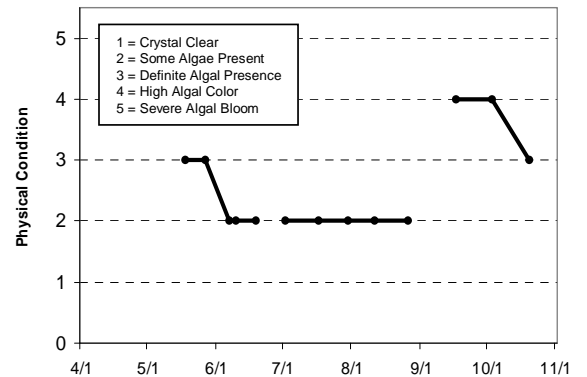
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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. The morphometry of the lake is unknown. 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 was the first year that Brick Pond has been involved in the CAMP. A search through the STORET system provided no historical water quality data.

The lake was monitored 7 times between mid April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	123.6	58.0	172.0	D
CLA (µg/l)	7.0	2.9	13.0	A
Secchi (m)	1.2	0.9	1.5	D
TKN (mg/l)	1.33	0.67	1.80	
Lake Grade				C

The lake received a lake grade of C for year 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 2008. 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 (e.g. sediment) 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 CAMP data. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

Throughout the summer, the volunteer(s) ranked the lake's perceived physical and recreational conditions on a 1-to-5 scale (see lake information sheet). The average user perception rankings, on a 1-to-5 scale, were 2.4 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 3.6 for recreational suitability (between 3- "swimming slightly impaired and 4- "no swimming/boating ok").

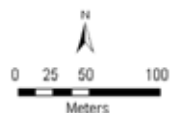
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Brick Pond
Stillwater, Washington Co.

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

● Sampling site
Contours in meters



2008 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	15.7	11.1	11.9	1.8	22	79		1.1	2	3
5/21	18.8	15.2	10.36	0.28	4	146		1.5	2	3
6/18	24.5	19.1	11.32	2.06	13	172		1.5	2	4
7/16	25	23	8.37	0.67	4.1	83		0.9	2	4
8/14	24	21.8	7.81	0.98	11	159		1.2	3	4
9/10	18	17.4	12.06	0.2	2.9	58		0.9	3	3
10/10	13.3	12.8	12.02	7.43	3.2	47		1.2	2	4

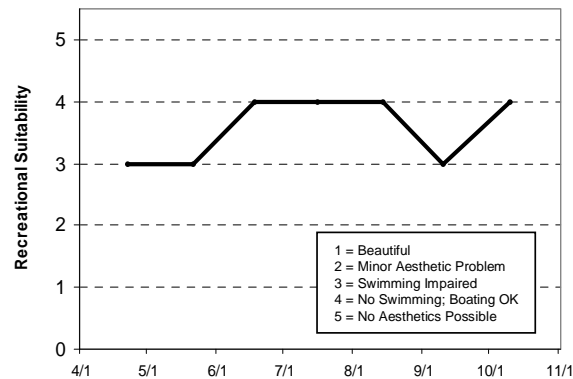
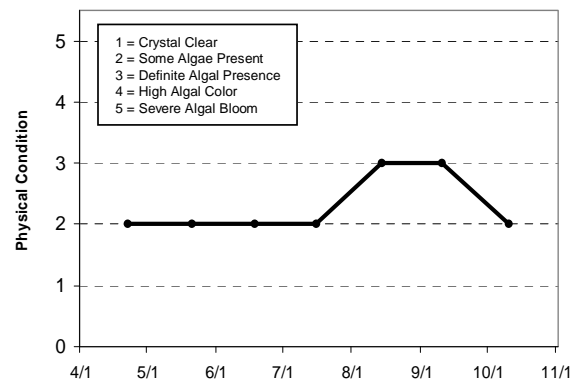
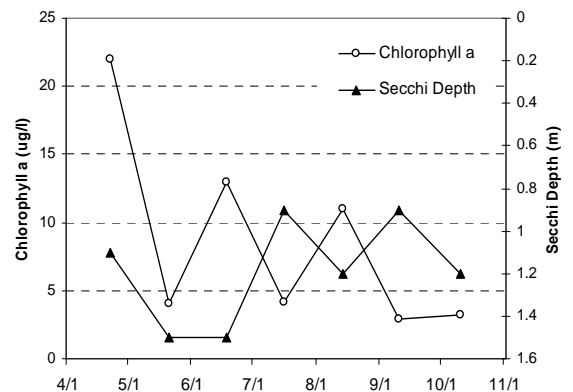
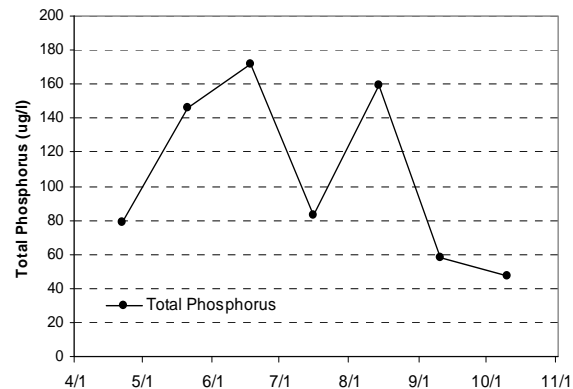
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					D
Chlorophyll a					A
Secchi Depth					D
Lake Grade					C

Source: Metropolitan Council and STORET data



Brickyard Lake (10-0225) Carver County Environmental Services

Brickyard Lake is a 17-acre lake located near the City of Chaska (Carver County). The maximum depth of the lake is 13.1 m (roughly 43 feet). Thirty-five percent of the lake's surface area is considered littoral zone (area of aquatic plant dominance).

The lake was monitored 14 times between mid-April and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	29.0	10.0	106.0	B
CLA (µg/l)	3.5	1.5	6.7	A
Secchi (m)	4.5	1.3	6.5	A
TKN (mg/l)	0.98	0.60	1.30	
<i>Lake Grade</i>				A

The lake received a lake grade of A for 2008. The lake's water quality is well represented by a lake grade of A in an historical context as well. The relatively higher TP summer-time mean concentration observed in 2008 was heavily influenced by a single spike in TP on September 15. Otherwise, the TP concentrations in 2008 were of similar magnitude as those in the historical database.

Throughout the summer, the volunteer(s) ranked the lake's perceived physical and recreational conditions on a 1-to-5 scale (see lake information sheet). The average user perception rankings, on a 1-to-5 scale, were 1.3 for physical condition (between 1- "crystal clear" and 2-"some algae present"), and 1.4 for recreational suitability (between 1- "beautiful" and 2-"minor aesthetic problem").

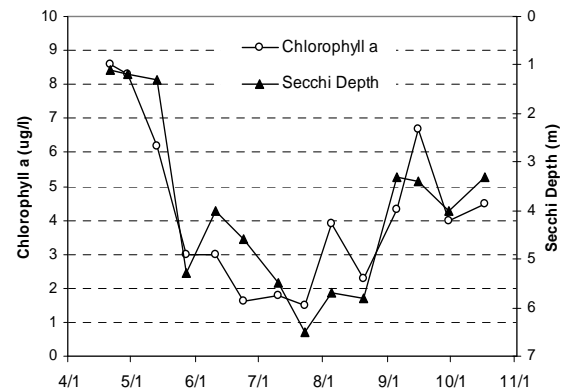
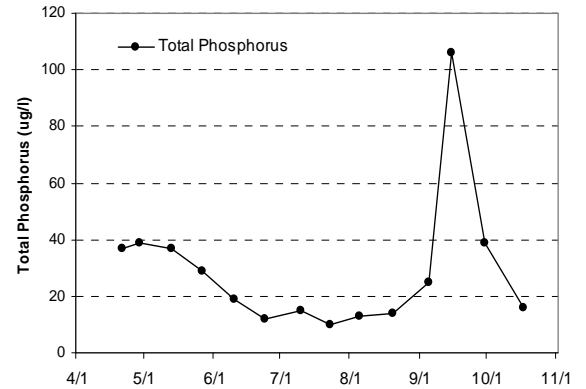
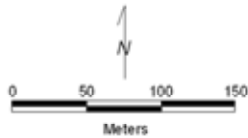
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Brickyard Lake Chaska, Carver Co.

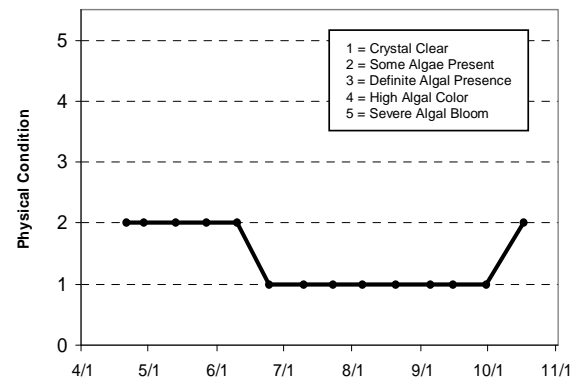
Lake ID: 100225
WMO: Carver County
Volunteer: Carver County

● Sampling site
Contours in meters



2008 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	12.48		14.27		8.6	37		1.1	2	4
4/29	8.7		13.1		8.3	39		1.2	2	4
5/13	15.09		15.02		6.2	37		1.3	2	2
5/27	17.95		8.86		3	29		5.3	2	3
6/10	20.99		8.08		3	19		4	2	2
6/24	24.43		10.11		1.6	12		4.6	1	1
7/10	24.94		8.81		1.8	15		5.5	1	1
7/23	26.21		6.98		1.5	10		6.5	1	1
8/5	25.86		7.41		3.9	13		5.7	1	1
8/20	25.76		9.02		2.3	14		5.8	1	1
9/5	22.05		8.47		4.3	25		3.3	1	1
9/15	19.85		6.54		6.7	106		3.4	1	1
9/30	19.29		7.27		4	39		4	1	1
10/17	14.45		6.86		4.5	16		3.3	2	2



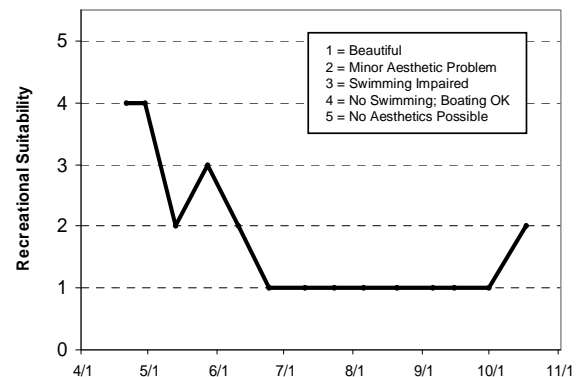
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



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

Bush Lake, 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. The lake has a surface area of 172 acres and has a maximum depth of 8.5 m (29 feet). Sixty-four percent of the lake's surface area is considered littoral zone (area of aquatic plant dominance). The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

This is the third year that Bush Lake has been enrolled in the CAMP. The lake had been monitored by Council staff in the past. The lake was monitored 13 times between early May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	15.9	10.0	25.0	A
CLA (µg/l)	5.4	1.6	10.0	A
Secchi (m)	3.1	2.1	4.6	A
TKN (mg/l)	0.88	0.55	1.10	
Lake Grade				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 and 1993. The water quality of the lake appears to fluctuate between a lake grade of A and B on the basis of the historical database. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

Throughout the monitoring season, the volunteer monitor ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. The mean perceived physical condition was 2.1 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability was 1.6 (between 1- "beautiful" and 2- "minor aesthetic problem").

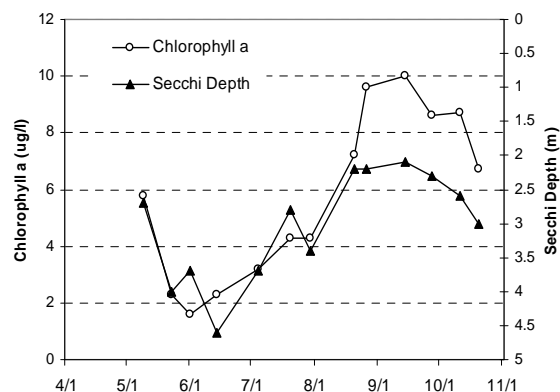
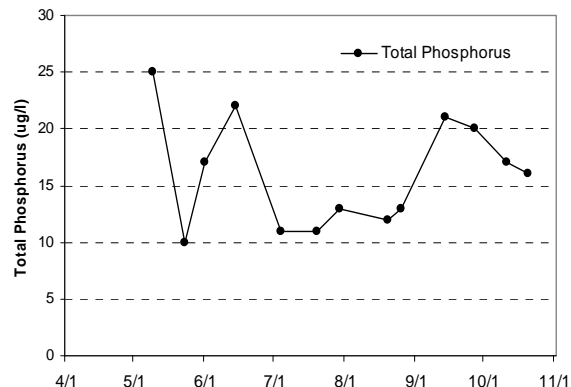
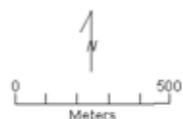
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Bush Lake Bloomington, Hennepin Co.

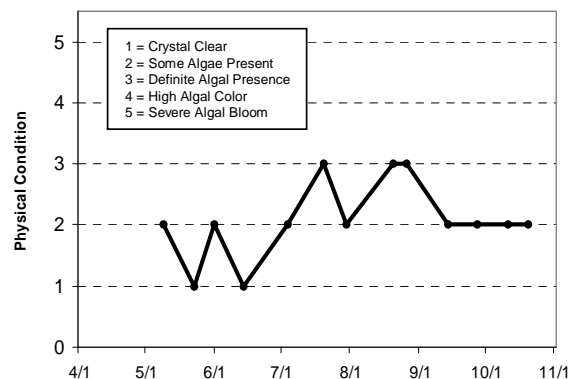
Lake ID: 270047
WD: Nine Mile Creek
Volunteer: Gregg Thompson

● Sampling site
Contours in meters



2008 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
5/9	16				5.8	25		2.7	2	1
5/23	18				2.3	10		4	1	1
6/1	22				1.6	17		3.7	2	1
6/14	22				2.3	22		4.6	1	1
7/4	25.9				3.2	11		3.7	2	2
7/20	27.2				4.3	11		2.8	3	2
7/30	28.7				4.3	13		3.4	2	2
8/20	27.4				7.2	12		2.2	3	
8/26	24.6				9.6	13		2.2	3	2
9/14	19.9				10	21		2.1	2	2
9/27	20.6				8.6	20		2.3	2	2
10/11	16.4				8.7	17		2.6	2	2
10/20	14				6.7	16		3	2	2



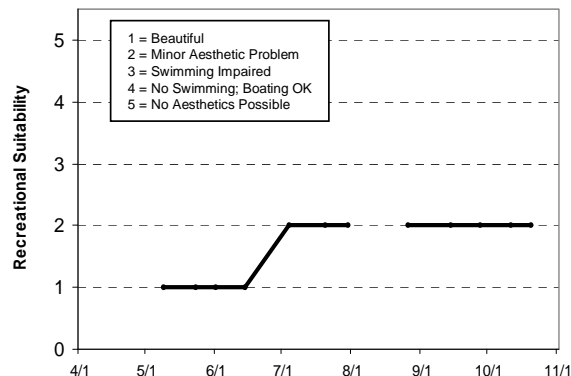
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

This is the first year that Capaul's Pond was monitored as part of the CAMP. A search through the STORET system revealed no historical water monitoring data for this water body. The basin was monitored 7 times between April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	88.2	63.0	111.0	D
CLA (µg/l)	30.6	16.0	48.0	C
Secchi (m)	1.1	0.9	1.4	D
TKN (mg/l)	1.96	1.60	2.60	
Lake Grade				D

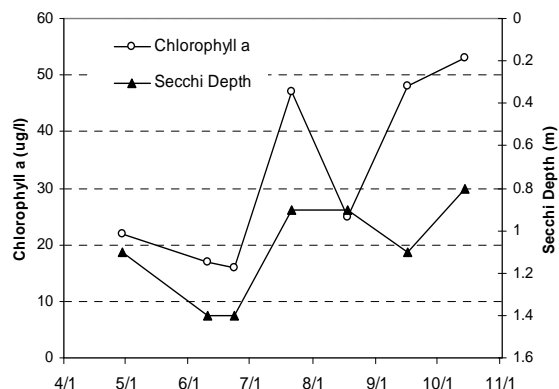
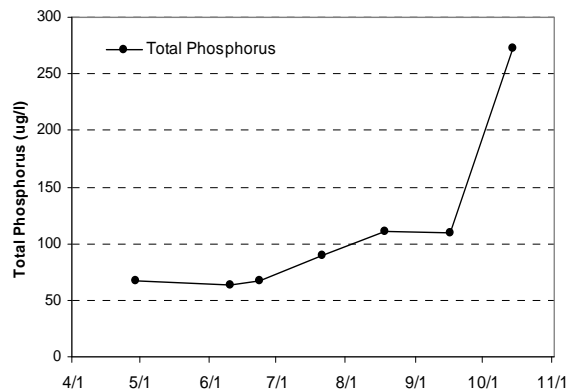
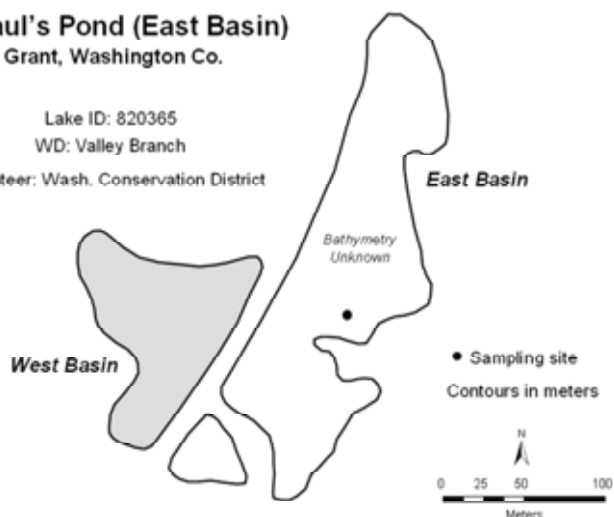
For 2008, the lake received a lake grade of D. Additional years of monitoring are suggested to build an historical water quality database for this lake.

Throughout the monitoring season, the volunteer monitor ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. The mean perceived physical condition was 3.0 (3- "definite algae present"), while the mean recreational suitability was 4.0 (4- "no swimming/boating ok").

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.

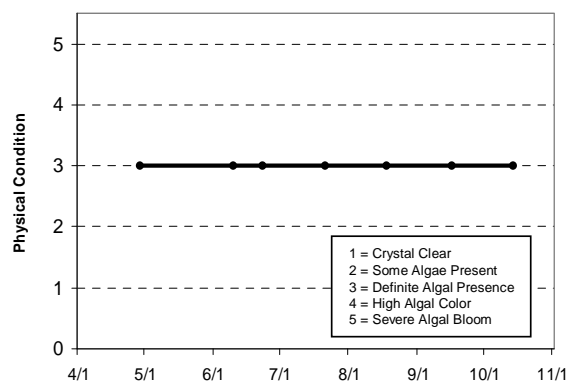
Capaul's Pond (East Basin) Grant, Washington Co.

Lake ID: 820365
WD: Valley Branch
Volunteer: Wash. Conservation District



2008 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	9.3	7.1	12.15	9.75	22	67		1.1	3	4
6/10	21.4	18.6	9.38	0.21	17	63		1.4	3	4
6/23	25.8	21.8	9.55	0.54	16	67		1.4	3	4
7/21	27.3	23.5	8.35	0.25	47	90		0.9	3	4
8/18	28.3	23.3	9.89	0.22	25	111		0.9	3	4
9/16	20.2	17.3	12.54	0.29	48	110		1.1	3	4
10/14	13.6	13.2	8.99	0.32	53	272		0.8	3	4



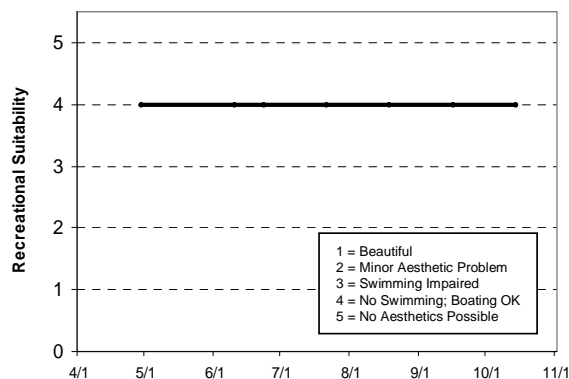
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					D
Chlorophyll a					C
Secchi Depth					D
Lake Grade					D

Source: Metropolitan Council and STORET data



Capaul's Pond [west 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 west basin. The basin is to the west of the Gateway State Trail.

This is the first year that Capaul's Pond was monitored as part of the CAMP. A search through the STORET system revealed no historical water monitoring data for this water body. The basin was monitored 7 times between April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	66.6	47.0	96.0	C
CLA (µg/l)	6.4	3.2	11.0	A
Secchi (m)	0.9	0.8	1.2	D
TKN (mg/l)	1.22	0.82	1.50	
Lake Grade				C

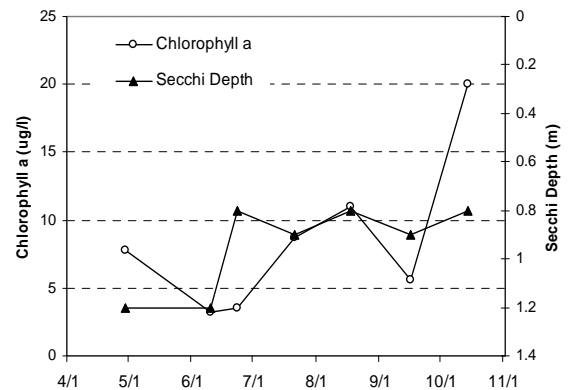
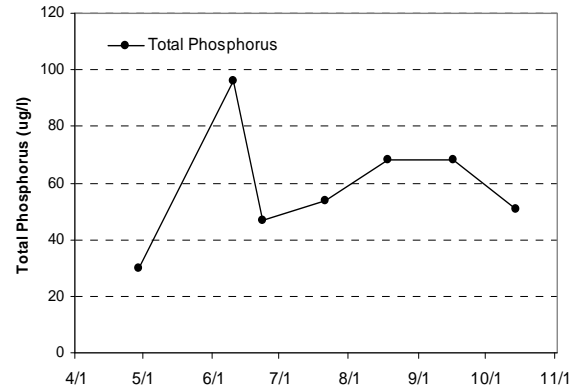
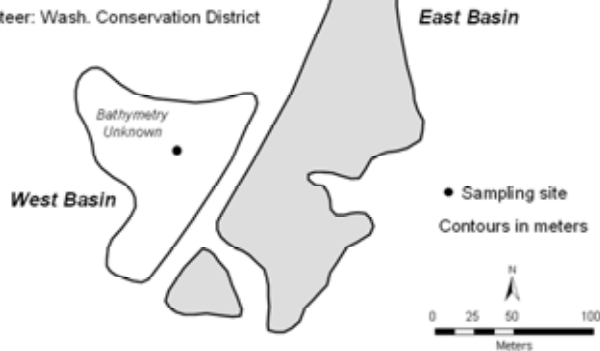
For 2008, the lake received a lake grade of C which is better water quality than the east basin. The concentration of CLA was notably less in the west basin than in the east basin but the water clarity was similar for both basins. This may indicate that the water clarity of the west basin may be more influenced by suspended solids from surface runoff or resuspension of basin sediment (as opposed to algal abundance) than in the east basin. Additional years of monitoring are suggested to determine water quality trends.

Throughout the monitoring season, the volunteer monitor ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. The mean perceived physical condition was 2.8 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability was 4.0 (4- "no swimming/boating ok").

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.

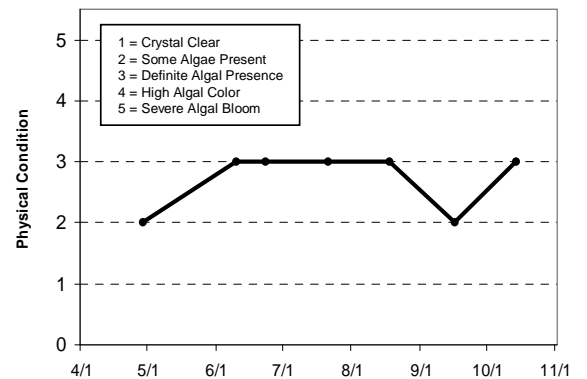
Capaul's Pond (West Basin) Grant, Washington Co.

Lake ID: 820365
WD: Valley Branch
Volunteer: Wash. Conservation District



2008 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	9	7.5	14.33	5.11	7.8	30		1.2	2	3
6/10	22.1	19.1	11.93	0.46	3.2	96		1.2	3	4
6/23	25.6	23.4	10.68	0.62	3.5	47		0.8	3	4
7/21	25.1	23.5	3.6	0.31	8.7	54		0.9	3	4
8/18	27	24.2	6.7	2.12	11	68		0.8	3	4
9/16	20.7	17.6	8.56	10.03	5.6	68		0.9	2	4
10/14	13.5	12.8	9.57	11.21	20	51		0.8	3	4



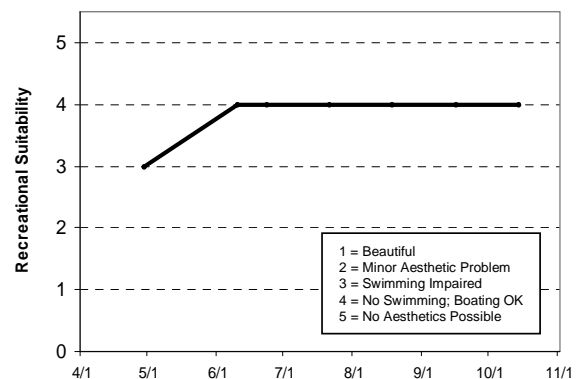
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					C
Chlorophyll a					A
Secchi Depth					D
Lake Grade					C

Source: Metropolitan Council and STORET data



Carol Lake (82-0017) Carnelian - Marine Watershed District

Carol Lake is located within Stillwater Township (Washington County). The lake covers an area of 63 acres and has a maximum and mean depth of 1.8 m (roughly 6 feet) and 0.9 m (3 feet). Because of the shallowness of the lake, the entire lake is considered littoral, the shallow (0-15 foot depth) area dominated by aquatic vegetation, and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column). The approximate volume of the lake is 186 acre-feet (ac-ft). The lake's watershed of 375 acres translates to a watershed-to-lake size ratio of 6:1. The larger the ratio the greater the potential stress put on the lake from surface runoff.

A search through the STORET nationwide water quality database for data on the lake revealed a fair amount of historic data (1996-2007). The lake was monitored 7 times from early may to late September 2008. 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.

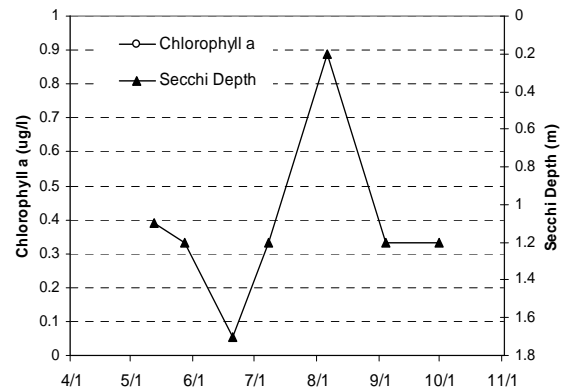
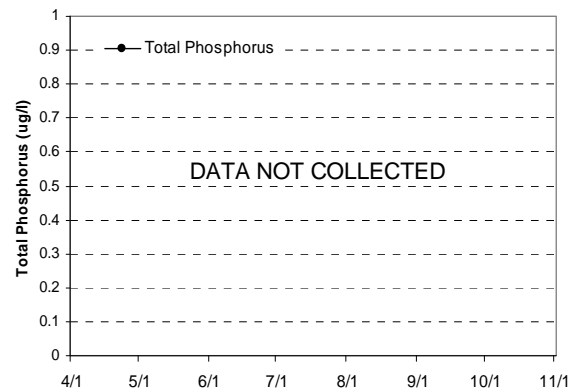
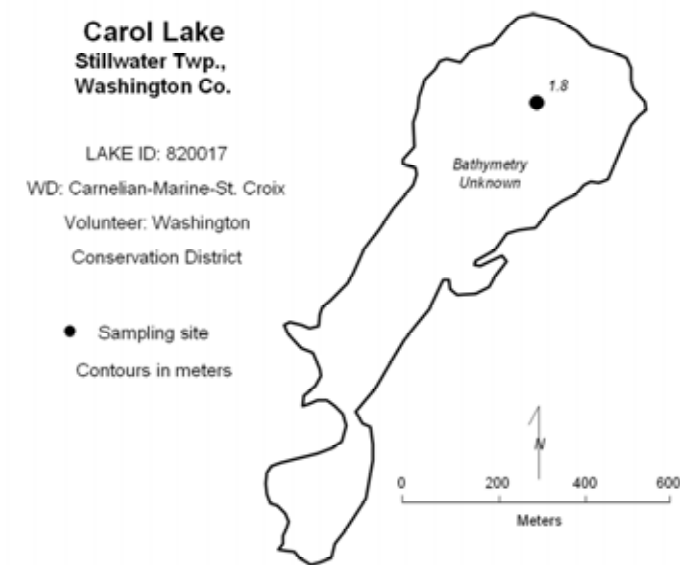
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)				
CLA (µg/l)				
Secchi (m)	1.1	0.2	1.7	D
TKN (mg/l)				
<i>Lake Grade</i>				

The Secchi depth grade for 2008 was a D, which is the same grade the lake has been receiving for water clarity since 2002. The water clarity of the lake has degraded since the 1990's as indicated by the drop from annual B grades to annual C grades to the recent annual D grades of the 2000's.

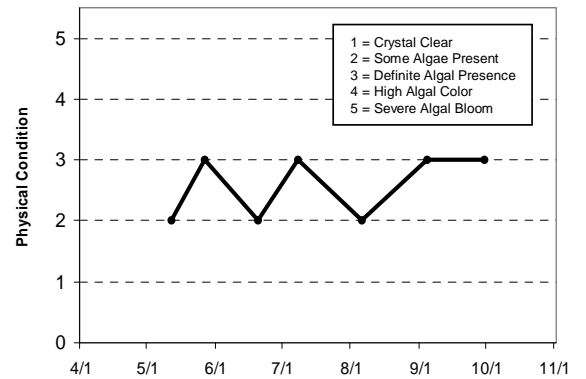
The last two graphs show seasonal variation in the lake's perceived physical condition and recreational suitability. The average user perception rankings, on a 1-to-5 scale, were 2.6 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 3.4 for recreational suitability (between 3- "swimming slightly impaired" and 4- "no swimming – boating ok").

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.



2008 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
5/12	15.5	14.5	9.77	4.95				1.1	2	2
5/27	18.6	16.6	8.76	1.43				1.2	3	4
6/20	23.3	20.1	10.3	0.18				1.7	2	4
7/8	25.3	22.8	9.23	0.68				1.2	3	4
8/6	24.1	21.9	5.31	0.18				0.2	2	4
9/4	18.8	17.9	2.43	0.23				1.2	3	4
9/30	18.3	16.7	3.78	0.32				1.2	3	2



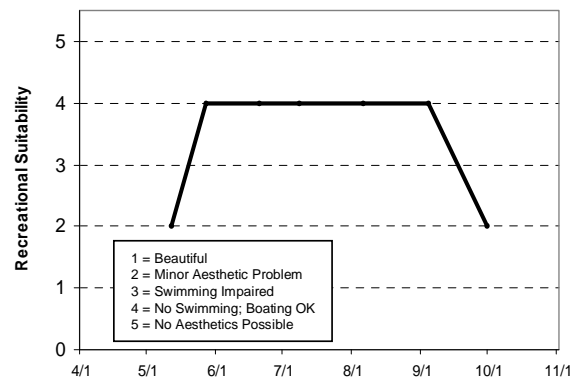
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade					B	B	B	B	B	B		C

Year	2004	2005	2006	2007	2008
Total Phosphorus	C	C	C	B	
Chlorophyll a	B	B	A	A	
Secchi Depth	D	D	D	D	D
Lake Grade	C	C	C	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 (roughly 13 feet). Because of the shallowness of the lake, its entire area is considered littoral zone (the 0-15 foot depth area dominated by aquatic vegetation), and the lake does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column). The lake has no public access. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

The lake was monitored 12 times between mid-May and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

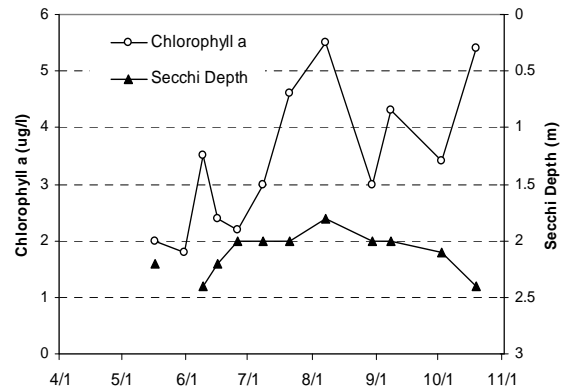
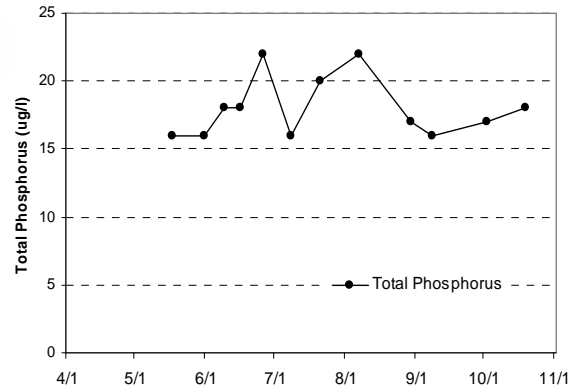
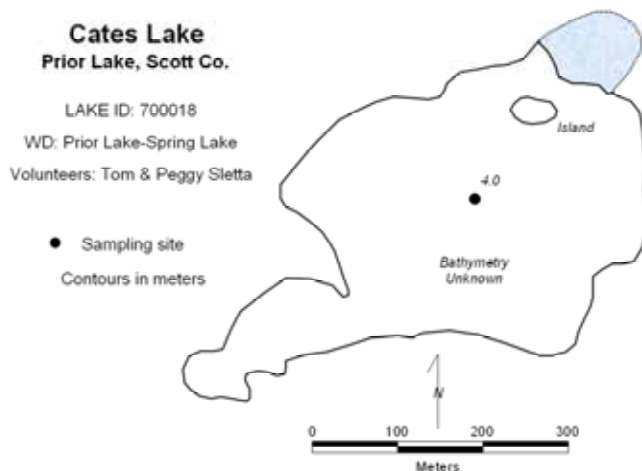
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	18.1	16.0	22.0	A
CLA (µg/l)	3.2	1.8	5.5	A
Secchi (m)	2.1	1.8	2.4	C
TKN (mg/l)	1.16	0.62	1.40	
Lake Grade				B

The lake received a lake grade of B for 2008, 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 2008 as for 2002, 2005, and 2007. The water quality of the lake appears to be relatively stable since 2002.

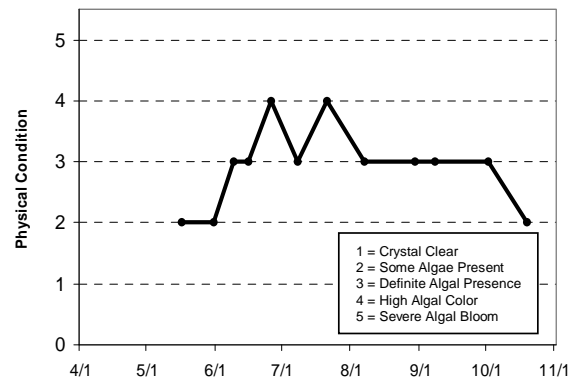
During each monitoring event, the volunteers' opinion of the lake condition was ranked on a 1-to-5 scale as shown on the lake information sheet. The average score for physical condition was 3.0 (3- "definite algae present"), and 4.0 for recreational suitability (4 - "no swimming – boating ok").

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.



2008 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	18.2				2	16		2.2	2	4
5/31	19				1.8	16		2	2	4
6/9	21.2				3.5	18		2.4	3	4
6/16	21.8				2.4	18		2.2	3	4
6/26	25				2.2	22		2	4	4
7/8	25.4				3	16		2	3	4
7/21	26.5				4.6	20		2	4	4
8/7	26.1				5.5	22		1.8	3	4
8/30	22.5				3	17		2	3	4
9/8	18.9				4.3	16		2	3	4
10/2	16.5				3.4	17		2.1	3	4
10/19	13.3				5.4	18		2.4	2	4



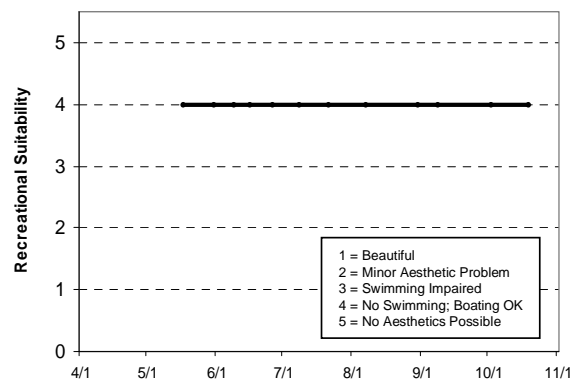
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade											B	B

Year	2004	2005	2006	2007	2008
Total Phosphorus	B	A	B	A	A
Chlorophyll a	A	A	A	A	A
Secchi Depth	C	C	C	C	C
Lake Grade	B	B	B	B	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. The lake has a surface area of 742 acres and has a maximum depth of 4.7 m (roughly 15 feet). The lake's mean depth of 2.1 m (6.9 feet) and surface area translates to an approximate lake volume of 5,194 ac-ft. Because the maximum depth is only 4.7 m (15 feet), 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).

The majority land use within the 11,104-acre contributing watershed is agricultural. The watershed-to-lake size ratio is 14:1 (the greater the ratio, the greater the potential stress on the lake from surface runoff).

This is the third year that Cedar Lake has been enrolled in CAMP. The lake had been monitored by Council staff in the past. The lake was monitored 14 times between mid-April and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	196.3	61.0	315.0	F
CLA (µg/l)	48.8	22.0	80.0	D
Secchi (m)	0.8	0.6	1.2	D
TKN (mg/l)	2.10	1.60	2.90	
Lake Grade				D

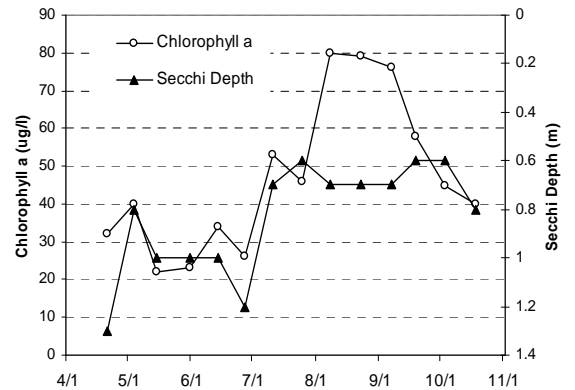
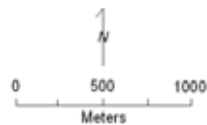
The lake received a lake grade of D for 2008 is similar to that recorded in 1981, 1984, 1993, 1998, 2006, and 2007 but better than those recorded for 1980 and 2001 (F). The 2008 water quality was worse than the C lake grade received for 2005. Because of the variability of the lake's grades, no trend is apparent from the lake's water quality database. The lake's water quality seems to be best represented by a lake grade of D. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

The volunteer monitor ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. The mean perceived physical condition was 2.4 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability was 2.2 (2- "minor aesthetic problem" and 3- "swimming impaired").

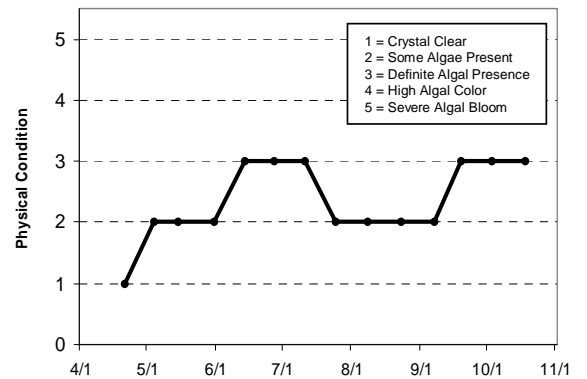
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

● Sampling site
Contours in meters
Volunteer: Jerry Edberg
LAKE ID: 700091
WMO: Scott County



	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(°C)	(°C)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
4/21	8.8				32	66	69	1.3	1	
5/4	11.1				40	93	84	0.8	2	2
5/15	16.4				22	61	71	1	2	2
5/31	18.4				23	78	108	1	2	2
6/14	19.7				34	122	123	1	3	3
6/27	24.6				26	199		1.2	3	3
7/11	25.1				53	241	268	0.7	3	2
7/25	26				46	306	286	0.6	2	2
8/8	26				80	315	325	0.7	2	2
8/23	24.6				79	309	362	0.7	2	2
9/7	20				76	266	263	0.7	2	2
9/19	19.1				58	169	192	0.6	3	2
10/3	16.1				45	128	128	0.6	3	2
10/18	12.2				40	101	96	0.8	3	2



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

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

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

1 = Beautiful
 2 = Minor Aesthetic Problem
 3 = Swimming Impaired
 4 = No Swimming; Boating OK
 5 = No Aesthetics Possible

Date	Recreational Suitability
4/1	1
5/1	2
6/1	2
7/1	3
8/1	2
9/1	2
10/1	2
11/1	2

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). No boats, canoes, or floatables are allowed on the 29-acre man-made lake that is one of only six lakes in the seven-county metropolitan area that are stocked with trout (brook and rainbows). The only fishing access to the lake is two fishing docks and the lake's shoreline. The lake, which is 0.6 miles in circumference, has a maximum depth of 9.1 m (30 ft). Only 12 percent of the lake is considered littoral zone (the 0-15 foot depth zone of the lake dominated by aquatic vegetation). The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

Cenaiko Lake was monitored 13 times between late April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	13.8	7.0	25.0	A
CLA (µg/l)	3.1	1.3	9.1	A
Secchi (m)	2.0	1.2	2.9	C
TKN (mg/l)	0.79	0.44	1.20	
Lake Grade				B

The lake received a water quality lake grade of B for 2008. 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. No apparent trends are evident from the lake's water quality database. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). The lake seems well represented by a lake grade of A/B on the basis of the historical database.

At each monitoring event, the volunteers' opinion of the lake condition was ranked on a 1-to-5 scale as shown on the lake information sheet. The average score for physical condition was 2.5 (between 2- "some algae present" and 3- "definite algae present"), and 2.0 for recreational suitability (2- "minor aesthetic problem").

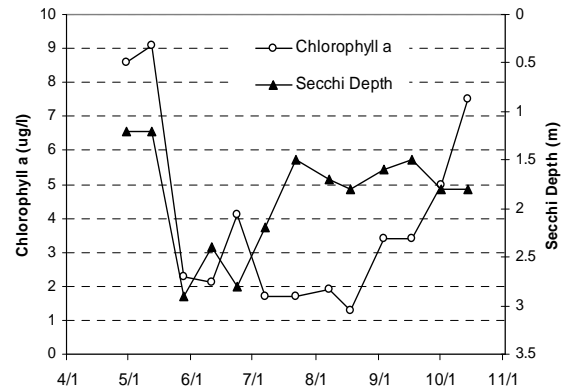
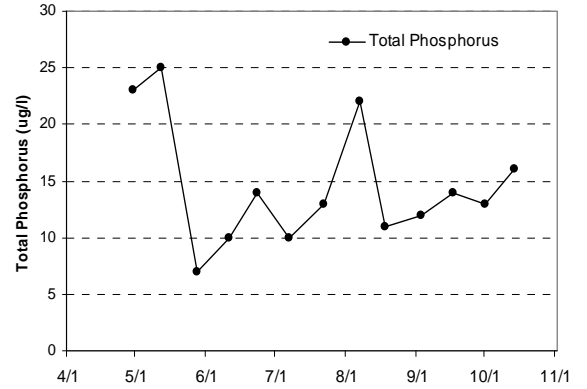
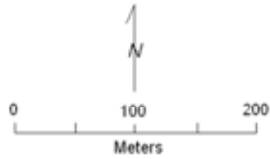
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Lake Cenaiko Coon Rapids, Anoka Co.

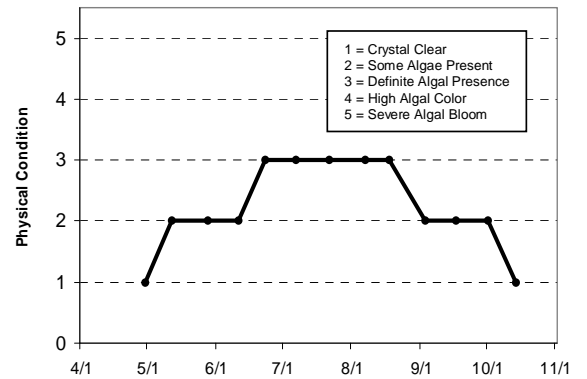
Lake ID: 20654
WD: Coon Creek
Volunteer: Anoka Co. Parks

● Sampling site
Contours in meters



2008 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	10.7				8.6	23		1.2	1	1
5/12	14.4				9.1	25		1.2	2	
5/28	19				2.3	7		2.9	2	1
6/11	20.1				2.1	10		2.4	2	1
6/23	24.7				4.1	14		2.8	3	2
7/7	26.8				1.7	10		2.2	3	3
7/22	28.5				1.7	13		1.5	3	
8/7	26.1				1.9	22		1.7	3	
8/18	26.3				1.3	11		1.8	3	3
9/3	22.5				3.4	12		1.6	2	2
9/17	22.7				3.4	14		1.5	2	2
10/1	16.9				5	13		1.8	2	1
10/14	14.5				7.5	16		1.8	1	1



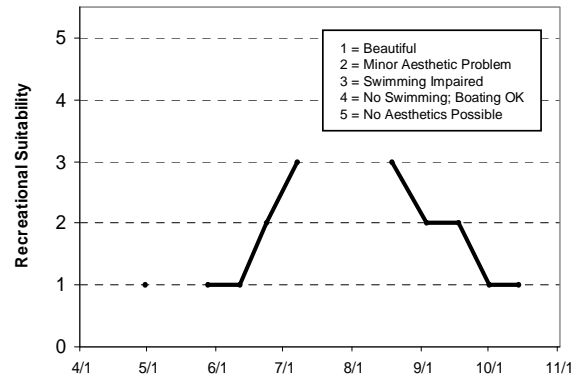
Lake Water Quality Grades Based on Summertime Averages

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						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
Total Phosphorus	A	A	A	A	A
Chlorophyll a	A	A	A	A	A
Secchi Depth	B	B	A	B	C
Lake Grade	A	A	A	A	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. Approximately 94 percent of the lake's surface area is considered littoral (the 0-15 feet depth zone of aquatic vegetation dominance).

This was the first year that Clear Lake has been involved in the CAMP. A search through the STORET nationwide water quality database provided only various water quality data for one date, May 6, 1980. Thus, the 2008 CAMP data are the only substantial quantity of available water quality data.

The lake was monitored 14 times between mid April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	18.9	4.0	70.0	A
CLA (µg/l)	2.8	1.2	3.9	A
Secchi (m)	6.1	4.9	7.9	A
TKN (mg/l)	0.63	0.32	1.70	
Lake Grade				A

The lake received a water quality lake grade of A for 2008. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings, were 1.8 for physical condition (between 1- "crystal clear and 2- "some algae present"), and 1.5 for recreational suitability (between 1- "beautiful" and 2- "minor aesthetic problem").

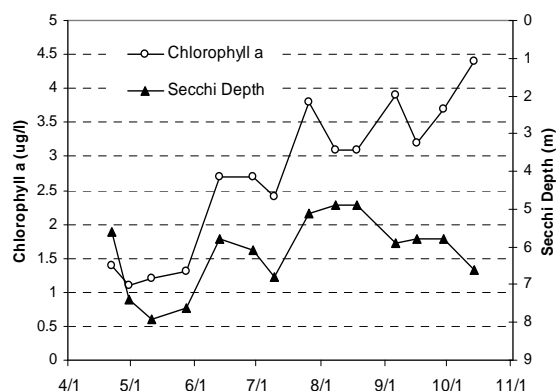
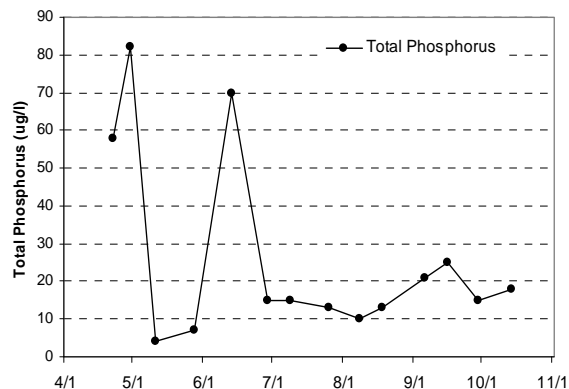
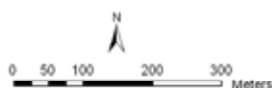
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Clear Lake May Twp., Washington Co.

Lake ID: 820045
WD: Carnelian-Marine
Volunteer: Warner Nature Center

● Sampling site
Contours in meters



2008 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	9.4				1.4	58		5.6	1	1
4/30	10.4				1.1	82		7.4	1	1
5/11	14.9				1.2	4		7.9	1	1
5/28	19				1.3	7		7.6		
6/13	21				2.7	70		5.8	1	1
6/29	26.3				2.7	15		6.1	2	1
7/9	26.5				2.4	15		6.8	2	2
7/26	26.5				3.8	13		5.1	2	2
8/8	26.5				3.1	10		4.9	2	2
8/18	26.5				3.1	13		4.9	2	2
9/6	21.9				3.9	21		5.9	2	1
9/16	20.2				3.2	25		5.8	2	2
9/29	18.8				3.7	15		5.8	2	1
10/14	14.2				4.4	18		6.6	1	1

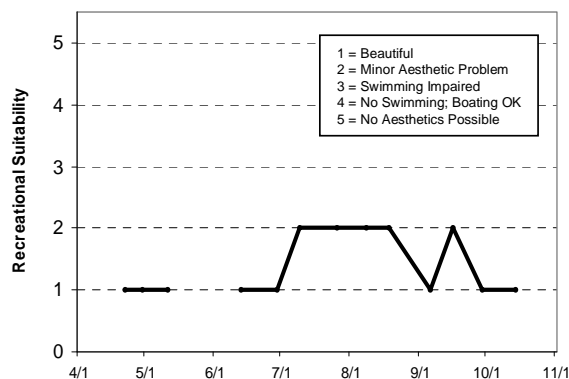
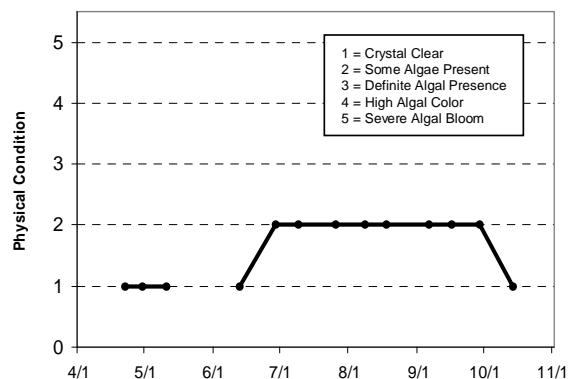
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Cloverdale Lake (82-0009) Valley Branch Watershed District

Cloverdale Lake is a 45-acre landlocked lake located within Baytown Township (Washington County). The mean and maximum depth of the lake is 3.0 m (roughly 10 feet) and 8.5 m (almost 30 feet), respectively. Roughly 86 percent of the lake's area is considered littoral (the 0-15 foot depth area of aquatic vegetation dominance). The lake's size and mean depth results in an approximate lake volume of 450 ac-ft.

The lake's surface area and watershed size (819 acres) translates to an 18:1 watershed-to-lake size ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 9 times between early May and early October 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	31.9	16.0	51.0	B
CLA (µg/l)	10.1	3.7	20.0	B
Secchi (m)	2.8	1.4	5.2	B
TKN (mg/l)	1.05	0.64	1.40	
Lake Grade				B

The lake received a water quality lake grade of B for 2008. For 6 of the past 8 years, the lake has received an annual 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.

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 2.3 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 2.0 for recreational suitability (2- "minor aesthetic problem").

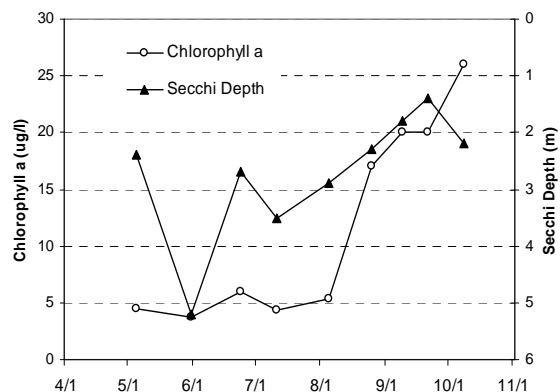
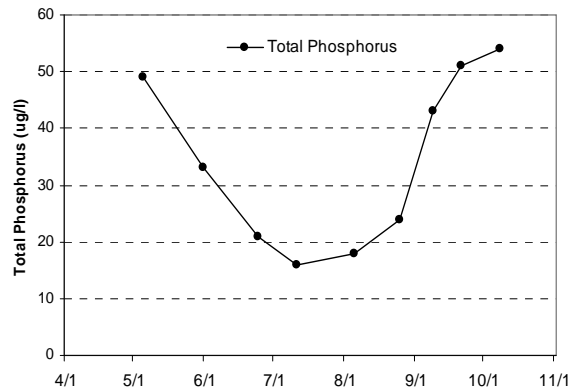
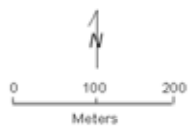
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Cloverdale Lake Lake Elmo, Washington Co.

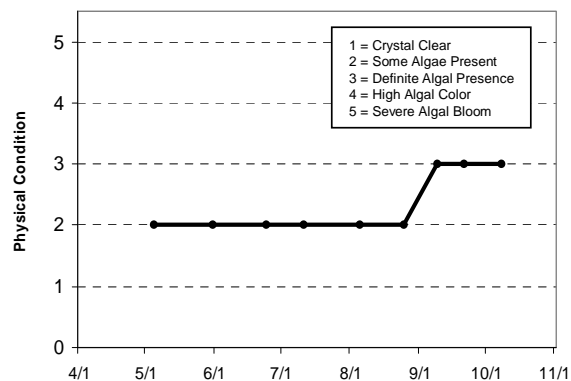
● Sampling site
Contours in meters

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



2008 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	12.4				4.5	49		2.4	2	1
5/31	21				3.7	33		5.2	2	1
6/24	26				6	21		2.7	2	2
7/11	23.7				4.3	16		3.5	2	2
8/5	28.6				5.4	18		2.9	2	2
8/25	31.4				17	24		2.3	2	3
9/9	31.4				20	43		1.8	3	2
9/21	27.6				20	51		1.4	3	3
10/8	24.4				26	54		2.2	3	3



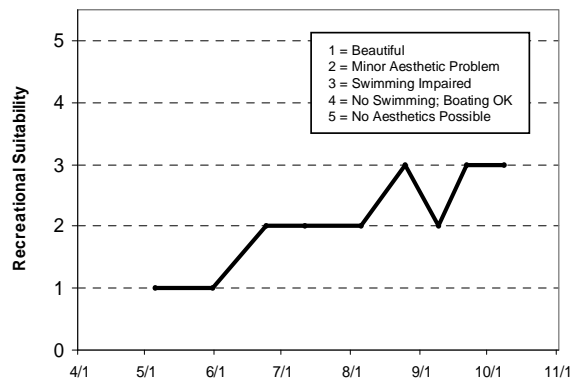
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade										C	B	B

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

A search through the STORET nationwide water quality database for historic data revealed no data other than the CAMP data. Thus, 2002 and 2004-2008 are the only years of available data.

The lake was monitored 13 times between late April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	174.2	144.0	234.0	F
CLA (µg/l)	148.2	58.0	250.0	F
Secchi (m)	0.3	0.2	0.3	F
TKN (mg/l)	3.59	2.70	4.20	
Lake Grade				F

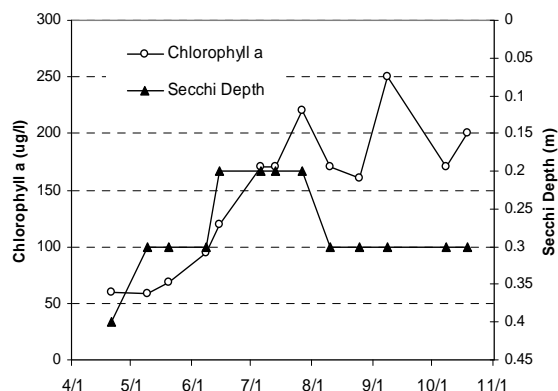
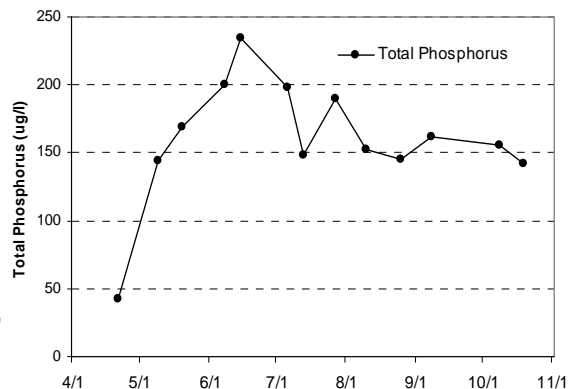
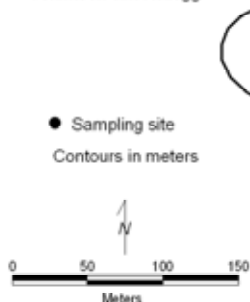
The lake's 2008 lake grade of F is consistent with the lake grades received for 2004-2007 and worse than the C received for 2002. For the past 5 years, the lake appears to be represented well by a lake grade of F.

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 3.1 for physical condition (between 3- "definite algae present" and 4-"high algal color"), and 4.0 for recreational suitability (4- "no swimming – boating ok").

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.

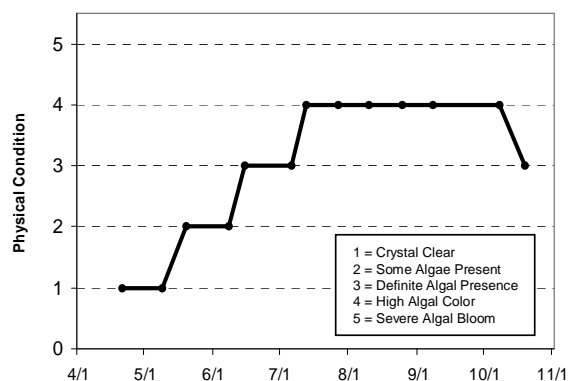
Cobble Crest Lake St. Louis Park, Hennepin Co.

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



2008 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	15.9				60	43		0.4	1	4
5/9	18.1				58	144		0.3	1	4
5/20	18.1				69	169		0.3	2	4
6/8	22.3				95	200		0.3	2	4
6/15	21.4				120	234		0.2	3	4
7/6	25.7				170	198		0.2	3	4
7/13	26.3				170	148		0.2	4	4
7/27	25.2				220	190		0.2	4	4
8/10	23.5				170	152		0.3	4	4
8/25	24.5				160	145		0.3	4	4
9/8	18.7				250	162		0.3	4	4
10/8	16.5				170	156		0.3	4	4
10/19	14.4				200	142		0.3	3	4



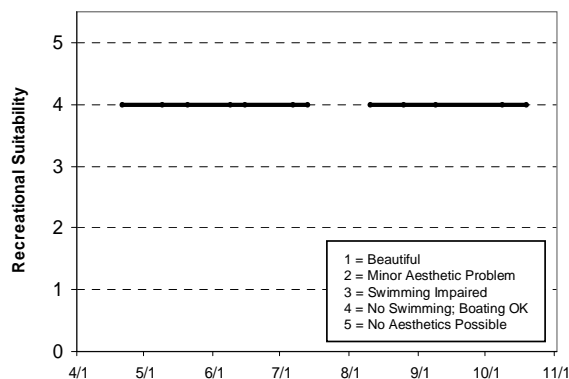
Lake Water Quality Grades Based on Summertime Averages

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											C	
Chlorophyll a											C	
Secchi Depth											C	
Lake Grade											C	

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

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.

A search through the STORET nationwide water quality database for historic data revealed no data other than the CAMP data. Therefore, 2005-2008 are the only years of water quality data available.

The lake was monitored 14 times between mid-April and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	48.7	19.0	130.0	C
CLA (µg/l)	27.1	5.6	56.0	C
Secchi (m)	0.8	0.7	1.0	D
TKN (mg/l)	1.50	0.33	2.60	
<i>Lake Grade</i>				C

The lake received a lake grade of C for 2008 which is similar to the lake grades received for the previous two years. The water quality in the period from 2006-2008 was notably improved over the water quality conditions observed 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 volunteers ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The resulting user perception rankings are shown on the information sheet. The mean physical condition ranking was 2.6 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability ranking was 2.4 (2- "minor aesthetic problem" and 3- "swimming impaired").

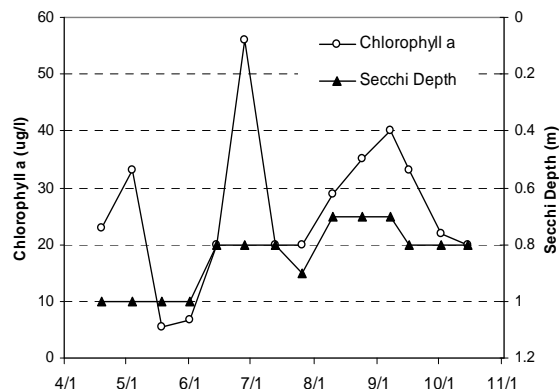
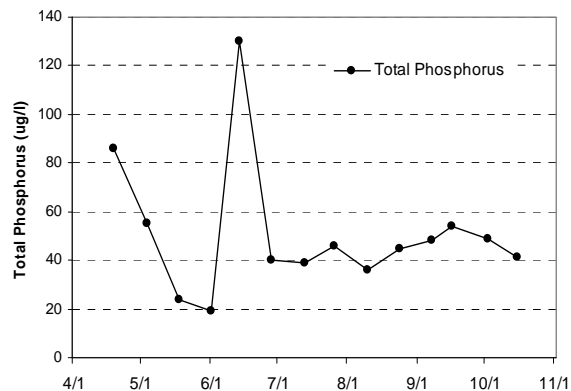
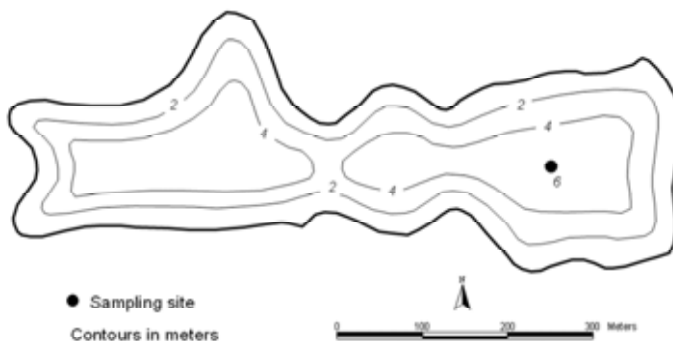
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Cobblestone Lake

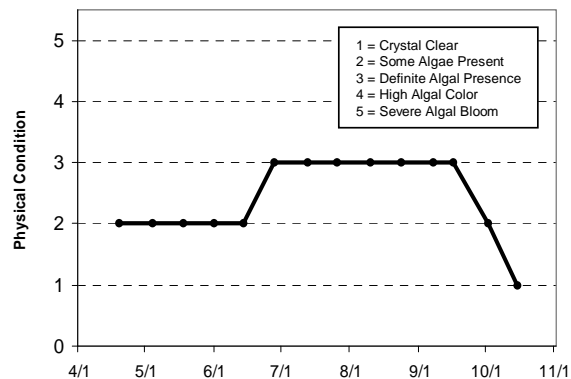
Apple Valley, Dakota Co.

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



2008 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	6.2				23	86		1	2	2
5/4	12.1				33	55		1	2	2
5/18	15.2				5.6	24		1	2	2
6/1	19.5				6.6	19		1	2	2
6/14	20.6				20	130		0.8	2	2
6/28	21.8				56	40		0.8	3	2
7/13	18.7				20	39		0.8	3	3
7/26	20.3				20	46		0.9	3	3
8/10	19.6				29	36		0.7	3	3
8/24	22.2				35	45		0.7	3	3
9/7	16				40	48		0.7	3	3
9/16	17.9				33	54		0.8	3	3
10/2	14.6				22	49		0.8	2	3
10/15	13.5				20	41		0.8	1	4



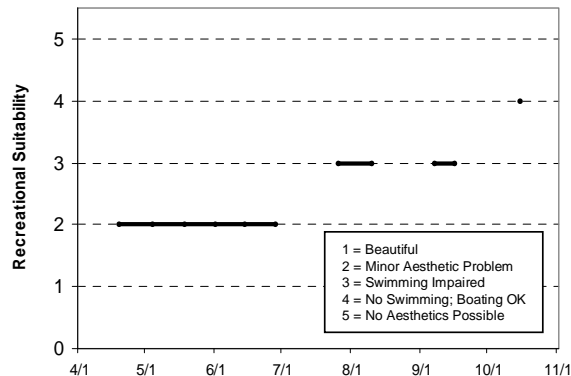
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus	D	C	C	C	C
Chlorophyll a	D	C	C	C	C
Secchi Depth	F	D	D	D	D
Lake Grade	D	C	C	C	C

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. Information from the City of Woodbury revealed that the lake has a surface area of 71 acres and a maximum depth of 3.4 m. The lake's large 8,088-acre contributing watershed results in a large 114:1 watershed-to-lake size ratio. A larger ratio indicates a greater potential for stress on the lake from surface runoff. Because of the shallowness of the lake, its entire area is considered littoral zone (the 0-15 foot depth area dominated by aquatic vegetation), and the lake does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column). The lake has no public access.

The lake was monitored 9 times between late-April and mid September 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	167.5	70.0	249.0	F
CLA (µg/l)	53.1	19.0	90.0	D
Secchi (m)	0.3	0.1	0.6	F
TKN (mg/l)	2.83	1.80	3.60	
Lake Grade				F

The lake received a water quality lake grade of F for 2008, which is consistent with the historical database. The lake's water quality seems well represented by an overall water quality grade of D or F, depending on the year. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

Throughout the monitoring period, the volunteer's opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page. The mean physical condition ranking was 3.0 (3- "definite algae present"), while the mean recreational suitability ranking was 4.0 (4- "no swimming; boating ok").

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

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

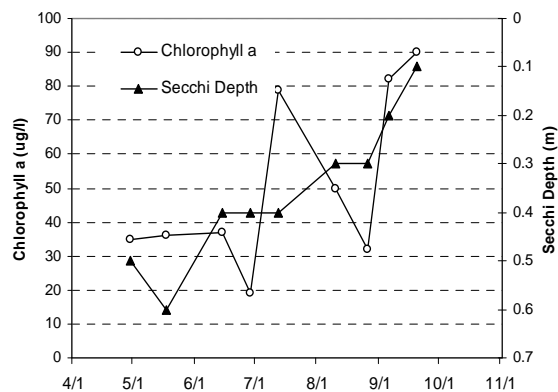
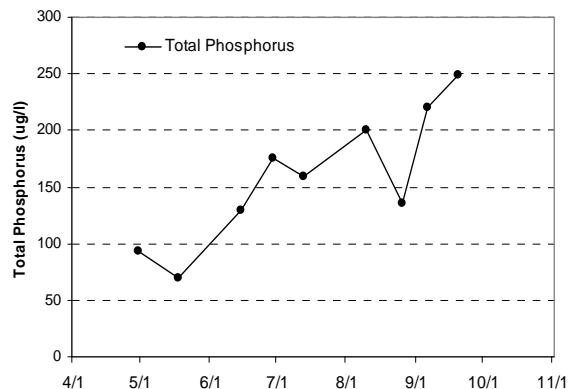
Colby Lake Woodbury, Washington Co.

Lake ID: 820094

WD: South Washington

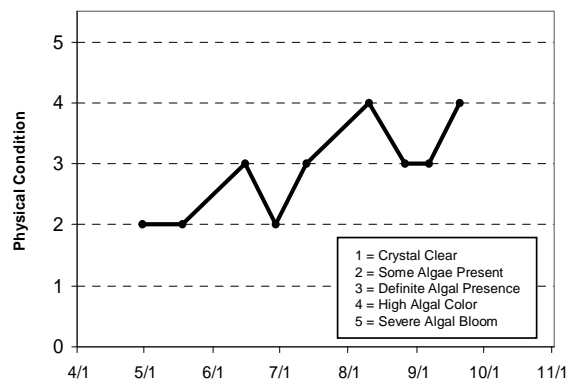
Volunteer: Annie Gustafson

• Sampling site
Contours in meters



2008 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	11.9				35	93		0.5	2	4
5/18	16.6				36	70		0.6	2	4
6/15	21.4				37	130		0.4	3	4
6/29	24.8				19	175		0.4	2	4
7/13	24.2				79	159		0.4	3	4
8/10	25.4				50	201		0.3	4	4
8/26	19.7				32	136		0.3	3	4
9/6	19.5				82	220		0.2	3	4
9/20	19.7				90	249		0.1	4	4



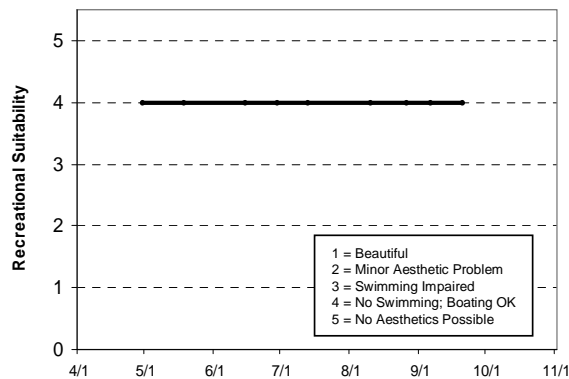
Lake Water Quality Grades Based on Summertime Averages

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			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
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

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. Given the shallow depth of the lake, the entire lake is considered littoral zone.

The lake was monitored 13 times between late April and early October 2008. 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.

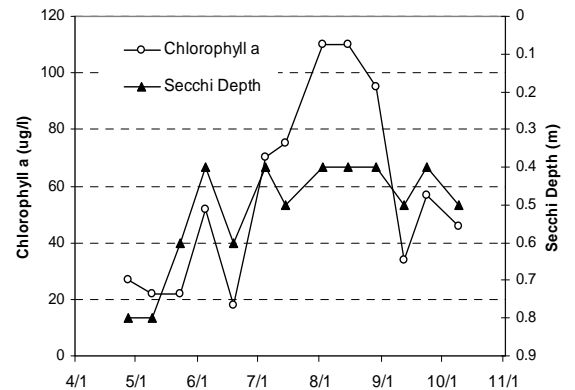
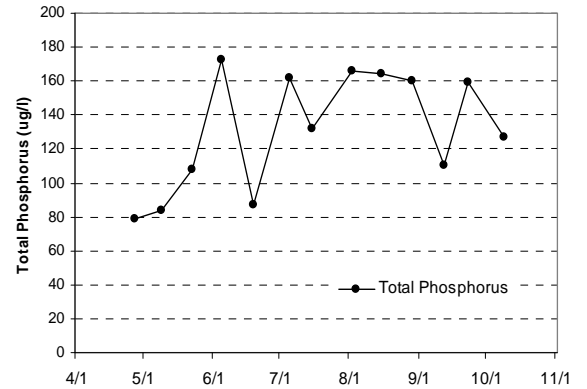
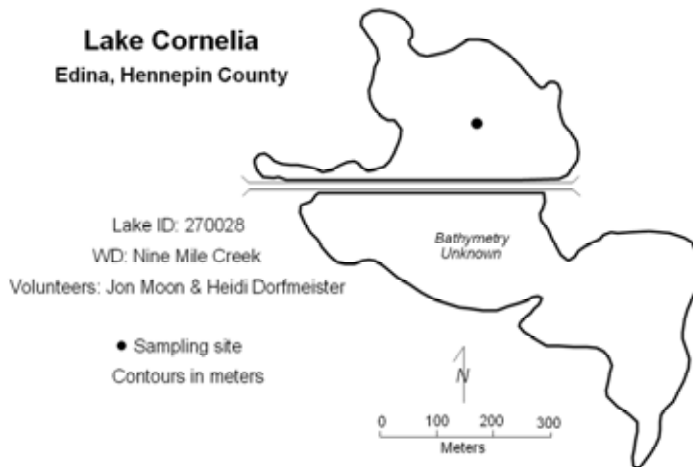
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	136.8	84.0	173.0	D
CLA (µg/l)	60.5	18.0	110.0	D
Secchi (m)	0.5	0.4	0.8	F
TKN (mg/l)	2.75	1.90	3.70	
Lake Grade				D

The lake received a water quality lake grade of D for 2008. Prior to 2008, the lake has received a lake grade of F every monitoring year, so the lake experienced an improvement in water quality in 2008. The 2008 summer-time means, minimums, and maximums concentrations for TP and CLA were less than those observed in 2007. In addition, water clarity was clearer in 2008 than in 2007. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

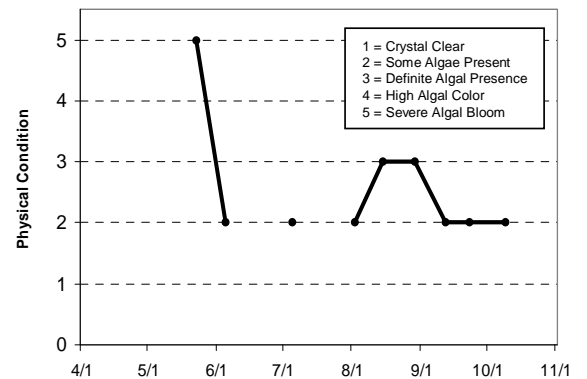
Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 2.6 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 4.1 for recreational 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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/27	10				27	79		0.8		4
5/9	17				22	84		0.8		4
5/23	21				22	108		0.6	5	5
6/5	20				52	173		0.4	2	4
6/19	28				18	87		0.6		4
7/5	20				70	162		0.4	2	4
7/15	26				75	132		0.5		4
8/2	32				110	166		0.4	2	4
8/15	28				110	164		0.4	3	4
8/29	24				95	160		0.4	3	4
9/12	21				34	110		0.5	2	4
9/23	22				57	159		0.4	2	4
10/9	15				46	127		0.5	2	4



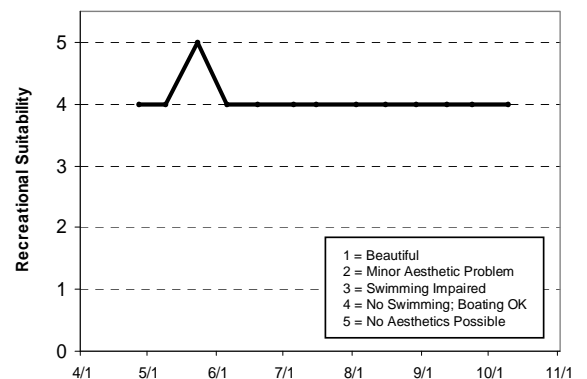
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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 unique resource in the Twin Cities Metropolitan Area. The lake is only one of six lakes in the seven-county metropolitan area stocked with trout (rainbows). The 10-acre lake has a maximum depth of 17.4 m (57 feet) and only three percent of the lake is considered littoral zone (the 0-15 foot depth zone of the lake dominated by aquatic vegetation). The lake's level is maintained by groundwater. It has a very small watershed that is completely publicly owned (MDNR 1996).

The only data available for Courthouse Lake are a result of CAMP monitoring from 1996-2008. Courthouse Lake was monitored 14 times between mid-April and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	19.5	11.0	45.0	A
CLA (µg/l)	4.1	1.2	12.0	A
Secchi (m)	3.9	1.2	5.1	A
TKN (mg/l)	0.95	0.55	2.00	
Lake Grade				A

The lake received a lake grade of A for 2008, which is consistent with the historical water quality database. The lake's water quality seems well represented by a lake grade of A. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

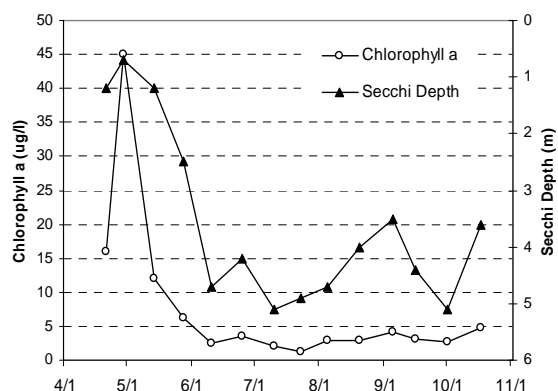
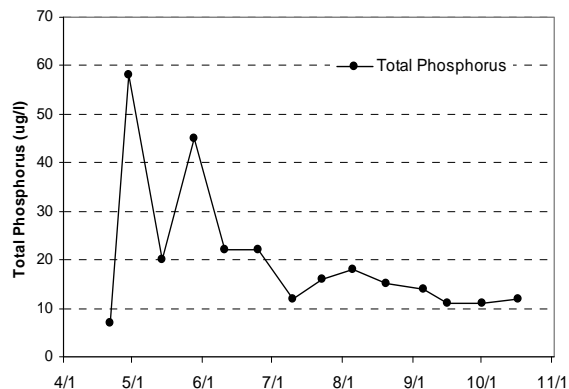
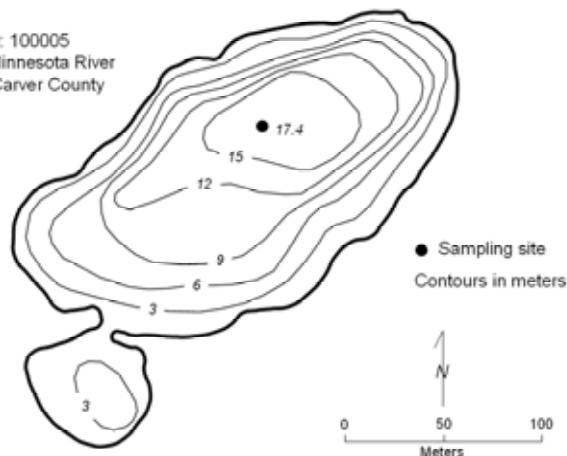
The average user perception rankings, on a 1-to-5 scale, were 1.7 for physical condition (between 1- "crystal clear" and 2- "some algae present"), and 1.8 for recreational suitability (between 1- "beautiful" and 2- "minor aesthetic problem").

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.

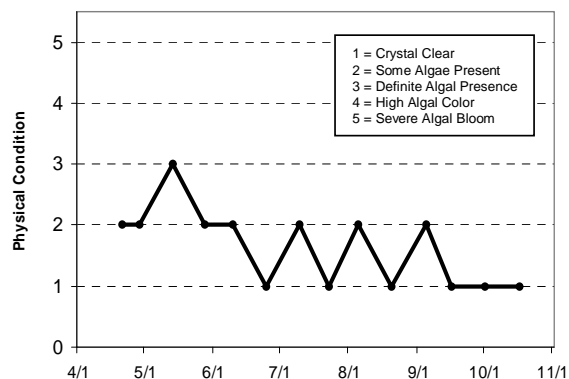
Courthouse Lake Chaska, Carver Co.

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



2008 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	12.72		13.96		16	7		1.2	2	2
4/29	8.73		12.72		45	58		0.7	2	4
5/14	14.46		14.25		12	20		1.2	3	4
5/28	17.85		9.28		6.3	45		2.5	2	2
6/10	20.51		7.94		2.5	22		4.7	2	2
6/25	25.13		9.52		3.5	22		4.2	1	2
7/10	25.61		8.28		2	12		5.1	2	1
7/23	26.64		6.64		1.2	16		4.9	1	1
8/5	26.45		6.95		3	18		4.7	2	2
8/20	26.38		7.59		3	15		4	1	1
9/5	22.79		9.06		4.1	14		3.5	2	2
9/16	19.54		7.14		3.1	11		4.4	1	1
10/1	19		7.55		2.8	11		5.1	1	1
10/17	14.93		7.6		4.7	12		3.6	1	1



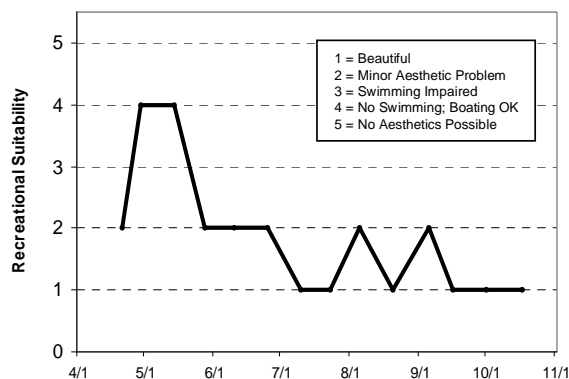
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade					A	B	A	A	A	A	B	A

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

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. The lake has a surface area of 292 acres, with 5.3 miles of shoreline. The maximum and mean depths of the lake are 11.3 m (37 feet) and 3.1 m (10 feet), respectively. The lake's surface area and mean depth translate to an approximate lake volume of 2,920 acre-feet. The lake's watershed covers approximately 2,001 acres of which roughly two-thirds is urban/developed. The watershed and lake surface areas translate to a moderate watershed-to-lake size ratio of 7:1 (the smaller the ratio the less stress on the lake from surface runoff).

Roughly 72 percent of the lake's area is considered littoral (the 0-15 foot depth area of aquatic vegetation dominance). Because of its multi-recreational uses, the lake is considered a "Priority Lake" in the Metropolitan Area. The lake, managed by the MDNR as a panfish lake and stocked with tiger muskellunge, has a public access and fishing pier on its north side and a public swimming beach on its eastern shore. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

A search of the STORET nationwide water quality database for data on the lake revealed an extensive database since the 1980's, with nutrient data available in 1980, 1983, 1989, and 1994-2006. Additionally, Secchi transparency data are available for all years between 1980 and 1999 except 1993.

The lake was monitored 14 times between mid-April and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

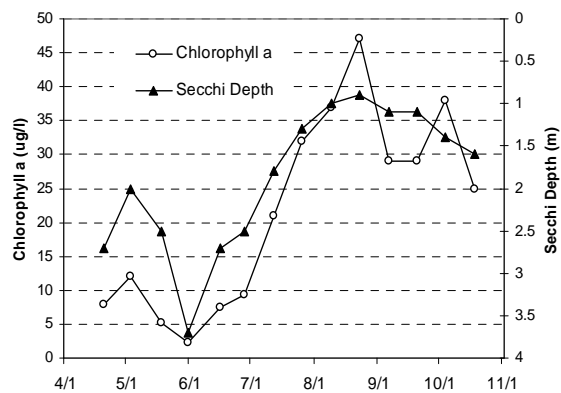
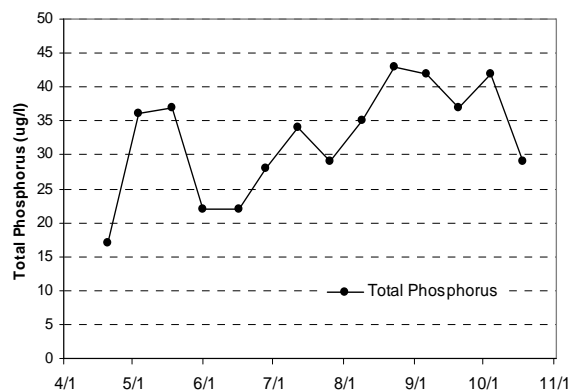
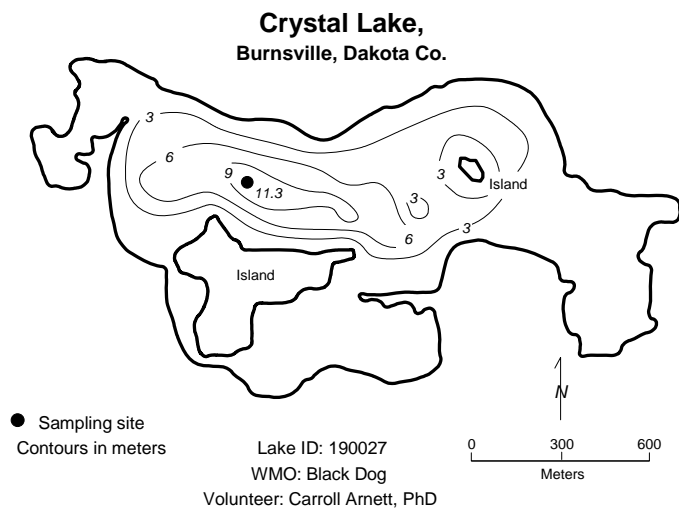
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	33.2	22.0	43.0	C
CLA (µg/l)	21.0	2.3	47.0	C
Secchi (m)	1.9	0.9	3.7	C
TKN (mg/l)	1.67	1.20	2.00	
Lake Grade				C

The lake received a lake grade of C for 2008. This lake grade is similar to those recorded from 1994-2000, and 2002-2007, and worse than the B's recorded in 1983, 1989, and 2001. The lake's water quality seems well represented by a lake grade of C with the occasional B. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

Throughout the monitoring period, the volunteer's opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The average user perception rankings, were 2.7 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 2.1 for recreational suitability (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

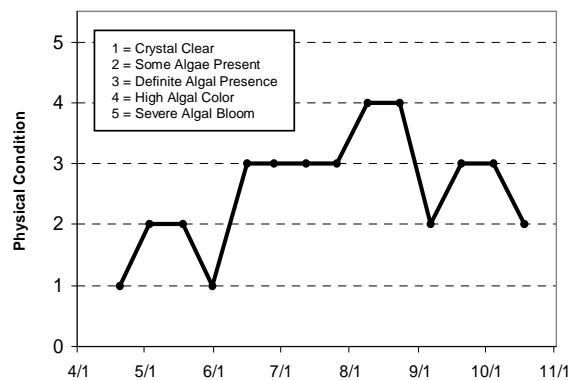
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 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	5.9				7.9	17		2.7	1	1
5/3	10				12	36		2	2	2
5/18	16.2				5.1	37		2.5	2	2
5/31	18				2.3	22		3.7	1	1
6/16	21				7.4	22		2.7	3	2
6/28	23.8				9.4	28		2.5	3	2
7/12	24.9				21	34		1.8	3	2
7/26	26.1				32	29		1.3	3	2
8/9	26.6				37	35		1	4	3
8/23	24				47	43		0.9	4	3
9/6	21.4				29	42		1.1	2	2
9/20	21				29	37		1.1	3	2
10/4	16.8				38	42		1.4	3	2
10/18	13.3				25	29		1.6	2	1



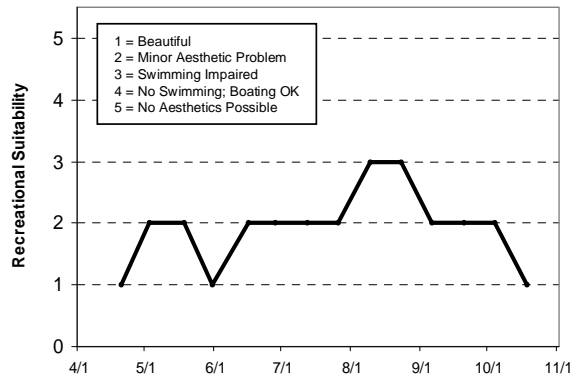
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



Crystal Lake [Robbinsdale] (27-0034) *Shingle Creek Watershed Management Commission*

Crystal Lake is a 76-acre lake located in the City of Robbinsdale (Hennepin County). The lake has a maximum and mean depth of 10.4 meters and 3.7 meters, respectively. It has an approximate volume of 917 ac-ft (Beduhn 1993). Sixty-eight percent of the lake's surface area is considered littoral zone (the 0-15 foot depth area of aquatic vegetation dominance). The lake's fishing pier and earthen public access are located on the southeastern end of the lake.

Crystal Lake was monitored 7 times between late May and early October 2008. 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.

2008 summer (May-September) data summary

Parameter	Mean	Minimum	Maximum	Grade
TP (µg/l)	41.0	27.0	63.0	C
CLA (µg/l)	15.2	3.6	30.0	B
Secchi (m)	2.3	0.9	4.5	B
TKN (mg/l)	1.63	1.40	2.00	
Lake Grade				B

The lake received a lake grade of B for 2008, which was a notable improvement in water quality with respect to the lake's historical database. This was the first year that the lake received a lake grade of B, which is notable since the only lake grades it has received in the past were Ds and Fs. All three water quality parameters (TP, CLA, and Secchi) saw consistent improvement over previous monitoring years. Additional monitoring is suggested to determine if this improvement may be evidence of an improving trend.

Throughout the monitoring period, the volunteer's opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The average user perception rankings were 2.0 for physical condition (2- "some algae present"), and 3.0 for recreational suitability (3- "swimming slightly impaired").

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

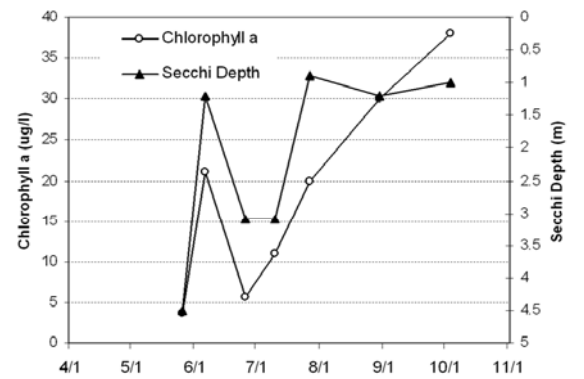
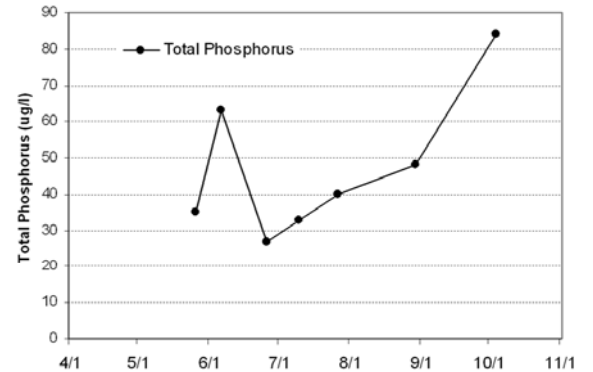
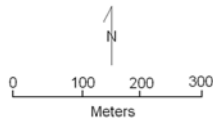
<http://www.dnr.state.mn.us/lakefind/>.

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.

Crystal Lake Robbinsdale, Hennepin Co.

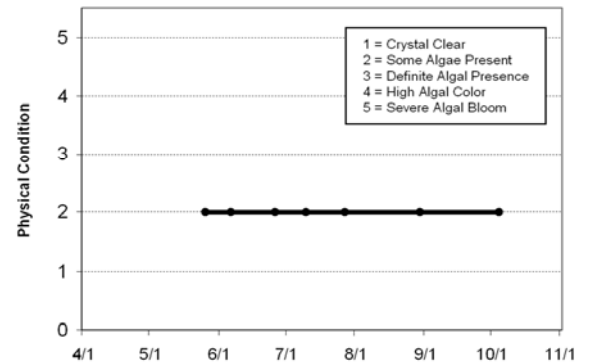
Lake ID: 270034
WMO: Shingle Creek
Volunteers: Wayne, Luke and Leif Sicora

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/26	18.3				3.6	35		4.5	2	4
6/6	20.3				21	63		1.2	2	4
6/26	27.5				5.6	27		3.1	2	4
7/10	25.6				11	33		3.1	2	1
7/27	27.5				20	40		0.9	2	2
8/30	23.8				30	48		1.2	2	3
10/4	16.7				38	84		1	2	2



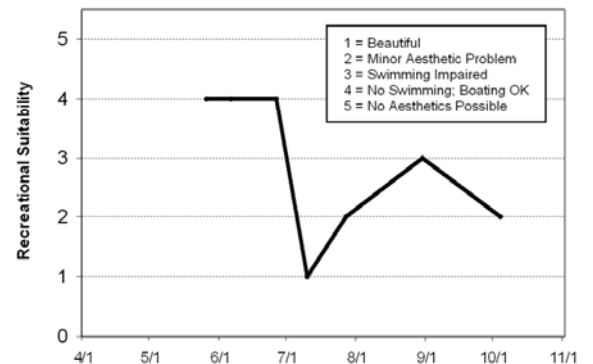
Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008
Total Phosphorus		D			C
Chlorophyll a		C			B
Secchi Depth		D			B
Lake Grade		D			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 very little known 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), and the lake does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column).

The lake was monitored 10 times between mid April and early October 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	198.5	29.0	914.0	F
CLA (µg/l)	21.9	5.2	38.0	C
Secchi (m)	2.0	0.4	3.1	C
TKN (mg/l)	3.24	0.91	11.00	
Lake Grade				D

The lake received a lake grade of D for 2008. The lake has received D lake grades in the past, but the notable difference for the monitoring season of 2008 is that water clarity and CLA concentrations were much improved over previous monitoring seasons. In fact, 2008 saw the best summer-time mean water clarity. The improved water clarity is consistent with the relatively lower CLA concentrations.

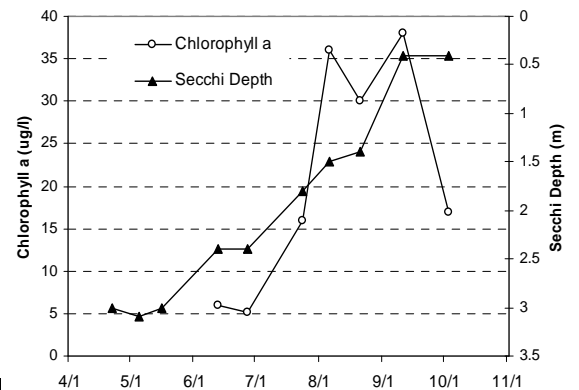
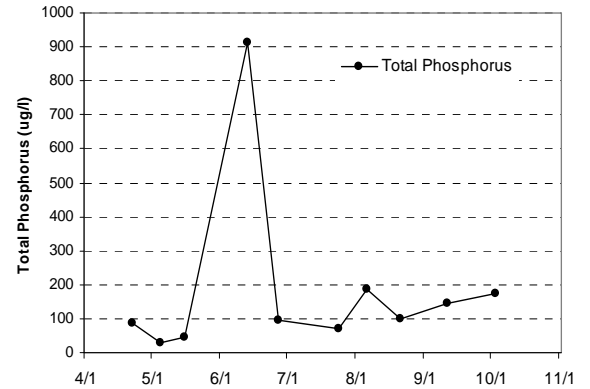
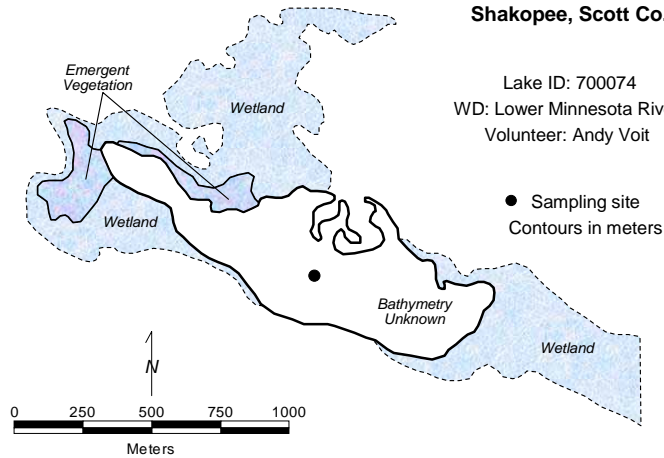
But the 2008 summer-time mean TP concentration remained high relative to CLA and water clarity. The summer-time mean TP concentration of 198.5 mg/L was heavily influenced by a single TP concentration of 914 mg/L observed on June 13. This spike of TP occurred immediately after a rain event. The spike in TP may be indicative of a surface runoff event that delivered a transient load of phosphorus to the lake. If the lone TP spike is removed from the mean calculation, the summer-time mean TP concentration becomes 104 mg/L. This revised mean would be the lowest summer-time mean TP concentration observed for Dean Lake, and this TP improvement would be consistent with the improvements seen in CLA and water clarity. Additional monitoring is suggested to determine if the improvements in water quality indicators observed in 2008 are evidence of an improving trend.

Throughout the monitoring period, the volunteer(s) ranked their opinion of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 3.3 for physical condition (between 3- "definite algae present" and 4- "high algal color"), and 2.5 for recreational suitability (between 2- "minor aesthetic problem and 3- "swimming slightly impaired").

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.

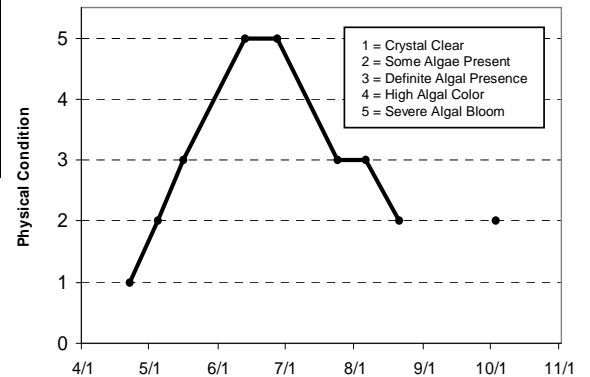
Dean Lake, Shakopee, Scott Co.

Lake ID: 700074
WD: Lower Minnesota River
Volunteer: Andy Voit



2008 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	15.3					89		3	1	1
5/5	14.5					29		3.1	2	1
5/16	20.4					47		3	3	1
6/13	20				6	914		2.4	5	4
6/27	26.6				5.2	97		2.4	5	4
7/24	27				16	69		1.8	3	4
8/6	28				36	185		1.5	3	2
8/21	25.7				30	101		1.4	2	2
9/11	19.7				38	146		0.4	2	2
10/3	17.6				17	174		0.4	2	1



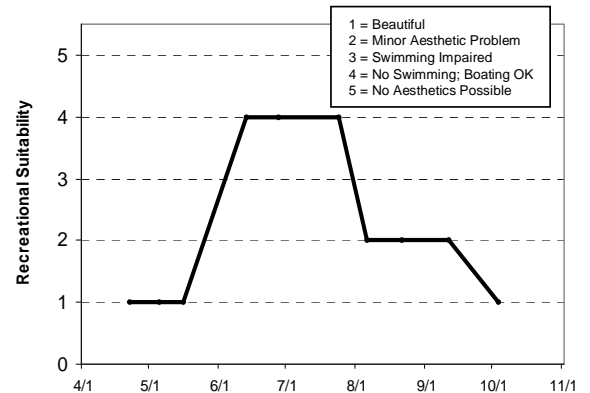
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



DeMontreville Lake (82-0101) Valley Branch Watershed District

Primary Report

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. The 160-acre lake has a mean and maximum depth of 2.4 m (~8 feet) and 7.3 m (24 feet). Roughly 90 percent of the lake's area is considered littoral zone (the 0-15 foot depth area of aquatic vegetation dominance). The lake's size and mean depth results in an approximate lake volume of 1,280 ac-ft. The lake's surface area and watershed size (1,108 acres) translates to a 7:1 watershed-to-lake size 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*).

This was the sixth year that Lake DeMontreville has been involved in the CAMP. The lake has been monitored in the past by Council staff, most recently in 2003. A search of the STORET nationwide water quality database for data on the lake revealed a moderate database since the 1980's with nutrient and Secchi transparency data available in 1980, 1984, 1991, 1993, 1995, 2000 and 2003-2007. Additionally, Secchi transparency data are available for 1985-1986, and 1988-1989.

The lake was monitored 13 times between early May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

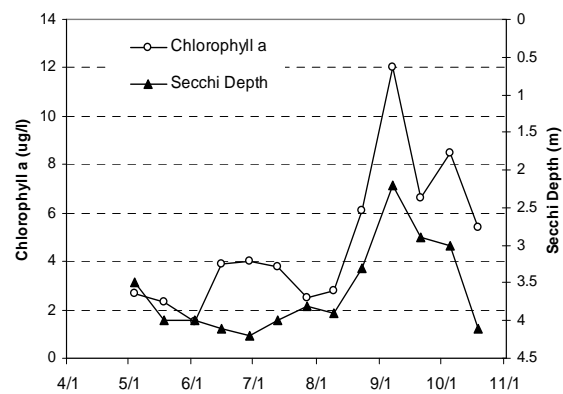
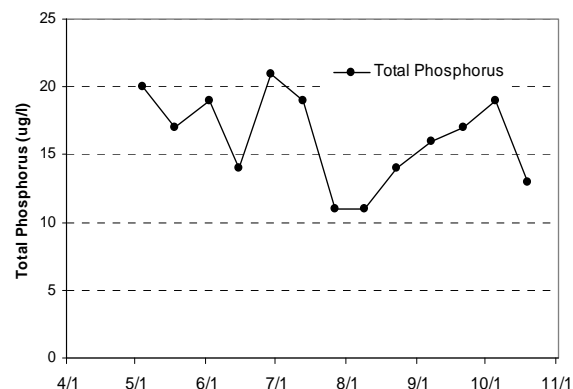
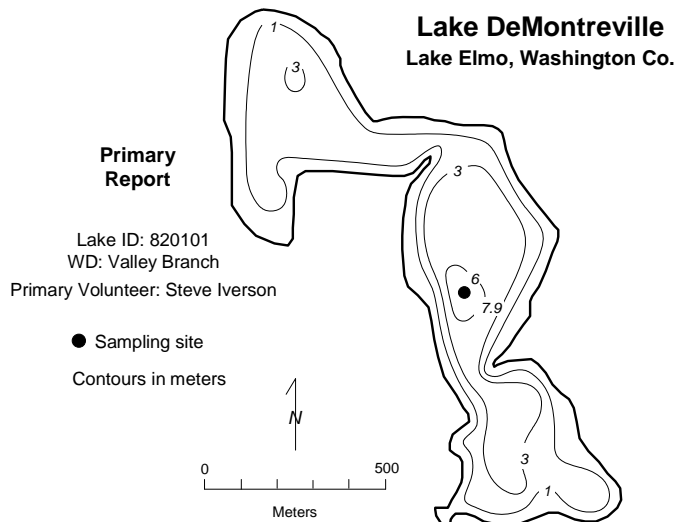
Parameter	Mean	Minimum	Maximum	Grade
TP (µg/l)	16.3	11.0	21.0	A
CLA (µg/l)	4.4	1.5	12.0	A
Secchi (m)	3.6	2.2	4.2	A
TKN (mg/l)	1.02	0.39	1.30	
Lake Grade				A

The lake received a lake grade of A for 2008. Historically, with the exception of the year 2007, 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). A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 1.8 for physical condition (between 1- "crystal clear" and 2- "some algae present"), and 1.0 for recreational suitability (1- "beautiful").

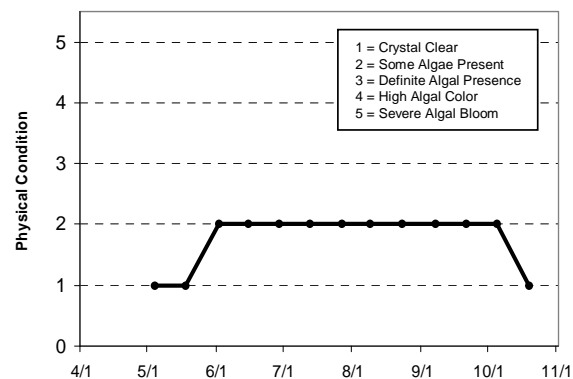
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 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	11.2				2.7	20		3.5	1	1
5/18	16.3				2.3	17		4	1	1
6/2	19.8				1.5	19		4	2	1
6/15	21.4				3.9	14		4.1	2	1
6/29	23.8				4	21		4.2	2	1
7/13	24.1				3.8	19		4	2	1
7/27	26.4				2.5	11		3.8	2	1
8/9	26.9				2.8	11		3.9	2	1
8/23	25.1				6.1	14		3.3	2	1
9/7	21.2				12	16		2.2	2	1
9/21	21				6.6	17		2.9	2	1
10/5	16.1				8.5	19		3	2	1
10/19	13.3				5.4	13		4.1	1	1



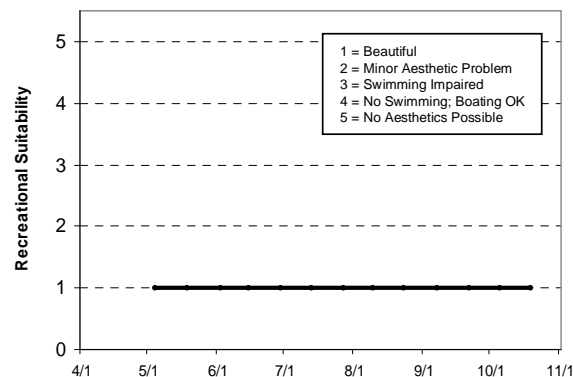
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade	B			B					A			A

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

Source: Metropolitan Council and STORET data



DeMontreville Lake (82-0101) Washington Conservation District

Secondary Report

Lake DeMontreville was also monitored by the Washington Conservation District (WCD) in 2008. The monitoring by WCD, therefore, provided duplicate monitoring for Demontreville Lake. For more detailed information on the lake, refer to its primary report.

The lake was monitored 7 times between late April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

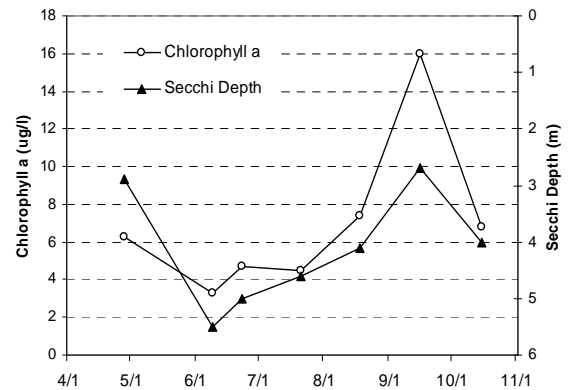
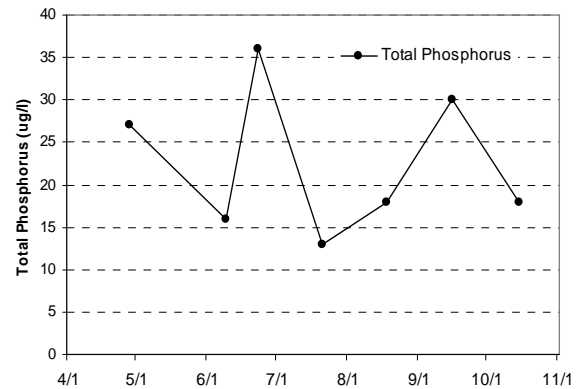
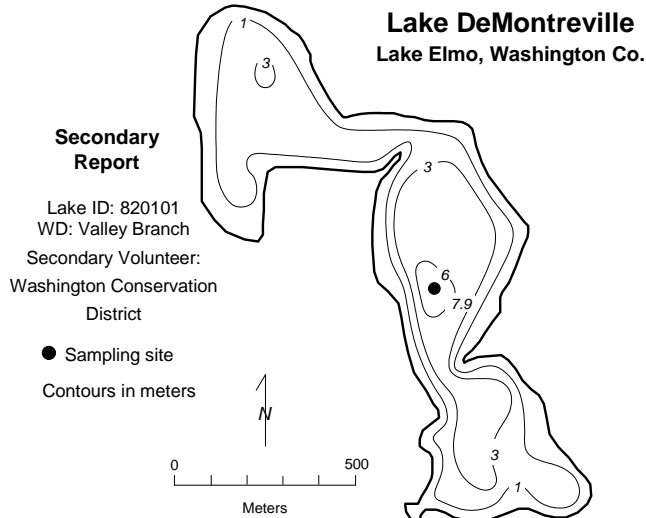
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	22.6	13	36	A
CLA (µg/l)	7.18	3.3	16	A
Secchi (m)	4.38	2.7	5.5	A
TKN (mg/l)	1.44	1.00	1.70	
<i>Lake Grade</i>				A

The lake received a lake grade of A for 2008 in addition to receiving A grades for TP, CLA, and Secchi depth, which are consistent with the grades provided in the primary report. Both the primary and secondary reports provide similar magnitudes of the individual water quality parameters. Both reports also show the elevated CLA concentrations and lowered water clarity during the autumn period. Therefore the data collected by the primary and secondary volunteers concur with each other.

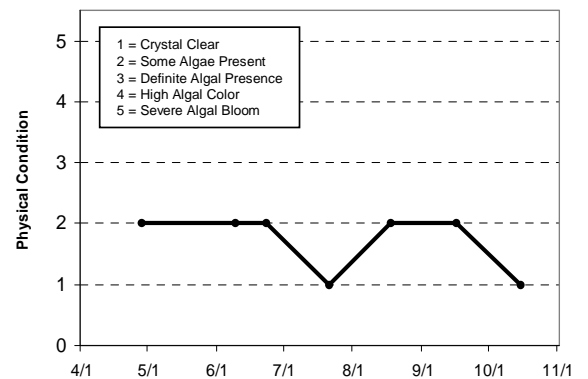
Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 1.8 for physical condition (between 1- "crystal clear" and 2- "some algae present"), and 2.0 for recreational suitability (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.



2008 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	7.3	7.3	11.39	11.41	6.3	27		2.9	2	1
6/9	20.2	11	8.08	0.22	3.3	16	50	5.5	2	2
6/23	23.2	11.9	8.46	0.63	4.7	36	52	5	2	2
7/21	25.5	13.2	6.86	0.32	4.5	13	242	4.6	1	1
8/18	25.2	13.9	7.43	0.31	7.4	18	168	4.1	2	2
9/16	18.9	18.2	8.21	0.28	16	30	18	2.7	2	3
10/15	14.6	14.6	8.08	0.31	6.8	18	16	4	1	1



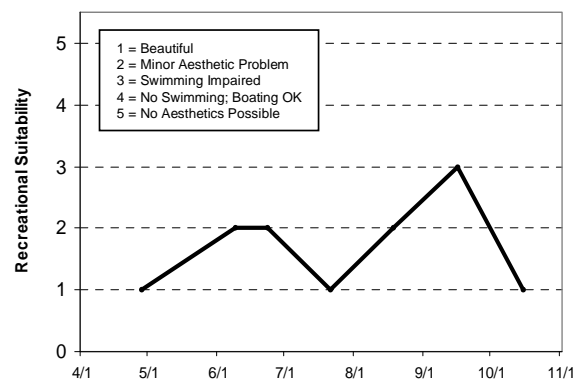
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade		B		B					A			A

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

Source: Metropolitan Council and STORET data



Downs Lake (82-0110) Valley Branch Watershed District

Downs Lake is located in Lake Elmo (Washington County). The mean and maximum depths of the 35-acre lake are 1.5 m (5 feet) and 2.1 m (7 feet), respectively. The lake's size and mean depth results in an approximate lake volume of 175 ac-ft. Because of the shallowness of the lake, the entire lake 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's 2,400-acre watershed translates to 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.

The lake was monitored 2 times in May 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	96.0	30.0	162.0	NA
CLA (µg/l)	62.5	60.0	65.0	NA
Secchi (m)	0.5	0.5	0.5	NA
TKN (mg/l)	1.31	0.62	2.00	
Lake Grade				NA

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 2008 data to previous monitoring years.

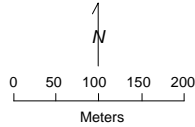
The volunteer(s) opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The average user perception rankings were 2.0 for physical condition (2- "some algae present"), and 4.0 for recreational suitability (4- "no swimming - boating ok").

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.

Downs Lake Lake Elmo, Washington Co.

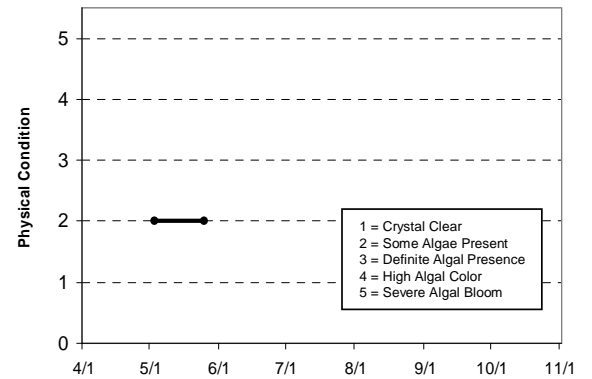
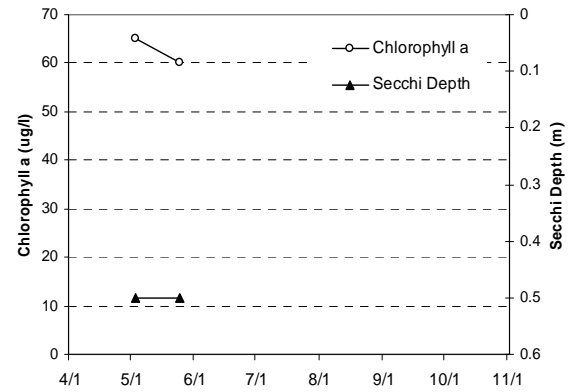
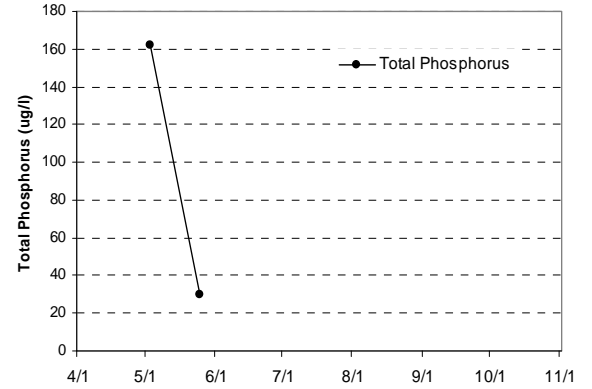
Lake ID: 820110
WD: Valley Branch
Volunteers: Wesley Sly Family

● Sampling site
Contours in meters



2008 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(°C)	(°C)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
5/3	12.3				65	162		0.5	2	4
5/25	20.6				60	30		0.5	2	4



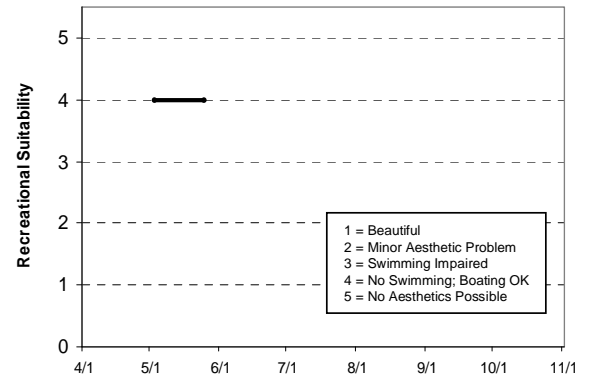
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008
Total Phosphorus	F	D	F	F	
Chlorophyll a	D	D	F	F	
Secchi Depth	F	F	F	F	
Lake Grade	F	D	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. The lake has a surface area of 233-acres and a maximum and mean depth of 7.9 m (26 feet) and 1.2 m (4 feet), respectively. Because of the shallowness of the lake, the entire area is considered littoral, (the shallow [0-15 foot depth] area dominated by aquatic vegetation) and does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column). The DNR has designated the lake as being infested with Eurasian Water Milfoil (*Myriophyllum spicatum*).

The lake has a 1,050-acre immediate watershed, which translates to a watershed-to-lake area ratio of 4.5:1 (the larger the ratio the greater the potential stress put on the lake from surface runoff).

This was the tenth year that Eagle Lake has been involved in CAMP, although it has been previously monitored by Council staff (as recently as 2004). The lake was monitored 13 times between early May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	182.8	93.0	264.0	F
CLA (µg/l)	82.3	27.0	160.0	F
Secchi (m)	0.6	0.3	1.1	F
TKN (mg/l)	2.84	2.10	3.80	
Lake Grade				F

The lake received a lake grade of F for 2008, which is similar to that recorded in 1985, 2002, 2006, and 2007. For the other previous monitoring years, the lake received lake grades of D and one C. The lake appears to fluctuate between a lake grade of D and F, with no distinct trends in either direction. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

The volunteer(s) opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The average user perception rankings were 3.5 for physical condition (between 3- "definite algae present" and 4- "high algal color", and 3.8 for recreational suitability (between 3- "swimming slightly impaired" and 4- "no swimming - boating ok").

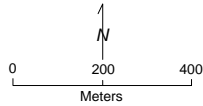
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Eagle Lake, Camden Twp. Carver Co.

Lake ID: 100121
WMO: Carver County
Volunteer: Carver County

● Sampling site
Contours in meters



2008 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	9.15		16.12		93	148		0.5	3	4
5/13	13.38		13.29		41	115		0.7	3	4
5/27	16.76		8.01		27	93		0.9	2	2
6/10	19.25		7.77		41	203		1	3	3
6/24	23.35		15.92		35	101		1.1	3	4
7/9	25.17		9.39		64	200		0.5	4	4
7/22	26.64		10.89		75	202		0.4	4	4
8/4	25.36		4.98		97	207		0.4	4	5
8/18	25.72		13.1		130	213		0.3	3	3
9/3	21.64		7.34		140	242		0.3	4	4
9/15	17.33		7.1		85	206		0.3	5	4
9/30	17.35		6.54		160	264		0.3	4	4
10/16	13.88		9.96		250	318		0.2	5	5

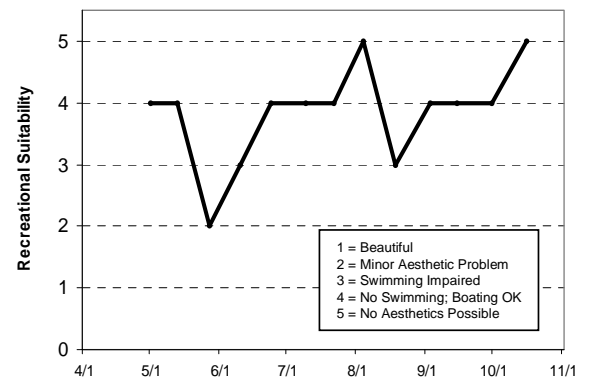
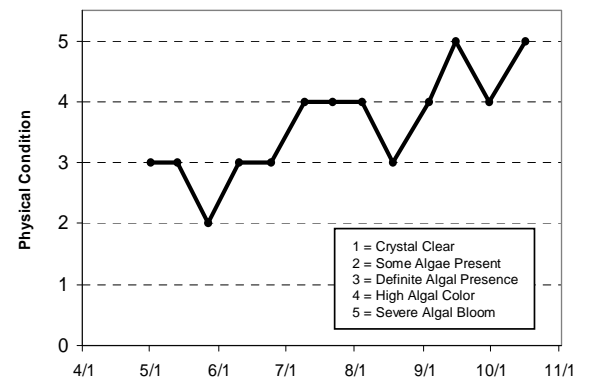
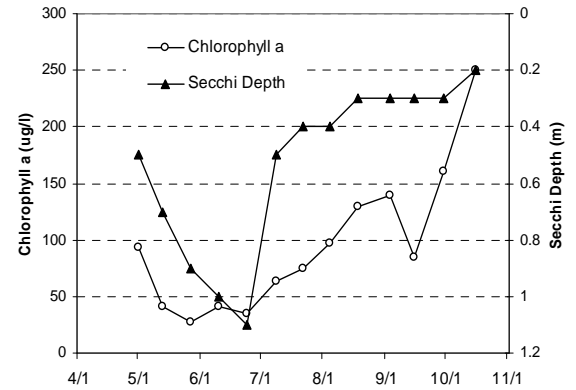
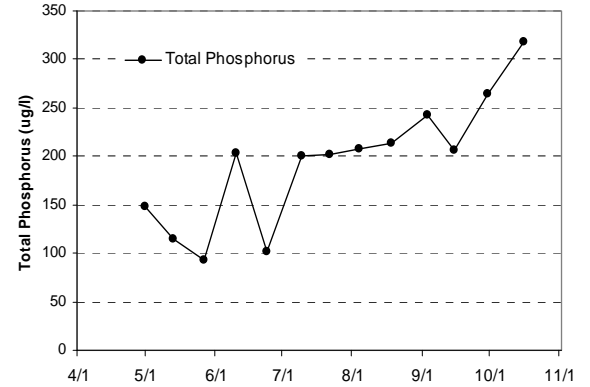
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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 lake's size and mean depth gives an approximate lake volume of 360 ac-ft. Because of the shallowness of the lake, the entire lake 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'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.

The lake was monitored 2 times in 2007, once in June and once in August 2008. Low lake water levels prevented access to open water for most of the year because of drought conditions. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	215.0	95.0	335.0	NA
CLA (µg/l)	91.7	3.3	180.0	NA
Secchi (m)	0.9	0.3	1.5	NA
TKN (mg/l)	3.25	1.50	5.00	
<i>Lake Grade</i>				NA

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 2008 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.

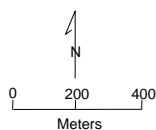
The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings, were 3.0 for physical condition (3- "definite algae present"), and 4.0 for recreational suitability (4- "no swimming – boating ok").

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.

Eagle Point Lake Lake Elmo, Washington Co.

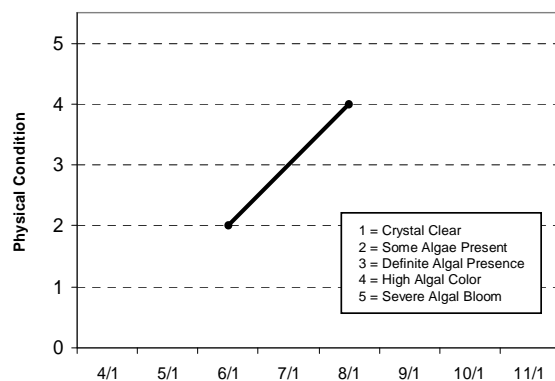
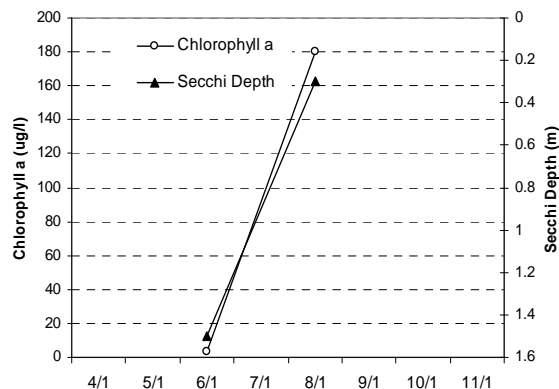
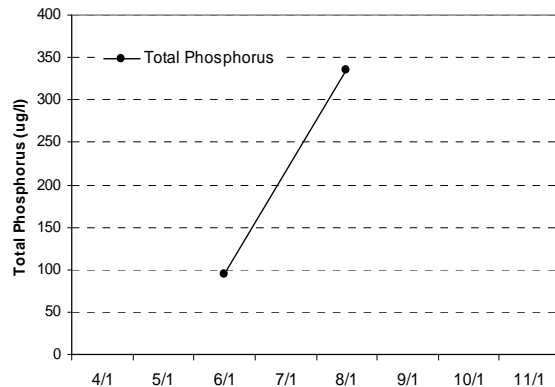
Lake ID: 820109
WD: Valley Branch
Volunteer: Bob Schumacher

● Sampling station
Contours in meters



2008 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(°C)	(°C)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
6/15	21				3.3	95		1.5	2	4
8/20	22				180	335		0.3	4	4



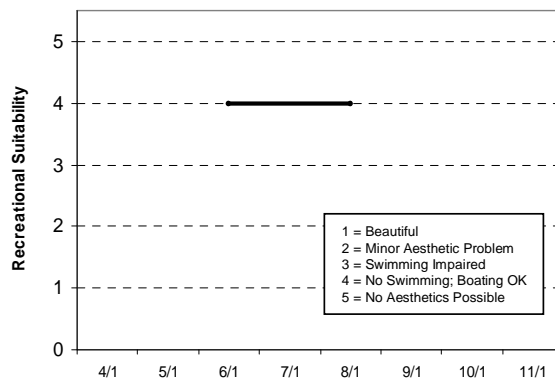
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					
Chlorophyll a					
Secchi Depth					
Lake Grade					

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*).

Earley Lake has been enrolled in CAMP since 1994. The lake was monitored 9 times between early May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	35.3	24.0	50.0	C
CLA (µg/l)	7.6	4.0	19.0	A
Secchi (m)	1.9	1.3	3.0	C
TKN (mg/l)	1.44	0.79	2.10	
Lake Grade				B

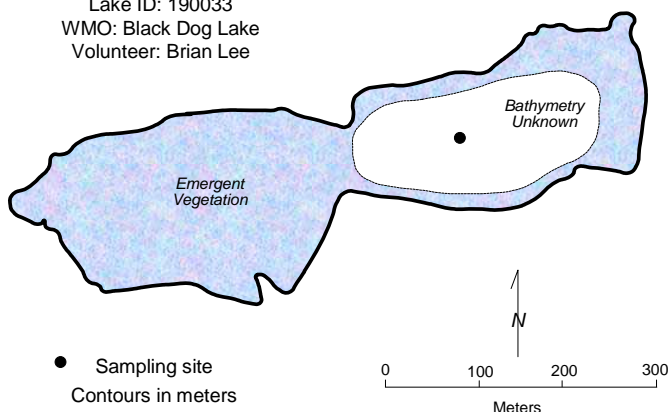
The lake received a lake grade of B for 2008, which is similar to water quality observed in 2006. The summer-time mean CLA concentration was lower in 2008 than most previous years. This lower CLA was the main reason for the improved lake grade in 2008. The lake received lake grades of C in the other years. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008). Additional monitoring is suggested to determine if recent lower mean CLA concentrations are indication of improving water quality.

Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. The mean physical condition ranking was 3.3 (between 3- "definite algae present" and 4- "high algal color"), while the mean recreational suitability ranking was 4.1 (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.

Earley Lake Burnsville, Dakota Co.

Lake ID: 190033
WMO: Black Dog Lake
Volunteer: Brian Lee



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/1					9.2	40		1.3	1	4
5/25					4	24		3	4	4
6/17					5.6	31		2	5	4
6/30	25.3				4.1	34		2.1	5	5
7/22					4.2	28		1.8	3	4
8/10	26				4.9	50		1.4	2	4
8/25	24.9				19	40		1.3	3	4
9/20	21.6				10	35		2	3	4
10/18	11.7				7.7	21		2.5		4

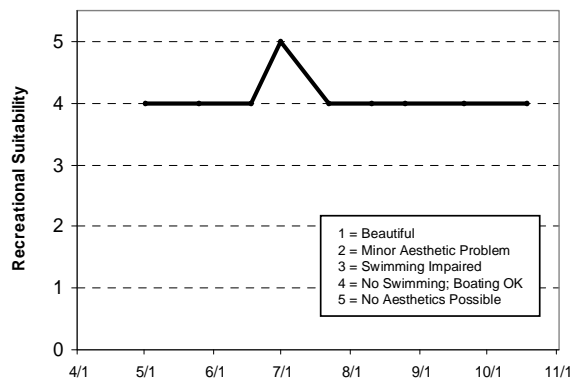
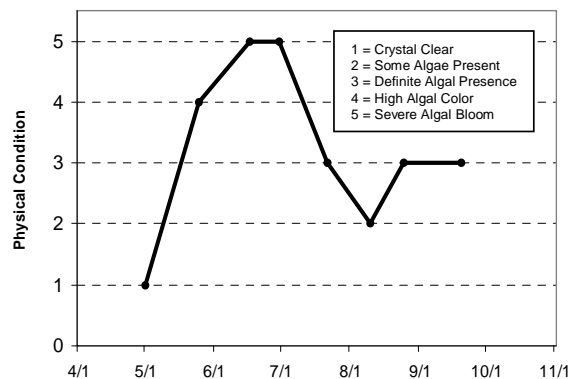
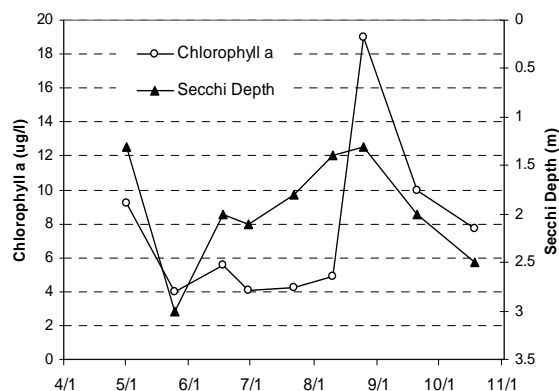
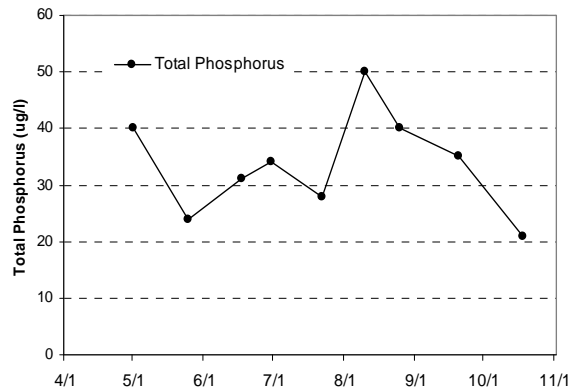
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



East Lake (19-0349) City of Lakeville

East Lake is a small lake located in Lakeville (Dakota County). There is very little morphological data available for the lake.

The year 2008 marks the fourth year in which East Lake has been involved in the CAMP. A search through the STORET nationwide water quality database for historic data revealed only the historic CAMP data. Therefore, 2005-2008 are the only years where water quality data are available.

The lake was monitored 14 times between mid-April and late October 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.

2008 summer (May-September) data summary

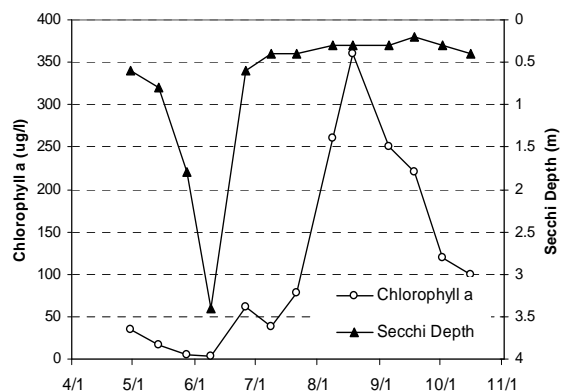
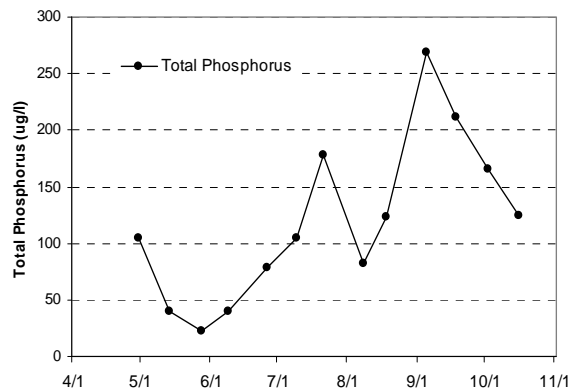
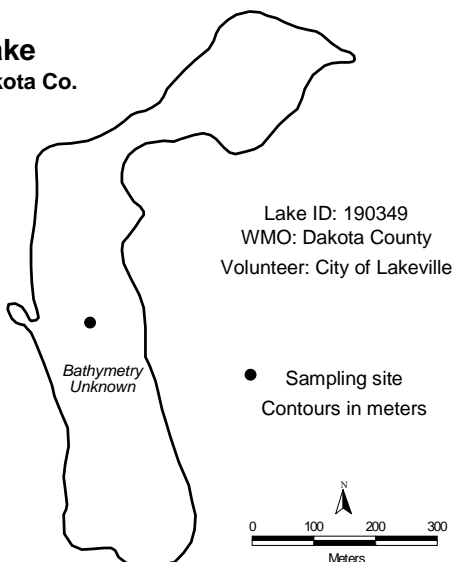
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	114.9	23.0	269.0	D
CLA (µg/l)	129.2	4.0	360.0	F
Secchi (m)	0.9	0.2	3.4	D
TKN (mg/l)	3.10	1.10	7.60	
Lake Grade				D

The lake received a lake grade of D for 2008. The water quality for 2008 was an improvement over the previous three years. The lake experienced clearer water and lower concentrations of CLA and TP during the spring and early summer of 2008 as compared to previous years. Further monitoring is suggested to help determine if the improved water quality seen in 2008 is evidence of an improving trend for this lake.

Throughout the monitoring period, the volunteers ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The resulting user perception rankings are shown on the information sheet. The mean physical condition ranking was 3.4 (between 3- "definite algae present" and 4- "high algal color"), and 4.0 for recreational suitability (4- "no swimming - boating ok").

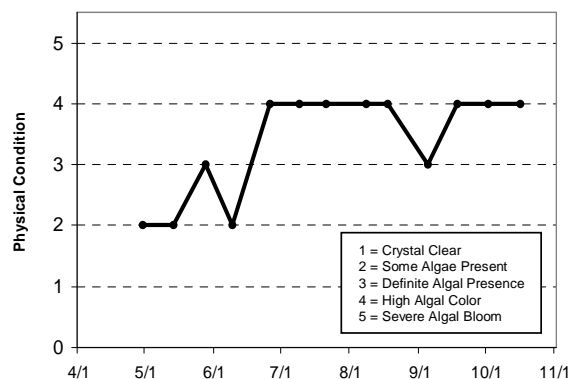
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

East Lake Lakeville, Dakota Co.



2008 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	11.7				35	105		0.6	2	2
5/14	16.1				16	40		0.8	2	4
5/28	18.3				5	23		1.8	3	4
6/9	20.6				4	40		3.4	2	4
6/26	26.1				61	78		0.6	4	4
7/9	26.1				38	104		0.4	4	4
7/21	28.3				78	178		0.4	4	4
8/8	26.7				260	82		0.3	4	4
8/18	26.6				360	123		0.3	4	4
9/5	69				250	269		0.3	3	4
9/18	19				220	212		0.2	4	4
10/2	14				120	165		0.3	4	4
10/16	11				99	124		0.4	4	4



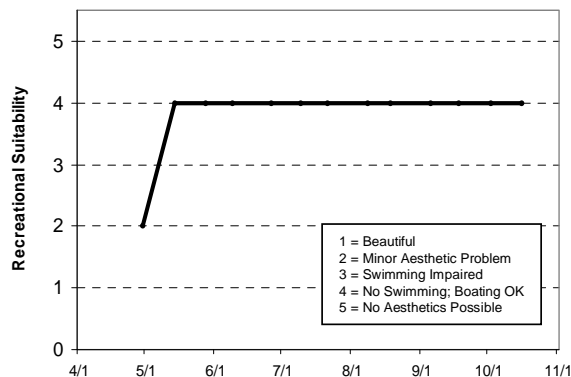
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



East Boot Lake (82-0034) Carnelian - Marine 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 size and mean depth results in an approximate lake volume of 282 ac-ft. Because of the overall shallowness of the lake, roughly 82 percent of the lake's surface area is considered littoral zone (area of aquatic plant dominance), the majority of the lake does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column). 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.

The lake was monitored 7 times between mid-April and early-October 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	37.8	30.0	51.0	C
CLA (µg/l)	10.9	2.1	18.0	B
Secchi (m)	3.6	1.8	7.3	A
TKN (mg/l)	1.29	0.85	2.30	
Lake Grade				B

The lake received a lake grade of B for 2008. The lake grade and grades received for the individual water quality parameters were typical of those received since 2004. 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.

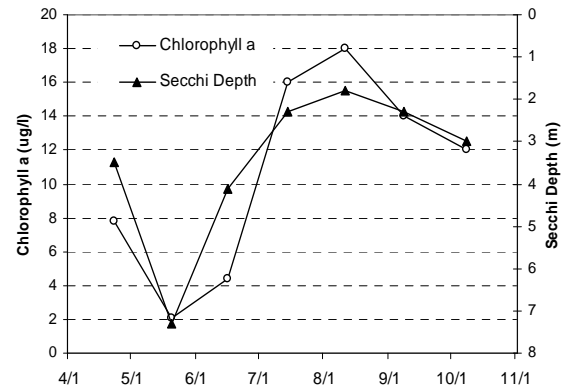
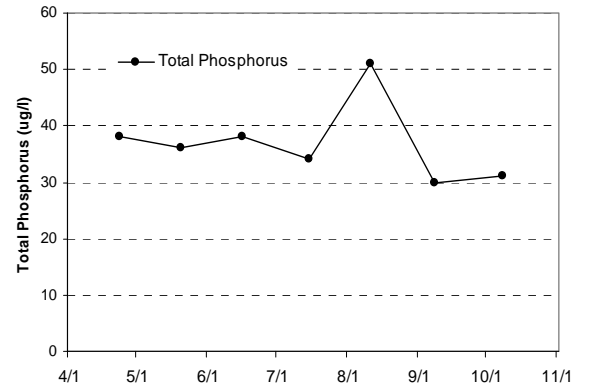
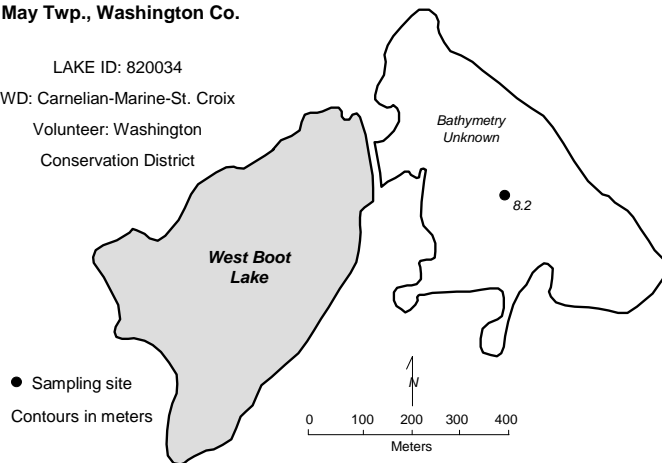
The last two graphs show seasonal variation in the lake's perceived physical condition and recreational suitability. The average user perception rankings, on a 1-to-5 scale, were 2.6 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 3.2 for recreational suitability (between 3- "swimming slightly impaired" and 4- "no swimming – boating ok").

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

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

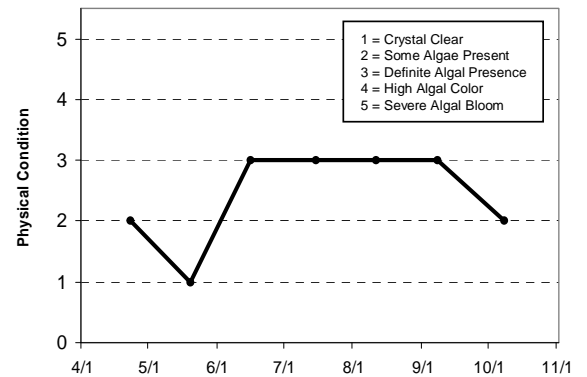
East Boot Lake May Twp., Washington Co.

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



2008 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
4/23	9	5.1	12	1.06	7.8	38		3.5	2	2
5/20	15.4	6.3	9.31	0.24	2.1	36	467	7.3	1	1
6/16	20.9	7.1	8.57	0.26	4.4	38	552	4.1	3	4
7/15	24.3	7.6	7.67	0.56	16	34	1000	2.3	3	3
8/11	24.9	9.9	6.85	0.36	18	51	1400	1.8	3	4
9/8	20	8.2	6.06	0.28	14	30	1910	2.3	3	4
10/8	15.1	8.3	6.77	0.32	12	31	1910	3	2	2



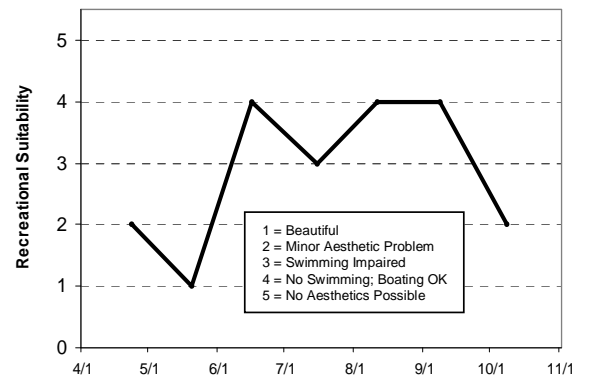
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



Echo Lake (82-0135) Valley Branch Watershed District

Echo Lake is a 41-acre lake located within the City of Mahtomedi (Washington County). The mean and maximum depth of the lake is 0.8 m (2.6 feet) and 1.8 m (6 feet), respectively. Because of the shallowness of the lake, its entire area is considered littoral (the shallow [0-15 foot depth] area dominated by aquatic vegetation), and it never maintains a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column) through the summer months. The lake's surface area and mean depth translate to a volume of roughly 107 ac-ft. There is no public access to the lake.

The lake's surface area and watershed size (194 acres) translates to a 4.7:1 watershed-to-lake size ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

This was the third year that Echo Lake has been involved in the CAMP. A search through the STORET nationwide water quality database for historic data on the lake came up with Secchi information for 2005. Thus, the 2006 – 2008 CAMP data are the only known nutrient data available.

The lake was monitored 8 times between early-May and late-October 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	38.0	33.0	43.0	NA
CLA (µg/l)	38.5	23.0	54.0	NA
Secchi (m)	0.7	0.5	0.8	NA
TKN (mg/l)	2.20	1.80	2.60	
Lake Grade				NA

There was an insufficient quantity of data to determine water quality grades for 2008. At least 5 sampling dates are needed in within the summer-time period to calculate letter grades. There is an insufficient quantity of data to determine water quality trends for this lake, therefore, to better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings, were 3.0 for physical condition (3- "definite algae present"), and 4.0 for recreational suitability (4- "no swimming – boating ok").

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.

Echo Lake Mahtomedi, Washington Co.

LAKE ID: 820135

WD: Valley Branch

Volunteer: Jim Serley

● Sampling site

Contours in meters



Bathymetry
Unknown

2008 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(°C)	(°C)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
6/27	24.6				23	43		0.8	3	4
7/20	26.5				54	33		0.5	3	4
10/2	14.4				67	95		0.4		4
10/19	12.3				60	83		0.5	3	4

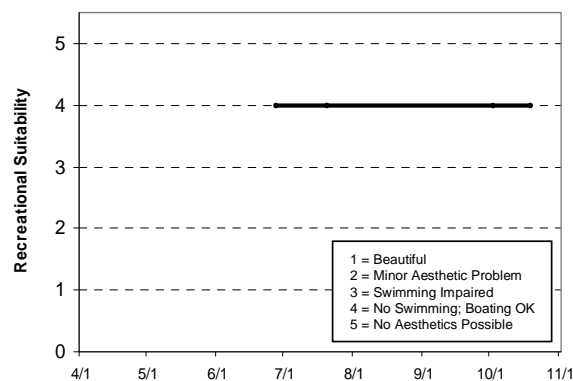
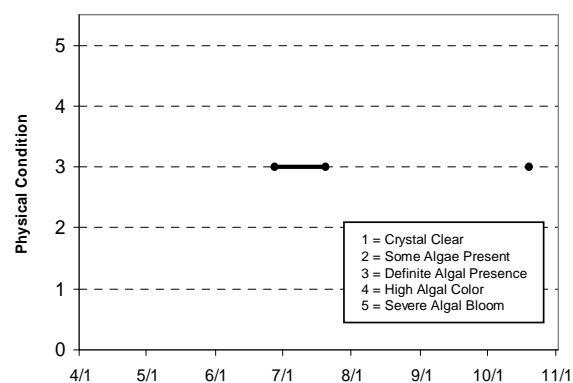
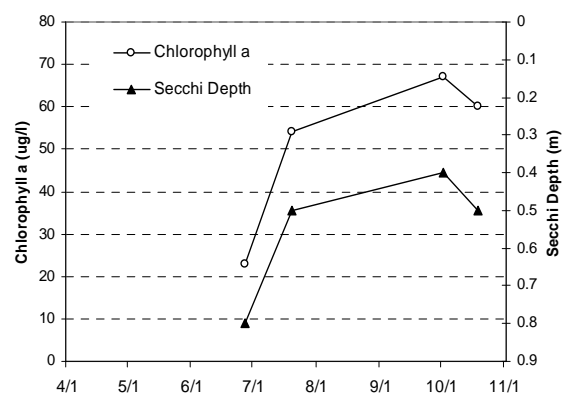
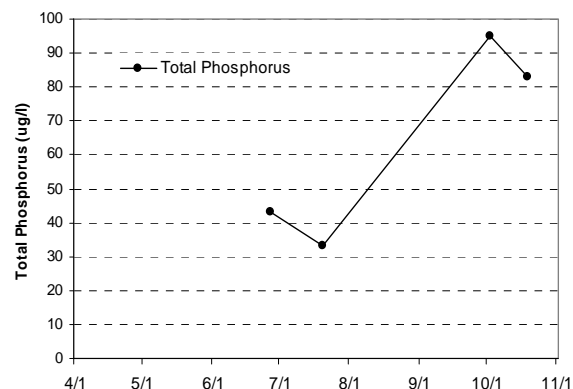
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus			D	D	
Chlorophyll a			C	F	
Secchi Depth		F	F	D	
Lake Grade			D	D	

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.

A search through the STORET nationwide water quality database for historic data on the lake revealed only the CAMP data. Therefore, 2005 – 2008 are the only known years where data are available. The lake was monitored 10 times between early May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	23.9	16.0	45.0	B
CLA (µg/l)	6.3	2.6	10.0	A
Secchi (m)	2.0	1.5	2.5	C
TKN (mg/l)	0.78	0.51	1.00	
Lake Grade				B

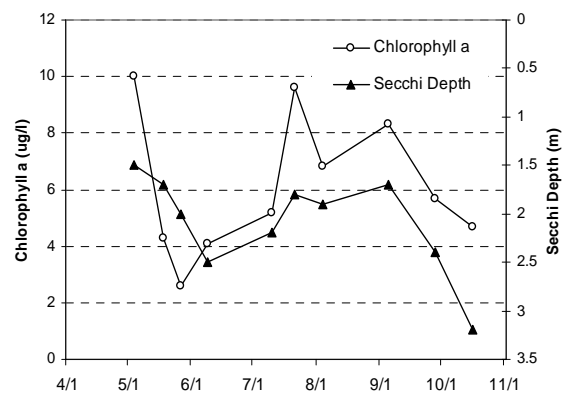
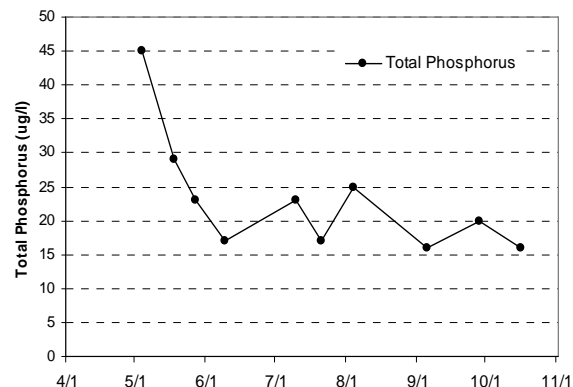
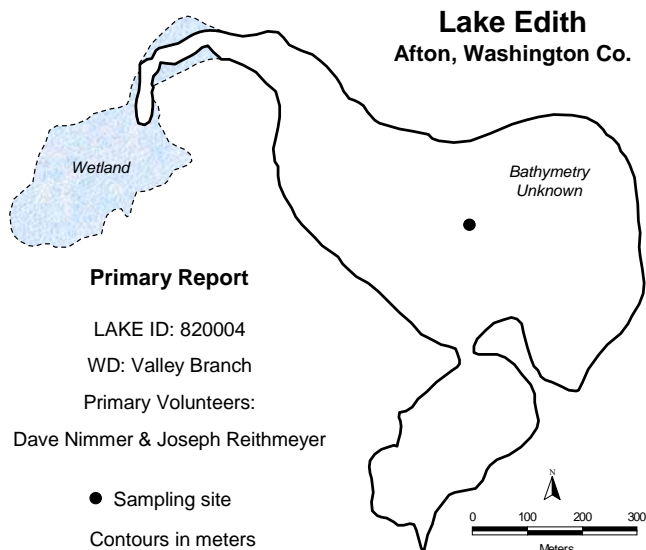
The lake received a lake grade of B for 2008, which is similar to the grade it received in 2006. For the four years that the lake has been monitored via the CAMP, the lake has fluctuated between a lake grade of A and B. Continued monitoring is suggested to help determine the long term nature of the water 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 during 2008. 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) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 2.0 for physical condition (2- "some algae present"), and 2.0 for recreational suitability (2- "minor aesthetic problem").

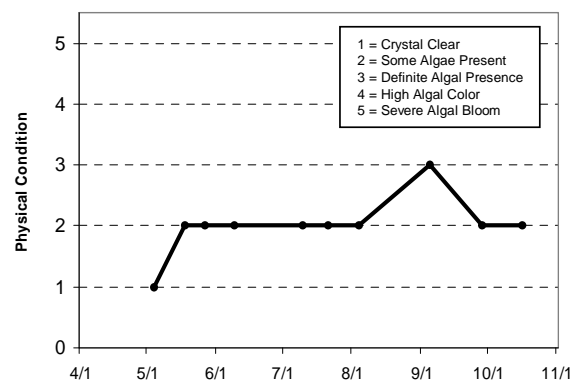
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/4	15.7				10	45		1.5	1	2
5/18	17.4				4.3	29		1.7	2	2
5/27	20				2.6	23		2	2	2
6/9	20.8				4.1	17		2.5	2	2
7/10	25.2				5.2	23		2.2	2	2
7/21	26.1				9.6	17		1.8	2	2
8/4	27.6				6.8	25		1.9	2	2
9/5	21.7				8.3	16		1.7	3	2
9/28	19.4				5.7	20		2.4	2	2
10/16	14				4.7	16		3.2	2	2



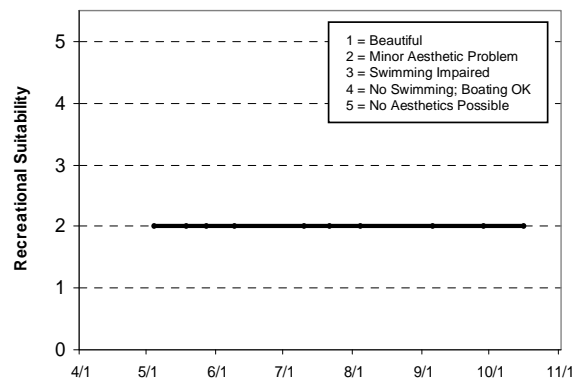
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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
Total Phosphorus	A	B	A	B	
Chlorophyll a	A	A	A	A	
Secchi Depth	B	C	B	C	
Lake Grade	A	B	A	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 2008. The monitoring by the WCD provided duplicate monitoring for the lake. For more detailed information on the lake, refer to its primary report.

The lake was monitored 7 times between late April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

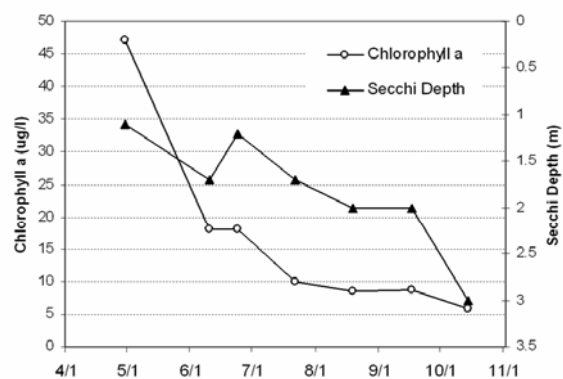
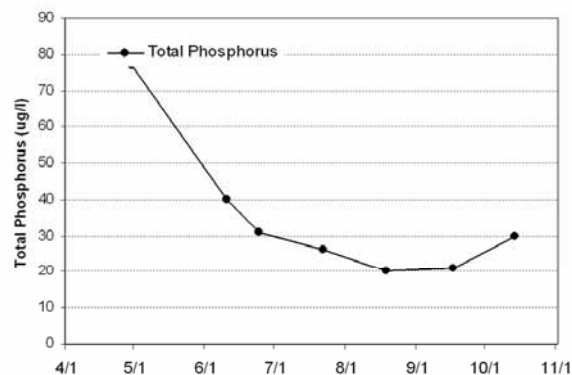
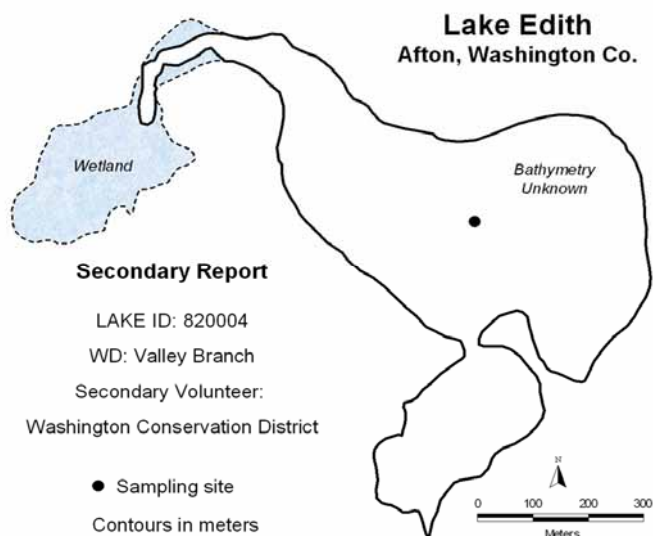
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	27.6	20.0	40.0	B
CLA (µg/l)	12.7	8.6	18.0	B
Secchi (m)	1.7	1.2	2.0	C
TKN (mg/l)	1.03	0.81	1.40	
Lake Grade				B

The lake received a lake grade of B for 2008, 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 agreement with respect to magnitude and temporal pattern with respect to those given in the primary report, with the one exception of the secondary volunteer observing higher CLA concentrations in the first spring monitoring date. Similarly as the primary volunteer, the secondary volunteer observed reduced summer-time water clarity conditions in contrast to what the CLA data would suggest. Therefore, overall, the data collected by the primary and secondary volunteers concur with each other.

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 3.0 for physical condition (3- "definite algae present"), and 3.8 for recreational suitability (between 3- "swimming slightly impaired and 4- "no swimming/boating ok").

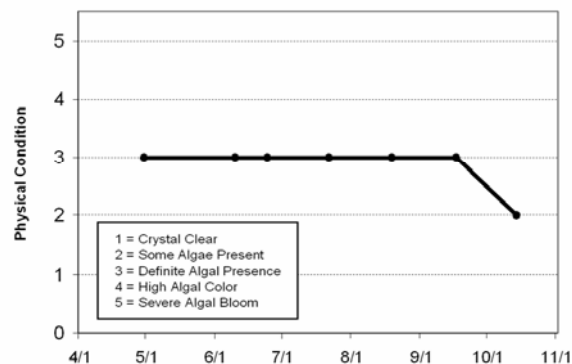
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/30	8.8	3.4	15.58	1.05	47	77	77	1.1	3	4
6/10	20.8	3.9	10.18	0.21	18	40	186	1.7	3	4
6/24	24.3	4.1	12.78	0.86	18	31	203	1.2	3	4
7/22	26.1	4.5	10.04	0.01	10	26	190	1.7	3	4
8/19	25.4	4.7	9.46	0.28	8.6	20	245	2	3	3
9/17	18.9	5	10.92	0.2	8.8	21	362	2	3	4
10/14	15	5.4	9.85	0.23	5.9	30	234	3	2	3



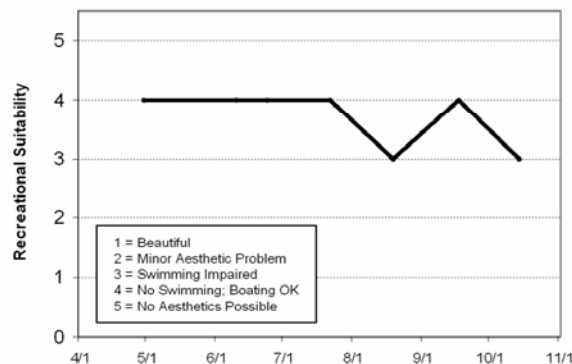
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus		A	B	A	B
Chlorophyll a		A	A	A	B
Secchi Depth		B	C	B	C
Lake Grade		A	B	A	B

Source: Metropolitan Council and STORET data



Lake Elmo (82-0106) Valley Branch Watershed District

Primary Report

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. The lake has a public access associated with the Lake Elmo Regional Park located on the west side of the lake. The 284-acre lake has a maximum depth of 41.7 m (roughly 140 feet [deepest in the TCMA]). Roughly 22 percent of the lake's surface area is considered littoral zone (the 0-15 foot depth area of aquatic plant dominance).

The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

This was the fifth year that Lake Elmo has been involved in the CAMP. The lake also has been monitored in the past by Council staff (most recently in 1991). A search of the STORET nationwide water quality database for data on the lake revealed a moderate database since the 1980's with nutrient and Secchi transparency data available in 1980-1982, 1984, 1988, 1991, 1994 and 2005-2006. Additionally, Secchi transparency data are available for 1985-1987, 1989-1990 and 1992-1993.

The lake was monitored 11 times from late April to mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	14.7	9.0	30.0	A
CLA (µg/l)	3.2	1.9	6.2	A
Secchi (m)	3.3	2.0	5.2	A
TKN (mg/l)	0.75	0.40	2.50	
Lake Grade				A

The lake received a lake grade of A for 2008, 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. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The summertime mean recorded physical condition was 1.0 (1- "crystal clear"). The mean suitability for recreation ranking, also on a 1-to-5 scale, was 1.0 (1- "beautiful").

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.

Lake Elmo

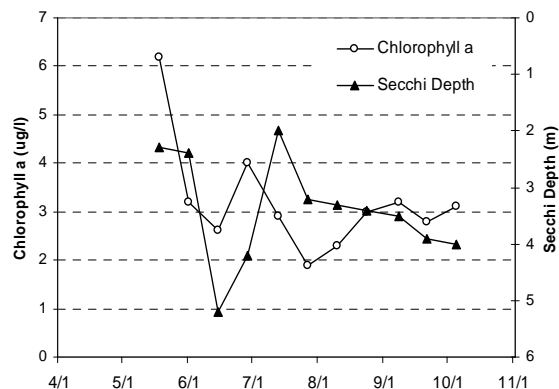
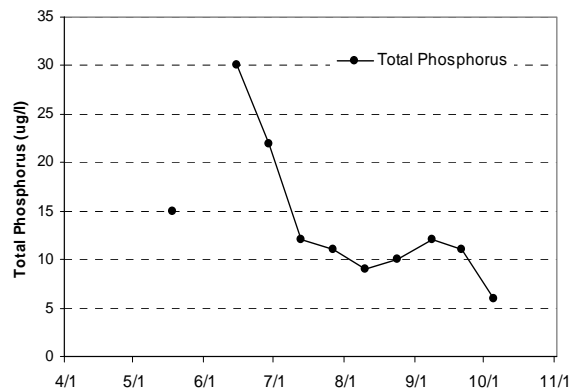
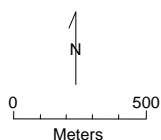
Lake Elmo, Washington Co.

Primary Report

Lake ID: 820106
WD: Valley Branch

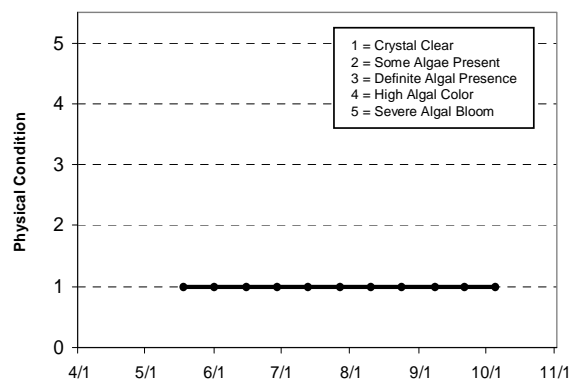
Primary Volunteer: Scott Knudson

● Sampling site
Contours in meters



2008 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
5/18	14.9				6.2	15		2.3	1	1
6/1	20.2				3.2			2.4	1	1
6/15	20.9				2.6	30		5.2	1	1
6/29	24.1				4	22		4.2	1	1
7/13	24.2				2.9	12		2	1	1
7/27	26.5				1.9	11		3.2	1	1
8/10	26				2.3	9		3.3	1	1
8/24	25				3	10		3.4	1	1
9/8	21.4				3.2	12		3.5	1	1
9/21	21.3				2.8	11		3.9	1	1
10/5	17				3.1	6		4	1	1



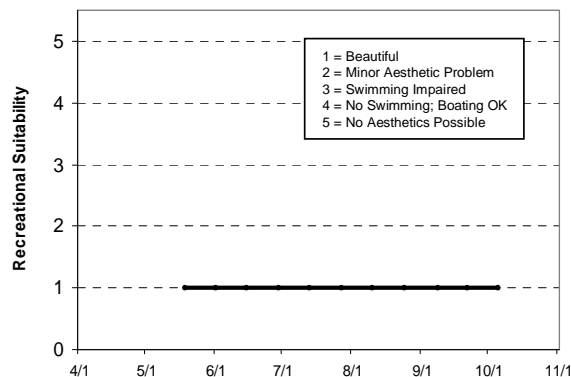
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	B	A	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
Lake Grade	B	A	B		B				A			A

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

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

Source: Metropolitan Council and STORET data



Lake Elmo (82-0106) Washington Conservation District

Secondary Report

Lake Elmo was also monitored by the Washington Conservation District (WCD) in 2008. The monitoring by the WCD provided duplicate monitoring for the lake. For more detailed information on the lake, refer to its primary report.

The lake was monitored 11 times from mid May to early October 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	17.8	13.0	24.0	A
CLA (µg/l)	3.4	2.8	4.1	A
Secchi (m)	4.3	3.4	5.0	A
TKN (mg/l)	0.64	0.48	0.76	
Lake Grade				A

The lake received a lake grade of A for 2008, which is the same as the lake grade received in the primary report. Both the secondary and primary volunteers observed water clarities that yielded A grades. The secondary and primary volunteers observed similar Secchi depths throughout the year except for one or possibly two observations during August and September. Overall, the data from the secondary volunteer concurs with those data of the primary volunteer.

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The summertime mean recorded physical condition was 1.8 (1- "crystal clear" and 2- "some algae present"). The mean suitability for recreation ranking, also on a 1-to-5 scale, was 1.4 (between 1- "beautiful" and 2- "minor aesthetic problem").

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.

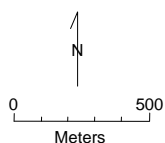
Lake Elmo

Lake Elmo, Washington Co.

Secondary Report

Lake ID: 820106
WD: Valley Branch
Secondary Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	5.6	5.2	11.67	10.07	7.7	24		3.5	2	1
6/9	18.9	7	8.82	0.25	3.6	22	12	4.4	2	2
6/23	22	4.7	9.47	1.49	3.4	24	18	5	2	2
7/21	25.2	4.9	6.86	0.51	2.8	16	10	3.4	2	1
8/19	25.2	5.4	7.88	0.41	3	14	13	4.1	2	1
9/17	19.8	5.6	9.49	0.25	4.1	13	13	4.7	1	1
10/16	14.8	6	8.22	0.36	4.8	14	14	5.2	1	1

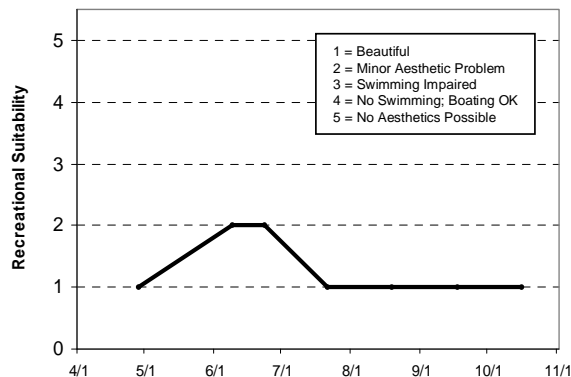
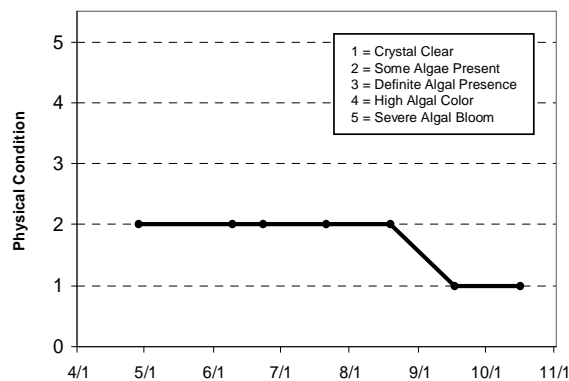
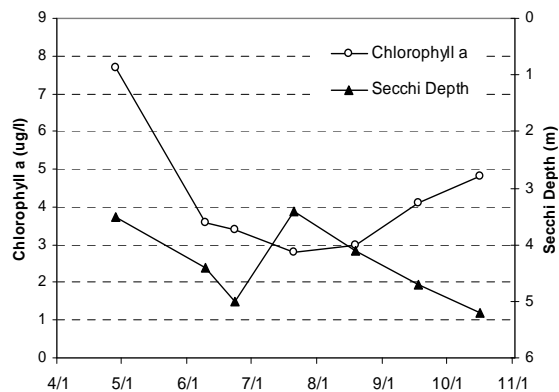
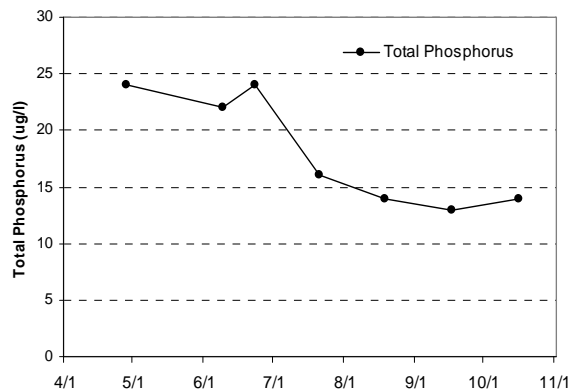
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	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
Lake Grade	B	A	B		B				A			A

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

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

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 2008 was the first 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.

The lake was monitored 3 times from late April to late June 2008. 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.

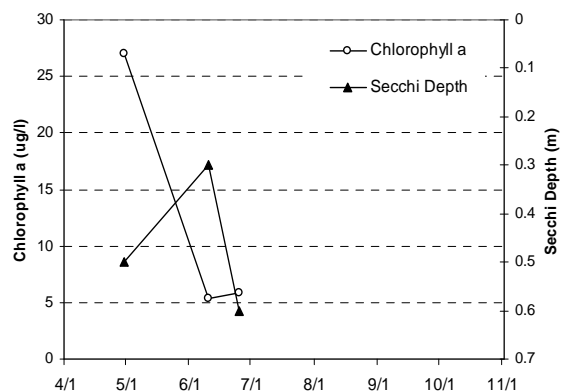
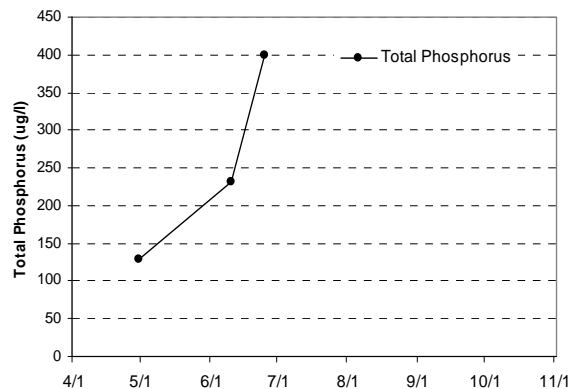
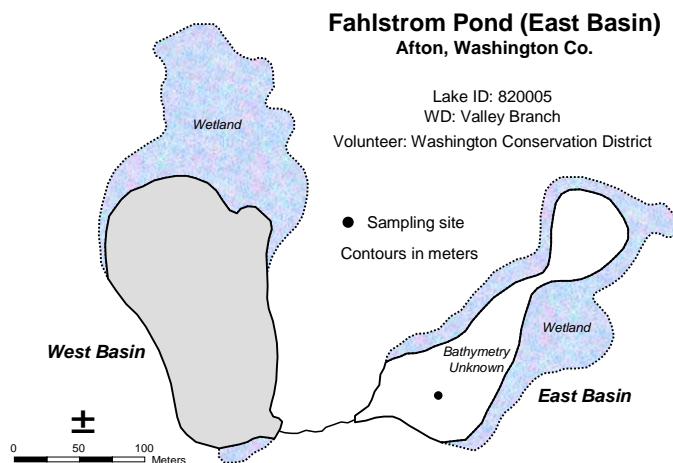
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	315.5	232.0	399.0	NA
CLA (µg/l)	5.6	5.4	5.8	NA
Secchi (m)	0.5	0.3	0.6	NA
TKN (mg/l)	1.60	1.30	1.90	
Lake Grade				NA

There were insufficient data to calculate a lake grade for 2008. 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.

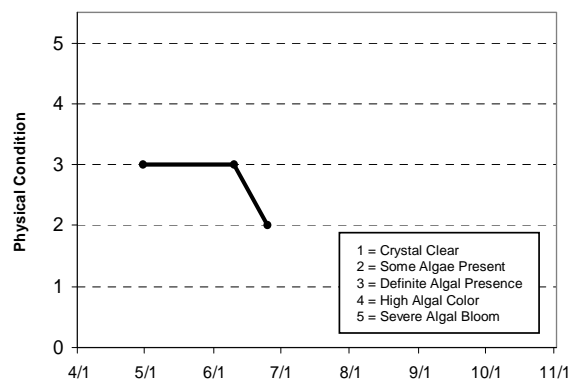
Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The mean summertime physical condition was 2.5 (between 2- "some algae present" and 3- "definite algae present"). The mean summertime suitability for recreation, also on a 1-to-5 scale, was 4.0 ("no swimming/boating ok").

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.



2008 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	11.2		11.89		27	128		0.5	3	4
6/10	22.7		6.15		5.4	232		0.3	3	4
6/25	25.6		2.4		5.8	399		0.6	2	4



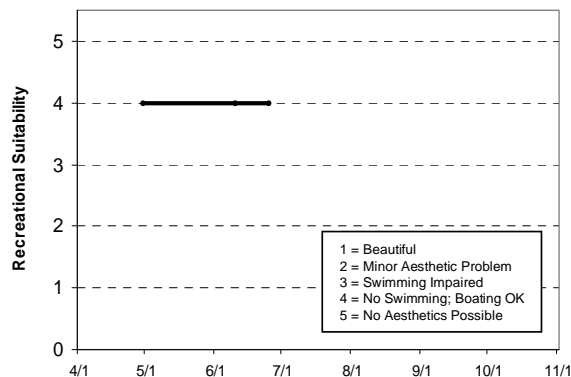
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					
Chlorophyll a					
Secchi Depth					
Lake Grade					

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 first 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.

The lake was monitored 5 times from late April to mid September 2008. 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.

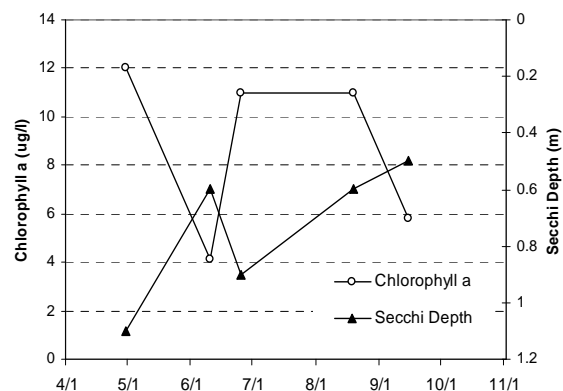
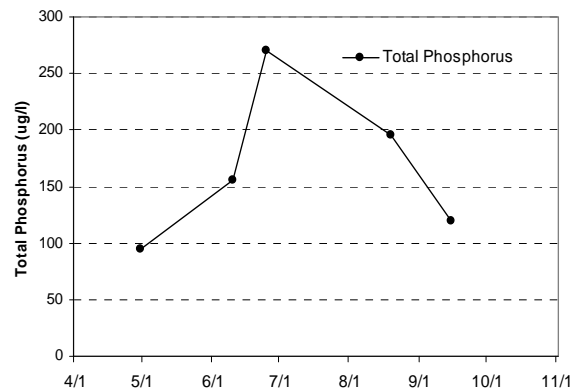
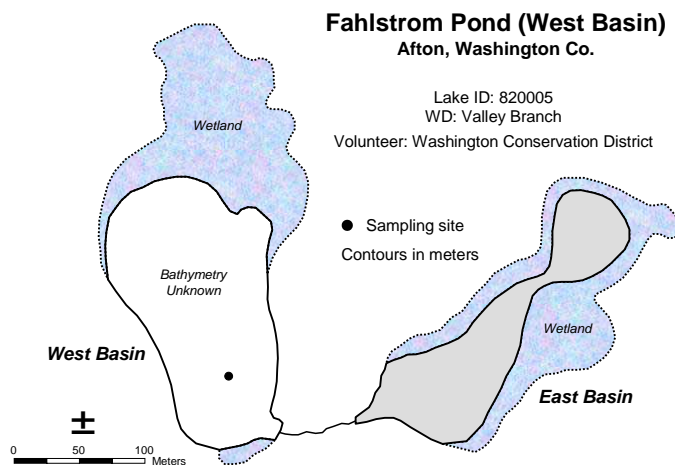
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	185.3	119.0	270.0	NA
CLA (µg/l)	8.0	4.1	11.0	NA
Secchi (m)	0.7	0.5	0.9	NA
TKN (mg/l)	2.05	1.70	2.30	
Lake Grade				NA

There were insufficient data to calculate a lake grade for 2008. 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.

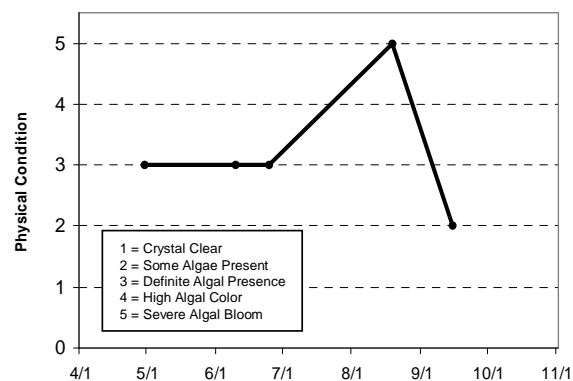
Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The mean summertime physical condition was 3.3 (between 3- "definite algae present" and 4- "high algal color"). The mean summertime suitability for recreation, also on a 1-to-5 scale, was 3.5 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/30	9.9	10	14.27	11.39	12	94		1.1	3	4
6/10	23.2		5.55		4.1	156		0.6	3	4
6/25	25.4	25.4	4.49	2.98	11	270		0.9	3	4
8/19	24.9		5.49		11	196		0.6	5	4
9/15	20.5	20.5	12.9	5.82	5.8	119		0.5	2	2

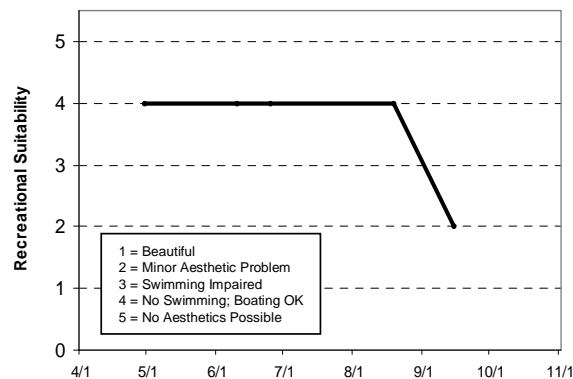


Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					
Chlorophyll a					
Secchi Depth					
Lake Grade					



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). The watershed-to-lake size ratio is 6:1 (the greater the ratio, the greater the potential stress on the lake from surface runoff).

The lake was monitored 13 times between mid April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	132.3	41.0	262.0	D
CLA (µg/l)	125.9	7.2	350.0	F
Secchi (m)	0.8	0.2	2.4	D
TKN (mg/l)	2.63	1.50	4.00	
Lake Grade				D

The lake received a lake grade of D for 2008, but received an F grade for CLA, which is the worse grade received for this parameter since 2004. The mean summer time Secchi depth raised the water clarity grade from the usual F to a D. The increase in the water clarity mean was caused mainly by two unusually clearer days in late May and early June. These two relatively clear days were associated with low CLA concentrations (<10 ug/L CLA). Otherwise the water quality for the other periods of the monitoring season appears similar to the water quality of previous recent monitoring seasons. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

Throughout the monitoring season, the volunteers monitor ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. The mean perceived physical condition was 3.2 (between 3- "definite algae present" and 4- "high algal color"), while the mean recreational suitability was 3.2 (between 3- "swimming slightly impaired" and 4- "no swimming – boating ok").

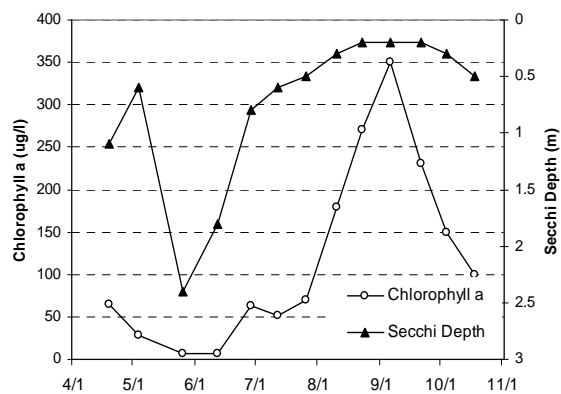
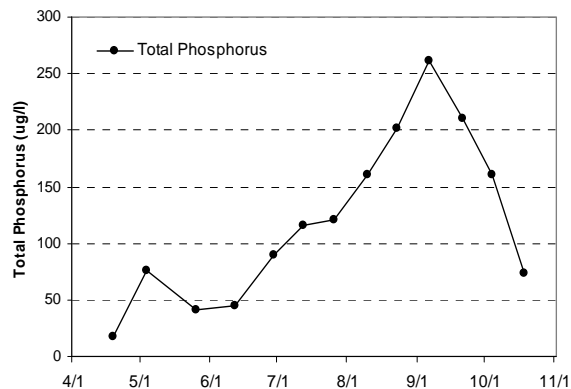
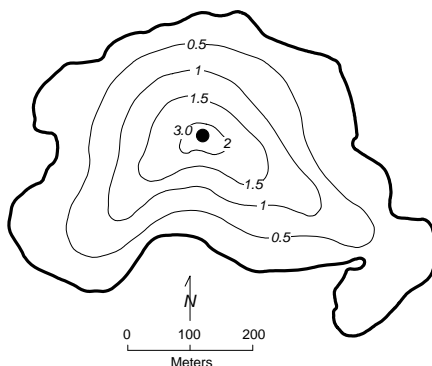
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Farquhar Lake Apple Valley, Dakota Co.

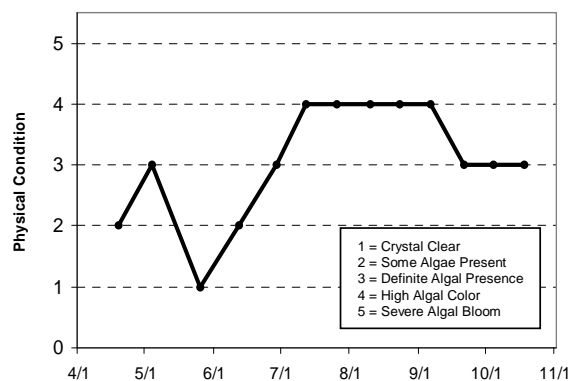
Lake ID: 190023
WMO: Dakota County
Volunteer: Bill Sherry

● Sampling site
Contours in meters



2008 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	5.8				65	17		1.1	2	2
5/4	13.2				29	76		0.6	3	3
5/26	18.8				7.4	41		2.4	1	1
6/12	23				7.2	45		1.8	2	2
6/29	24.6				63	90		0.8	3	3
7/12	25.5				52	116		0.6	4	4
7/26	26.1				70	121		0.5	4	4
8/10	25.1				180	160		0.3	4	4
8/23	24.5				270	202		0.2	4	4
9/6	20.7				350	262		0.2	4	4
9/21	22.7				230	210		0.2	3	3
10/4	16				150	160		0.3	3	3
10/18	12.2				100	73		0.5	3	3



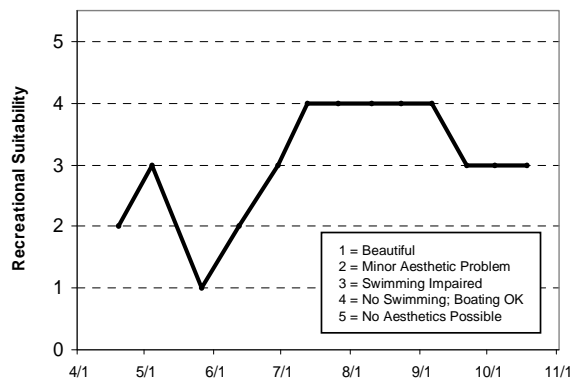
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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) and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column). The DNR has designated the lake as being infested with Eurasian Water Milfoil (*Myriophyllum spicatum*).

A search through the STORET nationwide water quality database determined that the 2001-2008 CAMP data are the only data available for the lake.

The lake was monitored 14 times from mid April to mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	22.5	12.0	33.0	A
CLA (µg/l)	4.0	1.8	6.6	A
Secchi (m)	3.4	2.5	4.0	A
TKN (mg/l)	0.52	0.25	0.62	
Lake Grade				A

The lake received a lake grade of A for 2008, which is similar to the A grades it has received in previous years. The lake's water quality appears well represented by a lake grade of A.

The last two graphs show seasonal variation in the lake's perceived physical condition and recreational suitability. The average user perception rankings, on a 1-to-5 scale, were 1.5 for physical condition (between 1- "crystal clear" and 2- "some algae present"), and 1.3 for recreational suitability (between 1- "beautiful" and 2- "minor aesthetic problem").

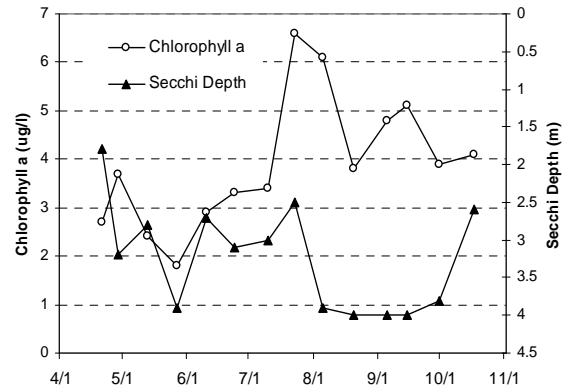
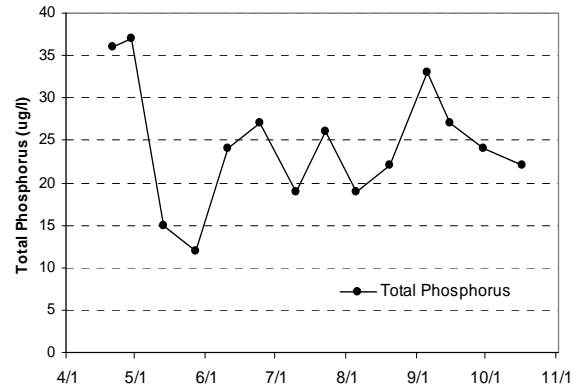
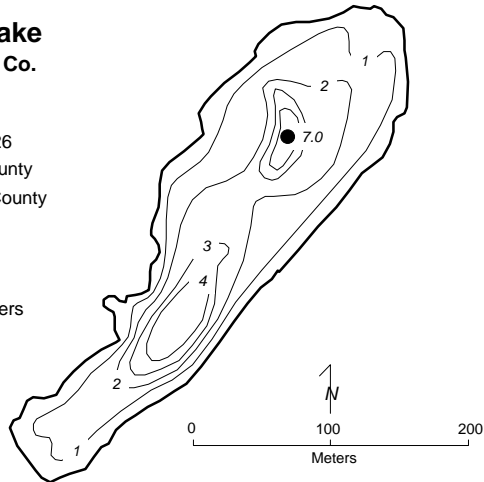
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fishery survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Fireman's Lake Chaska, Carver Co.

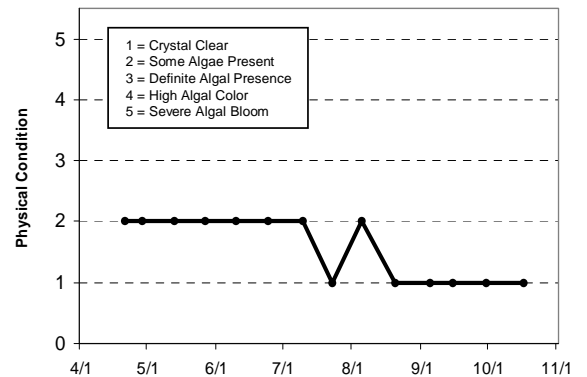
Lake ID: 100226
WMO: Carver County
Volunteer: Carver County

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	11.81		9.44		2.7	36		1.8	2	2
4/29	9.25		10.02		3.7	37		3.2	2	2
5/13	15.56		13.41		2.4	15		2.8	2	1
5/27	18.13		9.32		1.8	12		3.9	2	2
6/10	22.28		6.7		2.9	24		2.7	2	1
6/24	25.52		10.22		3.3	27		3.1	2	2
7/10	19.65		10.06		3.4	19		3	2	1
7/23	27.07		8.86		6.6	26		2.5	1	1
8/5	26.45		10.13		6.1	19		3.9	2	2
8/20	26.49		13.19		3.8	22		4	1	1
9/5	21.95		7.22		4.8	33		4	1	1
9/15	20		5.73		5.1	27		4	1	1
9/30	19.85		6.02		3.9	24		3.8	1	1
10/17	13.92		6.09		4.1	22		2.6	1	1



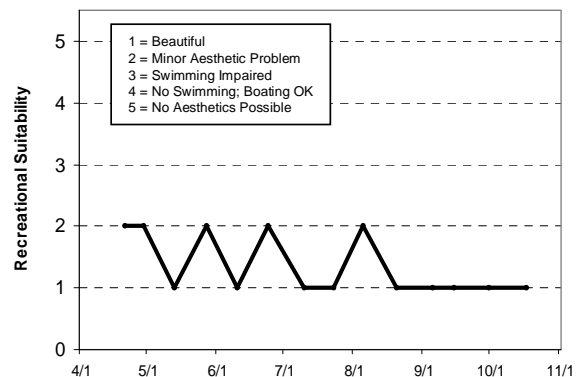
Lake Water Quality Grades Based on Summertime Averages

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

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

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. The lake has a surface area of 171 acres. The lake's mean and maximum depth of 4.4 m (14 feet) and 8.5 m (28 feet) translates to an approximate volume of 2,468 ac-ft. Roughly 43 percent of the lake's surface area is considered littoral. The littoral zone is the 0-15 feet deep area of the lake dominated by aquatic vegetation. The lake has a 434-acre watershed which yields a watershed-to-lake area ratio of 2.5:1 (the larger the ratio the greater the potential stress on the lake from surface runoff). The lake can be accessed on the northwestern end.

A search for historic water quality data through Council, MPCA, and STORET databases yielded in a few years of data (1980, 1984, 1990, 1995, 1997, and 1998-2007).

The lake was monitored 11 times between mid May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	42.6	22.0	120.0	C
CLA (µg/l)	18.8	12.0	24.0	B
Secchi (m)	1.3	1.1	2.3	C
TKN (mg/l)	1.46	1.20	1.80	
Lake Grade				C

The lake received a lake grade of C for 2008 which is typical for this lake. The lake appears to be represented by a lake grade of C given the historical water quality database. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

During each visit, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. The mean physical condition ranking was 2.8 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability ranking was 1.9 (between 1- "beautiful" and 2- "minor aesthetic problem").

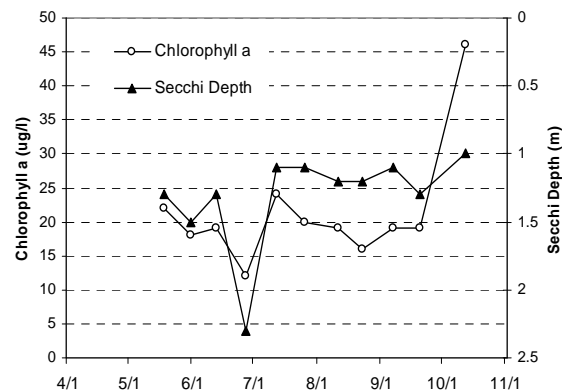
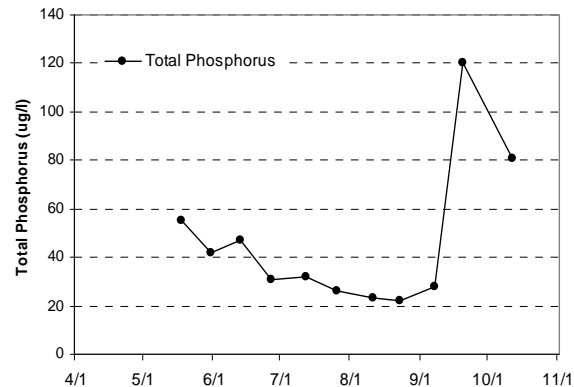
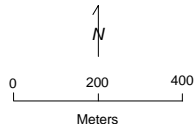
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Fish Lake Spring Lake Twp., Scott Co.

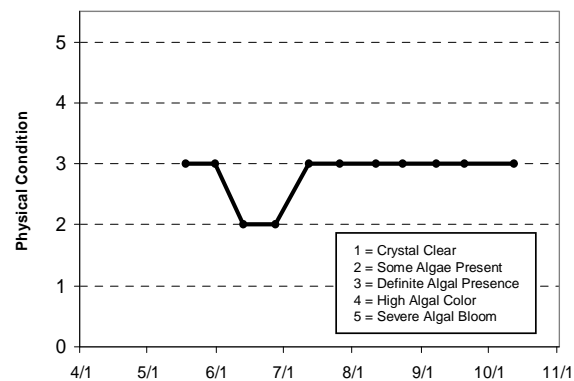
Lake ID: 700069
WD: Prior Lake-Spring Lake
Volunteer: Steve Pierson

● Sampling site
Contours in meters



2008 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
5/18	15.6				22	55		1.3	3	2
5/31	17.6				18	42		1.5	3	2
6/13	19.4				19	47		1.3	2	2
6/27	25.2				12	31		2.3	2	1
7/12	25				24	32		1.1	3	2
7/26	26.8				20	26		1.1	3	2
8/11	25.5				19	23		1.2	3	2
8/23	24.8				16	22		1.2	3	2
9/7	20.9				19	28		1.1	3	2
9/20	21.4				19	120		1.3	3	2
10/12	16.2				46	81		1	3	2



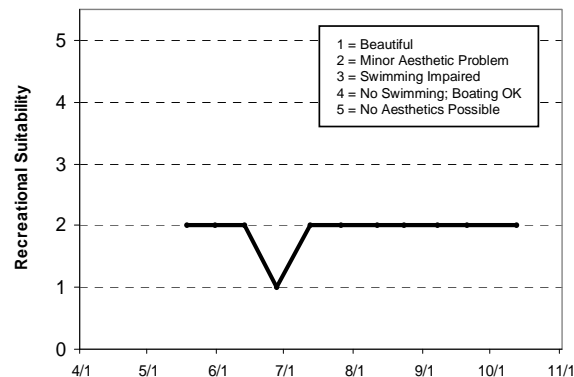
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Fish Lake [Washington County] (82-0064) *Carnelian - Marine 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. 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. It does not maintain a thermocline which is a density gradient owed to changing water temperatures throughout the lake's water column. The mean depth and surface area of the lake translates to an approximate volume of 360 ac-ft. The lake's watershed area of 683 acres translates to a watershed-to-lake size ratio of 9.5:1 (the greater the ratio, the greater the potential stress on the lake from surface runoff).

The lake was monitored 7 times between early May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	83.0	48.0	144.0	D
CLA (µg/l)	39.3	5.8	86.0	C
Secchi (m)	1.7	0.8	2.7	C
TKN (mg/l)	1.54	0.93	2.40	
Lake Grade				C

The lake received a lake grade of C for 2008, which continues the improvement in water quality that this lake has been experiencing over the past decade. This was the second 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.

The perceived physical and recreational conditions of the lake, recorded by the volunteers, were ranked on a 1-to-5 scale. The rankings are shown in both tabular and graphical form on the lake's associated information sheet. The mean physical condition ranking was 2.8 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability ranking was 3.3 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok).

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

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

Fish Lake Scandia, Washington Co.

LAKE ID: 820064

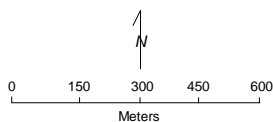
WD: Carnelian-Marine-St. Croix

Volunteer: Washington

Conservation District

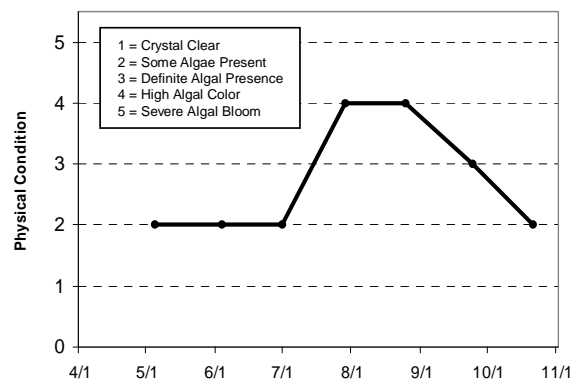
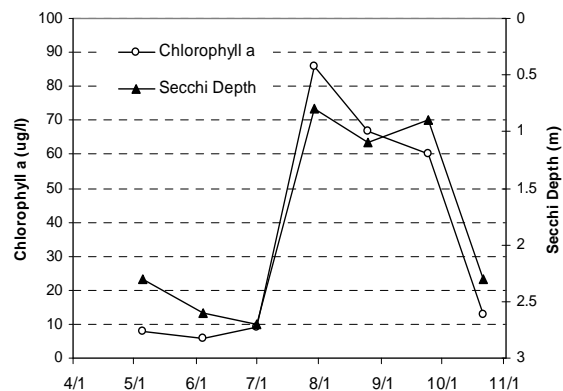
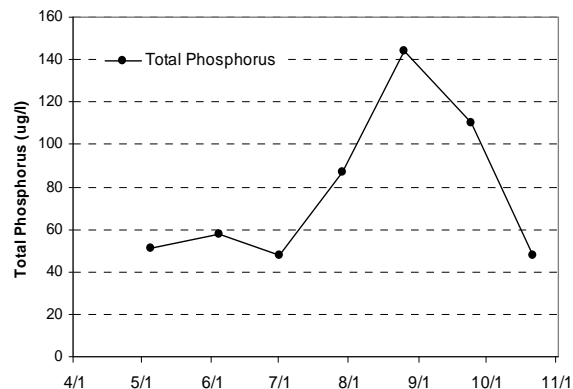
● Sampling site

Contours in meters



2008 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(°C)	(°C)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
5/5	11.4	10.7	9.38	0.64	7.9	51		2.3	2	3
6/4	18.5	18.1	614	0.19	5.8	58	64	2.6	2	2
7/1	24.6	23.3	7	0.34	9.1	48	52	2.7	2	3
7/29	26.4	23.7	7.46	0.17	86	87	149	0.8	4	4
8/25	22.6	2.22	6.19	4.62	67	144	132	1.1	4	4
9/24	19.4	19.3	5.99	1.65	60	110	134	0.9	3	4
10/21	10.6	10.7	6.09	0.48	13	48	31	2.3	2	3



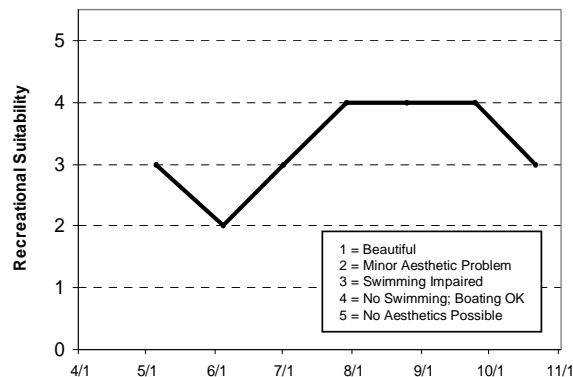
Lake Water Quality Grades Based on Summertime Averages

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							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
Total Phosphorus	D	C	D	D	D
Chlorophyll a	F	C	D	C	C
Secchi Depth	D	D	D	C	C
Lake Grade	D	D	D	C	C

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. Only the west basin was monitored through CAMP in 2008. The entire lake is considered a Priority Lake by the Metropolitan Council for its high regional recreation value. The MN DNR has designated the lake as being infested with Flowering rush (*Butomus umbellatus*).

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.

The west basin was monitored 14 times between mid May and early October 2008. 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.

2008 summer (May-September) data summary

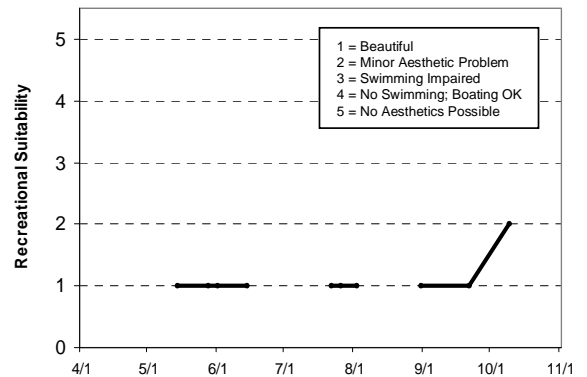
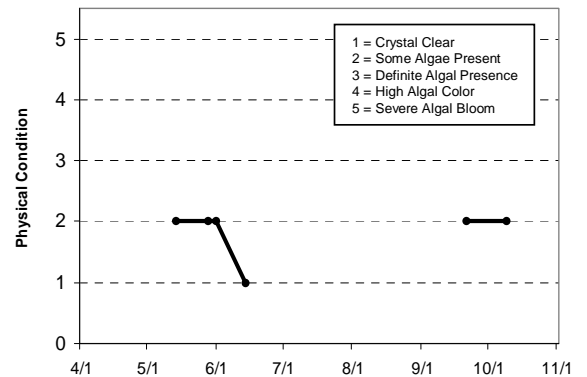
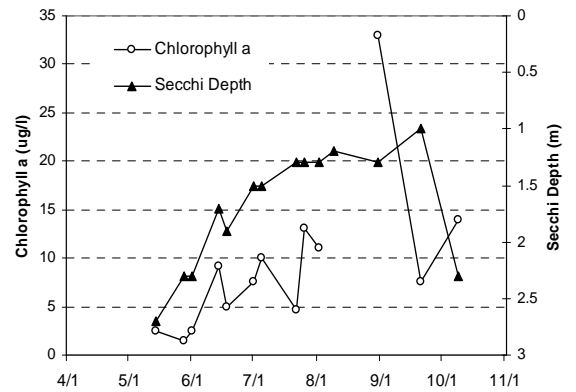
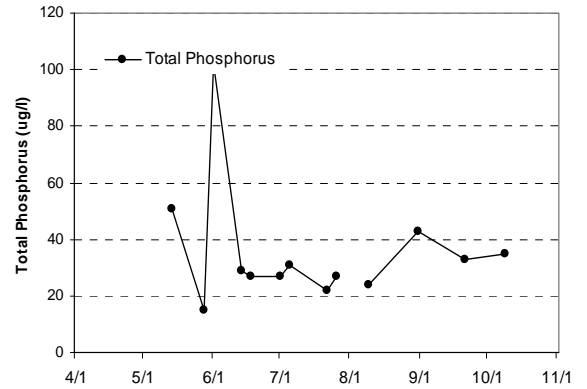
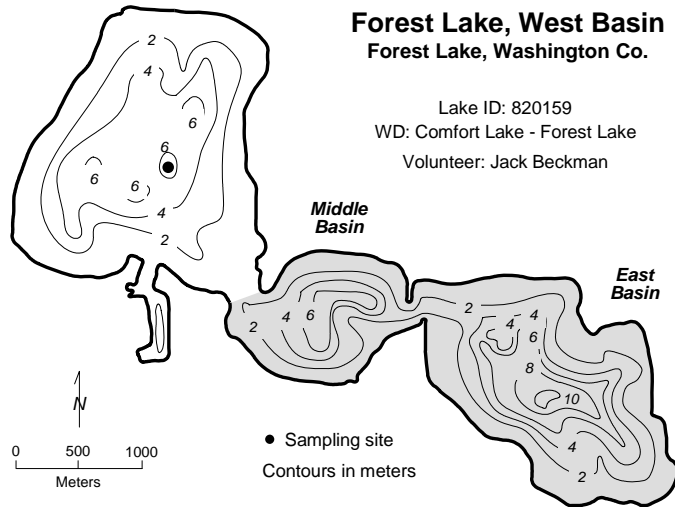
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	35.9	15.0	102.0	C
CLA (µg/l)	8.9	1.4	33.0	A
Secchi (m)	1.6	1.0	2.7	C
TKN (mg/l)	1.11	0.62	2.20	
Lake Grade				B

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. Of particular note for the 2008 monitoring season is that the lake experienced a relatively low CLA summer-time mean concentration compared to the summer-time means of TP concentration and Secchi depth (which yielded a CLA grade of A versus the C grades for TP and water clarity). The relatively lower CLA concentrations indicate that possibly something other than algae was causing the diminished water clarity. Suspended particulates may be a possible cause of the relatively lower water clarity and higher TP concentrations observed during 2008. 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.

The volunteer(s) recorded their opinions of the lake's physical and recreational conditions which were ranked on a scale of 1-to-5. The mean perceived physical condition was 2.5 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability was 1.0 (1- "beautiful").

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.



2008 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
5/14	13.9				2.4	51		2.7	2	1
5/28	18.3				1.4	15		2.3	2	1
6/1	19.7				2.4	102		2.3	2	1
6/14	18.9				9.1	29		1.7	1	1
6/18	21.1				4.9	27		1.9		
7/1	24.3				7.6	27		1.5		
7/5	23.8				10	31		1.5		
7/22	25.8				4.7	22		1.3		1
7/26	25.2				13	27		1.3		1
8/2	26.7				11			1.3		1
8/9	25.7					24		1.2		
8/31	22.2				33	43		1.3		1
9/21	19.8				7.5	33		1	2	1
10/9	13.2				14	35		2.3	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					C		C	C	C	B		C
Chlorophyll a					C		C	C	C	B		C
Secchi Depth					C		C	C	C	C		C
Lake Grade					C		C		C	B		C

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

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

This was the third year that Friedrich's Pond has been involved in CAMP. A search of historical data via the STORET nationwide water quality database yielded only the CAMP data.

The lake was monitored 11 times between early May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

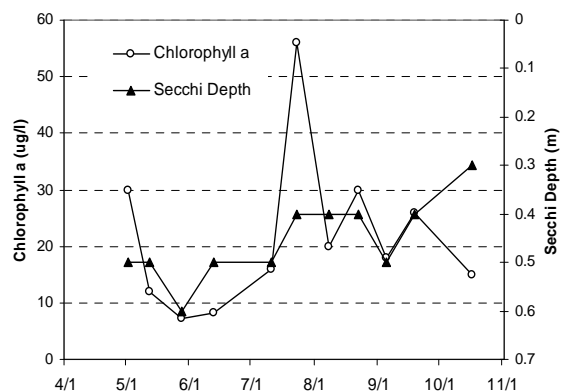
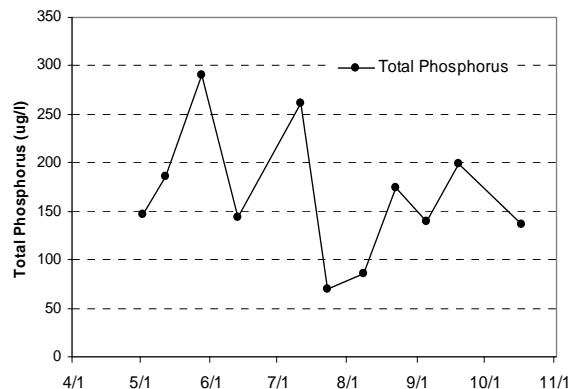
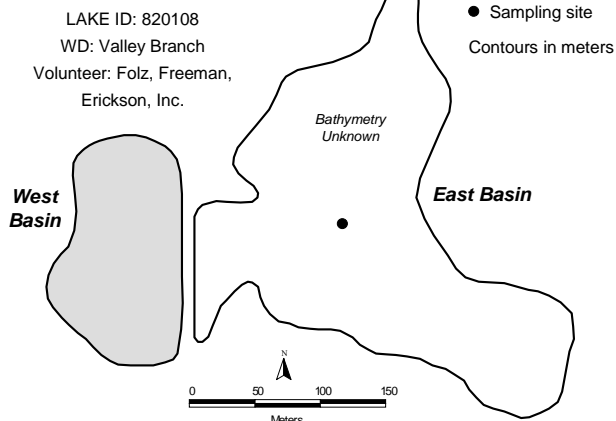
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	169.6	70.0	291.0	F
CLA (µg/l)	22.3	7.1	56.0	C
Secchi (m)	0.5	0.4	0.6	F
TKN (mg/l)	2.32	0.79	3.90	
Lake Grade				D

The lake received a lake grade of D for 2008, but the TP and Secchi grades were both F. The CLA grade for 2008 was a C, which was an improvement over the Fs received in 2006 and 2007. It appears unusual that CLA would be significantly better in 2008 with no corresponding improvement in water clarity or TP, for the reasons that these parameters were correlated in the previous two years. Additional monitoring is suggested to determine if the relatively lower CLA concentrations as observed in 2008 continue or if they were an anomaly.

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").

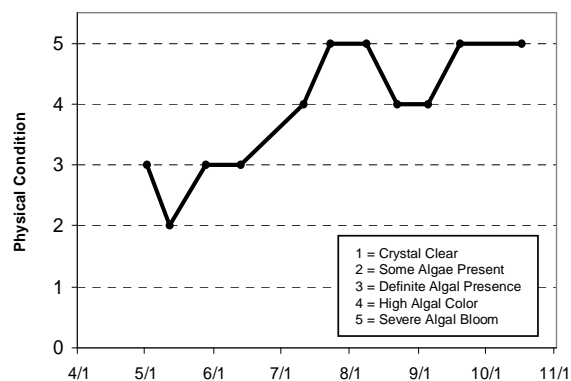
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Friedrich's Pond (East Basin) Lake Elmo, Washington Co.



2008 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	15.1				30	146		0.5	3	4
5/12	17				12	186		0.5	2	3
5/28	15.6				7.1	291		0.6	3	4
6/13	20.6				8.3	144		0.5	3	4
7/11	21.1				16	262		0.5	4	4
7/23	22.8				56	70		0.4	5	5
8/8	22.9				20	85		0.4	5	5
8/22	24				30	174		0.4	4	4
9/5	14.9				18	139		0.5	4	5
9/19	21.3				26	199		0.4	5	5
10/17	10				15	137		0.3	5	5



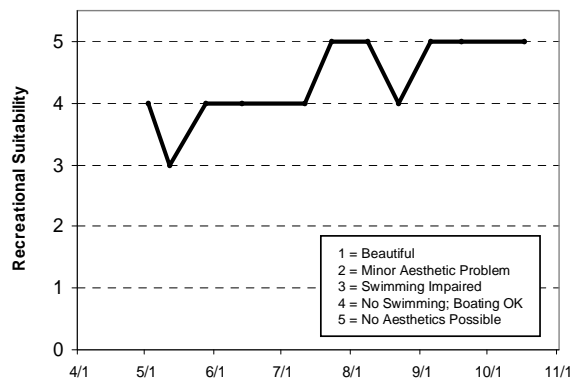
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus			F	F	F
Chlorophyll a			F	F	C
Secchi Depth			F	F	F
Lake Grade			F	F	D

Source: Metropolitan Council and STORET data



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 lake's approximate volume is 2,587 ac-ft. Because of the shallowness of the lake, it is entirely littoral zone (the area of aquatic plant dominance) and never maintains a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column) through the summer months. The major land uses within the lake's immediate watershed are undeveloped and park land.

A search through the STORET database for historic data on George Watch showed that the lake has been monitored several times in the past. There are nutrient data available for 1981-1983, 1985-1991, and 1996-2007.

The lake was monitored 12 times from mid May to mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	157.5	60.0	236.0	F
CLA (µg/l)	39.4	4.7	95.0	C
Secchi (m)	0.5	0.2	0.9	F
TKN (mg/l)	2.56	1.20	4.40	
<i>Lake Grade</i>				D

The lake received a lake grade of D for 2008, 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. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. The summertime mean physical condition was 2.7 (between 2- "some algae present" and 3- "definite algae present"). The mean suitability for recreation ranking was 3.8 (between 3- "swimming slightly impaired" and 4- "no swimming - boating ok").

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

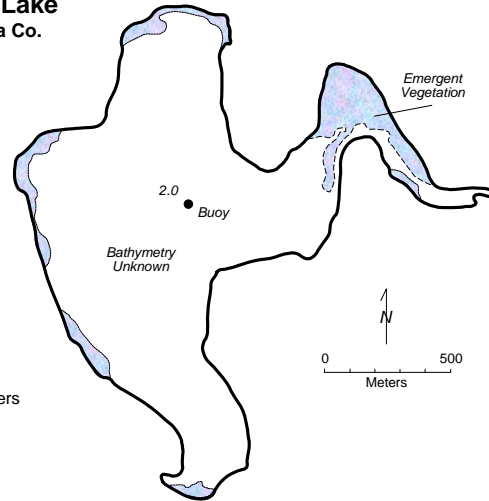
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

George Watch Lake Lino Lakes, Anoka Co.

Lake ID: 20005
WD: Rice Creek

Volunteer:
Wargo Nature
Center

● Sampling site
Contours in meters



2008 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
5/14	17.2				4.7	82		0.7	2	4
5/28	18.4				9.6	60		0.8	2	4
6/16	21.6				8.8	111		0.9	3	4
6/26	27.2				18	84		0.9	2	4
7/10	24.6				9.1	230		0.3		4
7/23	29.6				83	226		0.4	3	4
8/8	27					226		0.5	4	4
8/20	24.8				86	222		0.2	3	4
9/7	19.8					236		0.3	2	2
9/18	16.7				95	156		0.5	3	4
9/30	16.6				40	100		0.5	3	4
10/20	11.7				22	53		0.6	2	1

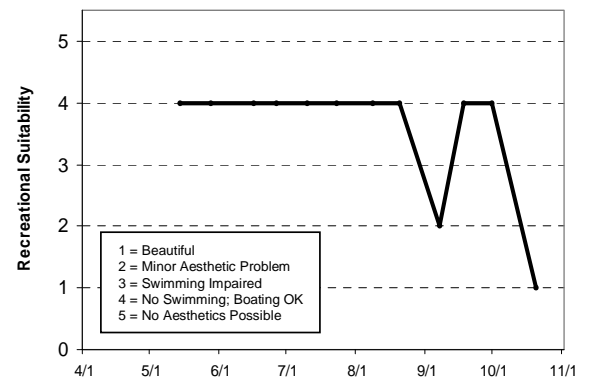
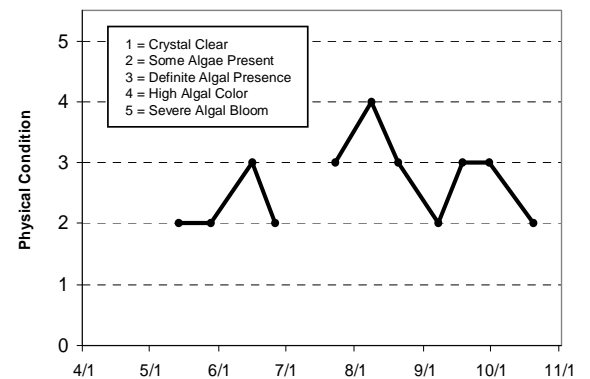
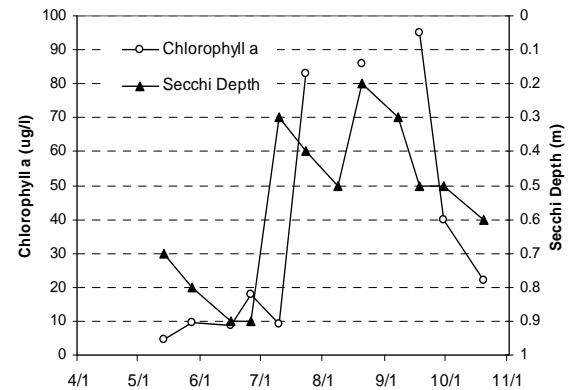
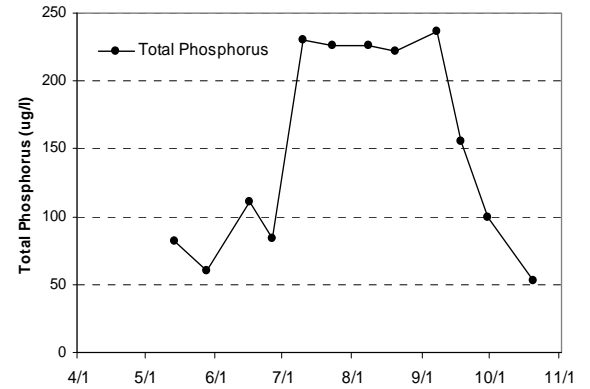
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	F	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	D	D	F
Lake Grade	F	D	D			D		D	D	F	D	F

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	D	C	F	D	F	D
Lake Grade					F	D	F	D	D	F	D	D

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

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.

This was the sixth year that German Lake has been involved in CAMP. A search through the STORET nationwide water quality database determined that the 2002 – 2008 CAMP data are the only known years of water quality data available for the lake.

The lake was monitored 7 times between early May and late September. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)				
CLA (µg/l)				
Secchi (m)	1.9	1.5	2.4	C
TKN (mg/l)				
<i>Lake Grade</i>				

Total phosphorus and chlorophyll samples were not collected so a lake grade cannot be determined. The lake received a water clarity grade of C for 2008 which is similar to grades received in 2002 and 2007, but worse than water clarity grades received during the period 2003 - 2006. Continued monitoring is suggested to continue building the water quality database for the lake.

Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page. The mean physical condition ranking was 1.6 (between 1- "crystal clear" and 2- "some algae present"), while the mean recreational suitability ranking was 1.9 (between 1- "beautiful" and 2- "minor aesthetics").

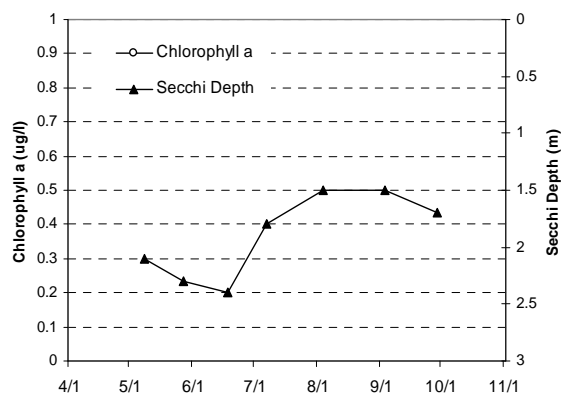
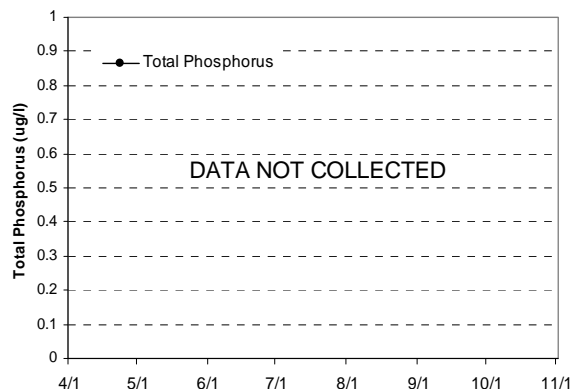
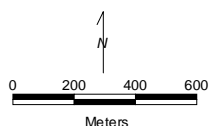
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

German Lake Scandia, Washington Co.

Lake ID: 820056
WD: Camelian-Marine-St. Croix

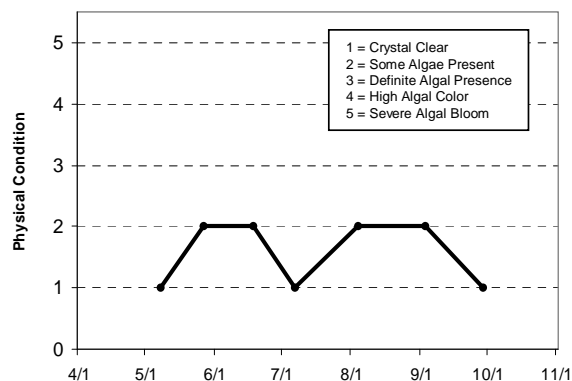
Volunteer: Washington
Conservation District

- Sampling site
- Contours in meters



2008 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
5/8	15.4	14.8	9.98	8.48				2.1	1	1
5/27	16.4	16.3	7.39	7.27				2.3	2	2
6/18	21.5	20.5	9.09	2.54				2.4	2	2
7/7	26.1	24.3	8.68	2.3				1.8	1	2
8/4	25	23.4	4.92	0.15				1.5	2	3
9/3	20.9	20.8	5.35	0.16				1.5	2	2
9/29	17.5	17.2	5.64	2.01				1.7	1	1



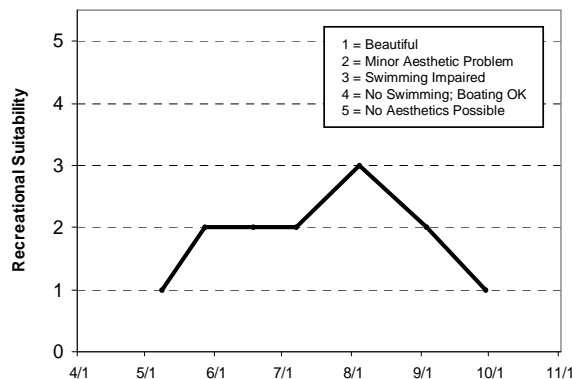
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Glen Lake (27-0093) Nine Mile Creek Watershed District

Glen Lake is located within the City of Minnetonka (Hennepin County). It has a surface area of a 98-acre lake. The maximum depth of the lake is 7.6 m (roughly 10 feet) and 8.5 m (almost 30 feet), respectively. Roughly 91 percent of the lake's area is considered littoral (the 0-15 foot depth area of aquatic vegetation dominance).

The 2006 – 2008 CAMP data are the only known nutrient data available. The lake was monitored 4 times between late April and early July. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	30.7	27.0	33.0	
CLA (µg/l)	12.6	5.7	18.0	
Secchi (m)	2.2	1.1	2.9	
TKN (mg/l)	1.07	1.00	1.20	
				Lake Grade

Only three sampling events were performed during the summer-time period. Therefore calculation of grades was not performed. At least 5 monitoring events are needed during the summer-time period to calculate grades.

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 2.0 for physical condition (2- "some algae present"), and 1.3 for recreational suitability (between 1- "beautiful" and 2- "minor aesthetic problem").

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/>.

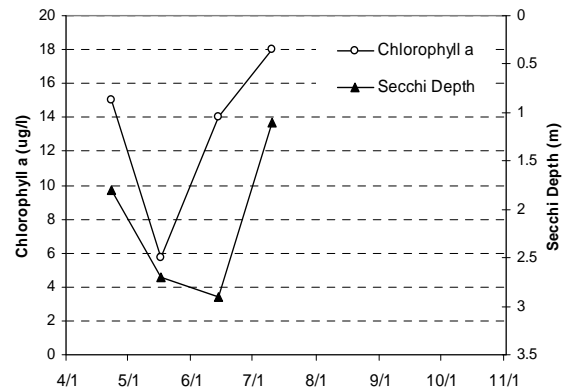
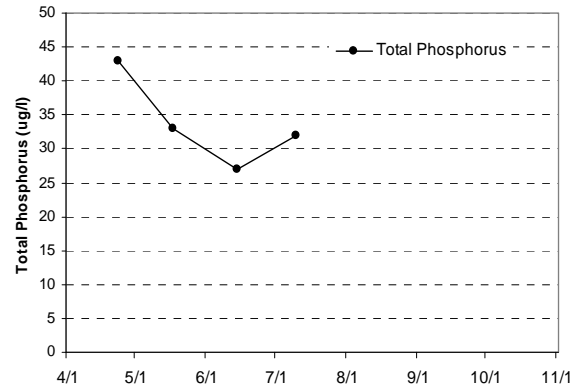
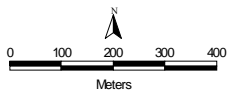
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Glen Lake Minnetonka, Hennepin Co.

Lake ID: 270093
WD: Nine Mile Creek

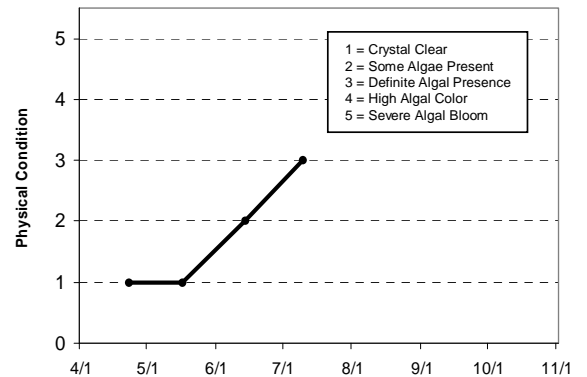
Volunteer: Christine Peterson

● Sampling site
Contours in meters



2008 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
4/23	12.1				15	43		1.8	1	1
5/17	18				5.7	33		2.7	1	1
6/14	21.1				14	27		2.9	2	1
7/10	25.5				18	32		1.1	3	2



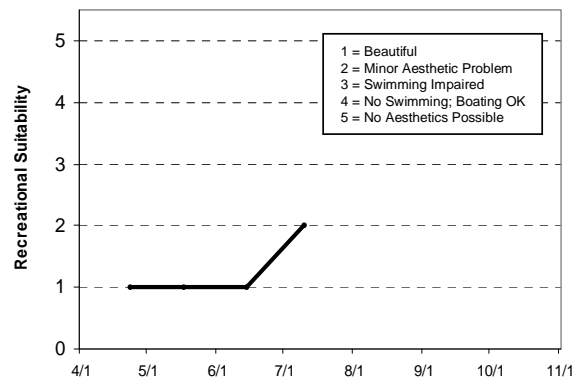
Lake Water Quality Grades Based on Summertime Averages

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

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's mean and maximum depth of 1.2 m (4 feet) and 4.2 m (14 feet) translates to an approximate volume of 88 ac-ft. Because of the shallowness of the lake, its entire surface area is considered littoral zone, which is the 0-15 feet depth zone of the lake dominated by aquatic vegetation. 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.

A search through the STORET nationwide water quality database determined that the 2002-2008 CAMP data are the only years of available water quality data for the lake. The lake was monitored 7 times between mid May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	30.3	18.0	48.0	B
CLA (µg/l)	2.9	1.6	5.7	A
Secchi (m)	1.7	1.0	2.2	C
TKN (mg/l)	0.72	0.52	1.00	
Lake Grade				B

The lake received a lake grade of B for 2008, which is similar to the lake grades received in the past. According to the historical water quality database, the lake appears represented by a lake grade of B.

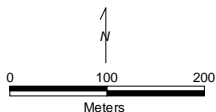
Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page. The mean physical condition ranking was 1.8 (between 1- "crystal clear" and 2- "some algae present"), while the mean recreational suitability ranking was 2.2 (between 2- "minor aesthetic problem" and 3- "swimming impaired").

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.

Goetschel Pond
Lake Elmo, Washington Co.

Lake ID: 820313
WD: Valley Branch
Volunteer: Rolf Larson

● Sampling site
Contours in meters



2008 Data

	Surf Temp	Bot Temp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(°C)	(°C)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
5/10	16.7				3.2	26		2.2	1	1
5/21	18.9				2.2	18		2	1	1
6/1	24				2.2	23		2.1	1	1
6/23	28.3				1.6	20		2	2	2
7/27	27.4				2.7	47		1	3	4
8/24	22.6				5.7	48		1.1	3	4
10/19	12.3				3.1	17		1.1	2	2

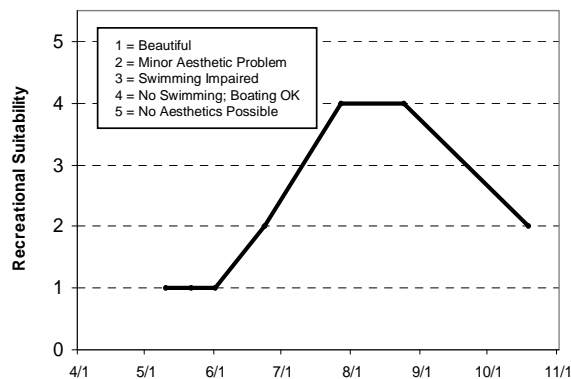
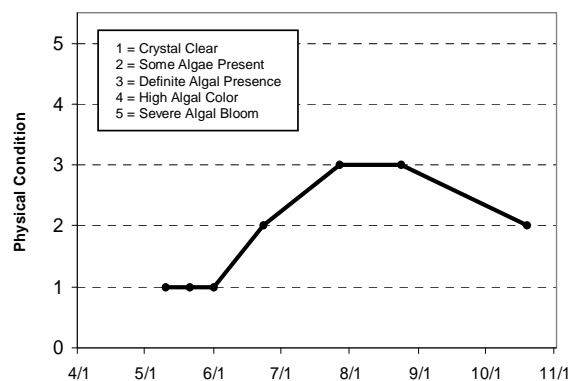
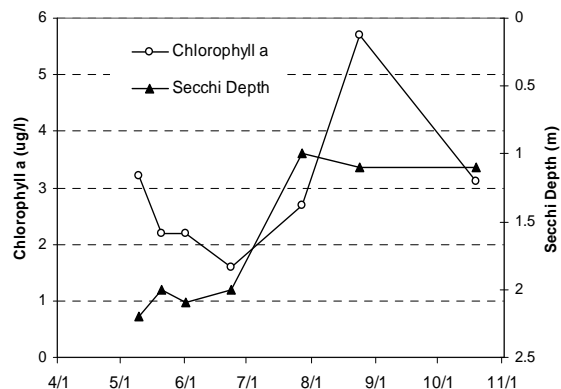
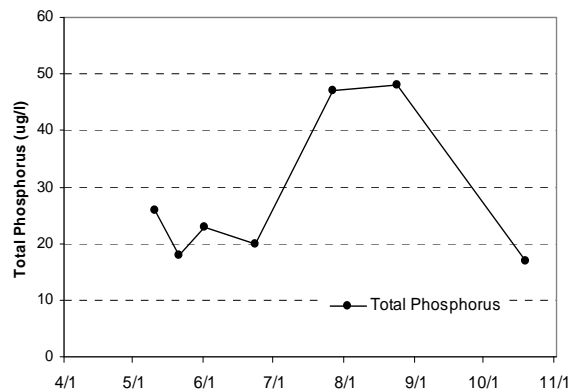
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade											B	B

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

A search through the STORET nationwide water quality database indicated that the CAMP data as being the only historical water quality data available for the lake. The lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	69.0	51.0	95.0	D
CLA (µg/l)	33.4	8.1	61.0	C
Secchi (m)	1.2	0.6	2.4	D
TKN (mg/l)	1.86	1.30	2.70	
Lake Grade				D

The lake received a lake grade of D for 2008 which is consistent with those received in some previous years. The 2008 CLA grade of C was an improvement over last year's CLA grade of D. The lake has historically received a CLA grade of C in year's past. The lake's water quality seems to be represented by a lake grade of C or D, depending on the year. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant declining trend in water clarity (MPCA 2008). To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

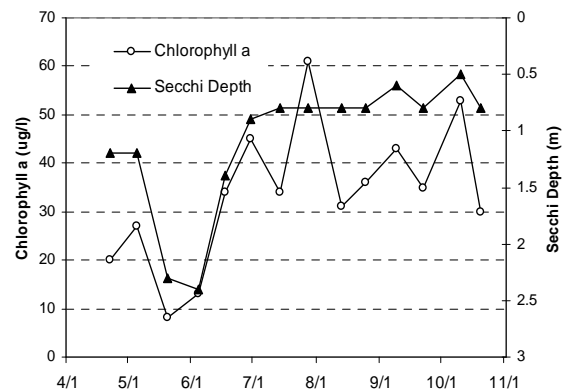
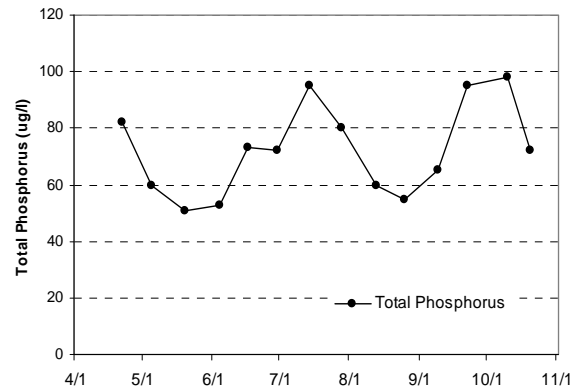
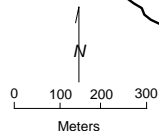
The last two graphs show seasonal variation in the lake's perceived physical condition and recreational suitability. The average user perception rankings, on a 1-to-5 scale, were 3.1 for physical condition (between 3- "definite algae present" and 4- "high algal color"), and 3.9 for recreational suitability (between 3- "swimming impaired" and 4- "no swimming – boating ok").

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.

Goggins Lake May Twp., Washington Co.

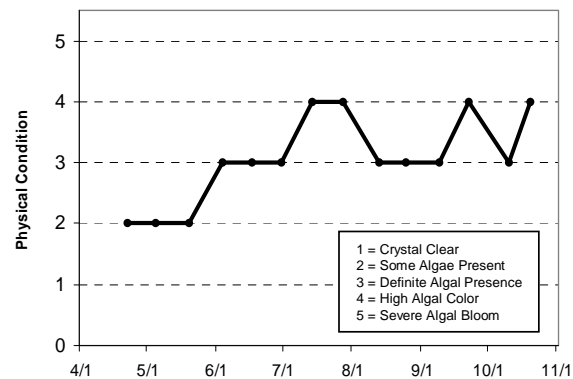
Lake ID: 820077
WD: Browns Creek
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 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	8.5	8.1	15.36	3	20	82		1.2	2	4
5/5	12	9.8	12.46	0.56	27	60		1.2	2	3
5/20	14.6	13.4	8.26	0.45	8.1	51	56	2.3	2	4
6/4	17.6	16.2	8.05	0.2	13	53	68	2.4	3	4
6/17	20.5	17.7	9.4	0.23	34	73	71	1.4	3	4
6/30	23	18.1	8.57	0.48	45	72	93	0.9	3	4
7/14	22.8	21.4	5.5	0.3	34	95	92	0.8	4	4
7/28	25.3	20.8	11.87	0.24	61	80	64	0.8	4	4
8/13	23.6	20.8	7.12	0.38	31	60	68	0.8	3	4
8/25	23.3	22.3	5.09	0.14	36	55	78	0.8	3	4
9/9	18.7	18.9	9.02	0.26	43	65	70	0.6	3	4
9/22	20.3	17.8	11.59	0.3	35	95	99	0.8	4	4
10/10	13.4	13.7	9.75	0.4	53	98	91	0.5	3	4
10/20	11.8	12	10.02	0.76	30	72	68	0.8	4	4



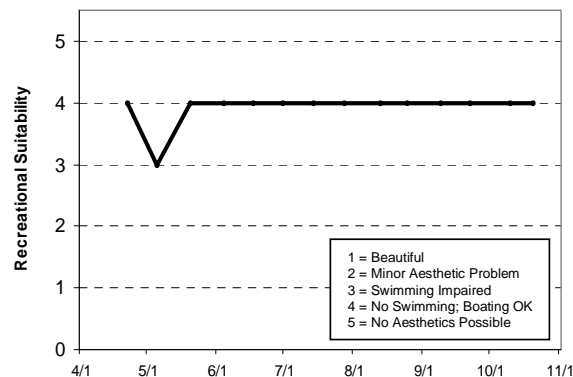
Lake Water Quality Grades Based on Summertime Averages

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								D	D	D	D	C
Chlorophyll a								C	C	C	C	C
Secchi Depth								C	D	D	D	C
Lake Grade								C	D	D	D	C

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

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's size and mean depth results in an approximate lake volume of 460 ac-ft. Roughly 42 percent of the lake is considered littoral zone, that is, an area of aquatic plant dominance. The lake's 7,680-acre watershed translates to a watershed-to-lake size ratio of 135:1. The greater the ratio, the greater the potential stress on the lake from surface runoff. Public access to the 57-acre lake is possible for non-motorized boats through Golden Lake County Park.

The lake was monitored 9 times between mid May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	52.8	35.0	80.0	C
CLA (µg/l)	16.8	5.8	27.0	B
Secchi (m)	1.6	1.3	2.3	C
TKN (mg/l)	2.72	2.10	3.20	
Lake Grade				C

The lake received a lake grade of C for 2008. The year 2008 marked the first year 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; therefore no long-term trends are apparent. It seems that the lake has a very wide fluctuation range in its water quality. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

The physical and recreational conditions of Golden Lake as perceived by the volunteer(s) were ranked on a 1-to-5 scale. These rankings are shown on the lake's information sheet on the next page. The summertime mean physical condition was 1.9 (between 1- "crystal clear" and 2- "some algae present"). The mean suitability for recreation was 1.9 (between 1- "beautiful" and 2- "minor aesthetic problem").

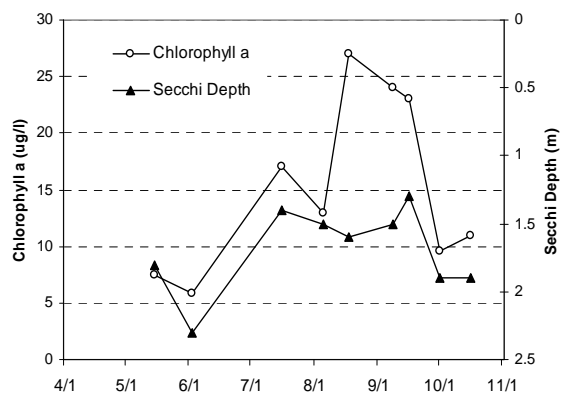
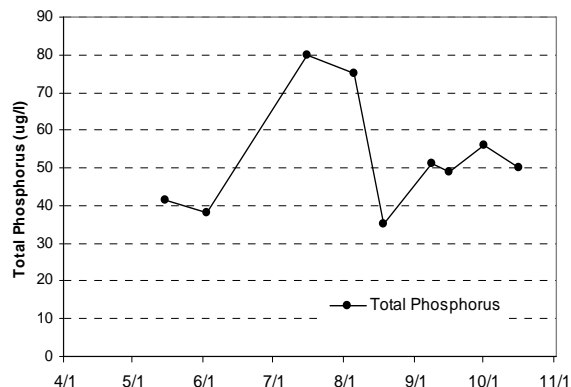
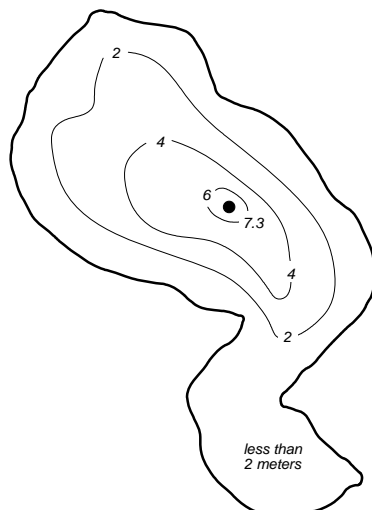
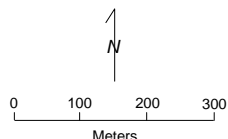
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Golden Lake Circle Pines, Anoka Co.

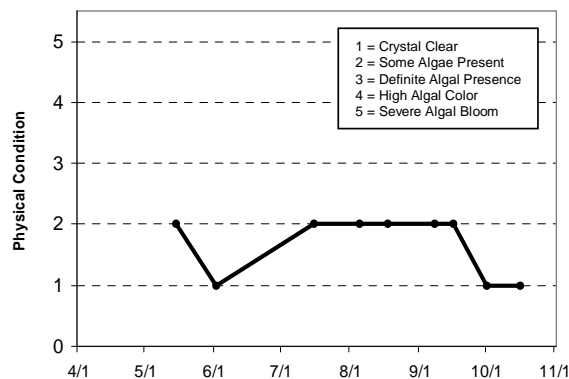
Lake ID: 20045
WD: Rice Creek
Volunteer: Dave Phipps
(City of Circle Pines)

● Sampling site
Contours in meters



2008 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
5/15	21.9				7.45	41.5		1.8	2	2
6/2	21.8				5.8	38		2.3	1	1
7/16	25.2				17	80		1.4	2	2
8/5	25.5				13	75		1.5	2	2
8/18	24.7				27	35		1.6	2	2
9/8	20.2				24	51		1.5	2	2
9/16	18.7				23	49		1.3	2	2
10/1	17.1				9.6	56		1.9	1	1
10/16	13.6				11	50		1.9	1	1



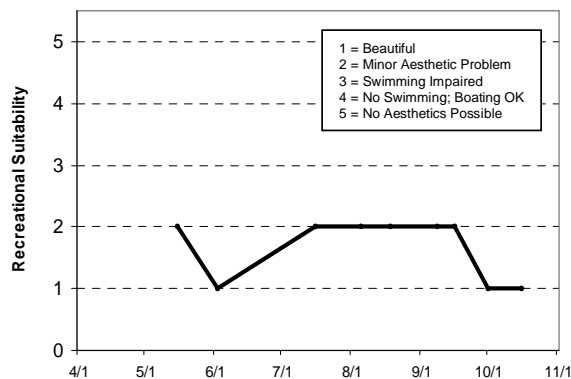
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	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
Lake Grade	D					D	C	D	F	F	F	F

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
Lake Grade		D			C	D	C	C	C	D	D	D

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

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. The lake does not maintain a thermocline because of the lake's shallowness. A thermocline is a density gradient caused by changing water temperatures throughout the lake's water column. The lake's mean depth of 1.5 m (4.9 feet) and its surface area translate to an approximate lake volume of 2,035 ac-ft. The lake has a 1,100-acre immediate watershed, which translates to a watershed-to-lake area ratio of 27:1. The larger the ratio the greater the potential stress put on the lake from surface runoff.

The lake was monitored 13 times between early May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	111.9	72.0	142.0	D
CLA (µg/l)	118.3	26.0	170.0	F
Secchi (m)	0.5	0.2	0.9	F
TKN (mg/l)	4.11	3.10	6.30	
Lake Grade				F

The lake received a lake grade of F for 2008 which is similar to grades received for the previous 4 years. The lake has also received similar individual water quality parameter grades for 2008 as it has for the previous 3 years. Because of the large variability in the lake's water quality data over the long term (i.e. grades ranging from C to F), no long-term trends are apparent. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

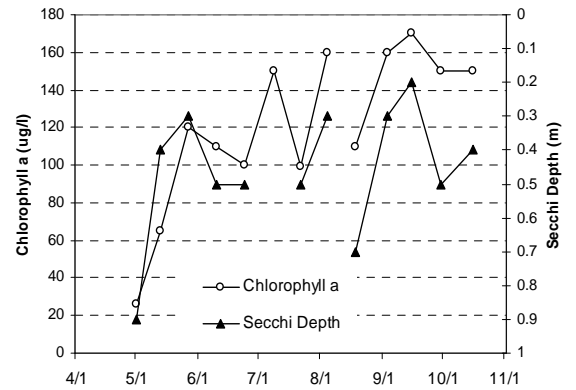
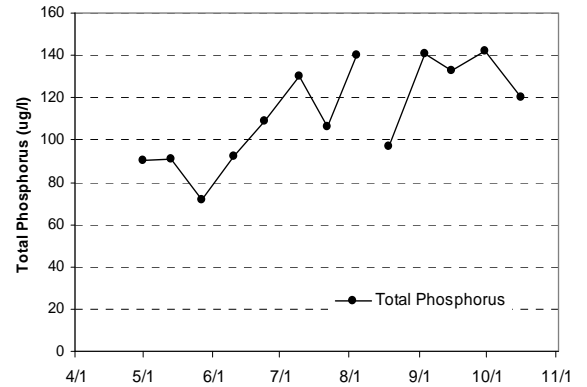
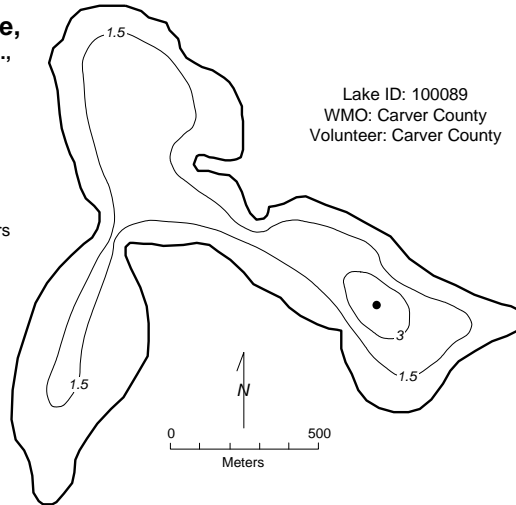
The physical and recreational conditions of the lake as perceived by the volunteer were ranked on a 1-to-5 scale. These rankings are shown on the lake's information sheet on the next page. The mean physical condition ranking was 2.9 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability ranking was 3.4 (between 3- "swimming slightly impaired" and 4- "no swimming – boating ok").

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

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

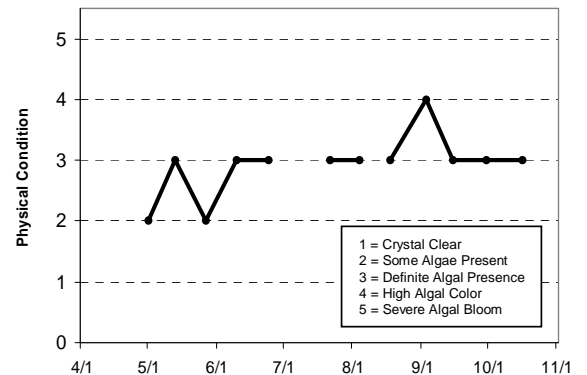
**Goose Lake,
Waconia Twp.,
Carver Co.**

• Sampling site
Contours in meters



2008 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	9.4		11.94		26	90		0.9	2	4
5/13	14.09		13.13		65	91		0.4	3	3
5/27	16.51		8.84		120	72		0.3	2	2
6/10	19.78		7.42		110	92		0.5	3	4
6/24	24.21		10.97		100	109		0.5	3	3
7/9					150	130				
7/22	26.44		8.28		99	106		0.5	3	3
8/4	25.16		6.7		160	140		0.3	3	4
8/18	26.86		11.17		110	97		0.7	3	3
9/3	20.51		7.12		160	141		0.3	4	3
9/15	16.28		6.42		170	133		0.2	3	4
9/30	16.47		7		150	142		0.5	3	4
10/16	11.61		8.36		150	120		0.4	3	4



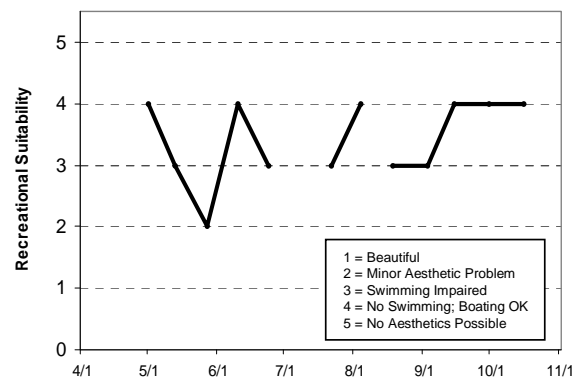
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade				D	C	F	C	D	F	D	D	F

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

Source: Metropolitan Council and STORET data



Goose Lake (82-0059) Marine on St. Croix Watershed Management Organization

Goose Lake is located in the City of Scandia (Washington County). The lake has a surface area of 83 acres and a circumference of 1.9 miles. The lake has a maximum and mean depth of 7.6 m (25 feet) and 2.4 m (8 feet), respectively. The lake's mean depth and size translate to a lake volume of approximately 664 ac-ft. Ninety eight percent of the surface area of the lake is considered littoral zone which is the zone of aquatic vegetation dominance. A public access is located on the western side of the lake.

The lake was monitored 14 times from mid April to mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	47.2	31.0	74.0	C
CLA (µg/l)	33.0	6.9	54.0	C
Secchi (m)	1.7	1.1	3.0	C
TKN (mg/l)	1.54	1.00	2.20	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to the lake grades received in the past. There is some variation in the parameters' annual means, however. The lake's overall water quality seems to be represented by a lake grade of C given the historical water quality database. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

Throughout the monitoring period, the volunteers' opinion of the lake's physical and recreational conditions was ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The mean physical condition ranking was 3.0 (3- "definite algae present"), while the mean recreational suitability ranking was 3.7 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

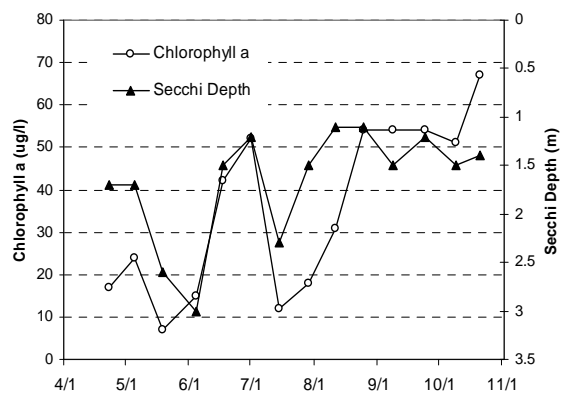
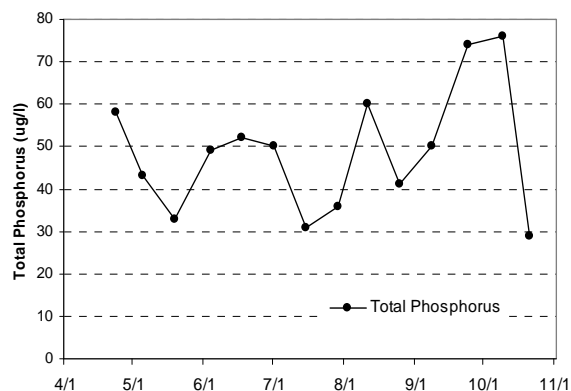
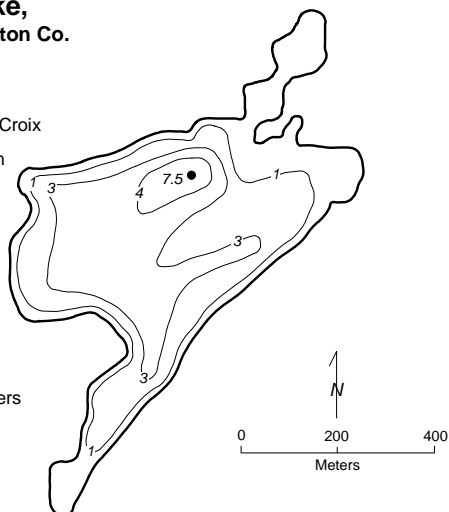
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Goose Lake, Scandia, Washington Co.

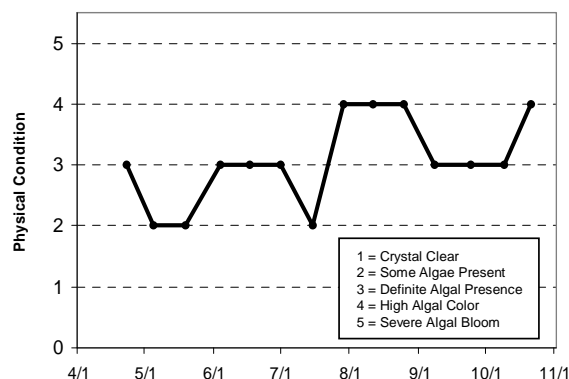
Lake ID: 820059
WD: Carnelian-Marine-St. Croix
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/23	7.1	5.6	11.48	1.67	17	58		1.7	3	2
5/5	9.9	9	11.84	0.7	24	43		1.7	2	3
5/19	15.1	12.1	9.59	0.28	6.9	33		2.6	2	3
6/4	17.7	14.6	8.11	0.11	15	49	94	3	3	4
6/17	19.9	15.8	10.11	0.17	42	52	136	1.5	3	4
7/1	23.6	15.5	9.22	0.47	52	50	192	1.2	3	4
7/15	23.3	15.5	6.61	0.36	12	31	228	2.3	2	3
7/29	26.1	16.8	9.47	0.27	18	36	175	1.5	4	4
8/11	24.6	16.7	8.14	0.24	31	60	268	1.1	4	4
8/25	22.9	18.4	6.14	0.28	54	41	41	1.1	4	4
9/8	19.5	18.4	3.88	0.24	54	50	43	1.5	3	4
9/24	19.3	17.9	6.99	0.24	54	74	278	1.2	3	4
10/9	14.5	14.5	7.84	0.33	51	76	63	1.5	3	4
10/21	12	12	9.67	0.37	67	29	59	1.4	4	5



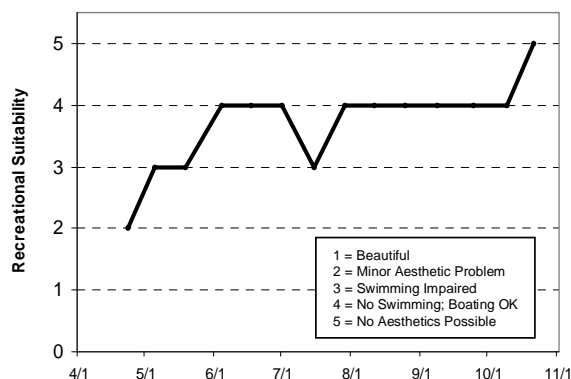
Lake Water Quality Grades Based on Summertime Averages

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

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 2008 was the first 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 for this lake.

The north basin was monitored 7 times from late April to mid October. 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.

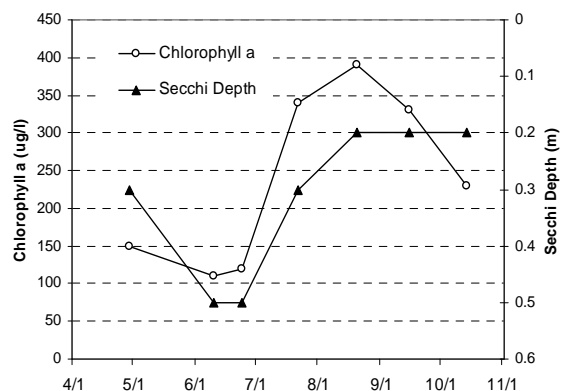
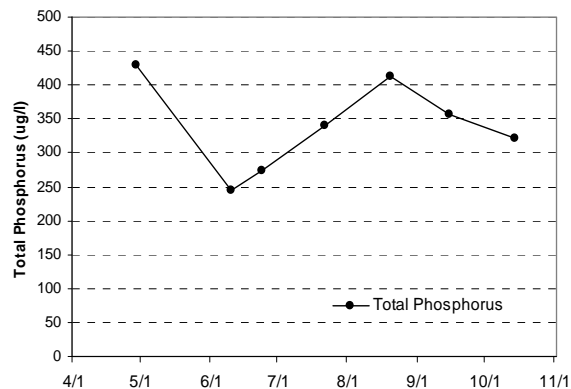
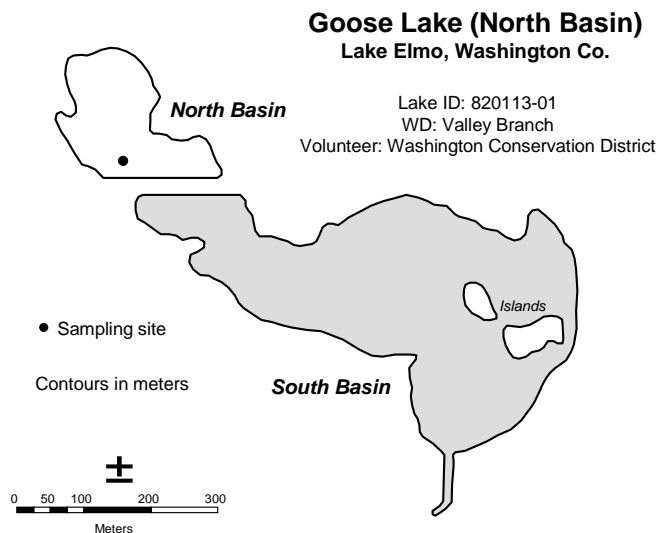
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	325.4	244.0	412.0	F
CLA (µg/l)	258.0	110.0	390.0	F
Secchi (m)	0.3	0.2	0.5	F
TKN (mg/l)	4.60	2.80	6.10	
Lake Grade				F

The north basin received a lake grade of F for 2008. Continued monitoring is suggested to build an historical water quality database for this lake site.

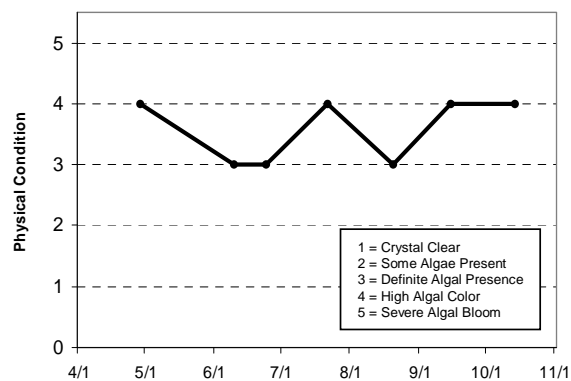
Throughout the monitoring period, the volunteer's opinion of the lake site's physical and recreational conditions was ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The mean physical condition ranking was 3.4 (between 3- "definite algae present" and 4- "high algal color"). The mean recreational suitability ranking was 4.0 (4- "no swimming/boating ok").

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.



2008 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	8.1	7.8	10.91	0.83	150	430		0.3	4	4
6/10	21.2	17.6	11.9	0.04	110	244		0.5	3	4
6/24	26.1	20.8	11.78	0.56	120	274		0.5	3	4
7/22	25.2	22.7	6.91	0.16	340	340		0.3	4	4
8/20	24.7	24.3	4.51	0.66	390	412		0.2	3	4
9/15	18.2	16.9	9.16	0.26	330	357		0.2	4	4
10/14	14.2	13.9	7.81	0.34	230	322		0.2	4	4



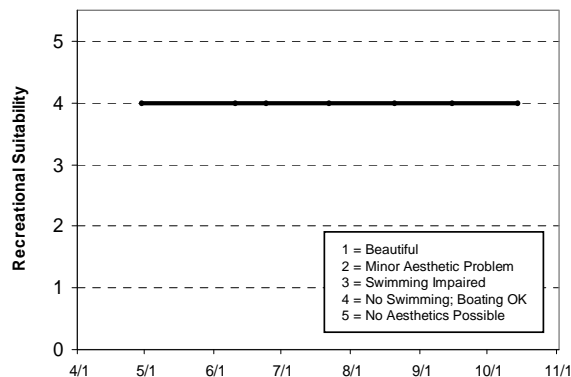
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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
Total Phosphorus					F
Chlorophyll a					F
Secchi Depth					F
Lake Grade					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 2008 was the first 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 for this lake.

The south basin was monitored 7 times from late April to mid October. 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.

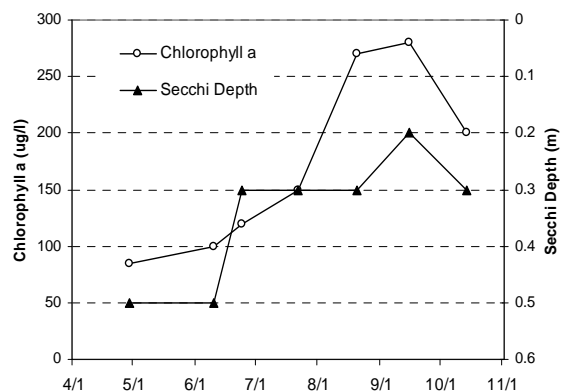
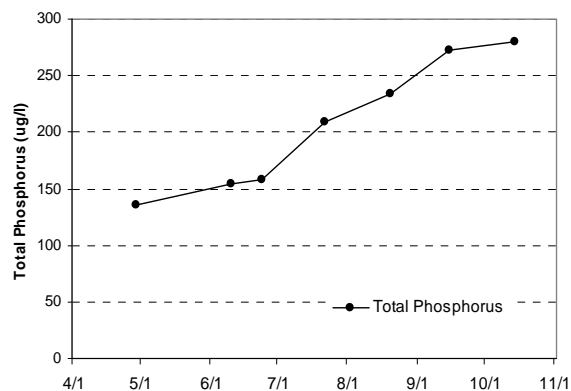
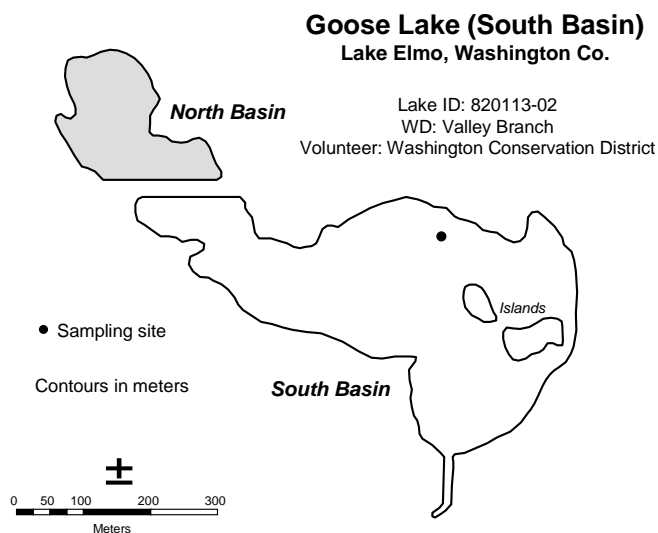
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	205.6	154.0	273.0	F
CLA (µg/l)	184.0	100.0	280.0	F
Secchi (m)	0.3	0.2	0.5	F
TKN (mg/l)	4.74	3.50	6.30	
Lake Grade				F

The south basin received a lake grade of F for 2008. Continued monitoring is suggested to build an historical water quality database for this lake site.

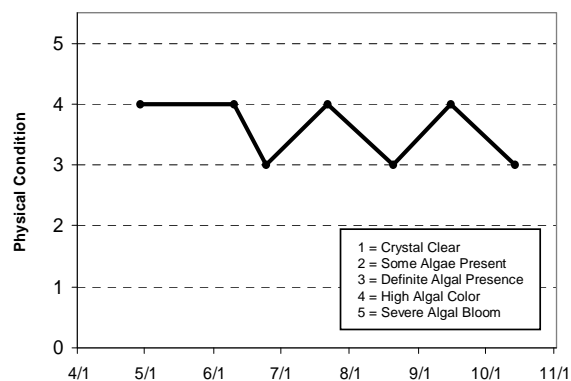
Throughout the monitoring period, the volunteers' opinion of the lake's physical and recreational conditions was ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The mean physical condition ranking was 3.6 (between 3- "definite algae present" and 4- "high algal color"). The mean recreational suitability ranking was 4.0 (4- "no swimming/boating ok").

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.



2008 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	7.4	7	13.74	0.99	85	136		0.5	4	4
6/10	21.1	17.9	10.34	0.09	100	154		0.5	4	4
6/24	25.7	21.2	13.58	0.5	120	158		0.3	3	4
7/22	25.9	22.2	8.56	0.18	150	209		0.3	4	4
8/20	25.2	22.2	8.02	0.25	270	234		0.3	3	4
9/15	18.2	16.7	9.71	0.3	280	273		0.2	4	4
10/14	13.7	13.9	8.32	0.35	200	280		0.3	3	4



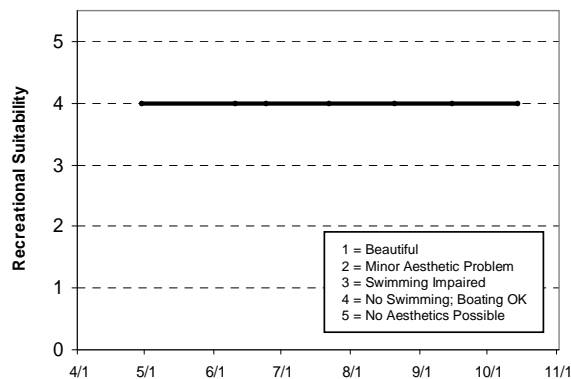
Lake Water Quality Grades Based on Summertime Averages

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												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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

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). Roughly 79 percent of the lake's surface 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). A search through the STORET nationwide water quality database for historical data provided no data other than CAMP data.

The lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	85.2	22.0	175.0	D
CLA (µg/l)	39.1	6.3	78.0	C
Secchi (m)	0.9	0.5	1.5	D
TKN (mg/l)	2.33	1.50	3.10	
Overall Grade				D

The lake received a lake grade of D for 2008. This is a similar lake grade as received in 2006 and 2003. The lake received a lake grade of C in 2004. Further monitoring is suggested for this lake to develop an historical water quality database.

Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. The mean physical condition ranking was 3.0 (3- "high algal color"); the mean recreational suitability ranking was 3.6 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

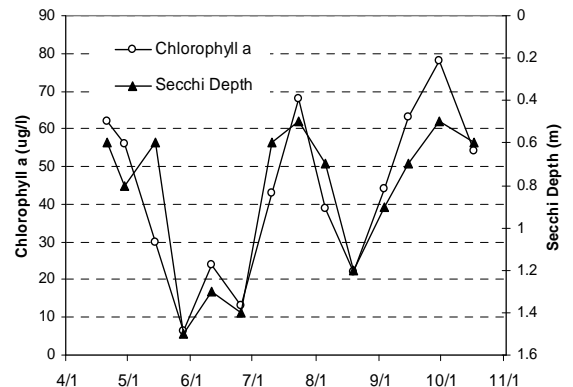
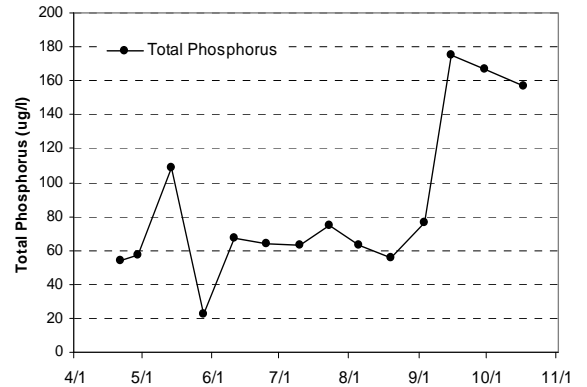
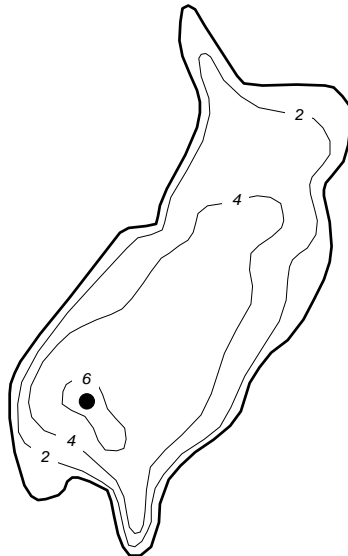
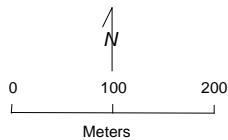
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 297-4916 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Grace Lake Chaska, Carver Co.

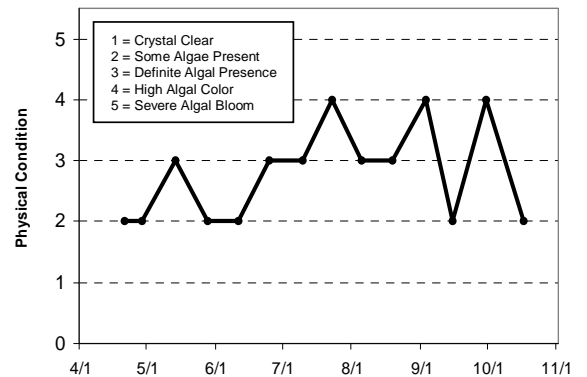
LAKE ID: 100218
WMO: Carver County
Volunteer: Carver Co.

● Sampling station
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	10.82		17.52		62	54		0.6	2	3
4/29	8.23		13.36		56	57		0.8	2	4
5/14	13.77		12.56		30	109		0.6	3	4
5/28	16.58		7.96		6.3	22		1.5	2	4
6/11	20.48		8.42		24	67		1.3	2	3
6/25	24.82		5.9		13	64		1.4	3	4
7/10	22.08		9.68		43	63		0.6	3	2
7/23	25.82		7.43		68	75		0.5	4	4
8/5	25.44		8.72		39	63		0.7	3	4
8/19	27.54		11.2		22	56		1.2	3	4
9/3	22.64		7.58		44	76		0.9	4	3
9/15	18.6		5.63		63	175		0.7	2	4
9/30	18.1		6.37		78	167		0.5	4	4
10/17	13.29		5.52		54	157		0.6	2	2



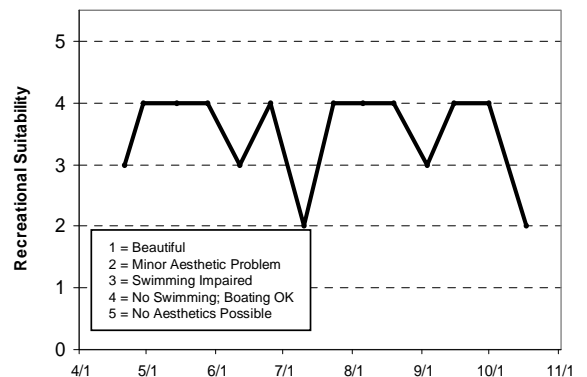
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Hay Lake (82-0065) Marine on St. Croix Watershed Management Organization

Hay lake is located in City of Scandia (Washington County). The lake has a surface area of 33 acres. The only other known bathymetric data is its maximum depth of 6.1 m (20 feet).

The lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	50.6	26.0	69.0	C
CLA (µg/l)	28.0	5.7	57.0	C
Secchi (m)	1.9	1.2	2.4	C
TKN (mg/l)	1.12	0.76	1.30	
<i>Lake Grade</i>				C

The lake received a lake grade of C for 2008, which is an indication of improved water quality in comparison to most of the past decade of CAMP monitoring. The year 2008 was the first year that all of the individual water quality parameters received C grades, which is better than all other past years of monitoring. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008). To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

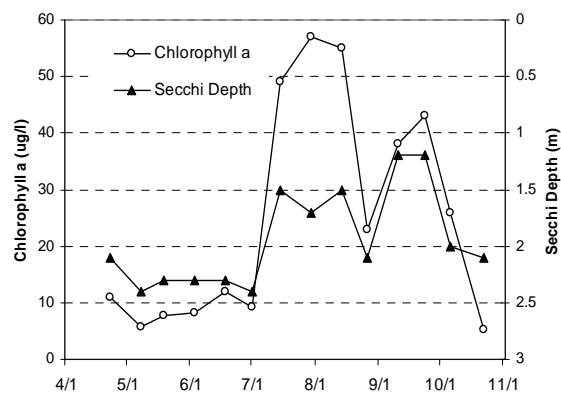
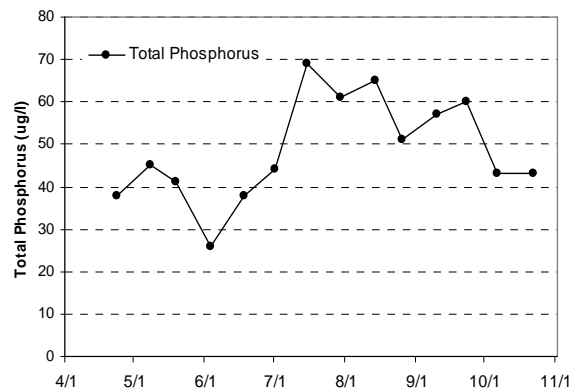
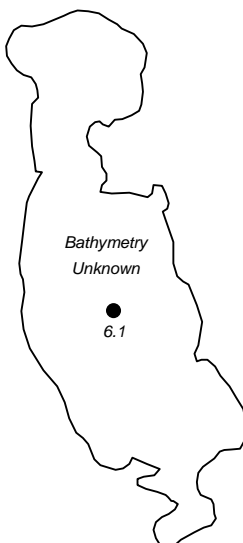
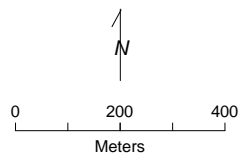
Throughout the monitoring period, the volunteer(s) ranked the perceived physical condition of the lake on a 1-to-5 scale. The mean perceived physical condition of Hay Lake was 1.6 (between 1- "crystal clear" and 2- "some algae present"), while the mean recreational suitability was 2.4 (between 2- "minor aesthetic possible" and 3- "swimming slightly impaired").

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.

Hay Lake **Scandia,** **Washington Co.**

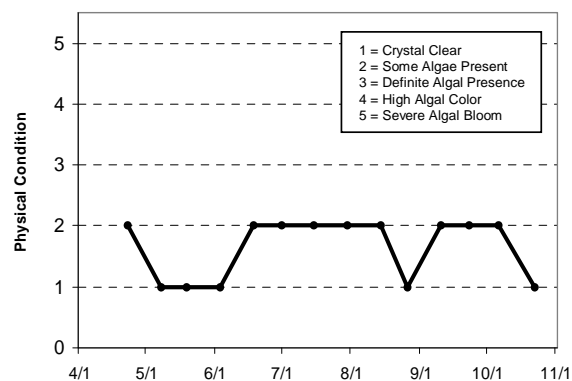
LAKE ID: 820065
 WD: Carnelian-Marine-St. Croix
 Volunteer: Washington
 Conservation District

- Sampling site
- Contours in meters



2008 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
4/23	11.1	9	10.68	0.89	11	38		2.1	2	2
5/8	15	13.8	9.22	0.98	5.7	45		2.4	1	2
5/19	16	15.9	8.52	1.36	7.6	41		2.3	1	2
6/3	19.7	18	7.67	0.55	8.3	26		2.3	1	2
6/18	21.2	20.6	8	0.19	12	38		2.3	2	2
7/1	25.4	22.8	7.36	2.65	9.2	44		2.4	2	3
7/15	23.2	22	7.29	0.77	49	69		1.5	2	3
7/30	26	22.2	6.54	0.17	57	61		1.7	2	3
8/14	22.6	21.9	3.21	0.58	55	65		1.5	2	2
8/26	22.4	21.4	4.78	3.48	23	51		2.1	1	2
9/10	17.1	17.1	5.1	0.8	38	57		1.2	2	2
9/23	20	19.7	7.09	1.25	43	60		1.2	2	3
10/6	13.2	13.2	8.67	0.38	26	43		2	2	2
10/22	9.8	10.1	7.46	2.65	5.3	43		2.1	1	1



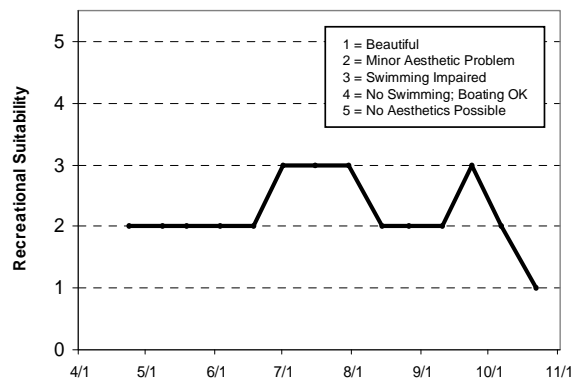
Lake Water Quality Grades Based on Summertime Averages

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							D	D	D	D		D
Chlorophyll a							F	F	F	F		C
Secchi Depth							D	D	D	D		C
Lake Grade							D	D	D	D		C

Year	2004	2005	2006	2007	2008
Total Phosphorus	D	D	D	D	C
Chlorophyll a	D	F	B	C	C
Secchi Depth	D	D	C	C	C
Lake Grade	D	D	C	C	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). Additionally, because of the lake's shallowness it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column).

This marks the fifth year that Henry Lake has been involved in CAMP. Other than for the 1995 and 2005-2008 CAMP data, a search through the STORET nationwide water quality database for historic data on the lake came up empty. Therefore, 1995, 2005-2008 are the only known years of data available.

The lake was monitored 7 times between late May and early September. 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.

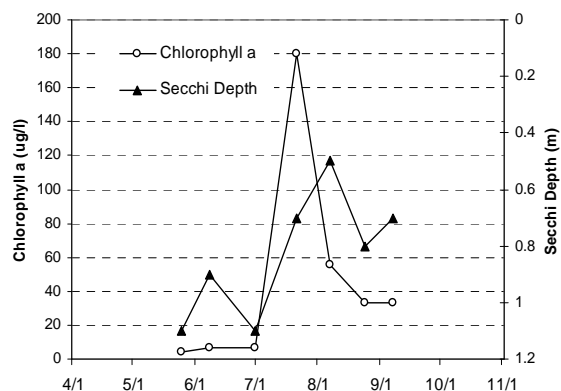
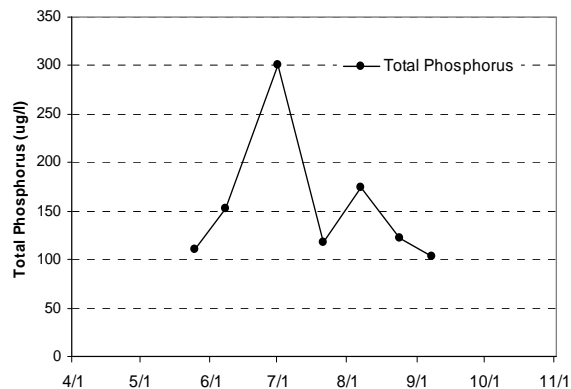
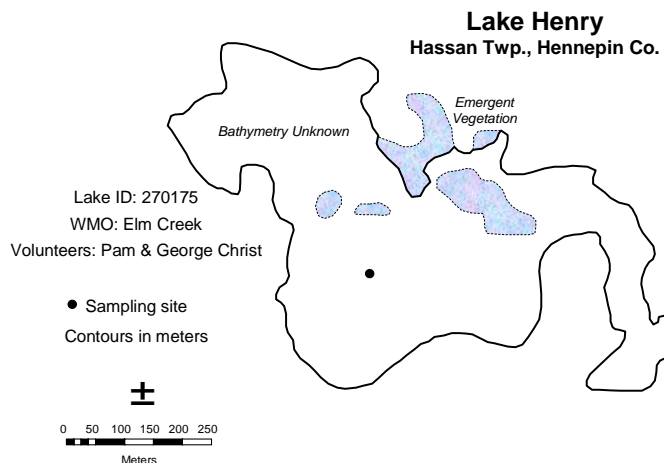
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	154.3	103.0	300.0	F
CLA (µg/l)	45.6	3.8	180.0	C
Secchi (m)	0.8	0.5	1.1	D
TKN (mg/l)	1.56	1.10	1.90	
Lake Grade				D

The lake received a lake grade of D for 2008 which is similar to the D lake grades received in 1995, 2005, and 2007. Additional years of data are needed to determine trends in water quality.

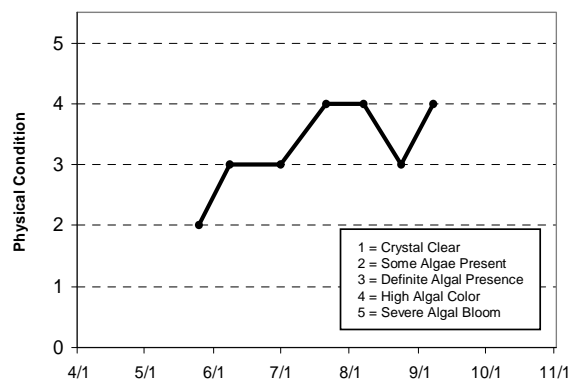
Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 3.3 for physical condition (between 3- "definite algal color" and 4- "high algal color"), and 4.7 for recreational suitability (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.



2008 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
5/25	18.6				3.8	111		1.1	2	3
6/8	22.1				6.7	153		0.9	3	5
7/1	23.3				6.6	300		1.1	3	5
7/21	26				180	117		0.7	4	5
8/7	25.5				56	174		0.5	4	5
8/24	24.1				33	122		0.8	3	5
9/7	17.8				33	103		0.7	4	5



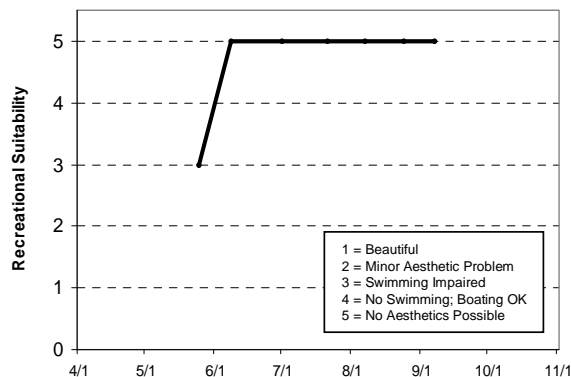
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

This was the third year that Hornbean Lake has been involved in CAMP. A search through the STORET nationwide water quality database for historic data on the lake came up empty. Thus, the 2006 through 2008 CAMP data are the only water quality 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 lake was monitored 7 times between mid-May and mid-October 2008. The resulting data are summarized in the tables and figures on the next page.

2008 summer (May-September) data summary

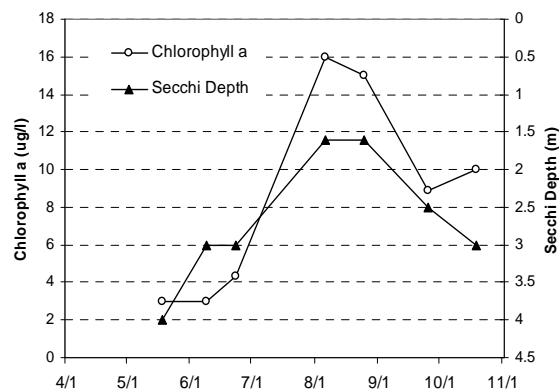
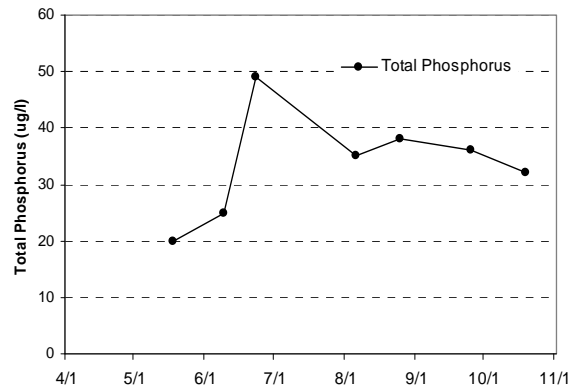
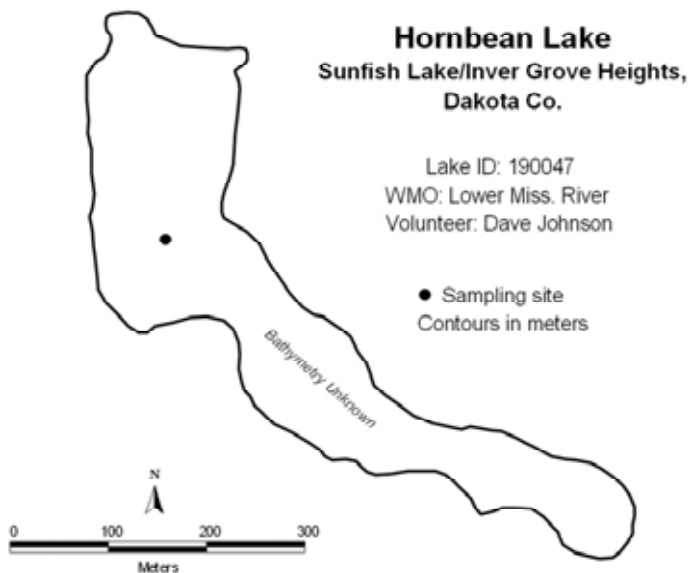
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	33.8	20.0	49.0	C
CLA (µg/l)	8.4	3.0	16.0	A
Secchi (m)	2.6	1.6	4.0	B
TKN (mg/l)	1.55	1.20	1.80	
Lake Grade				B

The lake's 2008 lake water quality grade was a B, which was a better grade than last year's grade of C. The CLA concentrations were lower in 2008 than those in 2007, which translated into an A grade for CLA in 2008 compared to the C grade in 2007. The lake's water clarity was clearer in 2008 than in 2007 which is consistent with the lower CLA concentration average observed in 2008.

As mentioned earlier, there are no nutrient data available for Hornbean Lake other than the 2006 through 2008 CAMP data. Therefore there are not sufficient data to determine long-term trends. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

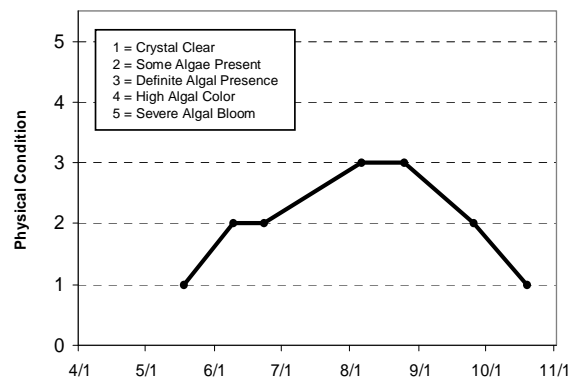
The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings, were 2.2 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 2.5 for recreational suitability (between 2- "minor aesthetic problem" and 3- "swimming impaired").

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.



2008 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
5/18	17.7				3	20		4	1	1
6/9	21.7				3	25		3	2	3
6/23	27				4.3	49		3	2	3
8/6	26.1				16	35		1.6	3	3
8/25	26.5				15	38		1.6	3	3
9/25	20.8				8.9	36		2.5	2	2
10/19	15.2				10	32		3	1	1



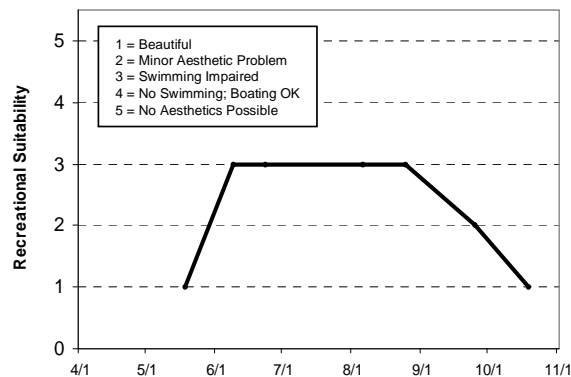
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus			C	C	C
Chlorophyll a			B	C	A
Secchi Depth			C	C	B
Lake Grade			C	C	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.

This was the third year that Horseshoe Lake has been involved in CAMP. A search through the STORET nationwide water quality database for historic data on the lake came up empty. Thus, the 2006 through 2008 CAMP data are the only nutrient 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 lake was monitored 9 times between mid-April and mid-October 2008. The resulting data and graphs appear on the next page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	20.4	13.0	30.0	A
CLA (µg/l)	3.4	1.9	5.1	A
Secchi (m)	2.1	1.8	2.4	C
TKN (mg/l)	0.64	0.57	0.71	
Lake Grade				B

The lake's 2008 lake water quality grade was a B, which was similar to last year's lake grade. However, the water quality in 2008 appears to be a higher quality than in 2007. For example, the TP concentrations for 2008 appear to be lower overall than those observed in 2007. The average, minimum, and maximum TP concentrations for 2008 were lower than those in 2007. Furthermore, water clarity appears to have been clearer in 2008 as indicated by greater average Secchi depths in 2008 compared to 2007. The minimum and maximum Secchi depths observed in 2008 were greater than those observed in 2007 as well. For several measurements in 2008, the Secchi disk was resting on the bottom of the lake yet it was still visible. So the average and maximum Secchi depth would have been greater than what is shown in the above table. It is likely that the Secchi depth grade would be a B, and the lake grade would be an A.

As mentioned earlier, there are no nutrient data available for Horseshoe Lake other than the 2006 through 2008 CAMP data. Therefore there are not sufficient data to determine long-term trends. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

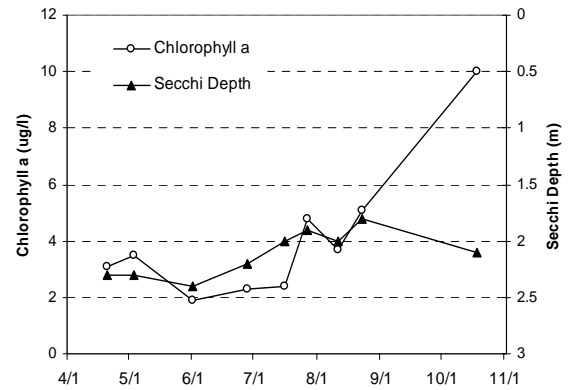
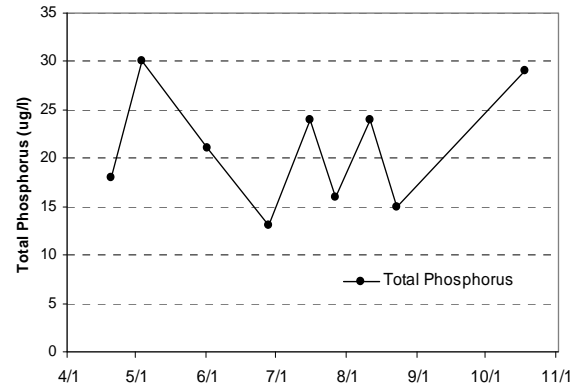
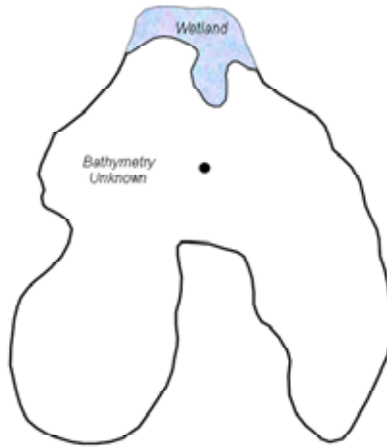
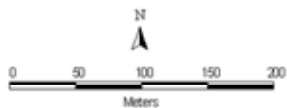
The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings were 2.0 for physical condition (2- "some algae present"), and 1.9 for recreational suitability (2- "minor aesthetic problem").

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.

Horseshoe Lake Sunfish Lake, Dakota Co.

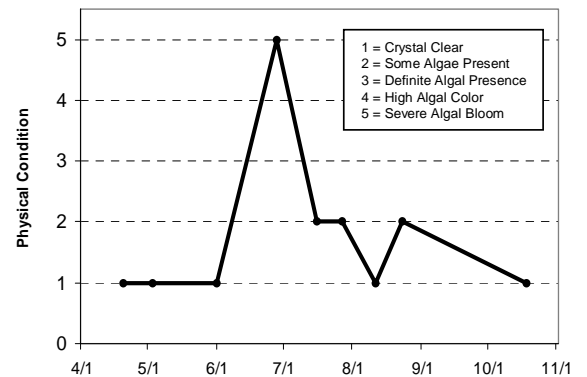
Lake ID: 190051
WMO: Lower Miss. River
Volunteer: Jim Naves

● Sampling site
Contours in meters



2008 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	10				3.1	18		2.3	1	1
5/3	12.1				3.5	30		2.3	1	1
6/1	20.2				1.9	21		2.4	1	3
6/28	23.7				2.3	13		2.2	5	4
7/16	28.5				2.4	24		2	2	1
7/27	27				4.8	16		1.9	2	1
8/11	27				3.7	24		2	1	2
8/23	24.3				5.1	15		1.8	2	1
10/18	12.9				10	29		2.1	1	1



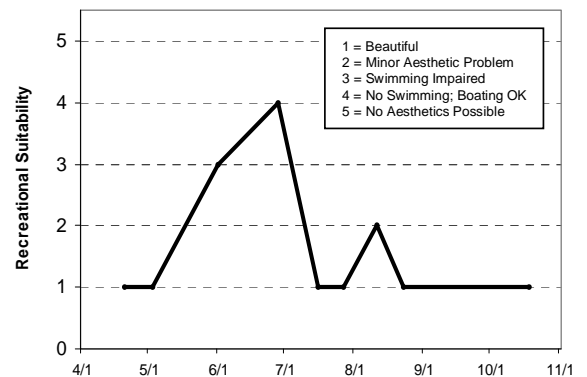
Lake Water Quality Grades Based on Summertime Averages

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												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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

Source: Metropolitan Council and STORET data



Hydes Lake (10-0088) Carver County Environmental Services

Hydes Lake is located within Waconia Township (Carver County). The lake is considered a Metropolitan Area “Priority Lake” because of its multi-recreational uses. A public access is located on the lake’s northeastern shore. The lake has a surface area of 215 acres. The mean and maximum depth of the lake is 3.0 (roughly 10 feet) and 5.5 m (18 feet). Because of the shallowness of the lake, 88 percent of the total lake 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’s surface area and mean depth result in an approximate lake volume of 2,150 ac-ft.

The lake has a 430-acre immediate watershed, which translates to a watershed-to-lake area ratio of 2:1 (the larger the ratio the greater the potential stress put on the lake from surface runoff).

The lake was initially enrolled the CAMP in 1999. The lake has been monitored by Council staff in the past (the last year being 1996). A search of the STORET nationwide water quality database for data on the lake revealed a moderate database throughout the 1990’s with nutrient data available in 1985, 1991, 1993, 1996 and now 1999-2006.

The lake was monitored 13 times between early May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	156.8	63.0	234.0	F
CLA (µg/l)	81.4	1.7	320.0	F
Secchi (m)	1.2	0.4	2.4	D
TKN (mg/l)	3.13	2.00	5.00	
Lake Grade				F

The lake received a lake grade of F for 2008. This was the worst lake grade received to date for this lake. The CLA concentrations in 2008 were higher than in previous years during the mid-summer period. The higher CLA concentrations reduced water clarity during this same period. The higher CLA concentrations combined with lower water clarity created water quality which is characteristic of F grade conditions. A trend analysis conducted by the MPCA on the lake’s Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). Additional monitoring is suggested to determine if the water quality of the lake is deteriorating or if the water quality of 2008 was an anomaly.

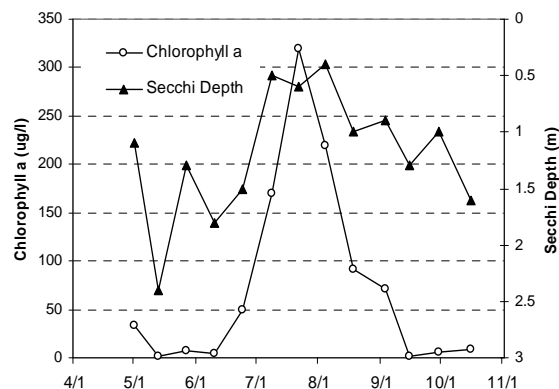
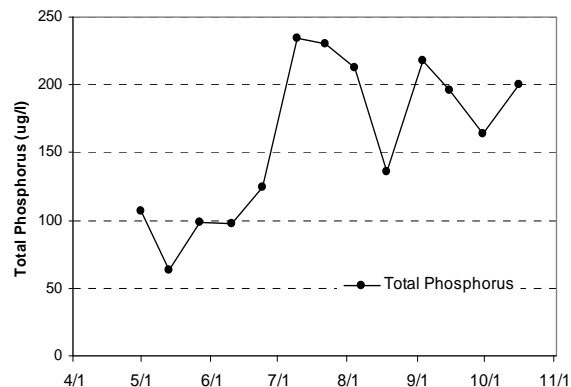
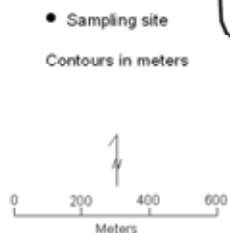
The bottom two graphs on the following page show seasonal variation in the lake’s perceived physical condition and recreational suitability. The average user perception rankings, on a 1-to-5 scale, were 3.3 for physical condition (between 3- “definite algae present” and 4- “high algal color”) and 3.8 for recreational suitability (between 3- “swimming slightly impaired” and 4- “no swimming/boating ok”).

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

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

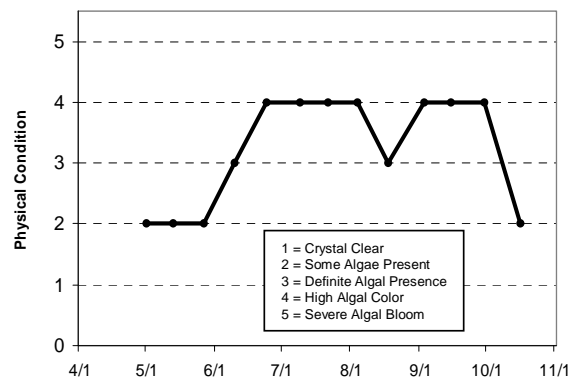
Hydes Lake Waconia Twp., Carver Co.

Lake ID: 100088
WMO: Carver County
Volunteer: Carver County



2008 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	8.8		13.24		33	107		1.1	2	4
5/13	13.12		9.74		2	63		2.4	2	3
5/27	16.65		9		6.7	99		1.3	2	2
6/10	19.13		9.31		5	98		1.8	3	2
6/24	23.58		12.07		50	124		1.5	4	5
7/9	25.24		13.29		170	234		0.5	4	4
7/22	26.37		12.2		320	230		0.6	4	5
8/4	25.81		9.77		220	213		0.4	4	5
8/18	26		10.92		92	136		1	3	4
9/3	21.93		6.85		71	218		0.9	4	4
9/15	17.66		3.81		1.7	196		1.3	4	4
9/30	17.59		5.14		5.3	164		1	4	4
10/16	12.8		7.06		8.2	200		1.6	2	4



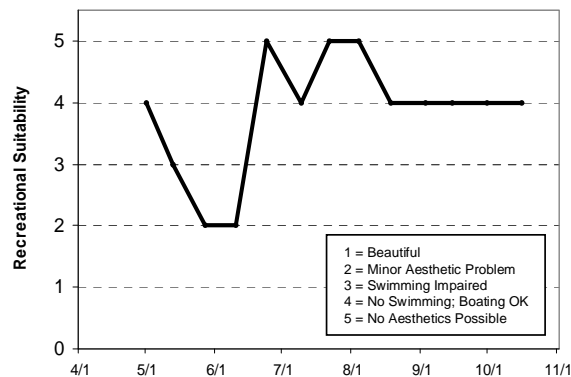
Lake Water Quality Grades Based on Summertime Averages

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

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.

A search through the STORET nationwide water quality database indicated one prior year of water quality data for the lake (1983) that was collected to the CAMP data collected in 2003 – 2008.

The lake was monitored 13 times between early May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	27.1	3.0	50.0	B
CLA (µg/l)	12.8	7.4	17.0	B
Secchi (m)	1.4	0.7	2.5	C
TKN (mg/l)	1.23	0.94	2.10	
Lake Grade				B

The lake received a lake grade of B for 2008, which is consistent with lake grades received in past years. On the basis of the historical water quality 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.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the lake's information sheet on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 2.4 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 2.3 for recreational suitability (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

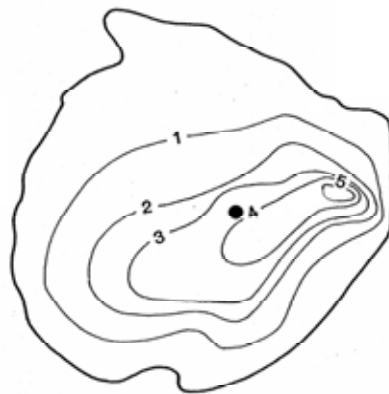
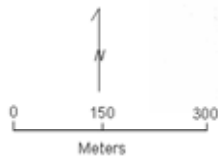
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Island Lake Linwood Twp., Anoka Co.

Lake ID: 20022
WMO: Sunrise River
Volunteer: Anoka Co. Parks

● Sampling site
Contours in meters



2008 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	10.1				8.3	26		2.5	2	
5/12	14.1				8	29		1.8	2	
5/29	17.8				12	50		1.6	2	2
6/12	19.2				8.7	27		1.7	2	2
6/26	26.4				17	35		1	3	3
7/9	25.9				17	27		0.7	2	2
7/23	27.6				15	23		0.7	3	3
8/6	26.1				16	27		0.9	2	2
8/20	26.6				7.4	3		1	2	2
9/3	21.3				16	26		1.5	3	
9/17	18.4				12	25		1.5	3	
9/30	16				16	27		1.3	3	
10/17	11.6				15	27		1.7	3	

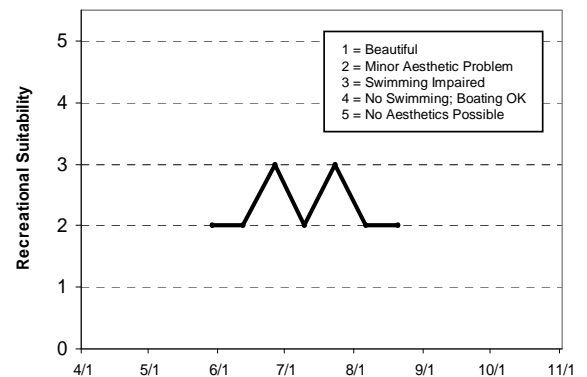
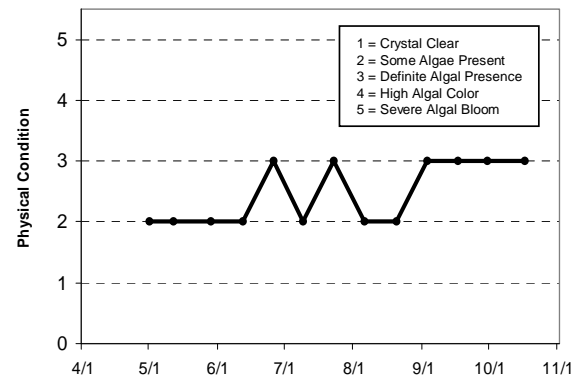
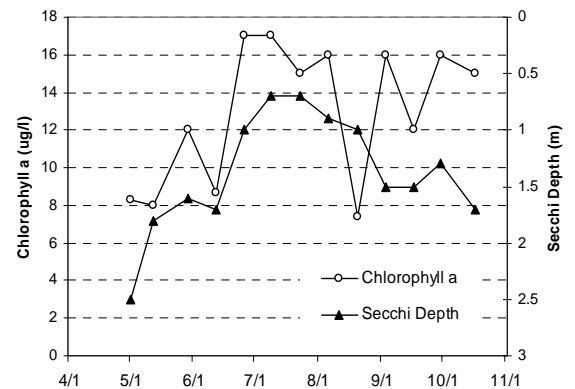
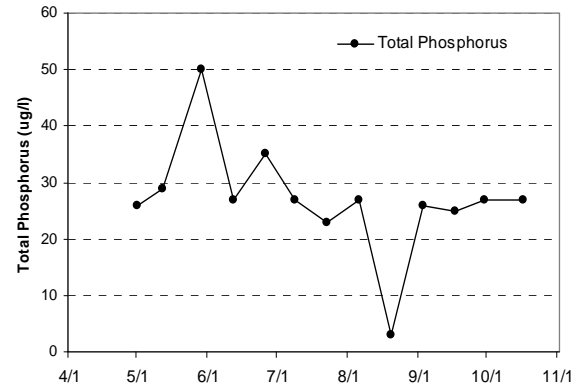
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Jane Lake (82-0104) Valley Branch Watershed District

Primary Report

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. The lake has a surface area of 155 acres. The maximum and mean depths of the lake are 12.0 and 3.7 m (39 and 12 feet), respectively. Approximately 72 % of the lake is considered littoral zone, which is the zone of aquatic plant dominance. The approximate volume of the lake is 1,860 acre-feet. The lake residence time is approximately 1.4 years. The size of the lake's watershed is approximately 1,402 acres.

The lake has a public access located on its south end, which gets heavy use by area fishermen. The DNR manages the lake for largemouth bass, bluegill and crappie. In addition to monitoring via the CAMP, the lake has been monitored by Council staff.

The lake was monitored 11 times from early May to early October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	13.5	11.0	17.0	A
CLA (µg/l)	3.0	1.2	4.9	A
Secchi (m)	4.6	3.8	5.8	A
TKN (mg/l)	0.60	0.44	0.85	
Lake Grade				A

The lake received a lake grade of A for 2008, which is consistent with lake grades received since the year 2000. A trend analysis conducted by the MPCA indicated no statistically significant trend for Secchi transparency (MPCA 2008).

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the lake's information sheet on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 1.0 for physical condition (crystal clear), and 1.0 for recreational suitability (beautiful).

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

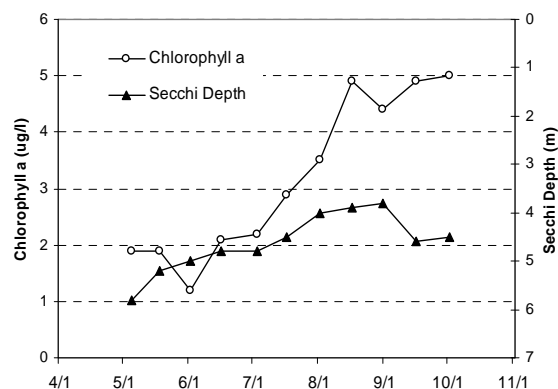
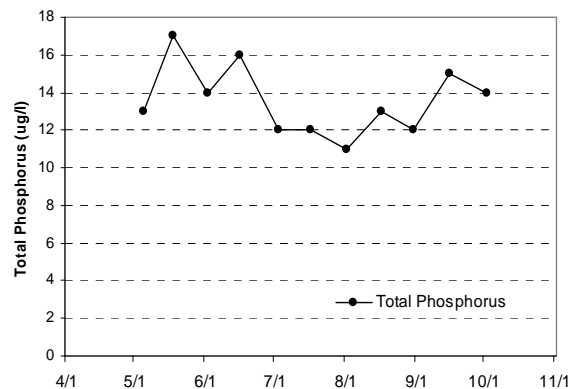
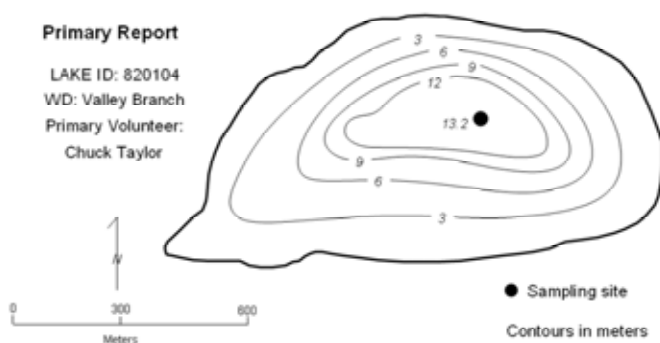
<http://www.dnr.state.mn.us/lakefind/>.

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.

Lake Jane Lake Elmo, Washington Co.

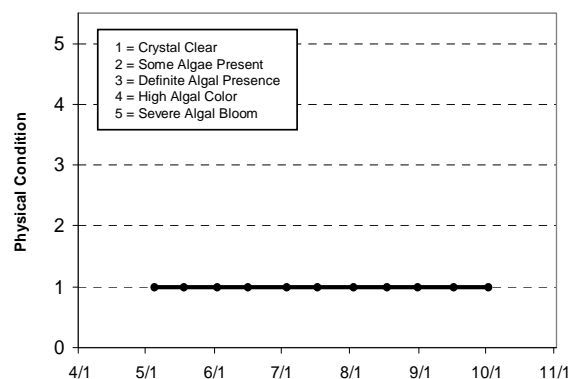
Primary Report

LAKE ID: 820104
WD: Valley Branch
Primary Volunteer:
Chuck Taylor



2008 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	12				1.9	13		5.8	1	1
5/18	16.2				1.9	17		5.2	1	1
6/2	19.4				1.2	14		5	1	
6/16	20.8				2.1	16		4.8	1	
7/3	24.2				2.2	12		4.8	1	
7/17	25.9				2.9	12		4.5	1	
8/2	26.5				3.5	11		4	1	
8/17	25.4				4.9	13		3.9	1	
8/31	23.5				4.4	12		3.8	1	
9/16	18.4				4.9	15		4.6	1	
10/2	16.9				5	14		4.5	1	1



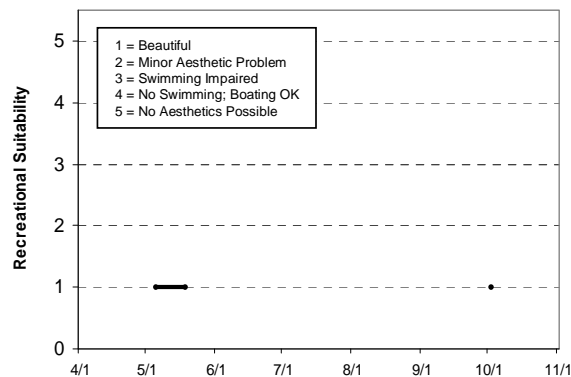
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Jane Lake (82-0104) Valley Branch Watershed District

Secondary Report

Jane Lake was also monitored by the Washington Conservation District (WCD) in addition to the monitoring performed by the primary volunteer. The WCD monitored the lake 7 times between late April and mid October. The resulting data are summarized in tables and figures on the next page. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	25.2	16.0	58.0	B
CLA (µg/l)	4.2	2.5	6.8	A
Secchi (m)	4.9	4.1	6.4	A
TKN (mg/l)	1.11	0.85	1.70	
Lake Grade				A

The lake received a lake grade of A for 2008 on the basis of the data collected by the secondary volunteer, which is a similar lake grade by the primary volunteer data. But there was a spike of TP on September 16 in the secondary volunteer data. The primary volunteer did not observe a TP spike. The effect of this spike was to increase the average summer-time TP concentration compared to the primary volunteer's TP average summer-time concentration. The TP spike observed in the secondary volunteer data on September 16 should be viewed as an isolated variation. A trend analysis conducted by the MPCA indicated no statistically significant trend for Secchi transparency (MPCA 2008).

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the lake's information sheet on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 1.8 for physical condition (between 1- "crystal clear" and 2- "some algae present"), and 2.0 for recreational suitability (minor aesthetic problem).

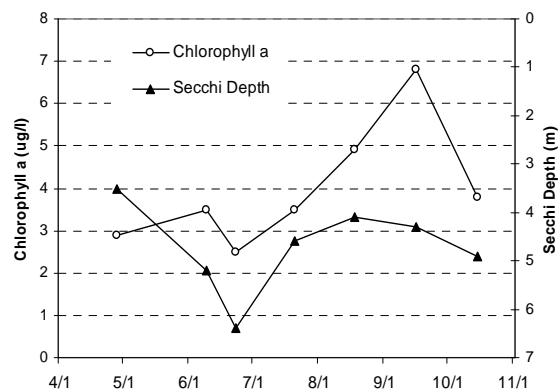
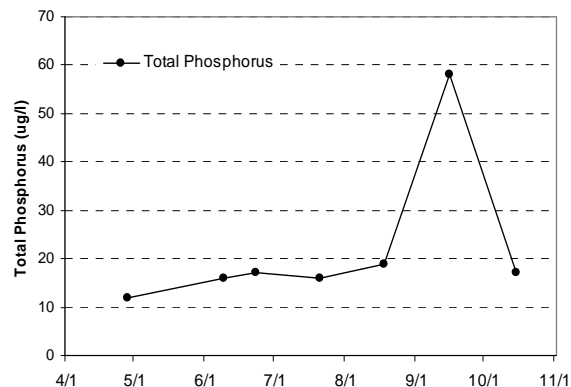
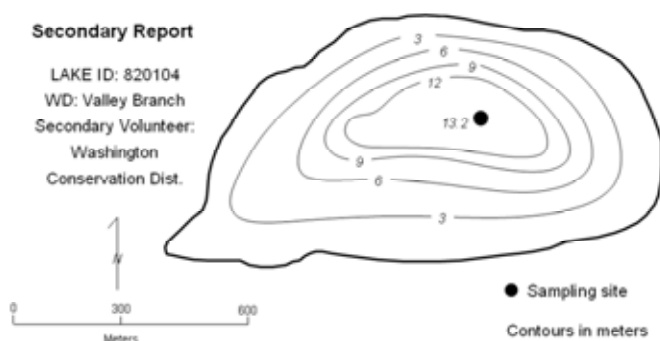
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Lake Jane Lake Elmo, Washington Co.

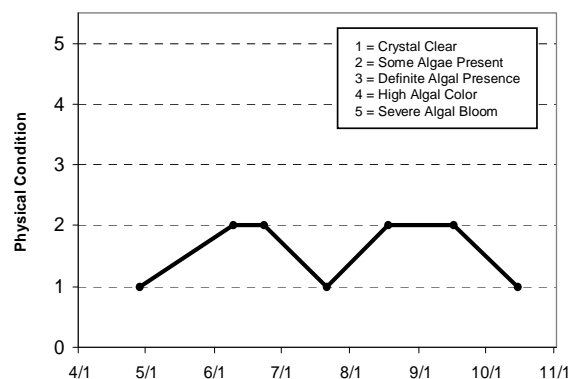
Secondary Report

LAKE ID: 820104
WD: Valley Branch
Secondary Volunteer:
Washington
Conservation Dist.



2008 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	7	6.6	11.52	1.03	2.9	12		3.5	1	1
6/9	19.8	11.5	8.55	0.24	3.5	16	18	5.2	2	3
6/23	23.3	9.9	8.46	0.72	2.5	17	23	6.4	2	2
7/21	25.7	1.06	6.82	0.3	3.5	16	30	4.6	1	1
8/18	25.2	10.9	7.63	0.26	4.9	19	48	4.1	2	2
9/16	18.8	11.4	8.57	0.3	6.8	58	18	4.3	2	2
10/15	14.2	14	7.42	0.33	3.8	17	12	4.9	1	1



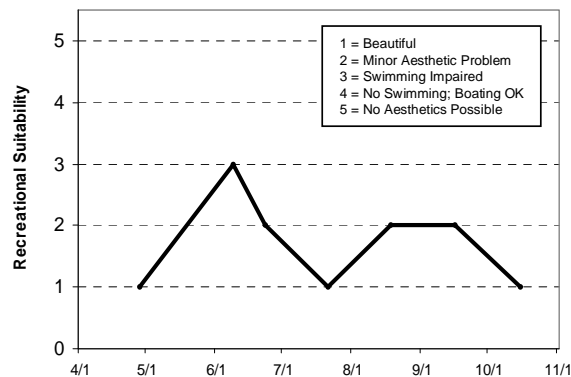
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Jellum's Bay [Site-1] (82-0052-02) *Carnelian - Marine 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. The lake's mean depth of 2.4 m (roughly 8 feet) and its surface area translate to an approximate lake volume of 569 ac-ft. The lake has a 333-acre watershed, which translates to a watershed-to-lake area ratio of 4.6:1. The larger the ratio the greater the potential stress put on the lake from surface runoff.

The lake was monitored 7 times between mid April and early October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	66.0	25.0	120.0	C
CLA (µg/l)	31.8	6.1	72.0	C
Secchi (m)	2.0	0.9	3.7	C
TKN (mg/l)	1.33	0.77	1.90	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to last year's lake grade. The 2008 and 2007 lake grades are the best years of water quality for the lake yet observed. 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.

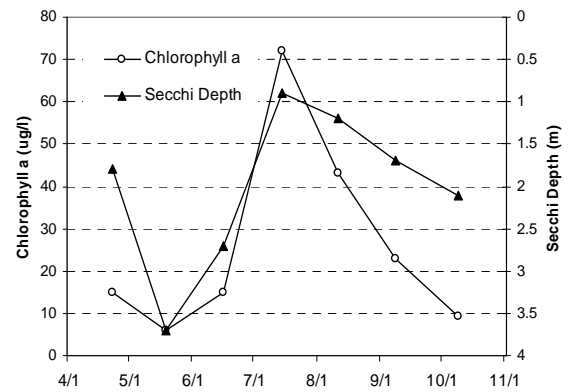
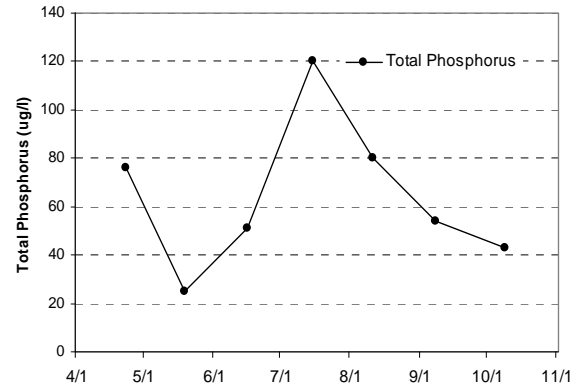
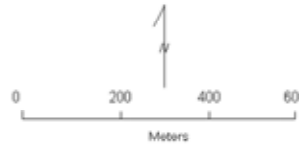
Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. The mean perceived physical condition of Jellum's Bay was 2.8 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability was 3.2 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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.

Jellum's Lake, Site 1 Scandia, Washington Co.

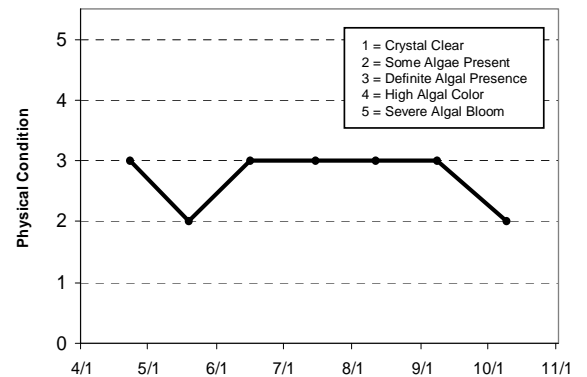
LAKE ID: 820052-02
WD: Camelian-Marine-St. Croix
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 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
4/23	9.9	8.4	11.03	7.1	15	76		1.8	3	3
5/19	15.7	14.5	8.56	4.32	6.1	25		3.7	2	2
6/16	20.9	18.9	7.41	0.37	15	51	103	2.7	3	2
7/15	24.3	20.8	7.43	0.32	72	120	75	0.9	3	4
8/11	24.7	20.2	7.27	0.24	43	80	423	1.2	3	4
9/8	19.5	19.1	5.41	0.23	23	54	43	1.7	3	4
10/9	13.8	13.6	4.38	0.92	9.4	43	80	2.1	2	2



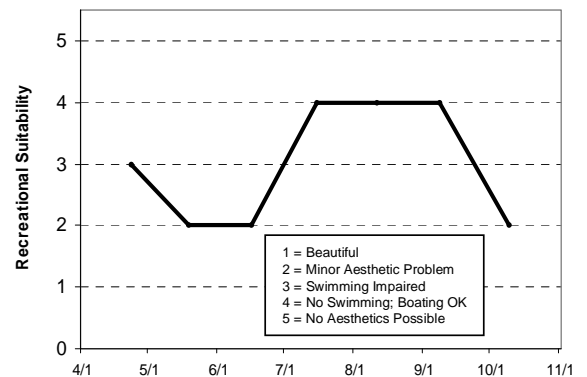
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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 very little known morphological data available for the lake.

This was the third year that Jonathan Lake has been involved in CAMP. A search through the STORET nationwide water quality database for data on the lake provided no data other than the CAMP data.

The lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	173.7	58.0	233.0	F
CLA (µg/l)	75.6	30.0	140.0	D
Secchi (m)	0.5	0.3	0.9	F
TKN (mg/l)	2.74	2.00	3.80	
Overall Grade				F

The lake received a lake grade of F for 2008, which is similar to the lake grade received in 2006, but worse than the D lake grade received in 2002. Additional monitoring is suggested to develop a historical water quality database for this lake.

Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page. The mean physical condition ranking was 3.5 (between 3- "definite algae present" and 4- "high algal color"); the mean recreational suitability ranking was 4.3 (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.

Jonathan Lake Chaska, Carver Co.

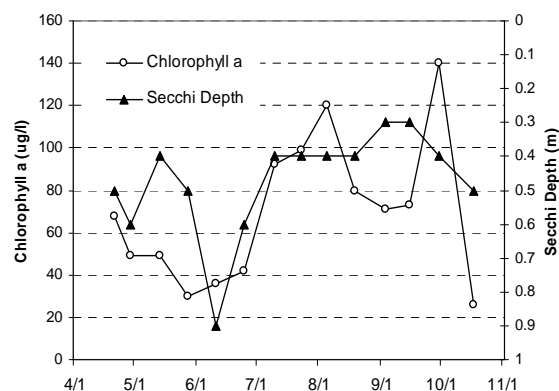
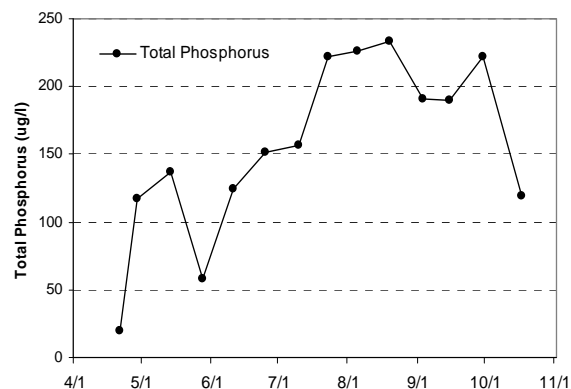
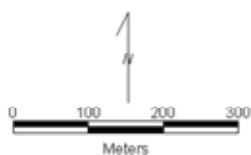
LAKE ID: 100217

WMO: Carver County

Volunteer: Carver Co.

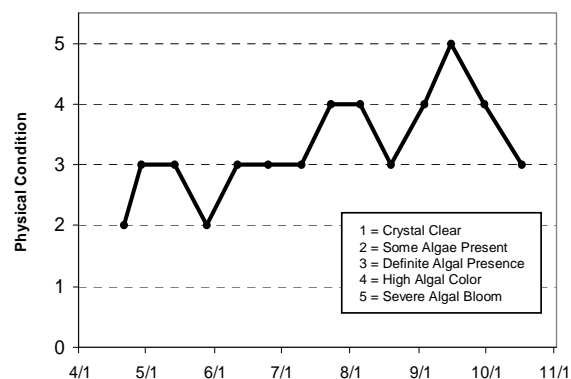
● Sampling site

Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	11.36		16.68		68	20		0.5	2	4
4/29	7.87		14.8		49	117		0.6	3	4
5/14	13.36		11.31		49	137		0.4	3	4
5/28	17.01		8.32		30	58		0.5	2	4
6/11	21.16		7.95		36	124		0.9	3	4
6/25	24.86		8.86		42	151		0.6	3	5
7/10	24.82		9.83		92	157		0.4	3	4
7/23	25.45		7.76		99	222		0.4	4	4
8/5	25.04		9.04		120	226		0.4	4	4
8/19	27.17		14.46		80	233		0.4	3	4
9/3	22.09		9.1		71	191		0.3	4	4
9/15	17.37		7.35		73	190		0.3	5	5
9/30	17.3		8.2		140	222		0.4	4	5
10/17	12.04		6.07		26	119		0.5	3	5



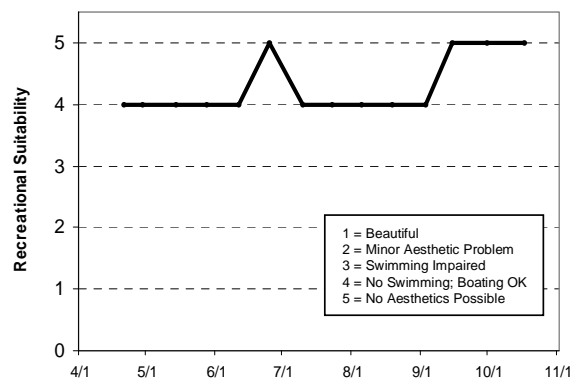
Lake Water Quality Grades Based on Summertime Averages

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												F
Chlorophyll a												C
Secchi Depth												F
Lake Grade												D

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

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.

This was the third year that July Lake has been involved in CAMP. 2006 – 2008 are the only years of known available water quality data for the lake.

The lake was monitored 7 times between mid April and early October. 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.

2008 summer (May-September) data summary

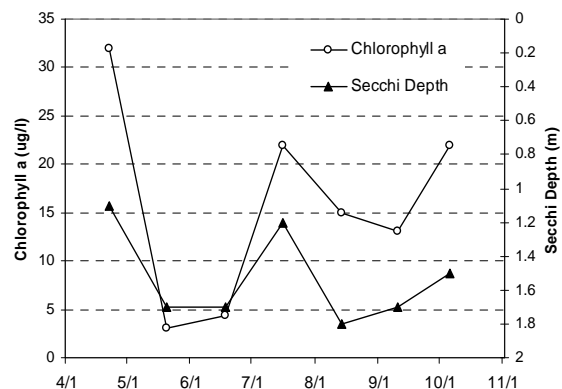
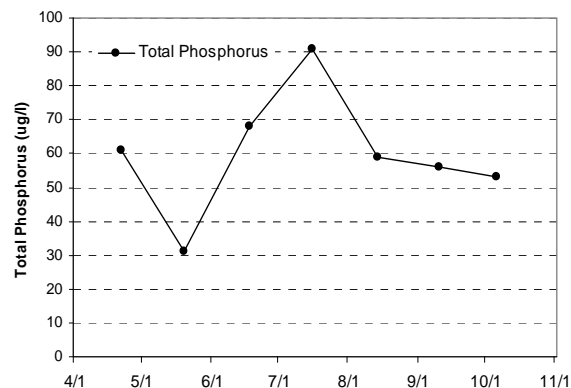
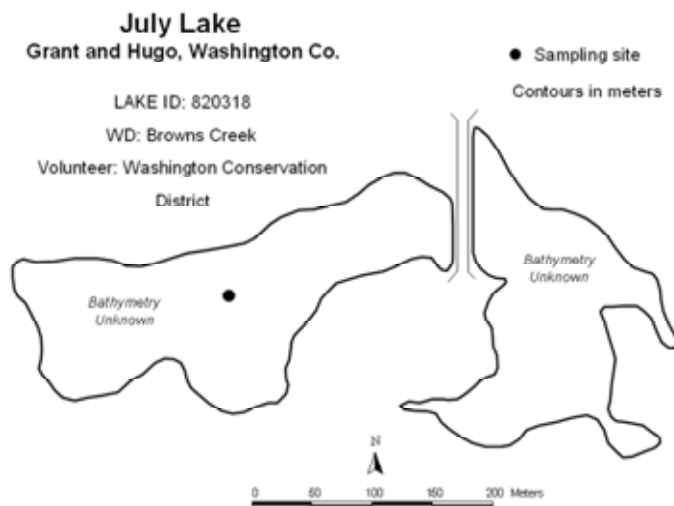
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	61.0	31.0	91.0	C
CLA (µg/l)	11.5	3.1	22.0	B
Secchi (m)	1.6	1.2	1.8	C
TKN (mg/l)	1.48	0.82	1.70	
Lake Grade				C

The lake received a lake grade of C for 2008. This is a marked improvement over the previous two years in which the lake received lake grades of F. The 2008 summer-time means for TP, CLA, and Secchi were much improved as well compared to those in 2006 and 2007. Abundance of macrophytes was observed to be greater in 2008 than in 2007. The water level in the lake was observed as normal in 2008 versus the below normal conditions observed in 2007, which is in contrast to most other lakes in the area.

There was a fish kill of bullheads during the spring of 2008. The reduction of the bullhead population may have contributed to the improvement in water clarity via reduction of bioturbation of the bottom sediments by the bullheads. The improved water clarity and reduced sediment bioturbation may also explain the increased abundance of macrophytes observed in 2008.

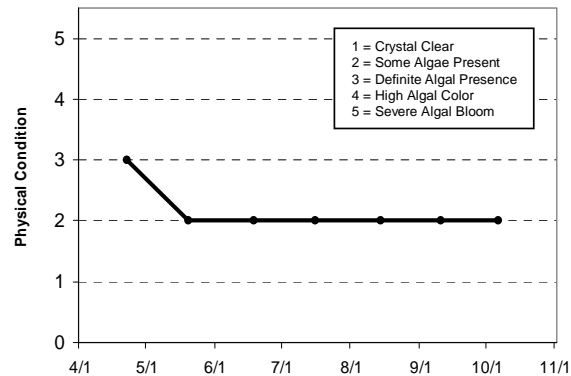
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the lake's information sheet on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 2.0 for physical condition (2- "some algae present"), and 2.8 for recreational suitability (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired"). The 2008 mean perception rankings

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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	13.4	10.8	13.91	3	32	61		1.1	3	4
5/20	17.4	15.2	6.4	0.66	3.1	31		1.7	2	3
6/18	22.9	18.6	4.89	0.15	4.4	68		1.7	2	3
7/16	25.3	21.3	8.58	0.42	22	91		1.2	2	3
8/14	24.2	23.2	7.38	0.78	15	59		1.8	2	3
9/10	18.2	18.2	7.65	0.16	13	56		1.7	2	2
10/6	14.1	13.7	12.52	0.42	22	53		1.5	2	2



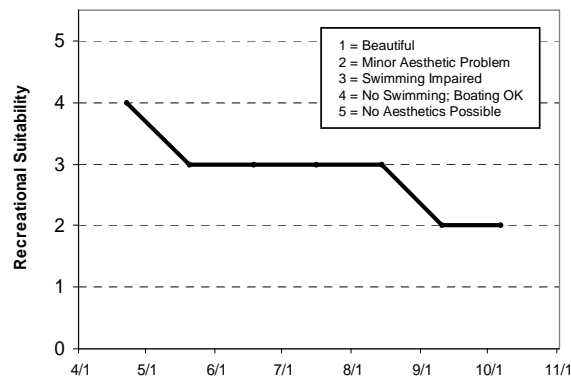
Lake Water Quality Grades Based on Summertime Averages

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

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 second year that Karth Lake was monitored in the CAMP. The lake was monitored 13 times between early May and mid October. 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.

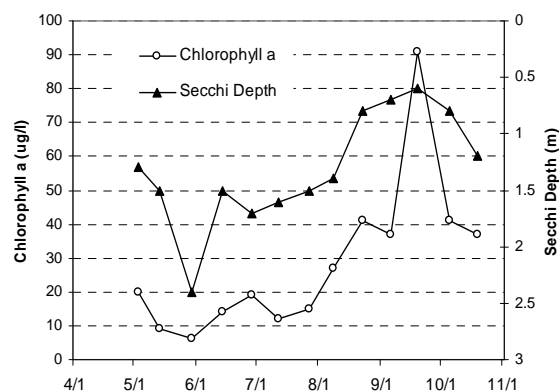
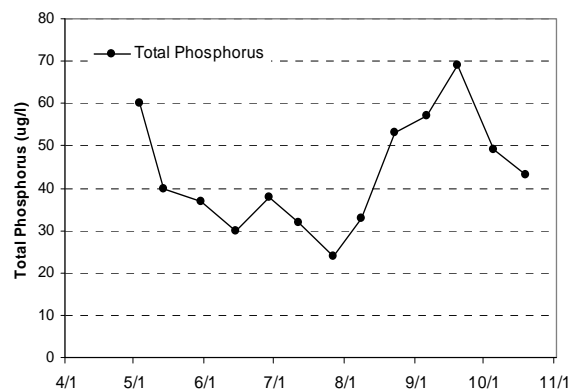
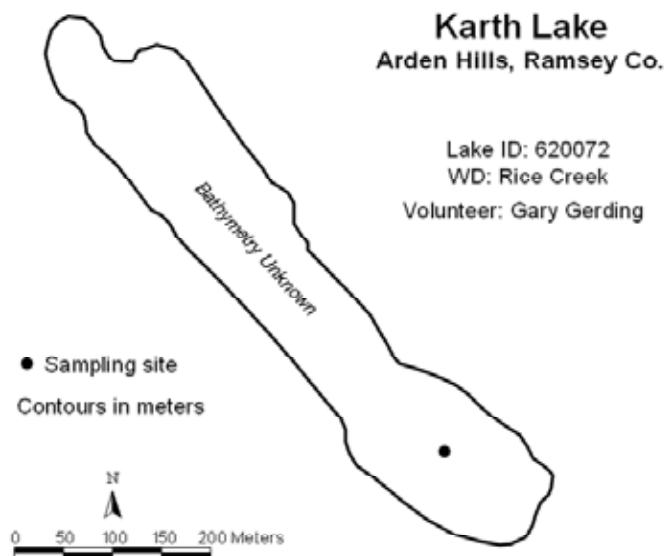
2008 summer (May-September) data summary

Parameter	Mean	Minimum	Maximum	Grade
TP (µg/l)	43.0	24.0	69.0	C
CLA (µg/l)	26.5	6.1	91.0	C
Secchi (m)	1.4	0.6	2.4	C
TKN (mg/l)	1.43	0.97	1.90	
Lake Grade				C

The lake received a lake grade of C for 2008. Further monitoring is suggested to develop a water quality database.

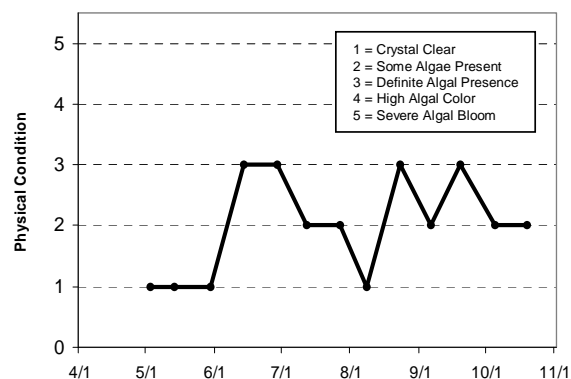
The volunteer(s) monitor ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. The mean perceived physical condition was 2.0 (some algae present), while the mean recreational suitability was 1.8 (between 1- "beautiful" and 2- "minor aesthetic problem").

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.



2008 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	12				20	60		1.3	1	1
5/14	16				9.2	40		1.5	1	1
5/30	19.7				6.1	37		2.4	1	1
6/14	22				14	30		1.5	3	2
6/29	24				19	38		1.7	3	2
7/12	24.4				12	32		1.6	2	2
7/27	27				15	24		1.5	2	2
8/6	26				27	33		1.4	1	1
8/23	25.3				41	53		0.8	3	3
9/6	22.4				37	57		0.7	2	2
9/19	21.8				91	69		0.6	3	2
10/5	16				41	49		0.8	2	2
10/19	14.2				37	43		1.2	2	2



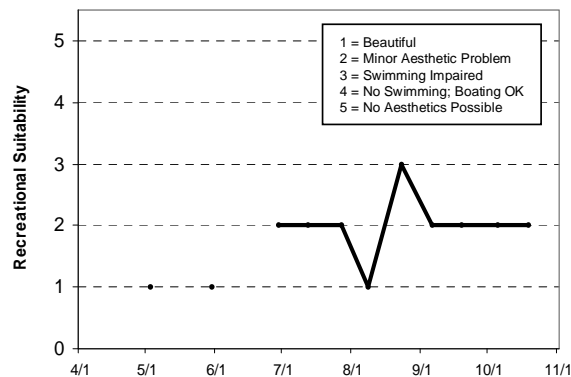
Lake Water Quality Grades Based on Summertime Averages

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

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). The lake's mean depth of 1.1 m (3.7 feet) and surface area translates to an approximate lake volume of 203 ac-ft. Because the maximum depth is 3.0 m, the entire lake area is considered littoral, which is the area 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*).

The area of the contributing watershed to the lake is 1,387 acres which excludes the surface area of the lake (BDWMO). The contributing watershed is nearly entirely developed. The watershed-to-lake size ratio is approximately 25:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored in the past by Council staff as part of a study on Crystal Lake. Keller lake is tributary to Crystal Lake. Keller Lake was again monitored by Council staff in 2006.

The lake was monitored 8 times between mid May and late August. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	34.5	18.0	48.0	C
CLA (µg/l)	5.2	2.5	8.0	A
Secchi (m)	2.0	1.7	2.3	C
TKN (mg/l)	1.47	1.10	1.70	
Lake Grade				B

The lake received a lake grade of B for 2008. However, the 2008 lake grade does not include the entire summer time season (May – September) because the monitoring activities ceased at the end of August. Therefore, comparison of this year's lake grade with previous years' lake grades should be done with caution since the 2008 lake grade estimates water quality for a shortened monitoring season. The volunteer noted that his monitoring activities were abandoned because of the lack of access to the monitoring site as caused by a great abundance of macrophytes inhibiting the ability to paddle a canoe.

Similar to past years, the 2008 water clarity would have been greater except on many monitoring events the lake's excessive submergent macrophyte growth obscured the Secchi disk. The lake's 2008 water clarity was actually better than that represented by the summer mean and associated water clarity grade.

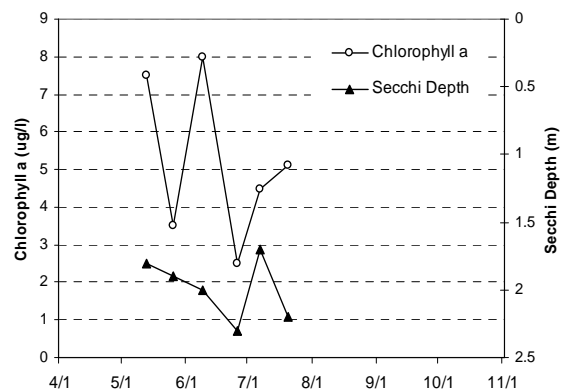
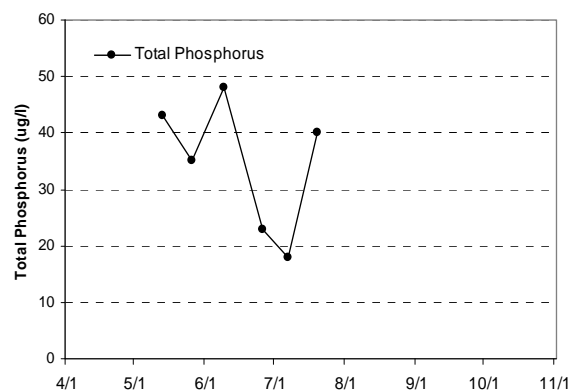
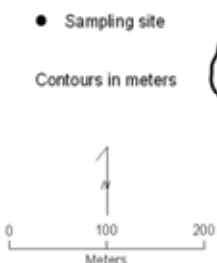
The volunteer monitor ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. The mean perceived physical condition was 2.7 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability was 4.0 ("no swimming - boating ok").

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading 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.

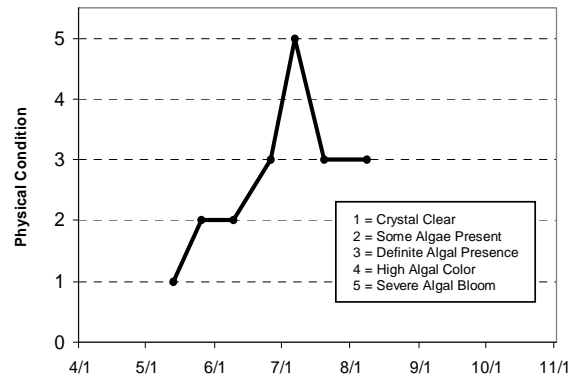
Keller Lake Burnsville, Dakota Co.

Lake ID: 190025
WMO: Black Dog
Volunteer: Glenn Gramse



2008 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
5/13	15.1				7.5	43		1.8	1	1
5/26	20.7				3.5	35		1.9	2	3
6/9	24.7				8	48		2	2	4
6/26	26.7				2.5	23		2.3	3	5
7/7	26.5				4.5	18		1.7	5	5
7/20	29.1				5.1	40		2.2	3	5
8/8								3	5	
8/25										



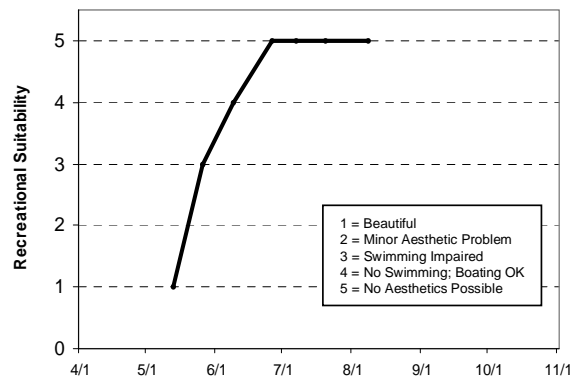
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus	C	C	D	D	C
Chlorophyll a	B	B	D	B	A
Secchi Depth	C	C	D	C	C
Lake Grade	C	C	D	C	B

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 (shoreline length of 1.7 miles), a maximum depth of 4.0 m (13 feet), and a contributing watershed of 193 acres. The resulting watershed-to-lake size ratio is a rather small at 4:1. The greater the ratio the greater affect of surface runoff has on the water quality of the lake. Because of the shallowness of the lake, the entire lake is considered littoral, which is area of aquatic vegetation dominance, and never develops and maintains a thermocline.

The lake was monitored by Council staff in 1993. Kingsley Lake was monitored 13 times between late April and mid October. 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.

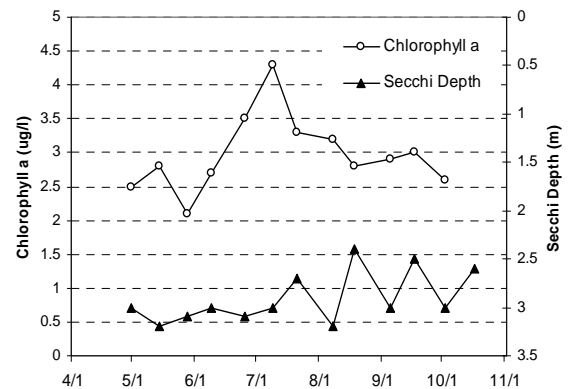
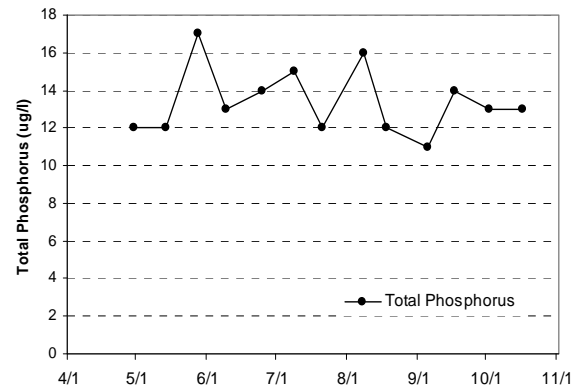
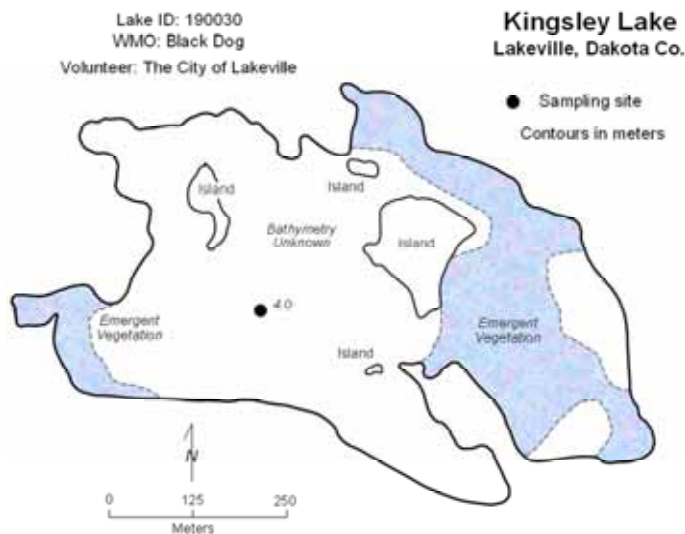
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	13.6	11.0	17.0	A
CLA (µg/l)	3.1	2.1	4.3	A
Secchi (m)	2.9	2.4	3.2	B
TKN (mg/l)	0.64	0.34	0.99	
Lake Grade				A

Similar to past years, the Secchi transparency in 2008 would have been greater except that on many 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. For these reasons, the water clarity may have been actually that of an A grade. On the basis of the water quality database, the lake's water quality appears represented by a lake grade of A or B. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

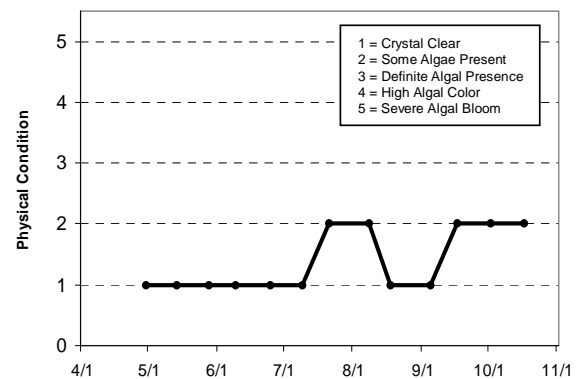
The physical and recreational conditions of the lake as perceived by the volunteer(s) were ranked on a 1-to-5 scale. The mean physical condition ranking was 1.3 (between 1- "crystal clear" and 2- "some algae present"), while the mean recreational suitability ranking was 1.1 (between 1-"beautiful" and 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.



2008 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	11.7				2.5	12		3	1	1
5/14	16.1				2.8	12		3.2	1	1
5/28	17.2				2.1	17		3.1	1	1
6/9	20.6				2.7	13		3	1	1
6/25	26.7				3.5	14		3.1	1	1
7/9	25.6				4.3	15		3	1	1
7/21	26.7				3.3	12		2.7	2	1
8/8	25.6				3.2	16		3.2	2	2
8/18	24.1				2.8	12		2.4	1	1
9/5	19				2.9	11		3	1	1
9/17	19				3	14		2.5	2	1
10/2	13				2.6	13		3	2	1
10/17	11					13		2.6	2	1



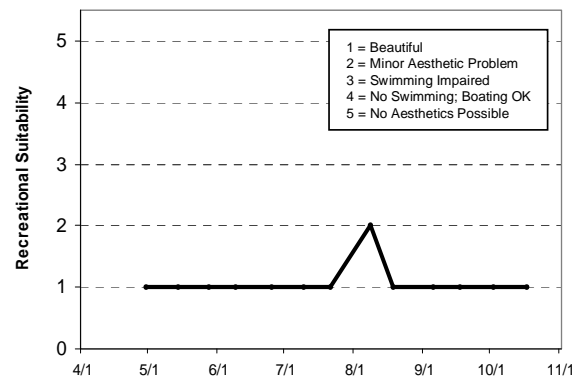
Lake Water Quality Grades Based on Summertime Averages

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		B		B	A	A			A	A	A	B
Chlorophyll a		A		A	A	A			A	A	A	A
Secchi Depth		A		B	B	B			B	C	B	B
Lake Grade		A		B	A	A			A	B	A	B

Year	2004	2005	2006	2007	2008
Total Phosphorus	A	A	B	A	A
Chlorophyll a	A	A	A	A	A
Secchi Depth	B	B	B	B	B
Lake Grade	A	A	B	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. The known available lake data found through a search for historical water quality was the 1998-2007 CAMP data.

The lake was monitored 14 times between late April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	67.4	34.0	125.0	C
CLA (µg/l)	50.7	5.1	120.0	D
Secchi (m)	1.5	1.1	2.0	C
TKN (mg/l)	1.31	0.72	1.90	
Lake Grade				C

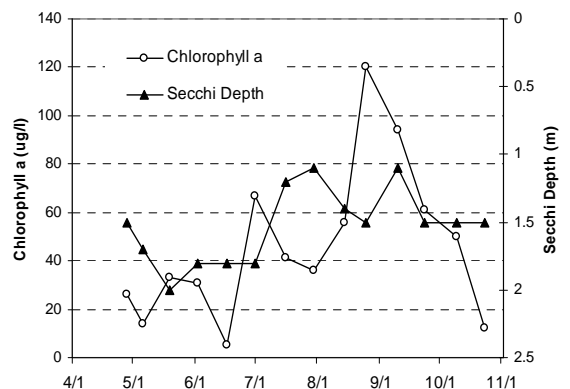
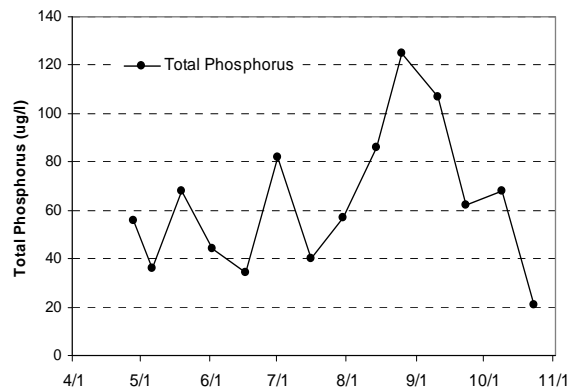
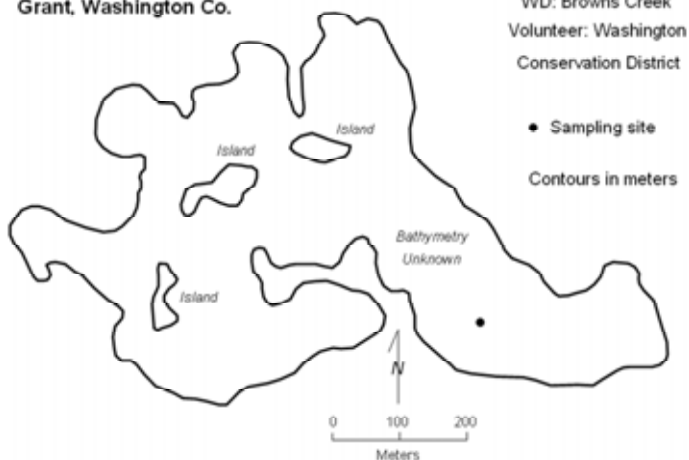
The lake received a lake grade of C for 2008, which is similar to previous years' lake grades. However the 2008 CLA grade was the worst grade (D) received for this lake since CAMP monitoring began in 1998. Continued monitoring is suggested to determine if the lower CLA grade is an anomaly or an indicator of a potential trend. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

The perceived physical and recreational conditions of the lake, recorded by the volunteers, were ranked on a 1-to-5 scale. The mean physical condition ranking was 1.9 (between 1- "crystal clear" and 2- "some algae present"). The mean recreational suitability ranking was 2.2 (between 2- "minor aesthetic problem and 3- "swimming slightly impaired").

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/>.

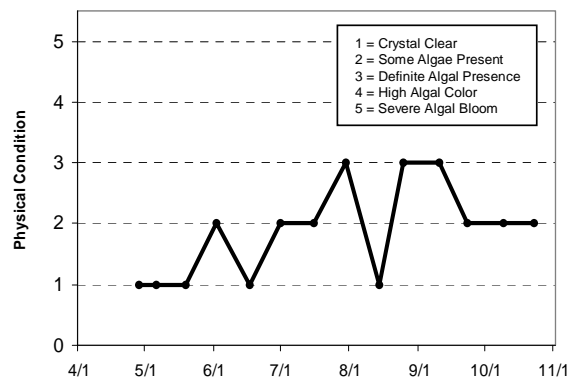
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Kismet Lake Grant, Washington Co.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	8	8	11.38	9.01	26	56		1.5	1	2
5/6	16.5	10.6	10.7	0.99	14	36		1.7	1	2
5/19	16.1	15.1	8.06	0.76	33	68		2	1	2
6/2	22	16.8	8.71	0.28	31	44		1.8	2	2
6/17	22.7	19.4	8.35	0.24	5.1	34		1.8	1	2
7/1	27.2	22.9	7.62	0.9	67	82		1.8	2	2
7/16	25	20	7.16	0.31	41	40		1.2	2	3
7/30	28.3	20.6	7.32	0.26	36	57		1.1	3	3
8/14	23.7	21.7	6.11	1.54	56	86		1.4	1	1
8/25	24.8	20	6.59	0.25	120	125		1.5	3	2
9/10	17.9	16.3	7.29	0.36	94	107		1.1	3	3
9/23	20.3	17.7	7.67	0.33	61	62		1.5	2	2
10/9	13.5	13	9.15	5.84	50	68		1.5	2	3
10/23	8.8	9.1	9.44	0.71	12	21		1.5	2	2



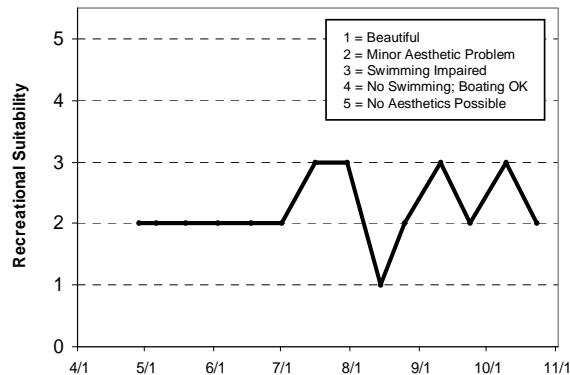
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

Other than for the 2002-2007 CAMP data, a search through the STORET nationwide water quality database for data on the lake came up empty.

The lake was monitored 13 times between mid May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	83.3	13.0	158.0	D
CLA (µg/l)	41.7	4.5	97.0	C
Secchi (m)	0.6	0.3	1.0	F
TKN (mg/l)	3.94	1.20	18.00	
<i>Lake Grade</i>				D

The lake received a lake grade of D for 2008, 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. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

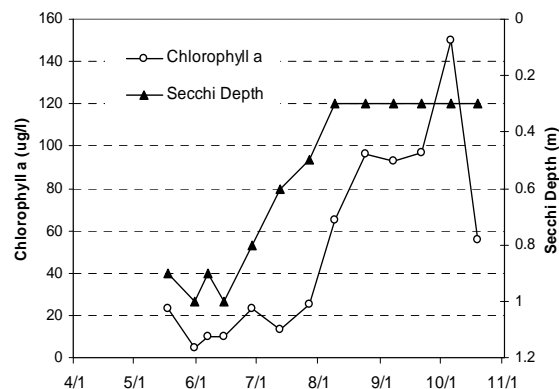
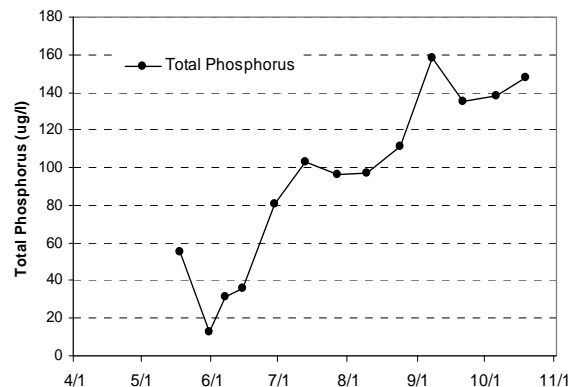
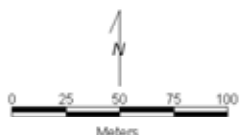
Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page. The mean physical condition ranking was 3.2 (between 3- "definite algae present" and 4- "high algal color"), while the mean recreational suitability ranking was 2.5 (between 2- "minor aesthetic problem and 3- "swimming slightly impaired").

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.

Klawitter Pond Lake Elmo, Washington Co.

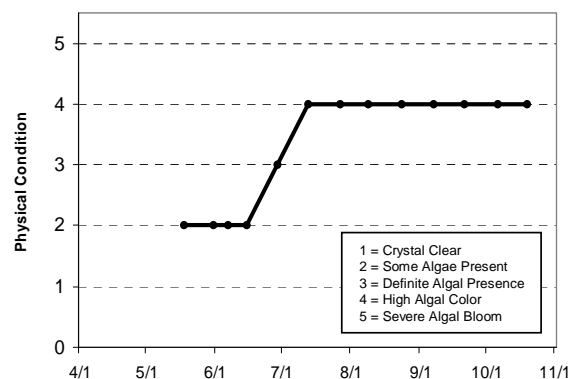
Lake ID: 820368
WD: Valley Branch
Volunteer: Bonnie Juran

● Sampling site
Contours in meters



2008 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
5/18	19.6				23	55		0.9	2	2
5/31	22.2				4.5	13		1	2	2
6/7	20.6				9.8	31		0.9	2	2
6/15	21.8				9.9	36		1	2	2
6/29	25.2				23	81		0.8	3	2
7/13	25.8				13	103		0.6	4	3
7/27	27.8				25	96		0.5	4	3
8/9	27.1				65	97		0.3	4	3
8/24	25.1				96	111		0.3	4	3
9/7	20.6				93	158		0.3	4	3
9/21	19.7				97	135		0.3	4	3
10/6	15.2				150	138		0.3	4	3
10/19	13.2				56	148		0.3	4	3



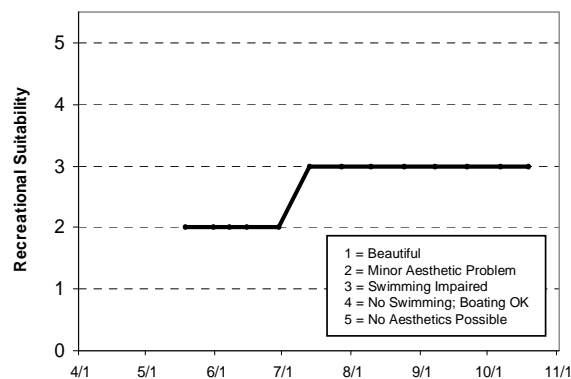
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade											C	D

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

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.

No water quality data for the lake was available in the STORET nationwide water quality database.

The lake was monitored 7 times between late April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	496.0	130.0	764.0	F
CLA (µg/l)	183.0	33.0	320.0	F
Secchi (m)	0.5	0.2	1.1	F
TKN (mg/l)	5.50	3.50	6.90	
Lake Grade				F

The lake received a lake grade of F for 2008. Additional years of monitoring are suggested to build a water quality database so to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page. The mean physical condition ranking was 3.4 (between 3- "definite algae present" and 4- "high algal color"), while the mean recreational suitability ranking was 4.0 ("no swimming/boating ok").

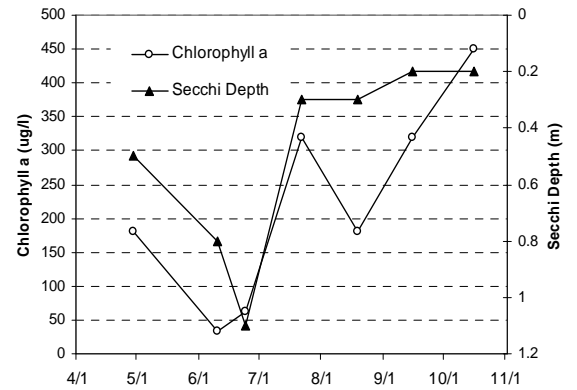
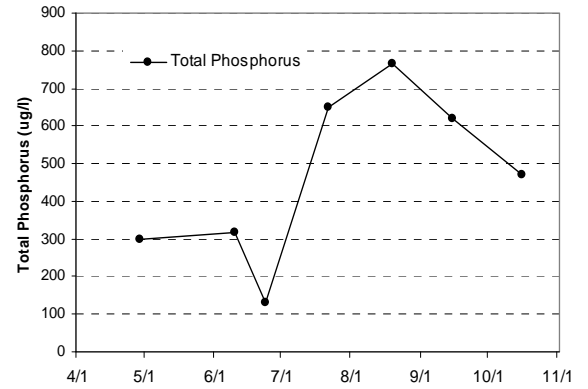
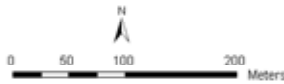
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Kramer Pond Lake Elmo, Washington Co.

Lake ID: 820117
WD: Valley Branch
Volunteer: Washington Conservation
District

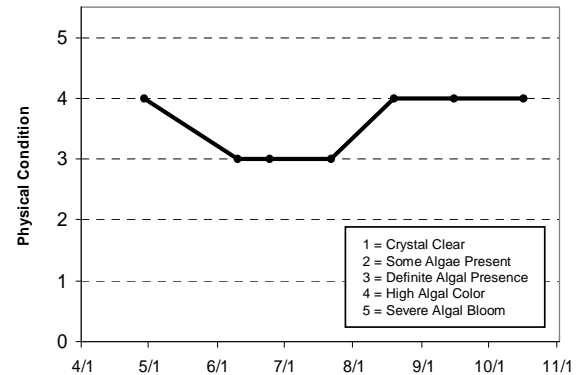
• Sampling site

Contours in meters



2008 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	6.4	6.2	14.83	1.03	180	300		0.5	4	4
6/10	20.8	20.7	6.19	6.15	33	318		0.8	3	4
6/24	25.4	23.2	10.87	0.33	62	130		1.1	3	4
7/22	25.8	24.3	9.93	0.16	320	648		0.3	3	4
8/19	25	22.9	5.46	0.14	180	764		0.3	4	4
9/15	17.5	15.9	10.49	0.26	320	620		0.2	4	4
10/16	10.1	10.8	10.7	0.32	450	472		0.2	4	4



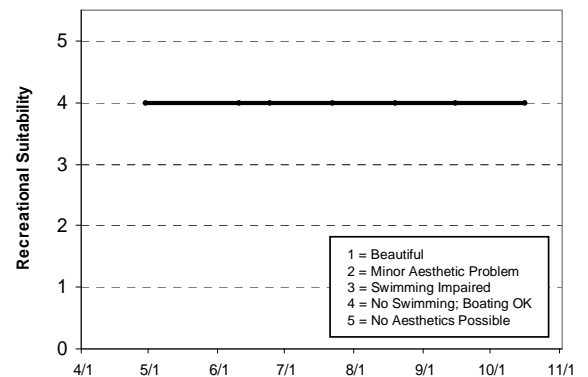
Lake Water Quality Grades Based on Summertime Averages

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

The lake was monitored 11 times between mid April and early October. 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.

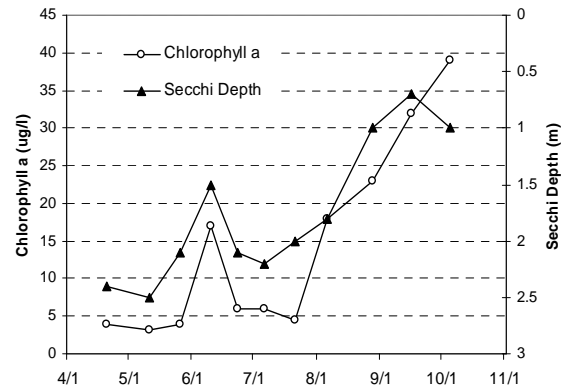
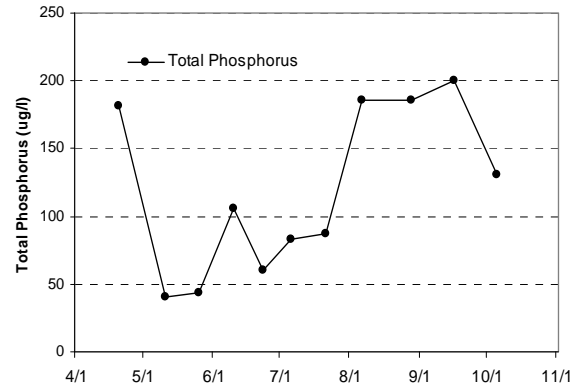
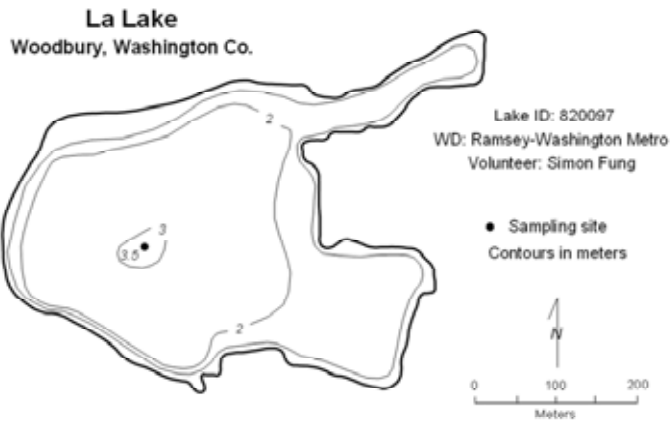
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	110.2	40.0	200.0	D
CLA (µg/l)	12.6	3.2	32.0	B
Secchi (m)	1.8	0.7	2.5	C
TKN (mg/l)	1.17	0.82	2.00	
Lake Grade				C

The lake received a lake grade of C for 2008. The 2008 lake grade and the parameter grades were a return to similar grades received in previous years (e.g. 2002, 1996). The water quality for 2008 appears to be an improvement over the water quality observed in 2007. 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. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant declining trend in water clarity (MPCA 2008).

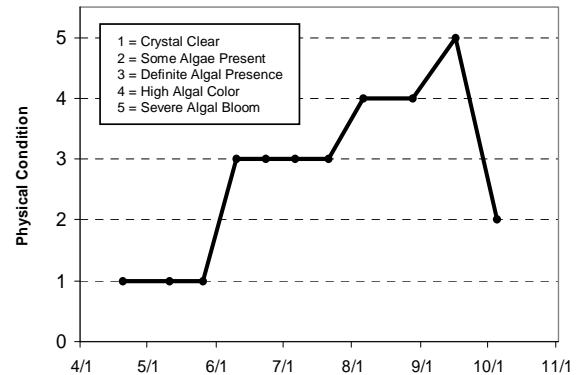
Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page. The mean physical condition ranking was 3.0 (3- "definite algae present"), while the mean recreational suitability ranking was 3.3 (between 3- "swimming slightly impaired" and 4- "no swimming; boating ok").

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.



2008 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	9.3				4	182		2.4	1	1
5/11	16.3				3.2	40		2.5	1	1
5/26	19.7				3.9	44		2.1	1	1
6/10	22.6				17	106		1.5	3	4
6/23	25				6	60		2.1	3	4
7/6	28.2				6	83		2.2	3	4
7/21	27				4.4	87		2	3	4
8/6	25.6				18	186		1.8	4	4
8/28	24				23	186		1	4	4
9/16	20.8				32	200		0.7	5	4
10/5	14.2				39	131		1	2	4



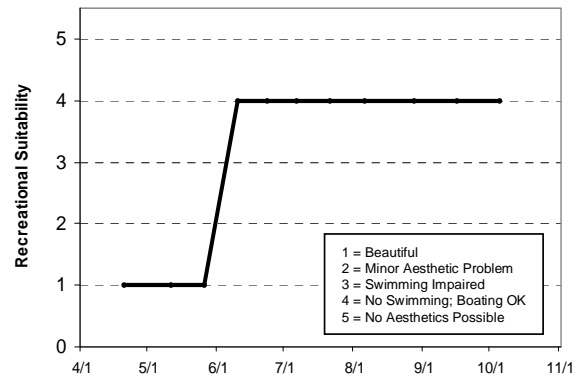
Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008
Total Phosphorus		C	D	D	D
Chlorophyll a		B	C	D	B
Secchi Depth		C	C	D	C
Lake Grade		C	C	D	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. The lake is an abandoned gravel pit maintained by groundwater (MDNR 1996). The lake has a surface area of 55 acres and a maximum depth of 9.8 m (32 feet). Approximately 65 percent of the lake is considered littoral zone, which is the 0 – 15 feet depth zone of the lake that dominated by aquatic vegetation. 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*).

This was the twelfth year that Lac Lavon has been involved in the CAMP. The only other known water quality data available for the lake were Secchi transparency data collected in 1989-1991.

Lac Lavon was monitored 12 times between mid April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	33.3	11.0	151.0	C
CLA (µg/l)	5.8	2.4	17.0	A
Secchi (m)	3.3	1.9	4.6	A
TKN (mg/l)	1.30	0.51	3.10	
Lake Grade				B

The lake received a lake grade of B for 2008, which is the first year the lake received a lake grade other than A. The main cause for the lower lake grade was the elevated concentrations of TP observed during the month of June 2008. There were two elevated TP concentrations for the sampling weeks in June. They were of sufficient magnitude to shift the TP grade from a typical A to a C. The TP concentrations for the other months in 2008, which are indicative of a TP grade of A, were similar in magnitude as the same months in previous years. It is possible that the elevated TP concentrations were caused by enhanced TP loading from one or more surface runoff events during late May or early June. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

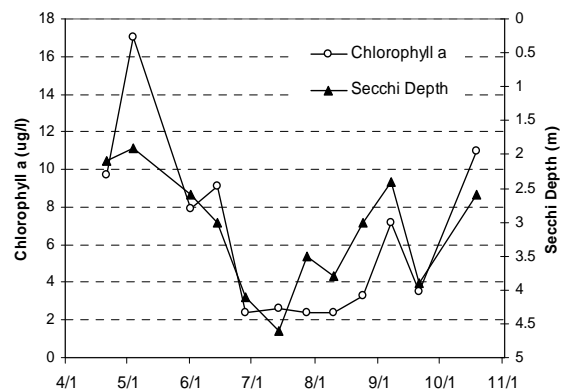
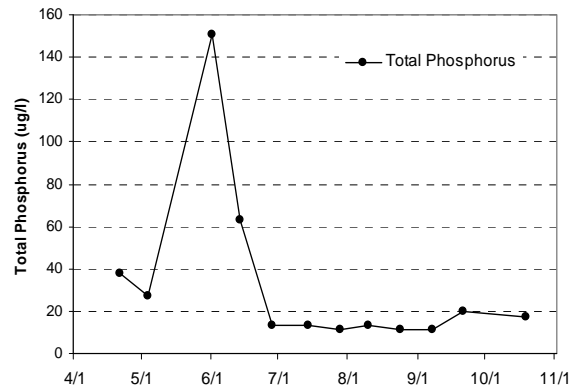
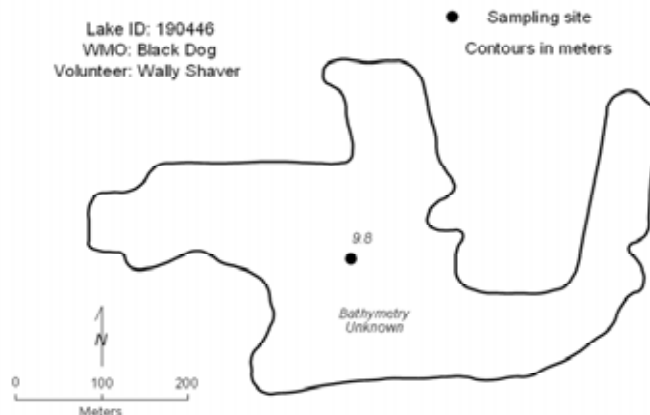
Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The mean physical condition ranking was 1.0 (1-“crystal clear”), while the mean recreational suitability ranking was 1.0 (1- “beautiful”).

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.

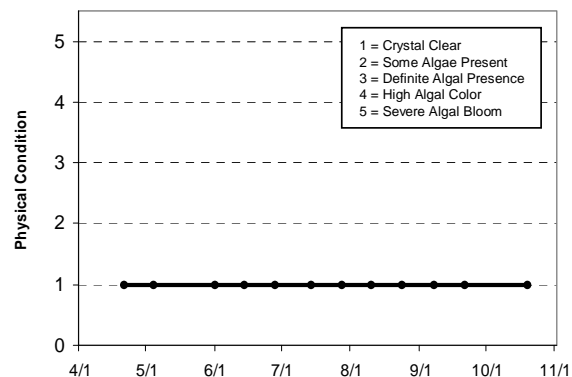
Lac Lavon Apple Valley/Burnsville, Dakota Co.

Lake ID: 190446
WMO: Black Dog
Volunteer: Wally Shaver



2008 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	10.8				9.7	38		2.1	1	1
5/4	10.2				17	27		1.9	1	1
6/1	19.8				7.9	151		2.6	1	1
6/14	19.7				9.1	63		3	1	1
6/28	23.5				2.4	13		4.1	1	1
7/14	25.8				2.6	13		4.6	1	1
7/28	27				2.4	11		3.5	1	1
8/10	25.6				2.4	13		3.8	1	1
8/24	24.7				3.3	11		3	1	1
9/7	20.5				7.2	11		2.4	1	1
9/21	20.6				3.5	20		3.9	1	1
10/19	13.8				11	17		2.6	1	1



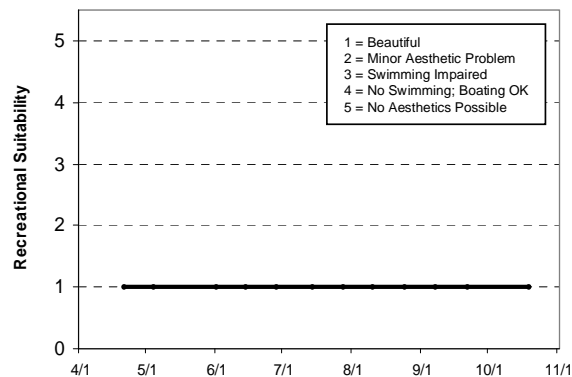
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade						A	A	A	A	A	A	A

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

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. No historical water quality data for the lake was available in the STORET nationwide water quality database.

The lake was monitored 12 times between mid May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	174.2	62.0	348.0	F
CLA (µg/l)	151.3	9.0	340.0	F
Secchi (m)	0.7	0.2	1.5	F
TKN (mg/l)	3.15	1.40	5.10	
<i>Lake Grade</i>				F

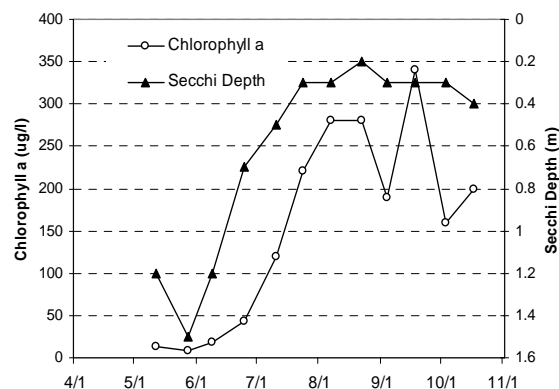
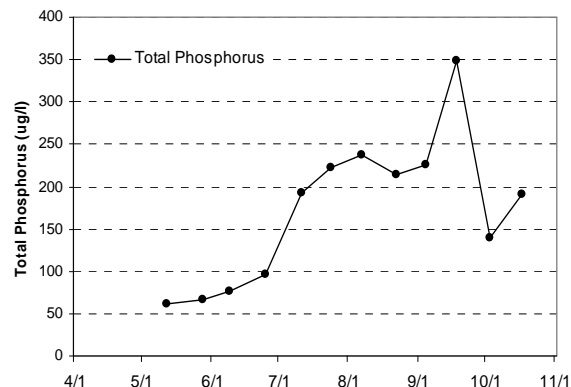
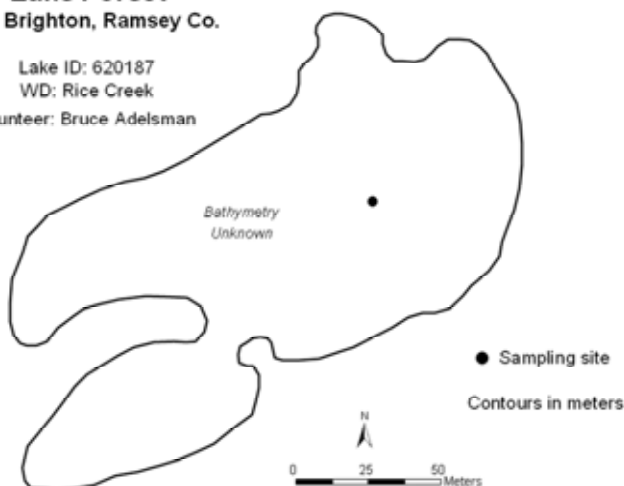
The lake received a lake grade of F for 2008. Additional years of monitoring are suggested to build a water quality database to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page. The mean physical condition ranking was 3.2 (between 3- "definite algae present" and 4- "high algal color"), while the mean recreational suitability ranking was 3.2 (between 3- "swimming slightly impaired and 4- "no swimming/boating ok").

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.

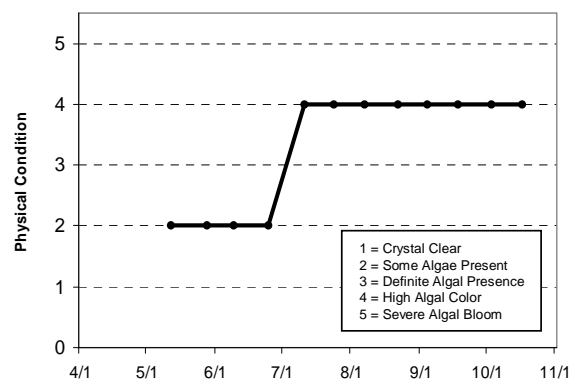
Lake Forest New Brighton, Ramsey Co.

Lake ID: 620187
WD: Rice Creek
Volunteer: Bruce Adelman



2008 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
5/12	16				13	62		1.2	2	2
5/28	19.5				9	67		1.5	2	2
6/9	23				18	76		1.2	2	2
6/25	26.1				43	96		0.7	2	2
7/11	24				120	193		0.5	4	4
7/24	24.7				220	223		0.3	4	4
8/7	24.3				280	238		0.3	4	4
8/22	24				280	214		0.2	4	4
9/4	19.9				190	225		0.3	4	4
9/18	17.9				340	348		0.3	4	4
10/3	14.1				160	139		0.3	4	4
10/17	11.9				200	191		0.4	4	4



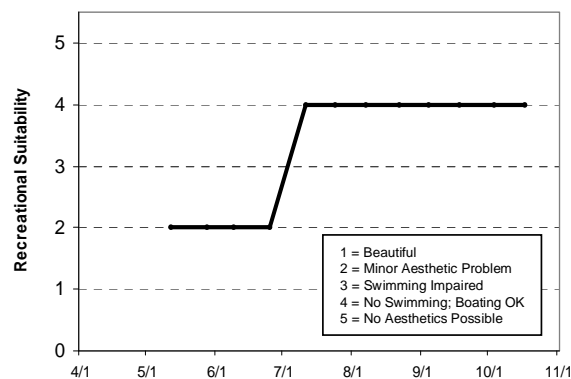
Lake Water Quality Grades Based on Summertime Averages

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

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. The monitoring results for each of the sites will be discussed individually. 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 mean depth is 1.2 m (3.9 feet). The volume is approximately 120 ac-ft. Because of the shallowness of the lake, its entire surface area is considered littoral zone, which is the 0-15 feet depth zone dominated by aquatic vegetation. The lake's contributing watershed is 257 acres, which translates to a watershed-to-lake area ratio of 9:1. 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*).

A search through the STORET nationwide water quality database for historical data provided Secchi transparency data for 1984, 1985, 1987, 1988, and 1990.

The north basin was monitored 13 times between mid May and mid October. 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.

2008 summer (May-September) data summary

Parameter	Mean	Minimum	Maximum	Grade
TP (µg/l)	66.8	31.0	131.0	C
CLA (µg/l)	21.3	4.0	56.0	C
Secchi (m)	1.2	0.8	1.6	D
TKN (mg/l)	1.73	1.20	2.70	
Lake Grade				C

The basin received a lake grade of C for 2008, which is similar to past years of lake grades. There are no other nutrient and chlorophyll-a data available for Site-1 other than the 2005-2008 CAMP data. Additional monitoring is suggested to continue to build the water quality database for determining possible trends in water quality.

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 2.1 for physical condition (between 2- "some algae present" and 3- "definite algae present"). The ranking of recreational suitability was made during only one monitoring event for 2008, so the average ranking is not reported.

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.

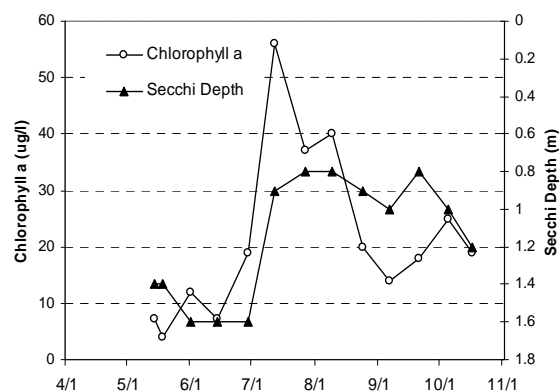
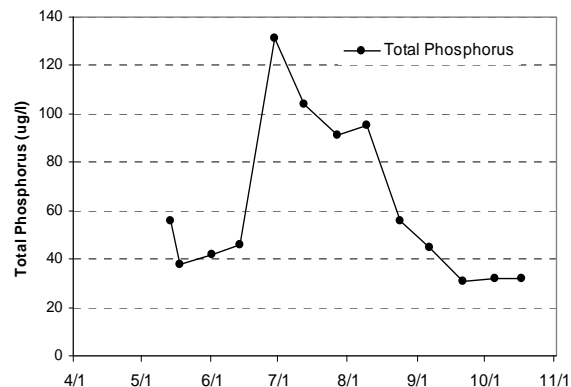
Langton Lake, Site 1 Roseville, Ramsey Co.

Lake ID: 620049-01

WD: Rice Creek

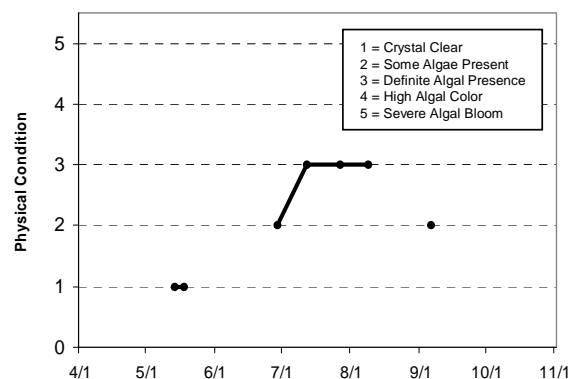
Volunteers: Tam & Dick McGehee; Yul Yost

● Sampling site
Contours in meters



2008 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
5/14	14.6				7.1	56		1.4	1	
5/18	17.5				4	38		1.4	1	1
6/1	21.9				12	42		1.6		
6/14	23.8				7.1	46		1.6		
6/29	25.7				19	131		1.6	2	
7/12	25.7				56	104		0.9	3	
7/27	25.9				37	91		0.8	3	
8/9	26.5				40	95		0.8	3	
8/24	23.8				20	56		0.9		
9/6	21.1				14	45		1	2	
9/21	22.8				18	31		0.8		
10/5	14.2				25	32		1		
10/17	12.4				19	32		1.2		



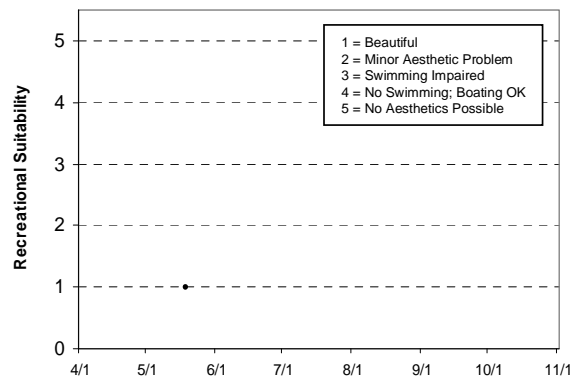
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus	C	C	C	C	C
Chlorophyll a	C	B	A	C	
Secchi Depth	D	D	D	D	
Lake Grade	C	C	C	C	

Source: Metropolitan Council and STORET data



Langton Lake [south basin, site-2] (62-004-02) Rice Creek Watershed District

Langton Lake is divided into two distinct basins. The monitoring results will be discussed individually for each of the basins. For a description of the entire lake, refer to the discussion for Site 1 of Langton Lake.

A search through STORET revealed many years of Secchi transparency data from 1984 and 1995-2007. There are no other nutrient and chlorophyll data available for Site-2 other than the 2005-2008 CAMP data.

The south basin was monitored 13 times between early May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	64.2	24.0	166.0	C
CLA (µg/l)	20.4	3.7	55.0	C
Secchi (m)	1.1	0.6	1.6	D
TKN (mg/l)	2.03	1.00	4.60	
Lake Grade				C

The lake received a lake grade of C for 2008 which is similar to the two previous years. The lake site has also received identical letter grades for each of the three parameters for the years 2005-2007. A recent MPCA-conducted trend analysis on the lake's Secchi transparency data revealed a statistically significant improvement in recent water clarity (MPCA 2008). Additional monitoring is suggested to continue to build the water quality database for determining possible trends in water quality beyond just water clarity.

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 2.8 for physical condition (between 2- "some algae present" and 3- "definite algae present"). The ranking of recreational suitability was made during only one monitoring event for 2008, so the average ranking is not reported.

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.

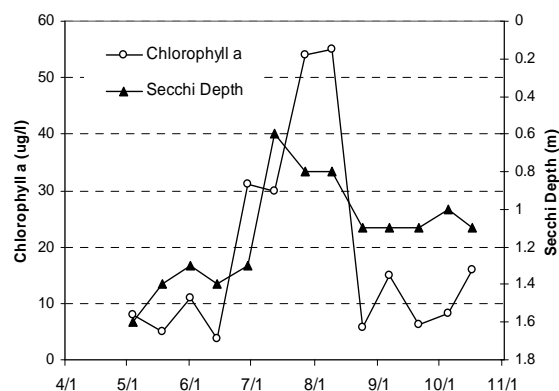
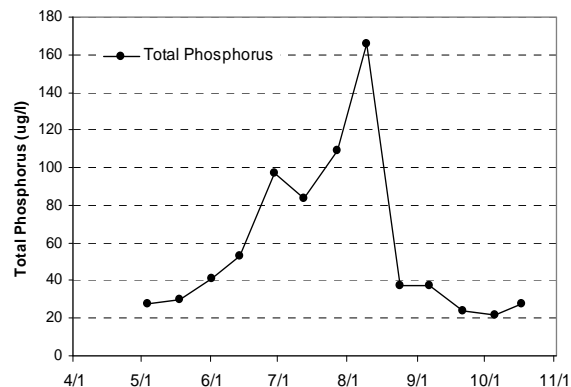
Langton Lake, Site 2 Roseville, Ramsey Co.

Lake ID: 620049-02

WD: Rice Creek

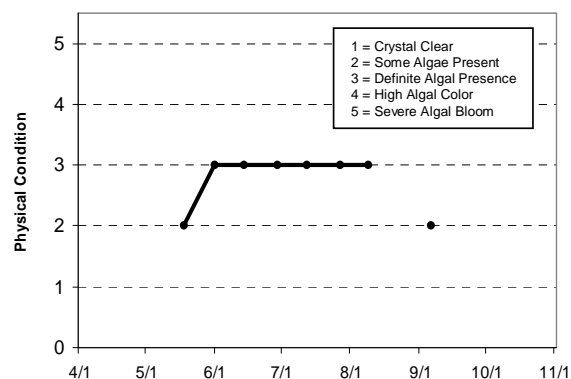
Volunteers: Tam & Dick McGehee; Yul Yost

● Sampling site
Contours in meters



2008 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	14.4				7.9	28		1.6		
5/18	17.2				5.1	30		1.4	2	1
6/1	22.1				11	41		1.3	3	
6/14	23.3				3.7	53		1.4	3	
6/29	25.6				31	97		1.3	3	
7/12	25.9				30	84		0.6	3	
7/27	27				54	109		0.8	3	
8/9	27.4				55	166		0.8	3	
8/24	24.4				5.7	37		1.1		
9/6	21.1				15	37		1.1	2	
9/21	22.8				6.3	24		1.1		
10/5	14				8.1	22		1		
10/17	12.2				16	28		1.1		



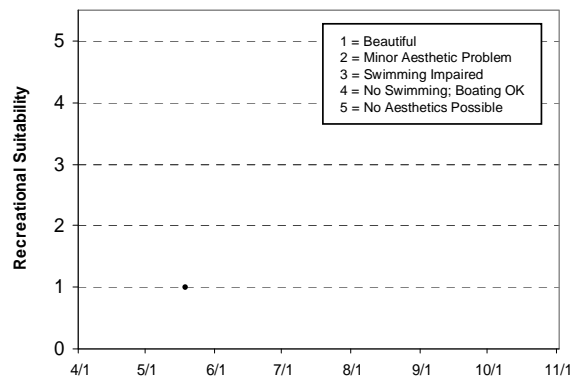
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008
Total Phosphorus	C	C	C	C	C
Chlorophyll a	B	B	B	B	C
Secchi Depth	C	D	D	D	D
Lake Grade	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. The watershed of the lake has an area of 324 acres, and it has mostly developed as urban landuse. The watershed to lake area ratio is 13:1. The higher the ratio, the greater the potential affects of surface runoff have on the water quality of the lake. 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.

In an attempt to inhibit algal populations within the lake, barley straw has been added annually since 2003. Barley straw has been used for algal control in the United Kingdom for many years. A recent study on Valley Lake in Lakeville, Minnesota has suggested that carbon from the decaying barley straw inhibits algal populations via microbial competition for phosphorus (McComas and Anhorn 2004). The results of the report are discussed in more detail in Valley Lake section of this report.

The lake was monitored 13 times between late April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	41.1	26.0	66.0	C
CLA (µg/l)	19.2	5.0	47.0	B
Secchi (m)	1.5	1.0	2.4	C
TKN (mg/l)	1.60	1.10	2.30	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to lake grades received in the past. The lake appears represented by a lake grade of C on the basis of the historical water quality database. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

The volunteer(s) ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. These rankings are shown on the lake's information sheet on the following page. The mean physical condition ranking was 2.4 (between 2- "some algae present and 3- "definite algae present"), while the mean recreational suitability ranking was 2.8 (between 2- "minor aesthetic problem" and 3- "swimming impaired").

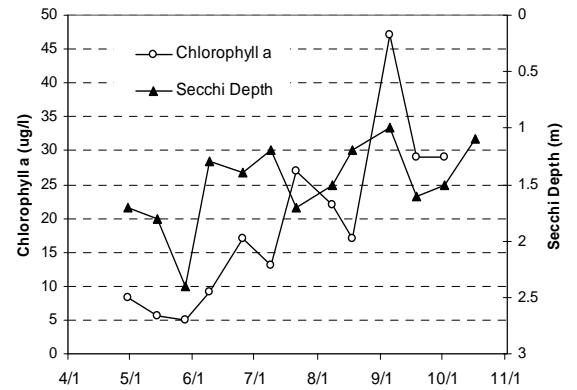
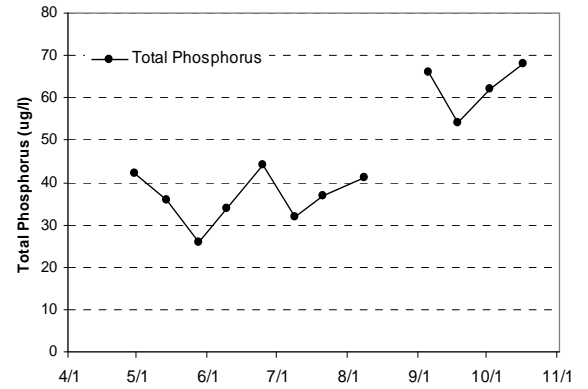
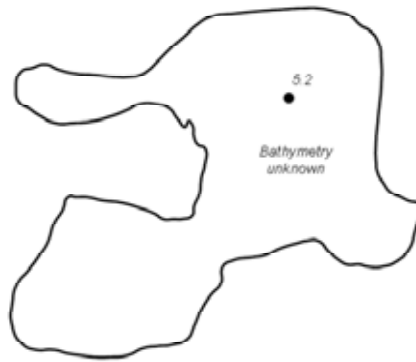
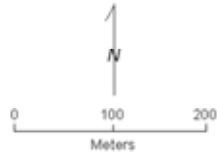
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Lee Lake Lakeville, Dakota Co.

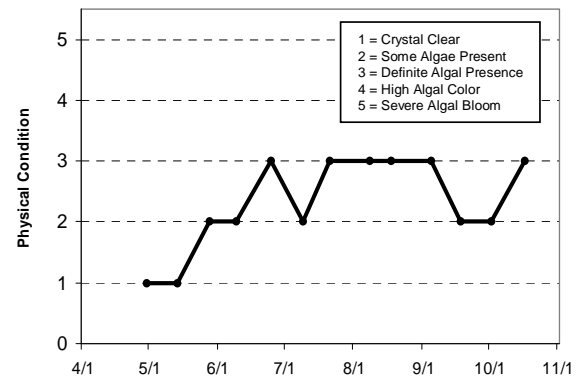
Lake ID: 190029
WMO: Black Dog
Volunteer: City of Lakeville

● Sampling site
Contours in meters



2008 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	10				8.4	42		1.7	1	1
5/14	13.9				5.5	36		1.8	1	1
5/28	17.2				5	26		2.4	2	1
6/9	20.6				9.1	34		1.3	2	4
6/25	27.2				17	44		1.4	3	3
7/9	27.2				13	32		1.2	2	3
7/21	27.2				27	37		1.7	3	4
8/8	26.1				22	41		1.5	3	3
8/18	25.5				17			1.2	3	2
9/5	20				47	66		1	3	4
9/18	20				29	54		1.6	2	3
10/2	15				29	62		1.5	2	1
10/17	11					68		1.1	3	4



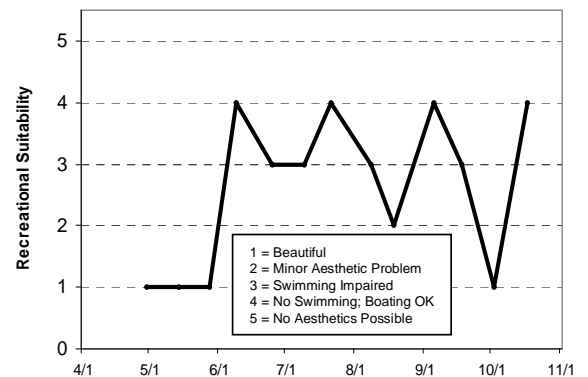
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					
Chlorophyll a					
Secchi Depth					
Lake Grade					

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.

A search through the STORET nationwide database for historic water quality data showed only past CAMP data. The years 2005, 2006, and 2008 are the only known years of available data. The lake was monitored 7 times between late April and mid October. 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.

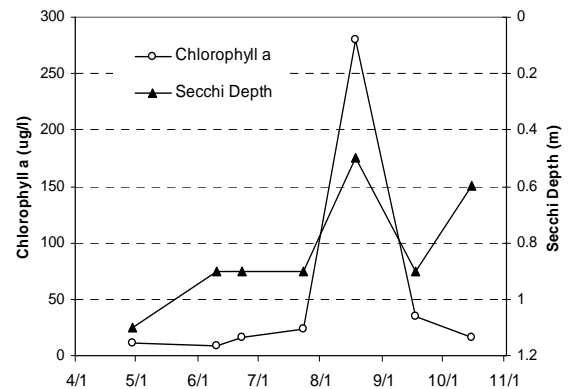
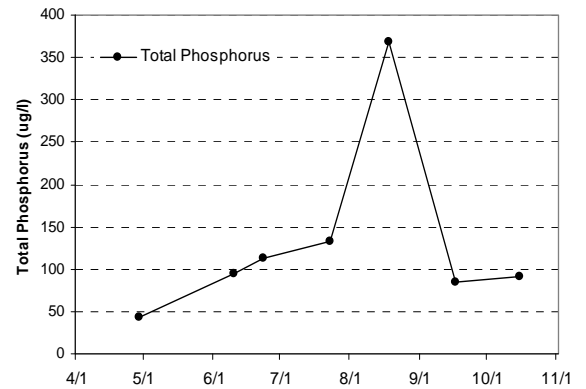
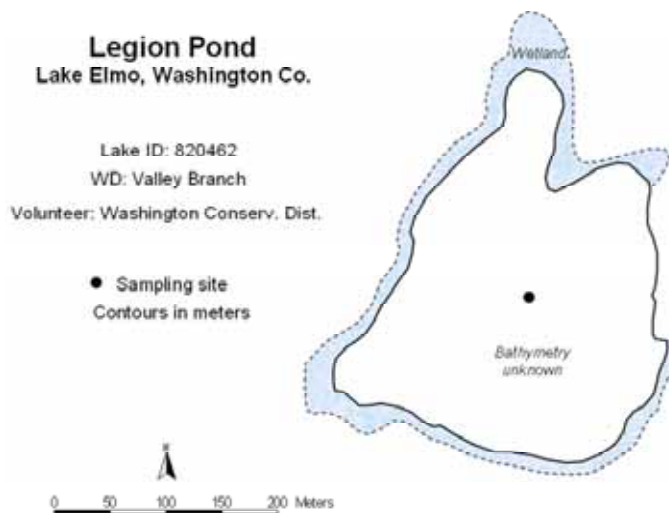
2006 summer (May-September) data summary

Parameter	Mean	Minimum	Maximum	Grade
TP (µg/l)	158.4	85.0	368.0	F
CLA (µg/l)	72.8	8.8	280.0	D
Secchi (m)	0.8	0.5	0.9	D
TKN (mg/l)	2.26	1.30	4.20	
Overall Grade				D

The lake received a lake grade of D for 2008. The TP grade of F and the CLA grade of D are the worst grades for these parameters that the lake received in the three years of CAMP monitoring. It appears that the 2008 water quality was less than that observed in 2005 and 2006. Continued monitoring is suggested to continue to build the water quality database to determine potential trends in the lake's water quality.

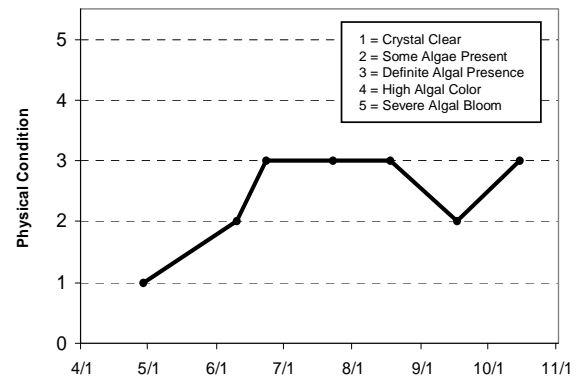
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 2.6 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 3.2 for recreational suitability (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/29	7.1		12.7		11	43		1.1	1	2
6/10	22.6	21.9	7.15	0.97	8.8	94		0.9	2	4
6/23	28.6	25.8	7.35	2.2	16	113		0.9	3	3
7/23	25.6	24.9	3.47	4.3	24	132		0.9	3	2
8/18	25.4	24.9	8.48	0.28	280	368		0.5	3	4
9/17	19.8	19.8	8.9	0.56	35	85		0.9	2	3
10/15	12.8	12.8	8.84	7.8	16	91		0.6	3	4



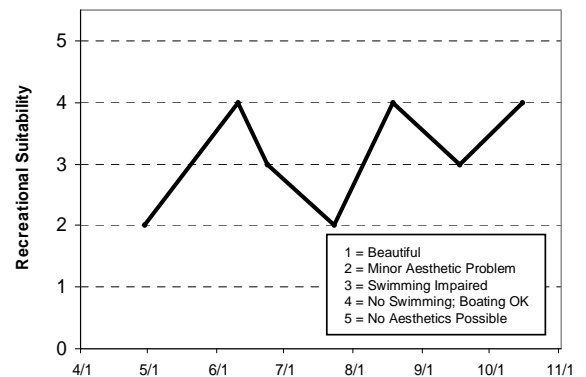
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus	D	D			F
Chlorophyll a	C	C			D
Secchi Depth	D	D			D
Lake Grade	D	D			D

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), which gives it a volume of 173 acre-feet. The maximum depth is 4.0 m (13 ft).

A search through the STORET nationwide water quality database provided Secchi transparency data for sporadic dates in 1998, 2000-2003, and 2005-2007. The 2007 CAMP data was also found in the STORET system.

The lake was monitored 11 times between mid May and early October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	31.1	26.0	40.0	B
CLA (µg/l)	7.0	2.2	15.0	A
Secchi (m)	1.8	1.0	2.3	C
TKN (mg/l)	1.54	1.20	1.90	
Lake Grade				B

The lake received a lake grade of B for 2008, which is an improvement over last year's C lake grade. All three water quality parameters received one letter grade better for 2008 than for 2007. Continued monitoring is suggested to continue to build the historical database for determining water quality trends.

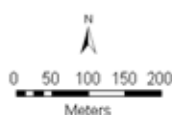
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 2.0 for physical condition ("some algae present"), and 3.5 for recreational suitability (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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.

LeMay Lake Mendota Heights, Dakota Co.

Lake ID: 190082
WMO: Gun Club Lake
Volunteer: City of Mendota Heights

● Sampling site
Contours in meters



2008 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(°C)	(°C)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
5/15	19.4				2.6	26		2	1	1
5/22	20.4				4.4	34		2.1	2	3
6/9	23				5.3	35		2	1	3
6/27	26.7				2.2	27		2.3	1	4
7/10	25.8				4.3	26		2.3	1	4
7/18	29.3				4.7	28		1.9	2	4
8/8	26.8				6.2	27		1.5	2	4
8/29	24.3				15	35		1.3	3	4
9/12	21.1				14	40		1	4	4
9/19	21.8				11	33		1.1	3	4
10/3	17.4				13	49		0.8	4	3

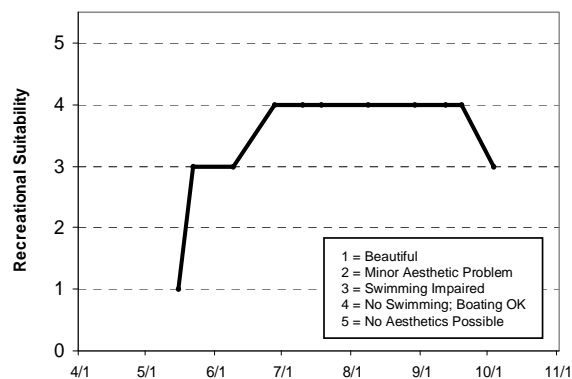
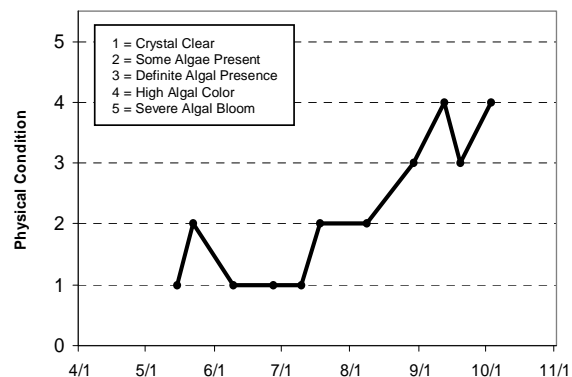
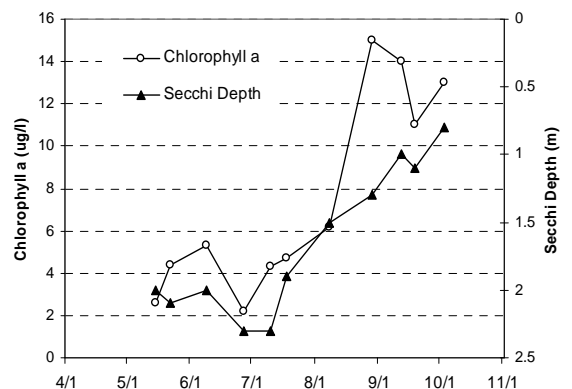
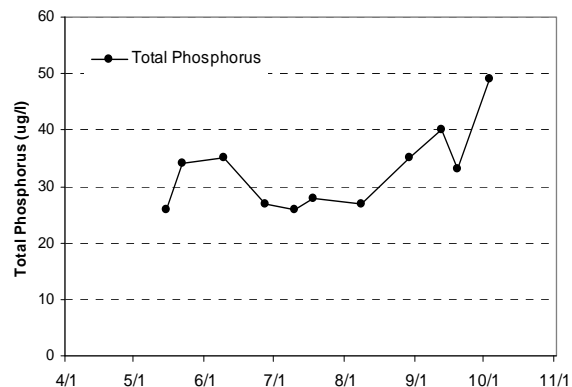
Lake Water Quality Grades Based on Summertime Averages

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

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.

A search for water quality data through STORET files resulted in a moderate amount of data. While 1995-2007 are the only years for which nutrient data are available, Secchi transparencies were collected through the MPCA's Citizen Lake Monitoring Program in 1985, and 1987-1992.

Lily Lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

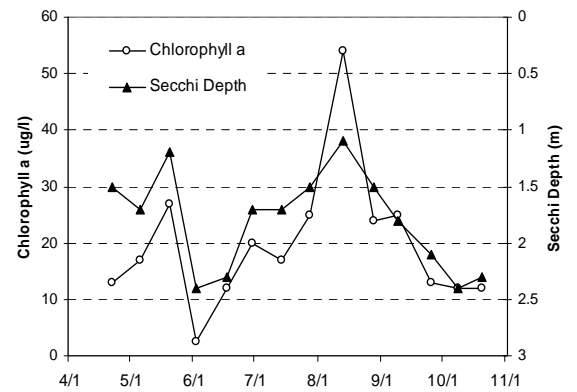
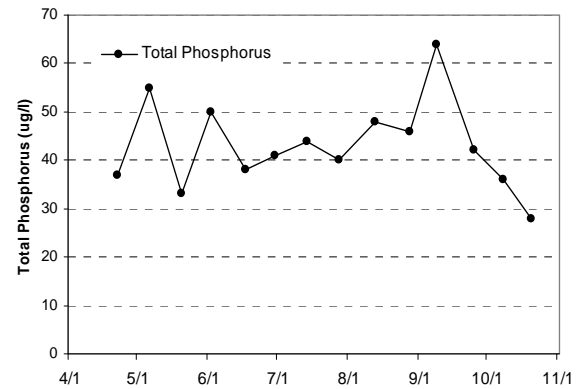
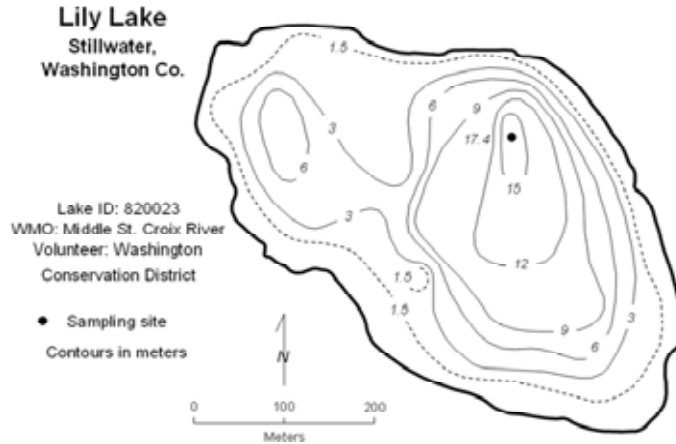
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	45.5	33.0	64.0	C
CLA (µg/l)	21.5	2.6	54.0	C
Secchi (m)	1.7	1.1	2.4	C
TKN (mg/l)	1.85	1.60	2.20	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to the lake grades it has received in previous years. 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 water clarity grades. But the historical TP grades have been a constant C grade for the past 14 years. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 2.6 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 2.9 for recreational suitability (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

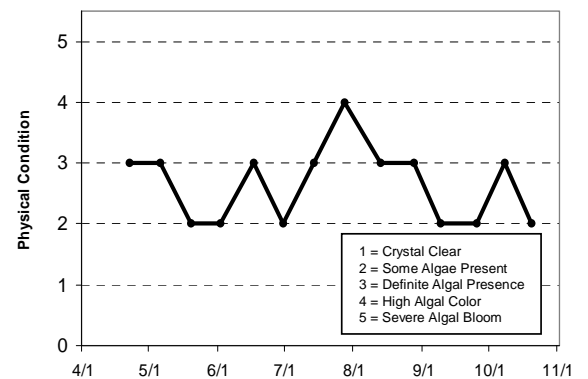
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 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	7.2	3.3	11.48	2.43	13	37		1.5	3	3
5/6	13.8	3.4	11.73	1.41	17	55		1.7	3	4
5/20	15.5	3.5	11.41	0.27	27	33	201	1.2	2	3
6/2	20.6	3.6	6.82	0.18	2.6	50	204	2.4	2	3
6/17	21.1	3.7	8.36	0.24	12	38	334	2.3	3	2
6/30	24	3.8	8.63	0.81	20	41	396	1.7	2	3
7/14	24.3	3.8	7.35	0.52	17	44	375	1.7	3	3
7/28	26.4	3.9	9.4	0.42	25	40	422	1.5	4	3
8/13	24.9	4.1	7.82	0.34	54	48	733	1.1	3	3
8/28	22.5	4.1	4.65	0.22	24	46	891	1.5	3	2
9/9	20	4.1	6.47	0.26	25	64	821	1.8	2	3
9/25	19.7	4.3	6.65	0.26	13	42	844	2.1	2	3
10/8	15.7	4.3	6.75	0.28	12	36	838	2.4	3	3
10/20	13	4.5	7.15	0.37	12	28	805	2.3	2	3



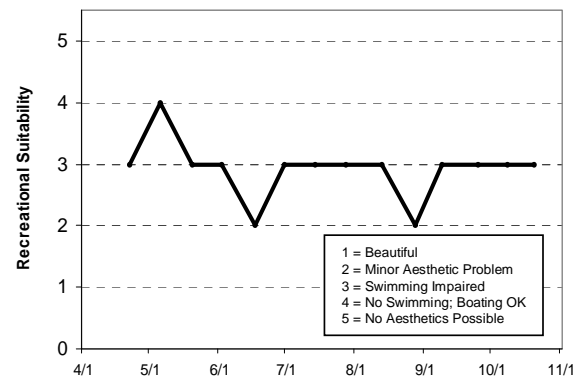
Lake Water Quality Grades Based on Summertime Averages

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				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	B	C	C
Lake Grade				B	C	C	C	C	C	B	C	C

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

Source: Metropolitan Council and STORET data



Linwood Lake (2-0026) Anoka County Parks

Linwood Lake is located in Linwood Township (Anoka County). The lake is considered a “Priority Lake” by the Metropolitan Council because of its high regional recreation value. The lake has a surface area of 559 acres, and a maximum depth of 13 m (42 feet). Approximately 85 percent of the surface area of the lake is considered littoral zone, which is the 0-15 feet depth zone of the lake where the majority of aquatic plants are located.

The year 2008 was the first year the lake was monitored via the CAMP. A search for water quality data through STORET files resulted in an appreciable amount of data. Metropolitan Council staff monitored the lake occasionally in the 1980s and 1990s. Additional data were collected by the MPCA’s volunteer lake monitoring program and Anoka County.

The lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

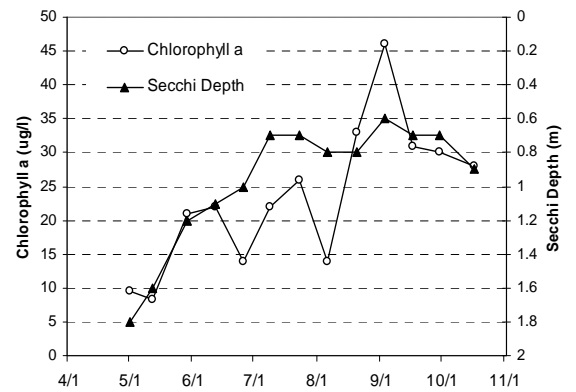
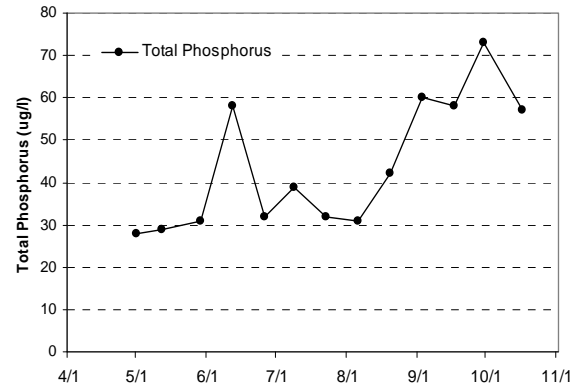
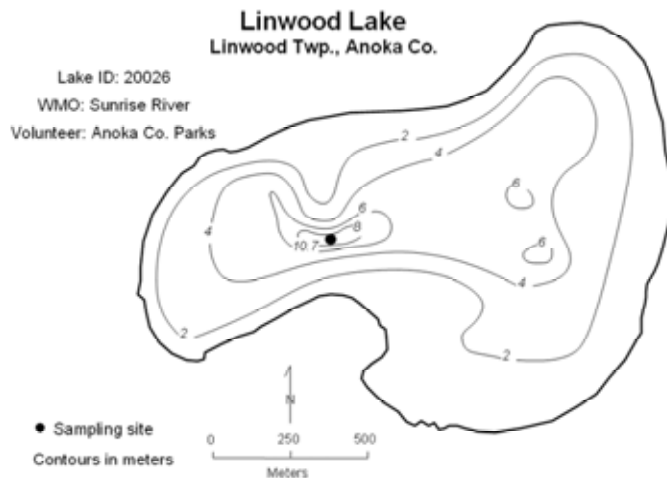
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	42.8	28.0	73.0	C
CLA (µg/l)	23.1	8.3	46.0	C
Secchi (m)	1.0	0.6	1.8	D
TKN (mg/l)	1.40	0.78	2.40	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to the lake grades it has received in previous years. On the basis of the historical water quality database, the lake appears represented by a lake grade of C. Similarly, the historical TP grades have been a C grade since 1983. However, there appears to be more variation in the historical water clarity grades as it has been a C or D for a given year. A trend analysis conducted by the MPCA on the lake’s Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

The volunteer’s perceptions of the physical and recreational conditions of the lake are shown on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 2.7 for physical condition (between 2- “some algae present” and 3- “definite algae present”), and 1.9 for recreational suitability (between 1- “beautiful” and 2- “minor aesthetic problem”).

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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/1	8.5				9.5	28		1.8	2	
5/12	12.9				8.3	29		1.6	2	
5/29	17.3				21	31		1.2	2	1
6/12	19.8				22	58		1.1	3	2
6/26	26.2				14	32		1	2	1
7/9	25.2				22	39		0.7	2	2
7/23	26.4				26	32		0.7	4	3
8/6	26.1				14	31		0.8	2	2
8/20	25.5				33	42		0.8	3	2
9/3	21.4				46	60		0.6	3	
9/17	17.5				31	58		0.7	3	
9/30	16.3				30	73		0.7	4	
10/17	11.7				28	57		0.9	3	

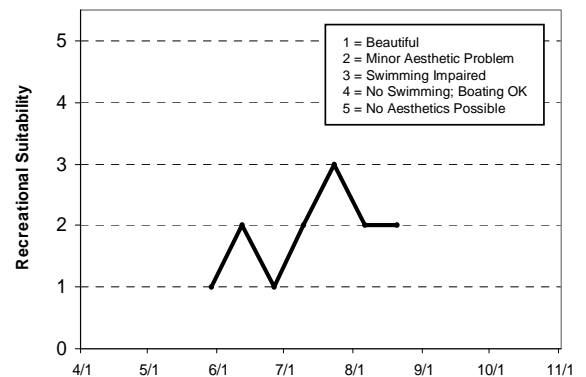
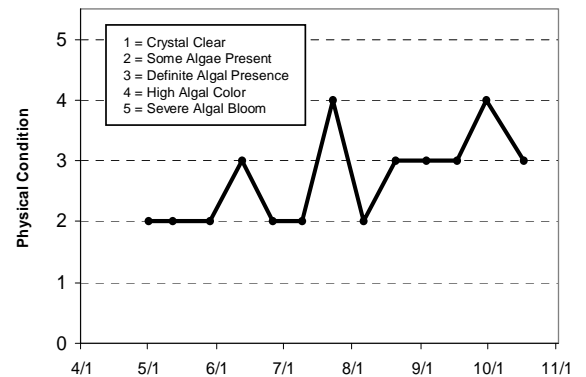
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Little Carnelian Lake (82-0014) *Carnelian - Marine 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. The lake has a surface area of 162 acres, and has a shoreline length of 1.7 miles. It has a mean and maximum depth of 10.7 m (35 feet) and 21.3 m (70 feet), respectively. The mean depth of the lake and its surface area translate to an approximate lake volume of 5,686 ac-ft. The lake does not have a public access. The lake's watershed has an area of 565 acres which translates to a watershed-to-lake area ratio of 3.5:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

This was the eighth year of CAMP monitoring in Little Carnelian Lake. A search of the STORET nationwide water quality database for data on the lake revealed a moderate database throughout the 1990's with nutrient data available in 1991-1996 and 1998-2007.

The lake was monitored 7 times between early May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)				
CLA (µg/l)				
Secchi (m)	5.6	2.1	7.9	A
TKN (mg/l)				
<i>Lake Grade</i>				

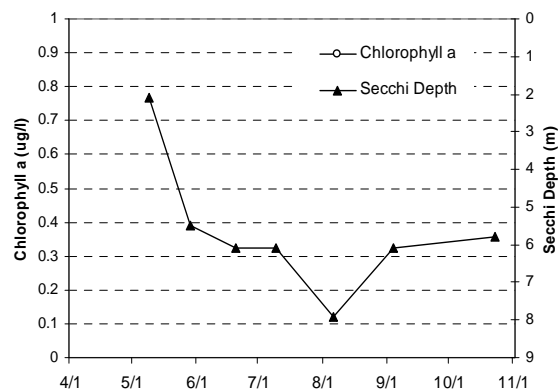
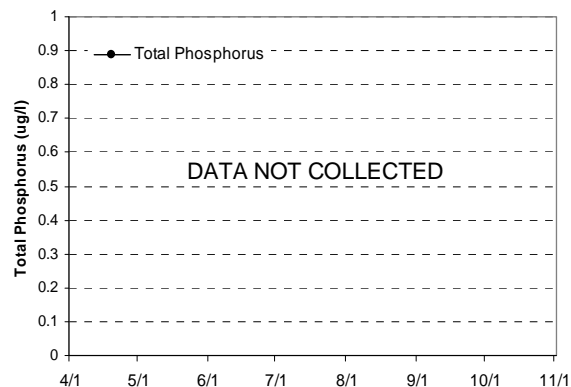
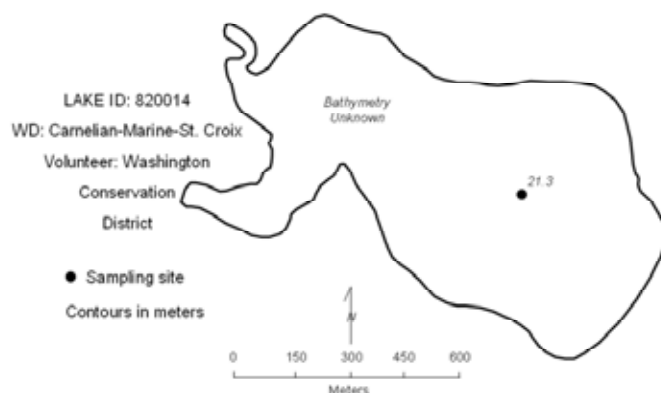
Similar to all past years of CAMP monitoring, the lake received a water clarity grade of A. TP and CLA were not monitored in 2008 so a lake grade cannot be determined. The historical water quality database indicates that the lake's water quality is well represented by a lake grade of A. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

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 2.6 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.9 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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/>.

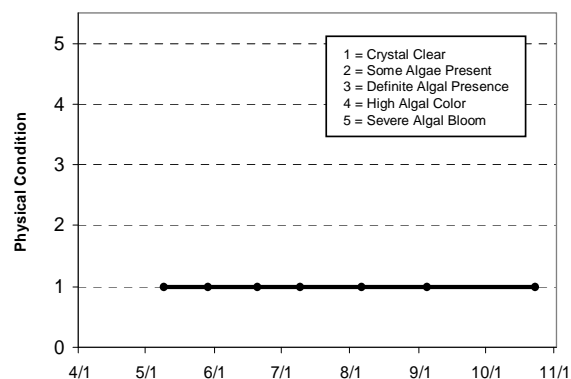
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Little Carnelian Lake Stillwater Twp., Washington Co.



2008 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
5/9	12.2	5.4	12.55	0.66				2.1	1	1
5/29	16.6	5.7	9.57	0.26				5.5	1	1
6/20	21.9	6	8.81	0.2				6.1	1	1
7/9	24.8	6.1	7.91	0.37				6.1	1	1
8/6	26	6.3	7.26	0.24				7.9	1	1
9/4	22.5	6.3	7.37	0.19				6.1	1	1
10/23	12.7	6.9	8.87	0.41				5.8	1	1



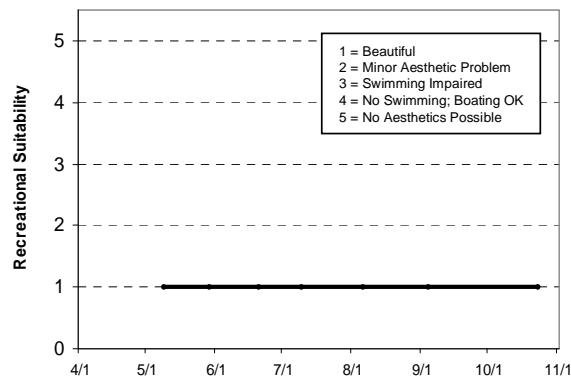
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade	A				A	A			A	A	A	A

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

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). Approximately 44 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 thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

This was the third year that Little Comfort Lake has been involved in CAMP. A search through the STORET nationwide water quality database for data on the lake provided additional data for 1994.

The lake was monitored 12 times between early May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	35.0	20.0	101.0	C
CLA (µg/l)	11.1	6.0	15.0	B
Secchi (m)	1.7	1.3	2.0	C
TKN (mg/l)	1.04	0.64	1.90	
Lake Grade				C

The lake received a lake grade of C for 2008. It also received C grades in 1994 and 2006.

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 2.0 ("some algae present"). The average recreational suitability ranking was 1.9 (between 1- "beautiful" and 2- "minor aesthetic problem").

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.

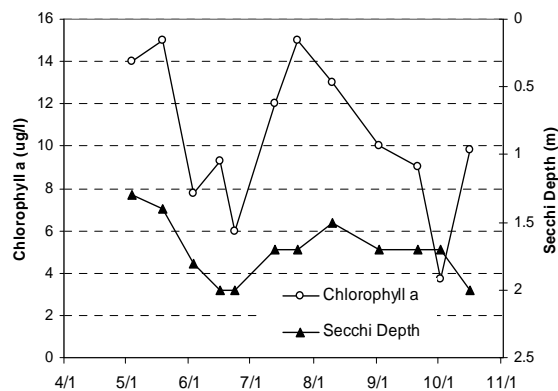
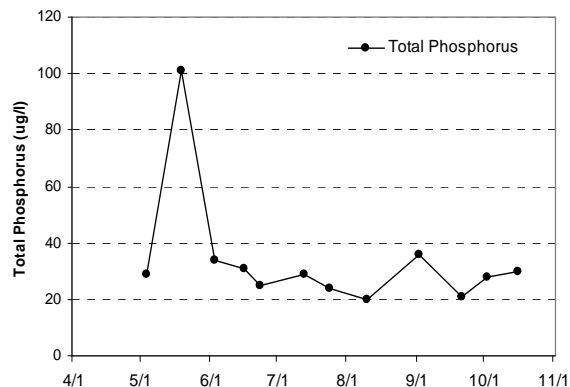
Little Comfort Lake Wyoming Twp., Chisago Co.

LAKE ID: 130054

WMO: Comfort Lake -
Forest Lake
Volunteer: Steve
Schreiber

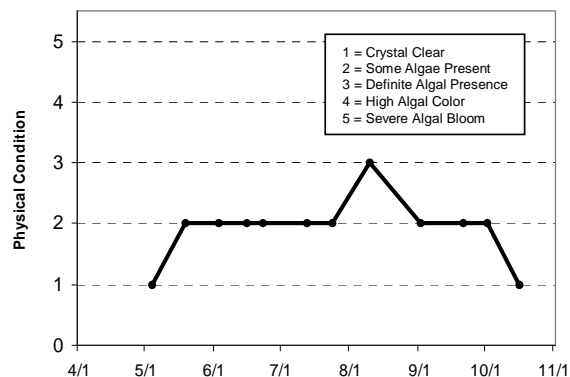
● Sampling site

Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/4	9.1				14	29		1.3	1	1
5/19	9.8				15	101		1.4	2	1
6/3	18.9				7.8	34		1.8	2	2
6/16	21.6				9.3	31		2	2	2
6/23	22.4				6	25		2	2	2
7/13	26.8				12	29		1.7	2	2
7/24	27.7				15	24		1.7	2	2
8/10	25.6				13	20		1.5	3	2
9/2	19.9				10	36		1.7	2	3
9/21	17.8				9	21		1.7	2	2
10/2	16.3				3.7	28		1.7	2	2
10/16	13.2				9.8	30		2	1	1



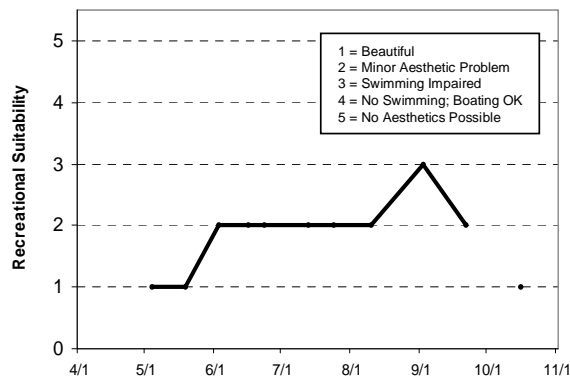
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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). The littoral area is approximately 67 percent of the surface area. The littoral area overlies the 0-15 feet depth zone, and it is the location of the majority of the lake's aquatic plants.

A search through the STORET nationwide water quality database for historical data revealed just the historical CAMP data.

The lake was monitored 14 times from mid April to mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	44.6	24.0	78.0	C
CLA (µg/l)	13.2	4.1	32.0	B
Secchi (m)	1.5	0.7	2.3	C
TKN (mg/l)	1.71	0.76	3.00	
Lake Grade				C

The lake received a lake grade of C for 2008, 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.

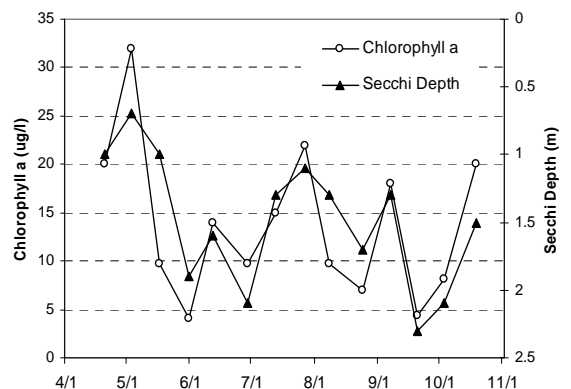
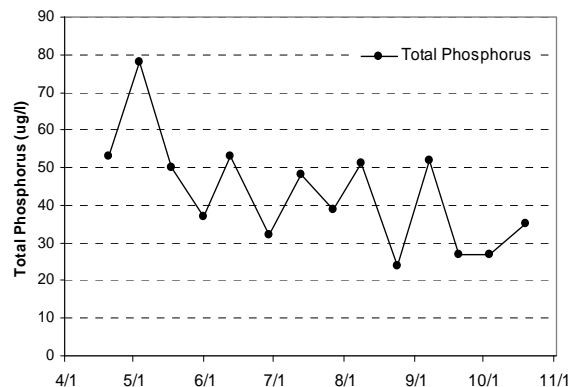
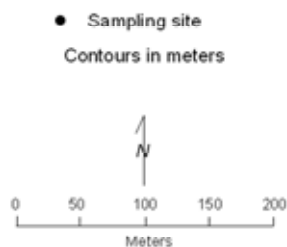
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.3 (2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.6 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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.

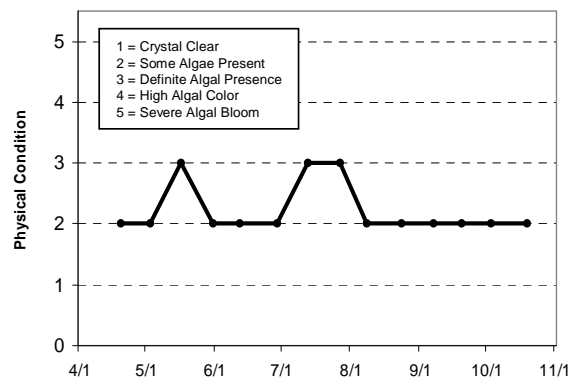
Little Johanna Lake Arden Hills/Roseville, Ramsey Co.

Lake ID: 620058
WD: Rice Creek
Volunteer: Fred Fox



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/20	12.1				20	53		1	2	2
5/3	10.6				32	78		0.7	2	2
5/17	19.2				9.8	50		1	3	3
5/31	18.1				4.1	37		1.9	2	2
6/12	22				14	53		1.6	2	3
6/29	25.1				9.8	32		2.1	2	3
7/13	24.5				15	48		1.3	3	3
7/27	26.1				22	39		1.1	3	3
8/8	26.1				9.7	51		1.3	2	3
8/24	24.9				6.9	24		1.7	2	3
9/7	20.1				18	52		1.3	2	2
9/20	22.3				4.4	27		2.3	2	2
10/3	16.8				8.1	27		2.1	2	2
10/19	12.6				20	35		1.5	2	2



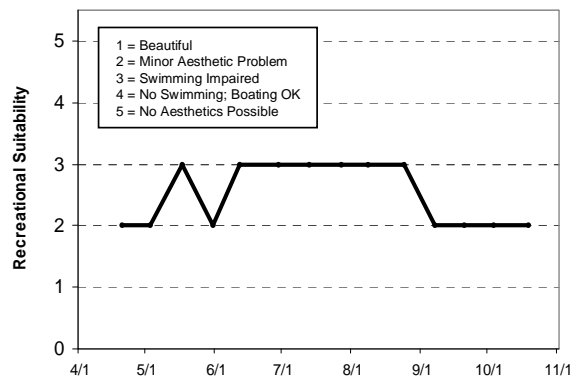
Lake Water Quality Grades Based on Summertime Averages

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

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.

A search for historical water quality data via STORET, the nationwide water quality database, provided the historical CAMP data only. The lake was monitored 11 times between mid April and mid October. 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.

2008 summer (May-September) data summary

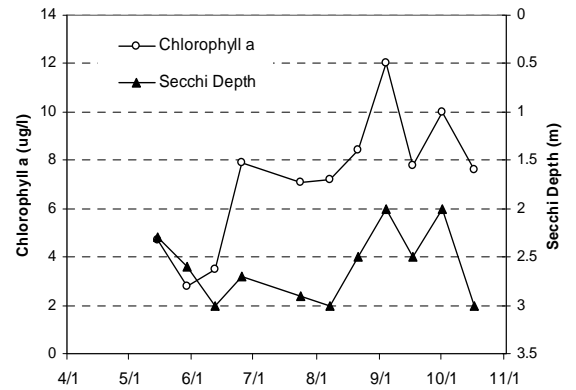
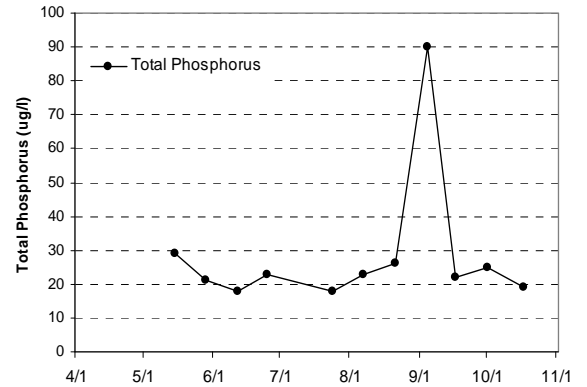
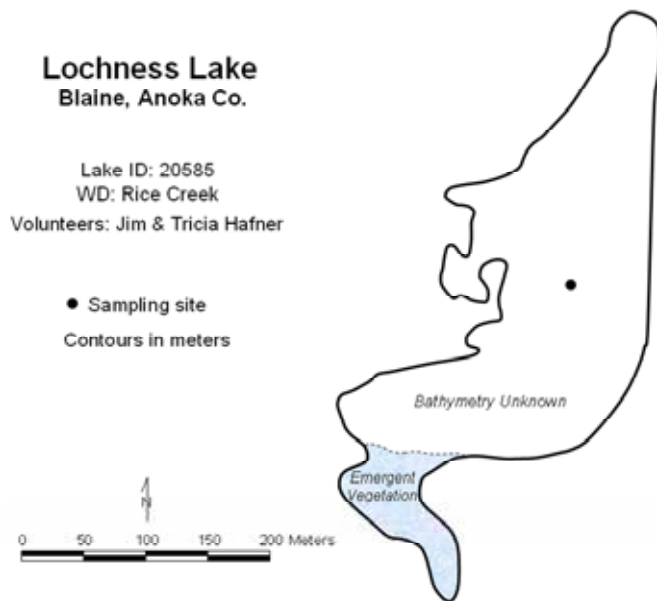
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	30.0	18.0	90.0	B
CLA (µg/l)	6.8	2.8	12.0	A
Secchi (m)	2.6	2.0	3.0	B
TKN (mg/l)	1.61	1.20	1.90	
Lake Grade				B

The lake received a lake grade of B for 2008, which is a reduction in water quality compared to last year's lake grade of A. Continued monitoring is suggested to build a historical water quality database for determining 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 is ranked on a scale of 1 to 5. The average physical condition ranking was 2.3 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 4.0 ("no swimming/boating ok").

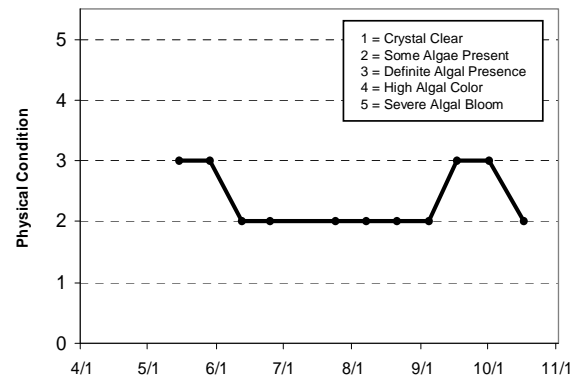
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake in 2005. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 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
5/15	15.8				4.7	29		2.3	3	4
5/29	18.3				2.8	21		2.6	3	4
6/12	19.6				3.5	18		3	2	4
6/25	24.6				7.9	23		2.7	2	4
7/24	25.9				7.1	18		2.9	2	4
8/7	25.7				7.2	23		3	2	4
8/21	25.9				8.4	26		2.5	2	4
9/4	21.6				12	90		2	2	4
9/17	18.7				7.8	22		2.5	3	4
10/1	17.1				10	25		2	3	4
10/17	12.7				7.6	19		3	2	4



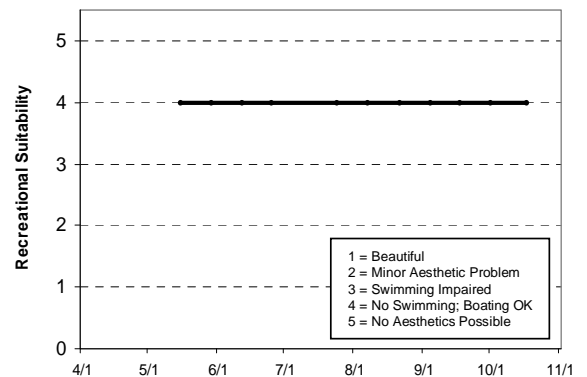
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus				A	B
Chlorophyll a				A	A
Secchi Depth				B	B
Lake Grade				A	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). There are no other known morphological data available for the lake. Because the lake is relatively shallow, it does not develop and maintain a thermocline, which is a density gradient owed to changing water temperatures throughout the water column. The entire lake is considered littoral zone, which is the shallow (0-15 feet) zone dominated by aquatic plants.

The lake was monitored 14 times from mid April to mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	260.4	82.0	492.0	F
CLA (µg/l)	211.2	23.0	520.0	F
Secchi (m)	0.4	0.2	0.7	F
TKN (mg/l)	4.12	1.20	7.10	
Lake Grade				F

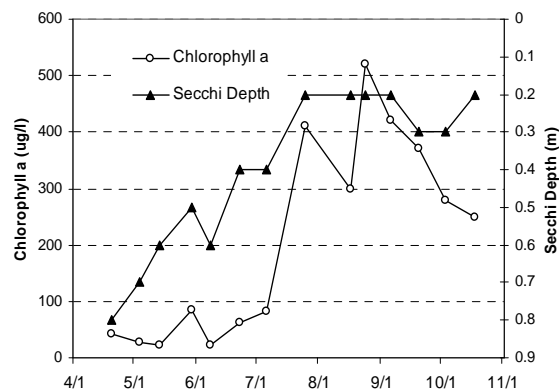
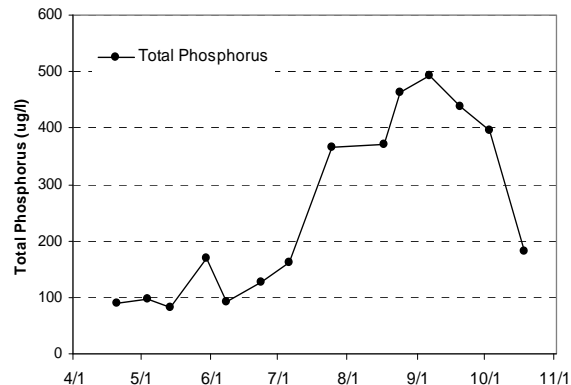
The lake received a lake grade of F for 2008, which is similar to those recorded in 2002-2007, and worse than the lake grade of D recorded in 1997. On the basis of the lake's historical water quality database, the water quality of the lake appears represented by a lake grade of F.

Throughout the course of the study, the volunteers ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. These user perception rankings are shown on the lake's information sheet on the following page. The mean physical condition ranking was 2.9 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability was 3.8 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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.

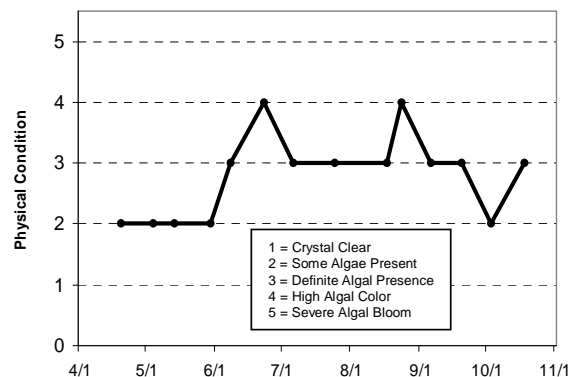
Long Lake Apple Valley, Dakota Co.

Lake ID: 190022
WMO: Dakota County
Volunteers: Christy McGlocklin & Al Kettlekamp



2008 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	9.2				42	90		0.8	2	4
5/4	13.9				28	98		0.7	2	2
5/14	17.8				23	82		0.6	2	
5/30	20.2				84	170		0.5	2	2
6/8	22.4				23	93		0.6	3	4
6/23	28				63	127		0.4	4	5
7/6	30.5				82	162		0.4	3	5
7/25	27.2				410	367		0.2	3	4
8/17	26.2				300	372		0.2	3	4
8/24	24				520	464		0.2	4	4
9/6	18.7				420	492		0.2	3	4
9/20	21.5				370	437		0.3	3	4
10/3	17				280	396		0.3	2	4
10/18	11.4				250	182		0.2	3	4



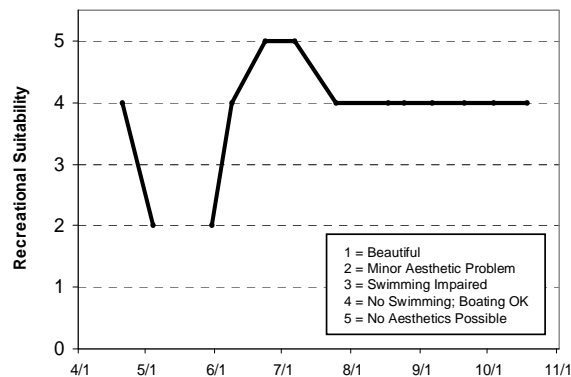
Lake Water Quality Grades Based on Summertime Averages

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						D					F	F
Chlorophyll a						D					F	F
Secchi Depth						F					F	F
Lake Grade						D					F	F

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

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). 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. 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*).

A search through the STORET nationwide water quality database for historic data on the lake revealed just the historical CAMP data.

The lake was monitored 10 times between mid April and mid September. 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.

2008 summer (May-September) data summary

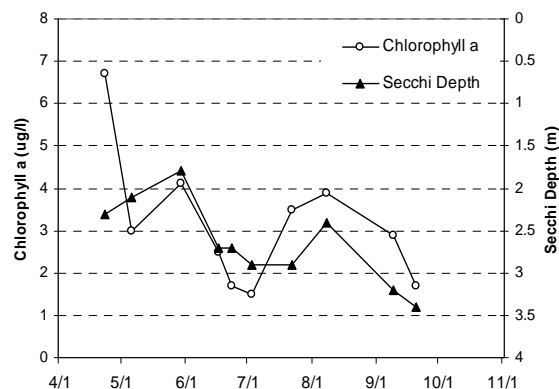
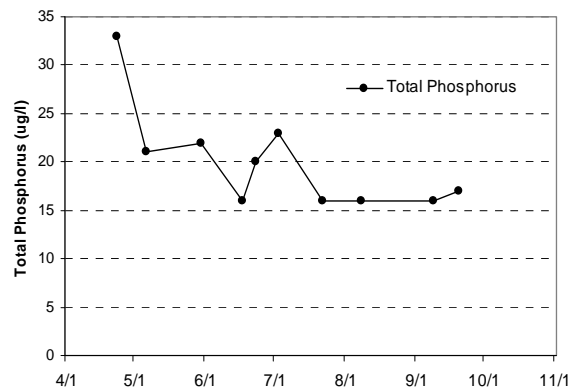
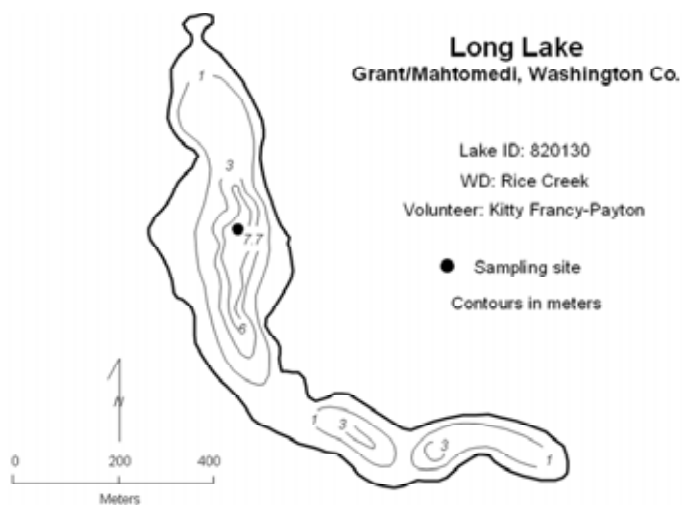
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	18.6	16.0	23.0	A
CLA (µg/l)	2.8	1.5	4.1	A
Secchi (m)	2.7	1.8	3.4	B
TKN (mg/l)	0.58	0.31	0.73	
Lake Grade				A

The lake received a lake grade of A for 2008, which is similar to the lake grade received in 2004, and it is an improvement over lake grades of the past 3 years. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). To better understand the lake's water quality and where it may be heading, additional years of data collection are needed to continue to build the water quality database.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions is ranked on a scale of 1 to 5. The average physical condition ranking was 2.2 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.4 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

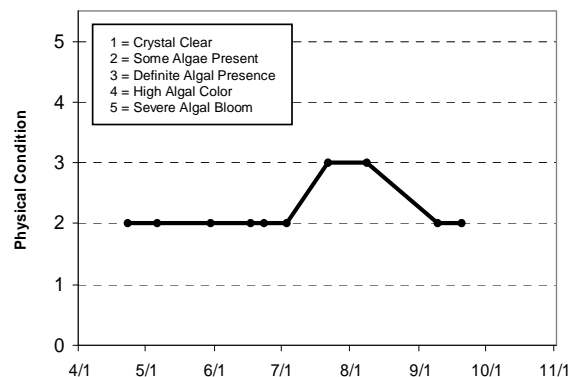
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake in 2005. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/23	9.2				6.7	33		2.3	2	2
5/6	14.9				3	21		2.1	2	3
5/30	17.2				4.1	22		1.8	2	2
6/17	21.1				2.5	16		2.7	2	2
6/23	23.5				1.7	20		2.7	2	2
7/3	18.2				1.5	23		2.9	2	2
7/22	26.1				3.5	16		2.9	3	3
8/8	25.7				3.9	16		2.4	3	3
9/9	19.3				2.9	16		3.2	2	3
9/20	20.4				1.7	17		3.4	2	2



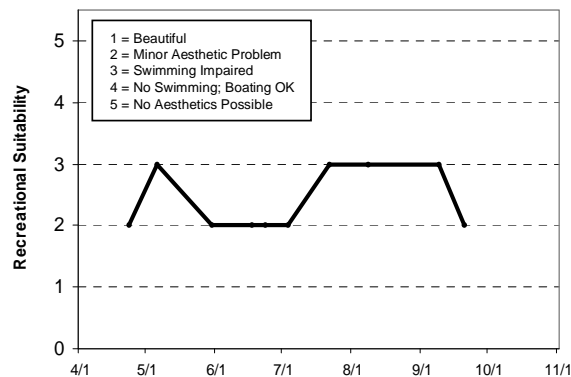
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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
Total Phosphorus	A	C	B	C	A
Chlorophyll a	A	A	A	A	A
Secchi Depth	B	B	B	B	B
Lake Grade	A	B	B	B	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). There is no other morphological data available for the lake. 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.

The lake was sampled 7 times between mid April and early October. 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.

2008 summer (May-September) data summary

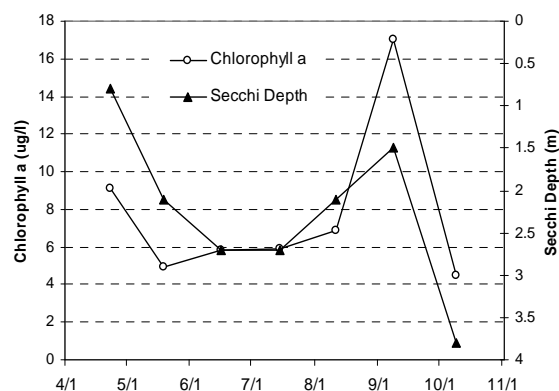
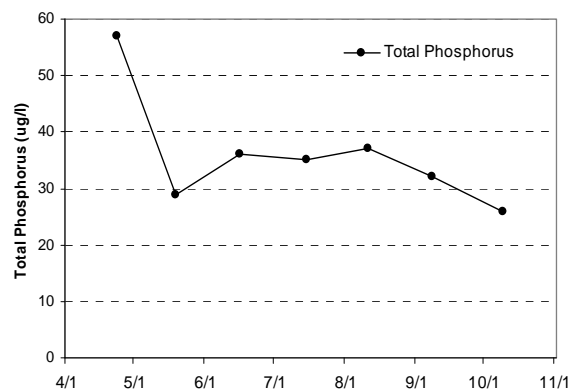
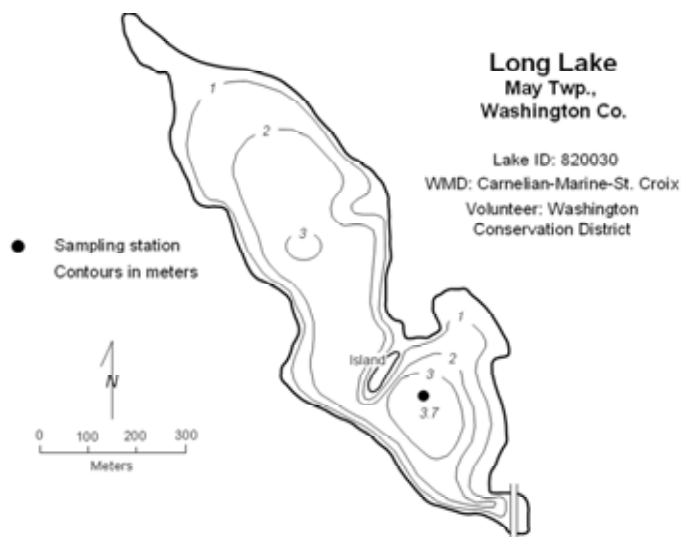
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	33.8	29.0	37.0	C
CLA (µg/l)	8.1	4.9	17.0	A
Secchi (m)	2.2	1.5	2.7	B
TKN (mg/l)	0.91	0.68	1.20	
Lake Grade				B

The lake received a lake grade of B for 2008, 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. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions is ranked on a scale of 1 to 5. The average physical condition ranking was 2.2 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.8 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

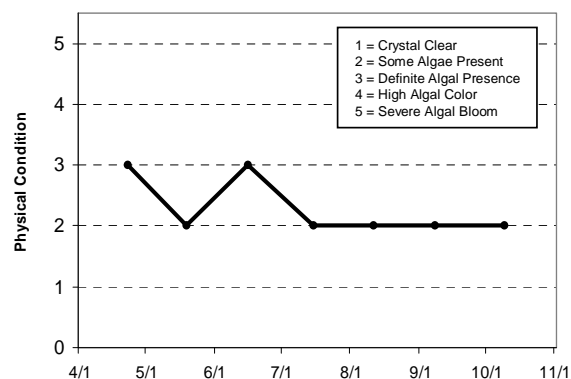
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/23	9.5	7.1	8.81	1.04	9.1	57		0.8	3	3
5/19	16.2	0	8.28	0	4.9	29		2.1	2	3
6/16	21	18.1	8.36	0.38	5.8	36	56	2.7	3	2
7/15	23.7	21.4	7.26	0.23	5.9	35	37	2.7	2	3
8/11	24.7	20.5	5	0.19	6.9	37	158	2.1	2	3
9/8	19.4	18.8	2.2	0.17	17	32	35	1.5	2	3
10/9	13.6	13.6	6.85	0.48	4.5	26	25	3.8	2	2



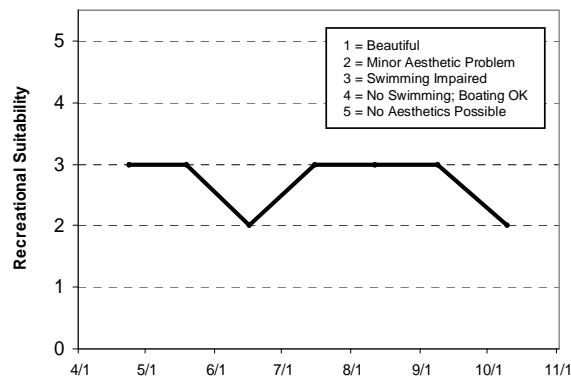
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008
Total Phosphorus	B	C	C	C	C
Chlorophyll a	A	B	A	B	A
Secchi Depth	B	B	B	C	B
Lake Grade	B	B	B	C	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. Approximately 55 percent of the lake's surface area is considered littoral zone which is the 0-15 feet depth zone of aquatic vegetation dominance. The lake's size and mean depth translate into a lake volume of 744 ac-ft. 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*).

The lake has been monitored in the past by Council staff (most recently in 2003). This was the sixth year that the lake has been monitored via the CAMP. A search for water quality data on Long Lake uncovered a very small database. The only other years of water quality data other than CAMP data were 1984, 1993, and 2003.

The lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	24.9	15.0	59.0	B
CLA (µg/l)	8.2	3.2	14.0	A
Secchi (m)	2.7	1.7	3.5	B
TKN (mg/l)	1.17	0.51	1.80	
Lake Grade				B

The lake received a lake grade of B for 2008. The annual lake grades appear to vary between B and C. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions is ranked on a scale of 1 to 5. The average physical condition ranking was 2.6 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.8 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

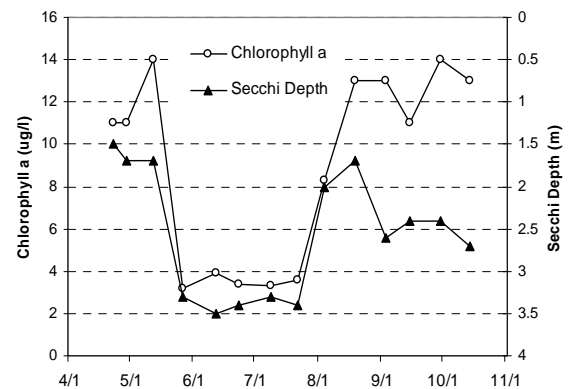
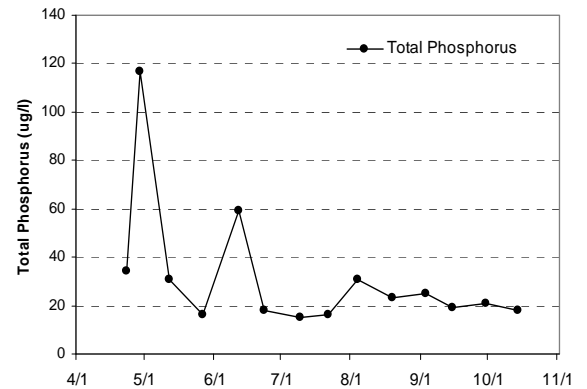
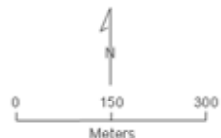
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Long Lake Pine Springs, Washington Co.

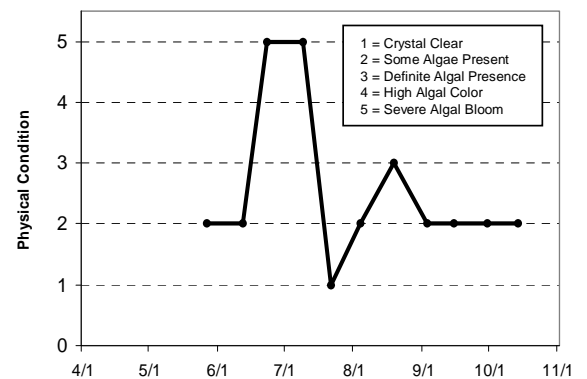
Lake ID: 820118
WD: Valley Branch
Volunteer: Bill Feely

● Sampling station
Contours in meters



2008 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
4/23	9.1				11	34		1.5		
4/29	8.4				11	117		1.7		
5/12	12.8				14	31		1.7		
5/27	17.7				3.2	16		3.3	2	2
6/12	20.4				3.9	59		3.5	2	3
6/23	25.1				3.4	18		3.4	5	4
7/9	24.7				3.3	15		3.3	5	4
7/22	25.6				3.6	16		3.4	1	2
8/4	26.8				8.3	31		2	2	3
8/19	25.3				13	23		1.7	3	3
9/3	22.5				13	25		2.6	2	3
9/15	20				11	19		2.4	2	2
9/30	18				14	21		2.4	2	2
10/14	14.7				13	18		2.7	2	1



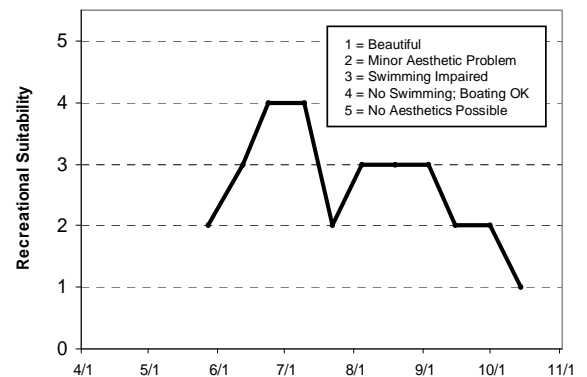
Lake Water Quality Grades Based on Summertime Averages

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

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

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

This was the eleventh year that Long Lake has been involved in CAMP (1995-1996 and 1998-2008). Additionally, Secchi transparencies collected through the MPCA's Citizen Lake Monitoring Program are available for 1987, 1989, and 1991-1994.

The lake was monitored 14 times from mid April to mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	51.5	37.0	64.0	C
CLA (µg/l)	19.1	6.8	47.0	B
Secchi (m)	1.6	0.9	2.7	C
TKN (mg/l)	1.98	1.60	2.50	
Lake Grade				C

The lake received a lake grade of C for 2008. 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 2008 was the first year that the lake received a B grade for CLA. This year's lake grade of C continues the improving trend since 2004. However, a recent MPCA conducted trend analysis on the lake's Secchi transparency data, revealed no statistically significant trends in recent water clarity (MPCA 2008).

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions is ranked on a scale of 1 to 5. The average physical condition ranking was 3.0 ("definite algae present"). The average recreational suitability ranking was 3.7 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

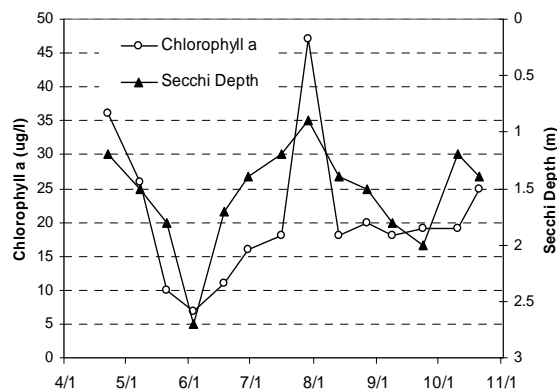
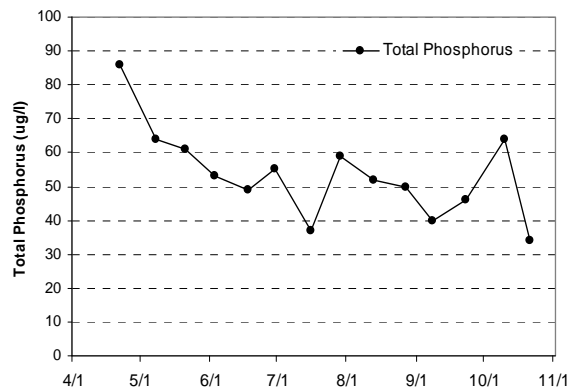
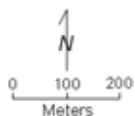
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Long Lake, Stillwater, Washington Co.

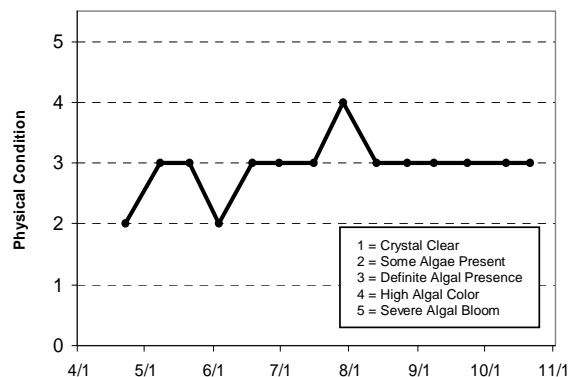
Lake ID: 820021
WD: Browns Creek
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 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	13.1	4.5	15	2.46	36	86		1.2	2	3
5/8	14.9	4.9	9.87	0.69	26	64		1.5	3	3
5/21	17.1	5.3	8.18	0.29	10	61		1.8	3	3
6/3	19.7	5.8	7.58	0.19	6.8	53		2.7	2	3
6/18	23.2	6.7	9.41	0.3	11	49		1.7	3	4
6/30	24.4	7.1	9.37	0.95	16	55		1.4	3	4
7/16	25.9	7.8	9.04	0.55	18	37		1.2	3	4
7/29	29.1	9.4	11.48	0.31	47	59		0.9	4	4
8/13	26.1	11.3	7.41	0.53	18	52		1.4	3	4
8/27	23.2	9.3	7.88	0.23	20	50		1.5	3	4
9/8	20.4	10.5	7.6	0.26	18	40		1.8	3	4
9/23	20.9	14.7	8.25	0.22	19	46		2	3	4
10/10	14.3	13.7	4.25	0.25	19	64		1.2	3	4
10/21	12.4	11.7	9.35	0.25	25	34		1.4	3	3



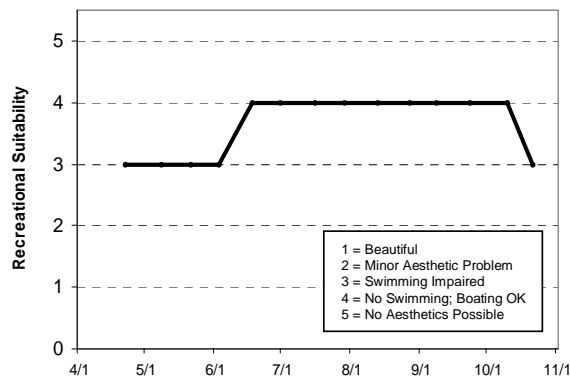
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
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	F	D	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
Lake Grade				D	D		F	F	F	F	D	D

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

Source: Metropolitan Council and STORET data



Long Lake [Washington Co.] (82-0068) *Carnelian - Marine 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 lake's surface area and mean depth translates to an approximate volume of 126 ac-ft. Because of the shallowness of the lake, the entire surface area is considered littoral zone, which is the area where the majority of the lake's aquatic plants are located. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The majority of the landuse within the lake's 381-acre watershed is undeveloped. The watershed-to-lake area ratio is 11:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

A search through the STORET nationwide water quality database revealed data for 1998-1999 and the historical CAMP data. The lake was monitored 8 times between early May and early October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	35.7	28.0	43.0	C
CLA (µg/l)	4.9	3.5	6.3	A
Secchi (m)	2.2	1.8	2.4	C
TKN (mg/l)	0.90	0.78	1.20	
Lake Grade				B

The lake received a lake grade of B for 2008, which is the best lake grade the lake has received in all the know years of monitoring for this lake. The lake received F lake grades in the late 1990s and early 2000s. The water quality of the lake has steadily improved since then, especially with respect to water clarity and CLA concentrations. Continued monitoring is suggested to determine if this trend continues.

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 2.1 (2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.6 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

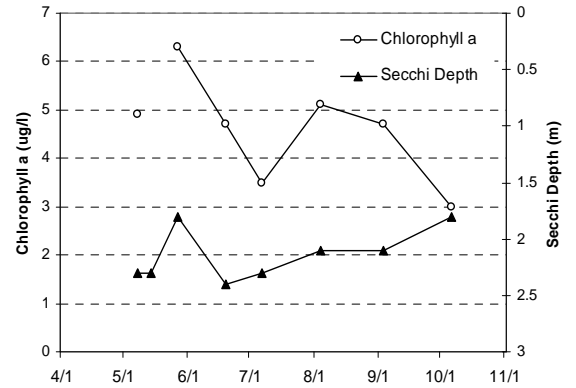
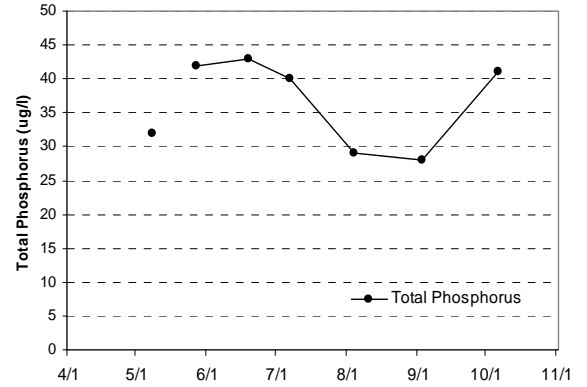
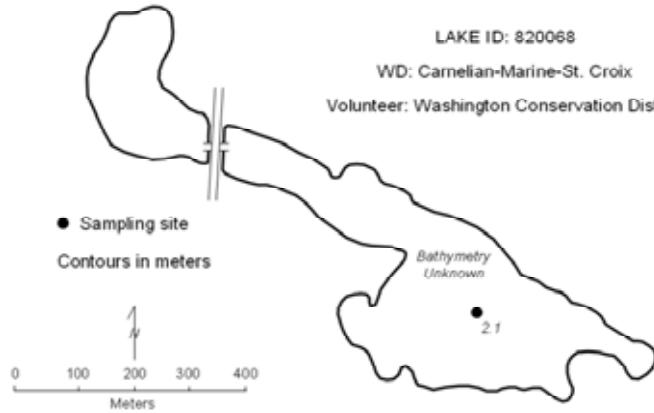
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Long Lake Scandia, Washington Co.

LAKE ID: 820068

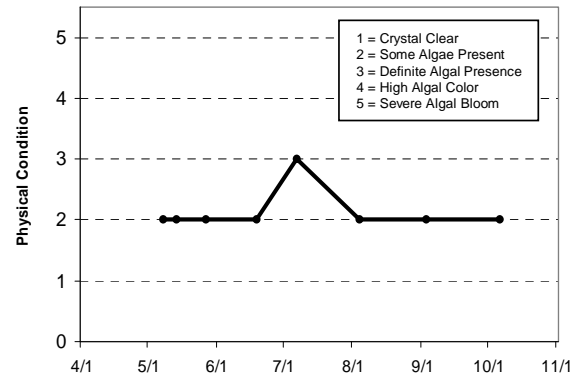
WD: Carnelian-Marine-St. Croix

Volunteer: Washington Conservation District



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/8	15.4	13.3	9.4	7.28	4.9	32		2.3	2	2
5/14	14.6							2.3	2	3
5/27	17	16.8	7.17	0.21	6.3	42		1.8	2	3
6/19	23.9	21.7	8.67	0.67	4.7	43		2.4	2	3
7/7	26.4	25.5	7.28	4.87	3.5	40		2.3	3	2
8/4	26.2	24.9	5.93	0.18	5.1	29		2.1	2	3
9/3	21.9	22	6.52	5.62	4.7	28		2.1	2	2
10/6	13.1	13.2	11.27	10.42	3	41		1.8	2	2



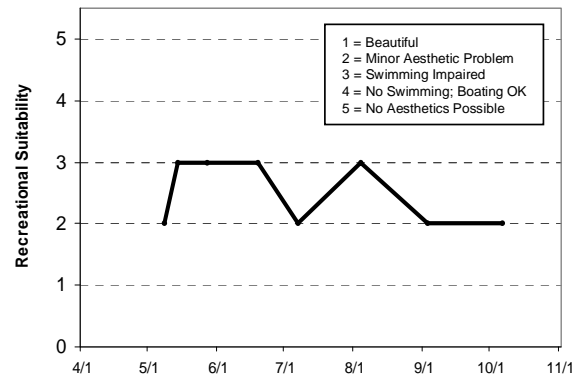
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade							F	F	F	D	C	F

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

Source: Metropolitan Council and STORET data



Loon Lake (82-0015-02) *Carnelian - Marine 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 mean depth of the lake and its surface area translate to an approximate lake volume of 206 ac-ft. Because of the shallowness of the lake, the majority of its 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. The lake's 407-acre watershed translates to a 6.4:1 watershed-to-lake size ratio. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 14 times between late April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	149.0	48.0	206.0	D
CLA (µg/l)	137.5	37.0	300.0	F
Secchi (m)	0.4	0.2	0.8	F
TKN (mg/l)	4.42	1.30	6.10	
Lake Grade				F

The lake received a lake grade of F for 2008, 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.

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 3.9 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.1 (between 4- "no swimming/boating ok" and 5- "no aesthetics possible").

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.

Loon Lake Stillwater Twp., Washington Co.

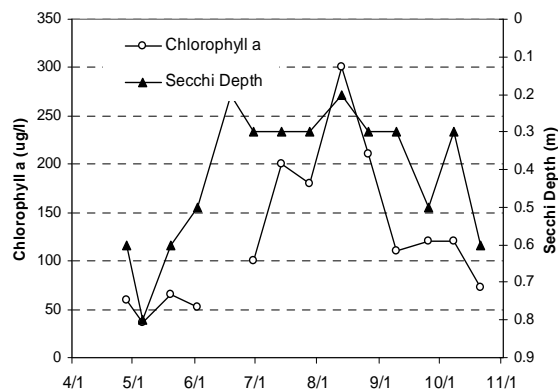
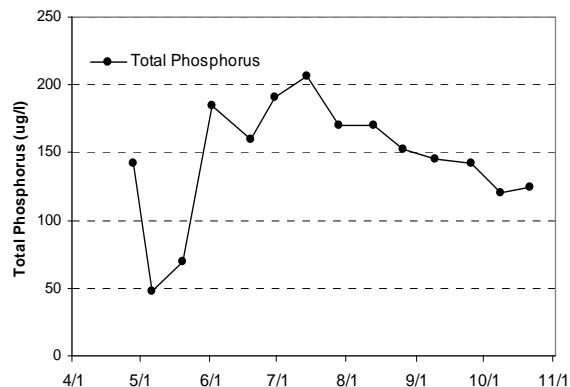
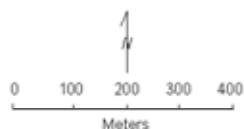
LAKE ID: 820015-02

WD: Carleton-Marine-St. Croix

Volunteer: Washington Conservation District

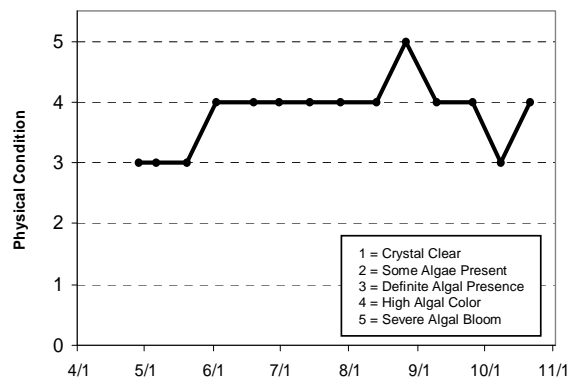
● Sampling site

Contours in meters



2008 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	8.7	8.7	11.1	8.78	59	142		0.6	3	3
5/6	14.2	11.3	11.13	0.56	37	48		0.8	3	4
5/20	15.7	14.9	8.81	6.76	65	70	198	0.6	3	4
6/2	20.3	14.1	9.92	0.12	53	185	108	0.5	4	4
6/19	22.2	16.4	9.42	0.16		160	175	0.2	4	4
6/30	23.3	15.9	5.4	0.47	100	191	222	0.3	4	4
7/14	23.5	17.6	7.79	0.32	200	206	200	0.3	4	4
7/28	25.6	19	7.76	0.24	180	170	186	0.3	4	4
8/13	24.4	23	9.79	0.73	300	170	180	0.2	4	4
8/26	22.3	20.7	4.25	0.19	210	152	151	0.3	5	4
9/9	18.9	18.2	5.06	0.18	110	145	134	0.3	4	4
9/25	19.1	19.1	5.53	0.2	120	142	125	0.5	4	5
10/8	14.3	13.8	7.04	0.32	120	120	127	0.3	3	4
10/21	11.1	11	6.9	0.36	72	124	118	0.6	4	4



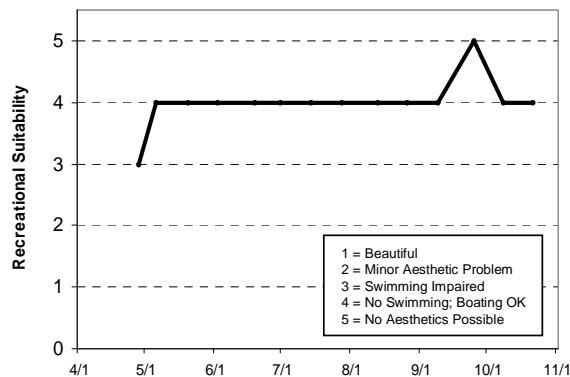
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade					F	F	F	F	D	D	D	F

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

Source: Metropolitan Council and STORET data



Lost Lake (82-0134) City of Mahtomedi

Lost Lake is a small lake located in the City of Mahtomedi (Washington County). There is little known morphological data available for the lake.

This was the third year that this lake has been involved in CAMP. A search through the STORET nationwide water quality database for data on the lake provided no other data other than historical CAMP data.

The lake was monitored 11 times between early May and mid September. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	40.5	20.0	53.0	C
CLA (µg/l)	6.8	1.5	15.0	A
Secchi (m)	1.5	0.9	2.1	C
TKN (mg/l)	1.21	0.60	1.70	
Lake Grade				B

The lake received a lake grade of B for 2008, which is an improvement over the lake grades of the past two years. The main driver of the improved water quality is the relatively lower CLA concentrations observed in 2008. The CLA grade was an A for 2008, which is a two-grade jump above the previous two years' CLA grades.

The region experienced below normal precipitation for 2008, and the lake water level was well below normal. In fact the volunteer had to end monitoring activities in September because of development of mud flats along shore which prevented access to the water. Therefore, a possible explanation for reduction in CLA may be related to the reduction of surface inflows into the lake. Less inflow could cause a reduction in external TP loading, which could limit algae growth via reduction in TP availability. Indeed, the mean, minimum, and maximum TP concentrations in 2008 were less than those observed in 2006 and 2007.

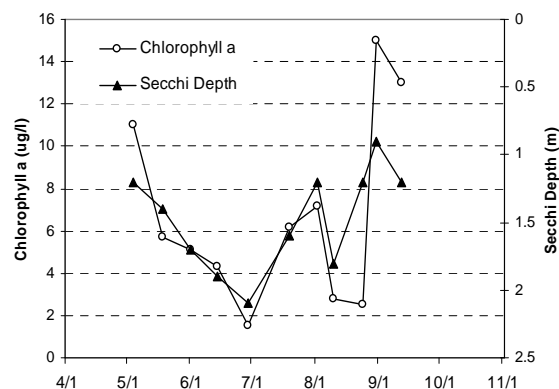
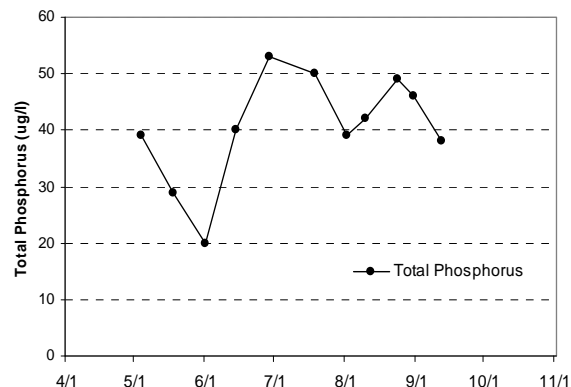
As mentioned earlier, there are no nutrient data available for the lake other than the 2006 – 2008 CAMP data. Additional data are needed to build the water quality database so as to better understand potential water quality trends.

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 3.1 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.7 (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.

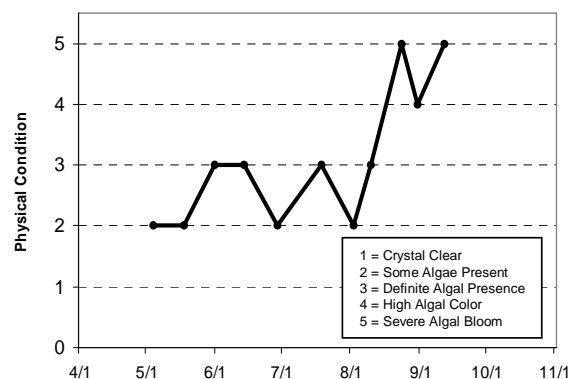
Lost Lake Mahtomedi, Washington Co.

LAKE ID: 820134
WD: Rice Creek
Volunteer: Martha Popp



2008 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	14.1				11	39		1.2	2	4
5/18	18.5				5.7	29		1.4	2	4
6/1	22.9				5.1	20		1.7	3	4
6/14	24.5				4.3	40		1.9	3	5
6/29	25.3				1.5	53		2.1	2	5
7/19	25.1				6.2	50		1.6	3	5
8/2	28.1				7.2	39		1.2	2	5
8/10	26.9				2.8	42		1.8	3	5
8/24	25.3				2.5	49		1.2	5	5
8/31	23.8				15	46		0.9	4	5
9/12	21.4				13	38		1.2	5	5



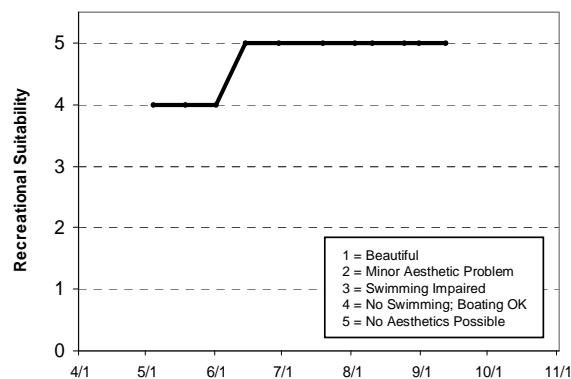
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus		D	C	C	
Chlorophyll a		C	C	A	
Secchi Depth		C	C	C	
Lake Grade		C	C	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. It has a surface area of 246 acres and a maximum and mean depth of 8.9 m (29.2 ft) and 4.3 m (14.2 ft.), respectively. The surface area and mean depth translate into a lake volume of 3,500 ac-ft. Approximately 74 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 lake's surface area and its 1,033-acre watershed translate into a 4:1 watershed-to-lake area ratio. 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*).

The lake was monitored previously by Council staff (1985, 1990 and 1999-2000) and the MPCA's volunteer Secchi program (1980, 1988-1991). The year 2008 marks the sixth year the lake has been monitored via the CAMP.

The lake was monitored 11 times between late April and mid October. 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.

2008 summer (May-September) data summary

Parameter	Mean	Minimum	Maximum	Grade
TP (µg/l)	43.9	23.0	82.0	C
CLA (µg/l)	23.2	4.4	60.0	C
Secchi (m)	1.3	0.8	2.1	C
TKN (mg/l)	1.83	0.98	2.40	
Lake Grade				C

The lake received a lake grade of C for 2008, which is consistent with all previous years' 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. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

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 2.4 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.4 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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/>.

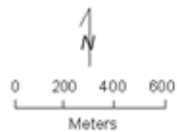
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lotus Lake Chanassen, Carver Co.

Lake ID: 100006
WD: Riley-Purgatory-Bluff Creek
Volunteer: Shelly Strohmaier

● Sampling site

Contours in meters



2008 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	8.5				14	59		1	2	2
5/17	18.3				16	82		0.9	3	3
6/7	21.2				4.4	23		1.3	2	2
6/26	25.4				7.9	24		2	2	2
7/9	25.1				9	25		2.1	2	2
7/19	26.8				14	26		1.7	2	2
7/29	27.3				19	42		1.3	2	2
8/16	25.3				60	57		0.9	3	3
9/6	21.7					56		0.75	3	3
9/21	20.9				55	60		1	3	3
10/11	18				12	42		1.3	2	2

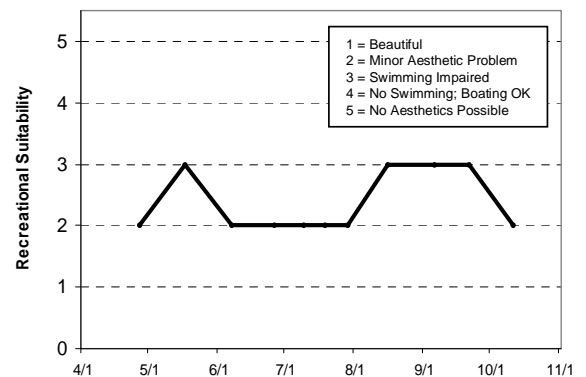
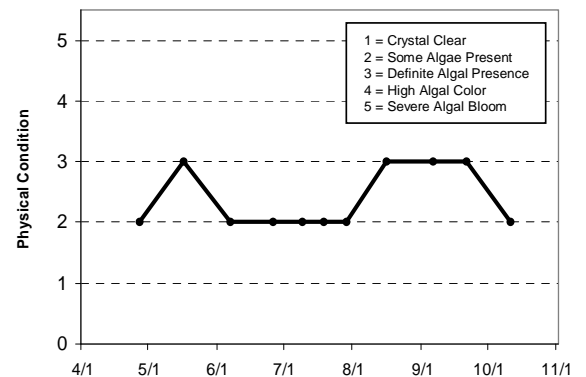
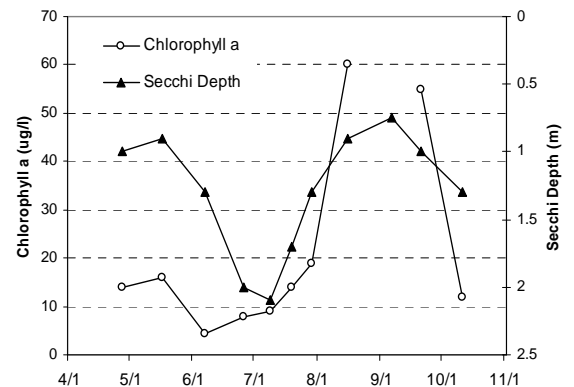
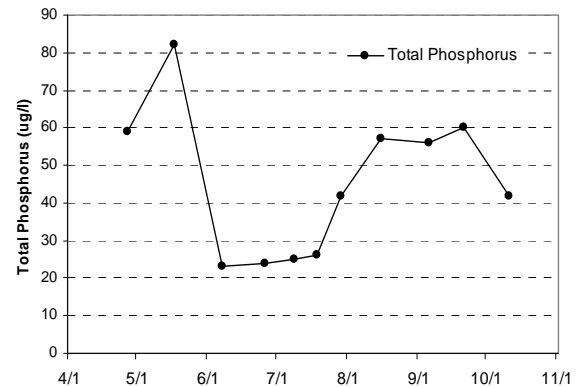
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade								C	C			D

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

Source: Metropolitan Council and STORET data



Louise Lake (82-0025) Carnelian - Marine Watershed District

Louise Lake is located in Stillwater Township (Washington County). The lake has a surface area of a 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 mean depth of the lake and its surface area translate to a lake volume of 283 ac-ft. Because of the shallowness of the lake, the entire 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 lake's 616-acre watershed and surface area translates to a watershed-to-lake size ratio of 13:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

A search through the STORET nationwide water quality database for data on the lake provided limited information (1996-2006).

The lake's was monitored 14 times late April to mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	145.7	108.0	224.0	D
CLA (µg/l)	35.4	13.0	74.0	C
Secchi (m)	0.8	0.5	1.4	D
TKN (mg/l)	2.46	1.90	3.10	
Lake Grade				D

The lake received a lake grade of D for 2008. 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.

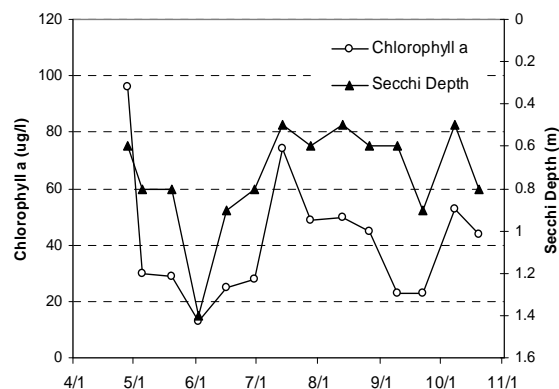
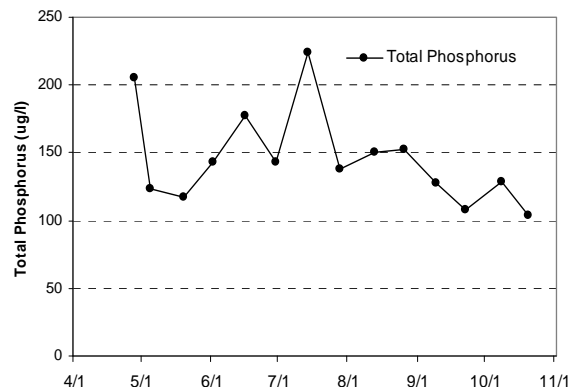
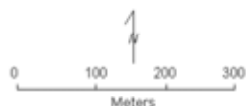
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 3.3 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.0 ("no swimming/boating ok").

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.

Lake Louise Stillwater Twp., Washington Co.

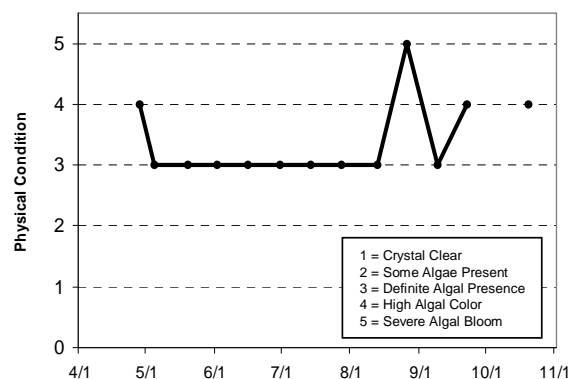
LAKE ID: 820025
WD: Carleton-Marine-St. Croix
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 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	7.5	7.5	13.21	13.09	96	205		0.6	4	4
5/5	12.4	11	11.28	0.59	30	123		0.8	3	4
5/20	15.3	14.6	9.02	0.53	29	117	107	0.8	3	4
6/2	20.6	17.6	8.48	2.22	13	143	151	1.4	3	4
6/16	20.6	20.5	9.94	9.57	25	177	165	0.9	3	4
6/30	23	20.8	6.32	0.35	28	143	133	0.8	3	4
7/14	23	21.7	8.68	0.38	74	224	198	0.5	3	4
7/28	26.3	22.5	9.03	0.2	49	138	241	0.6	3	4
8/13	24.1	23	5.8	0.56	50	150	168	0.5	3	4
8/26	22.4	22.4	10.27	5.16	45	152	144	0.6	5	4
9/9	18.2	17.5	9.45	9.02	23	128	108	0.6	3	4
9/22	20.9	19.3	11.36	0.35	23	108	98	0.9	4	4
10/8	13.9	13.7	10.15	0.3	53	129	115	0.5	4	4
10/20	11.4	11.2	9.69	0.39	44	104	124	0.8	4	4



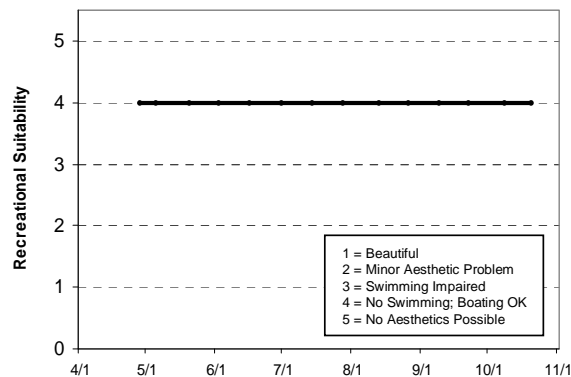
Lake Water Quality Grades Based on Summertime Averages

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					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
Lake Grade					C	D	C	D	C	D	D	

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

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.

This was the third year that Lynch Lake has been involved in CAMP. A search through the STORET nationwide water quality database for data on the lake provided no other data other than historical CAMP data.

The lake was monitored 14 times between late April and mid October. 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.

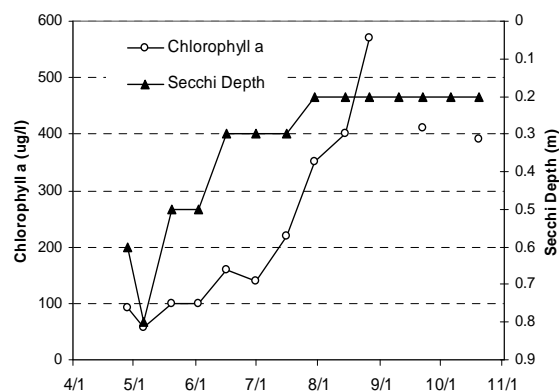
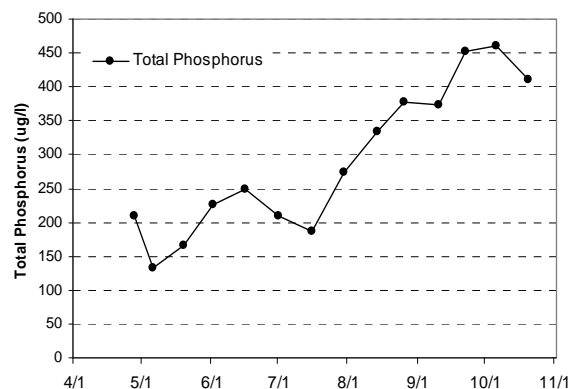
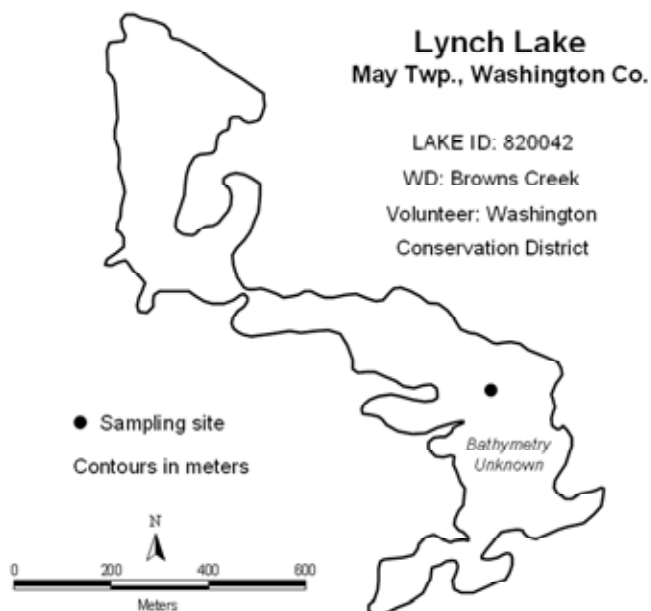
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	270.9	133.0	453.0	F
CLA (µg/l)	250.6	57.0	570.0	F
Secchi (m)	0.3	0.2	0.8	F
TKN (mg/l)	6.74	3.20	12.00	
Lake Grade				F

The lake received a lake grade of F for 2008. The 2007 overall water quality grade was an F. This lake also received F lake grades in 2006 and 2007. To continue to build the water quality database for this lake, additional years of data collection are needed.

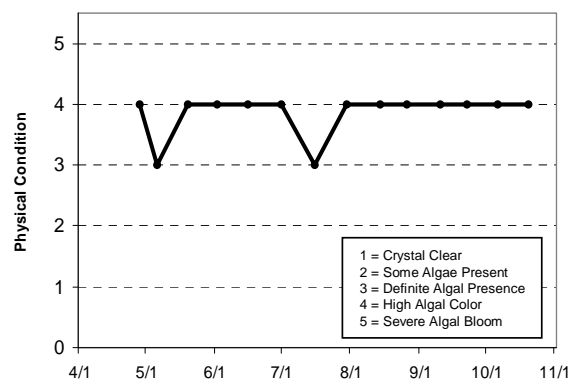
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 3.8 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.1 (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.



2008 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	7	7	12.68	12.5	91	210		0.6	4	4
5/6	16	12.8	13.34	0.61	57	133		0.8	3	4
5/20	15.8	15.2	10.94	0.25	99	166		0.5	4	4
6/2	21.5	18.3	10.39	0.17	100	226		0.5	4	4
6/16	21.1	20.7	10.4	9.33	160	248		0.3	4	4
7/1	26.3	21.7	13.84	0.29	140	209		0.3	4	4
7/16	24.7	22.7	7.2	0.92	220	187		0.3	3	4
7/30	26.4	23.7	9.84	0.29	350	273		0.2	4	4
8/14	23.3	22.7	10.72	0.89	400	335		0.2	4	4
8/26	24.3	22.4	13.69	10.35	570	377		0.2	4	4
9/10	17.2	17	8.93	0.2	373			0.2	4	4
9/22	21.2	20.5	11.98	0.3	410	453		0.2	4	5
10/6	12.9	13	14.22	0.44	461			0.2	4	4
10/20	11.6	11.2	11.52	0.42	390	410		0.2	4	4



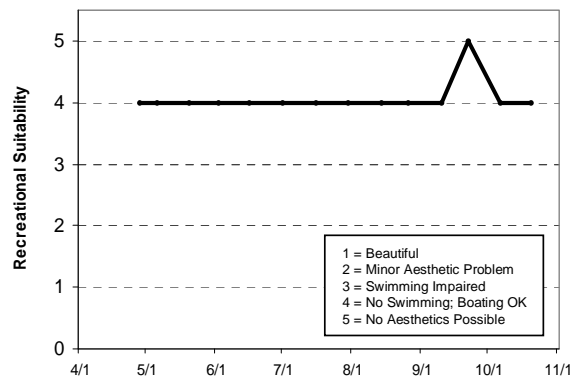
Lake Water Quality Grades Based on Summertime Averages

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



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. 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. The MDNR manages the lake for northern pike-panfish, and has stocked the lake with walleye over the past decade.

The lake was monitored 13 times from late April to mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	39.3	16.0	72.0	C
CLA (µg/l)	21.4	2.0	59.0	C
Secchi (m)	2.2	1.3	3.5	B
TKN (mg/l)	1.61	1.40	2.00	
Lake Grade				C

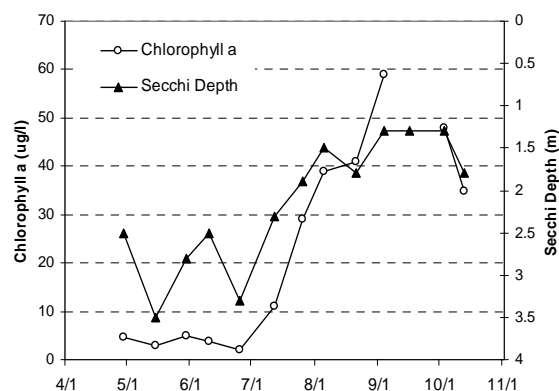
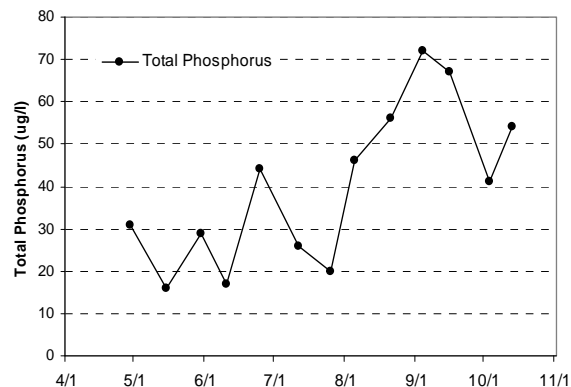
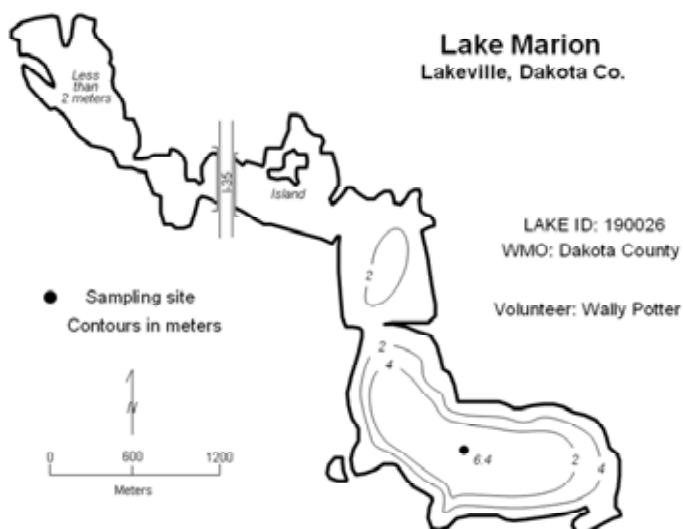
The lake received a lake grade of C for 2008, which is consistent with recent lake grades. The Secchi grade of B is a return to more clear water conditions not observed since 2001. On the basis of the historical water quality database, the surface water quality of the lake has varied from Bs to a D, with Cs being most common. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008). Continued monitoring is suggested to continue to build the historical water quality database for this lake.

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 1.5 (between 1- "crystal clear" and 2- "some algae present"). The average recreational suitability ranking was 1.0 ("beautiful").

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

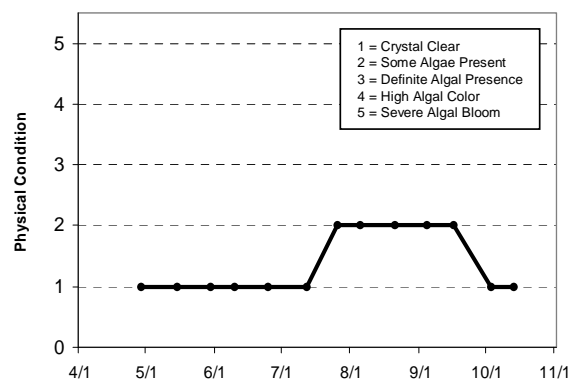
<http://www.dnr.state.mn.us/lakefind/>.

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.



2008 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	8.9				4.7	31		2.5	1	1
5/15	15.7				3	16		3.5	1	1
5/30	17.3				4.8	29		2.8	1	1
6/10	20.1				3.9	17		2.5	1	1
6/25	25				2	44		3.3	1	1
7/12	25				11	26		2.3	1	1
7/26	26				29	20		1.9	2	1
8/5	26.2				39	46		1.5	2	1
8/21	25.3				41	56		1.8	2	1
9/4	22.3				59	72		1.3	2	1
9/16	19.5				67			1.3	2	1
10/3	18.1				48	41		1.3	1	1
10/13	16				35	54		1.8	1	1



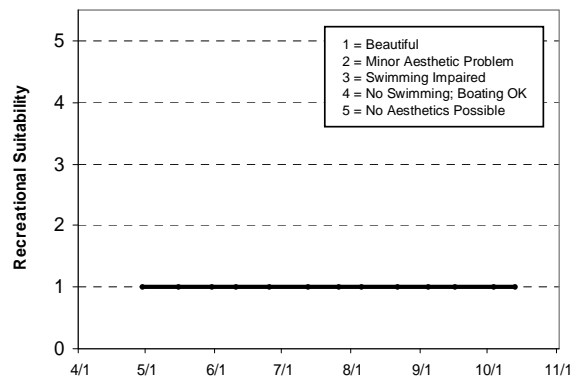
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade			B					B	B	B	C	C

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

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 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.

The lake has a drainage area of 413 acres. The lake's watershed-to-lake area ratio is 10:1 (the greater the ratio, the greater the potential stress on the lake from surface runoff). Because of the lake's shallowness, much of the lake is considered littoral zone, which is the 0-15 feet depth zone of the lake 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.

The lake was monitored 14 times between early May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	147.1	84.0	258.0	D
CLA (µg/l)	54.3	27.0	100.0	D
Secchi (m)	0.4	0.3	0.5	F
TKN (mg/l)	3.45	2.60	5.70	
Lake Grade				D

The lake received a lake grade of D for 2008. This grade is similar to those recorded in the early 2000's and 2007, but worse than the C's observed in 1995-1996. The lake experienced its worst recorded overall water quality (F) in 1998 and 2006 and its best water quality in 1995. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant declining trend in water clarity (MPCA 2008).

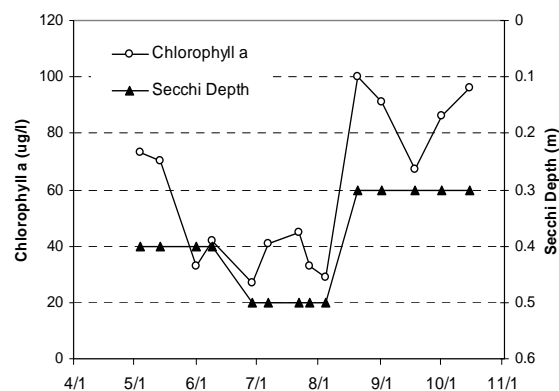
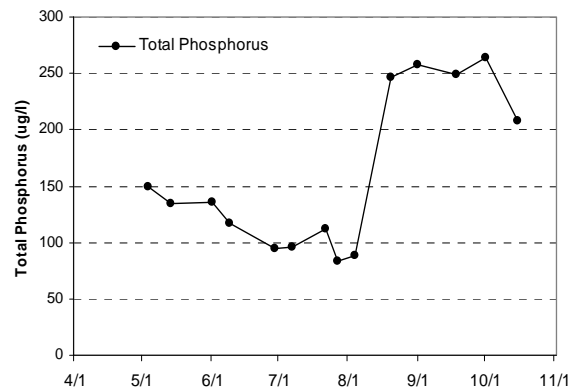
Throughout the course of the monitoring season the volunteer monitor ranked the lake's perceived physical and recreational conditions on a 1-to-5 scale. The mean physical condition was 4.0 (4- "high algal color") while the mean recreational suitability was 4.0 (4- "no swimming – boating ok").

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.

Markgrafs Lake Woodbury, Washington Co.

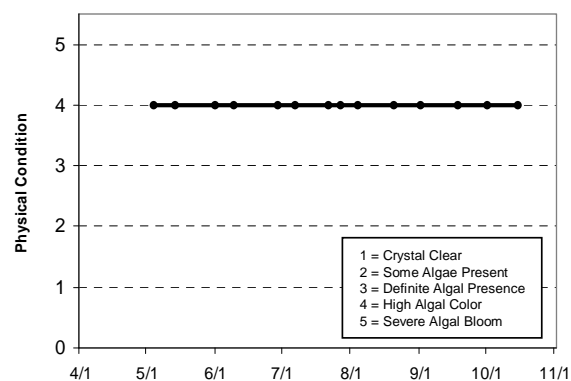
Lake ID: 820089
WD: South Washington
Volunteer: Terry Riley

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/4	12.7				73	150		0.4	4	4
5/14	16.8				70	135		0.4	4	4
6/1	19.1				33	136		0.4	4	4
6/9	20.2				42	117		0.4	4	4
6/29	25.5				27	94		0.5	4	4
7/7	26.4				41	96		0.5	4	4
7/22	26.7				45	112		0.5	4	4
7/27	26.4				33	84		0.5	4	4
8/4	26.5				29	88		0.5	4	4
8/20	26.1				100	246		0.3	4	4
9/1	23.3				91	258		0.3	4	4
9/18	18.6				67	249		0.3	4	4
10/1	17.1				86	264		0.3	4	4
10/15	13.1				96	208		0.3	4	4



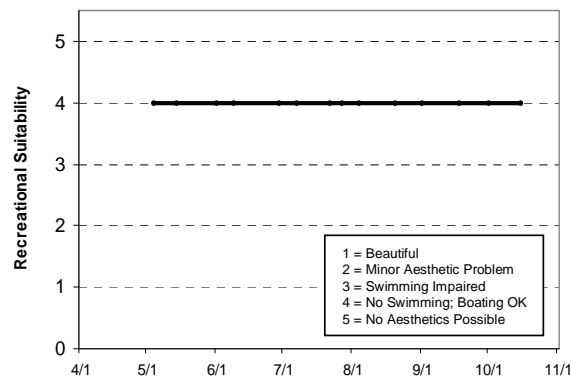
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					
Chlorophyll a					
Secchi Depth					
Lake Grade					

Source: Metropolitan Council and STORET data



Martin Lake (2-0034) Anoka County Parks

Marion Lake is located in Linwood Township (Anoka County). The lake is considered a “Priority Lake” by the Metropolitan Council because of its high regional recreation value. It has a surface area of 234 acres, and has a maximum depth of 6.1 m (20 feet). Approximately 60 percent of the lake’s surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The MDNR manages the lake for walleye.

The lake was monitored 13 times from early May to mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	92.0	21.0	166.0	D
CLA (µg/l)	44.1	9.6	100.0	C
Secchi (m)	0.6	0.4	1.1	F
TKN (mg/l)	2.04	1.30	3.80	
Lake Grade				D

The lake received a lake grade of D for 2008. The lake has received D lake grades in most years since 1983, but the Secchi grade of F for 2008 was the worst Secchi grade received by the lake. On the other hand, a trend analysis conducted by the MPCA on the lake’s Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008). Continued monitoring is suggested to determine if the decline in water clarity in 2008 is an anomaly or evidence of a change in trend.

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 3.0 (“definite algae present”). The average recreational suitability ranking was 2.0 (2- “minor aesthetic problem”).

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/>.

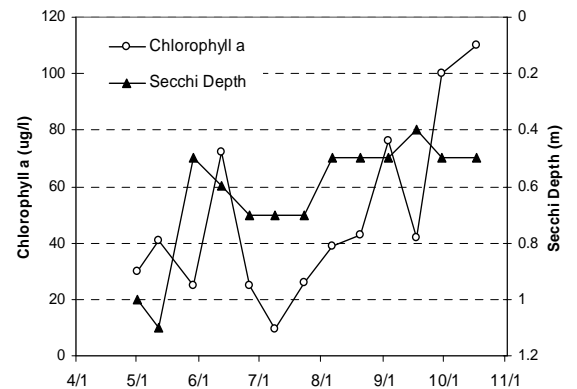
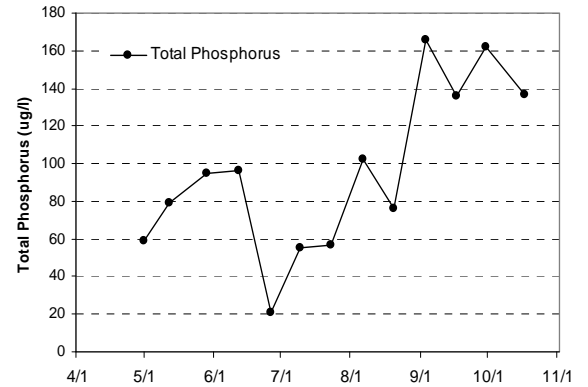
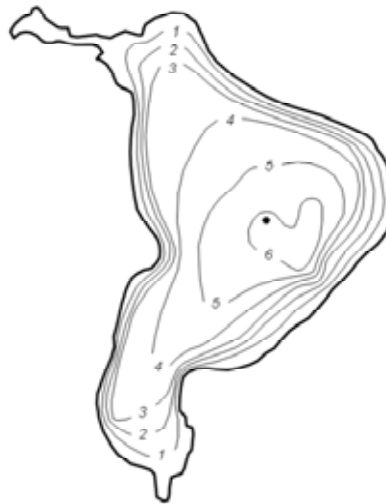
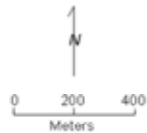
If you notice any errors in the lake’s data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Martin Lake Linwood Twp., Anoka Co.

Lake ID: 20034
WMO: Sunrise River
Volunteer: Anoka Co. Parks

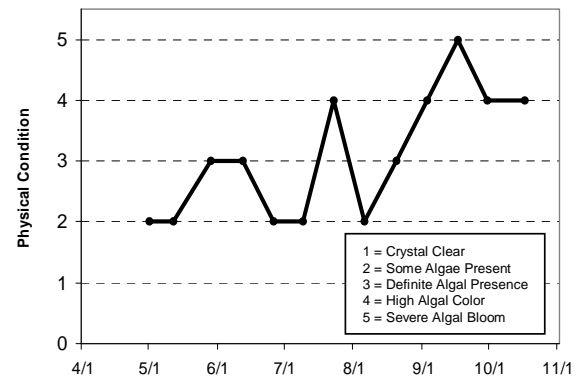
● Sampling site

Contours in meters



2008 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	9.4				30	59		1	2	
5/12	14.1				41	79		1.1	2	
5/29	17.3				25	95		0.5	3	2
6/12	20.4				72	96		0.6	3	2
6/26	27.4				25	21		0.7	2	1
7/9	25.6				9.6	55		0.7	2	1
7/23	26.5				26	57		0.7	4	3
8/6	25.9				39	102		0.5	2	2
8/20	25.5				43	76		0.5	3	3
9/3	22.3				76	166		0.5	4	
9/17	18.2				42	136		0.4	5	
9/30	16.9				100	162		0.5	4	
10/17	11.7				110	137		0.5	4	



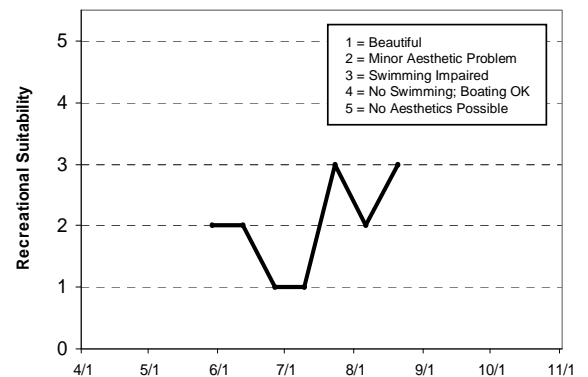
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

2008 was the third year that Masterman Lake was involved in CAMP. A search through the STORET nationwide water quality database for data on the lake provided just the historical CAMP data.

The lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

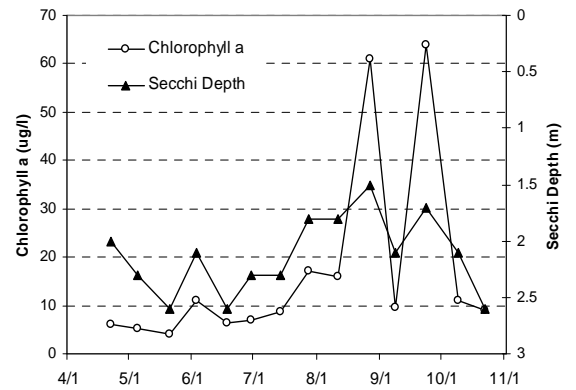
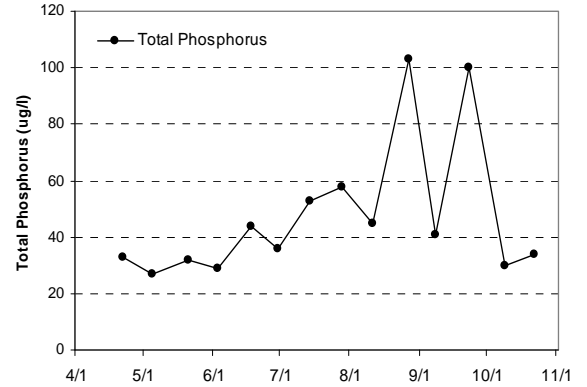
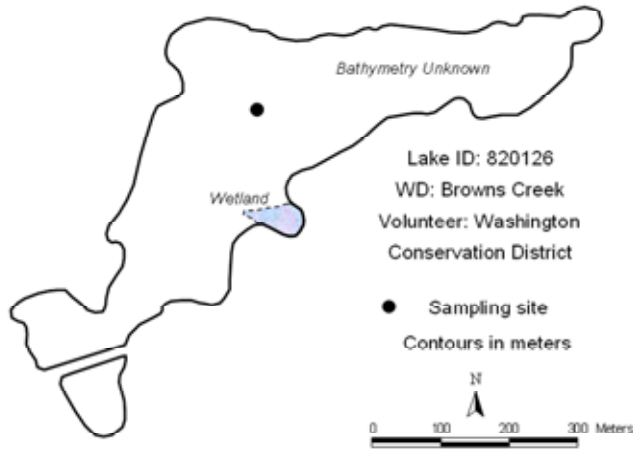
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	51.6	27.0	103.0	C
CLA (µg/l)	19.1	4.1	64.0	B
Secchi (m)	2.1	1.5	2.6	C
TKN (mg/l)	1.09	0.76	1.80	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to the lake grades received in the previous two years. To better determine water quality trends, additional years of monitoring are needed.

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 2.1 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.4 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

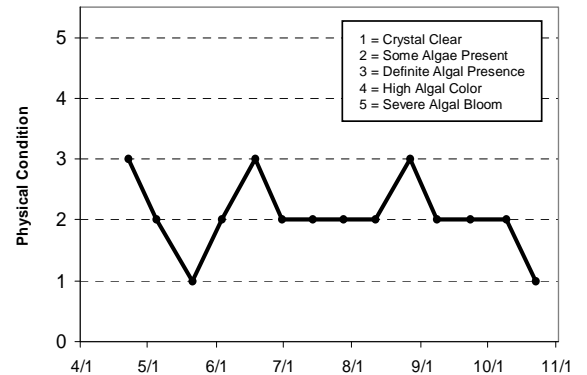
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Masterman Lake Grant, Washington Co.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	11.2	7.4	14.54	16.72	6.2	33		2	3	3
5/5	15	11.3	10.6	9.87	5.3	27		2.3	2	2
5/21	17.9	13.3	9.01	0.4	4.1	32		2.6	1	2
6/3	19.8	17.1	8.75	0.44	11	29		2.1	2	2
6/18	22.5	18.7	8.74	0.75	6.4	44		2.6	3	3
6/30	25.8	20.2	8.14	0.5	7	36		2.3	2	3
7/14	24.7	21.6	6.95	0.36	8.6	53		2.3	2	3
7/28	27.9	22.6	7.71	0.18	17	58		1.8	2	3
8/11	26.5	22.9	6.32	0.39	16	45		1.8	2	2
8/27	23.1	22.6	6.59	4.84	61	103		1.5	3	2
9/8	20.1	18.7	4.26	2.62	9.6	41		2.1	2	2
9/23	21	19.1	7.16	0.27	64	100		1.7	2	2
10/9	13.6	13.5	8.52	6.33	11	30		2.1	2	3
10/22	10.5	10.7	8.65	7.08	9	34		2.6	1	1



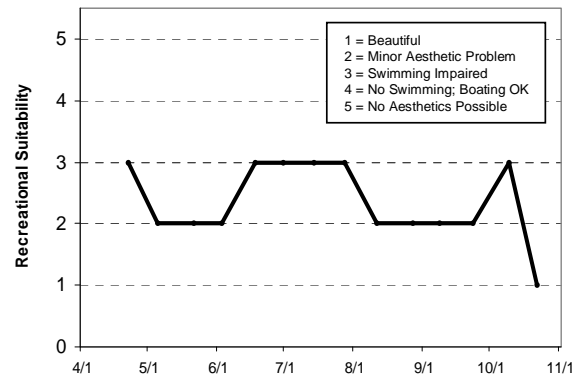
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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
Total Phosphorus			C	C	C
Chlorophyll a			B	B	B
Secchi Depth			C	C	C
Lake Grade			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 first year that Mays Lake was involved in the CAMP. A search through the STORET nationwide water quality database provided data only from one day in May, 1980.

The lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	12.1	3.0	17.0	A
CLA (µg/l)	2.8	1.8	3.6	A
Secchi (m)	5.4	4.3	6.3	A
TKN (mg/l)	0.63	0.46	1.20	
Lake Grade				A

The lake received a lake grade of A for 2008. Additional years of monitoring are needed to build the historical water quality database for this lake.

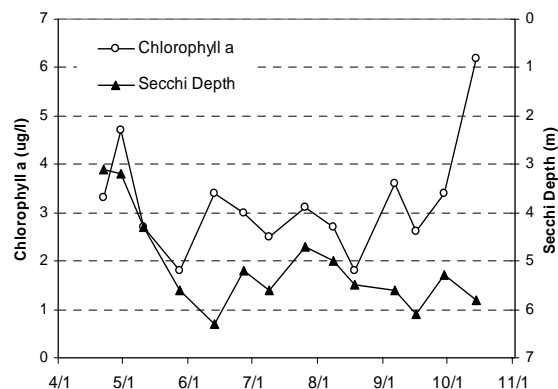
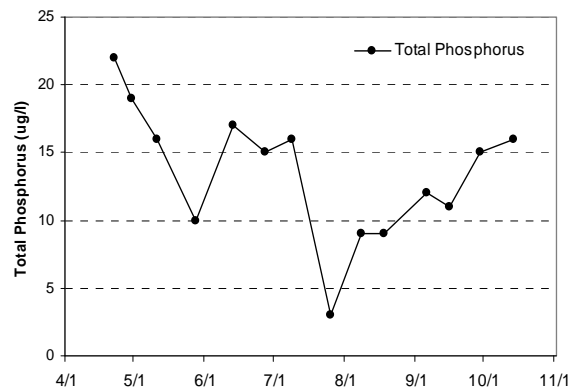
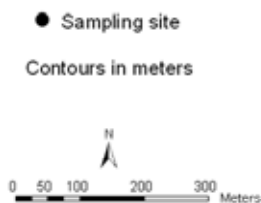
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.0 ("some algae present"). The average recreational suitability ranking was 1.7 (between 1- "beautiful and 2- "minor aesthetic problem").

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.

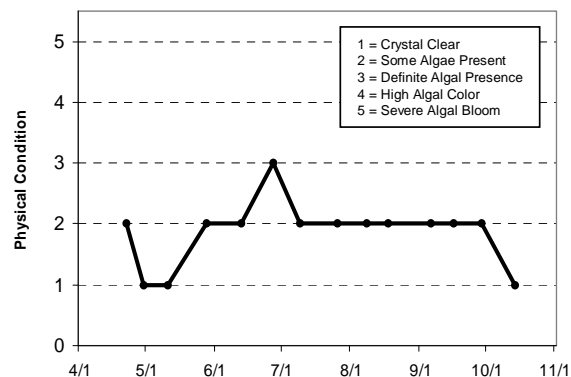
Mays Lake May Twp., Washington Co.

Lake ID: 820033
WD: Carnelian-Marine
Volunteer: Warner Nature Center



2008 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	9.7				3.3	22		3.1	2	2
4/30	9.8				4.7	19		3.2	1	1
5/11	14.5				2.7	16		4.3	1	1
5/28	19.2				1.8	10		5.6	2	2
6/13	21.3				3.4	17		6.3	2	1
6/27	26.1				3	15		5.2	3	1
7/9	27				2.5	16		5.6	2	2
7/26	26.3				3.1	3		4.7	2	2
8/8	26.6				2.7	9		5	2	2
8/18	26.3				1.8	9		5.5	2	2
9/6	21.4				3.6	12		5.6	2	2
9/16	20.1				2.6	11		6.1	2	2
9/29	18.6				3.4	15		5.3	2	2
10/14	14.4				6.2	16		5.8	1	2



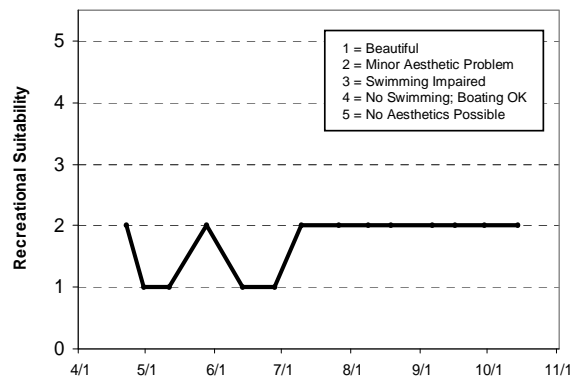
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					A
Chlorophyll a					A
Secchi Depth					A
Lake Grade					A

Source: Metropolitan Council and STORET data



McDonald Lake (82-0010) Valley Branch Watershed District

Primary Report

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 lake's size and mean depth results in an approximate lake volume of 324 ac-ft. Because of the shallowness of the lake, the entire area is considered littoral zone, and so the lake does not maintain a thermocline. Without a thermocline the water column is allowed to mix throughout the summer period.

The lake's surface area and watershed size (1,051 acres) translates to a 12:1 watershed-to-lake size ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

This was the ninth year in which McDonald Lake has been involved in the CAMP (the lake was enrolled in the program in 1999 and 2001-2007). The only historical water quality data found for McDonald Lake were Secchi transparency data for 1998 and 2000, and CAMP data from 1999 and 2001-2007. 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 lake was monitored 10 times between mid-April and mid-October 2008. The resulting data are summarized in tables and figures on the next page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	59	28	76	C
CLA (µg/l)	42	3.5	110	C
Secchi (m)	1.6	0.5	2.9	C
TKN (mg/l)	1.8	0.85	2.4	
Lake Grade				C

The lake's 2008 lake grade of C and parameter grades of C are typical of the grades received in the past, such as in 2001 – 2003 and in 2006. The lake has received a lake grade of C for 7 of the 9 years that the lake has been involved in the CAMP. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). The lake's water quality seems well represented by a lake grade of C, with some variation from year to year.

The water quality for 2008 appears to be an improvement over that observed in 2007 since higher CLA concentrations were not observed during the latter part of the monitoring season, as was seen in 2007. The CLA concentrations observed from mid-September to early October 2008 were on the order of 6 to 50 times less than the same period in 2007.

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 3.4 for physical condition (3- "definite algae present" and 4- "high algal color"), and 3.7 for recreational suitability (3- "swimming slightly impaired" and 4- "no swimming; boating ok").

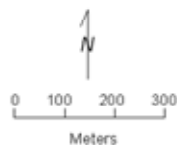
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

McDonald Lake Baytown Twp., Washington Co.

Primary Report

Lake ID: 820010
WD: Valley Branch
Primary Volunteer: Randy Hunt

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/20	6.6				10	58		2.5	2	2
5/14	18.8				6.8	28		2.7	2	2
6/1	21.4				3.5	61		2.9	3	3
6/12	22.5				9.9	76		2.5	3	3
7/3	26.4				23	44		1.1	3	4
7/16	28.9				110	60		0.5	4	5
8/24	24.7				43	72		0.8	4	4
9/18	20				100	74		0.5	5	5
10/9	14.8				13	49		1.8	3	4
10/15	13.5				12	38		1.9	3	4

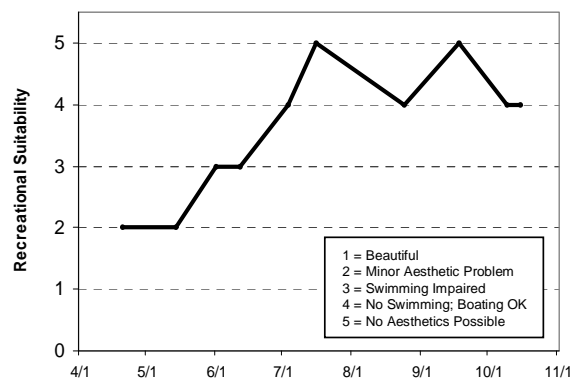
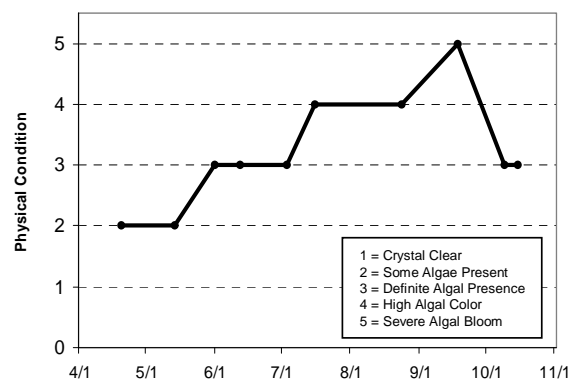
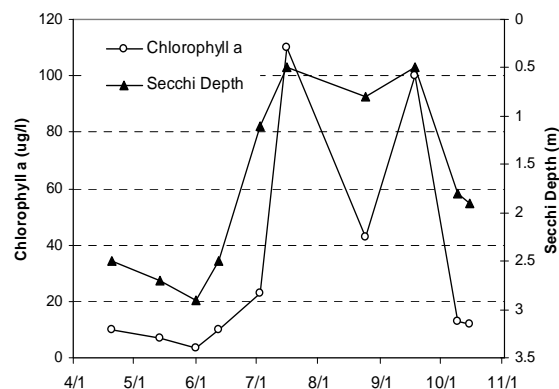
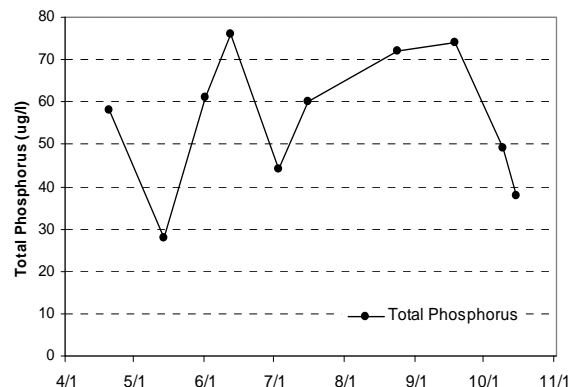
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



McDonald Lake (82-0010) Valley Branch Watershed District

Secondary Report

McDonald Lake was also monitored by the Washington Conservation District (WCD) in addition to the monitoring performed by the primary volunteer. The WCD monitored the lake 7 times between late April and mid-October 2008. The resulting data are summarized in tables and figures on the next page. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	50	26	81	C
CLA (µg/l)	75	8.6	140	D
Secchi (m)	1.4	0.5	2.9	C
TKN (mg/l)	1.6	0.56	2.3	
Lake Grade				C

The lake's 2008 lake grade of C by the secondary volunteer (WCD) agrees with the lake grade of C by the primary volunteer. The concentrations of TP and water clarity were similar throughout the monitoring season between the primary volunteer and the secondary volunteer.

The average CLA concentration of the secondary volunteer was higher than that of the primary volunteer, but this can be explained by the difference in CLA concentrations observed during the last half of August. The CLA concentration of the secondary volunteer was approximately 3 times higher than that of the primary volunteer for the period of the last half of August. However, the lower CLA concentration (primary volunteer) is in agreement with the increase in water clarity observed during this same period, which was observed both by the primary and secondary volunteers. Otherwise, the CLA concentrations from both the primary and secondary volunteers were similar throughout the monitoring period.

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 2.8 for physical condition (2- "some algae present" and 3- "definite algae present"), and 3.8 for recreational suitability (3- "swimming slightly impaired" and 4- "no swimming; boating ok").

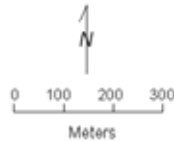
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

McDonald Lake Baytown Twp., Washington Co.

Secondary Report

Lake ID: 820010
WD: Valley Branch
Secondary Volunteer:
Washington Conservation
District

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	9	8.8	11.68	9.8	15	51		2	2	2
6/10	20.9	18.6	8.16	0.22	8.6	39	52	2.9	2	3
6/24	24.2	20.8	9.24	0.48	16	44	66	2.1	3	4
7/22	25.5	21.5	10.09	0.01	99	59	188	0.5	3	4
8/18	24.7	20.9	8.11	0.17	140	26	102	1.1	3	4
9/17	18.3	17.5	9.44	-0.3	110	81	94	0.6	3	4
10/14	14.9	14.8	4.1	0.27	22	71	58	2.1	3	4

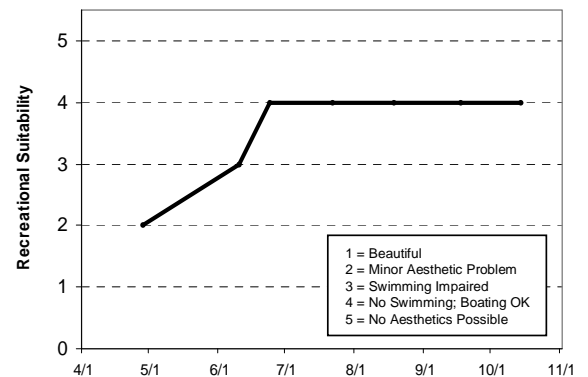
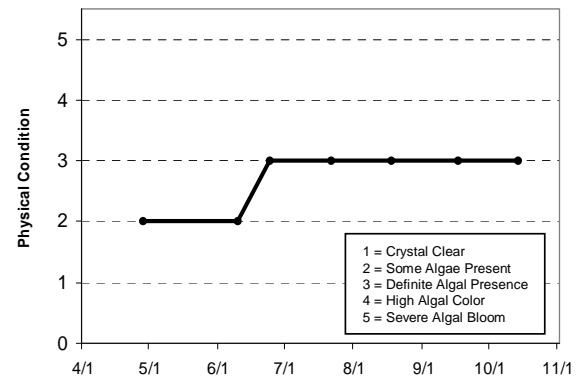
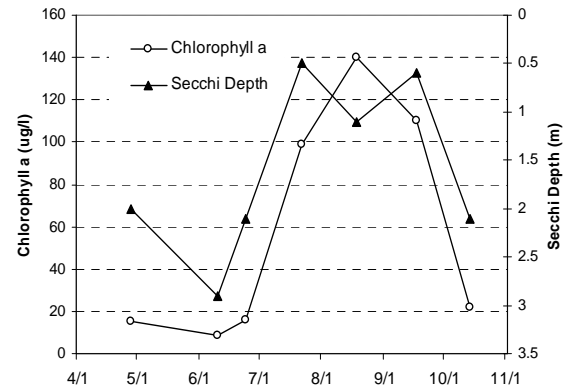
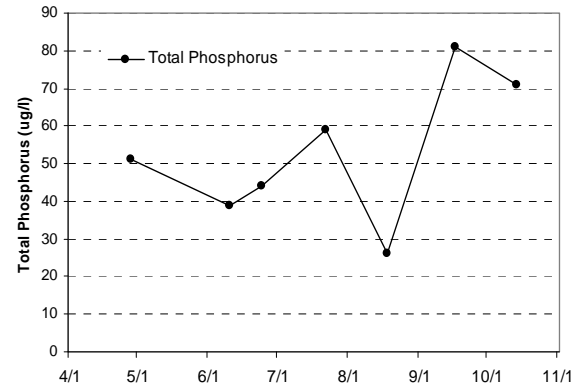
Lake Water Quality Grades Based on Summertime Averages

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										C	C	C
Chlorophyll a										B	C	C
Secchi Depth							C	C	C	C	C	C
Lake Grade								C		C	C	C

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

This was the second year that McKnight Lake has been involved in the CAMP. A search through the STORET nationwide water quality database for data on the lake provided no data other than the CAMP data.

The lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	168.9	106.0	209.0	F
CLA (µg/l)	82.1	32.0	130.0	F
Secchi (m)	0.5	0.3	0.8	F
TKN (mg/l)	2.91	2.00	4.20	
Overall Grade				F

The lake received a lake grade of F for 2008, which is similar to the lake grade received in 2006. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

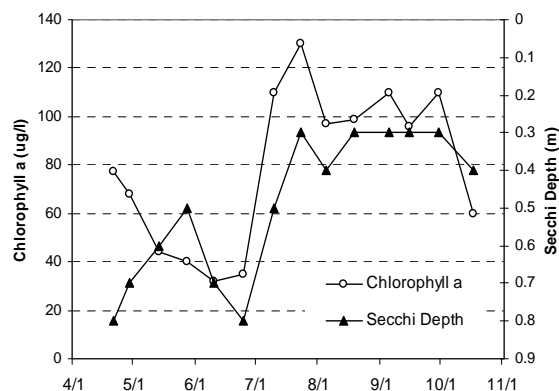
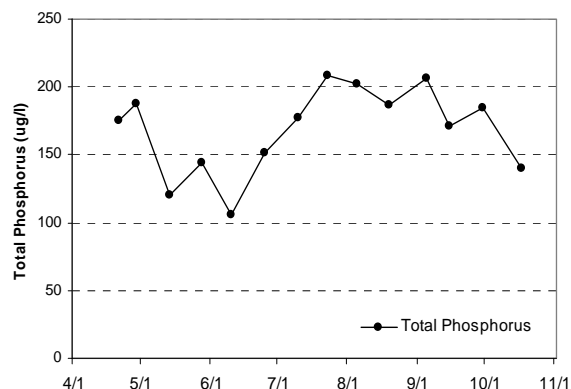
The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings, were 3.5 for physical condition (roughly 3- "definite algae present"), and 4.3 for recreational suitability (between 4- "no swimming/boating 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.

McKnight Lake Chaska, Carver Co.

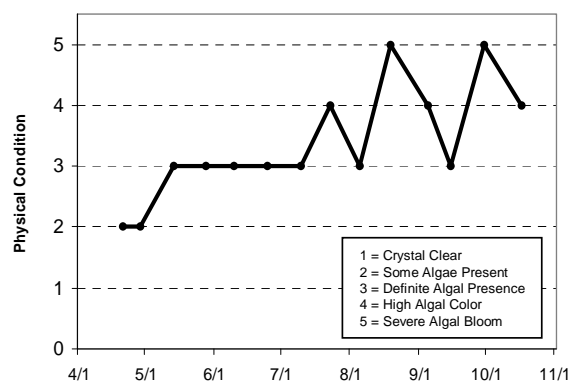
Lake ID: 100216
WMO: Hazeltine-Bavaria
Volunteer: Carver Co.

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	10.27		17.63		77	175		0.8	2	3
4/29	7.85		15.11		68	188		0.7	2	4
5/14					44	120		0.6	3	4
5/28	17.39		8.31		40	144		0.5	3	4
6/10	21.81		7.96		32	106		0.7	3	4
6/25	24.96		9.14		35	151		0.8	3	4
7/10	25.05		9.41		110	177		0.5	3	4
7/23	26.06		8.77		130	209		0.3	4	4
8/5	25.75		6.81		97	202		0.4	3	4
8/19	28.19		16.46		99	187		0.3	5	5
9/5	20.14		8.85		110	206		0.3	4	4
9/15	18.2		8.33		96	171		0.3	3	5
9/30					110	185		0.3	5	5
10/17	12.66		7.5		60	140		0.4	4	4



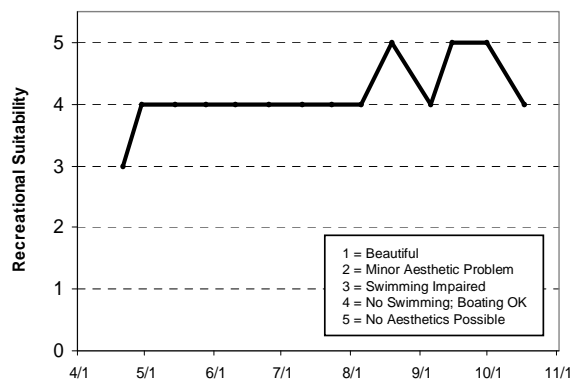
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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
Total Phosphorus			F		F
Chlorophyll a			D		F
Secchi Depth			F		F
Lake Grade			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 a 46 acres, and a maximum depth of 4.7 m (15 ft).

The lake has been involved in the CAMP since 1994. In 2008, the lake was monitored 15 times between mid April and mid October. 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.

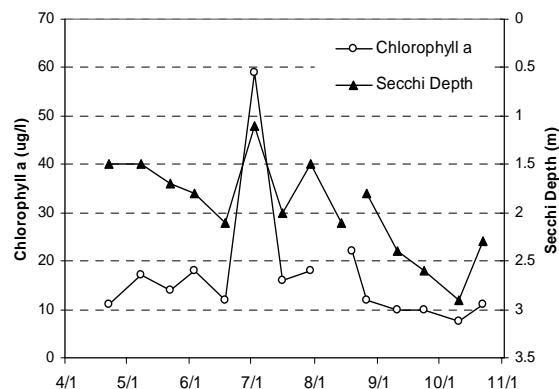
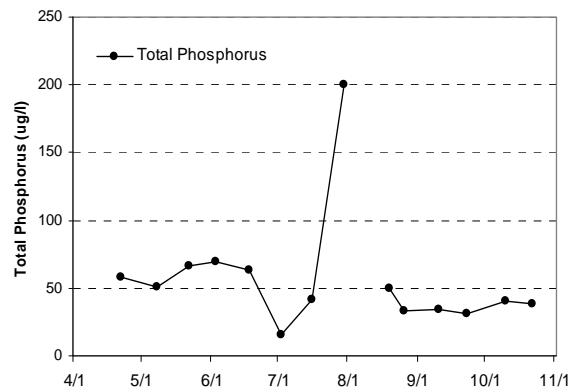
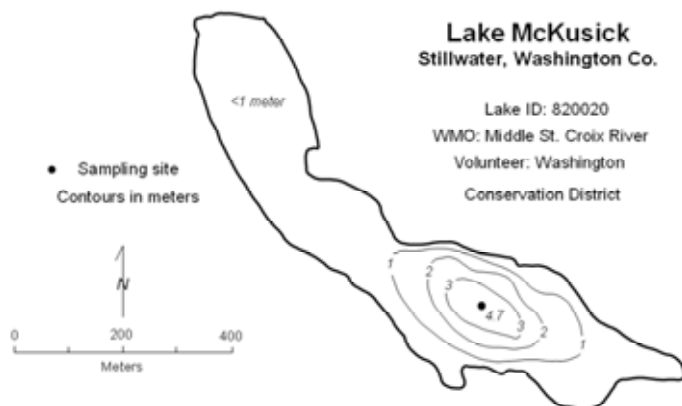
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	59.5	16.0	200.0	C
CLA (µg/l)	18.9	10.0	59.0	B
Secchi (m)	1.9	1.1	2.6	C
TKN (mg/l)	1.85	0.53	3.40	
<i>Lake Grade</i>				C

The lake received a lake grade of C for 2008, which is similar to lake grades received in some past years. The lake grades over the past 15 years have varied from D to B to C to B and back to C. The historical water quality database suggests that the lake has been represented by a lake grade of C or B for the past 9 years. The lake has not received a D lake grade since 1999. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

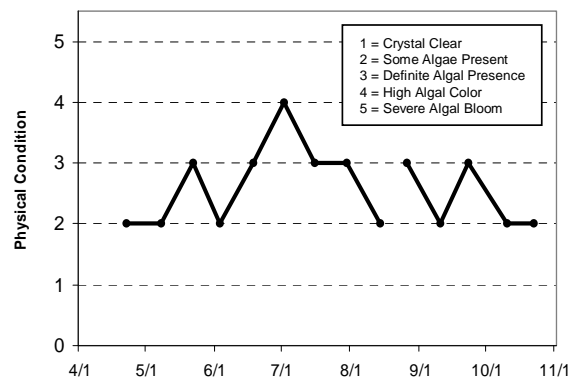
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.7 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 3.5 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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.



2008 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	10.9	4.8	14.38	1.66	11	58		1.5	2	2
5/8	14.9	11.7	10.23	0.61	17	51		1.5	2	3
5/22	16.7	12.2	9.12	0.26	14	66		1.7	3	3
6/3	20.1	13.6	8.2	0.12	18	69		1.8	2	3
6/18	22.6	18.7	9.59	0.29	12	63		2.1	3	4
7/2	24.6	15.5	11.15	0.44	59	16		1.1	4	4
7/16	25.1	21.7	8.44	0.25	16	42		2	3	4
7/30	27.6	20.3	8.45	0.21	18	200		1.5	3	4
8/14	24.8	22.9	8.66	0.83				2.1	2	3
8/19					22	50				
8/26	23.9	22.8	9.35	8.02	12	33		1.8	3	4
9/10	18.4	18.3	9.83	0.17	10	34		2.4	2	3
9/23	21.1	18.1	8.88	0.26	10	31		2.6	3	3
10/10	13.3	13.2	8.96	0.99	7.6	40		2.9	2	3
10/22	10.4	10.5	10.73	0.58	11	38		2.3	2	2



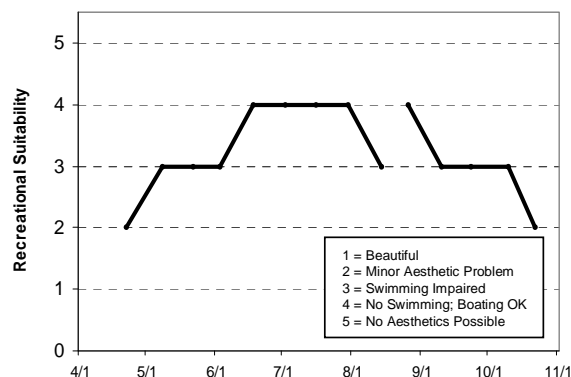
Lake Water Quality Grades Based on Summertime Averages

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

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
Chlorophyll a			D	C	C	C	D	D	B	B	C	B
Secchi Depth			D	D	D	C	D	D	B	B	D	C
Lake Grade			D	D	D	C	D	D	B	B	C	C

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

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). Because the maximum depth is less than 15 feet, the entire surface area is considered littoral zone, which is 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*).

The year 2008 was the third year that McMahon Lake has been enrolled in the CAMP. The lake was monitored by Council staff in the past as well. In 2008, the lake was monitored 11 times between mid May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	85.4	33.0	160.0	D
CLA (µg/l)	20.1	6.6	39.0	C
Secchi (m)	1.0	0.5	2.0	D
TKN (mg/l)	2.32	1.10	3.80	
Lake Grade				D

The lake received a lake grade of D for 2008, which is similar to lake grades received in previous years. The lake's Lake Grade of C in 2007 is the best overall water quality grade the lake has yet received. On the basis of the water quality database, the lake's water quality appears to be represented by a lake grade of D.

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 2.2 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 1.4 (between 1- "beautiful" and 2- "minor aesthetic problem").

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.

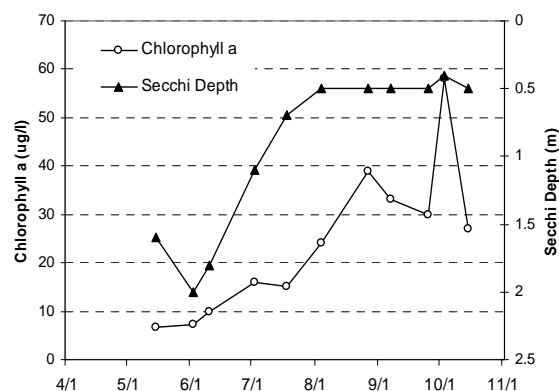
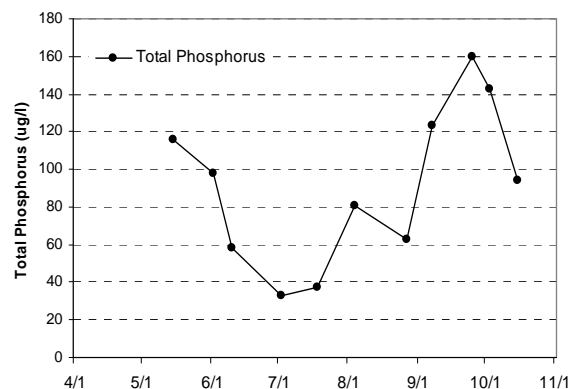
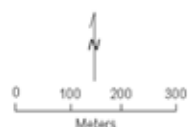
McMahon Lake

Spring Lake Twp.,
Scott Co.

Lake ID: 700050
WMO: Scott County
Volunteer:
Joe Williamson

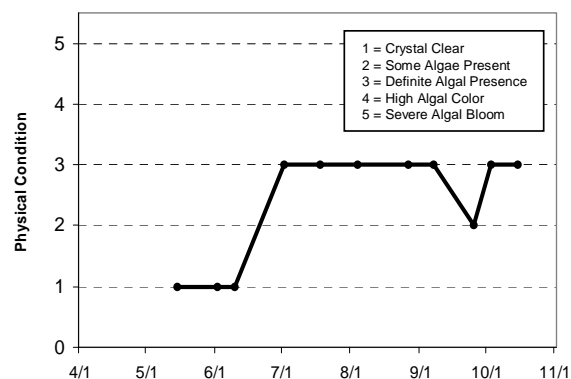
● Sampling site

Contours in meters



2008 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
5/15	15.5				6.6	116		1.6	1	1
6/2	20.6				7.4	98		2	1	1
6/10	20.8				10	58		1.8	1	1
7/2	24.7				16	33		1.1	3	2
7/18	28.7				15	37		0.7	3	1
8/4	25.7				24	81		0.5	3	1
8/27	23				39	63		0.5	3	2
9/7	18.8				33	123		0.5	3	2
9/25	20.7				30	160		0.5	2	2
10/3	17.9				58	143		0.4	3	2
10/15	14.2				27	94		0.5	3	2



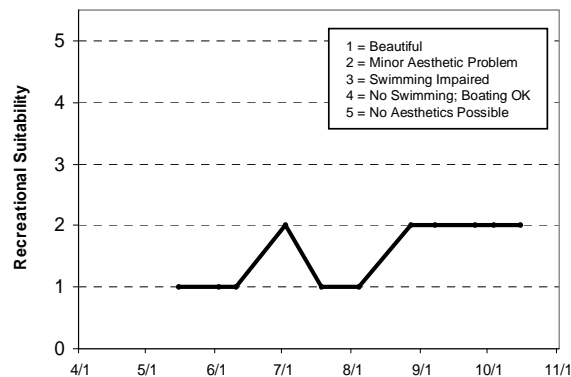
Lake Water Quality Grades Based on Summertime Averages

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

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		
Lake Grade				D			D			D		

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

Source: Metropolitan Council and STORET data



Meadow Lake (27-0057) Shingle Creek Watershed Management Commission

Meadow Lake is located in the City of New Hope (Hennepin County). The lake has a surface area of 11 acres, and a watershed area of 440 acres. The watershed-to-lake area ratio is 40:1. The larger the ratio, the greater the potential stress on the lake from surface runoff. The lake has a maximum depth of 1.2 m (4 ft); therefore the entire surface area of the lake 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 lake's water column.

The lake was monitored 14 times in 2008. 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.

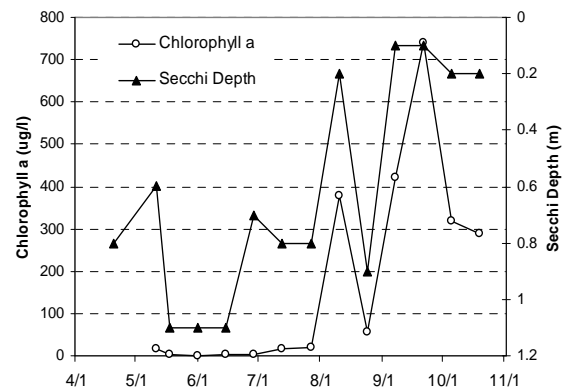
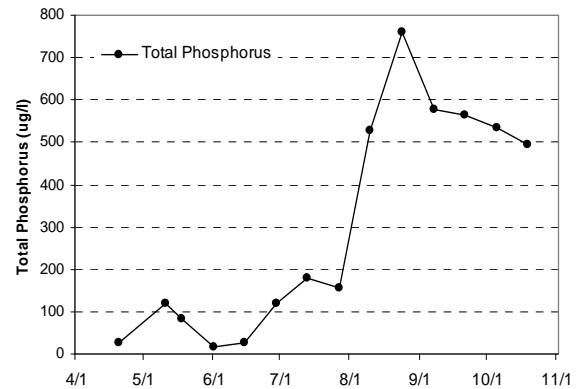
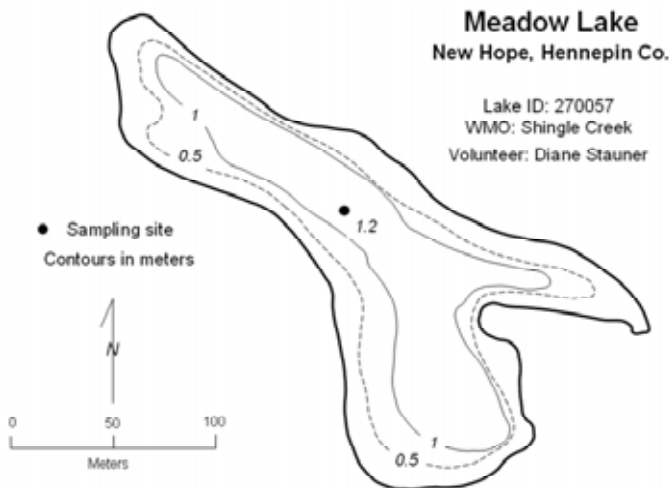
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	284.9	16.0	761.0	F
CLA (µg/l)	150.9	1.1	740.0	F
Secchi (m)	0.7	0.1	1.1	F
TKN (mg/l)	5.42	0.78	16.00	
<i>Lake Grade</i>				F

The lake received a lake grade of F for 2008, which is the same grade as the lake grades received in previous years. On the basis of the water quality database, the lake's water quality appears to be represented by a lake grade of F.

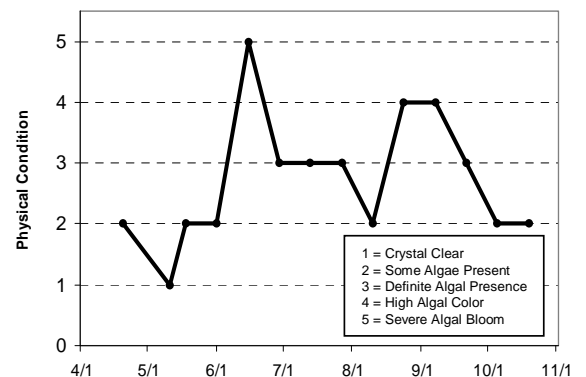
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.9 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 3.0 ("no swimming/boating ok").

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.



2008 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	13.3					25		0.8	2	2
5/11	16.7				17	120		0.6	1	4
5/18	17.8				2.3	84		1.1	2	1
6/1	24.4				1.1	16		1.1	2	4
6/15	22.8				2.7	28		1.1	5	4
6/29	25				3.1	121		0.7	3	
7/13	22.2				17	178		0.8	3	4
7/27	26.1				19	157		0.8	3	2
8/10	23.3				380	527		0.2	2	2
8/24	22.2				58	761		0.9	4	4
9/7	18				420	577		0.1	4	1
9/21	23				740	565		0.1	3	4
10/5	12				320	534		0.2	2	2
10/19	10				290	494		0.2	2	4



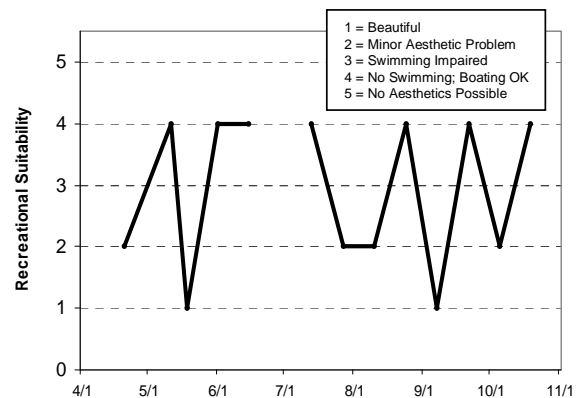
Lake Water Quality Grades Based on Summertime Averages

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					F			F			F	
Chlorophyll a					F			F			F	
Secchi Depth					F			F			F	
Lake Grade					F			F			F	

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

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. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 6 times in 2008. 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.

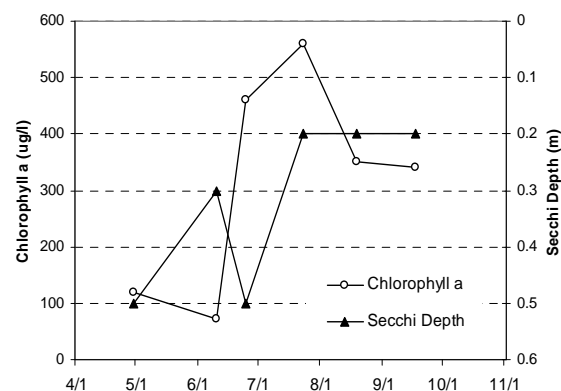
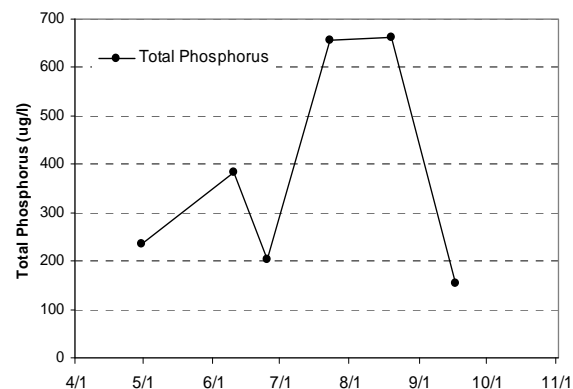
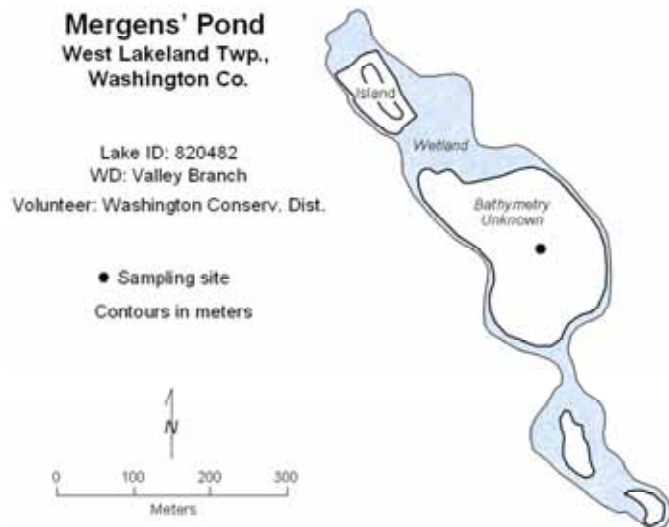
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	411.0	154.0	661.0	F
CLA (µg/l)	356.6	73.0	560.0	F
Secchi (m)	0.3	0.2	0.5	F
TKN (mg/l)	6.02	1.90	11.00	
Lake Grade				F

The lake received a lake grade of F for 2008, which is worse than the lake grades received in 2000 and 2005. Continued monitoring is suggested to determine if the water quality of the lake is experiencing a degrading trend.

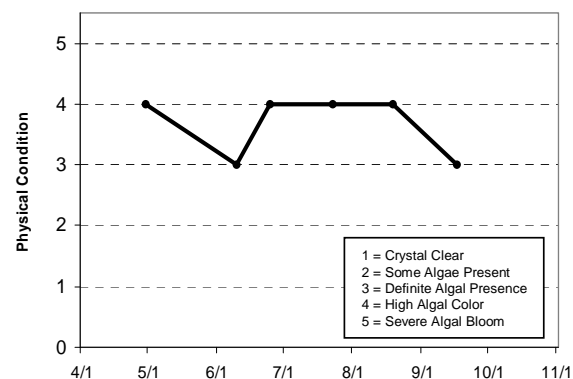
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 3.6 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.2 (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.



2008 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	9.2	9.1	14.38	0.97	120	235		0.5	4	4
6/10	19.1		5.42		73	382		0.3	3	4
6/25	24.2	23.9	5.31	0.48	460	202		0.5	4	4
7/23	23.9		7.76		560	656		0.2	4	4
8/19	23.6		6.77		350	661		0.2	4	4
9/17	19.9		7.45		340	154		0.2	3	5



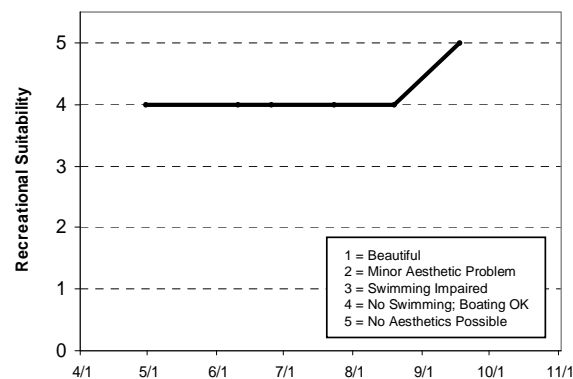
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus	NA	D			F
Chlorophyll a	NA	B			F
Secchi Depth	NA	D			F
Lake Grade		C			F

Source: Metropolitan Council and STORET data



Meuwissen Lake (10-0070) Carver County Environmental Services

Meuwissen Lake is located in Benton Township (Carver County). There is no bathymetric information available for the lake. The lake was previously monitored by the Minnesota Pollution Control Agency in 1979, and it was monitored one day in 1999 via the CAMP program.

The lake was monitored 11 times between mid April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	255.4	55.0	662.0	F
CLA (µg/l)	152.1	37.0	300.0	F
Secchi (m)	0.2	0.1	0.4	F
TKN (mg/l)	9.18	2.60	18.00	
<i>Lake Grade</i>				F

The lake received a lake grade of F in 2008. Additional years of monitoring are suggested to build an historical water quality database for this lake.

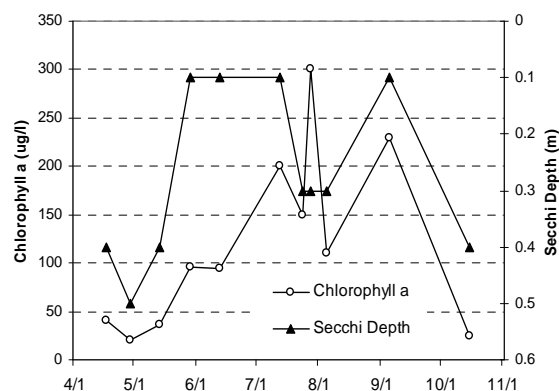
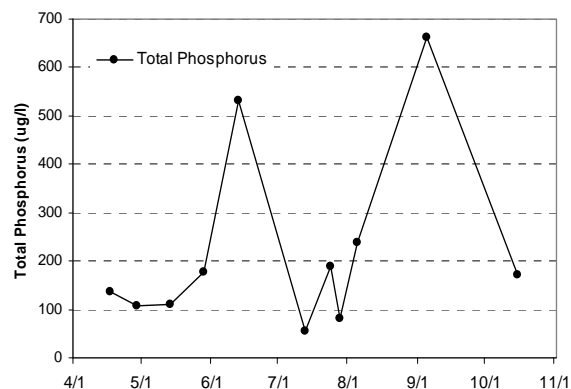
The volunteer(s) monitor ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. The mean perceived physical condition was 4.0 (4- "high algal color"); the mean recreational suitability was 5.0 (5- "no aesthetics possible").

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.

Meuwissen Lake Benton Twp./Cologne, Carver Co.

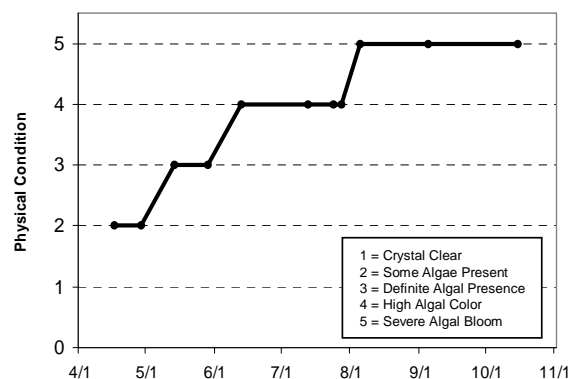
Lake ID: 100070
WD: Carver Creek
Volunteers: Mark & Jacob
Steinbauer; Don Smith

● Sampling site
Contours in meters



2008 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	7				41	136		0.4	2	5
4/29	7				21	107		0.5	2	5
5/14	15				37	110		0.4	3	5
5/29	19				96	177		0.1	3	5
6/13	18				94	532		0.1	4	5
7/13	21				200	55		0.1	4	5
7/24	21				150	188		0.3	4	5
7/28	20				300	81		0.3	4	5
8/5	22				110	238		0.3	5	5
9/5	20				230	662		0.1	5	5
10/15	11				24	172		0.4	5	5



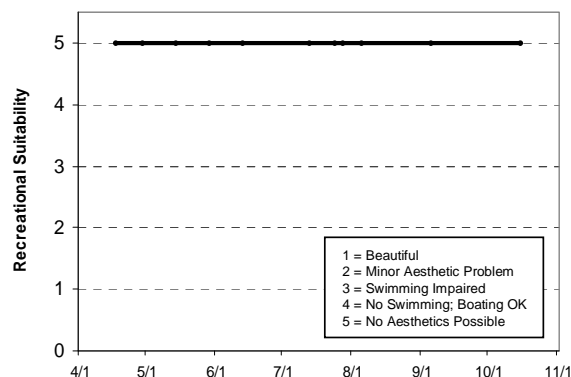
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					F
Chlorophyll a					F
Secchi Depth					F
Lake Grade					F

Source: Metropolitan Council and STORET data



Miller Lake (10-0029) Carver County Environmental Services

Miller Lake, a 145-acre lake located within Dahlgren Township (Carver County) is considered a Metropolitan Area “Priority Lake” because of its multi-recreational uses. The mean and maximum depths of the lake are 3.1 m (10 feet) and 4.3 m (roughly 14 feet), respectively. The lake’s mean depth and surface area translate to an approximate lake volume of 1,479 ac-ft. 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 16,701-acre immediate watershed, which translates to a watershed-to-lake area ratio of 115:1. The larger the ratio the greater the potential stress put on the lake from surface runoff (Carver County Planning 1999).

The lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	265.7	110.0	384.0	F
CLA (µg/l)	58.7	25.0	98.0	D
Secchi (m)	0.7	0.4	1.4	D
TKN (mg/l)	2.43	1.90	2.90	
Lake Grade				D

The lake received a lake grade of D for 2008, which is better than the water quality of 2007. No long-term trend is apparent from the lake’s water quality database. A trend analysis conducted by the MPCA on the lake’s Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). The lake is represented by a lake grade of D or F.

Throughout the monitoring period, the volunteer(s) ranked the perceived physical condition of the lake on a 1-to-5 scale. The mean perceived physical condition of Miller Lake was 3.6 (between 3- “definite algae present” and 4- “high algal color”), while the mean recreational suitability was 4.1 (between 4- “no swimming/boating ok” and 5- “no aesthetics possible”).

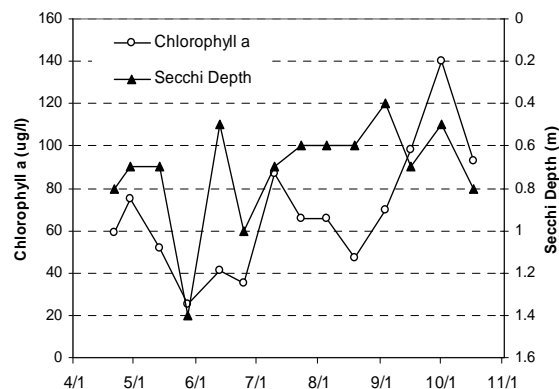
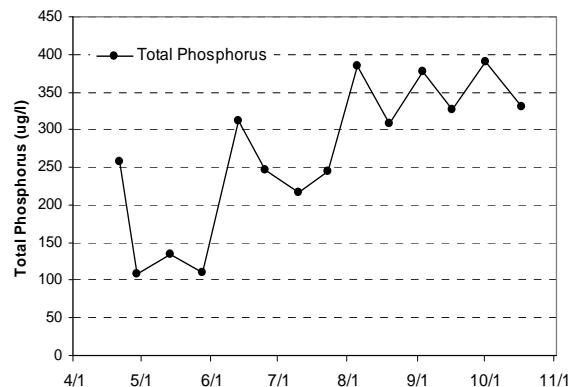
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Miller Lake Dahlgren Twp., Carver Co.

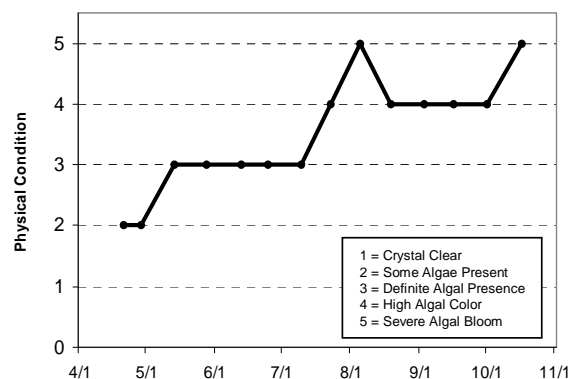
Lake ID: 100029
WMO: Carver County
Volunteer: Carver Co.

• Sampling site
Contours in meters



2008 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		14.05		59	258		0.8	2	3
4/29	6.53		14.32		75	109		0.7	2	4
5/14	14.99		14.99		52	134		0.7	3	4
5/28	17.31		9.49		25	110		1.4	3	4
6/13	19.73		7.18		41	311		0.5	3	4
6/25	24.3		9.64		35	246		1	3	4
7/10	25.52		13.06		87	217		0.7	3	4
7/23	26.45		12.67		66	244		0.6	4	4
8/5	25.9		11.27		66	384		0.6	5	5
8/19	25.78		17.9		47	308		0.6	4	4
9/3	22.4		8.86		70	377		0.4	4	4
9/16	17.73		9.22		98	326		0.7	4	4
10/1	16.93		8.82		140	391		0.5	4	4
10/17	12.68		10.25		93	330		0.8	5	5



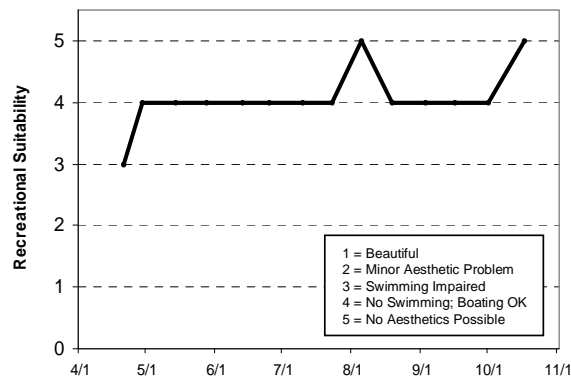
Lake Water Quality Grades Based on Summertime Averages

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				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
Lake Grade				F	F	D		D	D	D	D	F

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

Source: Metropolitan Council and STORET data



Minnetoga Lake (27-0088) *Nine Mile Creek Watershed District*

Lake Minnetoga is located in Minnetonka, Hennepin County. The lake has a surface area of 14.4 acres, and an average depth of 3.9 m (12.7 ft). The maximum depth is 8.2 m (26.9 ft). The volume of the lake is 183 acre-feet.

This was the second year that Lake Minnetoga has been involved in the CAMP. A search through the STORET nationwide water quality database revealed, other than the historical CAMP data, just two dates in 2001 with Secchi depth measurements.

The lake was monitored 12 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	27.3	12.0	56.0	B
CLA (µg/l)	7.9	2.4	15.0	A
Secchi (m)	2.6	1.3	4.0	B
TKN (mg/l)	1.79	1.40	2.20	
Lake Grade				B

The lake received a lake grade of B for 2008, which is an improvement over last year's C lake grade. Continued monitoring is suggested to build the water quality database for determining potential trends in water quality.

Throughout the monitoring period, the volunteer(s) ranked the perceived physical condition of the lake on a 1-to-5 scale. The mean perceived physical condition of the lake was 2.0 ("some algae present"; the mean recreational suitability was 1.5 (between 1- "beautiful" and 2- "minor aesthetic problem").

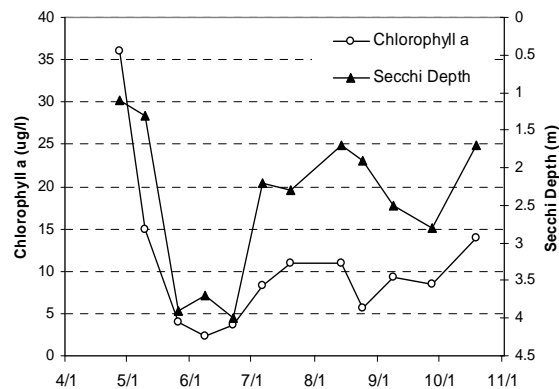
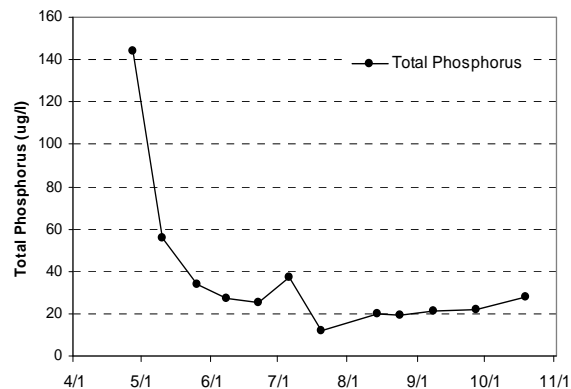
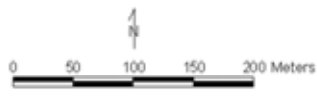
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Lake Minnetoga Minnetonka, Hennepin Co.

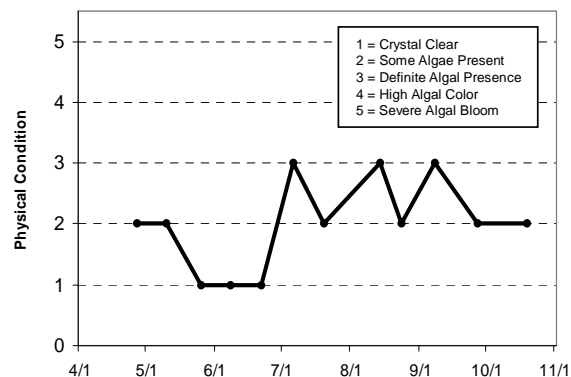
Lake ID: 270088
WD: Nine Mile Creek
Volunteers: Maressia & John Twele

● Sampling site
Contours in meters



2008 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	8.5				36	144		1.1	2	1
5/10	15.2				15	56		1.3	2	1
5/26	19				4	34		3.9	1	1
6/8	22.1				2.4	27		3.7	1	1
6/22	23.8				3.6	25		4	1	1
7/6	27.4				8.3	37		2.2	3	1
7/20	26				11	12		2.3	2	1
8/14	25.6				11	20		1.7	3	2
8/24	24.1				5.6	19		1.9	2	3
9/8	20.3				9.3	21		2.5	3	3
9/27	19.5				8.5	22		2.8	2	1
10/19	13.1				14	28		1.7	2	



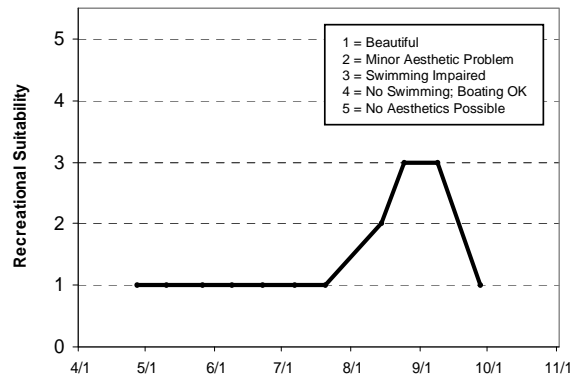
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus				C	B
Chlorophyll a				C	A
Secchi Depth				C	B
Lake Grade				C	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. 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*).

The lake has been previously monitored by Council staff, but 2008 marks the fifth year the lake has been monitored via the CAMP (2004 being the first). The lake was monitored 13 times in 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	46.3	21.0	79.0	C
CLA (µg/l)	14.8	2.0	35.0	B
Secchi (m)	1.7	0.5	3.8	C
TKN (mg/l)	1.97	1.50	3.10	
Lake Grade				C

The lake received a lake grade of C which is similar to those recorded in 1991, 1995, 2004, 2005, and 2007, but better than the D's recorded in 1999-2000 and 2003. The lake's water quality seems represented by lake grades between C and D. However, the lake received a CLA grade of B this year, which is an improvement over all previous monitored years. Continued monitoring is suggested to determine if the improved CLA grade is an indicator of a potential improving trend in average CLA concentrations.

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 1.3 (between 1- "crystal clear" and 2- "some algae present"). The average recreational suitability ranking was 1.0 ("beautiful").

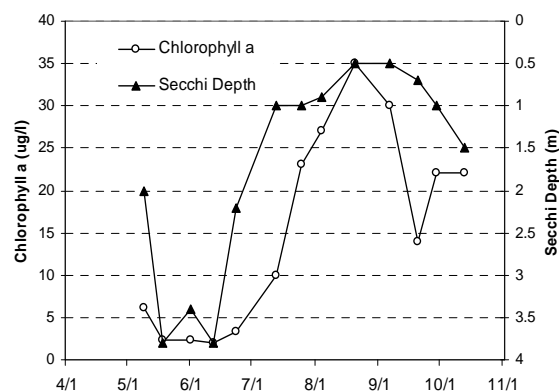
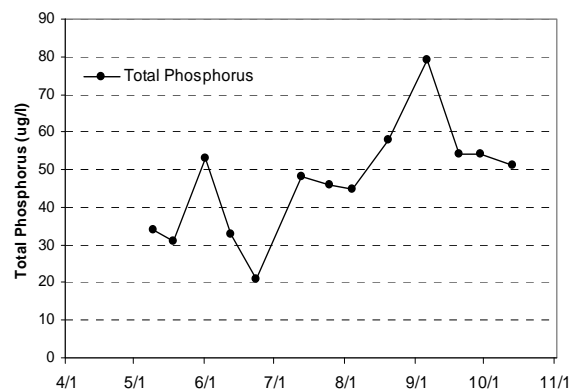
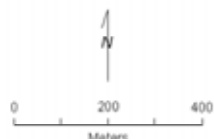
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Lake Mitchell Eden Prairie, Hennepin Co.

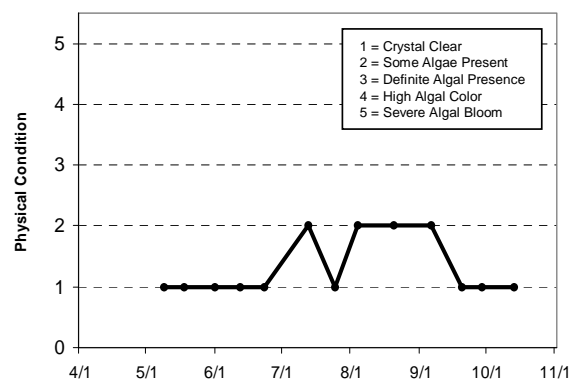
Lake ID: 270070
WD: Riley-Purgatory-Bluff
Creek
Volunteers: Fran & Gordon Warner

● Sampling site
Contours in meters



2008 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
5/9	15.4				6.1	34		2	1	1
5/18	16.8				2.4	31		3.8	1	1
6/1	21.8				2.3	53		3.4	1	1
6/12	22				2	33		3.8	1	1
6/23	23.8				3.4	21		2.2	1	1
7/13	24.4				10	48		1	2	1
7/25	26.5				23	46		1	1	1
8/4	28.5				27	45		0.9	2	1
8/20	25.8				35	58		0.5	2	1
9/6	21.8				30	79		0.5	2	1
9/20	23.2				14	54		0.7	1	1
9/29	19.5				22	54		1	1	1
10/13	15.4				22	51		1.5	1	1



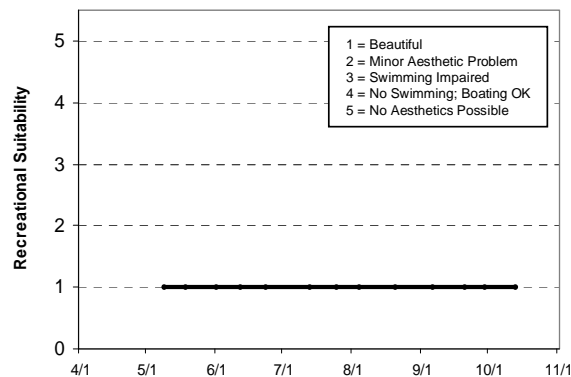
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade				C				D	D			D

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

Source: Metropolitan Council and STORET data



North Twin Lake (82-0018) *Carnelian - Marine 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 volume of the lake is approximately 207 ac-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 lake's 187-acre immediate watershed translates to a watershed-to-lake size ratio of 3:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

This was the eighth year that North Twin Lake has been involved in CAMP (2000-2006 being the others). A search through the STORET nationwide water quality database provided limited information other than the historical CAMP data.

The lake was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
Secchi (m)	1.1	0.9	1.5	D

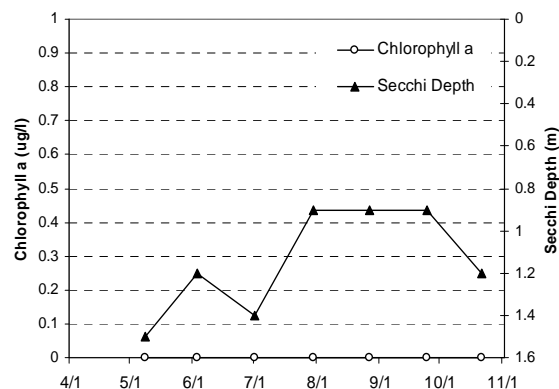
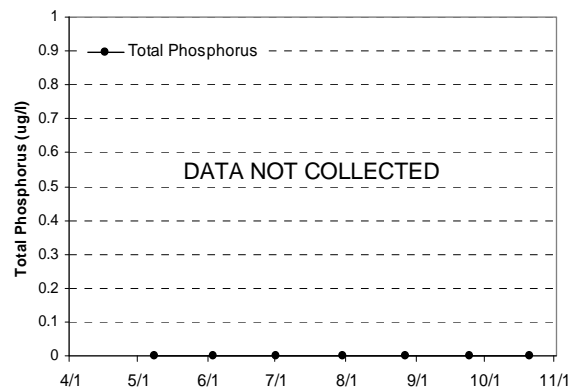
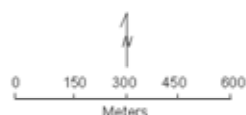
Only Secchi depth, temperature, and dissolved oxygen were monitored in 2008. Therefore no lake grade can be determined for this year.

The 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 1.5 (between 1- "crystal clear" and 2- "some algae present"). The average recreational suitability ranking was 1.7 (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.

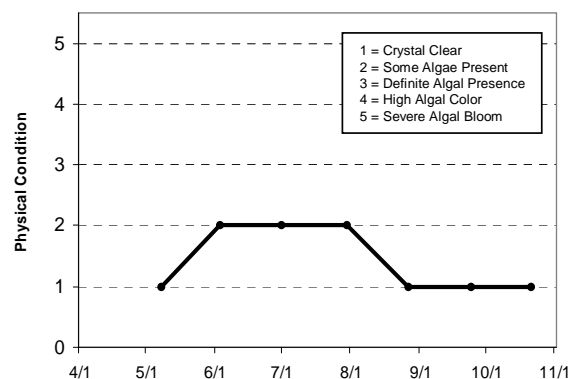
North Twin Lake Stillwater Twp., Washington Co.

LAKE ID: 820018
WD: Carnelian-Marine-St. Croix
Volunteer: Washington
Conservation District
● Sampling site
Contours in meters



2008 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
5/8	15.8	13.6	9.73	1.4				1.5	1	1
6/3	20.2	20.2	6.45	1.62				1.2	2	2
7/1	24.9	23.1	8.47	0.76				1.4	2	2
7/30	28.9	25.3	9.1	0.37				0.9	2	2
8/27	22.1	21.4	10.15	6.84				0.9	1	2
9/24	21.1	18.7	10.32	4.88				0.9	1	1
10/21	11	10.5	12.32	11.87				1.2	1	1



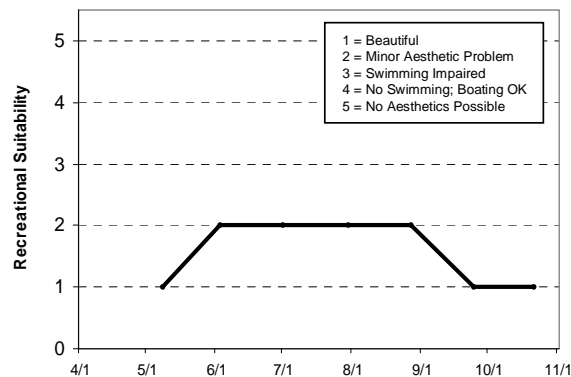
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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
Total Phosphorus	A	B	C	C	
Chlorophyll a	A	A	A	A	
Secchi Depth	C	D	C	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 lake has an approximate volume of 41 ac-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 lake's 1,341-acre immediate watershed translates to a watershed-to-lake area ratio of 89:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

This was the ninth year that Northwood Lake has been involved in the CAMP. The lake was also enrolled in the program in 2000-2007. Other than the 2000-2007 CAMP data, a search through the STORET nationwide water quality database revealed no other historical data.

The lake was monitored 9 times in 2008. 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.

2008 summer (May-September) data summary

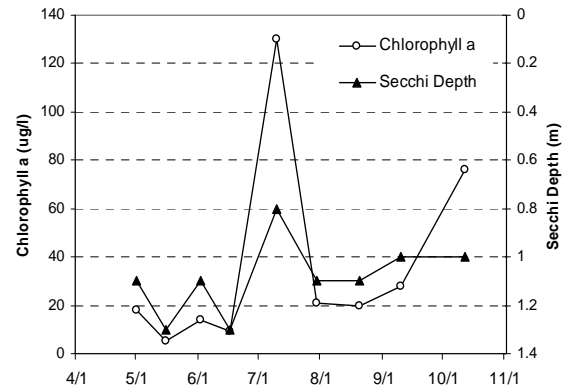
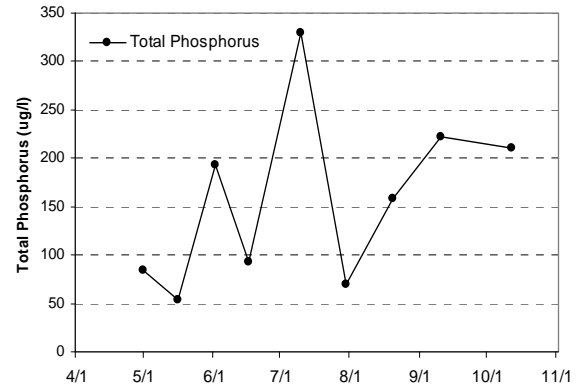
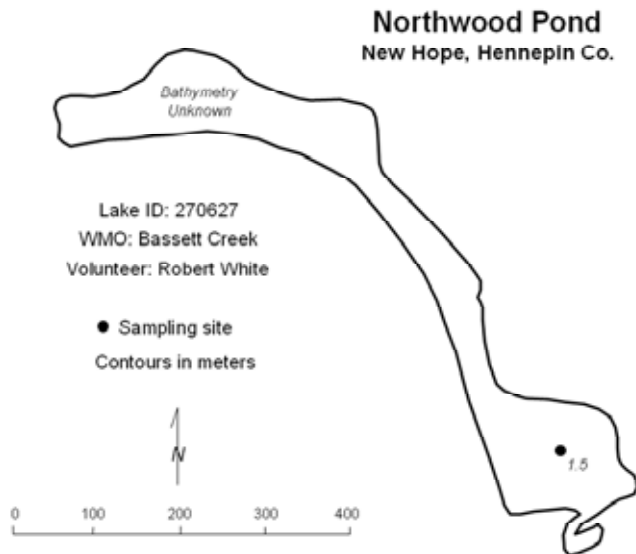
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	150.5	54.0	330.0	D
CLA (µg/l)	30.7	5.2	130.0	C
Secchi (m)	1.1	0.8	1.3	D
TKN (mg/l)	2.01	1.30	3.40	
Lake Grade				D

The lake received a lake grade of D in 2008 which is similar to the D lake grades received in 2000-2001, 2003, and 2006 – 2007 and worse than the C's received in 2002, and 2004-2005.

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.

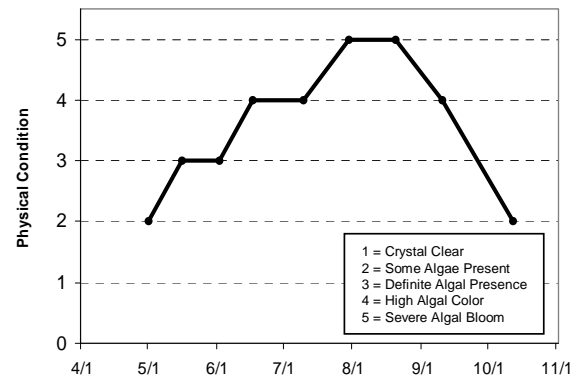
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 3.8 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.6 (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.



2008 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	16				18	84		1.1	2	4
5/16	18				5.2	54		1.3	3	4
6/2	21.5				14	193		1.1	3	4
6/17	24.9				9.1	93		1.3	4	5
7/10	28				130	330		0.8	4	5
7/30	27.3				21	69		1.1	5	5
8/20	25.8				20	159		1.1	5	5
9/10	21.8				28	222		1	4	5
10/12	18				76	211		1	2	4



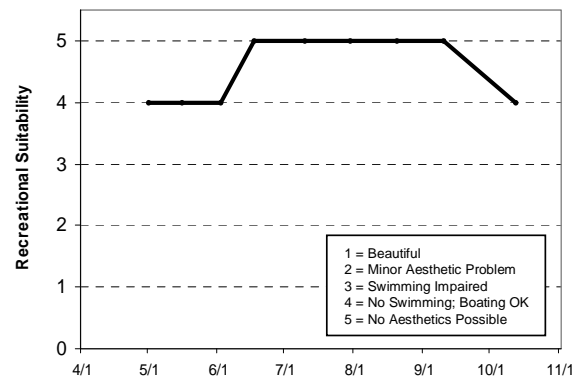
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Oak Lake (Site-1) (10-0093) Carver County Environmental Services

The entire Oak Lake is a 339-acre lake located within Watertown Township (Carver County). The maximum depth of the lake is 3.4 m (roughly 11 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).

This was the seventh year in which Oak Lake (Site-1) has been involved in CAMP (2001-2006 being the others). The 2001-2006 and 2008 CAMP data are the only known available data.

Oak Lake was monitored 15 times between mid April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

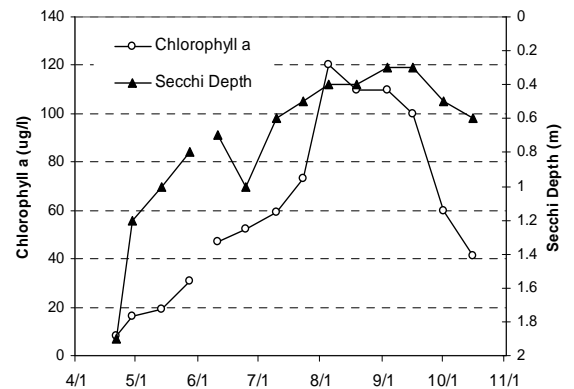
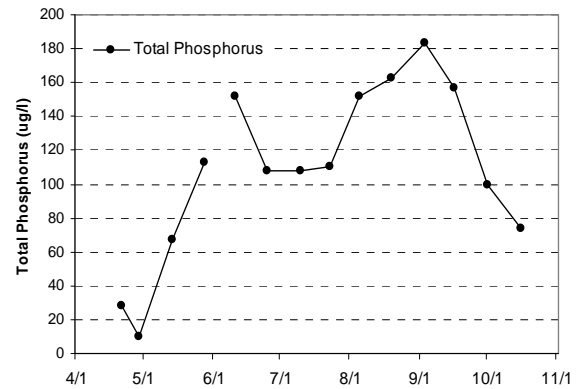
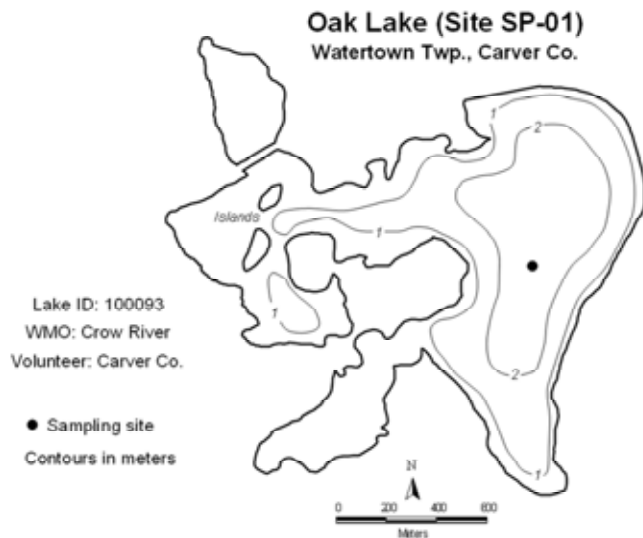
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	131.3	67.0	183.0	D
CLA (µg/l)	72.1	19.0	120.0	D
Secchi (m)	0.6	0.3	1.0	F
TKN (mg/l)	2.33	1.50	3.00	
Overall Grade				D

The lake received a lake grade of D for 2008. The lake has fluctuated from lake grades of C to D to F and back to D. There is no apparent trend in water quality. To better understand the lake's water quality and where it may be heading, additional years of data collection are suggested.

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 3.4 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").

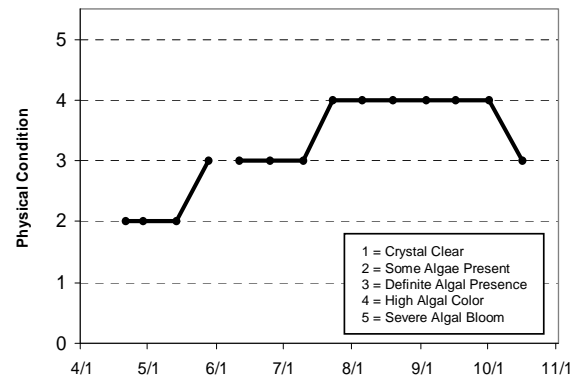
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 297-4916 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	6.83		11.76		8.3	28		1.9	2	4
4/29	7.08		10.99		16	10		1.2	2	4
5/14	13.55		12.67		19	67		1	2	3
5/28	16.72		9.05		31	113		0.8	3	5
6/1										
6/11	19		7.89		47	152		0.7	3	4
6/25	23.88		9.33		52	108		1	3	4
7/10	25.14		9.87		59	108		0.6	3	4
7/23	26.01		8.04		73	110		0.5	4	4
8/5	25.84		9.71		120	152		0.4	4	5
8/19	26.24		14.12		110	163		0.4	4	5
9/3	21.7		9.08		110	183		0.3	4	5
9/16	16.95		7.67		100	157		0.3	4	4
10/1	16.37		6.44		60	100		0.5	4	4
10/16	13.2		8.5		41	74		0.6	3	3



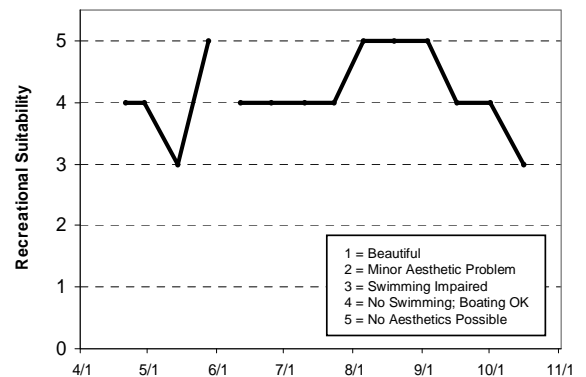
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

This marks the fourth year in which O'Connor Lake has been involved in CAMP. A search through the STORET nationwide water quality database for historic data on the lake revealed just the historical CAMP data.

The lake was monitored 15 times in 2008. 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.

2008 summer (May-September) data summary

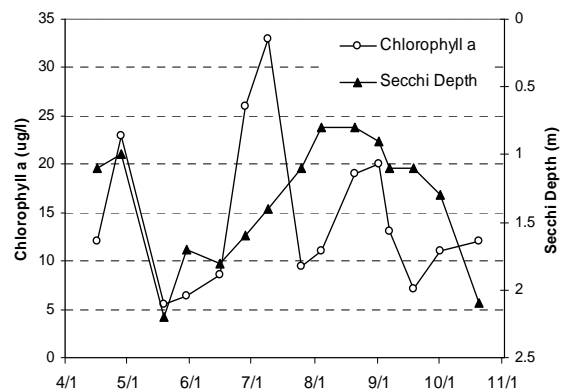
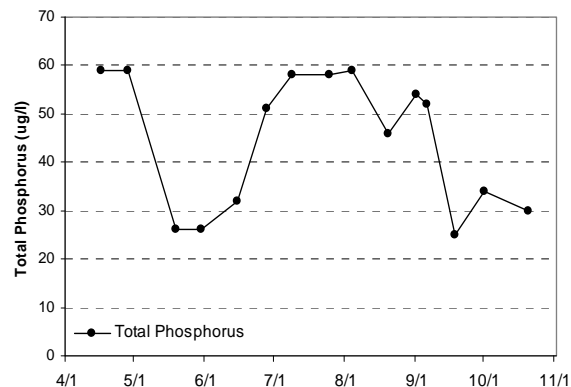
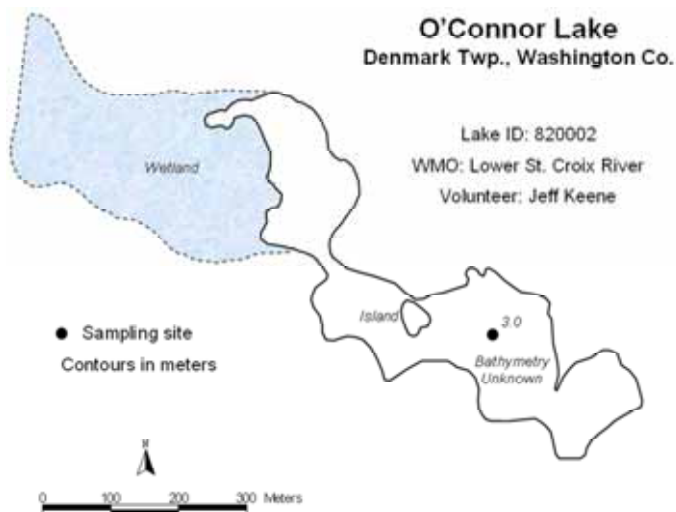
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	44.3	25.0	59.0	C
CLA (µg/l)	14.5	5.5	33.0	B
Secchi (m)	1.3	0.8	2.2	C
TKN (mg/l)	1.08	0.59	1.50	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to grades received in previous years. Continued monitoring is suggested to continue to build the water quality database.

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 2.7 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 4.0 (4- "no swimming/boating ok").

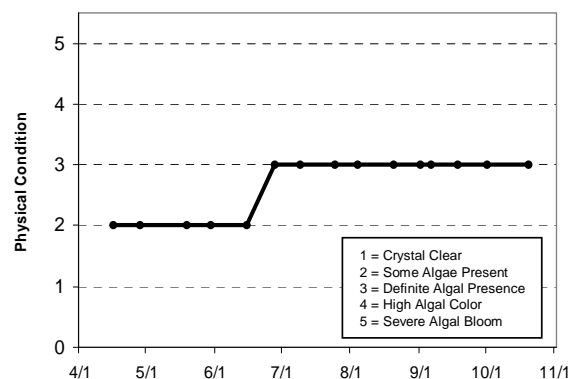
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/16	6.1				12	59		1.1	2	4
4/28	14.2				23	59		1	2	4
5/19	20.2				5.5	26		2.2	2	4
5/30	20.9				6.4	26		1.7	2	4
6/15	22.8				8.5	32		1.8	2	4
6/28	24.9				26	51		1.6	3	4
7/9	25.8				33	58		1.4	3	4
7/25	25.1				9.5	58		1.1	3	4
8/4	24.6				11	59		0.8	3	4
8/20	25.1				19	46		0.8	3	4
9/1	23.2				20	54		0.9	3	4
9/6	21.2				13	52		1.1	3	4
9/18	20.7				7.1	25		1.1	3	4
10/1	17				11	34		1.3	3	4
10/20	12.5				12	30		2.1	3	4



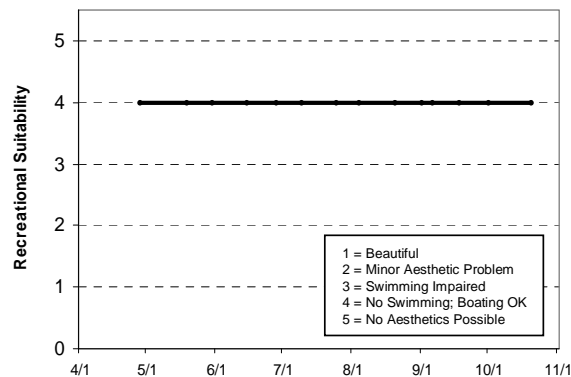
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus	C	C	C	C	C
Chlorophyll a	B	A	A	B	B
Secchi Depth	C	C	F	C	C
Lake Grade	C	B	C	C	C

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. 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*).

Although this is the third year that O'Dowd Lake has been enrolled in the CAMP, the lake was monitored by Council staff in the past. The lake was monitored 14 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	35.2	17.0	59.0	C
CLA (µg/l)	34.7	2.1	76.0	C
Secchi (m)	1.6	0.6	3.0	C
TKN (mg/l)	1.41	0.97	2.20	
Lake Grade				C

The lake received a lake grade of C for 2008. 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.

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").

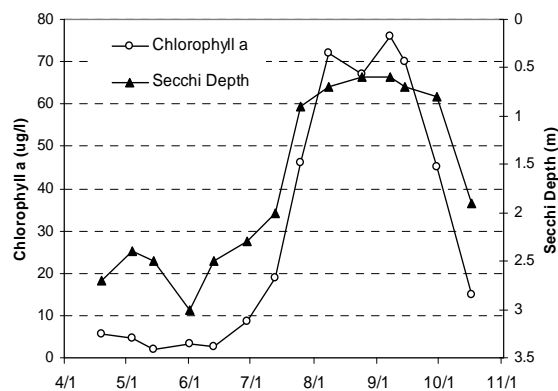
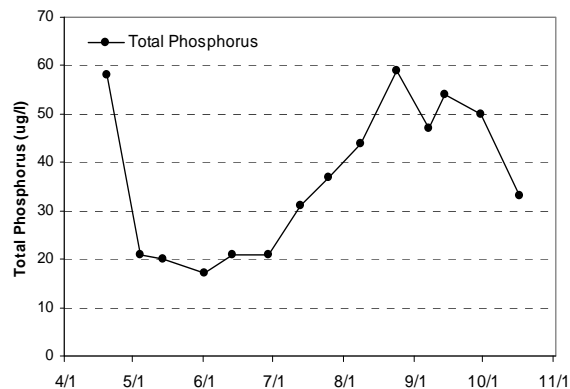
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

O'Dowd Lake
Louisville Twp./Shakopee,
Scott Co.

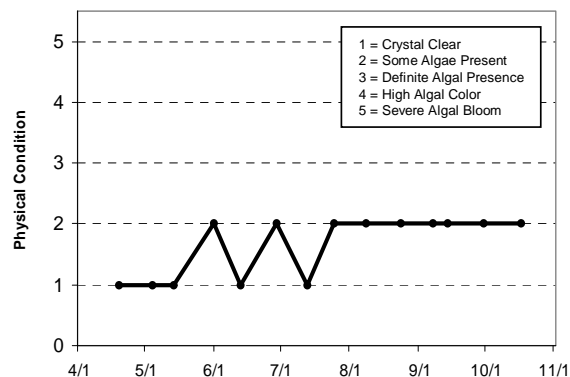
LAKE ID: 700095
WMO: Scott County
Volunteer: Sandy Boyce

● Sampling site
Contours in meters



2008 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	5.5				5.8	58		2.7	1	1
5/4	11.6				4.7	21		2.4	1	1
5/14	15.7				2.1	20		2.5	1	1
6/1	20.8				3.2	17		3	2	1
6/13	20.5				2.6	21		2.5	1	1
6/29	24.2				8.7	21		2.3	2	1
7/13	24.3				19	31		2	1	1
7/25	26.6				46	37		0.9	2	2
8/8	27.7				72	44		0.7	2	2
8/24	24.8				67	59		0.6	2	2
9/7	20.4				76	47		0.6	2	2
9/14	18.6				70	54		0.7	2	2
9/30	18.3				45	50		0.8	2	2
10/17	13.5				15	33		1.9	2	2



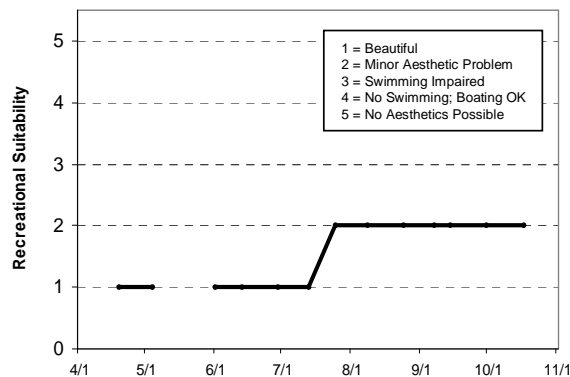
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Olson Lake (82-0103) Valley Branch Watershed District

Primary Report

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. 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 lake's area and mean depth result in an approximate lake volume of 614 ac-ft. The lake's surface area and watershed area of 200 acres translate to a 2:1 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*).

The lake was monitored 13 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	18.4	11.0	27.0	A
CLA (µg/l)	7.0	1.9	19.0	A
Secchi (m)	2.9	1.7	3.7	B
TKN (mg/l)	1.38	0.84	1.70	
Lake Grade				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 lake grade of A is evidence of the continued improvement in water quality. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

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 1.2 (between 1- "beautiful" and 2- "minor aesthetic problem").

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.

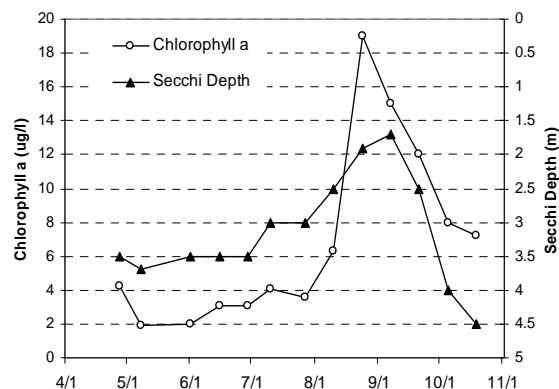
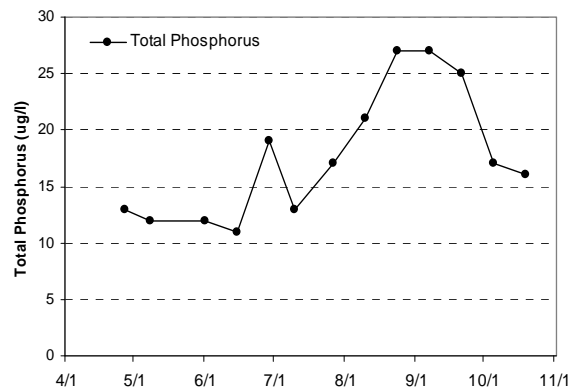
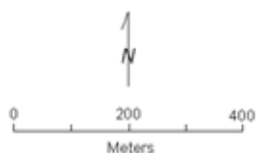
Lake Olson Lake Elmo, Washington Co.

Primary Report

Lake ID: 820103
WD: Valley Branch
Primary Volunteer: Bob Meier

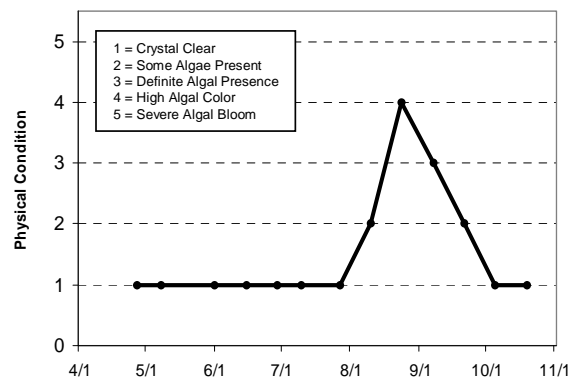
● Sampling site

Contours in meters



2008 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	8.9				4.2	13		3.5	1	1
5/8	13.9				1.9	12		3.7	1	1
6/1	20				2	12		3.5	1	1
6/15	21.4				3.1	11		3.5	1	1
6/29	24.1				3.1	19		3.5	1	1
7/10	25.2				4.1	13		3	1	1
7/27	26.1				3.6	17		3	1	1
8/10	26.3				6.3	21		2.5	2	1
8/24	24.8				19	27		1.9	4	2
9/7	19.7				15	27		1.7	3	2
9/21	19				12	25		2.5	2	1
10/5	15.7				8	17		4	1	1
10/19	13.3				7.2	16		4.5	1	1



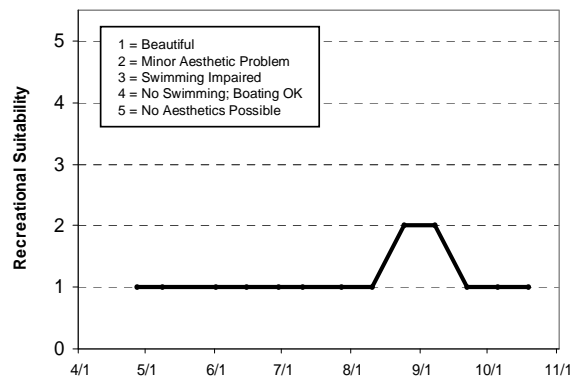
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



Olson Lake (82-0103) Valley Branch Watershed District

Secondary Report

Lake Elmo was also monitored by the Washington Conservation District (WCD) in 2008. The monitoring by the WCD provided duplicate monitoring for the lake. For more detailed information on the lake, refer to its primary report.

The lake was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	22.0	13.0	31.0	A
CLA (µg/l)	8.5	3.8	16.0	A
Secchi (m)	3.6	2.6	4.9	A
TKN (mg/l)	1.6	1.1	2.6	
Lake Grade				A

The data from the secondary volunteer compares well with the primary volunteer. Both volunteers observed the seasonal increase in CLA concentrations at the end of the summer period, and the associated decrease in water clarity at the same time. The secondary volunteer observed slightly clearer water clarity than the primary volunteer. Regardless, both datasets provide a lake grade of A for 2008.

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 2.2 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.0 ("minor aesthetic problem").

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.

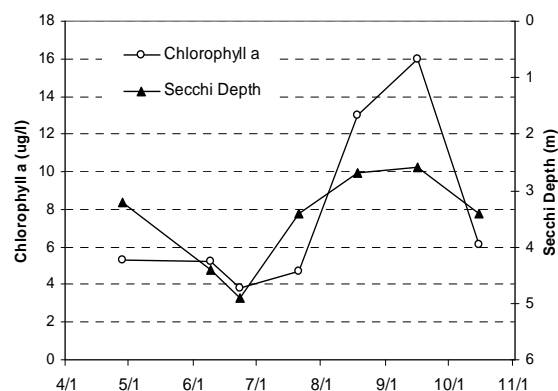
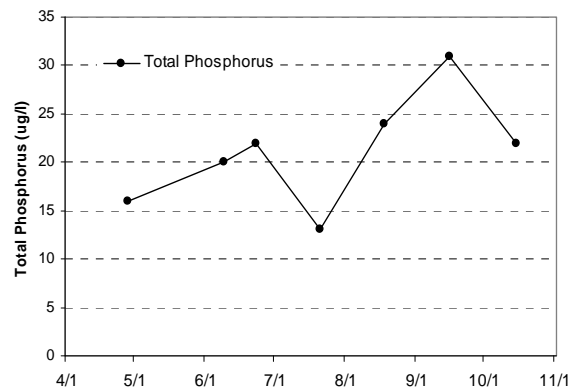
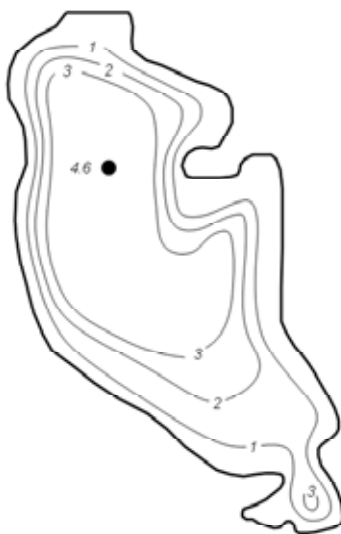
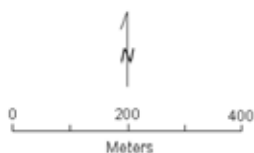
Lake Olson Lake Elmo, Washington Co.

Secondary Report

Lake ID: 820103
WD: Valley Branch
Secondary Volunteer:
Washington Conservation
District

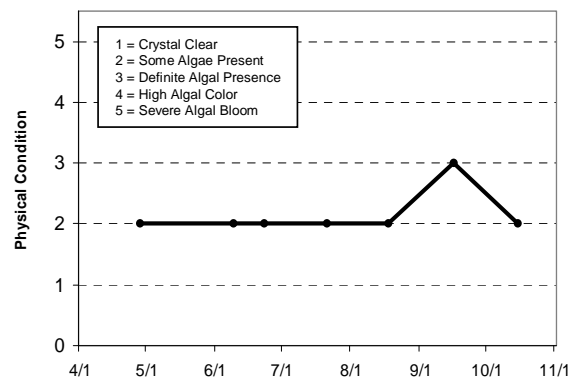
● Sampling site

Contours in meters



2008 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	8.2	8.3	11.98	8.88	5.3	16		3.2	2	1
6/9	19.9	18.4	8.29	7.02	5.2	20	27	4.4	2	2
6/23	22.8	21.2	9.15	0.81	3.8	22	16	4.9	2	2
7/21	25.6	24.4	7.11	0.22	4.7	13	21	3.4	2	1
8/18	25.1	24.4	7.93	0.21	13	24	22	2.7	2	2
9/16	18.5	18.5	8.97	0.18	16	31	30	2.6	3	3
10/15	14.2	14.3	7.71	0.35	6.1	22	19	3.4	2	2



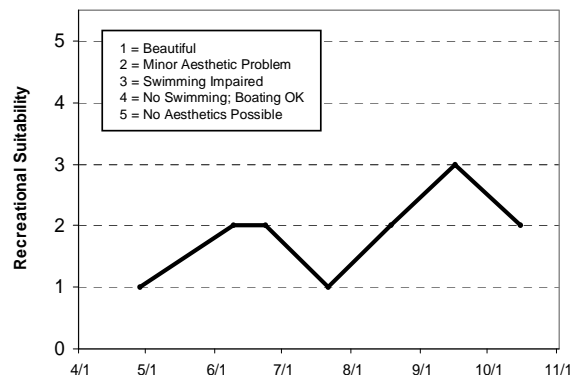
Lake Water Quality Grades Based on Summertime Averages

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

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

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. The 250-acre lake has a 2,012-acre watershed, which translates to an 8:1 watershed-to-lake size ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff. The maximum and mean depths of the lake are 10.0 m (33 ft) and 3.0 m (10 ft), respectively. The lake's surface area and mean depth translate to an approximate volume of 2,500 acre-feet. Approximately 75 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance.

A search through the STORET nationwide water quality database provided data for nutrient and Secchi transparency data for 1980-1981, 1983, 1989, 1993, 1998-2001, and 2003-2007, as well as just Secchi data for 1987-1988. The lake had been monitored by Council staff prior to 1999, and was again monitored by Council staff in 2006.

The lake was monitored 12 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	22.5	12.0	51.0	A
CLA (µg/l)	10.1	1.3	33.0	B
Secchi (m)	3.1	1.1	5.1	A
TKN (mg/l)	1.32	0.92	1.90	
Lake Grade				A

The lake received a lake grade of A for 2008, which is the first time that the lake received an A grade. All parameters notably improved in 2008. However, a trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). Continued monitoring is suggested to determine if the water quality of 2008 is an indicator of a potential improving water quality trend.

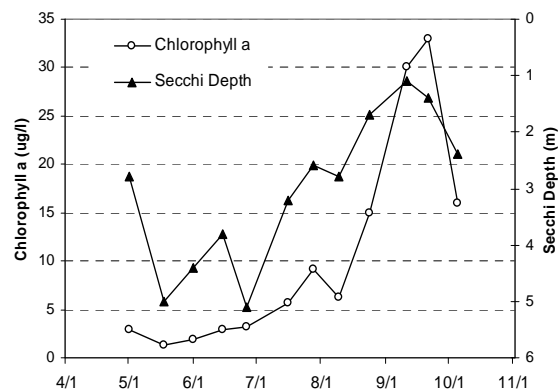
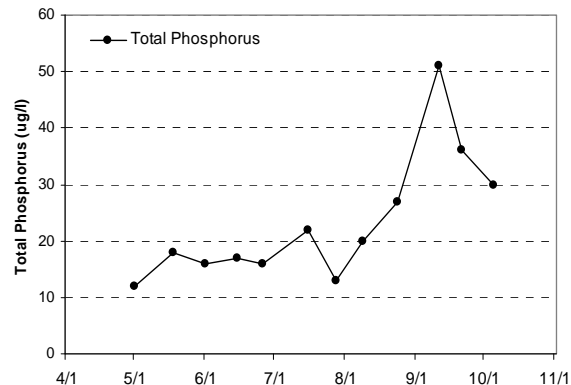
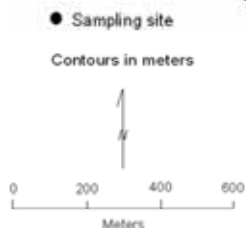
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 1.6 (between 1- "crystal clear" and 2- "some algae present"). The average recreational suitability ranking was 1.2 (between 1- "beautiful" and 2- "minor aesthetic problem").

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.

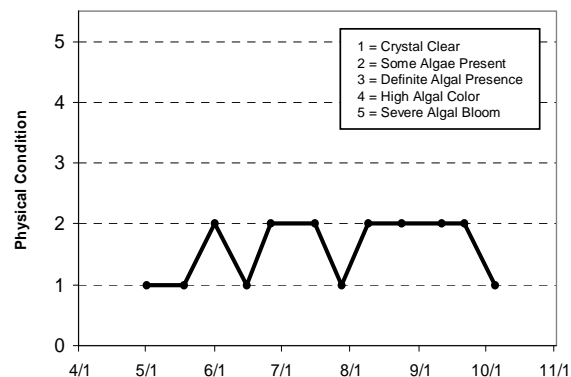
Orchard Lake Lakeville, Dakota Co.

LAKE ID: 190031
WMO: Black Dog
Volunteer:
Tom Goodwin



2008 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	9.8				2.9	12		2.8	1	1
5/18	17.2				1.3	18		5	1	1
6/1	20.2				1.9	16		4.4	2	1
6/15	21.2				2.9	17		3.8	1	1
6/26	25.9				3.2	16		5.1	2	1
7/16	27.7				5.6	22		3.2	2	1
7/28	26.1				9.2	13		2.6	1	1
8/9	27.2				6.3	20		2.8	2	1
8/24	24.6				15	27		1.7	2	1
9/11	19.2				30	51		1.1	2	2
9/21	21.3				33	36		1.4	2	2
10/5	16.2				16	30		2.4	1	1



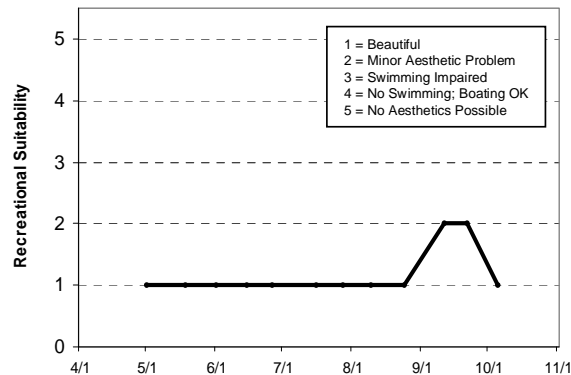
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



Ox Yoke Lake (27-0178) *Pioneer-Sarah Watershed Management Commission*

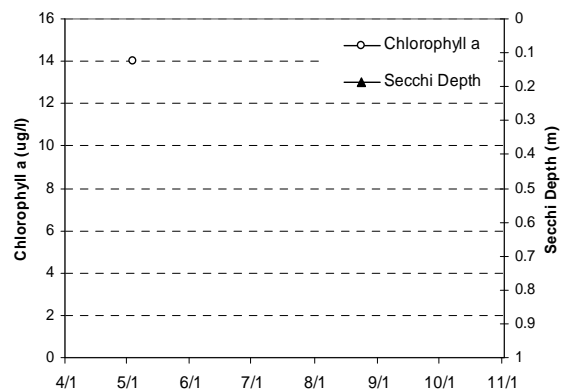
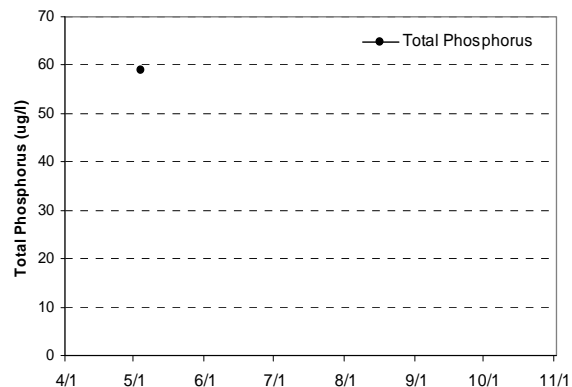
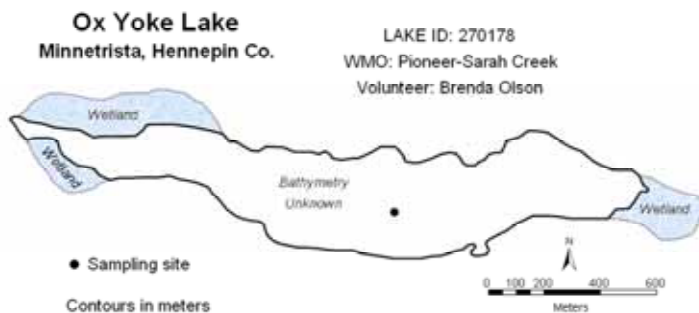
Ox Yoke Lake is located in the City of Minnetrista (Hennepin County). Little morphological data is available for the lake.

A search through the STORET nationwide water quality database provided data for Secchi transparency data for 2006 – 2008.

The lake was monitored once in 2008 as part of the CAMP. On that one sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), and total Kjeldahl nitrogen (TKN). The resulting data are summarized in tables and figures on the following page.

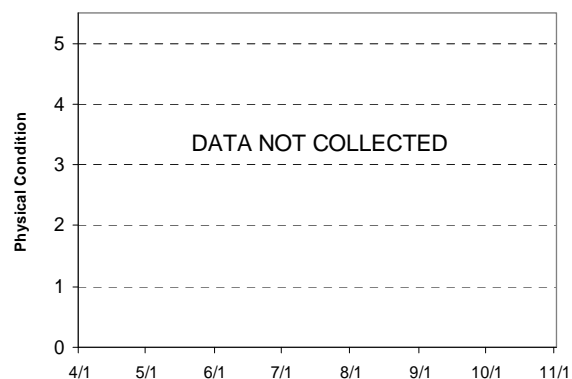
No grades were calculated on the basis of the CAMP data because only one sampling event was performed by the CAMP volunteer during 2008. However, a different volunteer measured Secchi depths in 2008 as part of the MPCA's Citizens Lake Monitoring Program (CLMP). The Secchi grade was an F for 2008, as calculated from the CLMP volunteer-collected 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.



2008 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(°C)	(°C)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
5/4					14	59				



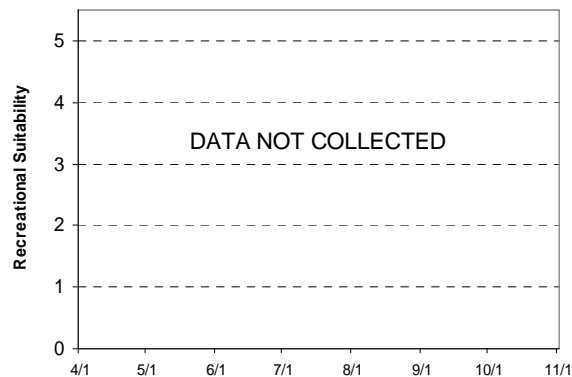
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					
Chlorophyll a					
Secchi Depth					F
Lake Grade					

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 lake's size and mean depth result in an approximate lake volume of 1,164 ac-ft. Approximately 70 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's 950-acre immediate watershed translates to a moderate watershed-to-lake area ratio of 10:1. 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*).

The lake was monitored 13 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	25.2	18.0	43.0	B
CLA (µg/l)	7.6	1.0	16.0	A
Secchi (m)	2.3	1.0	5.5	B
TKN (mg/l)	1.32	1.00	1.70	
Lake Grade				B

The lake received a lake grade of B for 2008, 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 2008. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). Continued monitoring is suggested to determine potential trends in the lake's water quality.

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 2.5 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.5 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

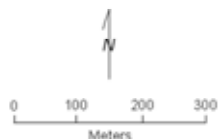
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Parkers Lake Plymouth, Hennepin Co.

Lake ID: 270107
WMO: Bassett Creek
Volunteer: Bob Videen

● Sampling site
Contours in meters



2008 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	8				12	39		1	4	4
5/17	12				5.8	43		1.5	3	3
5/28	13				1	23		5.5	1	1
6/9	16				8	24		4	2	2
6/23	26				12	18		2.7	3	2
6/29	24				6.1	20		2.6	2	2
7/21	27				3.2	22		1.5	2	2
8/7	27				10	21		1.4	3	3
8/20	27				7.5	20		2	2	2
9/4	22				16	29		1.2	2	4
9/16	20				2.2	18		2.3	3	3
10/2	18				4.5	20		4	2	2
10/16	16				5.5	22		4	4	4

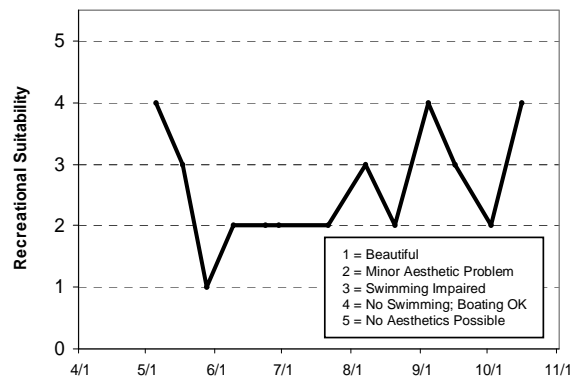
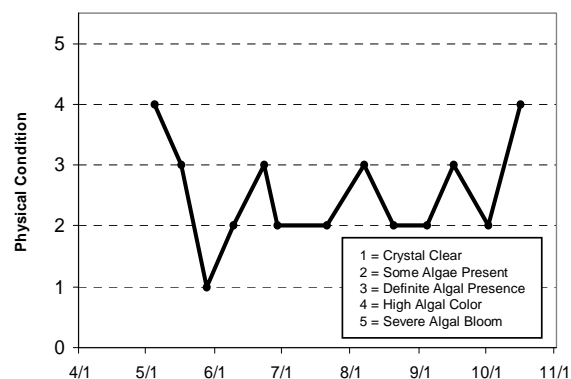
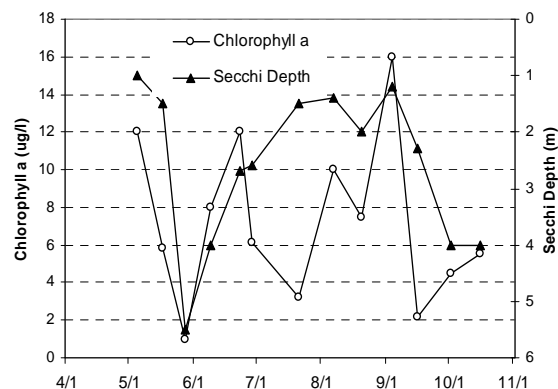
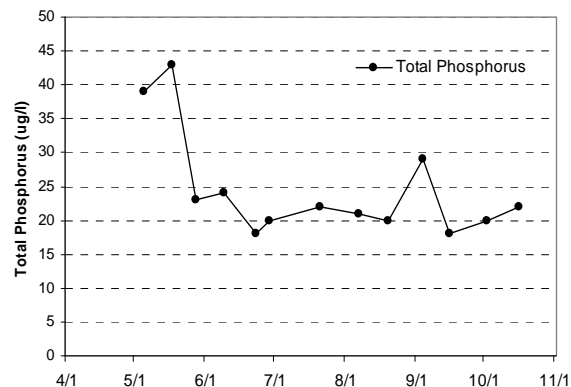
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade				C				C	A		A	B

Year	2004	2005	2006	2007	2008
Total Phosphorus	B	C	C	B	B
Chlorophyll a	A	B	A	A	A
Secchi Depth	C	B	A	B	B
Lake Grade	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. This was the third year that Pat Lake has been involved in the CAMP. A search through the STORET nationwide water quality database for data on the lake provided no data other than the historical CAMP data.

The lake was monitored 7 times in 2008. 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.

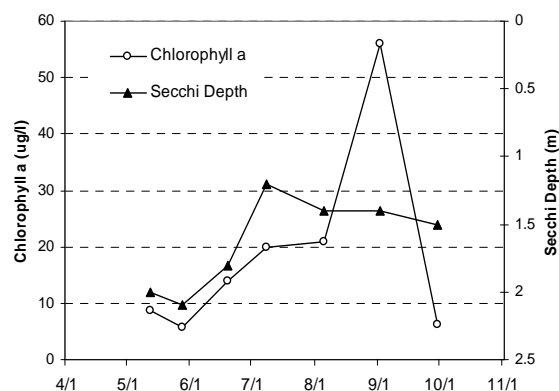
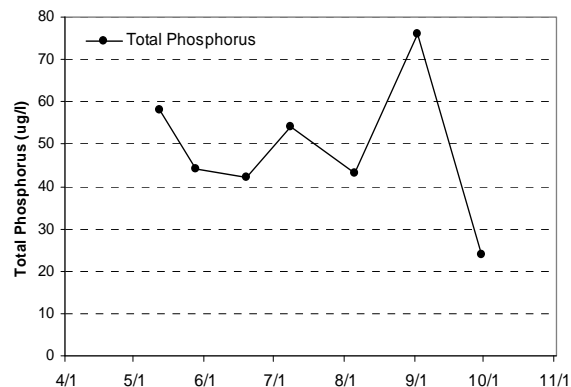
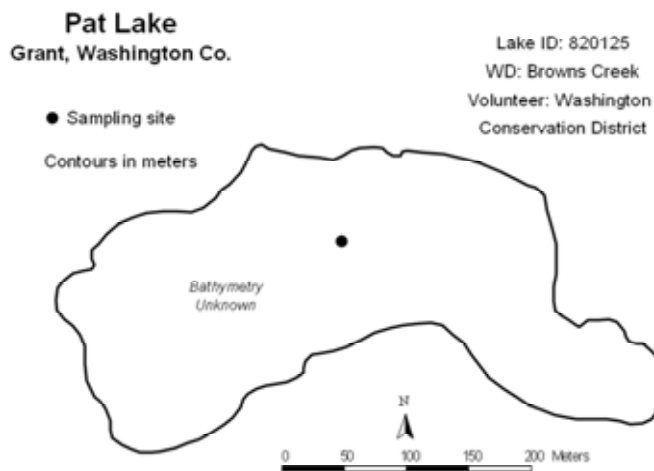
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	48.7	24.0	76.0	C
CLA (µg/l)	18.8	5.7	56.0	B
Secchi (m)	1.6	1.2	2.1	C
TKN (mg/l)	1.05	0.66	1.60	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to the lake grade received in 2006. There are only 3 monitoring seasons of data, so there are insufficient quantities of data to determine trends. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

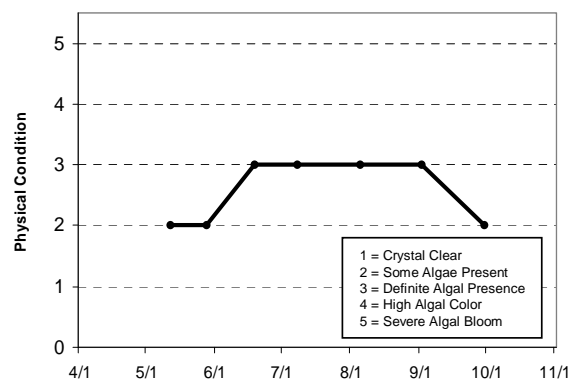
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.6 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 3.4 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/12	15.7	15.6	10	8.23	8.6	58		2	2	3
5/28	20.5	17.8	8.41	8.15	5.7	44		2.1	2	3
6/19	24.1	20.8	9.23	0.53	14	42		1.8	3	4
7/8	26.1	24.4	8.66	1.02	20	54		1.2	3	4
8/5	25.9	23.6	6.88	0.26	21	43		1.4	3	4
9/2	24.7	21.6	7.94	0.19	56	76		1.4	3	4
9/30	16.6	16.4	7.44	3.8	6.2	24		1.5	2	2



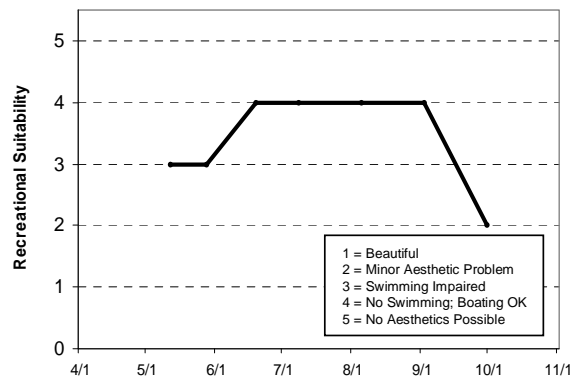
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Pike Lake [Ramsey Co.] (62-0069) Rice Creek Watershed District

Pike Lake is a 35-acre lake located within the City of New Brighton (Ramsey County). The mean and maximum depths of the lake are 2.1 m (6.9 ft) and 4.9 m (16 feet). The lake's mean depth and surface area translate to a lake volume of 242 ac-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 lake was monitored 13 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	72.6	33.0	125.0	D
CLA (µg/l)	30.5	4.3	60.0	C
Secchi (m)	1.1	0.5	3.0	D
TKN (mg/l)	1.94	0.96	2.70	
Lake Grade				D

The lake received a lake grade of D in 2008, which is similar to the lake grades received in most of the monitoring seasons since 1981. The lake has experienced occasional C and F lake grades in the past, but the lake has received a D lake grade every year consistently since 1999. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

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 2.9 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.6 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

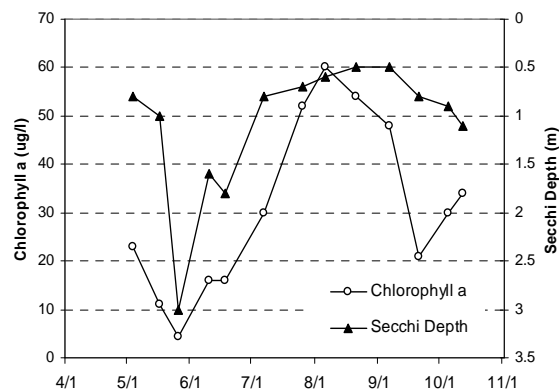
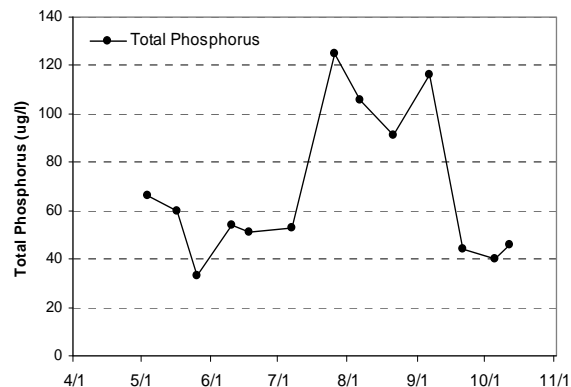
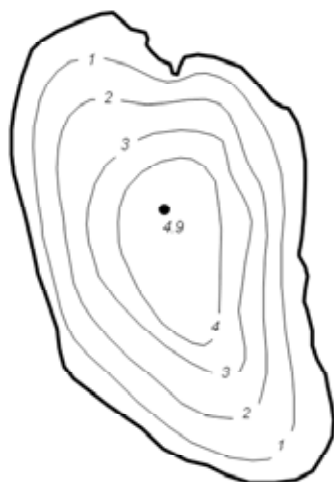
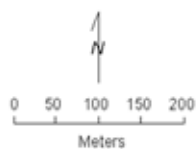
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Pike Lake New Brighton, Ramsey Co.

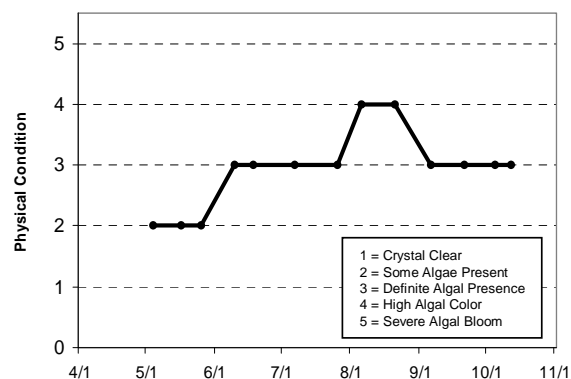
Lake ID: 620069
WD: Rice Creek
Volunteer: Phil Goodrich

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/4	13.2				23	66		0.8	2	2
5/17	18.8				11	60		1	2	2
5/26	19.6				4.3	33		3	2	2
6/10	21.6				16	54		1.6	3	2
6/18	23.6				16	51		1.8	3	3
7/7	27.4				30	53		0.8	3	3
7/26	26.4				52	125		0.7	3	3
8/6	26.6				60	106		0.6	4	3
8/21	26.2				54	91		0.5	4	3
9/6	22.1				48	116		0.5	3	3
9/21	22.5				21	44		0.8	3	3
10/5	17.3				30	40		0.9	3	2
10/12	17				34	46		1.1	3	3



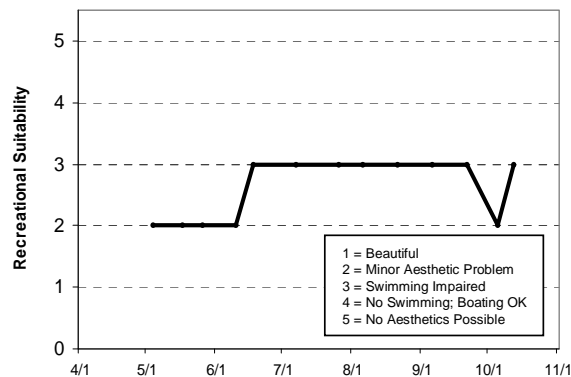
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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). The lake has an approximate lake volume of 1,740 ac-ft. Because of its multi-recreational uses, it is considered a “Priority Lake” in the Metropolitan Area. The lake has two aeration systems to prevent winter fish-kills. The systems are operated only during the winter period.

The lake was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	30.0	18.0	50.0	B
CLA (µg/l)	10.5	3.3	30.0	B
Secchi (m)	2.3	1.4	3.0	B
TKN (mg/l)	0.87	0.74	1.20	
Lake Grade				B

The lake received a lake grade of B in 2008, which is similar to the lake grades received since 2004. The annual lake grades have varied between B’s and C’s on the basis of the historical water quality database. A trend analysis conducted by the MPCA on the lake’s Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

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 1.9 (between 1- “crystal clear” and 2- “some algae present”). The average recreational suitability ranking was 2.3 (between 2- “minor aesthetic problem” and 3- “swimming slightly impaired”).

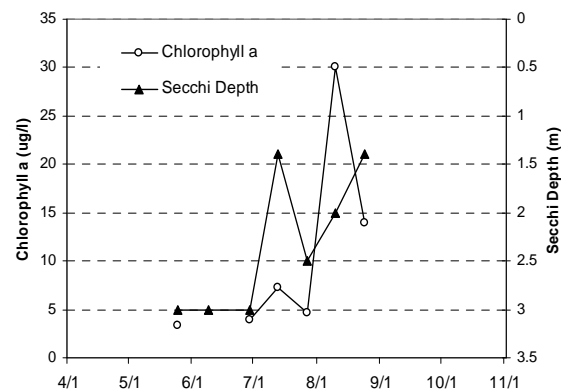
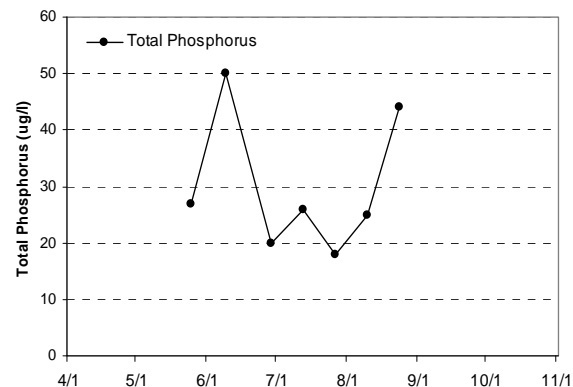
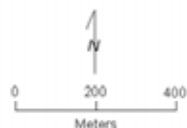
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Pine Tree Lake Dellwood/Grant, Washington Co.

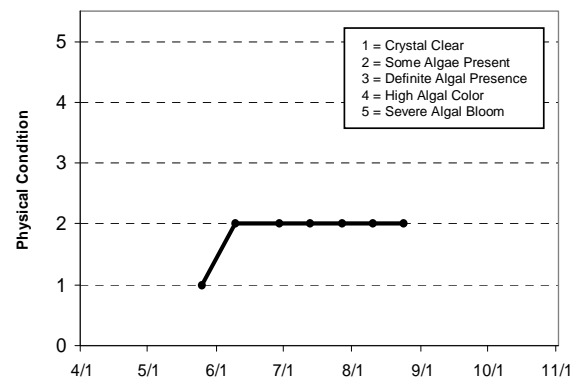
Lake ID: 820122
WD: Rice Creek
Volunteer: Gene Berwald

● Sampling site
Contours in meters



2008 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
5/25	17.9				3.3	27		3	1	1
6/9	22					50		3	2	3
6/29	24.8				3.9	20		3	2	1
7/13	24.2				7.3	26		1.4	2	3
7/27	26.9				4.7	18		2.5	2	3
8/10	26.7				30	25		2	2	3
8/24	25.1				14	44		1.4	2	2



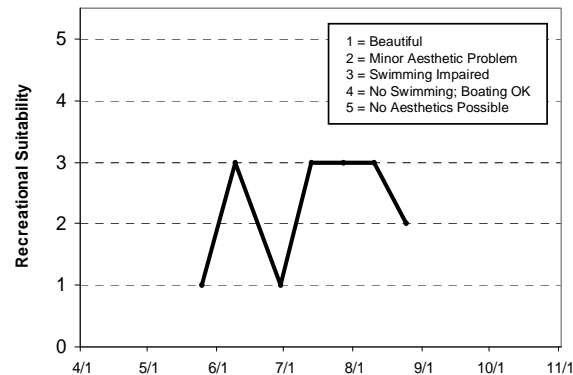
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade	B	B	C	C	B	B	B	B	B	C	C	C

Year	2004	2005	2006	2007	2008
Total Phosphorus	B	B	C	B	B
Chlorophyll a	A	B	A	A	B
Secchi Depth	B	B	B	B	B
Lake Grade	B	B	B	B	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. No historical monitoring data was provided by STORET, the national water quality database.

The lake was monitored 7 times in 2008. 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.

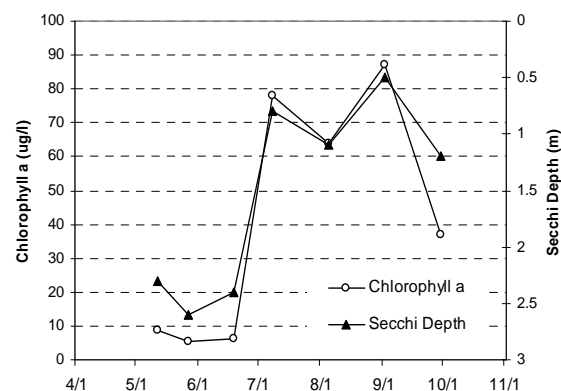
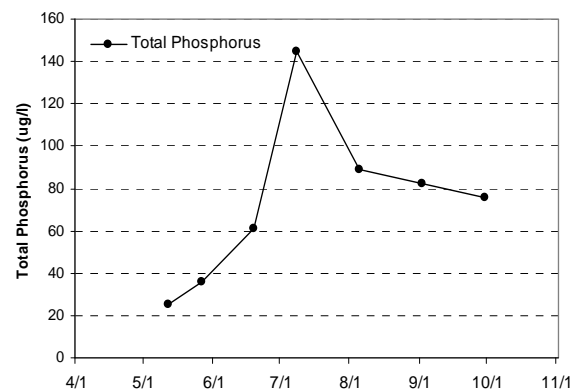
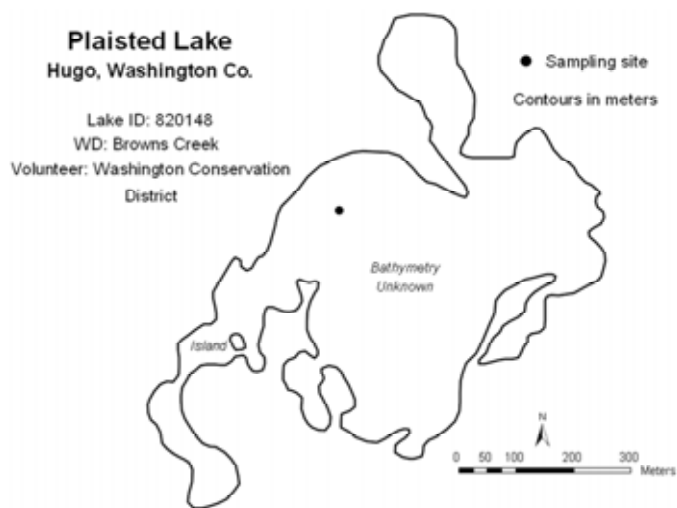
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	73.4	25.0	145.0	D
CLA (µg/l)	40.9	5.2	87.0	C
Secchi (m)	1.6	0.5	2.6	C
TKN (mg/l)	1.94	1.10	2.90	
<i>Lake Grade</i>				C

The lake received a lake grade of C in 2008. Continued monitoring is necessary to build the water quality database for this lake.

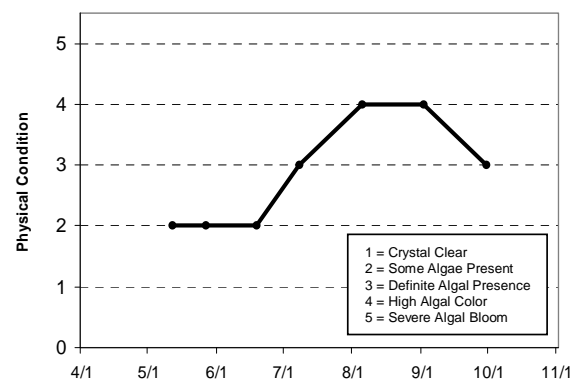
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.9 (between 1- "crystal clear" and 2- "some algae present"). The average recreational suitability ranking was 3.1 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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.



2008 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
5/12	14.1	14.1	11.52	11.5	8.8	25		2.3	2	3
5/27	17.1	16.8	8.73	4.58	5.2	36		2.6	2	3
6/19	24.1	19.9	8.35	2.03	6.2	61		2.4	2	3
7/8	26.5	20.8	10.79	0.22	78	145		0.8	3	2
8/5	25.9	20.9	4.78	0.14	64	89		1.1	4	4
9/2	23.8	21.8	7.16	0.17	87	82		0.5	4	4
9/30	17.6	17.2	5.55	0.22	37	76		1.2	3	3



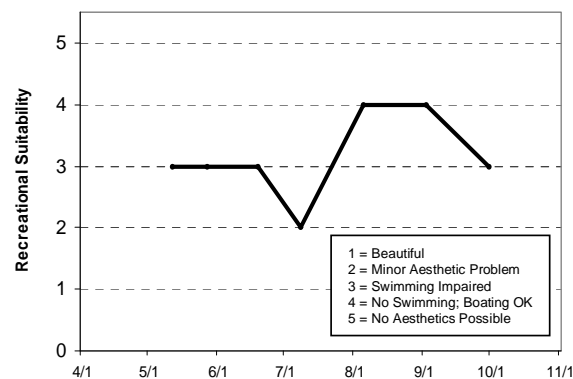
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
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
Total Phosphorus					D
Chlorophyll a					C
Secchi Depth					C
Lake Grade					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, a shoreline length of 1.75 miles, and a maximum depth of 12.5 m (41.0 feet). Approximately 50 percent of the lake's surface area is considered littoral, which is the shallow (0-15 feet) zone dominated by aquatic vegetation. There is a public access (canoe only) on the northwest end of the lake near one of its two inlets. The lake has no 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.

The lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

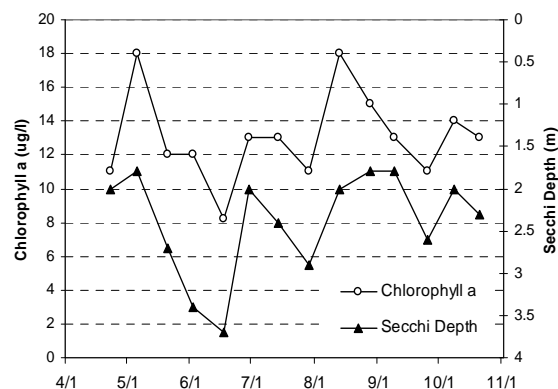
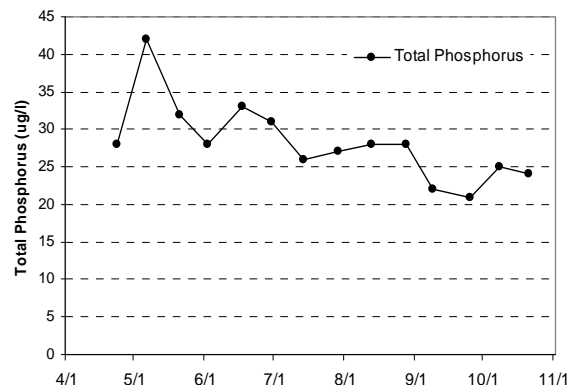
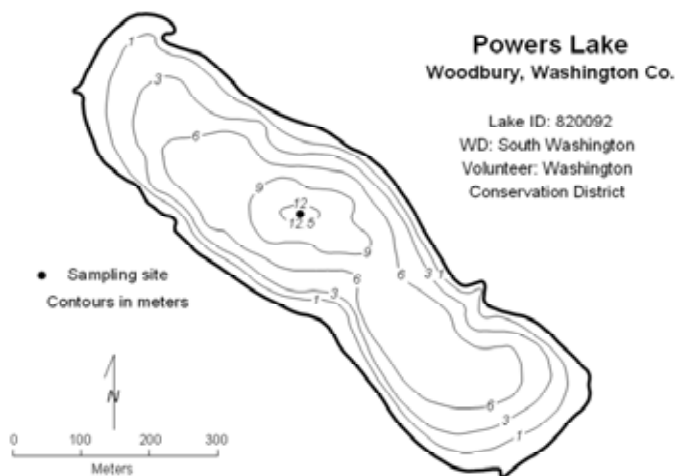
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	28.9	21.0	42.0	B
CLA (µg/l)	13.1	8.2	18.0	B
Secchi (m)	2.5	1.8	3.7	B
TKN (mg/l)	1.26	1.10	1.60	
Lake Grade				B

The lake received a lake grade of B for 2008. This grade is an improvement over recent years' lake grades. The water quality observed in 2008 is characteristic of the better water quality observed in the years 2000 and the 1990's. However, A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant declining trend in water clarity (MPCA 2008). Continued monitoring is suggested to determine if the improvement in water quality observed in 2008 is evidence of the beginning of a potential change in trend or an annual anomaly.

The physical and recreational conditions of the lake, as perceived by the volunteer, were ranked on a 1-to-5 scale and are displayed on the next page. The mean physical condition ranking was 3.0 (3- "definite algae present"), while the mean recreational suitability ranking was 3.6 (between 3- "swimming impaired" and 4- "no swimming – boating ok").

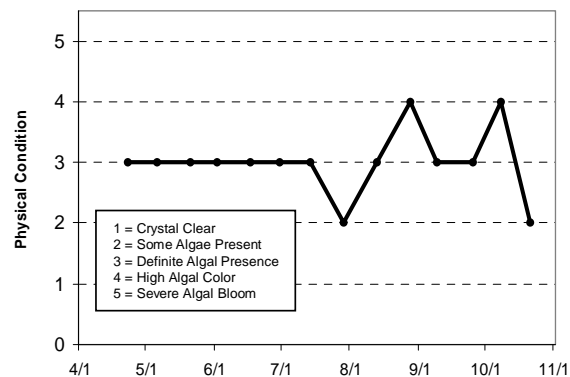
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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



2008 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
4/23	7.9	4.3	11.17	1.31	11	28		2	3	3
5/6	13.7	5.5	11.73	0.75	18	42		1.8	3	3
5/21	15.1	6.7	10.74	0.25	12	32	83	2.7	3	3
6/2	19.7	7.1	9.28	0.16	12	28	168	3.4	3	4
6/17	20.8	7.5	8.58	0.23	8.2	33	205	3.7	3	4
6/30	23.5	7.7	9.89	0.7	13	31	252	2	3	4
7/14	23.5	7.8	7.34	0.44	13	26	273	2.4	3	4
7/29	26.9	8.1	8.46	0.25	11	27	340	2.9	2	3
8/13	25.4	8.2	7.96	0.36	18	28	365	2	3	4
8/28	23	8.5	6.08	0.17	15	28	556	1.8	4	4
9/9	20.5	8.5	8.12	0.26	13	22	492	1.8	3	4
9/25	19.7	8.6	7.39	0.2	11	21	597	2.6	3	3
10/8	16.4	8.5	7.7	0.24	14	25	595	2	4	4
10/21	13	8.8	8.27	0.28	13	24	577	2.3	2	2



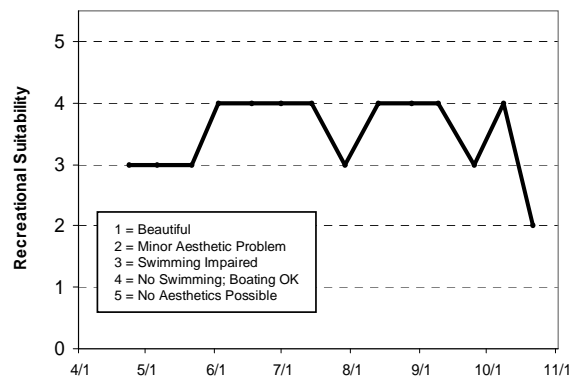
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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
Total Phosphorus	C	C	C	C	B
Chlorophyll a	C	C	C	B	B
Secchi Depth	C	C	C	C	B
Lake Grade	C	C	C	C	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. A search through the STORET system, the national water quality database, provided historical Secchi transparency data for 1989-1991 and 1997-1999.

This year was the first year that the lake was involved in the CAMP. The lake was monitored 13 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	149.1	50.0	284.0	D
CLA (µg/l)	77.1	15.0	190.0	F
Secchi (m)	0.4	0.1	0.6	F
TKN (mg/l)	3.19	1.10	5.70	
Lake Grade				F

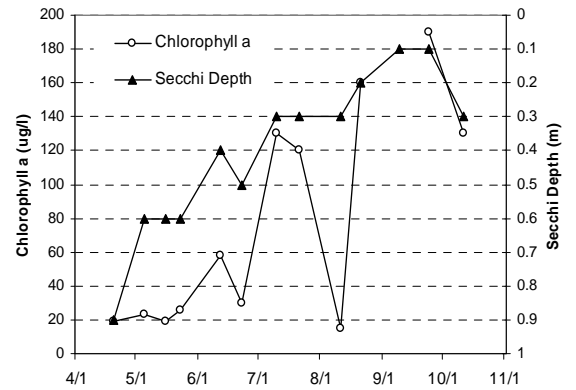
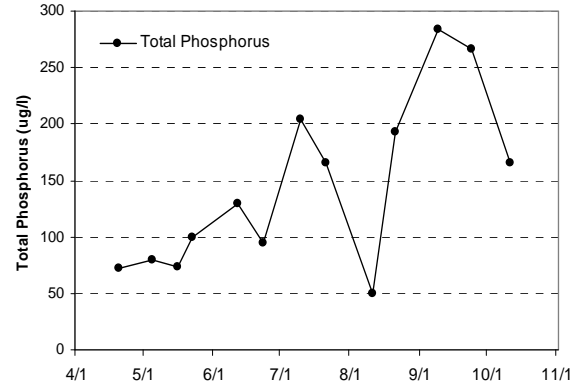
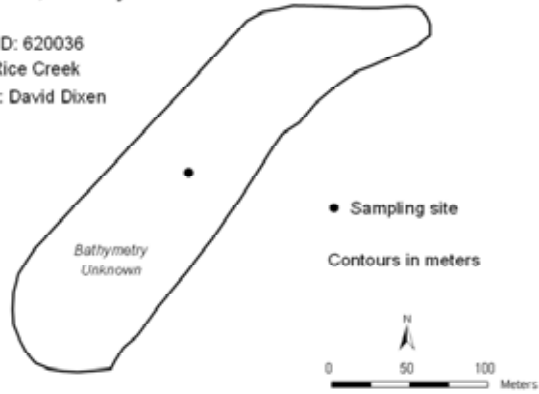
The lake received a lake grade of F for 2008. Continued monitoring is necessary to build the water quality database for this lake. The Secchi grade of F for 2008 is the same as the Secchi grades received for previous monitoring seasons dating back to 1989.

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 3.0 ("definite algae present"). The average recreational suitability ranking was 3.8 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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.

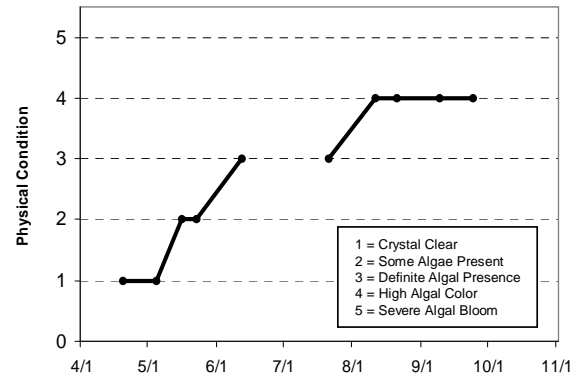
Priebe Lake White Bear Lake, Ramsey Co.

Lake ID: 620036
WD: Rice Creek
Volunteer: David Diken



2008 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				19	72		0.9	1	
5/5	13.8				23	80		0.6	1	
5/16	21.7				19	74		0.6	2	2
5/23	20.8				26	99		0.6	2	4
6/12	23.2				58	129		0.4	3	4
6/23	28.1				30	94		0.5		
7/10	24.7				130	204		0.3		
7/21	29.2				120	166		0.3	3	4
8/11	26.8				15	50		0.3	4	4
8/21	27.4				160	193		0.2	4	4
9/9	21.5					284		0.1	4	4
9/24	20.8				190	267		0.1	4	4
10/11	17.8				130	165		0.3		



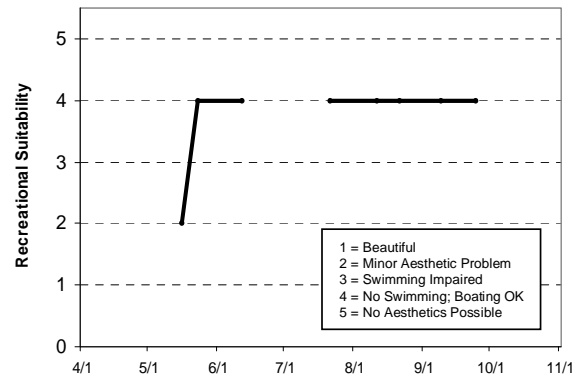
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

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. Approximately 39 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The lower basin's 2,090-acre watershed translates to a rather small watershed-to-lake area ratio of 2.5:1. The greater the ratio, the greater the potential stress on the lake from surface runoff. 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.*).

While the Metropolitan Council has monitored the lower basin of Prior Lake in the past, the basin has been a part of the CAMP since 1997. Lower Prior was monitored 12 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	19.9	10.0	39.0	A
CLA (µg/l)	11.0	2.3	28.0	B
Secchi (m)	3.0	1.5	5.0	B
TKN (mg/l)	1.08	0.84	1.20	
Lake Grade				B

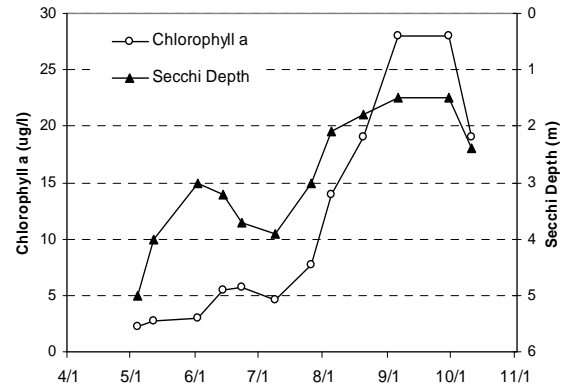
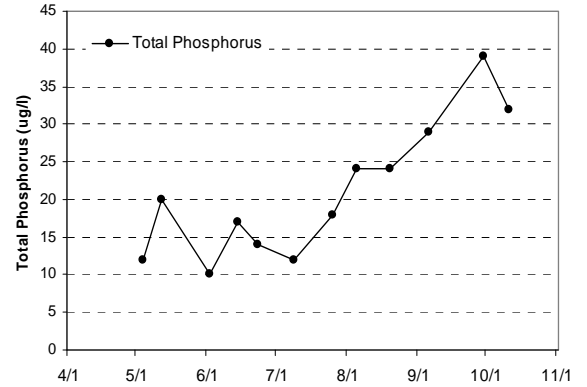
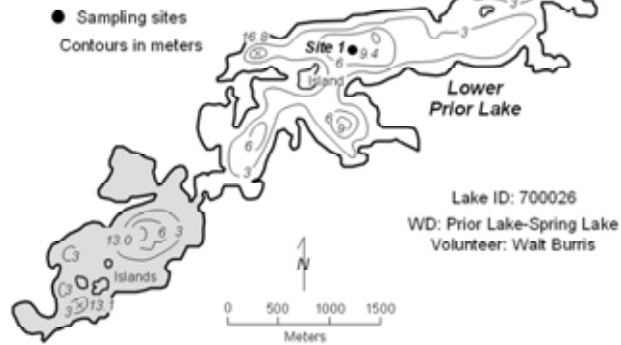
The lower basin received a lake grade of B for 2008. The historical lake grades appear to vary from A's to C's. With such variation, it is difficult to discern trends in the basin's water quality. Furthermore, a trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

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 2.1 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 1.5 (between 1- "beautiful" and 2- "minor aesthetic problem").

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/>.

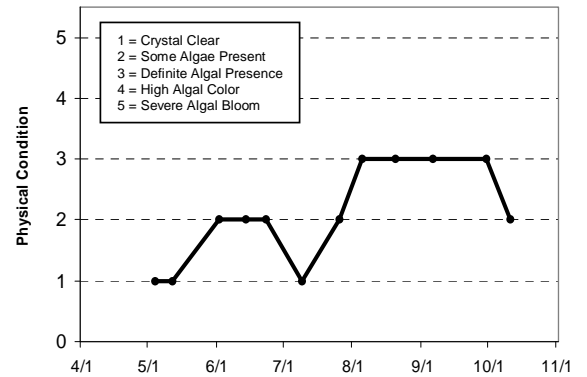
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Prior Lake, Lower Basin, Site 1 Prior Lake, Scott Co.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/4	9.7				2.3	12		5	1	1
5/12	12.8				2.8	20		4	1	1
6/2	19.4				3	10		3	2	1
6/14	19.9				5.5	17		3.2	2	1
6/23	24.6				5.7	14		3.7	2	1
7/9	25.2				4.6	12		3.9	1	1
7/26	26				7.7	18		3	2	1
8/5	26.6				14	24		2.1	3	2
8/20	26.3				19	24		1.8	3	2
9/6	21.9				28	29		1.5	3	3
9/30	18.6				28	39		1.5	3	2
10/11	16.6				19	32		2.4	2	1



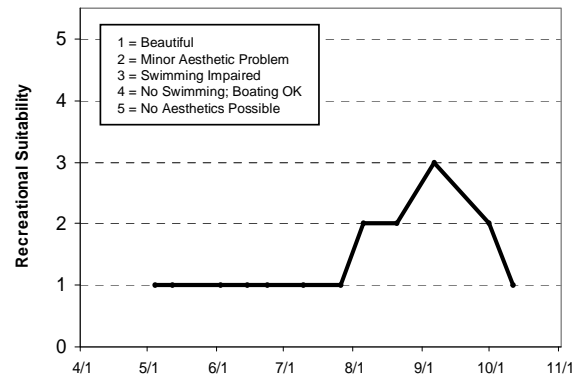
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus	B	C	C	B	A	C	A	A
Chlorophyll a	B	C	A	B	A	B	B	B
Secchi Depth	B	C	A	B	A	B	B	B
Lake Grade	B	C	B	B	A	B	B	B

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.

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. Approximately 85 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The upper basin's 3,430-acre watershed translates to a watershed-to-lake area ratio of 10:1. The greater the ratio, the greater the potential stress on the lake from surface runoff. 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.*).

While the Metropolitan Council has monitored the upper basin of Prior Lake in the past, the basin has been a part of the CAMP since 1997. The upper basin of Prior Lake was monitored 12 times in 2008. 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.

2008 summer (May-September) data summary

Parameter	Mean	Minimum	Maximum	Grade
TP (µg/l)	55.5	19.0	91.0	C
CLA (µg/l)	54.8	2.0	110.0	D
Secchi (m)	1.5	0.7	4.6	C
TKN (mg/l)	1.82	1.30	2.40	
Lake Grade				C

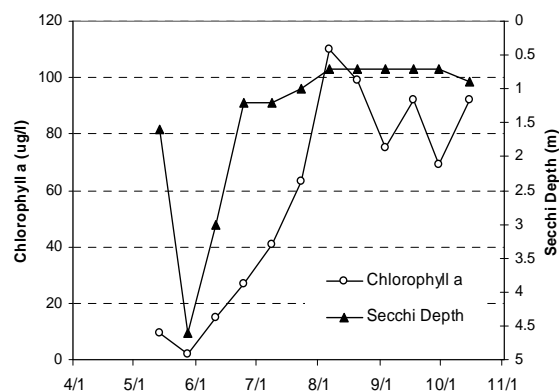
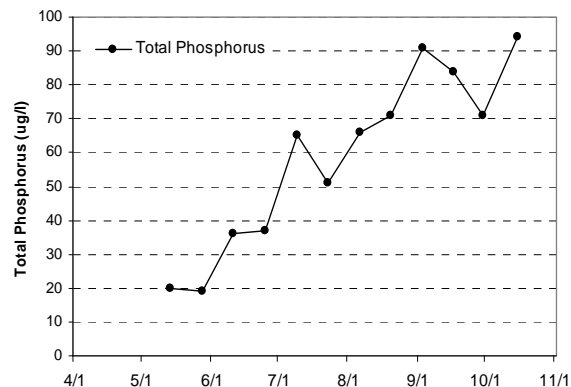
The upper basin received a lake grade of C for 2008. Historical data for the upper basin indicate that the water quality of the basin has varied between lake grades of C and D. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

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 2.1 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 1.8 (between 1- "beautiful" and 2- "minor aesthetic problem").

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/>.

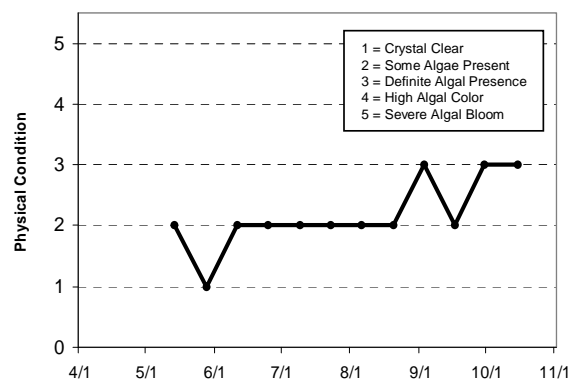
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Prior Lake, Upper Basin, Site 1 Prior Lake, Scott Co.



2008 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
5/14	13				9.5	20		1.6	2	2
5/28	18				2	19		4.6	1	1
6/11	19.6				15	36		3	2	1
6/25	24.3				27	37		1.2	2	2
7/9	25				41	65		1.2	2	2
7/23	26.2				63	51		1	2	2
8/6	26.1				110	66		0.7	2	2
8/20	26				99	71		0.7	2	2
9/3	22.8				75	91		0.7	3	2
9/17	19				92	84		0.7	2	2
9/30	19.3				69	71		0.7	3	2
10/15	14.5				92	94		0.9	3	2



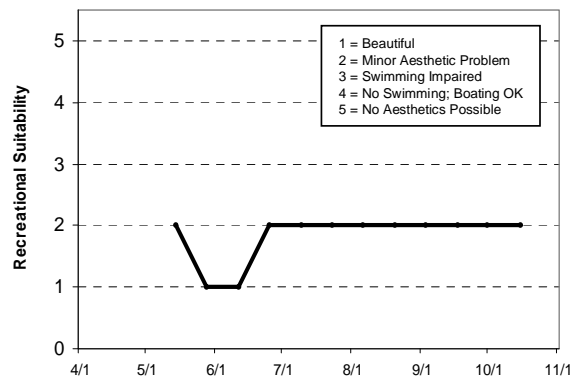
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total Phosphorus	C	C			D					D			
Chlorophyll a	D	D			D					C	C		
Secchi Depth	D	C	D	F	D	D	D	F	F	D	C	D	D
Lake Grade	D	D			D					D			

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		D	
Lake Grade			C	C	D			D		D		D	

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
Total Phosphorus	D	D	C	D	C	D	C	C
Chlorophyll a	D	D	D	D	C	D	D	D
Secchi Depth	D	D	C	D	C	C	D	C
Lake Grade	D	D	C	D	C	D	D	C

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. 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 majority of the land within the 600-acre watershed is undeveloped. The watershed-to-lake size ratio is 38:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	76.1	54.0	111.0	D
CLA (µg/l)	25.2	7.4	47.0	C
Secchi (m)	2.2	1.2	2.9	C
TKN (mg/l)	1.25	0.98	1.60	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to lake grades received in the past 4 years, but better than the D lake grades received in 1998 and 2000-2003. This year was the fourth consecutive year in which water clarity received a C grade, which is an improvement over the F grades that were recorded in 1998 and 2000-2003. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

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 2.9 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 3.9 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

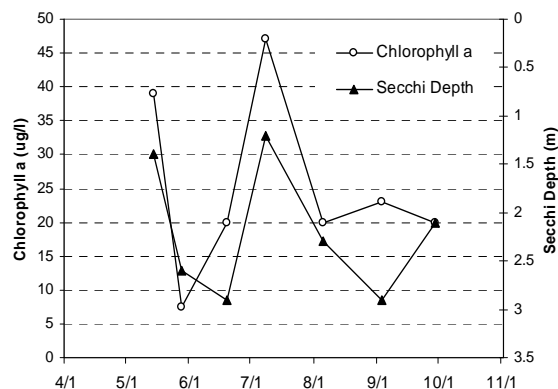
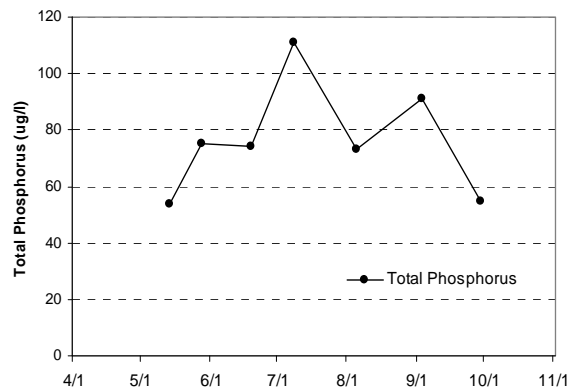
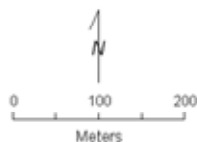
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Regional Park Lake Cottage Grove, Washington Co.

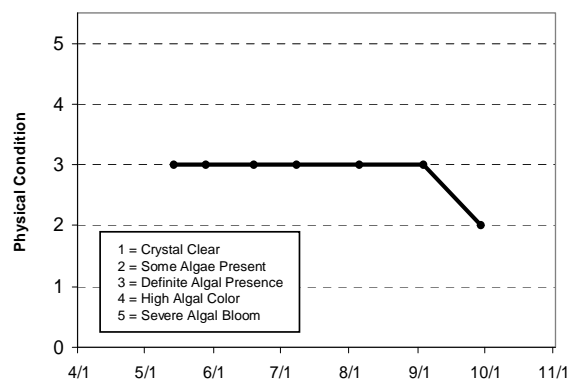
Lake ID: 820087
WD: South Washington
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/14	14.4	8.6	12.9	0.4	39	54		1.4	3	4
5/28	18.4	9.2	8.82	0.2	7.4	75		2.6	3	4
6/19	22.8	11.2	9.77	0.23	20	74		2.9	3	4
7/8	25.1	11.6	10.45	0.49	47	111		1.2	3	4
8/5	25.5	12.9	3.85	0.16	20	73		2.3	3	4
9/3	22.2	13.1	5.71	0.16	23	91		2.9	3	4
9/29	18.3	16.3	4.55	0.31	20	55		2.1	2	3



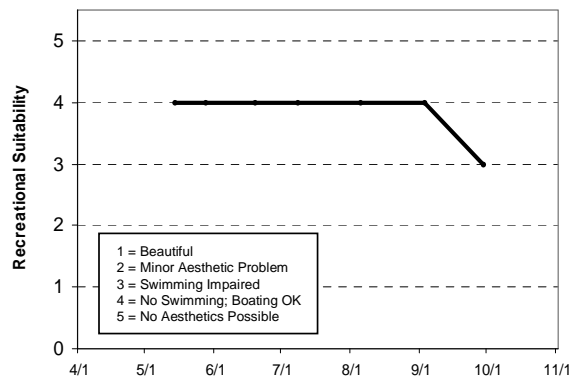
Lake Water Quality Grades Based on Summertime Averages

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							F	C	D	D	D	D
Chlorophyll a							B	B	C	C	D	C
Secchi Depth							F	D	F	F	F	F
Lake Grade							D	C	D	D	D	D

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

Source: Metropolitan Council and STORET data



Reitz Lake (10-0052) Carver County Environmental Services

Reitz Lake, a 79-acre lake located within Laketown Township (Carver County), is considered a Metropolitan Area “Priority Lake” because of its multi-recreational uses. A public access is located on its northeastern shore. The mean and maximum depths of the lake are 4.0 m (13 feet) and 11.0 m (36 feet). Roughly 58 percent of the lake area is considered littoral zone (area of aquatic plant dominance). The lake’s mean depth and surface area translate to an approximate volume of 1,027 ac-ft. The lake has a 3,711-acre immediate watershed, which translates to a 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*).

This was the tenth year that Reitz Lake has been involved in the CAMP. Council staff, however, has monitored the lake, in the past. A search through the STORET nationwide water quality database for historical data on the lake provided three years of data (1985, 1991 and 1993) prior to the 1999-2006 CAMP data.

The lake was monitored 11 times between early May and early October. 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.

2008 summer (May-September) data summary

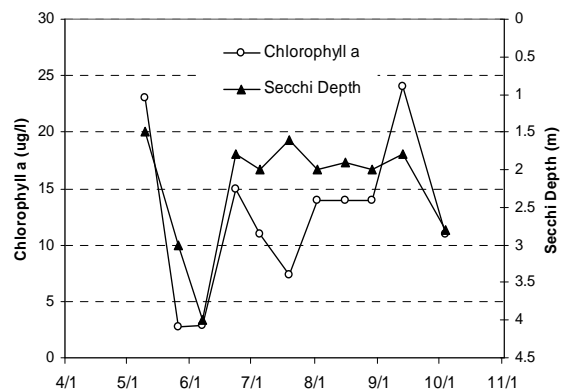
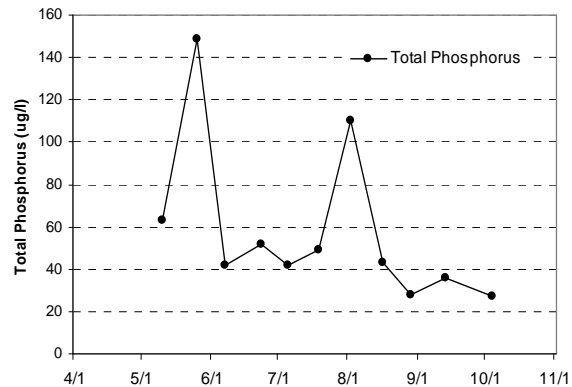
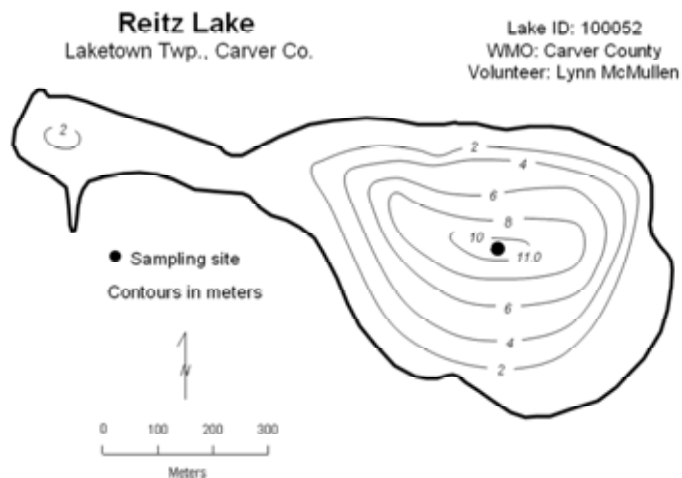
Parameter	Mean	Minimum	Maximum	Grade
TP (µg/l)	61.4	28.0	149.0	C
CLA (µg/l)	12.8	2.8	24.0	B
Secchi (m)	2.2	1.5	4.0	C
TKN (mg/l)	1.69	1.10	2.10	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to lake grades received in previous years. The recent years’ water quality is better than the water quality in the years 1985, 1991, and 1993. However, a trend analysis conducted by the MPCA on the lake’s Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

Throughout the monitoring period, the volunteers’ opinions of the lake’s physical and recreational conditions were ranked on a 1-to-5 scale. The mean perceived physical condition of the lake was 1.7 (between 1- “crystal clear” and 2- “some algae present”), while the mean recreational suitability was 1.2 (between 1- “beautiful” and 2- “minor aesthetic problem”).

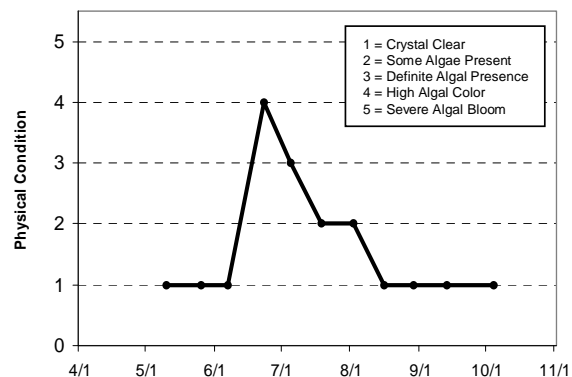
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/10	14				23	63		1.5	1	1
5/26	17				2.8	149		3	1	1
6/7	16				2.9	42		4	1	1
6/23	23				15	52		1.8	4	2
7/5	24				11	42		2	3	2
7/19	24				7.3	49		1.6	2	1
8/2	26				14	110		2	2	1
8/16	23				14	43		1.9	1	1
8/29	22				14	28		2	1	1
9/13	20				24	36		1.8	1	1
10/4	16				11	27		2.8	1	1



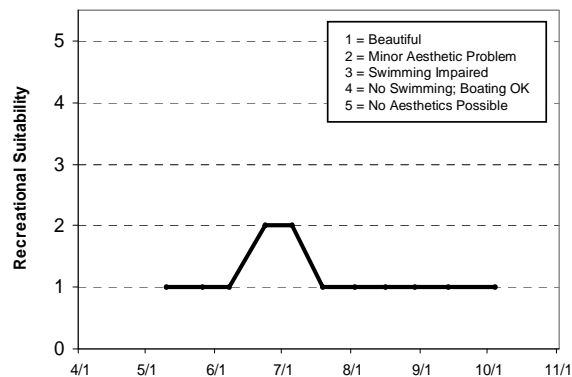
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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 lake's surface area and mean depth translates to an approximate lake volume of 3,535 ac-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 lake was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	70.3	33.0	103.0	D
CLA (µg/l)	57.2	8.2	96.0	D
Secchi (m)	0.4	0.2	0.7	F
TKN (mg/l)	2.15	1.60	2.70	
Lake Grade				D

The lake received a lake grade of D for 2008, 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.

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 2.2 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.7 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

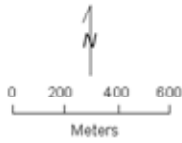
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Reshanau Lake Lino Lakes, Anoka Co.

Lake ID: 20009
WD: Rice Creek
Volunteer: Lori Fredlund

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/20	8.3				15	40		0.8	1	1
5/15	18.1				8.2	33		0.6	1	1
6/14	25				28	40		0.7	2	3
6/29	25				35	75		0.3	2	3
7/10	25.2				84	84		0.3	2	3
7/23	25.4				96	103		0.2	3	3
8/6	25.2				92	87		0.3	3	3

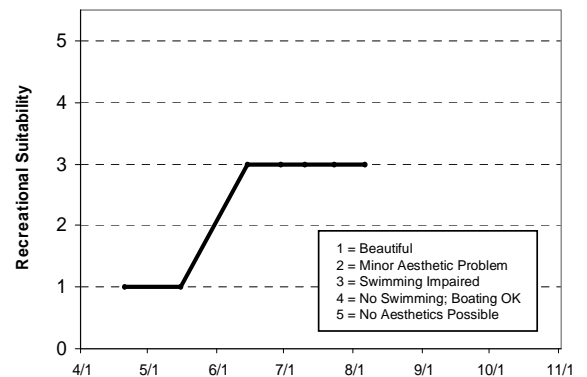
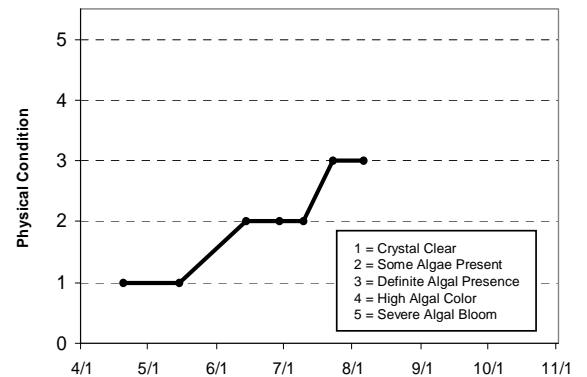
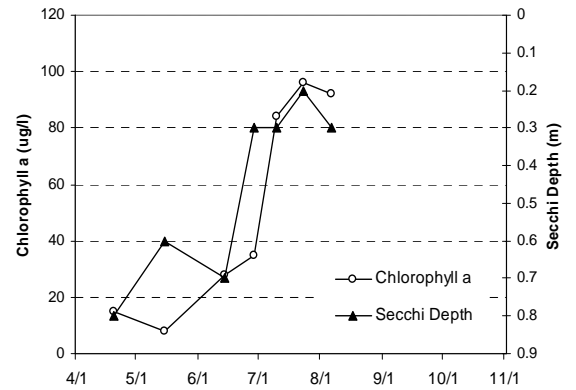
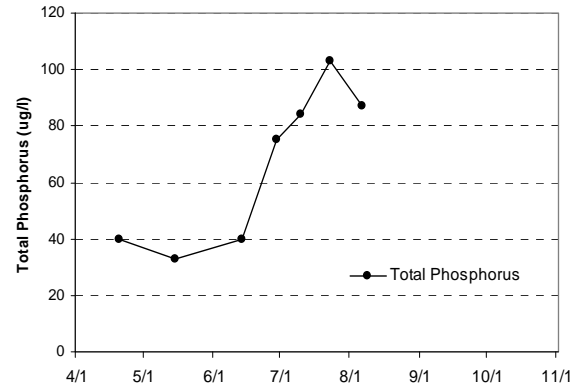
Lake Water Quality Grades Based on Summertime Averages

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

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 157:1 watershed-to-pond area ratio. Generally the larger the ratio, the greater the potential stress on the pond from surface runoff.

The pond was monitored 13 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	214.1	92.0	351.0	F
CLA (µg/l)	87.0	13.0	230.0	F
Secchi (m)	0.5	0.2	1.0	F
TKN (mg/l)	3.60	1.60	5.90	
Lake Grade				F

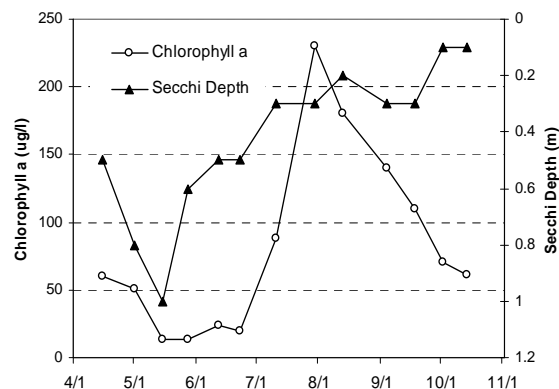
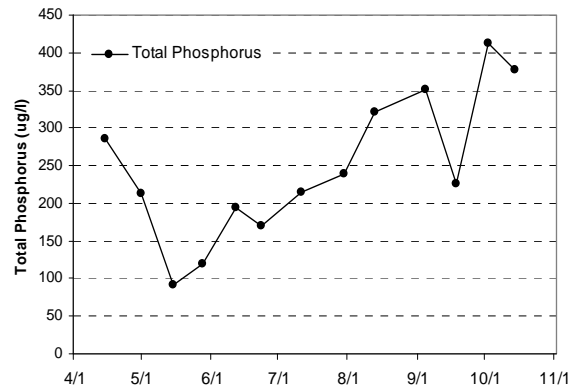
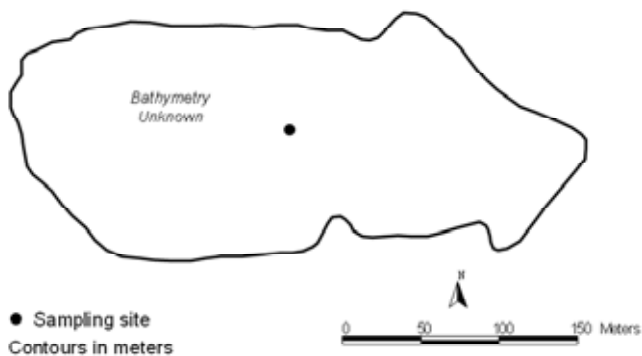
The pond received a lake grade of F for 2008, which is worse than the D lake grades received in the previous two years. The mean summer-time CLA concentration was notably higher in 2008 than the previous two years. Continued monitoring is suggested to acquire data for determining if the pond is experiencing worsening water quality conditions.

The volunteer's perceptions of the physical and recreational conditions of the pond were not recorded by the volunteer.

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.

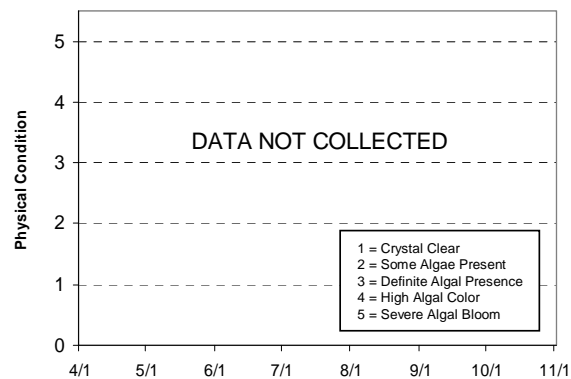
Rest Area Pond
West Lakeland Twp.,
Washington Co.

Lake ID: 820514
WD: Valley Branch
Volunteer: MnDOT



2008 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	5.2				60	286		0.5		
5/1	9.2				51	213		0.8		
5/15	17.3				13	92		1		
5/28	18.9				14	120		0.6		
6/12	22.2				24	194		0.5		
6/23	23.7				20	170		0.5		
7/11	23.9				88	214		0.3		
7/30	26.7				230	239		0.3		
8/13	23.7				180	322		0.2		
9/4	20.8				140	351		0.3		
9/18	19.5				110	226		0.3		
10/2	16.3				71	413		0.1		
10/14	14.3				61	378		0.1		



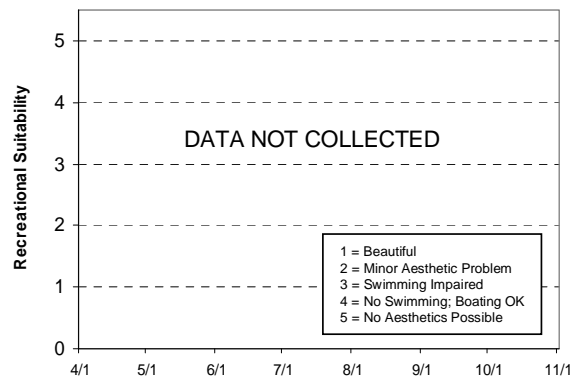
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus			D	F	F
Chlorophyll a			D	C	F
Secchi Depth			D	F	F
Lake Grade			D	D	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, an average depth of 1.9 m (6.2 ft), and a volume of 1570 acre-feet. The maximum depth is 3.4 m (11 ft). Because of the shallowness of the lake, the entire area is considered littoral zone, and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column). The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

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

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

2008 summer (May-September) data summary

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

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

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

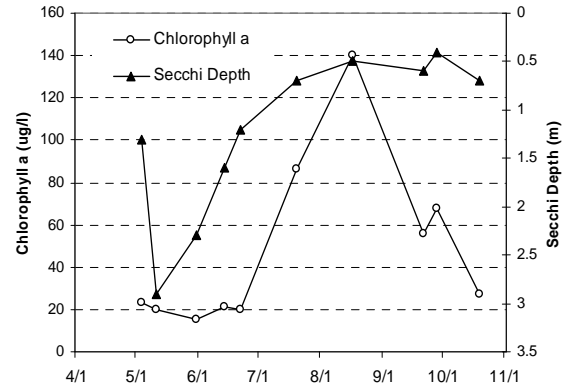
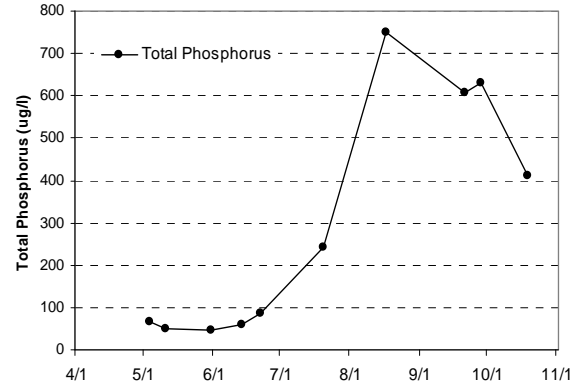
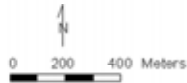
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Rice Lake Maple Grove, Hennepin Co.

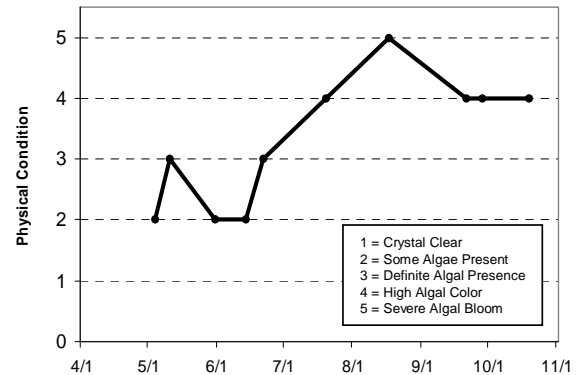
Lake ID: 270116
WMO: Elm Creek
Volunteer: George Schneider

● Sampling site
Contours in meters



2008 Data

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



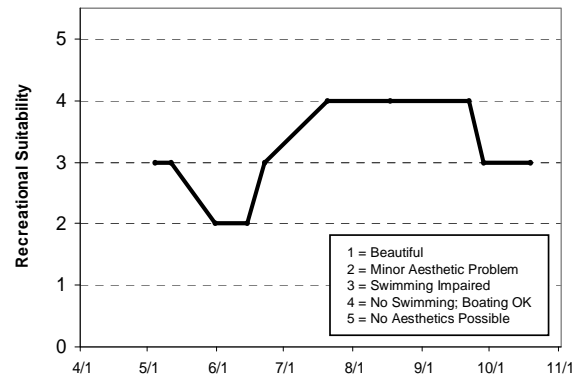
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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. It has a surface area of 297 acres. The maximum and mean depths are 15.0 m and 6.6 m, respectively. Roughly 34 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 has a 4,796-acre immediate watershed, which translates to a watershed-to-lake area ratio of 16:1. 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*).

While Riley Lake has previously been monitored by Council staff, 2008 marks the sixth year the lake has been monitored through the CAMP. Riley Lake was monitored 12 times in 2008. 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.

2008 summer (May-September) data summary

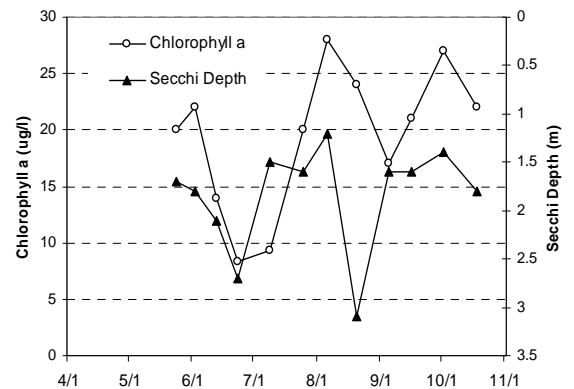
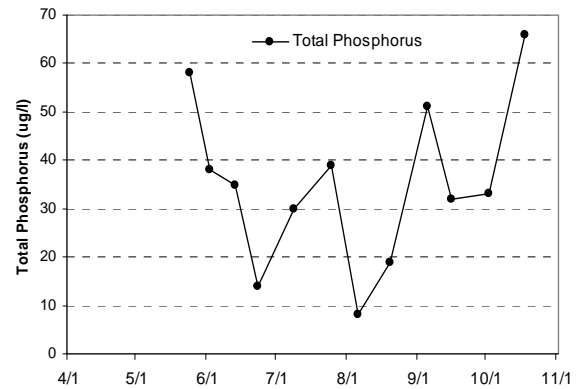
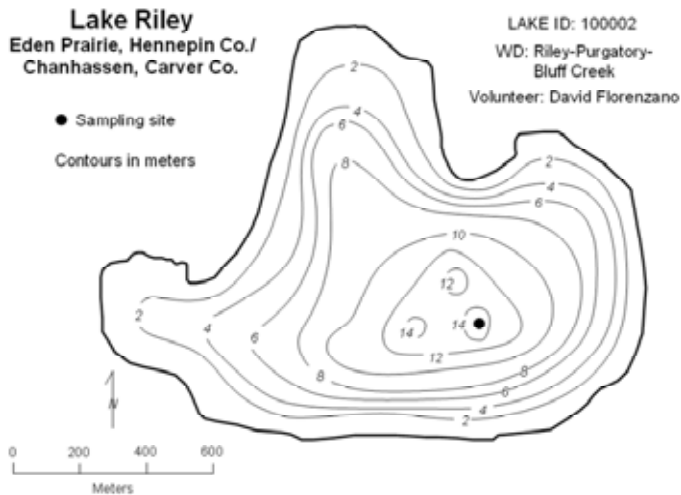
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	32.4	8.0	58.0	C
CLA (µg/l)	18.4	8.4	28.0	B
Secchi (m)	1.9	1.2	3.1	C
TKN (mg/l)	1.78	1.40	2.10	
Lake Grade				C

The lake received a lake grade of C for 2008, which is consistent with most years of monitoring dating back to 1980. The lake appears to be characterized as a C lake grade. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

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 3.1 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 2.6 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

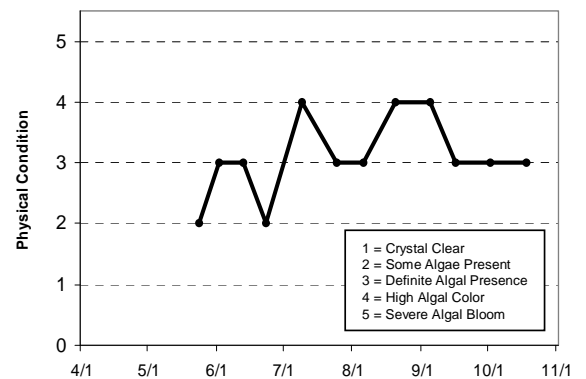
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 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	15.9				20	58		1.7	2	2
6/2	18.1				22	38		1.8	3	2
6/13	17.7				14	35		2.1	3	3
6/23	22.5				8.4	14		2.7	2	3
7/9	25.8				9.3	30		1.5	4	3
7/25	26.1				20	39		1.6	3	3
8/6	26				28	8		1.2	3	2
8/20	26.3				24	19		3.1	4	3
9/5	21.6				17	51		1.6	4	3
9/16	18.8				21	32		1.6	3	2
10/2	17.2				27	33		1.4	3	2
10/18	13.5				22	66		1.8	3	3



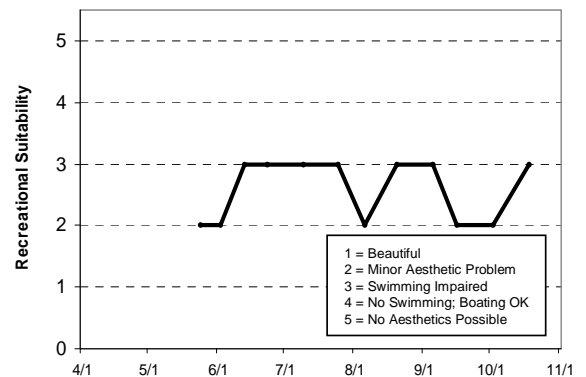
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade		C				C			C		C	C

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

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 an average depth of 1.3 m (4.2 ft) which would give it a volume of 393 acre-feet. The maximum depth is 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.

This was the second year that Rogers Lake has been involved in the CAMP. A search through the STORET nationwide water quality database for historic data on the lake showed no monitoring data other than the historical CAMP data. The lake was monitored 9 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	27.6	19.0	50.0	B
CLA (µg/l)	4.9	1.7	12.0	A
Secchi (m)	1.4	1.1	1.9	C
TKN (mg/l)	1.71	1.40	2.10	
Lake Grade				B

The lake received a lake grade of B for 2008. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed to build the water quality database.

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 storm sewers and the surrounding urbanized watershed. It is possible for higher suspend solids loadings to decrease water clarity which would decrease light penetration thereby inhibiting algal growth.

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 2.1 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.0 ("minor aesthetic problem").

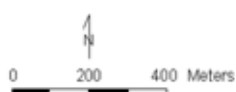
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Rogers Lake Mendota Heights, Dakota Co.

Lake ID: 190080
WMO: Lower Mississippi River
Volunteer: Doug Hennes

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
6/1	23.1				1.7	19		1.9	2	1
6/14	22.7				3.4	50		1.7	2	1
7/9	25.9				3.2	23		1.1	3	3
7/23	27.3				4.5	22		1.5	2	2
8/10	25.9				6.4	26		1.1	3	4
9/2	23				3.3	20		1.1	2	2
9/21	22.7				12	33		1.3	1	1
10/2	16.1				8.4	38		1.3	1	1
10/19	12.5				4.8	27		1.7	1	1

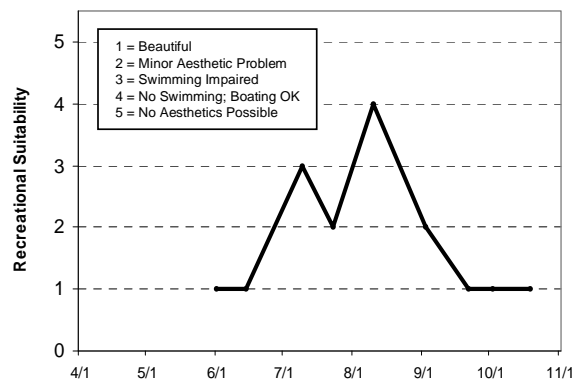
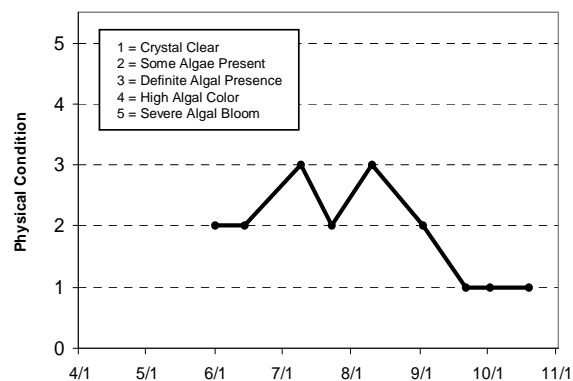
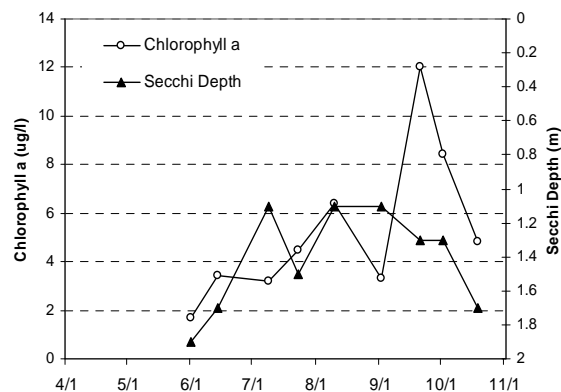
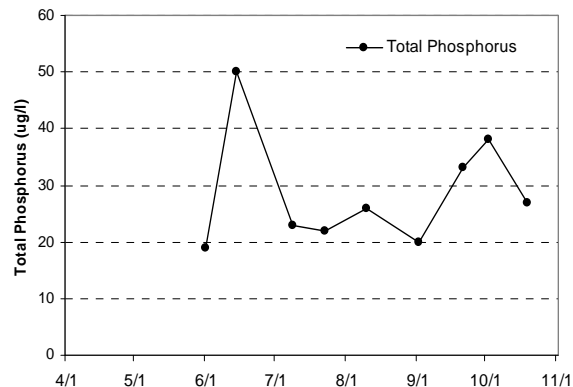
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Rose Lake (27-0092) City of Minnetonka

Rose Lake is a small 17-acre lake located in the City of Minnetonka (Hennepin County). There is very little known morphological data available for the lake.

The lake was monitored 13 times in 2008. 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.

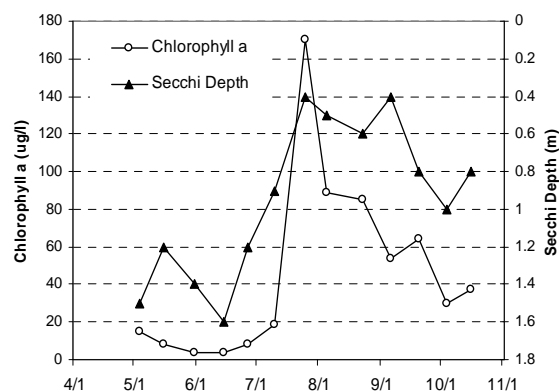
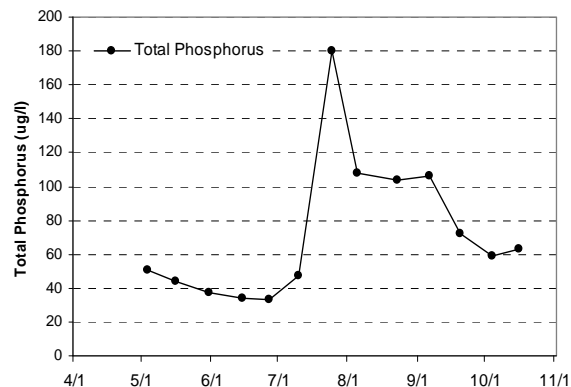
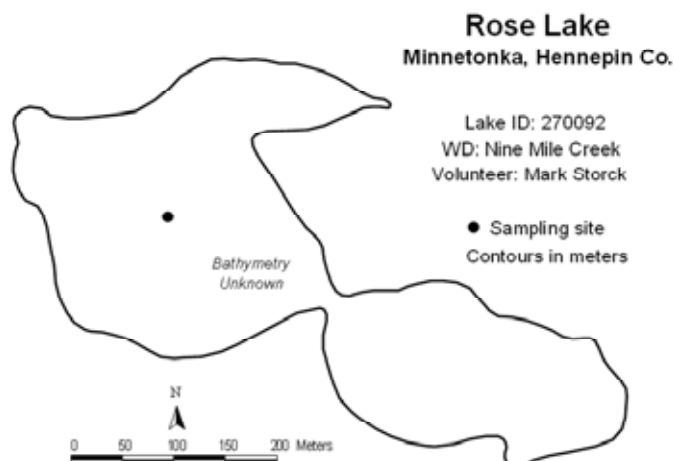
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	74.2	33.0	180.0	D
CLA (µg/l)	47.3	3.7	170.0	C
Secchi (m)	1.0	0.4	1.6	D
TKN (mg/l)	1.59	1.30	2.10	
Lake Grade				D

The lake received a lake grade of D for 2008, which is consistent with the previous lake grades received in the previous two years. Additional monitoring is suggested to continue to build the water quality database.

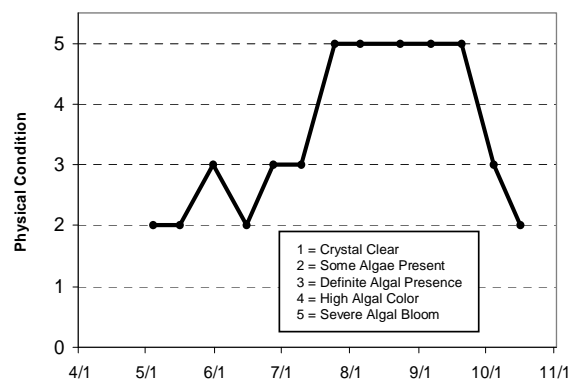
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 3.6 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.5 (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.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/4	11.7				15	51		1.5	2	1
5/16	21.1				8.3	44		1.2	2	4
5/31	22.2				3.7	37		1.4	3	5
6/15	21.6				4.1	34		1.6	2	5
6/27	24.9				7.9	33		1.2	3	5
7/10	22				19	47		0.9	3	5
7/25	22.9				170	180		0.4	5	
8/5	22.3				89	108		0.5	5	5
8/23	21.9				85	104		0.6	5	5
9/6	17.8				54	106		0.4	5	5
9/20	18				64	72		0.8	5	5
10/4	14.6				30	59		1	3	5
10/16	12.7				37	63		0.8	2	5



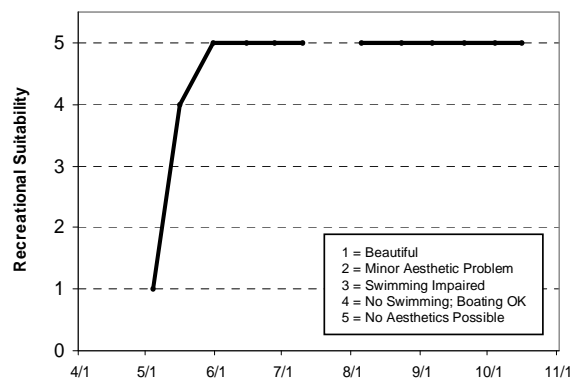
Lake Water Quality Grades Based on Summertime Averages

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

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 is very little known morphological data available for the lake.

This was the first year the lake was monitored via the CAMP. A search through STORET, the national water quality database, showed no historical water quality data for this lake.

Site 1 (north basin) was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	116.0	49.0	157.0	D
CLA (µg/l)	95.6	35.0	170.0	F
Secchi (m)	0.5	0.3	0.8	F
TKN (mg/l)	2.45	0.96	3.70	
Lake Grade				F

Site 1 received a lake grade of F for 2008. Additional monitoring is suggested to continue to build the water quality database.

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 3.6 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.0 ("no swimming/boating ok").

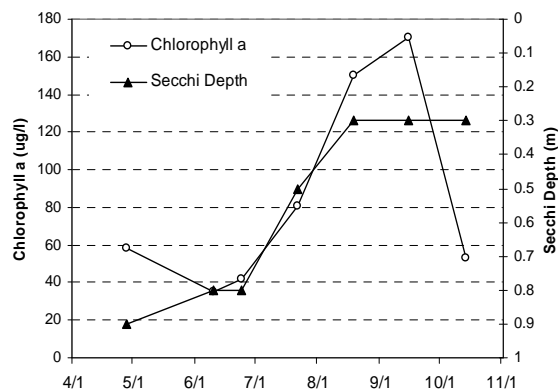
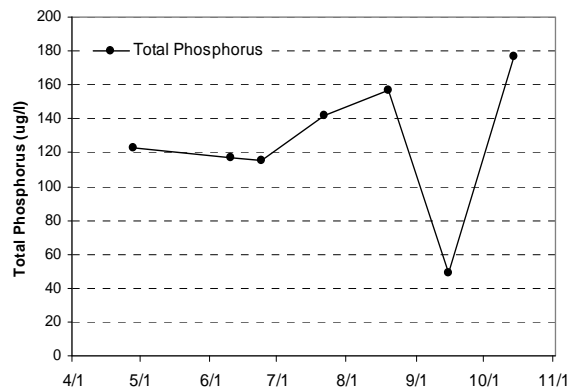
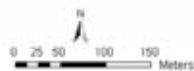
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Rose Lake (North Basin) Lake Elmo, Washington Co.

Lake ID: 820112
WD: Valley Branch
Volunteer: Washington
Conservation District

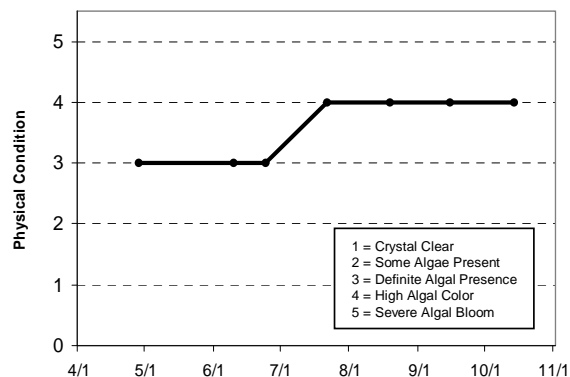
● Sampling site

Contours in meters



2008 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	8.4	8.4	11.02	10.69	58	123		0.9	3	4
6/10	21.5	18.6	10.18	0.92	35	117		0.8	3	4
6/24	27	18.9	9.11	0.48	42	115		0.8	3	4
7/22	27.5	18.4	9.72	0.18	81	142		0.5	4	4
8/19	29.4	17.9	10.76	0.15	150	157		0.3	4	4
9/15	18	16.6	11.27	0.2	170	49		0.3	4	4
10/14	13.7	13.3	9.86	0.4	53	177		0.3	4	4



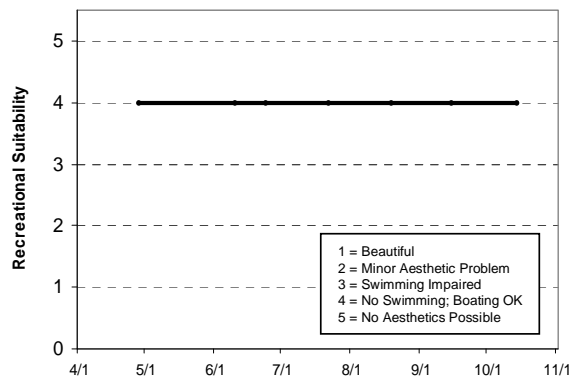
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					D
Chlorophyll a					F
Secchi Depth					F
Lake Grade					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 is very little known morphological data available for the lake.

This was the first year the lake was monitored via the CAMP. A search through STORET, the national water quality database, showed no historical water quality data for this lake.

Site 2 (south basin) was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	132.0	26.0	176.0	D
CLA (µg/l)	143.8	49.0	250.0	F
Secchi (m)	0.5	0.2	0.8	F
TKN (mg/l)	3.94	1.90	7.90	
Lake Grade				F

Site 2 received a lake grade of F for 2008. Additional monitoring is suggested to continue to build the water quality database.

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 3.8 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.0 ("no swimming/boating ok").

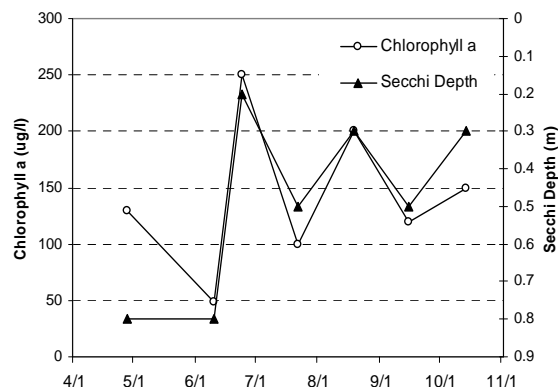
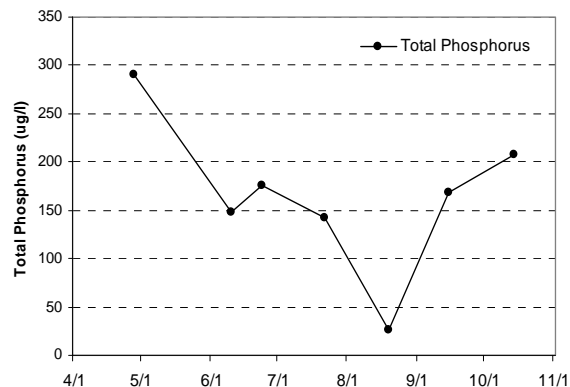
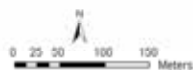
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Rose Lake (South Basin) Lake Elmo, Washington Co.

Lake ID: 820112
WD: Valley Branch
Volunteer: Washington
Conservation District

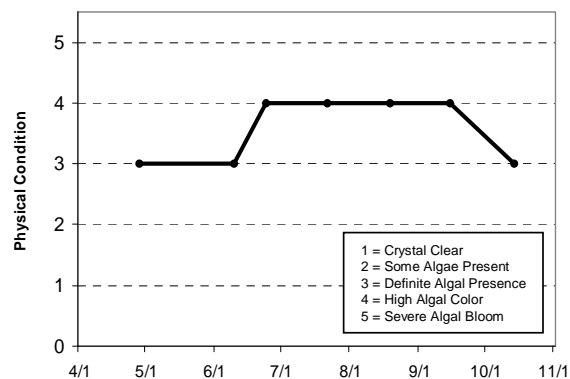
● Sampling site

Contours in meters



2008 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	7.8	7.8	10.98	10.76	130	291		0.8	3	4
6/10	21	14.5	11.37	0.01	49	148		0.8	3	4
6/24	26.7	14.4	15.58	0.71	250	176		0.2	4	4
7/22	27.1	14.4	11.44	0.21	100	142		0.5	4	4
8/19	28.6	15.6	11.49	0.16	200	26		0.3	4	4
9/15	19.4	16.1	12.42	0.2	120	168		0.5	4	4
10/14	13.8	13.7	7.09	0.34	150	208		0.3	3	4



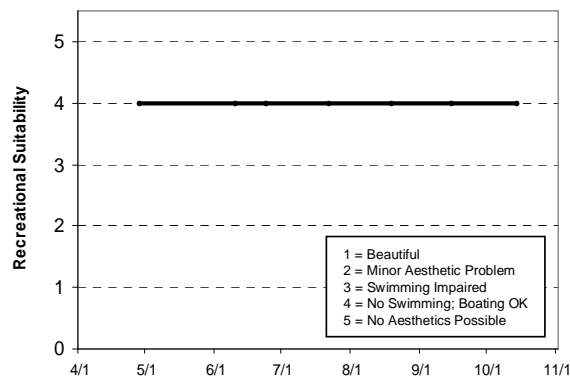
Lake Water Quality Grades Based on Summertime Averages

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												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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

This was the fourth year that Rutz Lake has been involved in the CAMP. The four years of CAMP data are the only known water quality data available for the lake.

The lake was monitored 5 times from mid May to early August. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	168.8	104.0	233.0	F
CLA (µg/l)	50.8	14.0	75.0	D
Secchi (m)	0.5	0.4	0.6	F
TKN (mg/l)	2.56	2.40	2.80	
Lake Grade				F

The lake received a lake grade of F for 2008, which is similar to the lake grade received for 2007, but worse than the D grades received for 2000 and 2006. Because of the limited years of data for this lake, a trend in water quality is difficult to determine with sufficient confidence. To better understand the lake's water quality and where it may be heading, more data are needed.

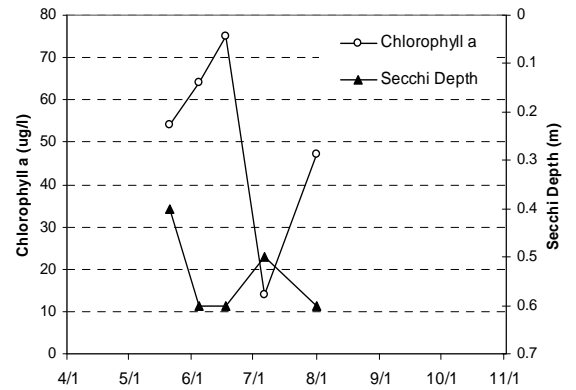
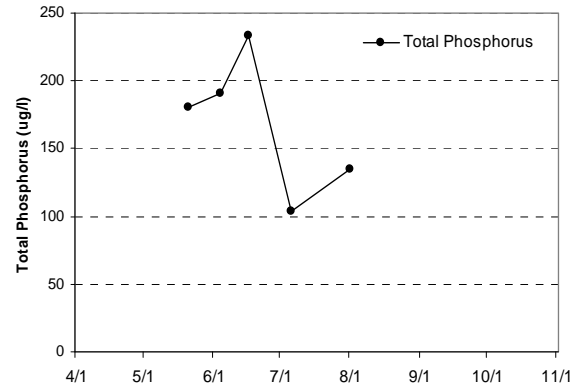
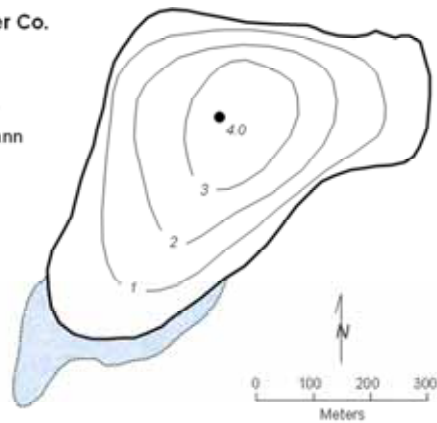
The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings, were 2.6 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 3.2 for recreational suitability (between 3- "swimming slightly impaired" and 4- "no swimming – boating ok").

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.

Rutz Lake Waconia Twp., Carver Co.

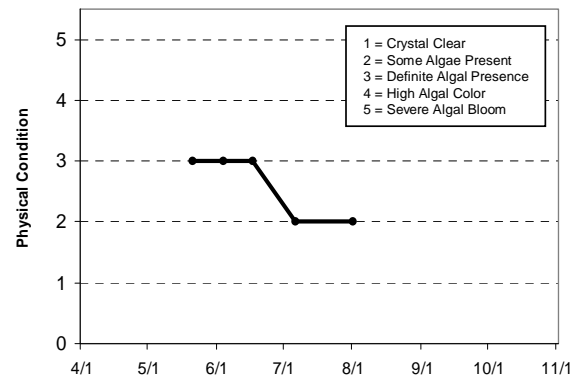
Lake ID: 100080
WMO: Carver County
Volunteer: Marty Ziernann

● Sampling site
Contours in meters



2008 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
5/21	18				54	181		0.4	3	4
6/4	23				64	191		0.6	3	4
6/17	24				75	233		0.6	3	2
7/6	27				14	104		0.5	2	3
8/1	29.7				47	135		0.6	2	3



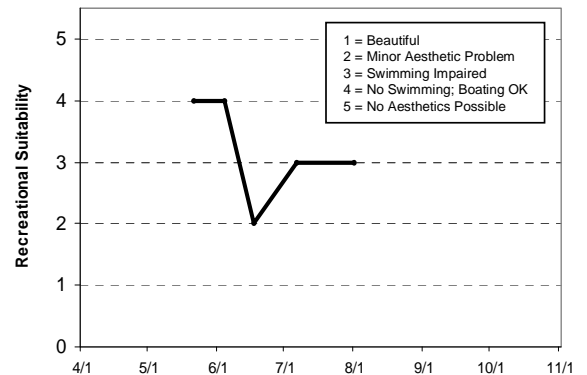
Lake Water Quality Grades Based on Summertime Averages

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												F
Chlorophyll a												C
Secchi Depth												D
Lake Grade												D

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

Source: Metropolitan Council and STORET data



Ryan Lake (27-0058) Shingle Creek Watershed Management Commission

Ryan Lake is located in the City of Robbinsdale (Hennepin County). The 35-acre lake has a maximum depth of approximately 10.7 m (35 ft). The watershed for the lake has an area of 5,510 acres. The surface area of the watershed and lake translate to a watershed-to-lake area ratio of 157:1. The larger the ratio the greater the potential stress on the lake from surface runoff.

A search of the STORET database revealed minimal data from 1980-1981, 1994-1995 (Secchi data), 1996, 1998, 2000 and 2002. The only years of historical data for TP, CLA and Secchi data are 1996, 1998, 2000, 2002, and 2003. While studies by Dr. Joe Shapiro were thought to have been undertaken in the mid-1980's no data were found.

The lake was monitored 13 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	37.9	26.0	60.0	C
CLA (µg/l)	9.1	2.1	18.0	A
Secchi (m)	2.0	1.0	3.8	C
TKN (mg/l)	1.57	0.86	2.20	
Lake Grade				B

The lake received a lake grade of B for 2008, which is similar to lake grades received in 2002 and 2003. The lake grades have fluctuated from C to B to D and back to B over the previous 13 years. Continued monitoring is suggested to continue to build the historical database.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 1.7 for physical condition (between 1- "crystal clear" and 2- "some algae present"), and 1.6 for recreational suitability (between 1- "beautiful" and 2- "minor aesthetic problem").

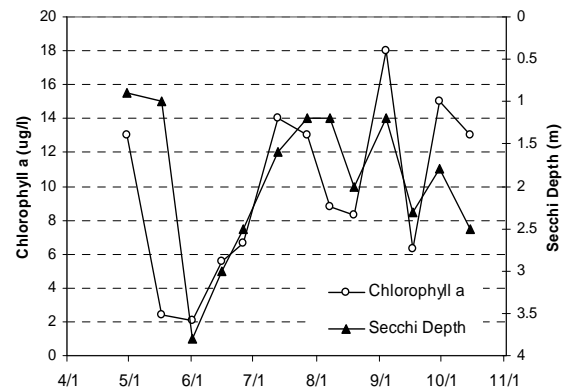
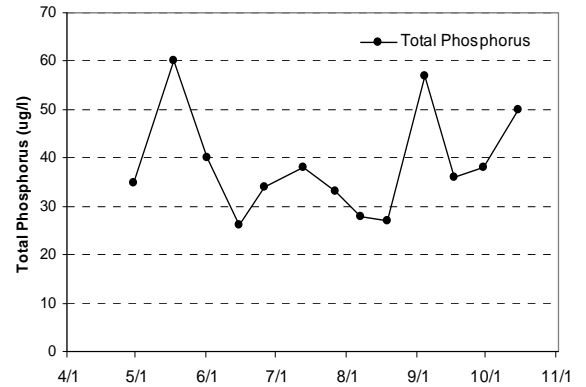
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Ryan Lake Brooklyn Park/Robbinsdale, Hennepin Co.

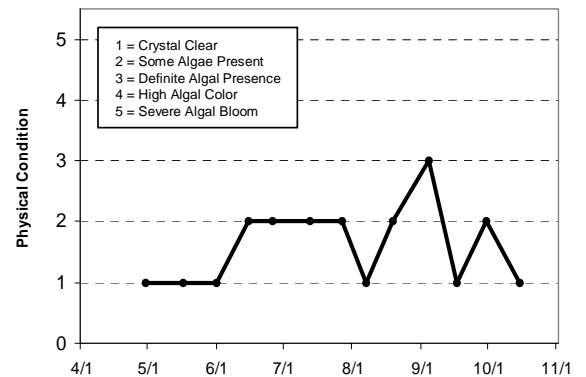
Lake ID: 270058
WMO: Shingle Creek
Volunteer: Paul Brenna

● Sampling site
Contours in meters



2008 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	10.9				13	35		0.9	1	
5/17	18.8				2.4	60		1	1	1
6/1	21.7				2.1	40		3.8	1	1
6/15	22.6				5.6	26		3	2	1
6/26	26.9				6.6	34		2.5	2	2
7/13	24.8				14	38		1.6	2	2
7/27	26.3				13	33		1.2	2	2
8/7	26.8				8.8	28		1.2	1	1
8/19	28.4				8.3	27		2	2	2
9/4	21				18	57		1.2	3	2
9/17	21				6.3	36		2.3	1	1
9/30	17.1				15	38		1.8	2	3
10/15	13.5				13	50		2.5	1	2



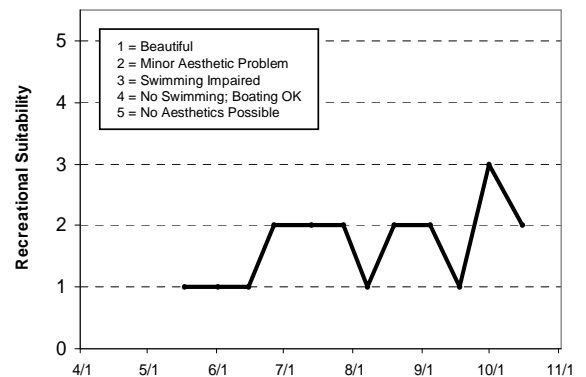
Lake Water Quality Grades Based on Summertime Averages

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		D		C	C
Chlorophyll a					B		B		C		A	A
Secchi Depth				C	C	C	B		D		C	B
Lake Grade					C		B		D		B	B

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

Source: Metropolitan Council and STORET data



Sand Lake (82-0067) Marine on St. Croix Watershed Management Organization

Sand Lake is a 46-acre lake located within City of Scandia (Washington County). The lake has a surface area of 46 acres (1.8 miles in circumference) and a mean and maximum depth of 2.4 m (8 feet) and 5.5 m (18 feet), respectively. The lake, which has two inlets has an approximate volume of 368 ac-ft. Approximately 46 percent of the lake's surface area is considered littoral, the shallow (0-15 foot) area dominated by aquatic vegetation.

In 2007, the lake was monitored 14 times. 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.

2008 summer (May-September) data summary

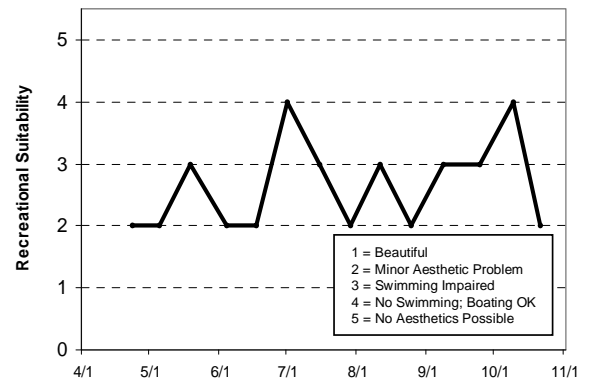
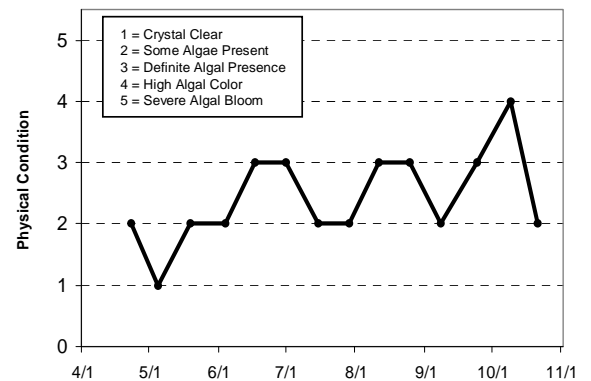
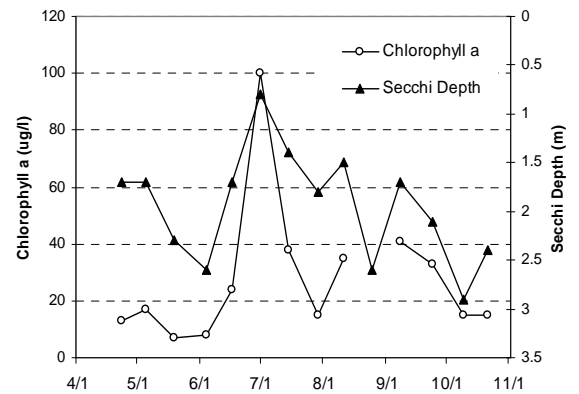
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	41.5	30.0	52.0	C
CLA (µg/l)	31.8	7.2	100.0	C
Secchi (m)	1.8	0.8	2.6	C
TKN (mg/l)	1.35	0.96	2.10	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to most lake grades received in previous years of monitoring since 1993. The lake appears to be characterized as a C lake, though it occasionally has received B lake grades. A recent trend analysis by the MPCA on the lake's Secchi depth data showed no statistically significant trend in water clarity.

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 2.4 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.6 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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.



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.

This was the second year that Scout Lake has been involved in the CAMP. A search through the STORET database revealed no historical water quality data other than the CAMP data.

The lake was monitored 14 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	61.2	24.0	94.0	C
CLA (µg/l)	41.9	6.8	85.0	C
Secchi (m)	1.3	0.5	2.8	C
TKN (mg/l)	2.11	0.81	3.20	
Lake Grade				C

The lake received a lake grade of C for 2008, which is an improvement from last year's D lake grade. Additional years of monitoring will be needed to build the water quality database to determine trends in water quality.

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.

Scout Lake Apple Valley, Dakota Co.

Lake ID: 190198
WMO: Dakota County
Volunteer: Dan Stanek

● Sampling site
Contours in meters



2.9 m

Bathymetry Unknown

2008 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	6.6				26	236		1.5		
5/2	12.1				13	55		1.5	1	
5/16	20.6				6.8	45		1.7	1	1
5/31	22.2				11	45		2.8	1	1
6/12	24.4				13	24		2	1	1
6/26	26.9				9	36		1.5	1	3
7/10	26.5				26	92		1.2		
7/23	28.9				80	76		0.7	2	
8/6	27.8				57	59		0.7	3	
8/23	25.9				85	66		0.5	3	
9/6	22.3				84	94		0.6		
9/19	22.4				76	81		0.6		
10/3	16.9				53	83		0.6		
10/18	14.1				38	64		1.1		

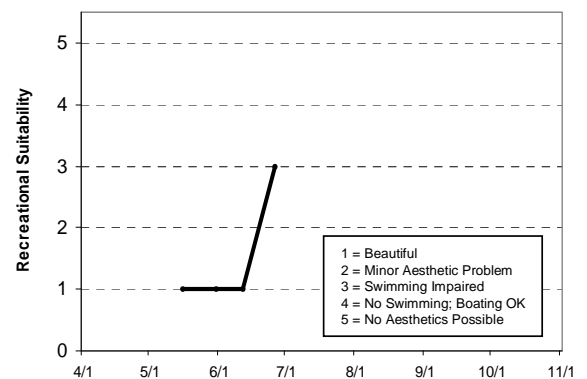
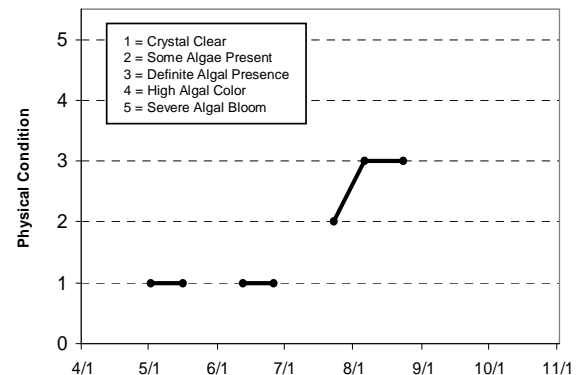
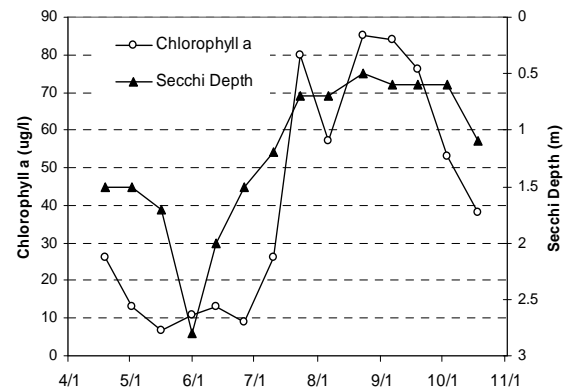
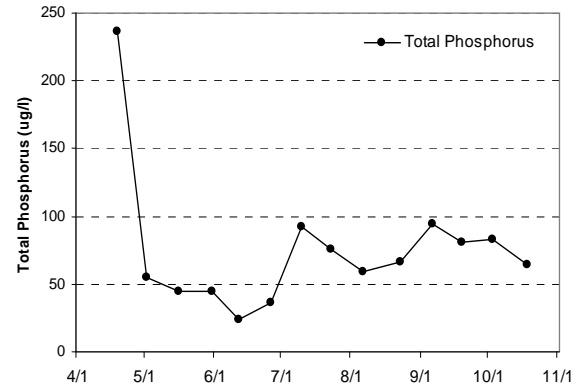
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus				D	C
Chlorophyll a				C	C
Secchi Depth				F	C
Lake Grade				D	C

Source: Metropolitan Council and STORET data



Sea Lake (82-0053) Forest Lake – Comfort Lake Watershed District

Scout Lake is a small lake located in Scandia (Washington County). Little information is available on the morphology of the lake. This was the first year that the lake has been involved in the CAMP. A search through the STORET database revealed no historical water quality data for the lake.

The lake was monitored 12 times in 2008. 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.

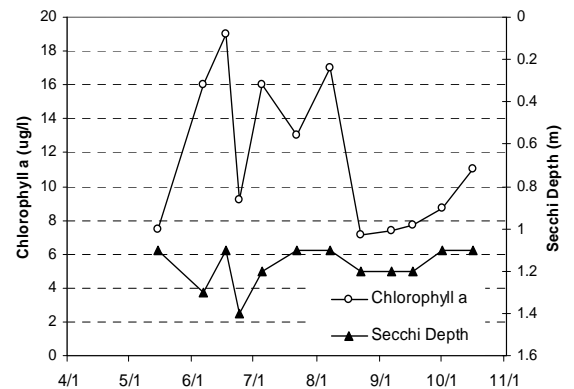
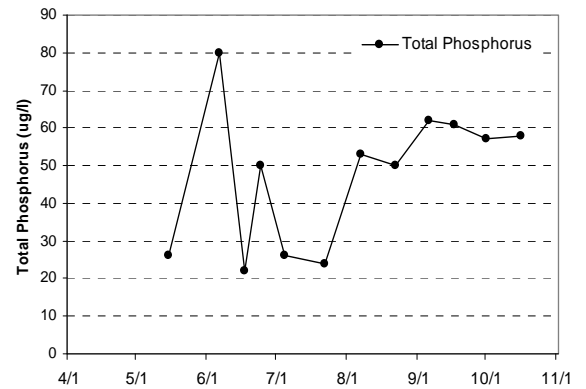
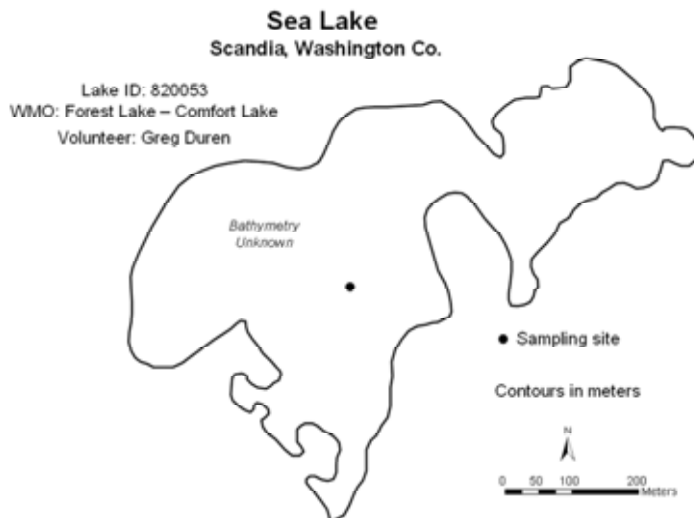
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	45.4	22.0	80.0	C
CLA (µg/l)	12.0	7.1	19.0	B
Secchi (m)	1.2	1.1	1.4	D
TKN (mg/l)	1.61	0.78	3.00	
<i>Lake Grade</i>				C

The lake received a lake grade of C for 2008. Additional years of monitoring will be needed to build the water quality database to determine trends in water quality. The water clarity grade of D does not correlate well with the chlorophyll-a grade of B. 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 suspended solids loadings to decrease water clarity which would decrease light penetration thereby inhibiting algal growth.

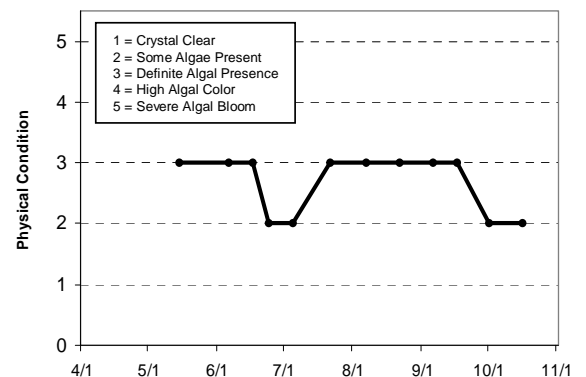
The volunteer's perceptions of the physical conditions of the lake are shown on the next page. The condition was ranked on a scale of 1 to 5. The average physical condition ranking was 2.8 (between 2- "some algae present" and 3- "definite algae present"). The recreational suitability rankings were not recorded by the volunteer.

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.



2008 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
5/15	13.3				7.5	26		1.1	3	
6/6	20				16	80		1.3	3	
6/17	22.5				19	22		1.1	3	
6/24	21.1				9.2	50		1.4	2	
7/5	23.7				16	26		1.2	2	
7/22	25.4				13	24		1.1	3	
8/7	25.2				17	53		1.1	3	
8/22	25.6				7.1	50		1.2	3	
9/6	25.7				7.4	62		1.2	3	
9/17	24.9				7.7	61		1.2	3	
10/1	17.2				8.7	57		1.1	2	
10/16	11.1				11	58		1.1	2	



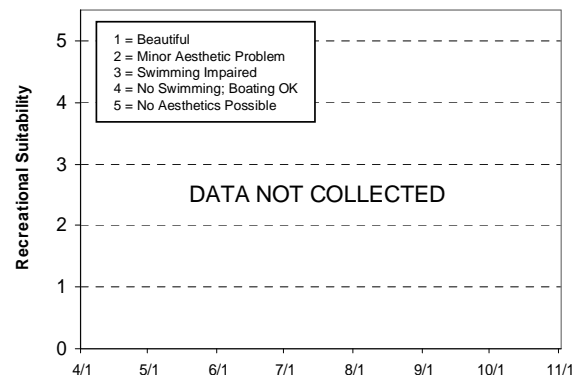
Lake Water Quality Grades Based on Summertime Averages

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												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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

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. Other than that the maximum depth of the lake is approximately 5.0 m (17 feet), there is very little known morphological data available. The lake has been enrolled in CAMP since 1995.

The lake was monitored 4 times in 2008. 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.

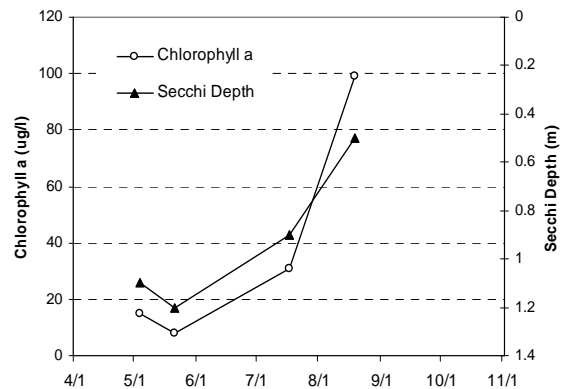
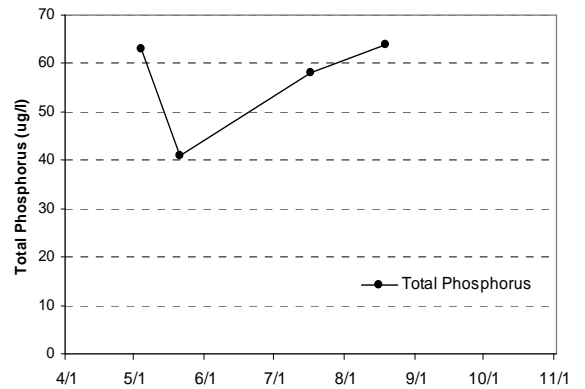
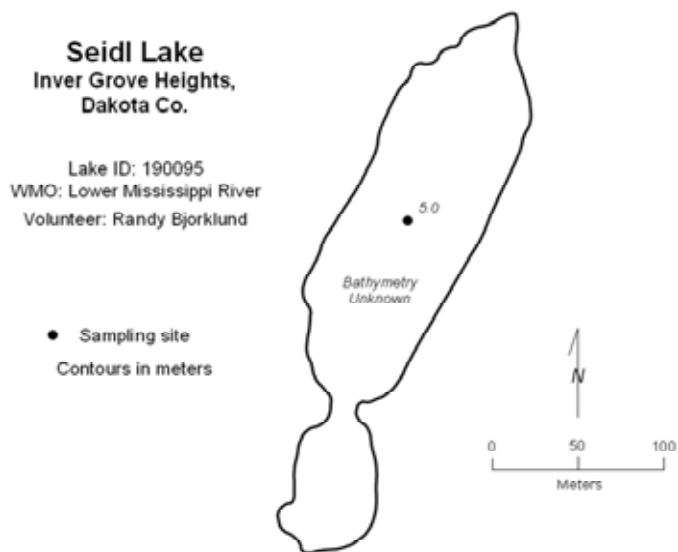
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	56.5	41.0	64.0	
CLA (µg/l)	38.3	8.1	99.0	
Secchi (m)	0.9	0.5	1.2	
TKN (mg/l)	2.05	1.40	2.60	
				Lake Grade

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. However, a trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant declining trend in water clarity (MPCA 2008).

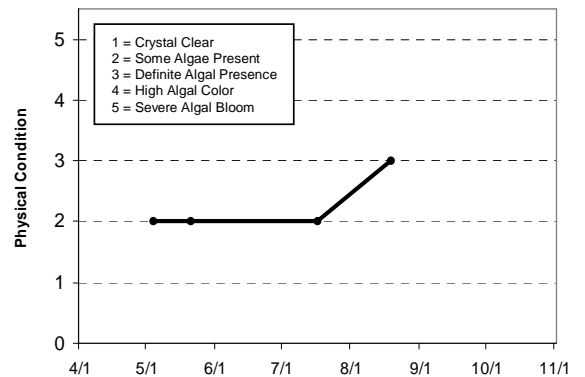
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.3 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 3.8 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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.



2008 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	14.3				15	63		1.1	2	4
5/21	18.4				8.1	41		1.2	2	4
7/17	28.9				31	58		0.9	2	3
8/19	29.4				99	64		0.5	3	4



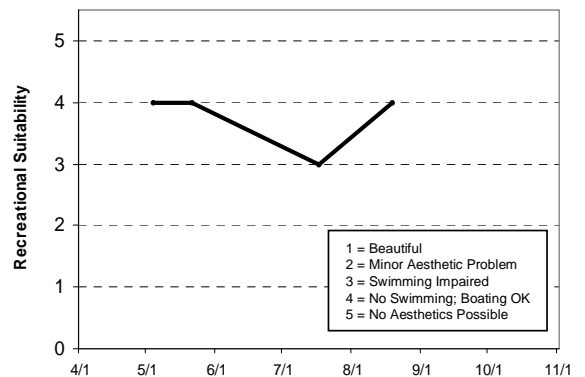
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade				B	B	C	C	D	C	C	D	C

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

Source: Metropolitan Council and STORET data



Silver Lake [Washington County] (82-0016) Carnelian - Marine 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 (roughly 11 feet) and 1.7 m (five-and-a-half feet), respectively. The mean depth of the lake and its surface area translate to an approximate lake volume of 549 ac-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 lake's 455-acre watershed and surface area translates to a watershed-to-lake size ratio of 4.6:1 (the greater the ratio, the greater the potential stress on the lake from surface runoff).

The lake was monitored 7 times in 2008. 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.

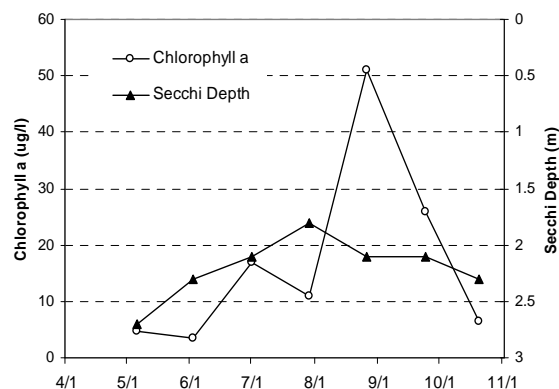
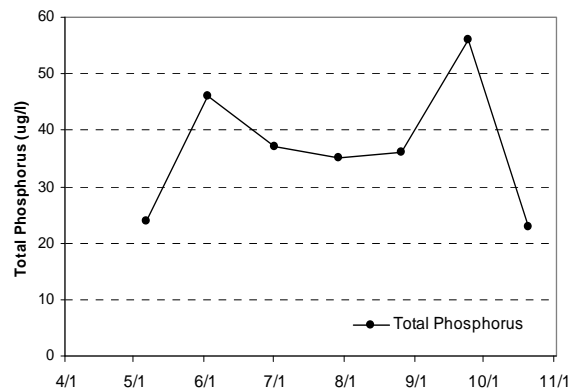
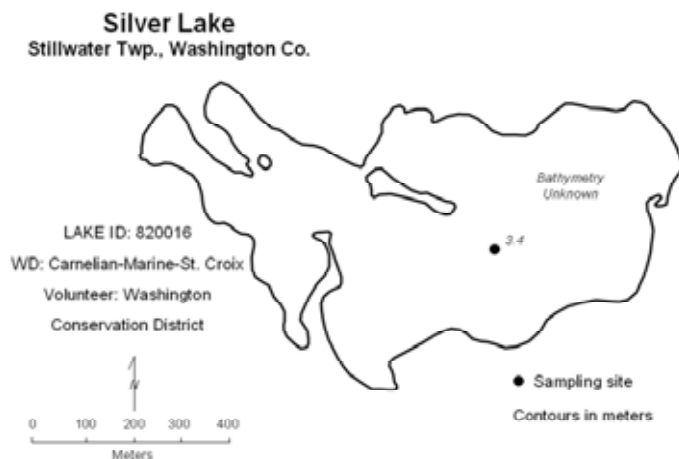
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	39.0	24.0	56.0	C
CLA (µg/l)	18.9	3.4	51.0	B
Secchi (m)	2.2	1.8	2.7	C
TKN (mg/l)	0.96	0.75	1.50	
Lake Grade				C

The lake's 2007 Lake Grade is similar to that recorded in 1996-1998 and 2000-2001 and 2006, better than the Lake Grade of D in 1999 and worse than the Lake Grades of B in 2004-2005. When looking at the grades and individual parameter means, it is apparent that 2004 was the lakes best-recorded water quality year. The water quality database shows that the lake has varied from C to D to B to C grades since 1996. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

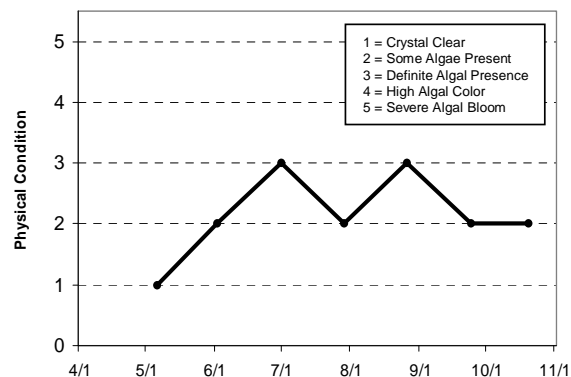
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.2 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.5 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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.



2008 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	13.6	12.6	10.99	8.47	4.7	24		2.7	1	1
6/2	20.5	18.6	8.48	2.7	3.4	46	22	2.3	2	2
7/1	24.6	20.3	9.57	0.35	17	37	120	2.1	3	4
7/29	26.9	21.2	8.08	0.23	11	35	154	1.8	2	3
8/26	22.3	21.5	6.26	0.3	51	36	459	2.1	3	2
9/24	19.7	18.9	6.6	0.32	26	56	39	2.1	2	3
10/20	12	11.9	9.25	6.18	6.4	23	27	2.3	2	2



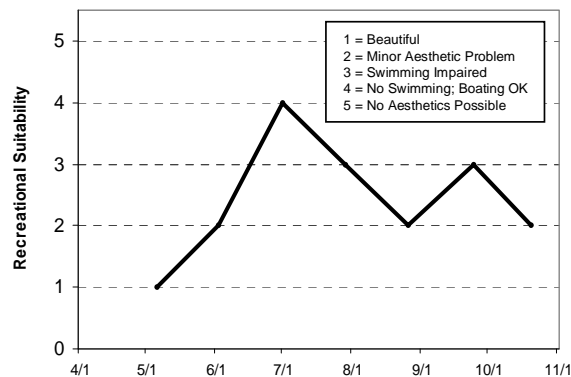
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade					C	C	C	D	C	C		

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

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.

The lake was monitored 5 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	250.2	142.0	387.0	F
CLA (µg/l)	151.8	30.0	310.0	F
Secchi (m)	0.5	0.3	0.7	F
TKN (mg/l)	2.24	1.30	3.20	
<i>Lake Grade</i>				F

The lake received a lake grade of F for 2008, which is similar to last year's lake grade of F. With two consecutive years of the lake receiving F lake grades, the water quality of the lake may be degrading. Continued monitoring of this lake is suggested to determine if this downward trend continues.

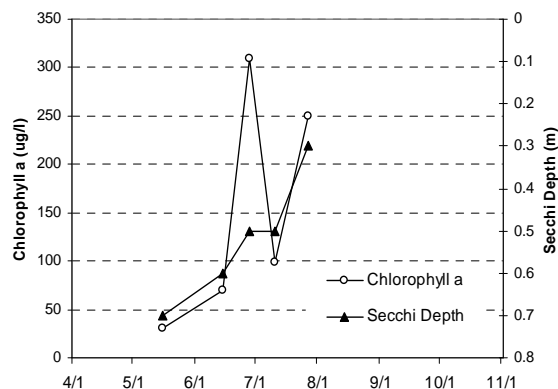
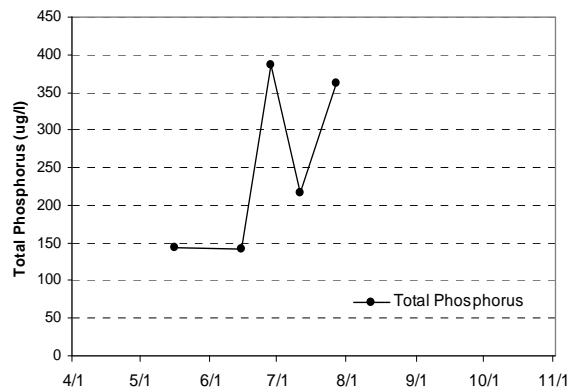
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 1.6 (between 1- "crystal clear" and 2- "some algae present"). The average recreational suitability ranking was 2.4 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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.

South Oak Lake St. Louis Park, Hennepin Co.

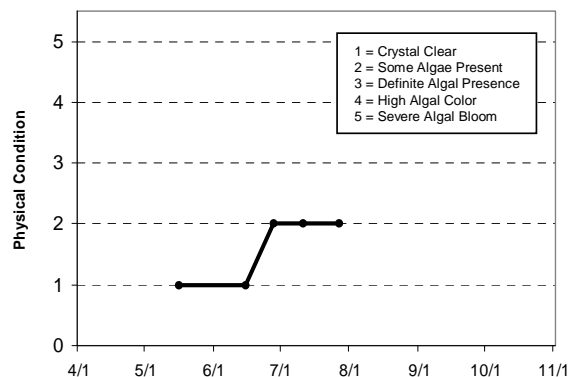
Lake ID: 270661
WD: Minnehaha Creek
Volunteer: Aaron Patterson

• Sampling site
Contours in meters



2008 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
5/16	15.7				30	143		0.7	1	4
6/15	22.1				70	142		0.6	1	2
6/28	24.9				310	387		0.5	2	2
7/11	22.8				99	216		0.5	2	2
7/27	26.1				250	363		0.3	2	2



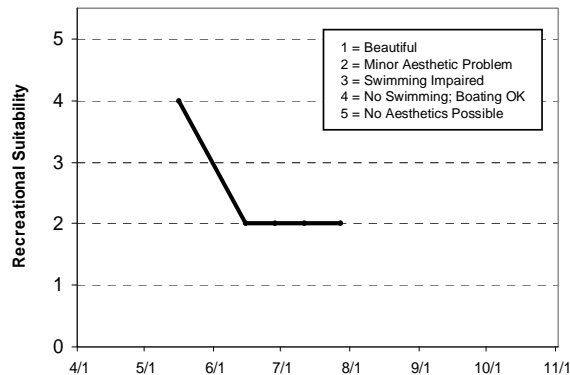
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade											D	D

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

Source: Metropolitan Council and STORET data



South Rice Lake (27-0645) Bassett Creek Watershed Management Organization

South Rice Lake is a 3.2-acre lake located within the City of Golden Valley (Hennepin County). The maximum and mean depths of the lake are 2.5 m (roughly 8 feet) and 0.5 m (one-and-a-half feet), respectively. The mean depth of the lake and its surface area translate to an approximate lake volume of 5.4 ac-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 lake's 63-acre immediate watershed and surface area translates to a watershed-to-lake area ratio of 20:1 (the greater the ratio, the greater the potential stress on the lake from surface runoff). When including the lake's whole contributing watershed (including flow from Grimes Pond and North Rice Lake), however, the size increases to 514 acres (160:1) (Barr 1997).

The lake was monitored 6 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	137.7	88.0	232.0	D
CLA (µg/l)	38.0	3.6	85.0	C
Secchi (m)	0.6	0.3	0.9	F
TKN (mg/l)	2.07	1.20	2.70	
<i>Lake Grade</i>				D

The lake received a lake grade of D for 2008, which is similar to most lake grades received in the previous years since 2000.

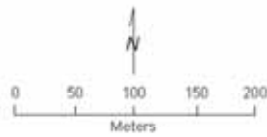
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 3.8 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.3 (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.

South Rice Pond
Golden Valley, Robbinsdale,
Hennepin Co.

Lake ID: 270645
WMO: Bassett Creek
Volunteer: Steve Streff

● Sampling site
Contours in meters



2008 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	20				18	108		0.9	2	3
6/8	23				53	232		0.9	3	4
6/22	24				3.6	89		0.9	3	4
7/6	27				7.3	179		0.5	5	5
8/3	22				61	88		0.3	5	5
8/17	22				85	130		0.3	5	5

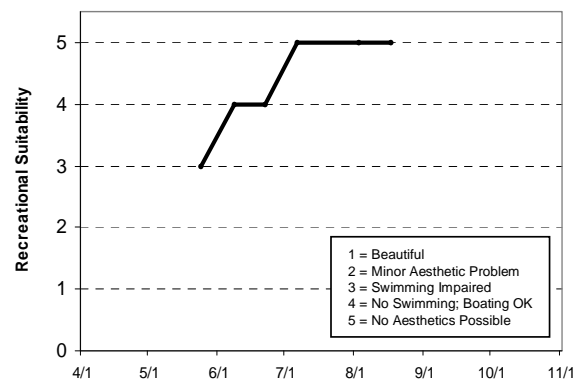
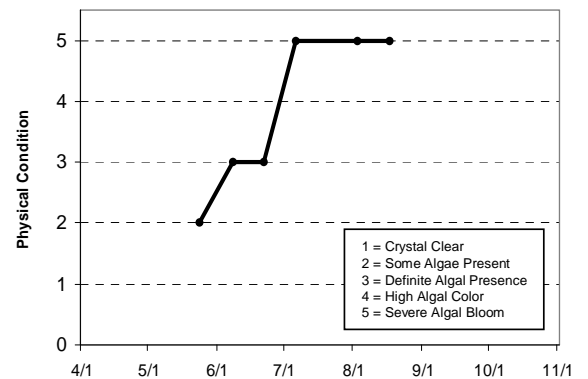
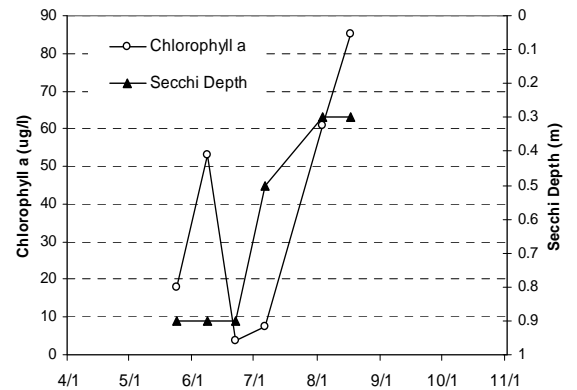
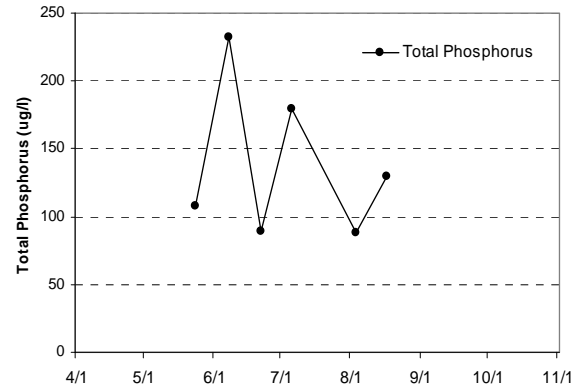
Lake Water Quality Grades Based on Summertime Averages

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									F	F	D	F
Chlorophyll a									F	B	B	C
Secchi Depth									F	F	F	F
Lake Grade									F	D	D	D

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

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). About 41 percent of the lake's area is considered littoral, the shallow (0-15 feet) area dominated by aquatic vegetation.

The lake was monitored 14 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	58.9	27.0	165.0	C
CLA (µg/l)	19.9	4.5	43.0	B
Secchi (m)	2.1	1.2	4.3	C
TKN (mg/l)	1.37	0.84	3.00	
Lake Grade				C

The lake received a lake grade of C for 2008. The lake has consistently received C lake grades during monitoring years since 1995.

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 2.9 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 3.3 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

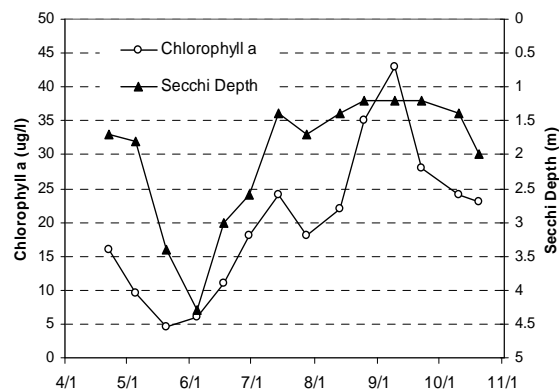
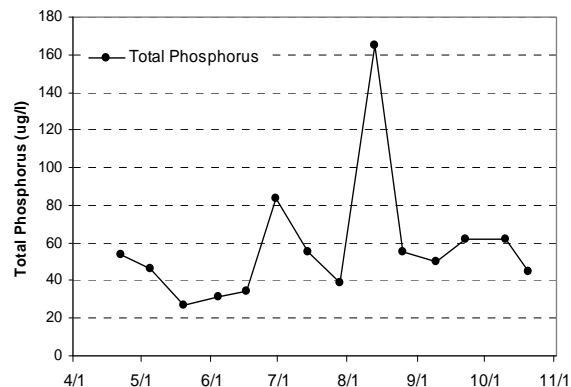
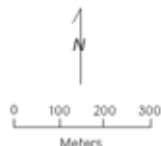
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

South School Section Lake, Hugo, Washington Co.

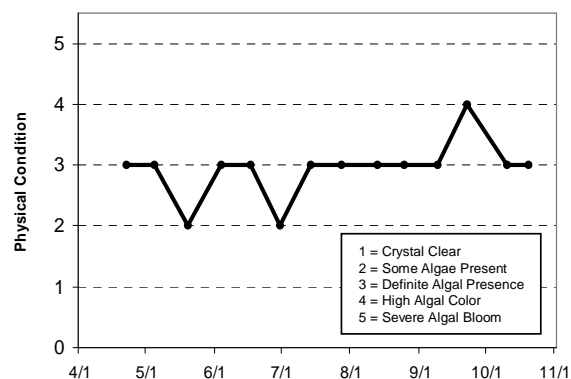
Lake ID: 820151
WD: Browns Creek
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 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	5.9	5.2	15.99	5.23	16	54		1.7	3	4
5/5	9.9	9.2	11.36	0.59	9.6	46		1.8	3	4
5/20	14.2	14.1	9.27	0.71	4.5	27	24	3.4	2	2
6/4	17.7	16.3	8.36	0.15	6	31	20	4.3	3	3
6/17	19.7	19.3	7.67	0.17	11	34	28	3	3	2
6/30	22.7	19.2	7.18	0.45	18	84	81	2.6	2	3
7/14	22.7	22.4	6.05	0.31	24	55	49	1.4	3	4
7/28	25.2	21.4	8.26	26	18	39	63	1.7	3	3
8/13	24.1	22.1	5.68	0.27	22	165	45	1.4	3	3
8/25	24	23	6.97	3.77	35	55	48	1.2	3	4
9/9	19.2	19.4	8.11	0.23	43	50	50	1.2	3	4
9/22	20.1	18.5	10	0.28	28	62	69	1.2	4	4
10/10	14.2	14.1	7.01	0.66	24	62	44	1.4	3	4
10/20	12.3	12.3	8.07	0.35	23	45	39	2	3	4



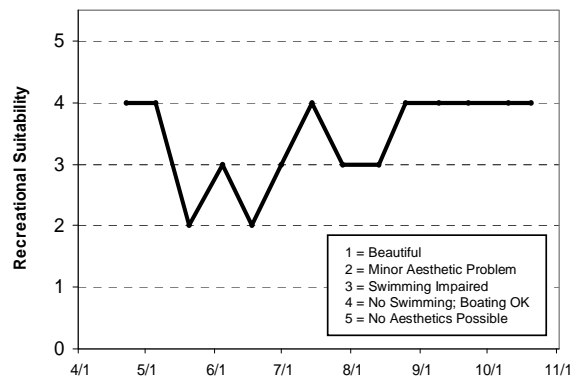
Lake Water Quality Grades Based on Summertime Averages

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				C	C		C					
Chlorophyll a				C	C		C					
Secchi Depth				C	C		C					
Lake Grade				C	C		C					

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

Source: Metropolitan Council and STORET data



South Twin Lake (82-0019) Carnelian - Marine 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 mean depth of the lake and its surface area translate to an approximate lake volume of 356 ac-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 lake's 63-acre immediate watershed and surface area translates to a watershed-to-lake area ratio of 1.2:1 (the greater the ratio, the greater the potential stress on the lake from surface runoff).

The lake was monitored 8 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	74.0	45.0	109.0	D
CLA (µg/l)	35.5	13.0	69.0	C
Secchi (m)	1.1	0.6	1.7	D
TKN (mg/l)	2.13	1.70	3.00	
Lake Grade				D

The lake received a lake grade of D for 2008. The lake has received various lake grades since 1996. They varied from D to F to C to D. To better understand the lake's overall water quality and where it may be heading, continued monitoring is suggested.

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 3.3 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.0 ("no swimming/boating ok").

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.

South Twin Lake Stillwater Twp., Washington Co.

LAKE ID: 820019

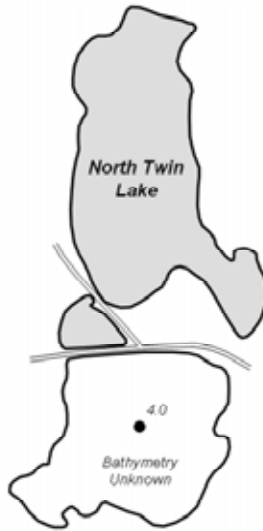
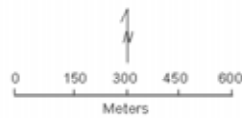
WD: Carnelian-Marine-St. Croix

Volunteer: Washington

Conservation District

● Sampling site

Contours in meters



2008 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(°C)	(°C)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
5/5										
5/6	13.2	11.4	10.93	0.69	13	45		1.7	3	4
6/4	18.6	17.7	8.27	0.28	25	60	52	1.5	3	4
7/1	24.5	22.1	10.33	0.33	23	65	101	1.2	3	4
7/29	26.9	22.7	10.96	0.17	51	78	210	0.6	4	4
8/26	22.8	22.2	7.5	0.17	69	109	100	0.6	4	4
9/24	19.8	19.6	5.23	0.22	32	87	93	0.8	3	4
10/20	12.2	12.2	8.17	0.34	23	77	76	1.4	4	4

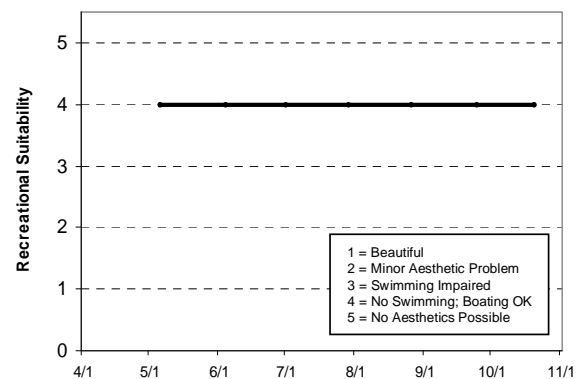
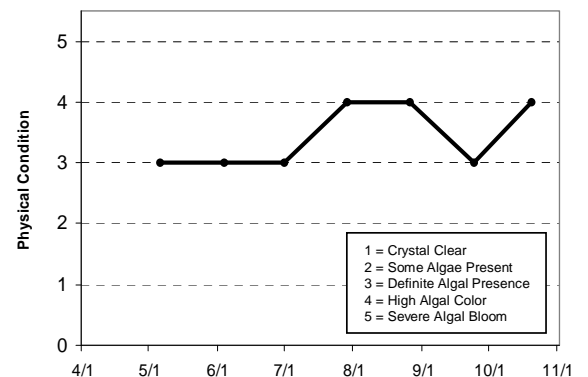
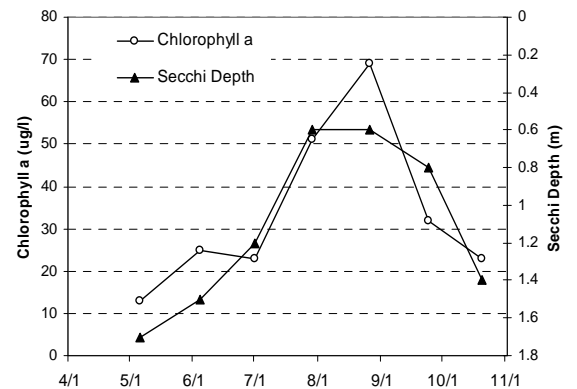
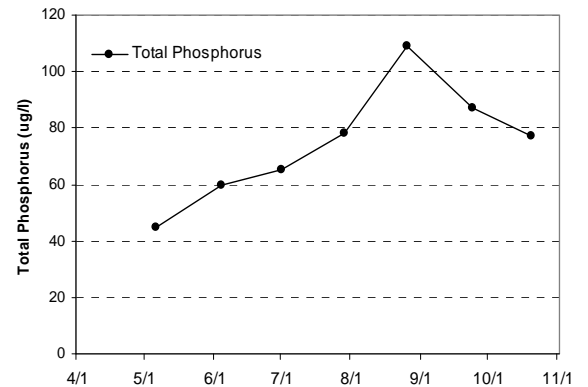
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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. 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. About 50 percent of the lake's area is considered littoral, which is the 0-15 feet depth area dominated by aquatic vegetation. The approximate volume of the lake is approximately 11,500 acre-feet (ac-ft). The lake has a 13,500-acre watershed. The lake and watershed areas translate to a watershed-to-lake area ratio of 21:1. The larger the ratio, the greater the potential stress on the lake's quality from surface runoff.

In an attempt to improve the lake's water quality, a ferric chloride (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 FeCl_3 into the wetland outlet. The FeCl_3 disassociates 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.

The lake has been monitored in the past by Metropolitan Council staff and via the CAMP. The lake was monitored 5 times in 2008 via 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	58.6	48.0	65.0	C
CLA ($\mu\text{g/l}$)	59.6	55.0	63.0	D
Secchi (m)	0.9	0.6	1.4	D
TKN (mg/l)	1.92	1.70	2.20	
Lake Grade				D

The lake received a lake grade of D in 2008. The lake grades have varied from Cs to Ds since 1980. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). Continued monitoring is suggested to provide water quality data for supporting the PLSLWD's efforts in managing Spring Lake.

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 2.0 ("some algae present"). The average recreational suitability ranking was 1.5 (between 1- "beautiful" and 2- "minor aesthetic problem").

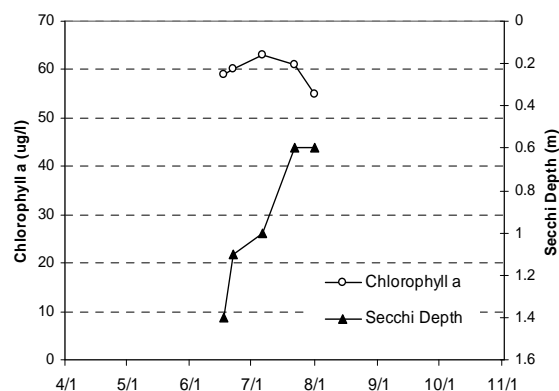
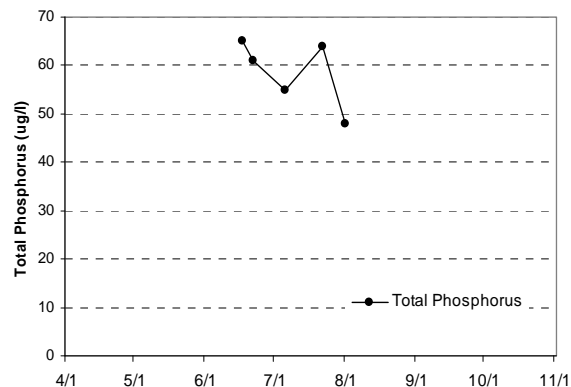
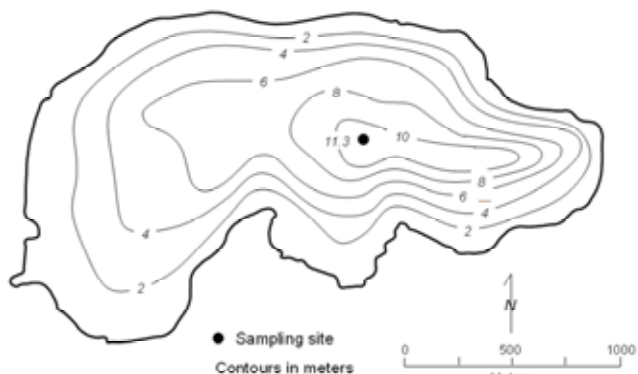
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Spring Lake

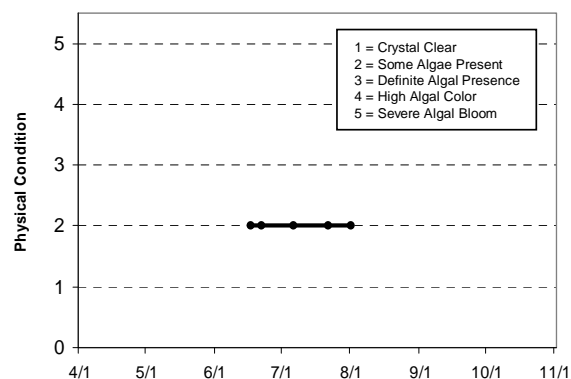
Prior Lake/Spring Lake Twp., Scott Co.

Lake ID: 700054
WD: Prior Lake-Spring Lake
Volunteer: Lisa Kalberg



2008 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
6/17	20.4				59	65		1.4	2	2
6/22					60	61		1.1	2	2
7/6	25.1				63	55		1	2	2
7/22	27.6				61	64		0.6	2	1
8/1	25				55	48		0.6	2	1



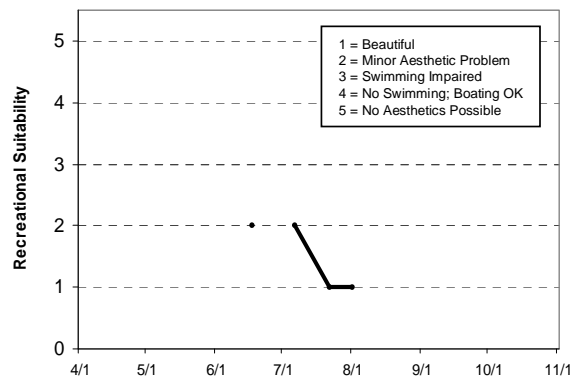
Lake Water Quality Grades Based on Summertime Averages

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
Lake Grade	D	C	C		D							

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
Lake Grade					D	D			D	D	F	C

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

Source: Metropolitan Council and STORET data



Square Lake (82-0046) *Marine on St. Croix Watershed Management Organization*

Square Lake is located in May Township (Washington County). The lake has a surface area of 193 acres, and a maximum and mean depth of 20.7 and 9.0 m, respectively. It has an approximate volume of 5,694 ac-ft. Approximately 65 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance.

It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value and exceptional water clarity. The lake is stocked with rainbow trout by the MN DNR. The lake's level is maintained by a combination of groundwater and runoff from the lake's watershed (MDNR 1996). The lake's watershed area is about 782 acres. The watershed is rural and largely undeveloped. The watershed and lake area translate to a watershed-to-lake area ratio of 4:1. The smaller the ratio, the less stress is put on the lake from surface runoff.

The lake has been monitored via the CAMP in 1993-1997 and 1999-2008. The lake also has been monitored in the past by Metropolitan Council staff. The lake was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
Secchi (m)	5.0	4.4	5.2	A

The lake continues to receive A grades for water clarity. However, A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant declining trend in water clarity (MPCA 2008).

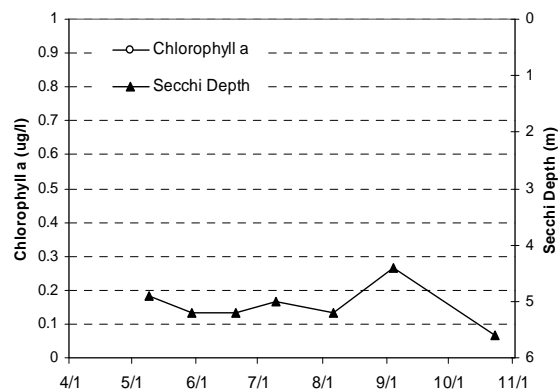
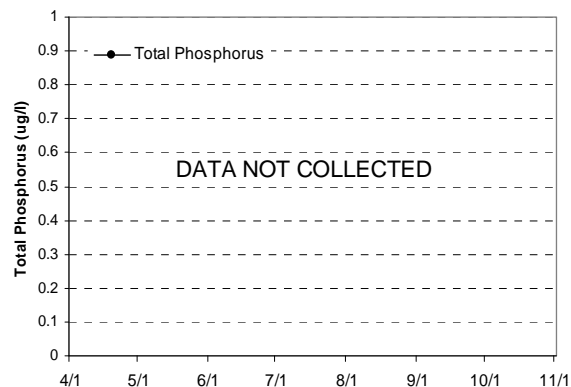
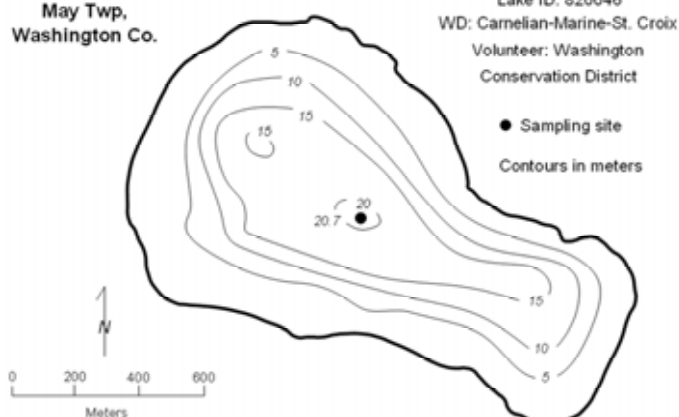
More detailed discussions on the lake, its water chemistry, biological make-up, and hydrology and their influence on the lake can be found in the recent diagnostic-feasibility study completed on the lake as part of a Clean Water Partnership (Square Lake 2001). The complete report highlights the concern of a degrading water clarity trend, the importance of the lake's biological make-up on its overall water quality, and the influence the lake's surface and groundwater watersheds have on the lake's phosphorous load. The Clean Water Partnership report also includes proposed watershed, shoreland, and in-lake projects designed to address issues affecting the lake's quality. An additional resource is an October 2002 report summarizing the lakes recent zooplankton population from monitoring conducted from August 2001-July 2002 (Washington Conservation District 2002)

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 1.2 (between 1- "crystal clear" and 2- "some algae present"). The average recreational suitability ranking was 1.0 ("beautiful").

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/>.

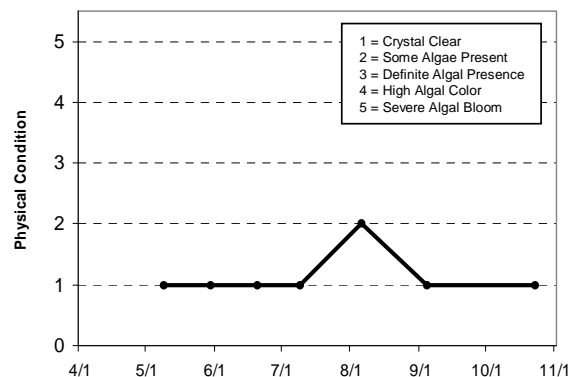
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Square Lake
May Twp,
Washington Co.



2008 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
5/9	11.4	6.1	11.24	0.5				4.9	1	1
5/30	16.1	0.13	10.41	6.6				5.2	1	1
6/20	22.3	6.7	9.38	0.18				5.2	1	1
7/9	24.7	6.8	8.58	0.37				5	1	1
8/6	25.8	6.9	7.42	0.28				5.2	2	1
9/4	22.4	7	7.04	0.23				4.4	1	1
10/23	12.2	7.3	8.76	0.29				5.6	1	1



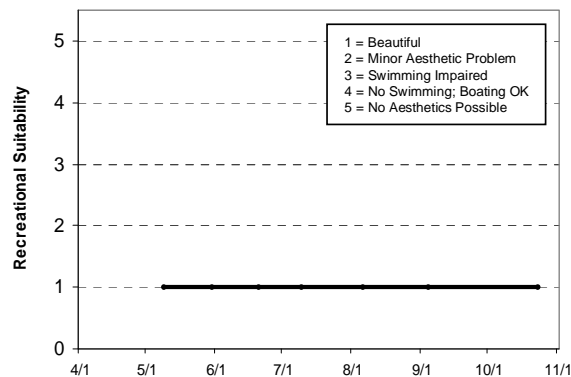
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	B	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	A
Lake Grade	A	A	A	A	A	A				A		

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
Lake Grade		A	A	A	A	A	A	A	A	A	A	A

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

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 five monitoring sites amongst the four pools in 2008. The results will be discussed for the entire lake, as well as individually for each of the five sites.

Lake St. Croix (approximately 8,600 acres) is considered by the MNDNR to extend from Stillwater, Minnesota to Prescott, Wisconsin, a distance of approximately 23 miles. The morphometry 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>
Bayport Pool	6.0	2,800	62,500	6.2-7.3
Troy Beach Pool	6.0	3,100	107,800	9.9-11.0
Black Bass Pool	7.0	1,300	59,600	12.9-14.0
Kinnickinnic Pool	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.*).

This marks the fourth year in which any of the Lake St. Croix sites have been formally involved in CAMP. A citizen-monitoring program conducted by the St. Croix Basin Team produced water quality data for four sites (Bayport Pool- Site 2; Troy Beach Pool-Site 3; Troy Beach Pool-Site 5; and Black Bass Pool-Site 6) during the 1999-2002 and 2005-2008 periods, and for one site (Kinnickinnic Pool-Site 7) during the 2000-2001 and 2005-2008 periods. All data are available in STORET.

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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	41	25	72	C
CLA (µg/l)	16	4.8	33	B
Secchi (m)	1.6	1.0	3.2	C
TKN (mg/l)	0.75	0.44	1.30	
Lake Grade				C

The whole lake received a lake grade of C for 2008, which is similar to those recorded in 1999-2002 and 2005-2007. That said, the individual parameter means indicate that 2006 was the lake's best water quality year since the inception of the volunteer monitoring program. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

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>
Total Phosphorus	D	D	C	C			C	C	C	C
Chlorophyll <i>a</i>	B	C	C	C			B	B	C	B
Secchi Depth	C	C	C	C			C	C	C	C
Overall	C	C	C	C			C	C	C	C

Source: Metropolitan Council and STORET data

The volunteer's perceptions of the physical and recreational conditions of the lake were averaged to determine the perceptions for the whole lake. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.3 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.0 ("minor aesthetic problem").

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.

St. Croix Lake [Bayport Pool-Site 2] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Bayport Pool-Site 2] was monitored 9 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	42.0	34.0	56.0	C
CLA (µg/l)	19	8.2	33	B
Secchi (m)	1.4	1.2	1.6	C
TKN (mg/l)	0.74	0.56	1.00	
Lake Grade				C

The pool received a lake grade of C for 2008, which is similar to lake grades received in the past. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

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 2.0 ("some algae present"). The average recreational suitability ranking was 1.6 (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.

Lake St. Croix, Bayport Pool, Site 2 Minnesota/Wisconsin

Lake ID: 820001-02
Volunteers: Jim and Roberta Harper

● Sampling site
Contours in meters



2008 Data

	Surf Tmp	CLA	Surf TP	Secchi		
Date	C	ug/L	ug/L	(m)	PC	RS
5/20	17.4	14	56	1.4	1	1
6/1	21.2	23	46	1.2	2	1
6/17	21.1	11	34	1.2	2	2
6/30	24.2	8.2	56	1.4	2	1
7/14	27.4	12	41	1.4	2	2
7/28	28.0	26	37	1.6	2	1
8/8	27.2	33	37	1.2	2	2
9/9	24.4	23	37	1.6	3	2
9/22	20.7	21	35	1.6	2	2

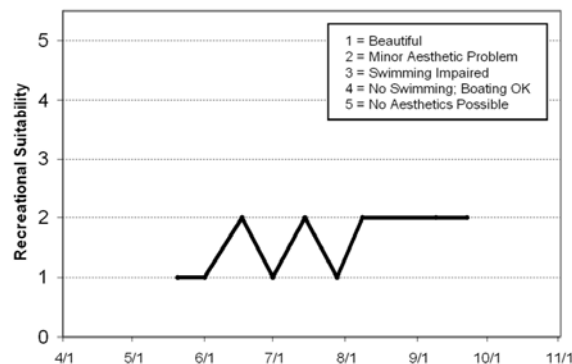
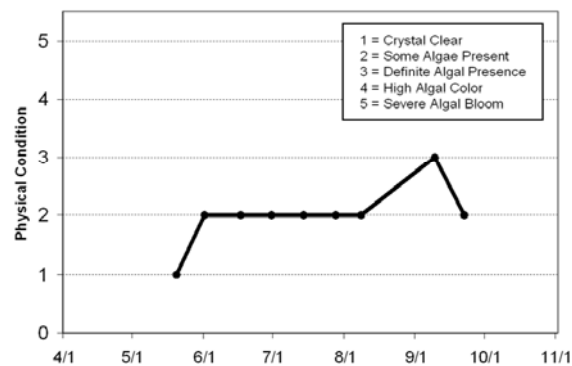
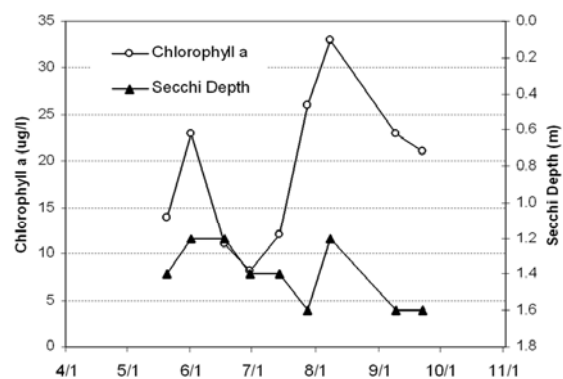
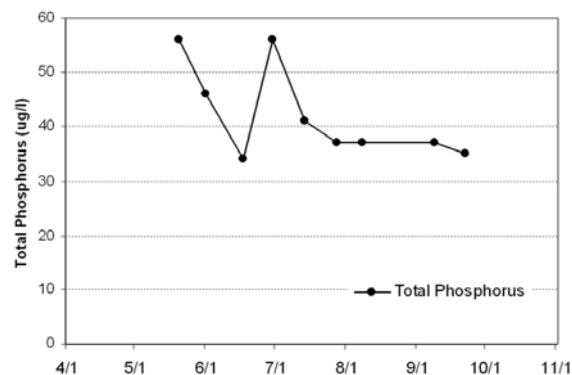
Lake Water Quality Grades Based on Summertime Averages

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

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

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 10 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	42.0	26.0	66.0	C
CLA (µg/l)	15	4.9	24	B
Secchi (m)	1.6	1.0	2.0	C
TKN (mg/l)	0.65	0.44	0.90	
Lake Grade				C

The site received a lake grade of C for 2008, which is similar to those recorded in 1999-2001 and 2005-2007, and better than the D recorded in 2002. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

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 2.1 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.1 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

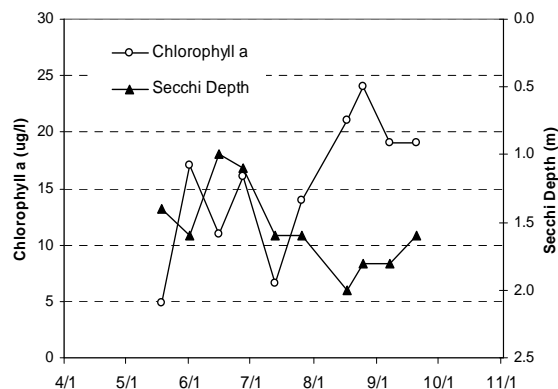
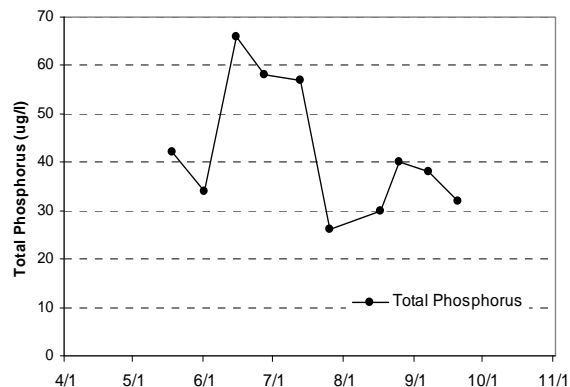
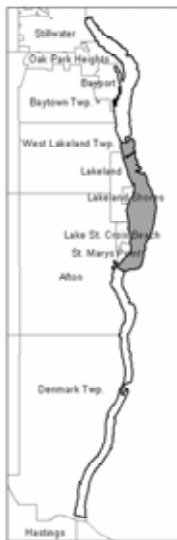
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lake St. Croix, Troy Beach Pool, Site 3 Minnesota/Wisconsin

Lake ID: 820001-03

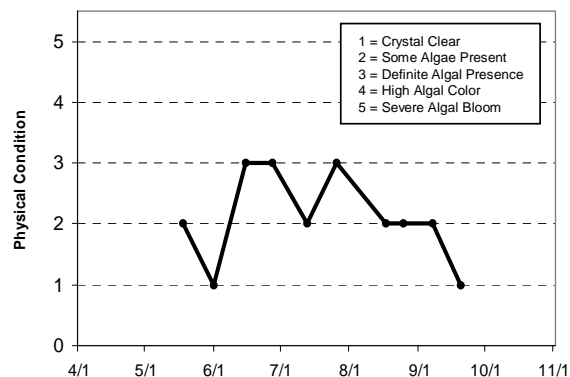
Volunteers: Cecilia and Harry Martin

● Sampling site
Contours in meters



2008 Data

	Surf Tmp	CLA	Surf TP	Secchi		
Date	C	ug/L	ug/L	(m)	PC	RS
5/18	15.1	4.9	42	1.4	2	2
6/1	20.8	17	34	1.6	1	1
6/15	21.1	11	66	1.0	3	3
6/27	25.0	16	58	1.1	3	3
7/13	23.8	6.6	57	1.6	2	2
7/26	26.4	14	26	1.6	3	3
8/17	24.6	21	30	2.0	2	2
8/25	25.5	24	40	1.8	2	2
9/7	20.3	19	38	1.8	2	2
9/20	20.5	19	32	1.6	1	1



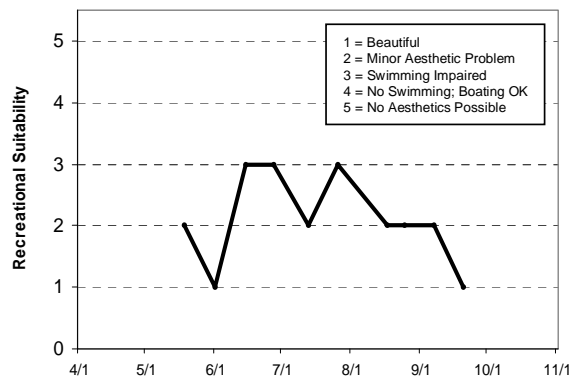
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008
Total Phosphorus		C	C	C	C
Chlorophyll a		B	B	C	B
Secchi Depth		C	C	C	C
Lake Grade		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 8 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	38.0	25.0	50.0	C
CLA (µg/l)	16	7.0	22	B
Secchi (m)	1.7	1.0	2.0	C
TKN (mg/l)	0.72	0.54	0.92	
Lake Grade				C

The site received a lake grade of C, which is similar to those recorded in 1999-2002 and 2005-2007. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

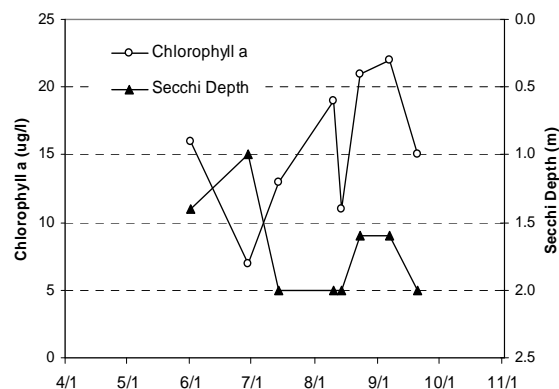
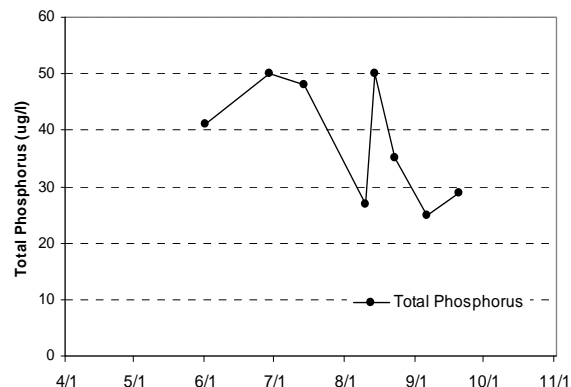
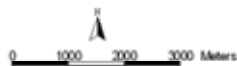
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.1 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 1.4 (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.

Lake St. Croix, Troy Beach Pool, Site 5 Minnesota/Wisconsin

Lake ID: 820001-05
Volunteers: Richard and Sheryl Lindholm

● Sampling site
Contours in meters



2008 Data

	Surf Tmp	CLA	Surf TP	Secchi		
Date	C	ug/L	ug/L	(m)	PC	RS
6/1	19.2	16	41	1.4		1
6/29	23.0	7.0	50	1.0	1	1
7/14	26.1	13	48	2.0	2	2
8/10	26.1	19	27	2.0	2	1
8/14	26.2	11	50	2.0	4	3
8/23	24.9	21	35	1.6	2	1
9/6	22.3	22	25	1.6	2	1
9/20	21.7	15	29	2.0	2	1

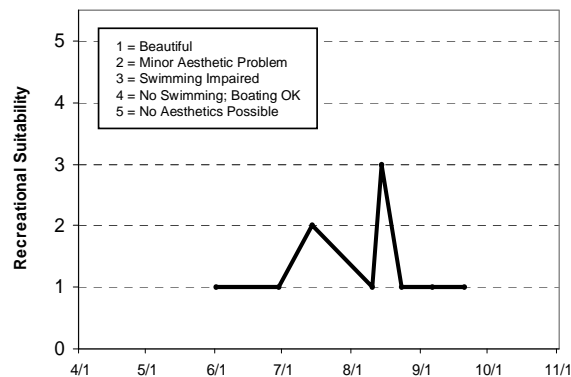
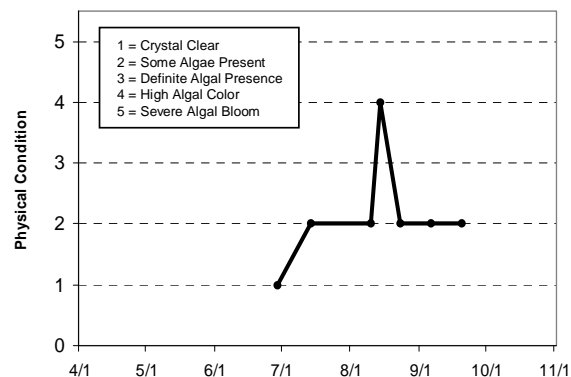
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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
Total Phosphorus		C	C	C	C
Chlorophyll a		C	B	C	B
Secchi Depth		C	C	C	C
Lake Grade		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 10 times between mid-May and late-September, 2007. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	41.0	27.0	54.0	C
CLA (µg/l)	15.0	4.8	23.0	B
Secchi (m)	1.7	1.4	2.0	C
TKN (mg/l)	0.81	0.64	1.00	
Lake Grade				C

The site received a lake grade of C for 2008, which is similar to those recorded in 1999-2002 and 2005-2006. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

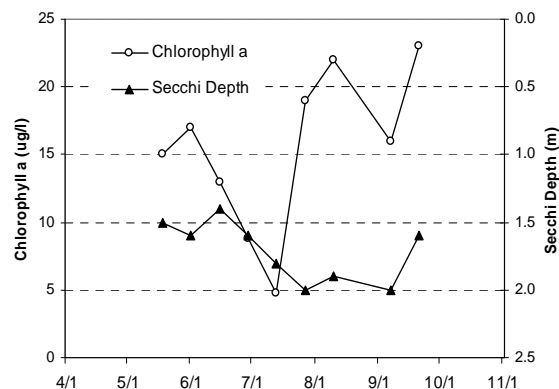
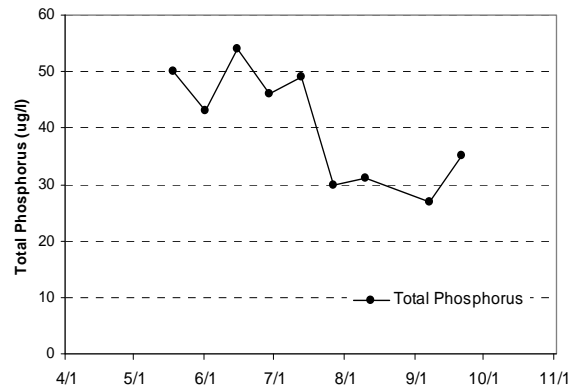
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.6 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.3 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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.

Lake St. Croix, Black Bass Pool, Site 6 Minnesota/Wisconsin

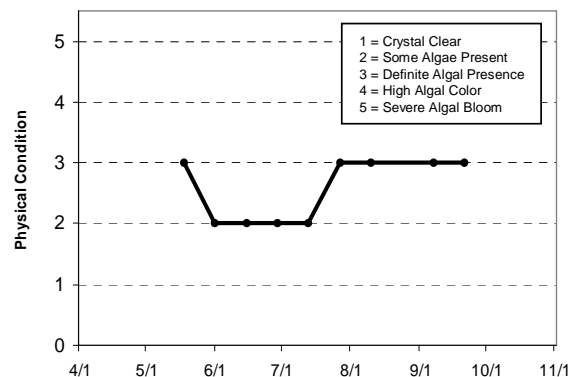
Lake ID: 820001-06
Volunteer: Rick Meierotto

● Sampling site
Contours in meters



2008 Data

	Surf Tmp	CLA	Surf TP	Secchi		
Date	C	ug/L	ug/L	(m)	PC	RS
5/18	15.9	15	50	1.5	3	2
6/1	20.5	17	43	1.6	2	2
6/15	22.4	13	54	1.4	2	2
6/29	23.9	8.8	46	1.6	2	2
7/13	24.1	4.8	49	1.8	2	2
7/27	26.8	19	30	2.0	3	2
8/10	26.4	22	31	1.9	3	3
9/7	22.9	16	27	2.0	3	3
9/21	22.8	23	35	1.6	3	3



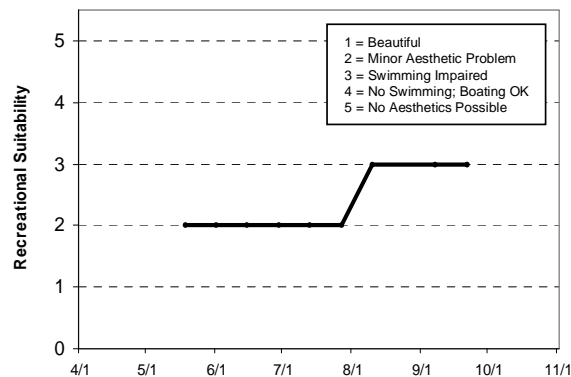
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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 5 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	43.0	25.0	72.0	C
CLA (µg/l)	20	9.4	33	B
Secchi (m)	2.0	1.0	3.2	C
TKN (mg/l)	0.91	0.43	2.10	
Lake Grade				C

The site received a lake grade of C for 2008, which is similar to the C recorded in 2000 and but worse than the B lake grades received in 2005 – 2007. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

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 3.0 ("definite algae present"). The average recreational suitability ranking was 3.2 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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.

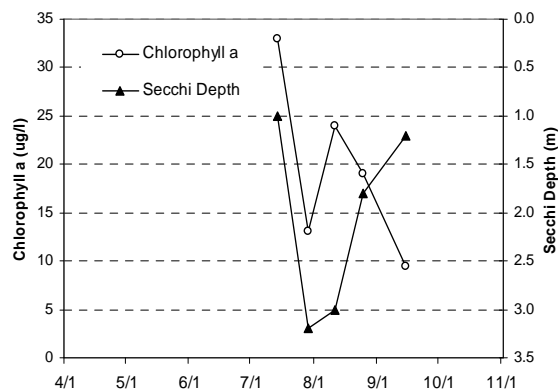
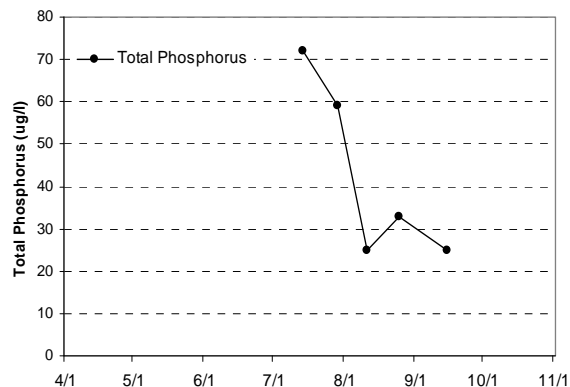
Lake St. Croix, Kinnickinnic Pool, Site 7 Minnesota/Wisconsin

Lake ID: 820001-07

Volunteer: Carpenter Nature Center

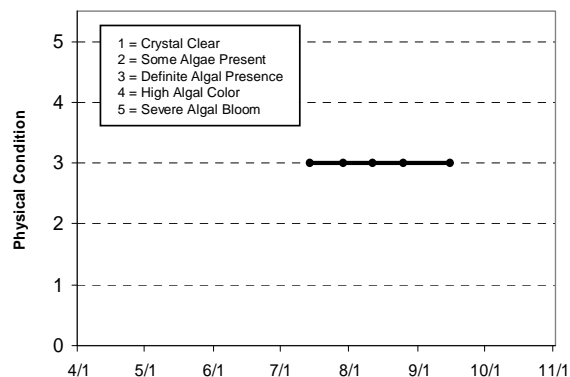
● Sampling site

Contours in meters



2008 Data

	Surf Tmp	CLA	Surf TP	Secchi		
Date	C	ug/L	ug/L	(m)	PC	RS
7/14	28.7	33	72	1.0	3	3
7/29	27.5	13	59	3.2	3	3
8/11	25.4	24	25	3.0	3	3
8/25	24.9	19	33	1.8	3	4
9/15	22.0	9.4	25	1.2	3	3



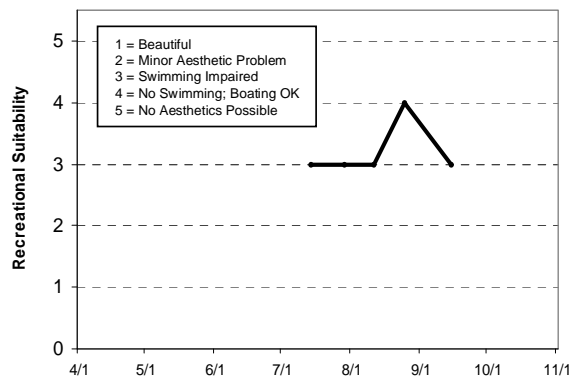
Lake Water Quality Grades Based on Summertime Averages

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

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). Approximately 46 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 was monitored 9 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	19.1	16.0	23.0	A
CLA (µg/l)	7.1	1.5	19.0	A
Secchi (m)	2.9	1.7	4.4	B
TKN (mg/l)	0.95	0.75	1.10	
<i>Lake Grade</i>				A

The lake received a lake grade of A for 2008, which is similar to lake grades received in the past. Continued monitoring is suggested to continue to build the water quality database for improving confidence in detecting potential trends in water quality.

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 3.1 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 1.9 (between 1- "beautiful" and 2- "minor aesthetic problem").

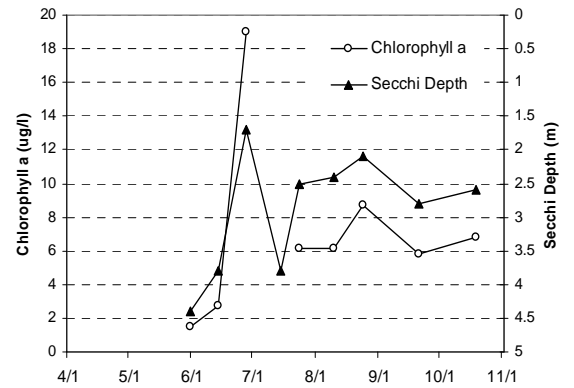
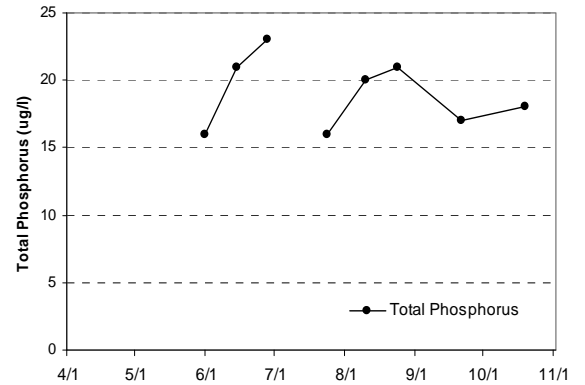
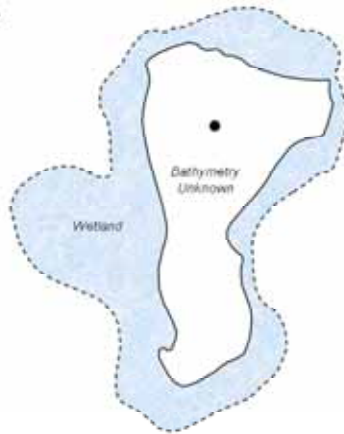
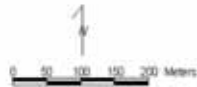
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

St. Joe's Lake Chanhassen, Carver Co.

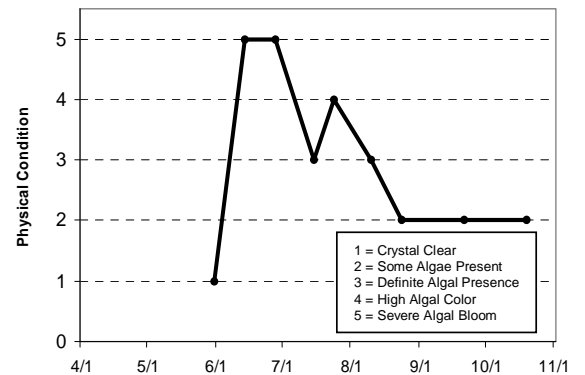
LAKE ID: 100011
WD: Minnehaha Creek
Volunteers: Sue Morgan and
Linda Scott

● Sampling site
Contours in meters



2008 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	18.5				1.5	16		4.4	1	1
6/14	20.5				2.7	21		3.8	5	2
6/28	23.7				19	23		1.7	5	4
7/15	24.9							3.8	3	2
7/24	26				6.1	16		2.5	4	2
8/10	26.6				6.1	20		2.4	3	2
8/24	25				8.7	21		2.1	2	1
9/21	21.2				5.8	17		2.8	2	1
10/19	13.2				6.8	18		2.6	2	1



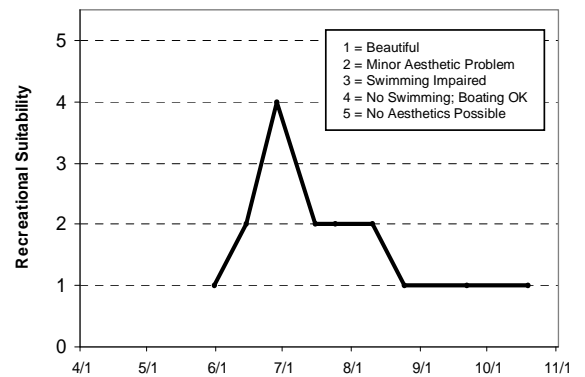
Lake Water Quality Grades Based on Summertime Averages

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												
Chlorophyll a												
Secchi Depth				C		B						
Lake Grade												

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

Source: Metropolitan Council and STORET data



Staples Lake (82-0028) Carnelian - Marine 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 mean depth of the lake and its surface area translate to an approximate lake volume of 165 ac-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 lake's 127-acre watershed and surface area translates to a watershed-to-lake size ratio of 5.3:1 (the greater the ratio, the greater the potential stress on the lake from surface runoff).

The lake was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
Secchi (m)	2.6	1.8	3.4	B

The lake received a water clarity grade of B for 2008, which is consistent with the historical database.

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 2.4 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.6 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

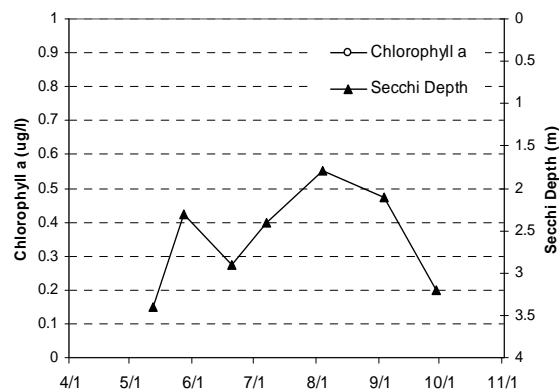
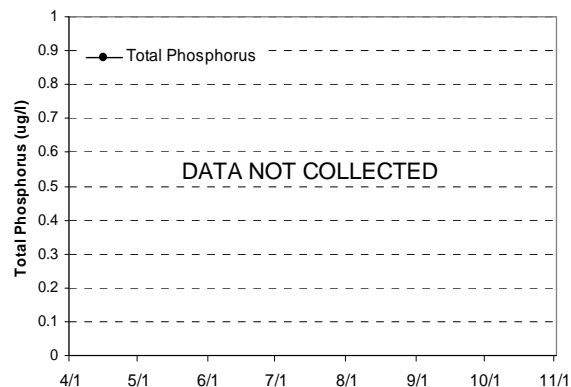
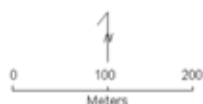
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Staples Lake May Twp., Washington Co.

LAKE ID: 820028
WD: Camelian-Marine-St. Croix
Volunteer: Washington
Conservation District

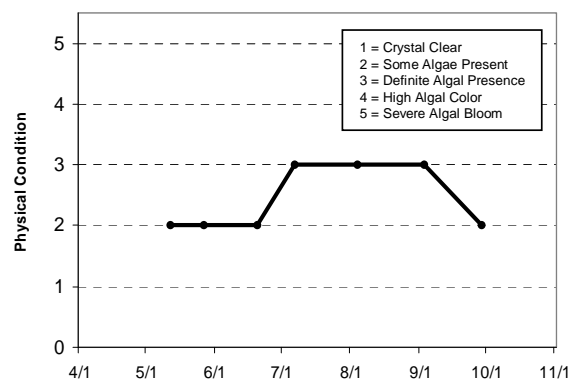
● Sampling site

Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/12	14.1	12.4	9.67	3.51				3.4	2	3
5/27	17	15.7	8.32	0.19				2.3	2	3
6/20	23.7	18.3	8.74	0.19				2.9	2	2
7/7	26.3	22.7	7.4	0.32				2.4	3	2
8/4	25.2	21.6	4.99	0.23				1.8	3	3
9/3	22	19.9	4.35	0.12				2.1	3	3
9/29	18.1	17.6	4.63	0.18				3.2	2	2



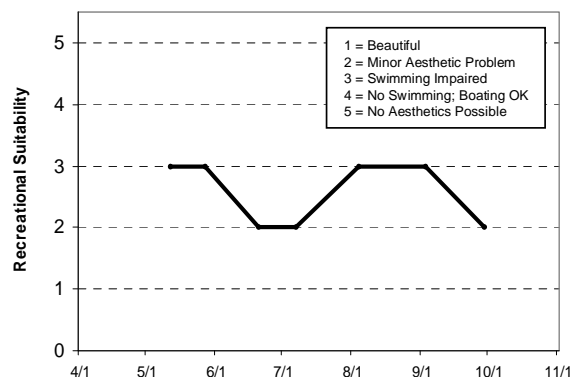
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade						B	B	B	B	B		

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

Source: Metropolitan Council and STORET data



Success Lake (27-0634) Shingle Creek Watershed Management Commission

Success Lake is located in the City of Brooklyn Park (Hennepin County). Bathymetric information is unavailable for this lake.

The lake was monitored 10 times in 2008. 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.

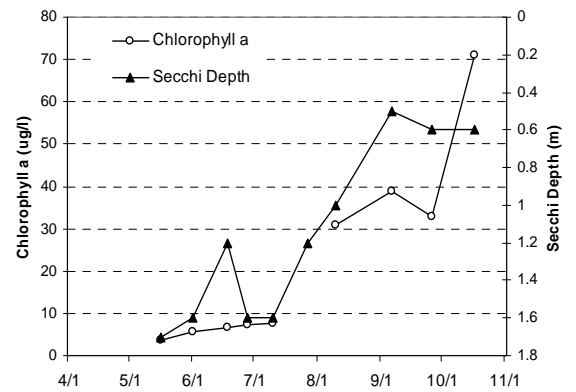
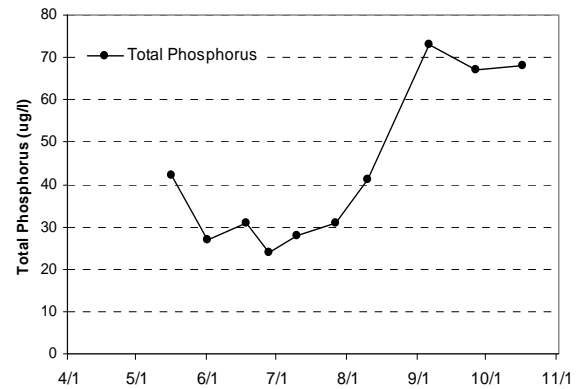
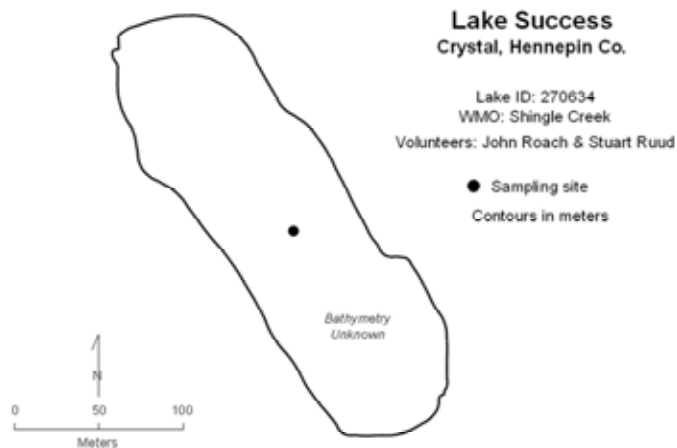
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	40.4	24.0	73.0	C
CLA (µg/l)	16.7	3.6	39.0	B
Secchi (m)	1.2	0.5	1.7	C
TKN (mg/l)	1.20	0.34	2.00	
Lake Grade				C

The lake received a lake grade of C for 2008, which is consistent with the lake grades received in 2003 and 2006. However, the lake received a better lake grade of B in 1996. Continued monitoring is suggested to continue to build the historical water quality database for determining potential trends in water quality.

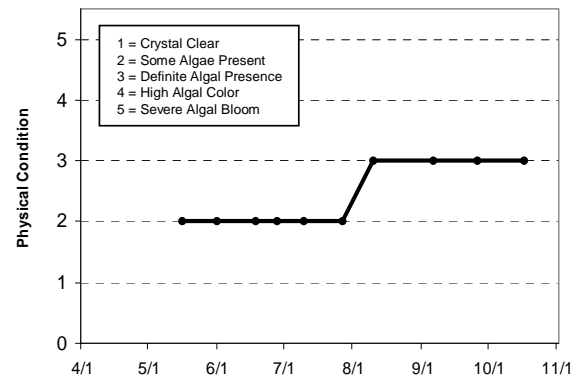
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.3 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.7 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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.



2008 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
5/16	20.1				3.6	42		1.7	2	2
6/1	21.9				5.8	27		1.6	2	2
6/18	24.2				6.5	31		1.2	2	3
6/28	24.5				7.4	24		1.6	2	2
7/10	25.3				7.6	28		1.6	2	2
7/27	27.1				31			1.2	2	2
8/10	26.2				31	41		1	3	3
9/6	21.7				39	73		0.5	3	4
9/26	21.2				33	67		0.6	3	4
10/17	12.5				71	68		0.6	3	3



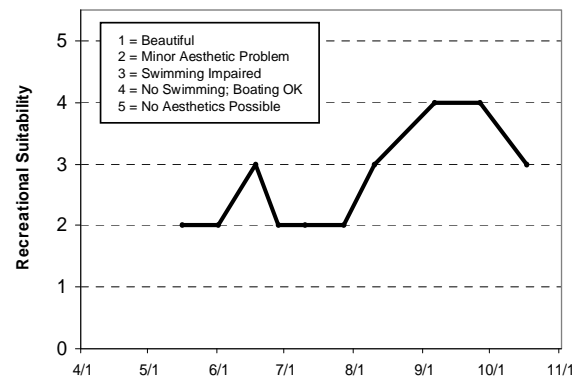
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Sunfish Lake [Sunfish Lake] (19-0050) City of Sunfish Lake

Sunfish Lake is a small 49-acre lake located in the City of Sunfish Lake (Dakota County). This was the third year that Sunfish Lake has been involved in the CAMP. A search through the STORET nationwide water quality database for data on the lake provided no data other than Secchi depth information for 1984-1986 and 1991. Therefore 2006 through 2008 are the only years of available water quality data.

The lake was monitored 13 times between early May and mid-October 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	39	13	73	C
CLA (µg/l)	32	1.7	82	C
Secchi (m)	1.6	0.6	4.1	C
TKN (mg/l)	1.1	0.62	1.9	
Lake Grade				C

The lake water quality grade for 2008 was a C, which is similar to the lake grades received in 2006 and 2007. The average TP concentration was similar in magnitude as observed in 2007. The minimum and maximum TP concentrations were similar between 2008 and 2007 as well. The average CLA concentration in 2008 was higher in comparison to 2007, with the same pattern observed in the minimum and maximum CLA values. The average water clarity was lower in 2008 than in 2007 but the minimum and maximum water clarity measurements were similar in 2008 and 2007. It appears that the lake water quality in 2008 was similar to 2007 with respect to TP, but algal abundance was higher and water clarity was lower in 2008 compared to 2007, on average, as indicated by the CLA and Secchi measurements. However, the average TP, Secchi depth, and TKN measurements in 2008 were indicative of better water quality in comparison to those measurements in 2006. CLA concentrations (average, minimum, maximum) in 2008 were similar to those observed in 2006.

As mentioned earlier, there are no nutrient data available for Sunfish Lake other than the 2006 through 2008 CAMP data. Therefore there are insufficient data at this time to determine long-term trends with sufficient statistical confidence. Given the past 3 years of water quality data, the lake appears to be characterized by a lake water quality grade of C with some variation in water quality conditions from year to year. Furthermore, Secchi measurements indicate that the water clarity from the mid-1980s was represented by a grade of C as well. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

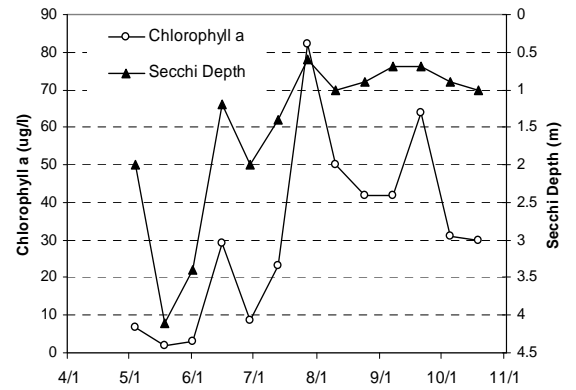
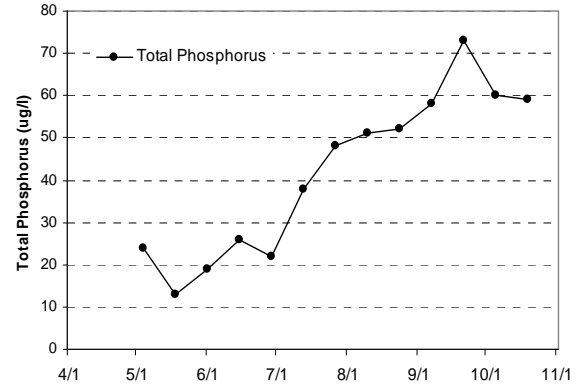
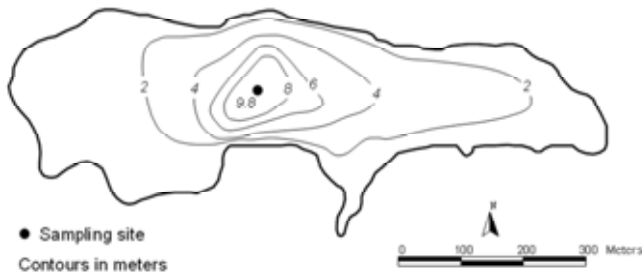
The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings were 3.0 for physical condition ("definite algae present"), and 1.9 for recreational suitability (between 1- "Beautiful" and 2- "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.

Sunfish Lake

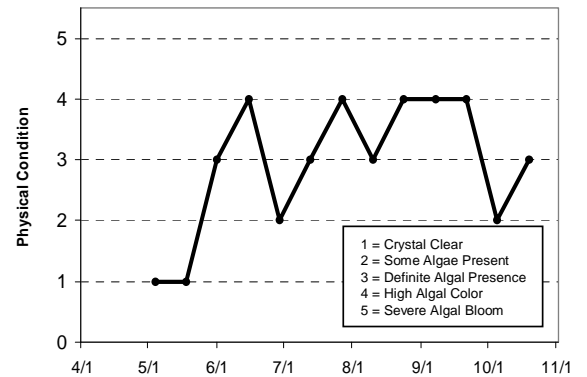
Sunfish Lake, Dakota Co.

Lake ID: 190050
WMO: Lower Mississippi River
Volunteer: Dick Bancroft



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/4	13.1				6.9	24		2	1	1
5/18	16.4				1.7	13		4.1	1	1
6/1	19.2				3.1	19		3.4	3	1
6/15	21.3				29	26		1.2	4	2
6/29	23.9				8.5	22		2	2	1
7/13	23.9				23	38		1.4	3	1
7/27	26.5				82	48		0.6	4	3
8/10	24.7				50	51		1	3	3
8/24	23.6				42	52		0.9	4	3
9/7	19.9				42	58		0.7	4	3
9/21	20.7				64	73		0.7	4	3
10/5	15.3				31	60		0.9	2	2
10/19	13.4				30	59		1	3	2



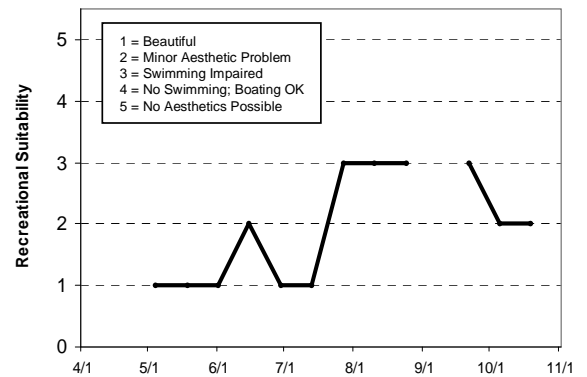
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Sunfish Lake [Lake Elmo] (82-0107) Valley Branch Watershed District

Sunfish Lake is a 50-acre lake located in the City of Lake Elmo (Washington County). The lake has a maximum depth of approximately 3.4 m (11 ft). The lake has a 526-acre immediate drainage area, which results in a watershed-to-lake area ratio of approximately 11:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 7 times in 2008. 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.

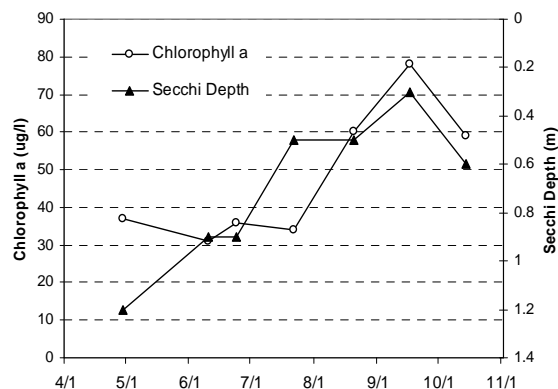
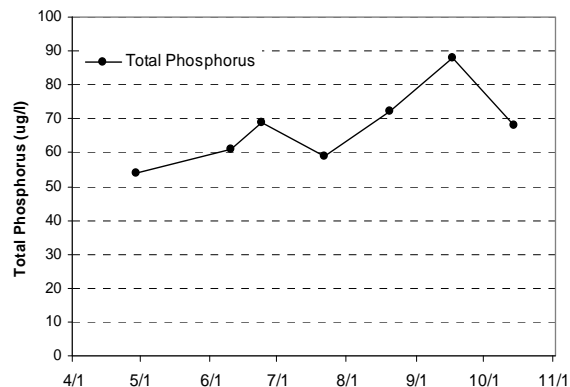
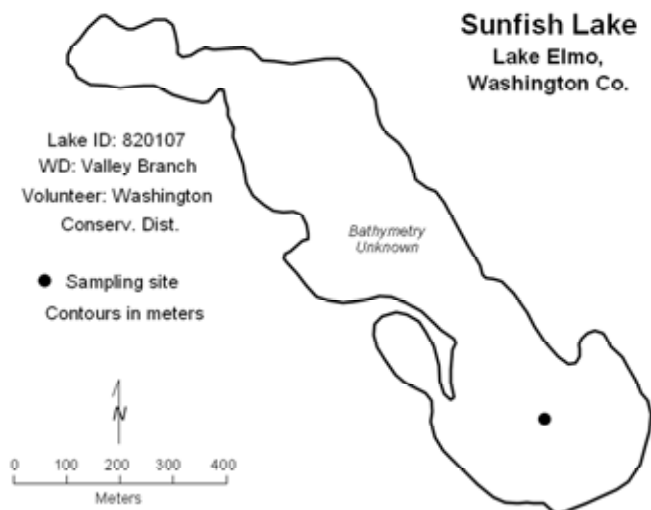
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	69.8	59.0	88.0	D
CLA (µg/l)	47.8	31.0	78.0	C
Secchi (m)	0.6	0.3	0.9	F
TKN (mg/l)	1.92	1.50	2.30	
<i>Lake Grade</i>				D

The lake received a lake grade of D for 2008, which is similar to lake grades received in the past. Continued monitoring is suggested to continue to build the water quality database for this lake.

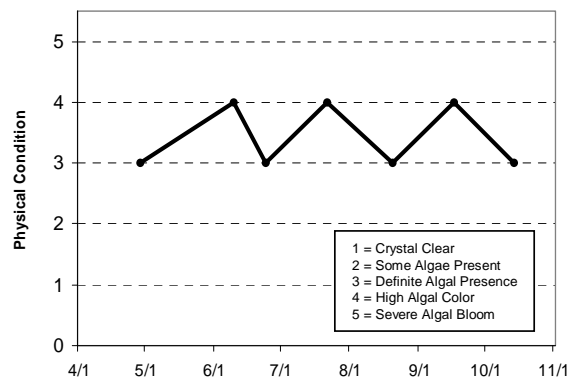
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 3.6 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.0 ("no swimming/boating ok").

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.



2008 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	8	7.4	11.77	1.11	37	54		1.2	3	4
6/10	21.4	18.5	9.4	0.05	31	61		0.9	4	4
6/24	25	20.1	8.84	0.5	36	69		0.9	3	4
7/22	26.2	22.4	8.32	19	34	59		0.5	4	4
8/20	25.6	22.8	9.18	0.17	60	72		0.5	3	4
9/17	20.1	17.5	12.18	0.3	78	88		0.3	4	4
10/14	14.3	14.3	9.93	0.45	59	68		0.6	3	4



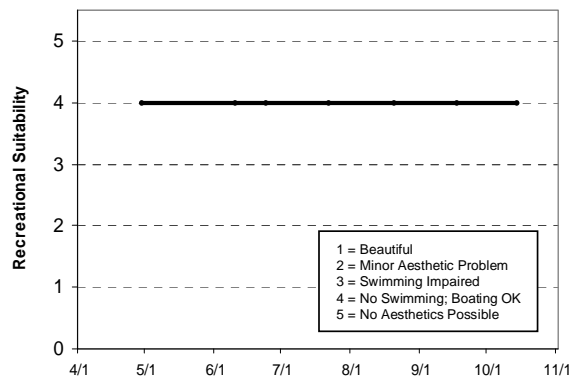
Lake Water Quality Grades Based on Summertime Averages

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												C
Chlorophyll a												C
Secchi Depth												D
Lake Grade												C

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

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 approximate volume of the lake is 104 ac-ft. 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.

The lake was monitored 14 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	22.5	16.0	32.0	A
CLA (µg/l)	5.5	2.4	10.0	A
Secchi (m)	2.5	1.5	4.2	B
TKN (mg/l)	0.91	0.77	1.10	
Lake Grade				A

The lake received a lake grade of A for 2008, which is the first time it received such a lake grade. The total phosphorus concentrations were generally lower in 2008 than in previous years. The lake generally maintains an overall letter grade of B with some variation in the individual parameter letter grades. Additional monitoring is suggested to provide data for evaluating potential trends in water quality, such as the TP parameter.

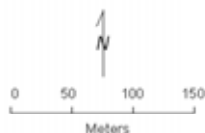
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 1.5 (between 1- "crystal clear" and 2- "some algae present"). The average recreational suitability 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.

Sunnybrook Lake Grant, Washington Co.

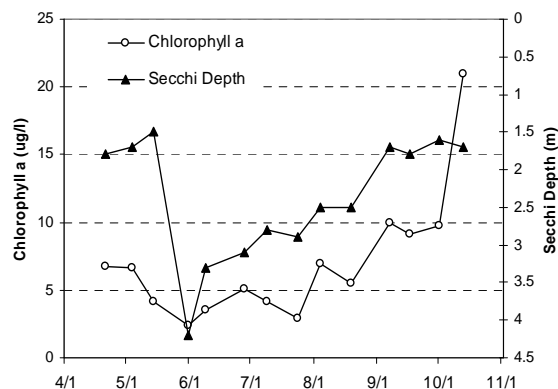
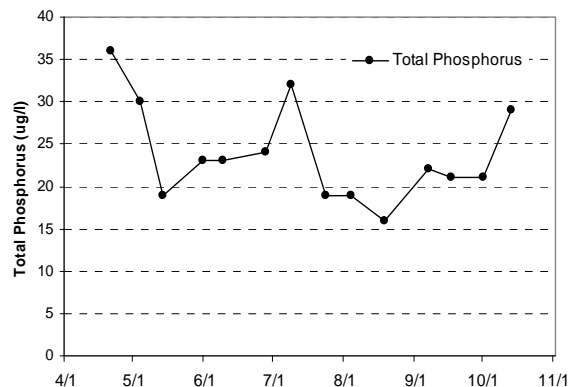
Lake ID: 820133
WD: Valley Branch
Volunteer: Arnie Johnson

● Sampling site
Contours in meters



Bathymetry
Unknown

6.1



2008 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	7.2				6.7	36		1.8	1	1
5/4	13.6				6.6	30		1.7	1	1
5/14	17.8				4.2	19		1.5	1	1
5/31	18.4				2.4	23		4.2	1	1
6/9	21.3				3.5	23		3.3	2	2
6/28	25.1				5.1	24		3.1	2	2
7/9	25.9				4.1	32		2.8	2	2
7/24	26.8				2.9	19		2.9	1	2
8/4	26.2				6.9	19		2.5	1	1
8/19	27.7				5.5	16		2.5	1	1
9/7	20.7				10	22		1.7	2	1
9/17	19.4				9.1	21		1.8	2	2
10/1	17.2				9.8	21		1.6	2	1
10/13	16.2				21	29		1.7	1	1

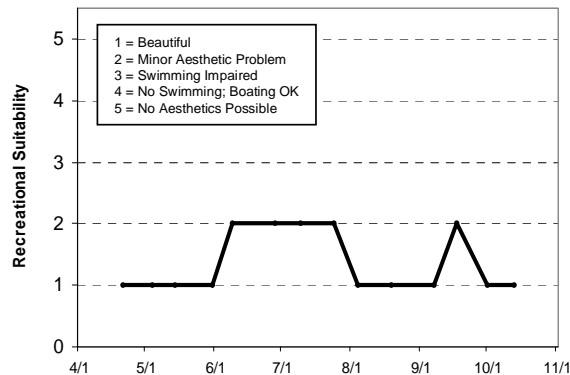
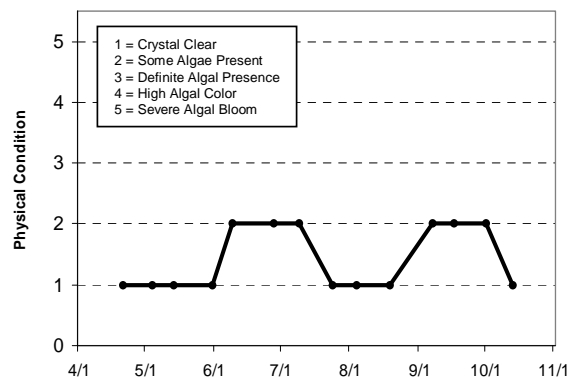
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Sunset Lake (82-0153) Rice Creek Watershed District

Sunset Lake, with a surface area of about 124 acres (2.3 miles in circumference), is located in the southern portion of the City of Hugo (Washington County). It has a maximum depth of 5.2 m (17 ft). The lake is considered a “Priority Lake” by the Metropolitan Council due to its multi-recreational uses. 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. The lake was monitored 9 times from in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	22.0	13.0	44.0	A
CLA (µg/l)	4.2	1.9	6.6	A
Secchi (m)	3.3	2.5	4.2	A
TKN (mg/l)	0.64	0.34	0.76	
Lake Grade				A

The lake received a lake grade of A for 2008. The lake has received A lake grades since 2001. According to the historical water quality database, the lake’s 2001-2008 lake grades of A have been an improvement over the B lake grades received in 1994 and 2000 and the C lake grades received in 1993 and 1995-1999.

Besides the lake’s CAMP data, Secchi transparencies were measured throughout the mid- and late-1980’s as part of the MPCA’s volunteer program. The lake appears to have changed from a C grade lake to an A grade lake over the past 25 years. A trend analysis conducted by the MPCA on the lake’s Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

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 1.9 (between 1- “crystal clear” and 2- “some algae present”). The average recreational suitability ranking was 2.3 (between 2- “minor aesthetic problem” and 3- “swimming slightly impaired”).

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.

Sunset Lake Hugo, Washington Co.

Lake ID: 820153

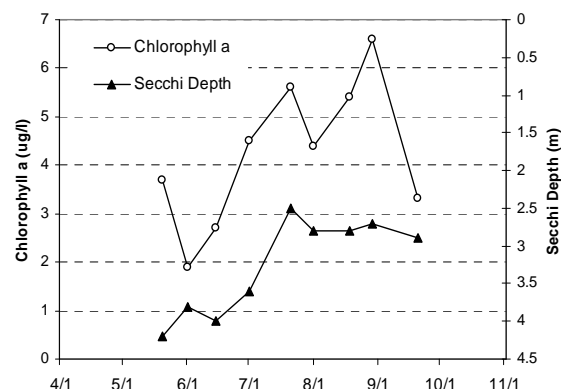
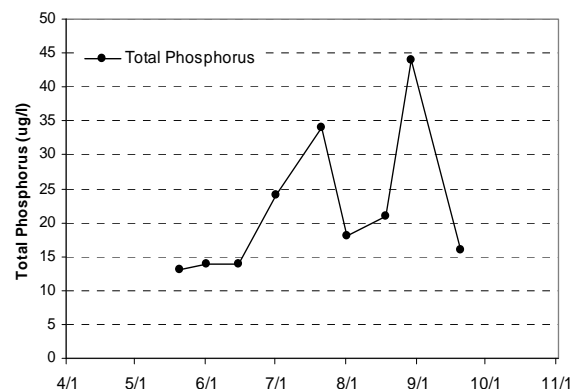
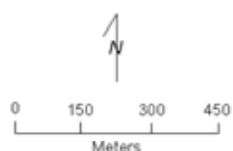
WD: Rice Creek

Volunteer:

Diane Coderre

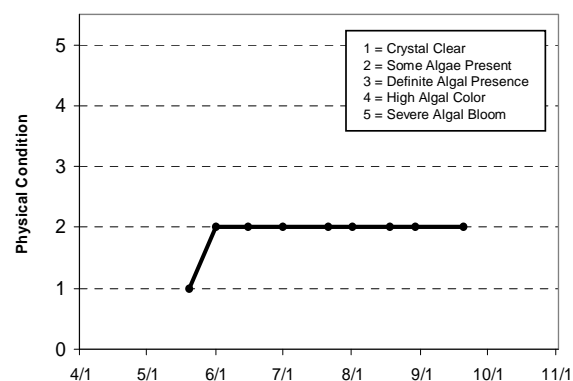
● Sampling site

Contours in meters



2008 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
5/20	16.6				3.7	13		4.2	1	1
6/1	21.2				1.9	14		3.8	2	3
6/15	22.5				2.7	14		4	2	3
7/1	25.8				4.5	24		3.6	2	
7/21	27.5				5.6	34		2.5	2	
8/1	28				4.4	18		2.8	2	
8/18	27.7				5.4	21		2.8	2	
8/29	24.1				6.6	44		2.7	2	
9/20	21.9				3.3	16		2.9	2	



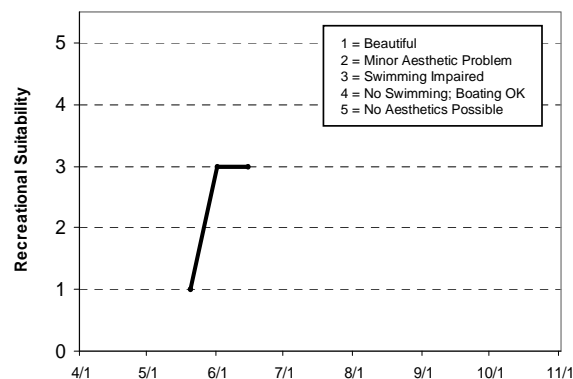
Lake Water Quality Grades Based on Summertime Averages

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	
Lake Grade					C							

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

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

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 city 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*).

The pond was sampled 14 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	50.2	33.0	70.0	C
CLA (µg/l)	7.1	2.2	12.0	A
Secchi (m)	1.8	1.4	2.1	C
TKN (mg/l)	1.67	1.10	2.00	
Lake Grade				B

The pond received a lake grade of B for 2008. 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 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 storm sewers and the surrounding urbanized watershed. It is possible for higher suspend solids loadings to decrease 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.

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 3.8 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 3.9 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

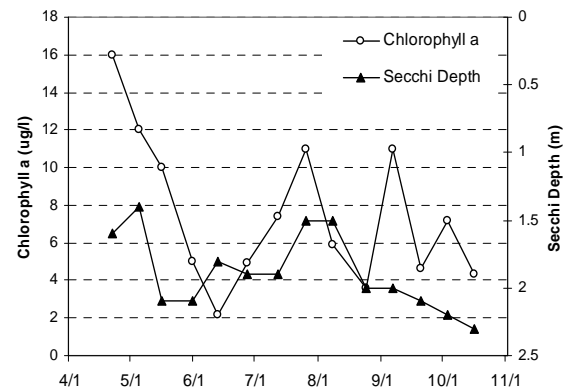
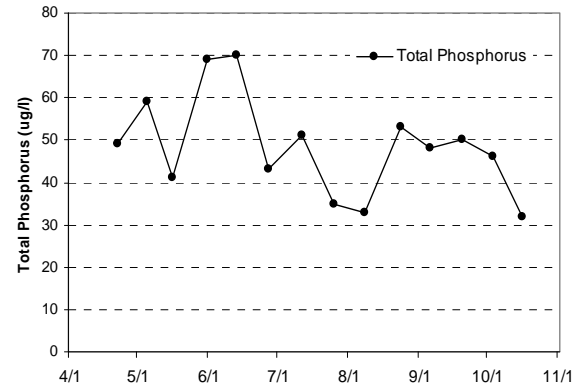
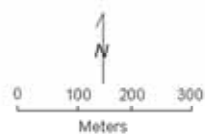
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Sunset Pond Burnsville, Dakota Co.

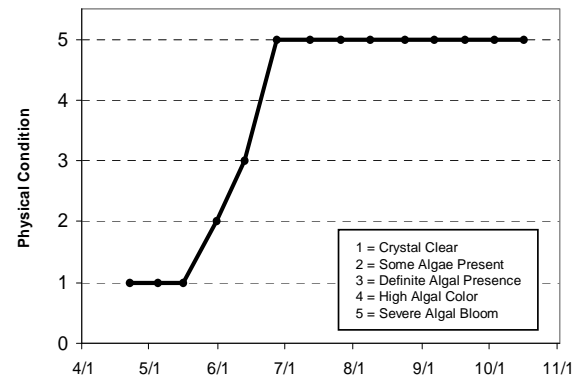
Lake ID: 190451
WMO: Black Dog
Volunteer: Dan Wallace

● Sampling site
Contours in meters



2008 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	15.5				16	49		1.6	1	1
5/5	16.6				12	59		1.4	1	1
5/16	17.8				10	41		2.1	1	1
5/31	17.2				5	69		2.1	2	3
6/13	20.6				2.2	70		1.8	3	4
6/27	24.1				4.9	43		1.9	5	5
7/12	24.7				7.4	51		1.9	5	5
7/26	24.2				11	35		1.5	5	5
8/8	23.7				5.9	33		1.5	5	5
8/24	21.4				3.6	53		2	5	5
9/6	18.2				11	48		2	5	5
9/20	19.9				4.6	50		2.1	5	4
10/3	16.4				7.2	46		2.2	5	4
10/16	12.7				4.3	32		2.3	5	2



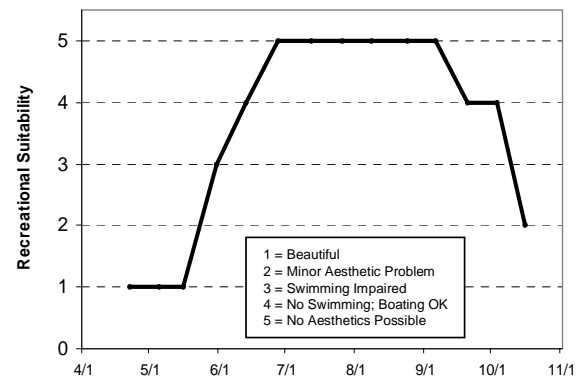
Lake Water Quality Grades Based on Summertime Averages

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	D
Chlorophyll a			A	B	B	B	A		A	A	A	B
Secchi Depth			C	C	C	C	C		C	B	B	C
Lake Grade			B	C	C	C	B		B	B	B	C

Year	2004	2005	2006	2007	2008
Total Phosphorus	D		D	C	C
Chlorophyll a	A		B	A	A
Secchi Depth	B		C	C	C
Lake Grade	B		C	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. Because of its multi-recreational uses, the lake is considered a "Priority Lake" in the Metropolitan Area. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

This was the third year that Susan Lake has been involved in CAMP. A search through the STORET nationwide water quality database for data on the lake provided only the historical CAMP data.

The lake 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	425.2	30.0	3790.0	F
CLA (µg/l)	61.4	10.0	120.0	D
Secchi (m)	0.9	0.0	2.1	D
TKN (mg/l)	6.68	1.70	49.00	
Lake Grade				D

The lake received a lake grade of D for 2008, which is worse than the C lake grades received in the previous two year. Continued monitoring is recommended to build the water quality base for this lake, and to aid in evaluating potential trends in water quality.

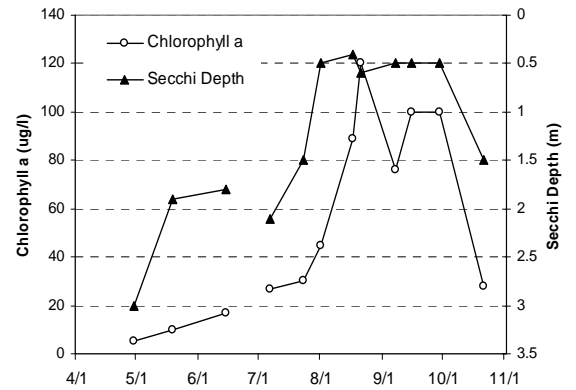
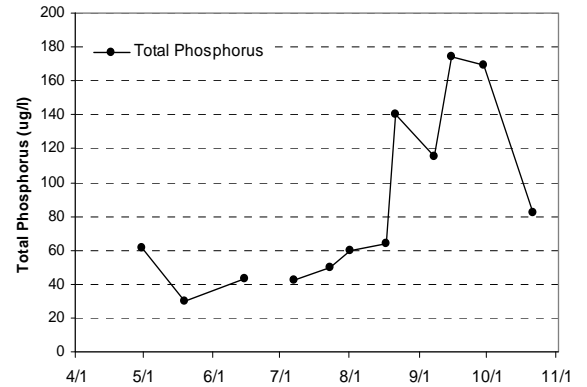
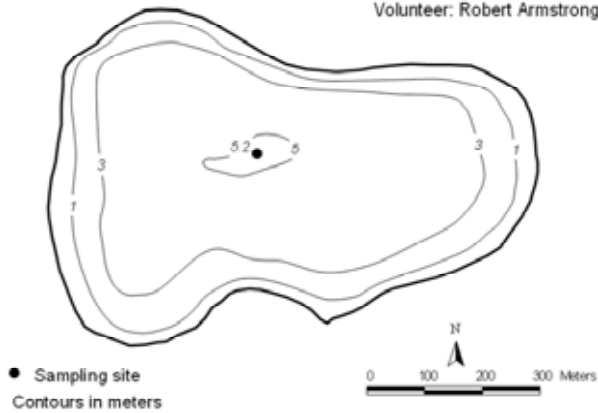
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 3.3 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 2.6 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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.

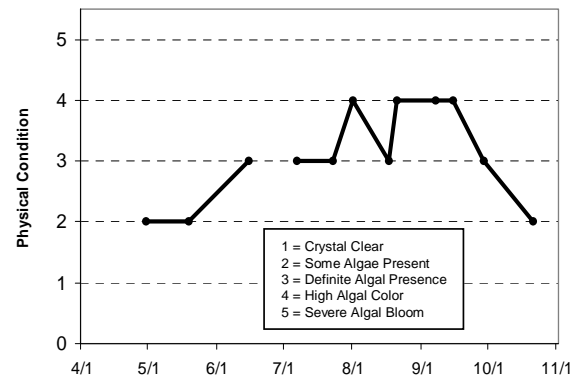
Lake Susan Chanhassen, Carver Co.

Lake ID: 100013
WD: Riley-Purgatory-Bluff Creek
Volunteer: Robert Armstrong



2008 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	9.1				5.2	61		3	2	
5/19	16.1				10	30		1.9	2	1
6/15	22.4				17	43		1.8	3	2
6/17										
7/7	19.5				27	42		2.1	3	3
7/23	25.5				30	50		1.5	3	3
8/1	27.7				45	60		0.5	4	3
8/17	25.7				89	64		0.4	3	2
8/21	23.7				120	140		0.6	4	3
9/7	22.9				76	115		0.5	4	3
9/15	17.2				100	174		0.5	4	3
9/29	18.4				100	169		0.5	3	3
10/21	11.4				28	82		1.5	2	3



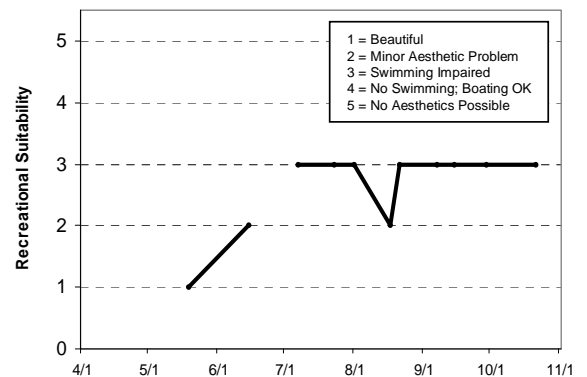
Lake Water Quality Grades Based on Summertime Averages

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

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*).

The year 2008 was the seventh year that Swede Lake has been involved in the CAMP (2002 being the first). Additionally, Metropolitan Council staff monitored the lake in 1996 and 2001. The 1996 and 2001-2008 data are the only water quality data found for the lake.

The lake was monitored 14 times between mid April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	318.8	127.0	753.0	F
CLA (µg/l)	199.1	31.0	650.0	F
Secchi (m)	0.4	0.2	0.7	F
TKN (mg/l)	5.07	2.70	8.60	
Lake Grade				F

The lake received a lake grade of F for 2008. The lake has received F lake grades for two thirds of the years the lake has been monitored. The remaining years the lake received lake grades of D. The lake's water quality seems well represented by a lake grade of F with occasional variation.

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 3.2 for physical condition (between 3- "definite algae present" and 4- "high algal color"), and 4.0 for recreational suitability (4- "no swimming - boating ok").

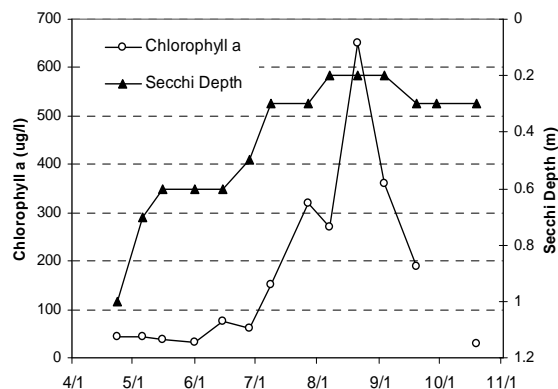
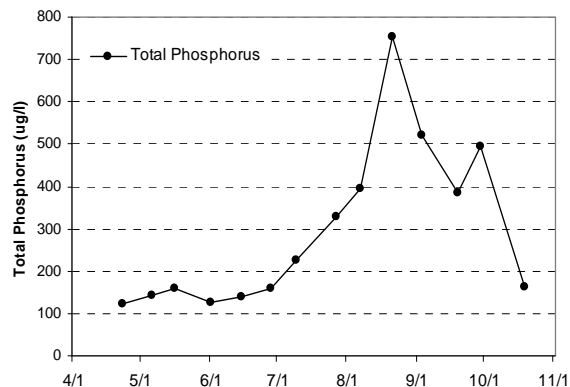
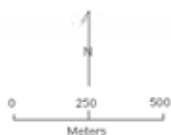
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Swede Lake Watertown Twp., Carver Co.

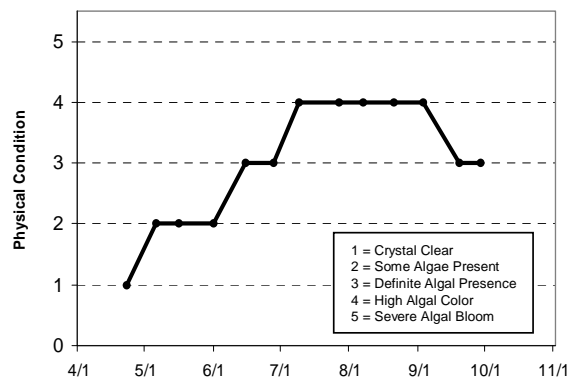
Lake ID: 100095
WMO: Carver County
Volunteer:
Wayne Hubin

● Sampling site
Contours in meters



2008 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
4/23	14				45	122		1	1	
5/6	16				45	142		0.7	2	4
5/16	17				39	158		0.6	2	4
6/1	19				31	127		0.6	2	4
6/15	23				75	138		0.6	3	4
6/28	23				60	158		0.5	3	4
7/9	26				150	226		0.3	4	4
7/27	27.5				320	328		0.3	4	4
8/7	27				270	396		0.2	4	4
8/21	27				650	753		0.2	4	4
9/3	23				360	521		0.2	4	4
9/19	21				190	385		0.3	3	4
9/29	21					494		0.3	3	4
10/19	17				29	161		0.3		



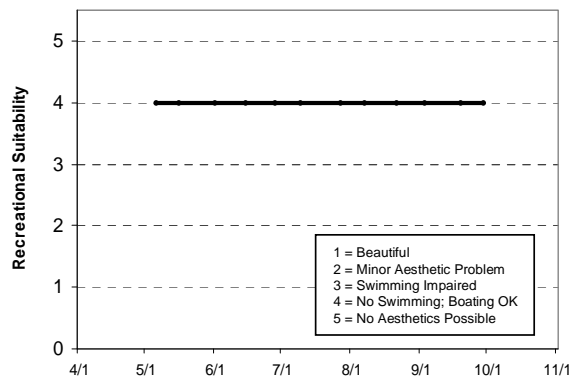
Lake Water Quality Grades Based on Summertime Averages

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					D					D	F	F
Chlorophyll a					F					D	C	F
Secchi Depth					F					D	C	F
Lake Grade					F					D	D	F

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

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 66-acre lake has a mean and maximum depth of 3.6 m (11.8 feet) and 8.0 m (26.0 feet), respectively. It has an approximate lake volume of 790 ac-ft. Approximately 52 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. Additionally, the lake's surface area and 2,400-acre watershed translates to a 36:1 watershed-to-lake area ratio. 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 west and south shorelines of Sweeney Lake consist of single family homes. The east shore is bordered by the Glenwood Hills Hospital and park consisting of a lawn, a golf course, and a wooded area (Barr, 1994).

The lake has a hypolimnetic aeration system which generally operates year round. The lake aerators were 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 an impaired water in 2004 by the Minnesota Pollution Control Agency. The impaired listing is due to excessive nutrients.

Site 1 of the lake (the southern site) was monitored 12 times in 2008 via 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. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	39.3	18.0	104.0	C
CLA (µg/l)	17.0	6.6	46.0	B
Secchi (m)	1.5	0.8	2.1	C
TKN (mg/l)	1.55	1.00	2.40	
Lake Grade				C

The 2008 water quality lake grade of C is similar to the lake grades received in 2000-2005 and 2007, and an improvement over the grade of D received in 2006. Water clarity was noticeably less clear in the years 2006 and 2007, but improved during the 2008 monitoring season. Over the long term however, the water quality of the lake seems well represented by a lake grade of C. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

Throughout the monitoring period, the physical and recreational conditions of the lake were ranked on a 1-to-5 scale according to the volunteer's perceptions. The 2008 average perceived physical condition of the lake was 1.3 (between 1- "crystal clear" and 2- "some algae present"), while the mean recreational suitability was 1.1 (between 1- "beautiful" and 2- "minor aesthetic problem").

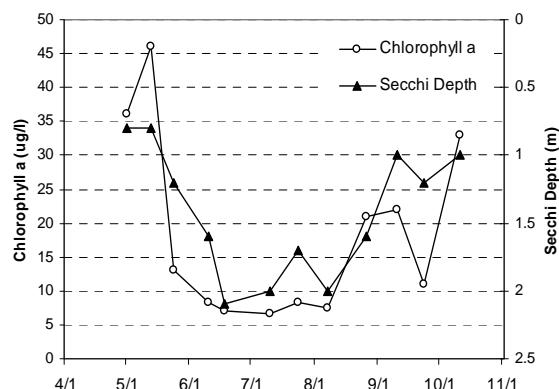
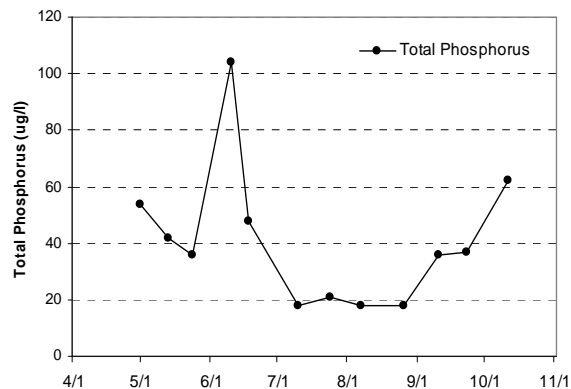
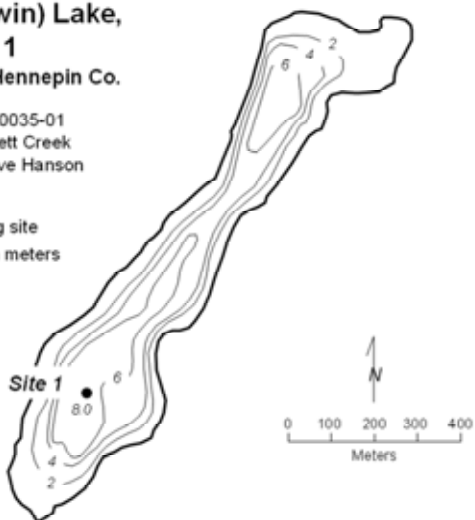
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Sweeney (Twin) Lake, Site 1 Golden Valley, Hennepin Co.

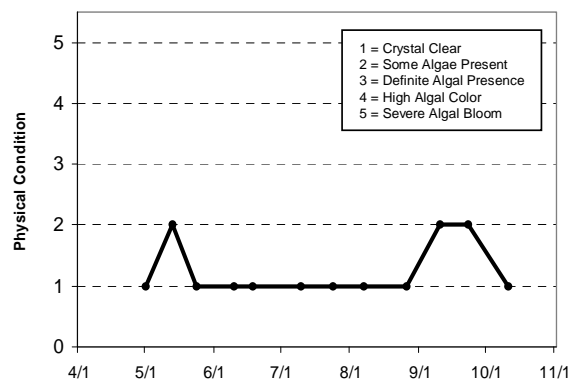
Lake ID: 270035-01
WMO: Bassett Creek
Volunteer: Dave Hanson

● Sampling site
Contours in meters



2008 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	16.5	5.3	16	2.7	36	54		0.8	1	1
5/13	14.8	6.2	16.1	0.48	46	42		0.8	2	1
5/24	18.9	7.2	11.9	0.23	13	36		1.2	1	1
6/10	20.2	7.7	8.18	0.16	8.3	104		1.6	1	1
6/18	21.5	8.3	8.9	0.15	7	48		2.1	1	1
7/10	25.9	11.2	8.7	0.17	6.6	18		2	1	1
7/24	26.6	13.5	8.57	0.17	8.3	21		1.7	1	1
8/7	27.1	14.1	9.5	0.11	7.4	18		2	1	1
8/26	24.2	12.4	8.7	0.16	21	18		1.6	1	1
9/10	19.5	12.8	7.6	0.17	22	36		1	2	1
9/23	20.7	13.8	9.91	0.21	11	37		1.2	2	2
10/11	15.2	14.8	6.6	4.32	33	62		1	1	1



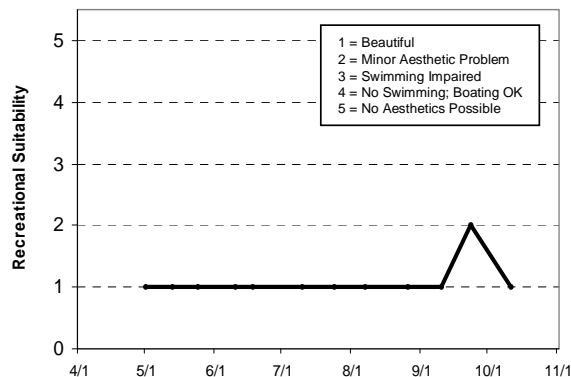
Lake Water Quality Grades Based on Summertime Averages

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	C	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
Total Phosphorus	C	C	C	D	C	C
Chlorophyll a	B	B	C	C	B	B
Secchi Depth	C	C	C	D	D	C
Lake Grade	C	C	C	D	C	C

Source: Metropolitan Council and STORET data



Sylvan Lake (27-0171) Elm Creek Watershed Management Commission

Sylvan Lake is located in Hassan Township (Hennepin County). The lake has a surface area of approximately 114 acres. It has a maximum depth of approximately 4 m (13 feet). Because of the shallowness of the lake, its entire surface area is considered littoral zone. The littoral zone is the shallow 0-15 feet depth zone dominated by aquatic vegetation).

The year 2008 was the first year that the lake has been monitored via the CAMP. A search through the EPA's STORET database provided Secchi water clarity data for the year 1997. Therefore, the 2008 CAMP data are the only nutrient data available for the lake.

The lake was monitored 10 times between mid May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	425.3	274.0	514.0	F
CLA (µg/l)	26.7	1.7	66.0	C
Secchi (m)	2.0	1.0	4.0	C
TKN (mg/l)	1.46	0.78	2.40	
Lake Grade				D

The lake received a lake grade of D for 2008. The TP concentrations were very high as indicated by the summer-time mean of 425 ug/L which yields a parameter grade of F. The CLA concentrations and water clarity both received C parameter grades. The CLA and water clarity grades are consistent with respect to each other not only in magnitude of the mean, but also consistent with respect to patterns in peaks and lows of the seasonal data. Therefore the water quality with respect to water clarity and algal abundance was not affected as greatly by TP as would be suggested by the higher TP concentrations. Further monitoring is suggested to determine if this interesting pattern is a characteristic of this lake.

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 2.8 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 3.1 for recreational suitability (between 3- "swimming slightly impaired" and 4- "no swimming - boating ok").

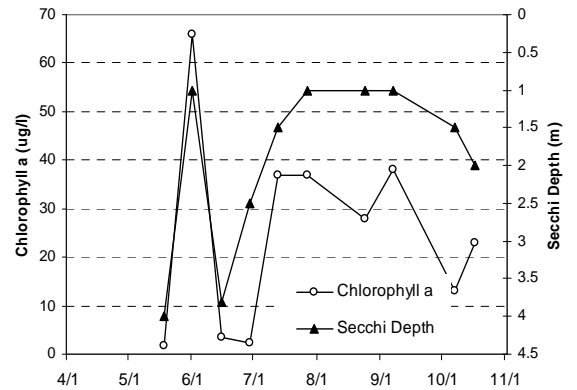
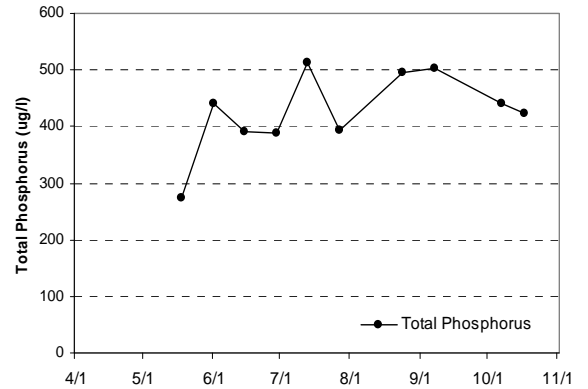
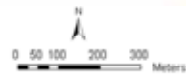
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Sylvan Lake Hassan Twp., Hennepin Co.

LAKE ID: 270171
WMO: Elm Creek
Volunteer: Dirk Colby

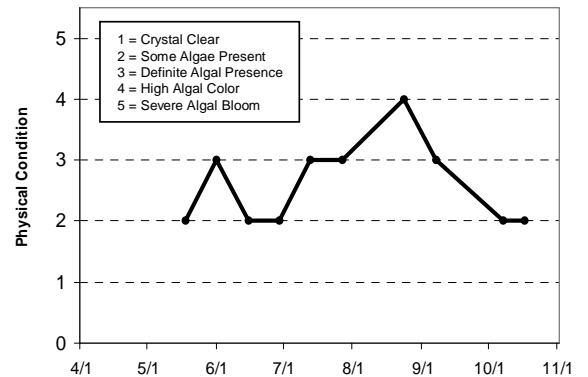
● Sampling station

Contours in meters



2008 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
5/18	16				1.7	274		4	2	1
6/1	19				66	441		1	3	4
6/15	19.5				3.5	391		3.8	2	3
6/29	21.5				2.2	389		2.5	2	3
7/13					37	514		1.5	3	
7/27	25.2				37	394		1	3	4
8/24	22.8				28	496		1	4	4
9/7	19				38	503		1	3	3
10/7	15				13	441		1.5	2	4
10/17	11.9				23	422		2	2	3



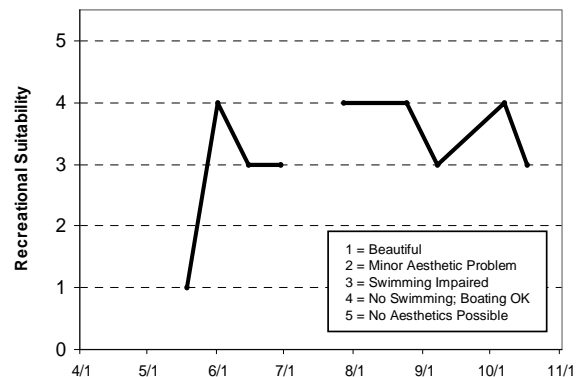
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					F
Chlorophyll a					C
Secchi Depth					C
Lake Grade					D

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. The lake's mean and maximum depth of 1.7 m (5.6 feet) and 10.3 m (34 feet) translates to an approximate volume of 420 ac-ft. Approximately 67 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 has a 303-acre watershed which results in a watershed-to-lake area ratio of 4:1. The larger the ratio the greater the potential stress on the lake from surface runoff. The lake has no inlets and no public access to the lake.

The lake was monitored 9 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	12.9	8.0	35.0	A
CLA (µg/l)	2.6	1.3	4.7	A
Secchi (m)	4.7	4.0	5.5	A
TKN (mg/l)	0.83	0.38	2.60	
Lake Grade				A

The lake received a lake grade of A for 2008, which is consistent with the lake grades received over the past two decades. The historic water quality database indicates that the lake has maintained its high quality over the past 20+ years. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

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 1.1 (between 1- "crystal clear" and 2- "some algae present"). The average recreational suitability ranking was 1.0 ("beautiful").

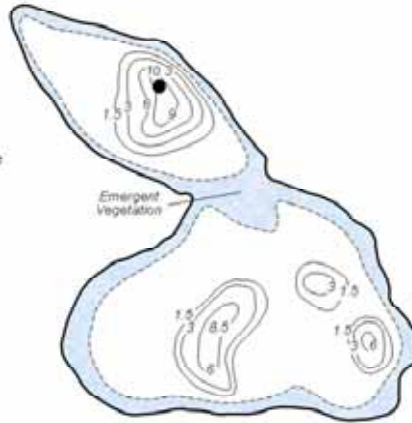
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Sylvan Lake
(Halfbreed Lake)
Forest Lake/Scandia,
Washington Co.

LAKE ID: 820080
WD: Comfort Lake - Forest Lake
Volunteer: Curt Sparks

● Sampling station
Contours in meters



2008 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	12.1				2.1	8		5.1	1	1
5/23	17.8				1.3	9		5.5	1	1
6/12	22.3				2.5			4	1	1
7/7	25.2				2.4	9		4.5	2	1
7/30	26.8				3	10		4	1	1
8/19	26.4				2.3	11		4.5	1	1
9/4	22.1				4.7	35		5.1	1	1
9/18	18.6				2.5	8		4.8	1	1
10/2	16.1				4.4	11		4.4	1	1

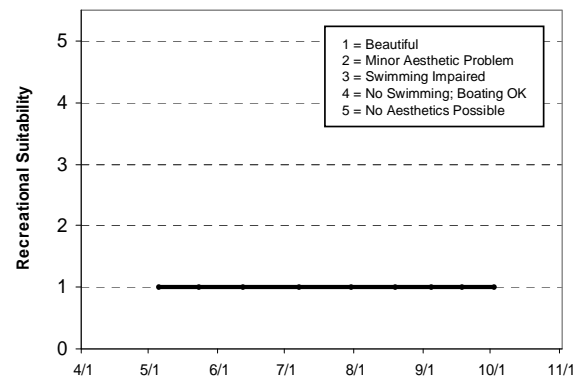
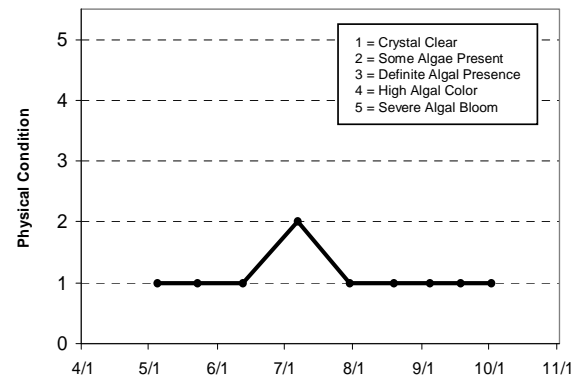
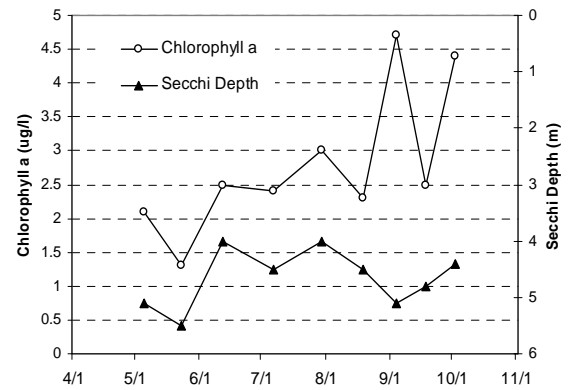
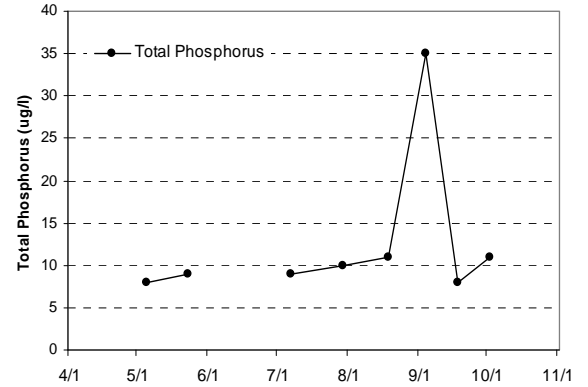
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade		A			A		A	A	A	A	A	A

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

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.

The lake was monitored 11 in 2008. 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.

2008 summer (May-September) data summary

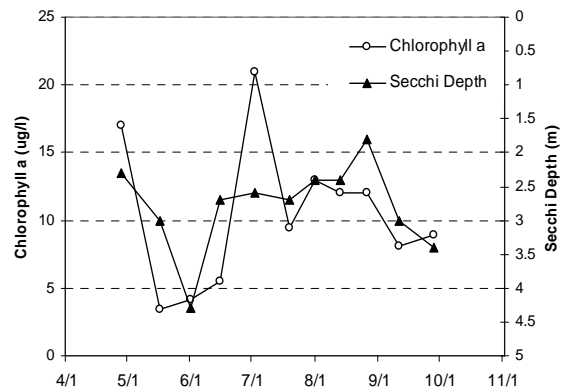
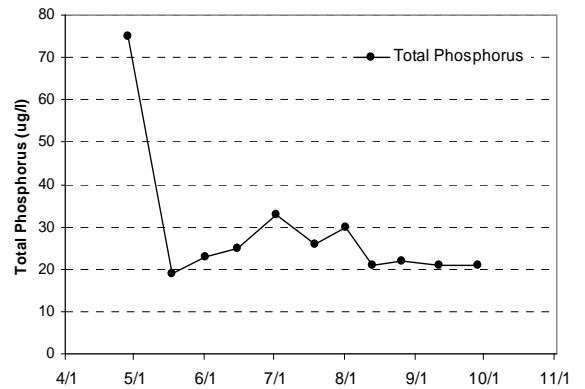
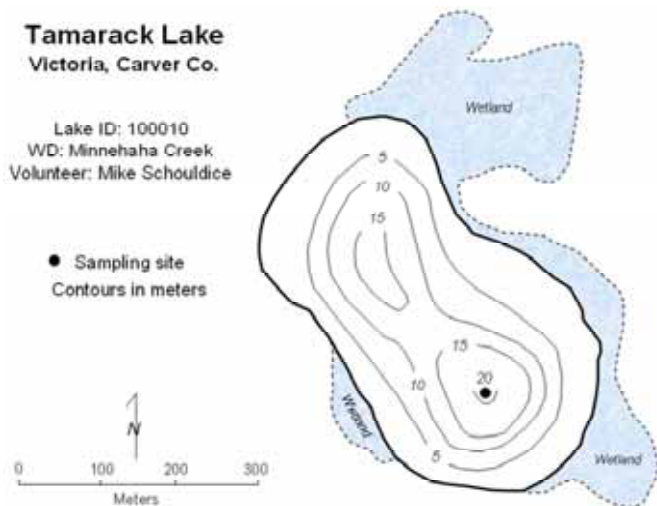
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	24.1	19.0	33.0	B
CLA (µg/l)	9.7	3.4	21.0	A
Secchi (m)	2.8	1.8	4.3	B
TKN (mg/l)	1.21	0.96	1.40	
<i>Lake Grade</i>				B

The lake received a lake grade of B for 2008, which is similar to the B lake grades received in 2001, 2002, and 2007. The lake has received varying lake grades over the past 9 years of CAMP monitoring, varying in the C and B grades. Continued monitoring is suggested to continue to build the water quality database for increasing the ability to detect potential trends in water quality.

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 2.3 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 1.0 ("beautiful").

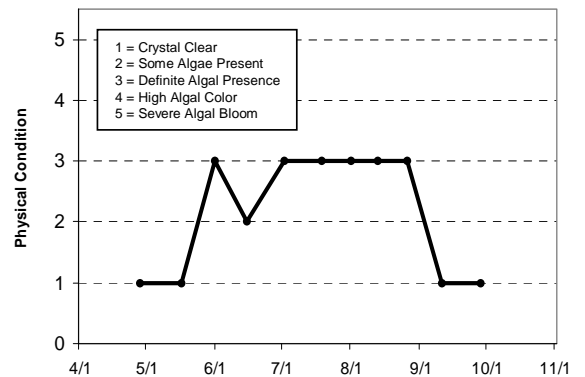
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.



2008 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	4.4				17	75		2.3	1	1
5/17	16				3.4	19		3	1	1
6/1	21				4.1	23		4.3	3	1
6/15	21				5.5	25		2.7	2	1
7/2	22				21	33		2.6	3	1
7/19	27				9.4	26		2.7	3	1
8/1	27				13	30		2.4	3	1
8/13	22				12	21		2.4	3	1
8/26	22				12	22		1.8	3	1
9/11	17				8.1	21		3	1	1
9/28	18				8.9	21		3.4	1	1



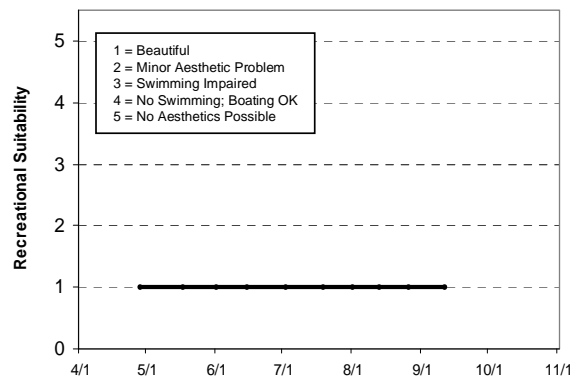
Lake Water Quality Grades Based on Summertime Averages

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										C	B	C
Chlorophyll a										C	A	B
Secchi Depth						A				C	B	C
Lake Grade										C	B	C

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

Source: Metropolitan Council and STORET data



Terrapin Lake (82-0031) *Marine on St. Croix Watershed Management Organization*

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.

The lake was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
Secchi (m)	3.3	2.7	3.8	A

The lake received a Secchi grade of A for 2008, which is consistent with the historical water quality database. No lake grade was given for the lake this year because total phosphorus and chlorophyll-a were not monitored.

There are insufficient data to determine potential trends in water quality because of the limited quantity of data in the database. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

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 1.9 (between 1- "crystal clear" and 2- "some algae present"). The average recreational suitability ranking was 1.9 (between 1- "beautiful" and 2- "minor aesthetic problem").

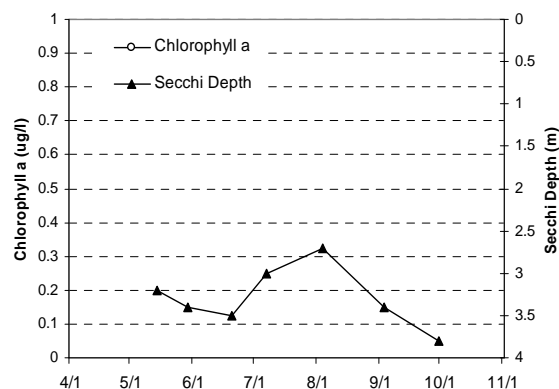
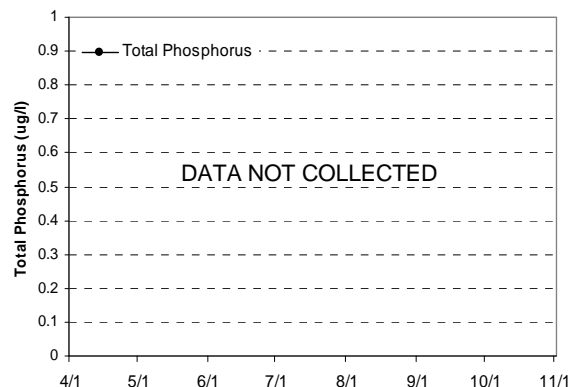
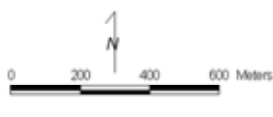
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Terrapin Lake May Twp., Washington Co.

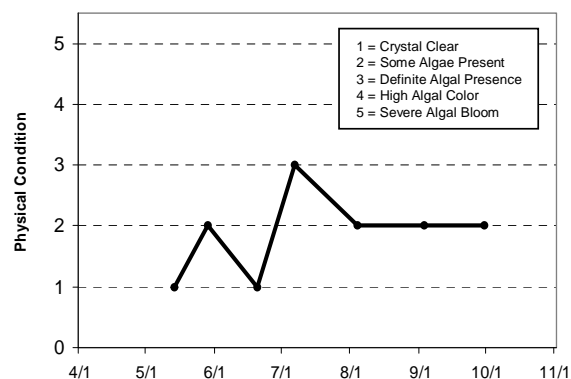
LAKE ID: 820031
WD: Carleton-Marine-St. Croix
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 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
5/14	14.2	13.7	9.51	1.68				3.2	1	1
5/29	18	16.8	9.18	0.76				3.4	2	1
6/20	23.5	19.2	9.79	0.23				3.5	1	2
7/7	26	23	9.45	0.56				3	3	2
8/4	25	21	5.41	0.2				2.7	2	3
9/3	21.8	20.8	4.63	0.2				3.4	2	2
9/30	17.6	17.8	4.45	3.8				3.8	2	2



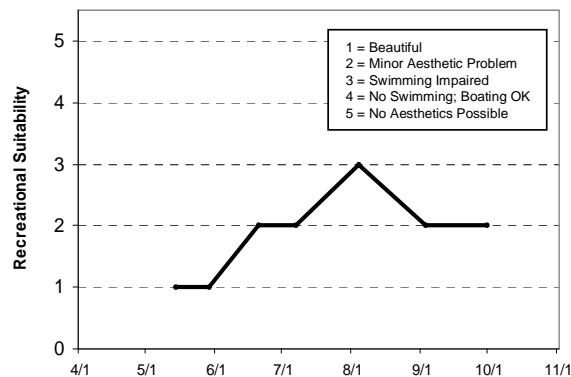
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Turtle Lake (82-0036) Carnelian - Marine Watershed District

Turtle Lake is located in May Township (Washington County). The lake has a surface area of 44 acres, and has a maximum and mean depth of 2.4 m (7.9 ft) and 1.2 m (3.9 ft), respectively. It has an approximate volume of 172 ac-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 lake's watershed area is approximately 699 acres. The lake has 16:1 watershed-to-lake area ratio. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
Secchi (m)	1.4	0.9	1.7	C

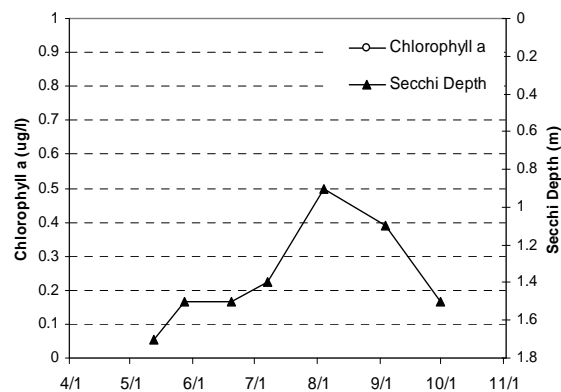
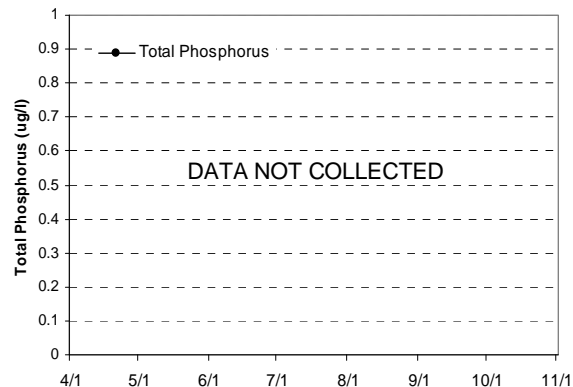
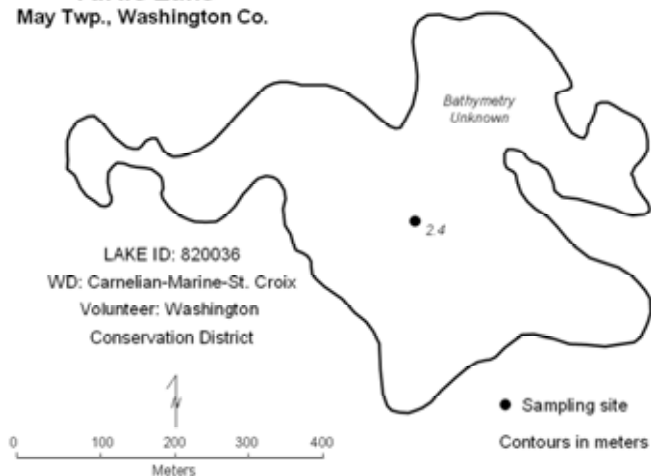
The lake received a Secchi grade of C for 2008, which is consistent with the historical water quality database for the monitoring years since 1999. No lake grade was given for the lake this year because total phosphorus (TP) and chlorophyll-a (CLA) were not monitored.

A review of the historical water quality database shows that lake grades and individual parameter grades (particularly chlorophyll-a and Secchi depth grades) seem to have improved during the period from 1991-2008. However, a lake grade has not been able to be determined since 2003. To better understand the lake's water quality and where it may be heading, continued monitoring is suggested particularly for adding the two other trophic indicator parameters, TP and CLA, so as to determine an up to date lake grade.

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 2.0 ("some algae present"). The average recreational suitability ranking was 2.9 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

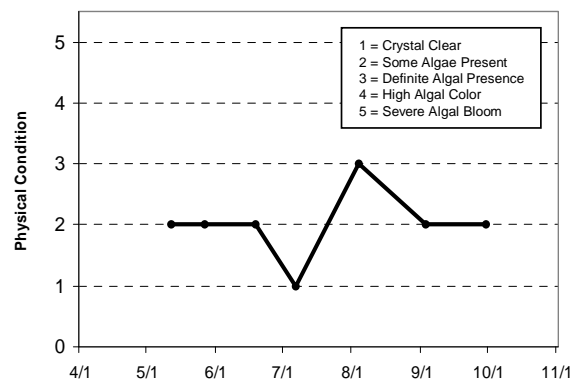
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Turtle Lake May Twp., Washington Co.



2008 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
5/12	13.6	13.5	7.3	7.14				1.7	2	2
5/27	16.2	15.7	6.76	6.78				1.5	2	3
6/19	24	21	8.84	0.98				1.5	2	4
7/7	26.2	23.3	9.58	0.33				1.4	1	2
8/4	26.1	23.2	10.33	0.32				0.9	3	4
9/3	20.2	19.7	7.3	0.38				1.1	2	3
9/30	15.3	15.6	6.83	1.58				1.5	2	2



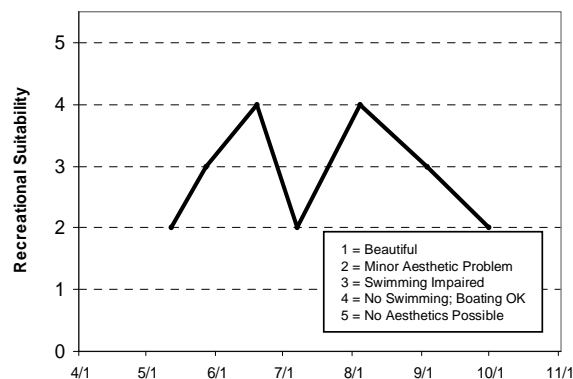
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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*).

The lake was monitored 14 times in 2008. 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.

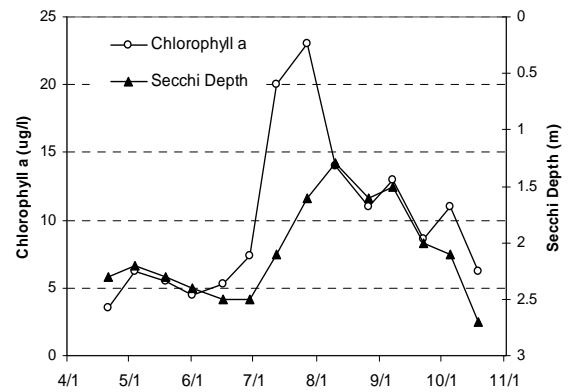
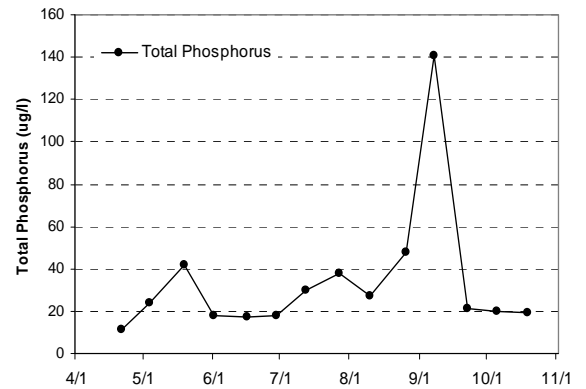
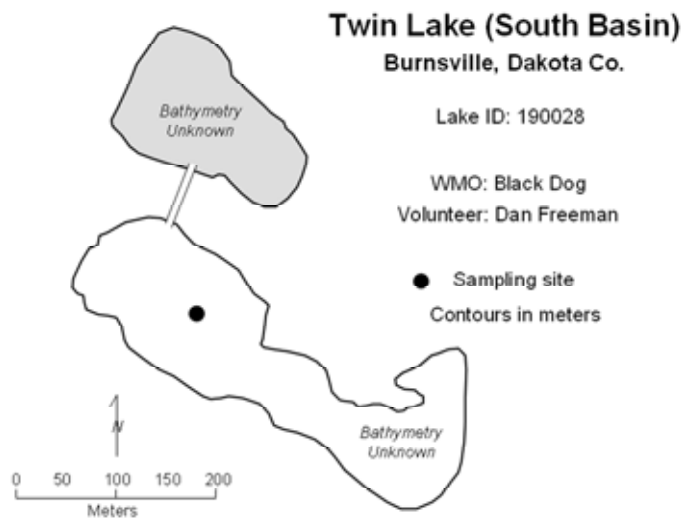
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	38.5	17.0	141.0	C
CLA (µg/l)	10.8	4.5	23.0	B
Secchi (m)	2.0	1.3	2.5	C
TKN (mg/l)	1.30	0.56	1.80	
Lake Grade				C

The lake received a lake grade of C for 2008. The lake grades received in the past have varied in the B and C range. Crushed corn meal was added as a carbon amendment in year 2006 to try to decrease algal concentrations. Since 2005 CLA grades have varied widely from an A in 2005, to a C in 2006, back to an A in 2007, and then to a B in 2008. The water clarity grades have remained a C since 2001.

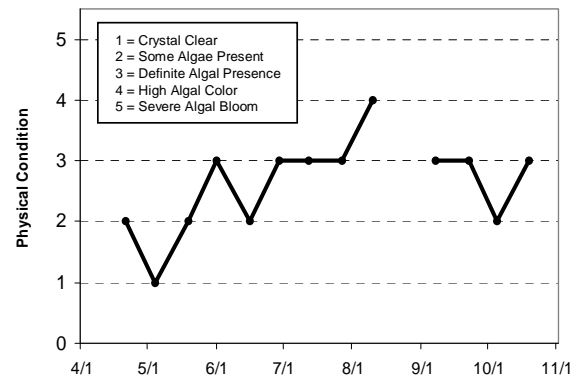
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.7 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 4.1 (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.



2008 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	13				3.5	11		2.3	2	4
5/4	13				6.2	24		2.2	1	4
5/19	17.1				5.5	42		2.3	2	4
6/1	20.6				4.5	18		2.4	3	4
6/16	21				5.3	17		2.5	2	4
6/29	24.9				7.4	18		2.5	3	4
7/12	26.6				20	30		2.1	3	4
7/27	26.5				23	38		1.6	3	4
8/10	26.5				14	27		1.3	4	4
8/26	23.2				11	48		1.6	5	
9/7	19				13	141		1.5	3	4
9/22	21.2				8.6	21		2	3	4
10/5	15				11	20		2.1	2	4
10/19	13.9				6.2	19		2.7	3	4



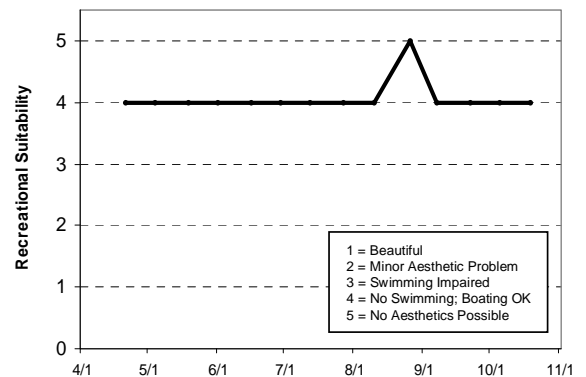
Lake Water Quality Grades Based on Summertime Averages

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	C	C	C	C
Chlorophyll a								B	A	A	A	A
Secchi Depth								D	C	C	C	C
Lake Grade								C	B	B	B	B

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

Source: Metropolitan Council and STORET data



Twin Lake [upper basin] (27-0042-01) *Shingle Creek Watershed Management Commission*

The upper basin of Twin Lake is located in the City of Brooklyn Park (Hennepin County). It has a maximum depth of 2.4 m (8 ft) and a mean depth of 0.9 m (3 ft). The entire surface area of the basin is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The basin does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

Twin Lake consists of 3 basins: upper, middle, and lower. The lake has a surface area of approximately 215 acres. Approximately 80 percent of the lake's surface area is considered littoral zone.

The basin was monitored 12 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	129.2	74.0	252.0	D
CLA (µg/l)	93.6	11.0	180.0	F
Secchi (m)	0.6	0.2	1.2	F
TKN (mg/l)	2.58	2.10	3.20	
Lake Grade				F

The basin received a lake grade of F for 2008, which is consistent with most lake grades from the previous 13 years. The basin received D lake grades in 1991, 1993, and 1998. On the basis of the historical water quality database, the water quality of this basin has fluctuated between lake grades D and F, but with only F lake grades being received over the past decade. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

The volunteer's perceptions of the physical and recreational conditions of the basin 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 2.3 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.1 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

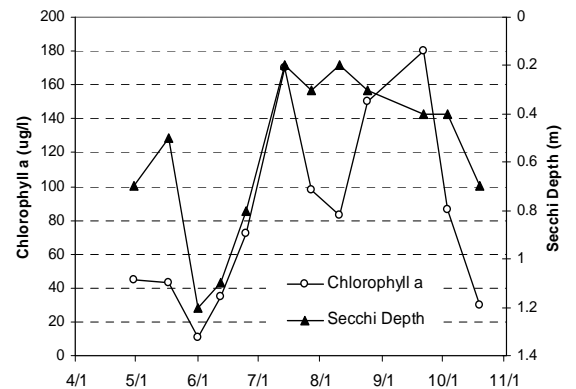
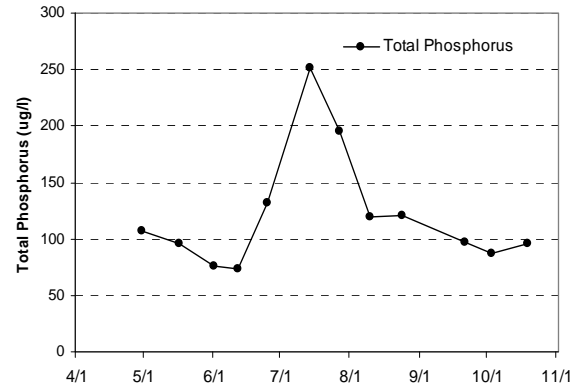
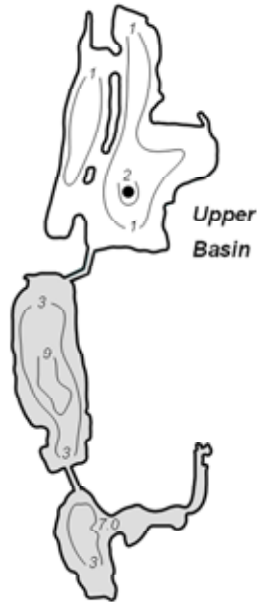
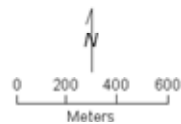
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Twin Lake, Upper Basin, Brooklyn Center, Hennepin Co.

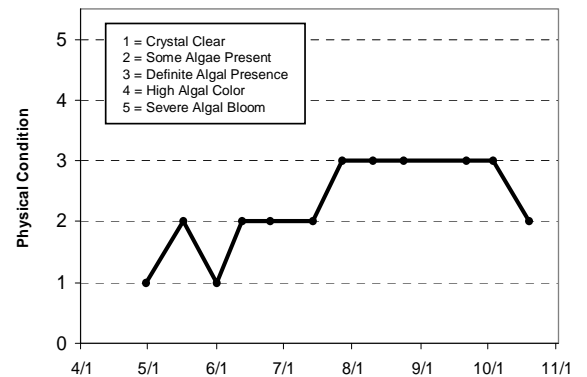
Lake ID: 270042-01
WMO: Shingle Creek
Volunteer: Kris Mann

● Sampling site
Contours in meters



2008 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	10				45	107		0.7	1	1
5/17	20				43	96		0.5	2	2
6/1	25.7				11	76		1.2	1	1
6/12	23.8				35	74		1.1	2	1
6/25	30.3				72	132		0.8	2	2
7/14	28.5				170	252		0.2	2	3
7/27	29.2				98	196		0.3	3	2
8/10	29.5				83	119		0.2	3	2
8/24	27.4				150	121		0.3	3	3
9/1	24.8				180	97		0.4	3	3
10/3	20.3				86	87		0.4	3	3
10/19	23.2				30	96		0.7	2	2



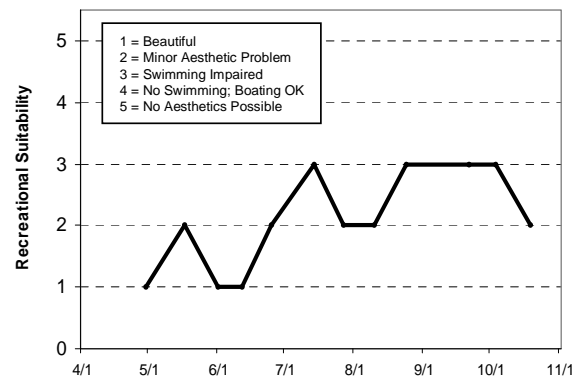
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Twin Lake [middle basin] (27-0042-02) Shingle Creek Watershed Management Commission

The middle basin of Twin Lake is located in the City of Crystal (Hennepin County). It has a maximum depth of 14 m (46 ft) and a mean depth of 4.9 m (16 ft). Twin Lake consists of 3 basins: upper, middle, and lower. The lake has a surface area of approximately 215 acres. Approximately 80 percent of the lake's surface area is considered littoral zone.

The basin was monitored 13 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	44.1	22.0	96.0	C
CLA (µg/l)	17.7	2.1	37.0	B
Secchi (m)	1.9	0.9	4.9	C
TKN (mg/l)	1.55	1.10	1.80	
Lake Grade				C

The basin received a lake grade of C for 2008, which is consistent with the lake grades received over the past decade. The basin has received B and D lake grades in the past. Since 1985 the annual lake grades have varied between B to D but have been consistently C over the past decade. Continued monitoring is suggested to determine if the lake grades of the past decade indicate that the water quality of the basin is stabilizing at a C lake grade.

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 2.5 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 3.9 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

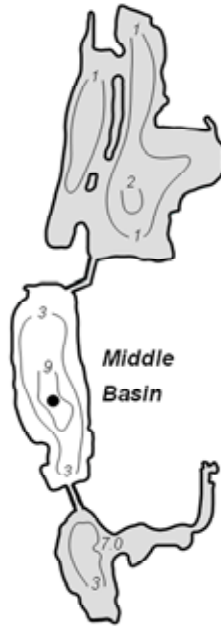
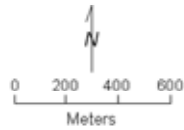
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Twin Lake, Middle Basin, **Crystal, Hennepin Co.**

Lake ID: 270042-02
WMO: Shingle Creek
Volunteer: Janet Moore

● Sampling site
Contours in meters



2008 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				29	96		0.9	2	4
5/20	18				2.1	55		4.9	2	3
6/4	20				5.1	47		3.8	2	4
6/19	27				5	58		3.3	3	4
6/29	26				37	50		1	2	4
7/10	25				15	29		1.4	3	4
7/24	25				16	44		0.9	3	4
8/7	26				14	22		1.3	2	4
8/21	25				29	25		1.1	2	4
9/5	21				18	28		1.5	3	4
9/20	22				24	31		1.3	3	4
10/3	18				34	66		1.4	2	4
10/15	13.5				16	51		1.6	2	4

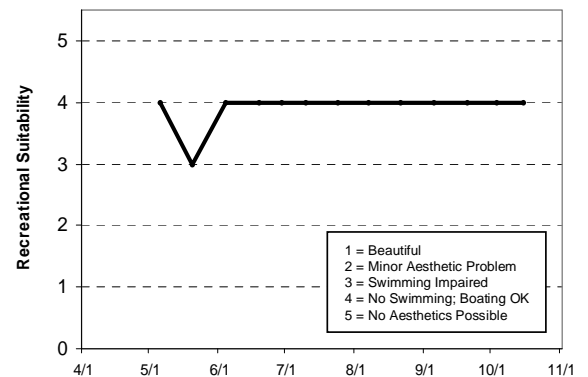
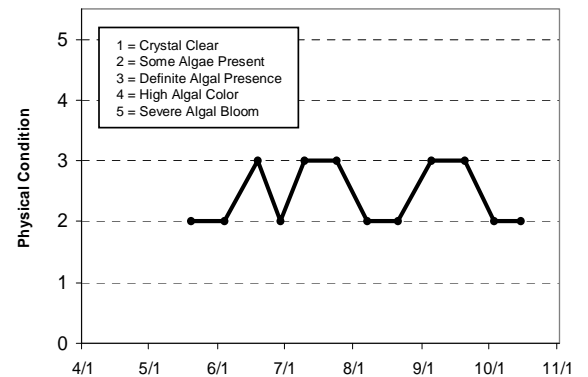
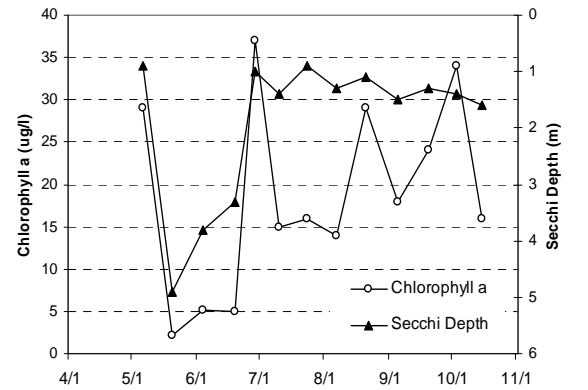
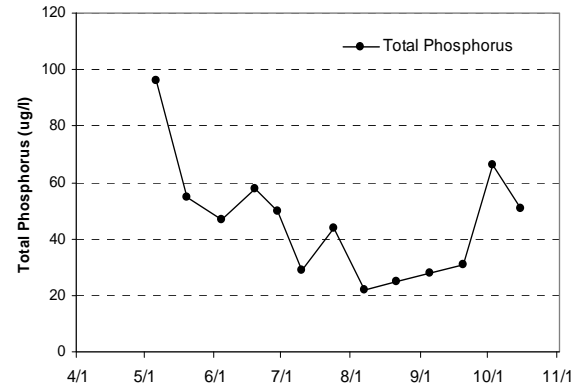
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

The lake was monitored 10 times in 2008. 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.

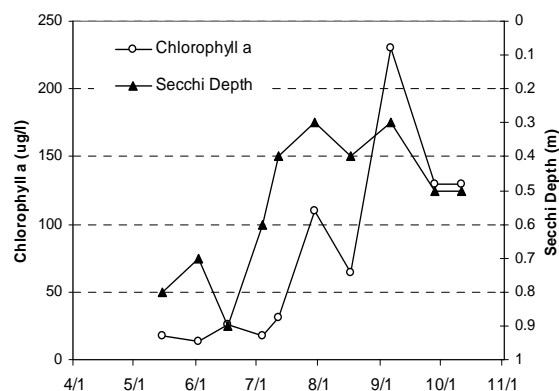
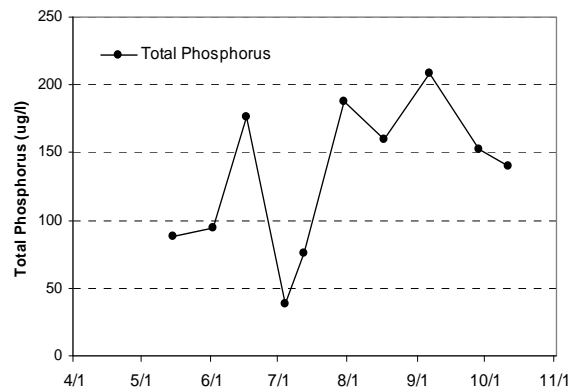
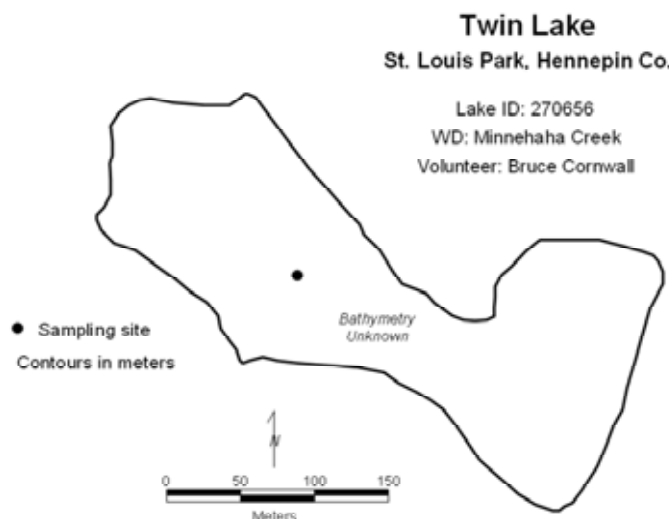
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	131.2	38.0	208.0	D
CLA (µg/l)	71.1	13.0	230.0	D
Secchi (m)	0.5	0.3	0.9	F
TKN (mg/l)	2.22	0.96	3.50	
<i>Lake Grade</i>				D

The lake received a lake grade of D for 2008, which is an improvement over last year's F lake grade. Water clarity (Secchi) remains poor with a grade of F. The chlorophyll-a grade has digressed 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 digressed to Fs. These observations seem to indicate that the water quality for Twin Lake has degraded since 2002. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

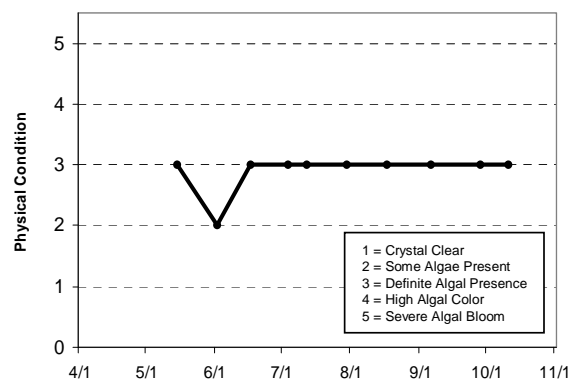
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.9 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 4.0 ("no swimming/boating ok").

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.



2008 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(°C)	(°C)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
5/15	21				18	88		0.8	3	4
6/2	22.7				13	94		0.7	2	4
6/17	23.1				26	176		0.9	3	4
7/4	24.5				18	38		0.6	3	4
7/12	24.3				31	76		0.4	3	4
7/30	29.6				110	188		0.3	3	4
8/17	27.4				64	160		0.4	3	4
9/6	20.6				230	208		0.3	3	4
9/28	18.5				130	153		0.5	3	4
10/11	15.3				130	140		0.5	3	4



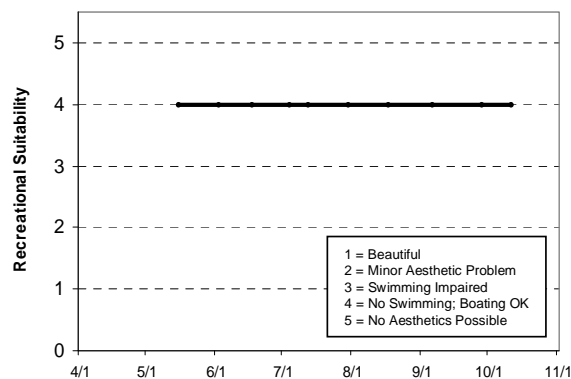
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade											D	D

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

Source: Metropolitan Council and STORET data



Twin Lake [south basin] (82-0048) Washington Conservation District

Twin Lake is located in May Township (Washington County). 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.

The lake was monitored 14 times in 2008. 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.

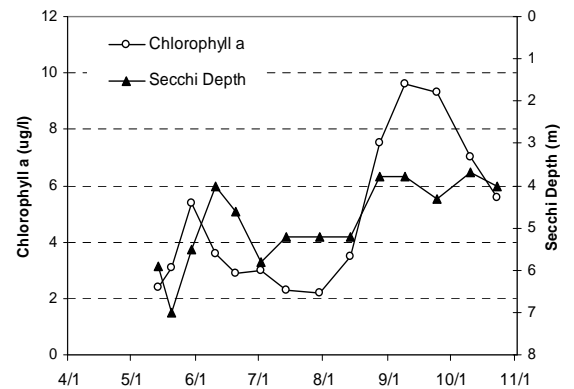
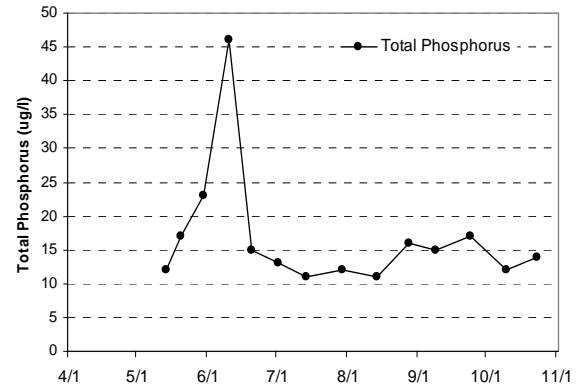
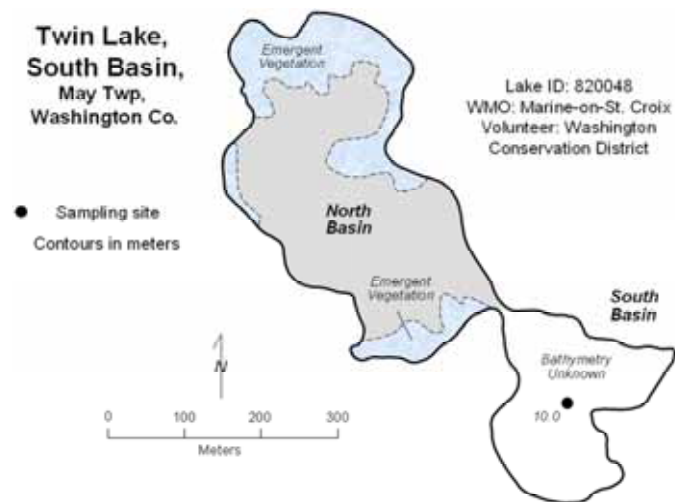
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	17.3	11.0	46.0	A
CLA (µg/l)	4.6	2.2	9.6	A
Secchi (m)	5.0	3.8	7.0	A
TKN (mg/l)	0.68	0.45	1.30	
Lake Grade				A

The lake received a lake grade of A for 2008, which is consistent with the other two historical lake grades in the water quality database (1997, 1998). A search for historical monitoring data through STORET, the national water quality database, revealed only the historical CAMP data collected in 1997 and 1998.

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 1.4 (between 1- "crystal clear" and 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 1.4 (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.



2008 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
5/13										
5/14	13.6	5.7	9.84	0.38	2.4	12		5.9	1	1
5/20	15.4	5.9	9.32	0.27	3.1	17		7	1	1
5/30	17.2	6.3	9.12	0.19	5.4	23		5.5	1	1
6/10	20.7	6.8	8.35	0.26	3.6	46		4	1	2
6/20	24	7	8.01	0.25	2.9	15		4.6	1	1
7/2	25	8	8.29	0.56	3	13		5.8	1	1
7/14	26.3	8.8	7.47	0.48	2.3	11		5.2	2	2
7/30	28.2	9.4	7.97	0.25	2.2	12		5.2	1	1
8/14	24.9	9.4	7.07	1.02	3.5	11		5.2	1	1
8/28	23.6	9.4	6.11	0.26	7.5	16		3.8	3	2
9/9	22	10.3	7.7	0.28	9.6	15		3.8	2	2
9/24	21.3	11	8.32	0.25	9.3	17		4.3	2	2
10/10	15.3	10.5	7.18	0.33	7	12		3.7	2	1
10/23	12.2	10.2	7.73	0.47	5.6	14		4	2	1

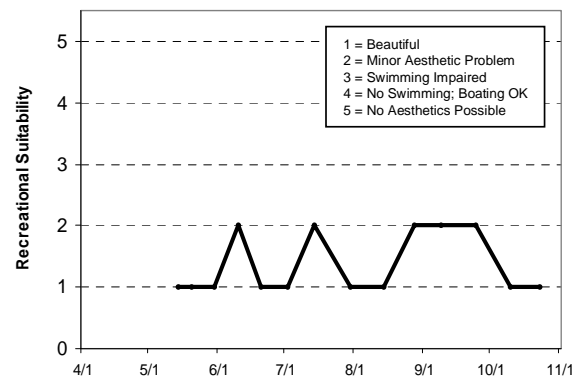
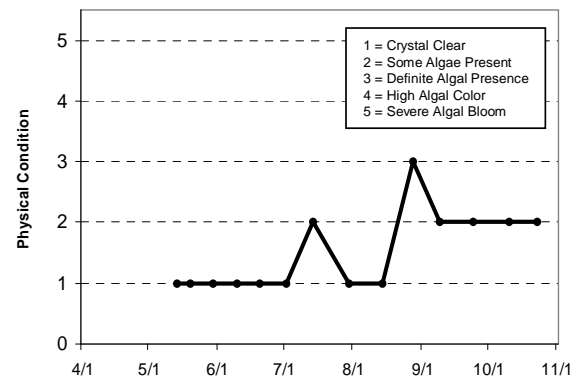
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Valentine Lake (62-0071) Rice Creek Watershed District

Valentine Lake is located within the City of Arden Hills in Ramsey County. The lake has a surface area of 60-acres and a maximum and mean depth of 4.0 m (13.1 feet) and 1.5 m (4.9 feet), 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. The volume of the lake is approximately 300 ac-ft. The drainage area of the lake is approximately 2,237 acres. Therefore, the watershed-to-lake area ratio is 37:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 13 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	65.2	33.0	89.0	C
CLA (µg/l)	16.8	5.4	71.0	B
Secchi (m)	1.8	0.8	3.2	C
TKN (mg/l)	1.67	1.10	2.00	
Lake Grade				C

The lake received a lake grade of C for 2008, which is consistent with the historical water quality database. The TP grade returned to a C from last year's D grade. On the basis of the historical database, the lake appears to be represented by a lake grade of C. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

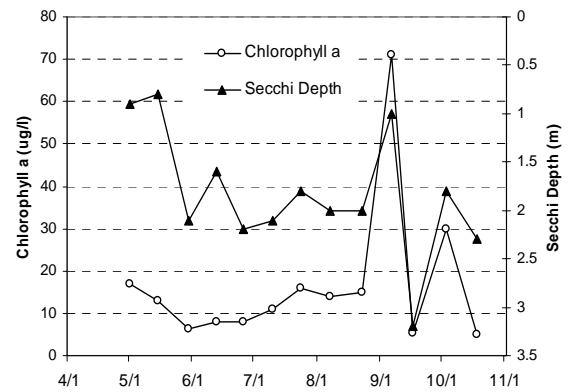
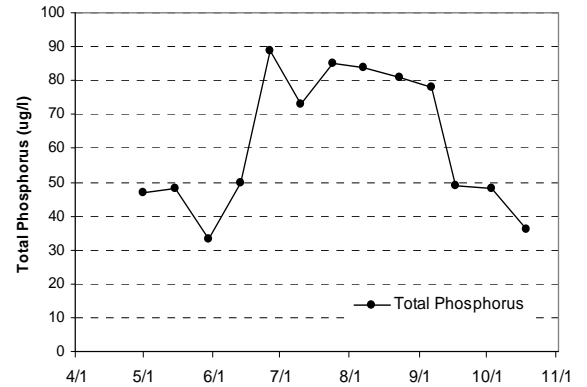
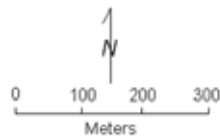
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.0 ("some algae present"). The average recreational suitability ranking was 2.5 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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.

Valentine Lake Arden Hills, Ramsey Co.

Lake ID: 620071
WD: Rice Creek
Volunteer: Bob Kistler

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/1	11.2				17	47		0.9	2	1
5/15	17.6				13	48		0.8	2	1
5/30	17.6				6.3	33		2.1	2	4
6/13	20.9				7.9	50		1.6	2	4
6/26	26.1				7.9	89		2.2	3	4
7/10	25.4				11	73		2.1	2	4
7/24	25.5				16	85		1.8	2	4
8/7	26.5				14	84		2	1	4
8/23	24.1				15	81		2	2	4
9/6	20.5				71	78		1	3	4
9/17	19.6				5.4	49		3.2	1	4
10/3	16.4				30	48		1.8	2	4
10/18	12.6				4.9	36		2.3	2	4

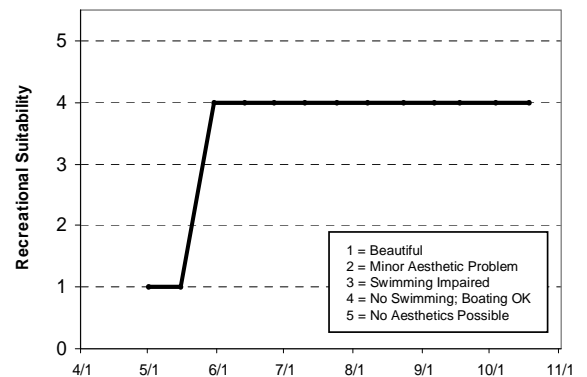
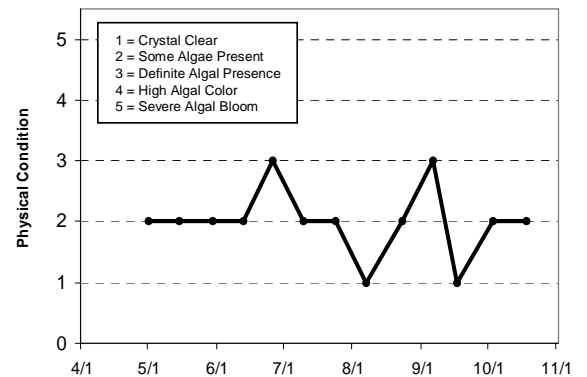
Lake Water Quality Grades Based on Summertime Averages

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										C	C	C
Chlorophyll a										B	B	C
Secchi Depth										C	C	D
Lake Grade										C	C	C

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

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). Because of the shallowness of the lake, the entire lake is considered littoral zone, which is 0 – 15 feet depth zone dominated by aquatic vegetation. The majority of the land within the lake's 117-acre watershed is parkland or single-family residential homes. The watershed-to-lake size ratio is 8:1. 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*).

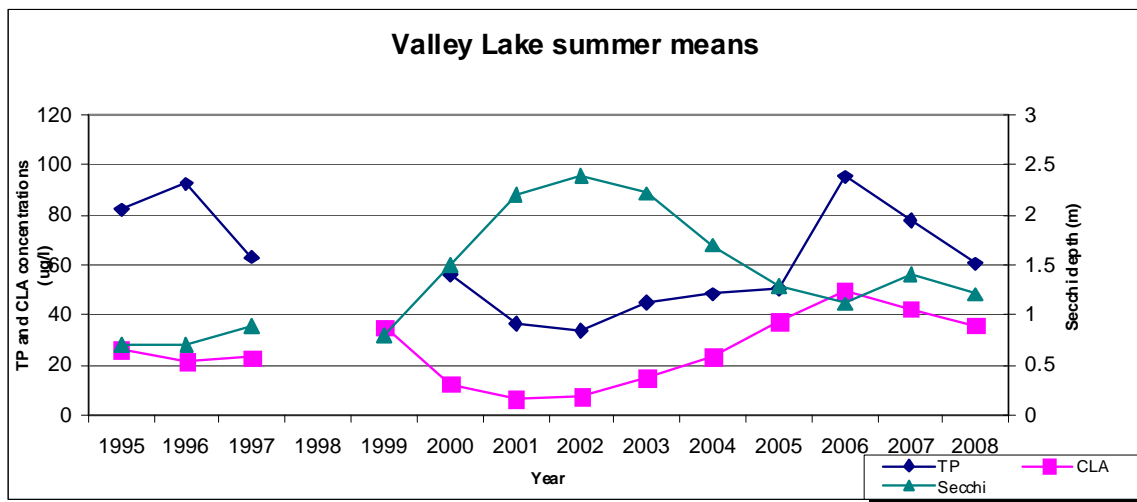
The lake has been involved in a project where barley straw or crushed corn was added to the lake in an attempt to inhibit algal populations. Barley straw has been used for algal control in the United Kingdom for many years but the controlling mechanism has not been known. Therefore, the Valley Lake project was an attempt to answer two questions; 1) the success of the barley straw treatment in Valley Lake; and 2) to clarify the controlling mechanism. CAMP data was used to evaluate the effectiveness of the carbon amendments. The 2006 Metropolitan Council lake study report (METC 2007) included a synopsis of the carbon amendment study. More detailed discussion of the study can be found in McComas and Stuckert (2007).

A search through the STORET nationwide water quality database revealed no water quality data on the lake other than the 1995 CAMP data. The lake was monitored 13 times between late April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	60.6	48.0	86.0	C
CLA (µg/l)	36.0	11.0	96.0	C
Secchi (m)	1.2	0.6	2.2	C
TKN (mg/l)	1.33	0.74	2.10	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to previous years' lake grades. The individual water quality parameter grades were similar to those observed during the 2004 and 2005 monitoring seasons. The following figure shows an improvement in summer time means for the three water quality parameters from 1999 to 2002, and then a continued decline from 2002 through 2006. TP and CLA appear to be improving since 2006, but water clarity appears stagnant over the same time period. It appears that recent summer time means are returning to similar values observed in the mid-1990's. Furthermore, a trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).



The volunteer(s) ranked their perception of the lake's physical and recreational conditions on a 1-to-5 scale as shown on the attached information sheet. The summertime mean recorded physical condition was 2.5 (between 2- "some algae present" and 3- "definite algae present"). The mean suitability for recreation ranking was 2.7 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

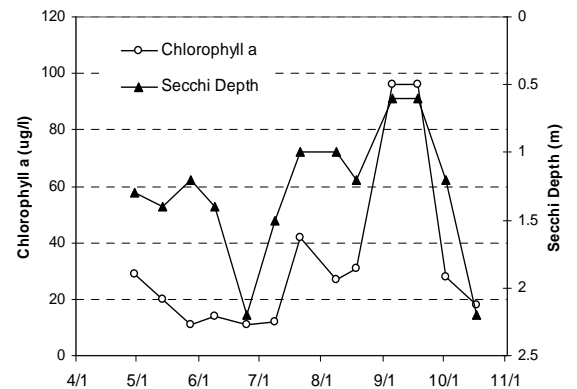
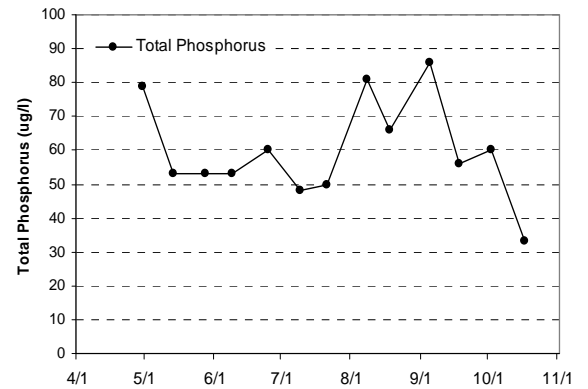
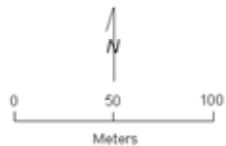
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Valley Lake Lakeville, Dakota Co.

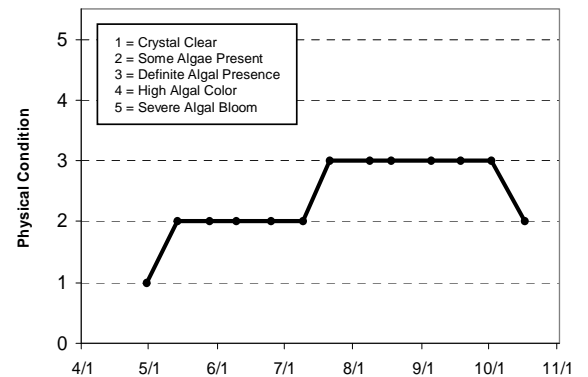
Lake ID: 190348
WMO: Dakota County
Volunteer: City of Lakeville

● Sampling site
Contours in meters



2008 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	10				29	79		1.3	1	1
5/14	14				20	53		1.4	2	1
5/28	18				11	53		1.2	2	2
6/9	21				14	53		1.4	2	3
6/25	25				11	60		2.2	2	2
7/9	26				12	48		1.5	2	3
7/21	28				42	50		1	3	3
8/8	27				27	81		1	3	3
8/18	25.9				31	66		1.2	3	2
9/5	21				96	86		0.6	3	4
9/18	19				96	56		0.6	3	4
10/2	14				28	60		1.2	3	3
10/17	11				18	33		2.2	2	3



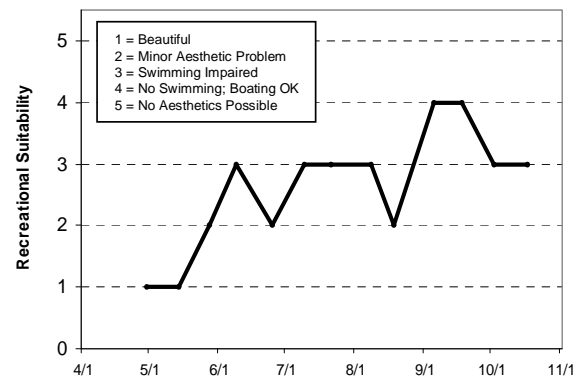
Lake Water Quality Grades Based on Summertime Averages

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				D	D	C			C	C	C	C
Chlorophyll a				C	C	C		C	B	A	A	B
Secchi Depth				D	D	D		D	C	C	B	B
Lake Grade				D	D	C			C	B	B	B

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

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. The lake is one of the largest bodies of water in the region. It has a surface area of approximately 3,000 acres (6.8 miles in circumference), and mean and maximum depths of 4.0 and 11.3 m (13.1 and 47.1 feet), respectively. The lake has an approximate volume of 38,632 ac-ft (resulting in a retention time of about 10 years) and an approximate watershed-to-lake size ratio of 4:1. 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*).

Lake Waconia has been involved in CAMP since 1994 (and monitored by Council staff in 2004). In 2008, the lake was monitored 13 times between early May and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	43.3	19.0	96.0	C
CLA (µg/l)	23.2	4.9	74.0	C
Secchi (m)	2.5	1.0	4.5	B
TKN (mg/l)	1.10	0.51	1.60	
<i>Lake Grade</i>				C

The lake received a lake grade of C for 2008, which is consistent with the historical database. The lake grades fluctuate from year to year, but generally the lake receives either a B or C lake grade. The lake has experienced this pattern since 1980. Nutrient water quality data is available for 1980, 1981, 1985, 1990, and 1994-2008 (all as a part of the Council's lake monitoring programs). Additionally, Secchi transparencies have been collected through the MPCA's Citizen Lake Monitoring Program since 1974. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

The volunteer's perceptions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale during each monitoring event. The rankings are shown on the information sheet on the next page. The mean physical condition ranking was 2.2 (between 2- "some algae present" and 3- "definite algae present"), and the mean recreational suitability ranking was 2.0 (2- "minor aesthetic problem").

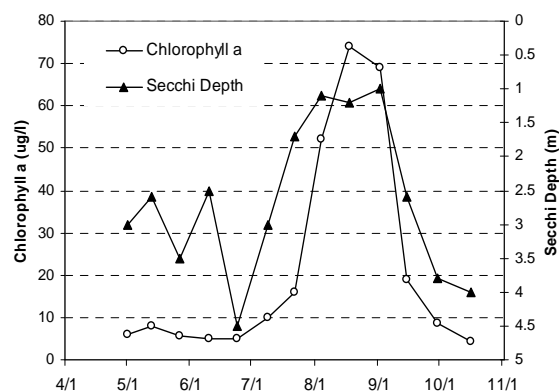
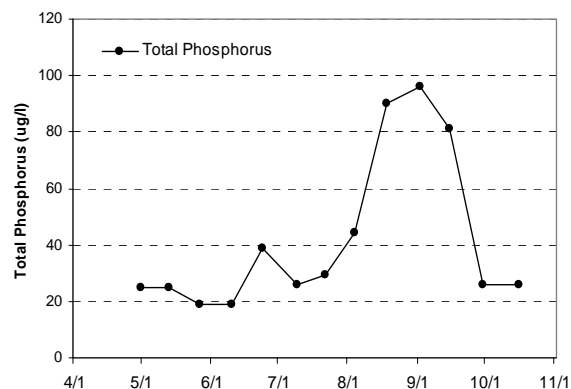
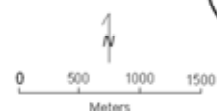
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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.

Lake Waconia Laketown Twp./Waconia Twp., Carver Co.

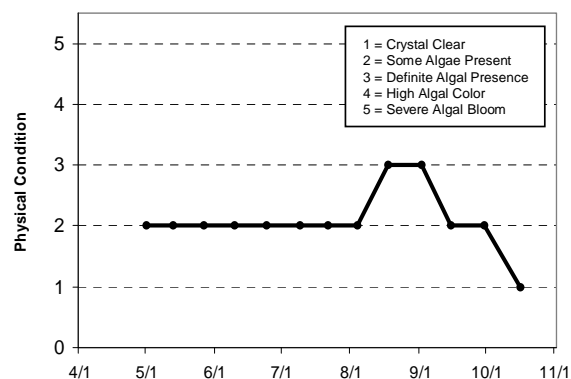
Lake ID: 100059
WMO: Carver Creek
Volunteer: Carver County

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/1	6.98		11.29		5.9	25		3	2	3
5/13	11.22		10.89		8	25		2.6	2	2
5/27	15.52		7.89		5.5	19		3.5	2	1
6/10	19.12		8.35		4.9	19		2.5	2	2
6/24	22.43		10.95		4.9	39		4.5	2	2
7/9	24.31		8.61		10	26		3	2	2
7/22	24.18		7.71		16	29.5		1.7	2	2
8/4	24.95		6.41		52	44.5		1.1	2	2
8/18	25.88		12.52		74	90		1.2	3	2
9/2	22.85		7.76		69	96		1	3	3
9/15	17.88		5.4		19	81		2.6	2	2
9/30	17.94		4.84		8.6	26		3.8	2	1
10/16	13.41		6.47		4.3	26		4	1	1



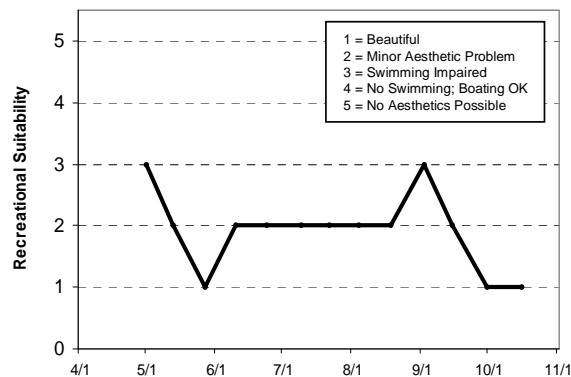
Lake Water Quality Grades Based on Summertime Averages

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

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 for the pond is unknown. The entire area of the pond is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the pond does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The pond's watershed area is approximately 141 acres. The watershed to pond area ratio is 19:1. The greater the ratio, the greater the potential stress on the pond from surface runoff.

The pond was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	37.3	30.0	51.0	
CLA (µg/l)	6.2	4.7	8.7	A
Secchi (m)	1.0	0.3	1.5	D
TKN (mg/l)	1.53	1.20	2.00	
Lake Grade				

The lake did not receive a lake grade for 2008, because there were an insufficient number of samples for TP. At least 5 samples spread throughout the summer-time period are required to calculate a grade.

The water clarity grade of D 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 storm sewers and the surrounding suburban watershed. It is possible for higher suspend solids loadings to decrease water clarity which would decrease light penetration thereby inhibiting algal growth.

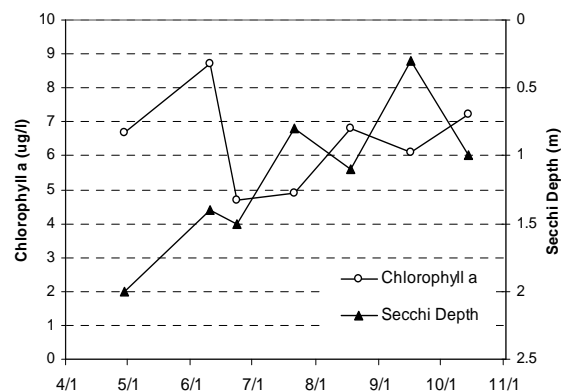
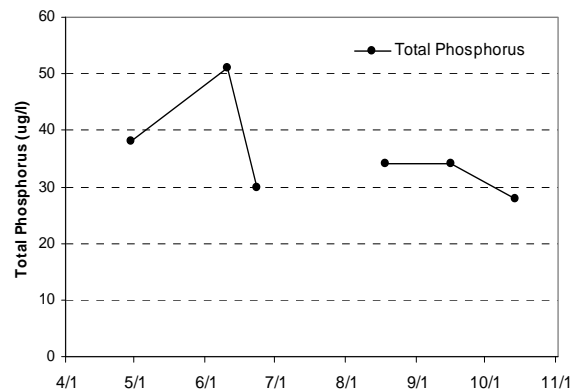
The volunteer's perceptions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale during each monitoring event. The rankings are shown on the information sheet on the next page. The mean physical condition ranking was 2.8 (between 2- "some algae present" and 3- "definite algae present"), and the mean recreational suitability ranking was 4.0 ("no swimming/boating ok").

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.

Weber Pond Mahtomedi, Washington Co.

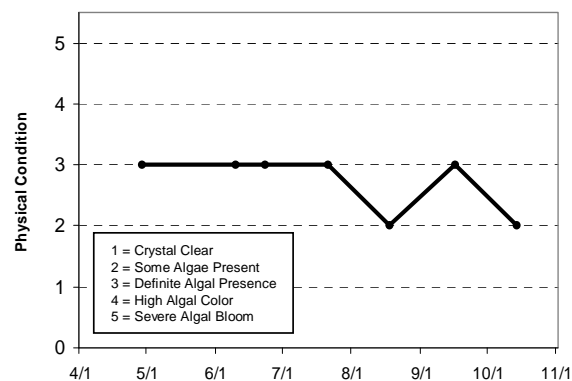
Lake ID: 820119
WD: Valley Branch
Volunteer: Washington
Conserv. Dist.

● Sampling site
Contours in meters



2008 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	8.7	7.7	11.45	1.36	6.7	38		2	3	4
6/10	20.6	16.6	11.22	0.32	8.7	51		1.4	3	4
6/23	25.9	20.6	13.9	0.78	4.7	30		1.5	3	4
7/21	28.1	24.2	9.23	0.41	4.9			0.8	3	4
8/18	27.3	21.5	9.98	0.2	6.8	34		1.1	2	4
9/16	20	16	12.73	0.49	6.1	34		0.3	3	4
10/14	13.9	13.8	10.15	1.86	7.2	28		1	2	4



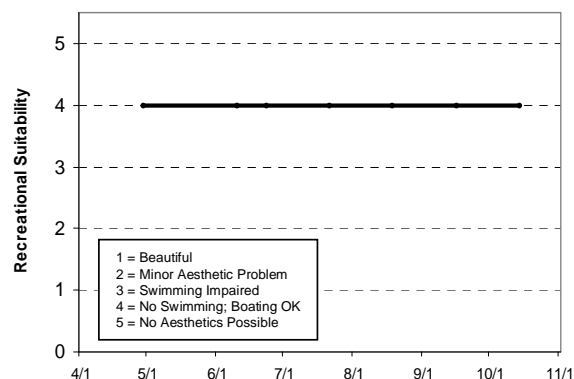
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



West Boot Lake (82-0044) *Carnelian - Marine 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. The 110-acre lake has a mean and maximum depth of 5.9 m (19 feet) and 11.9 m (39 feet), respectively. The mean depth of the lake and its surface area translate to an approximate lake volume of 2,090 ac-ft. Approximately 56 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's 209-acre immediate watershed translates to a 2:1 watershed-to-lake area ratio. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 7 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
Secchi (m)	4.5	3.8	5.3	A

A lake grade was not given this year because total phosphorus and chlorophyll-a were not collected in 2008. The Secchi depth grade of A for 2008 is consistent with the A grades received since 1999. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

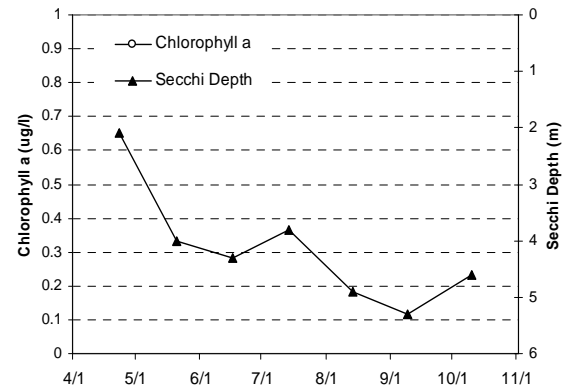
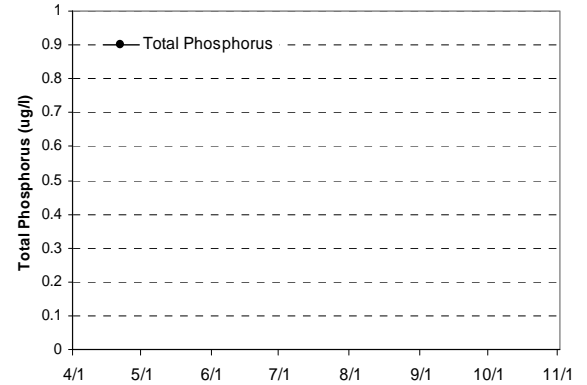
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.2 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.2 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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.

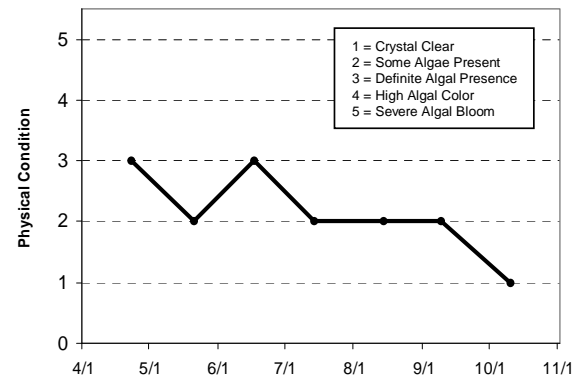
West Boot Lake May Twp., Washington Co.

LAKE ID: 820044
WD: Carnelian-Marine-St. Croix
Volunteer: Washington
Conservation District



2008 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
4/23	9.4	4.5	10.48	1.05				2.1	3	2
5/21	16.5	4.6	8.88	0.24				4	2	3
6/17	22.2	4.6	9	0.28				4.3	3	2
7/14	25.8	4.7	7.13	0.45				3.8	2	2
8/14	23.9	4.9	5.06	0.49				4.9	2	2
9/9	20.1	5	6.86	0.27				5.3	2	2
10/10	14	5.3	7.36	0.32				4.6	1	1



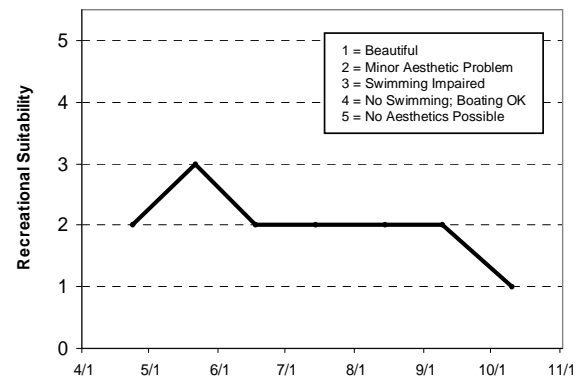
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade					B	C	B	A	A	A	A	A

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

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.

A search through STORET, the nation-wide water quality database, showed that the north basin was monitored for nutrients and Secchi depth for two days in 2000.

The north basin was monitored 7 times in 2008. 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.

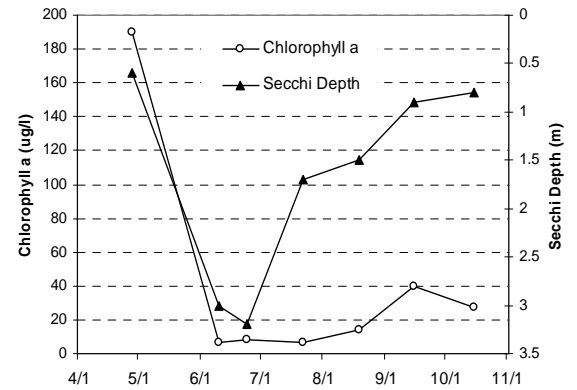
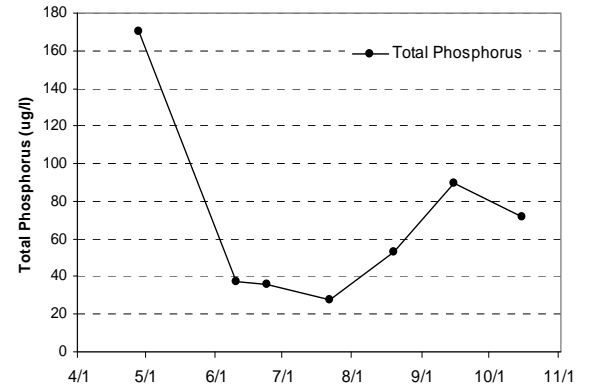
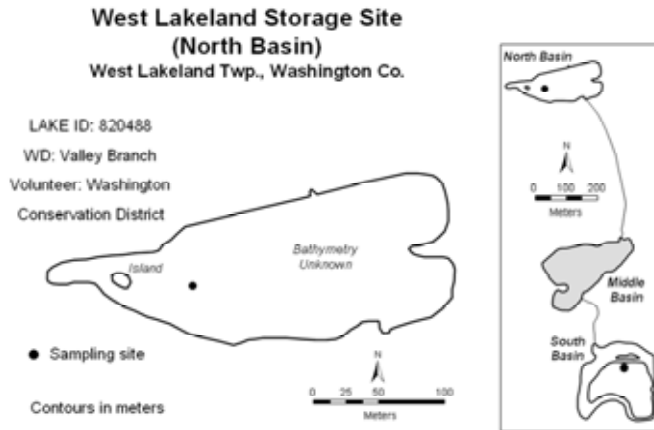
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	48.8	28.0	90.0	C
CLA (µg/l)	15.2	6.8	40.0	B
Secchi (m)	2.1	0.9	3.2	C
TKN (mg/l)	1.70	1.30	2.40	
Lake Grade				C

The north basin received a lake grade of C for 2008. Additional years of monitoring are needed to build the water quality database for this water body.

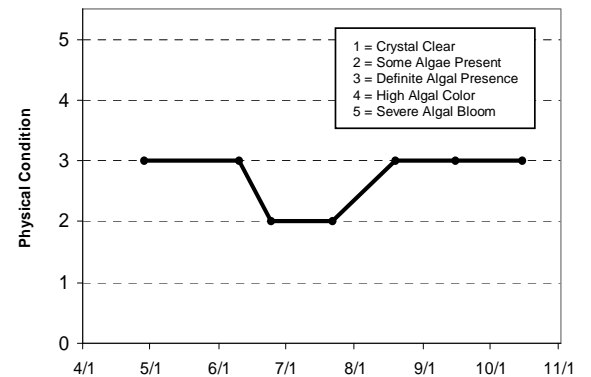
The volunteer's perceptions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale during each monitoring event. The rankings are shown on the information sheet on the next page. The mean physical condition ranking was 2.6 (between 2- "some algae present" and 3- "definite algae present"), and the mean recreational suitability ranking was 3.2 (between 3- "swimming impaired" and 4- "no swimming/boating ok").

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.



2008 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	7.7	5.5	15.07	0.11	190	170		0.6	3	4
6/10	21.2	8.3	9.44	0.02	7	37		3	3	2
6/24	25.2	7.9	8.75	0.78	8	36		3.2	2	3
7/22	27.1	9.5	7.3	0.26	6.8	28		1.7	2	3
8/19	25.8	13.8	8.17	0.23	14	53		1.5	3	4
9/15	19.8	15.1	6.65	0.2	40	90		0.9	3	4
10/15	13.8	13.5	6.33	0.21	27	72		0.8	3	4



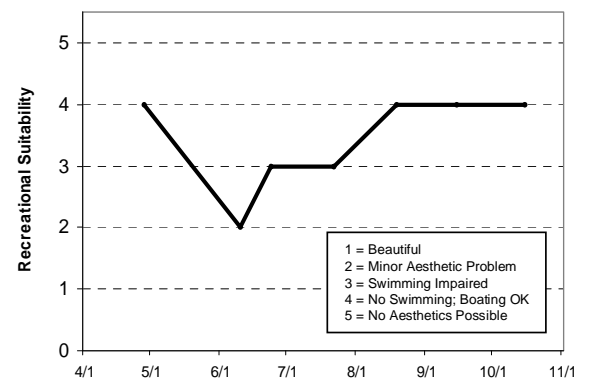
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					C
Chlorophyll a					B
Secchi Depth					C
Lake Grade					C

Source: Metropolitan Council and STORET data



West Lakeland Storage Site [south basin] *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 south basin had a maximum depth of 0.46 m (1.5 ft) in 2008. Other bathymetric information for the basin is unknown. The entire area of the basin is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance.

No other monitoring data is known for this water body. A search through STORET was not possible because the south basin does not have a DNR lake ID number.

The north basin was monitored 3 times in 2008. 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.

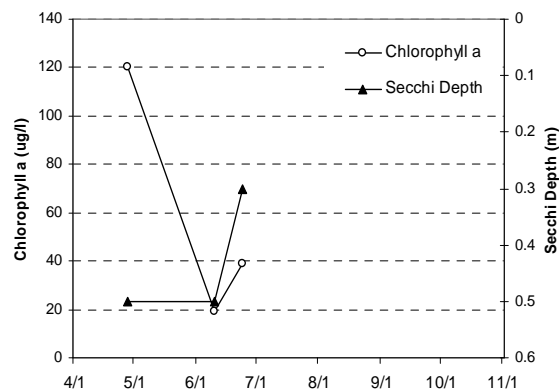
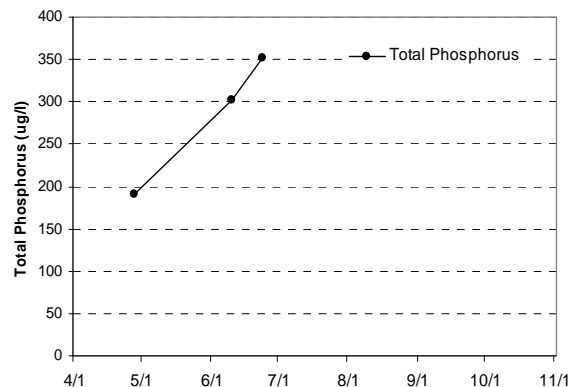
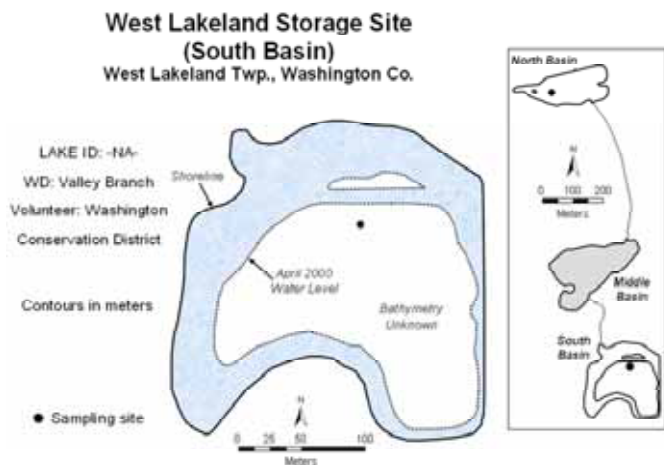
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	327.0	302.0	352.0	
CLA (µg/l)	29.0	19.0	39.0	
Secchi (m)	0.4	0.3	0.5	
TKN (mg/l)	6.60	4.70	8.50	
Lake Grade				

The south basin did not receive a lake grade and individual parameter grades because there were only 3 monitoring events in 2008. At least 5 monitoring events throughout the summer-time period are required to calculate a grade. Monitoring was discontinued in 2008 because of extremely low water levels.

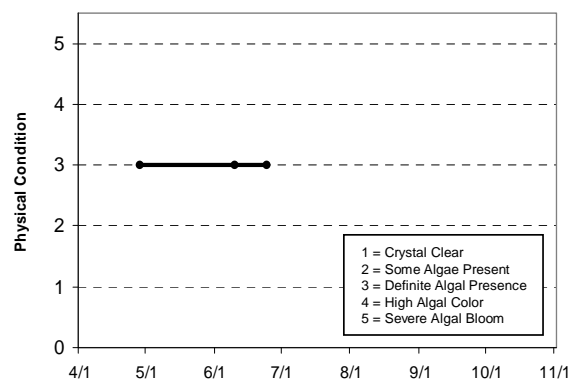
The volunteer's perceptions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale during each monitoring event. The rankings are shown on the information sheet on the next page. The mean physical condition ranking was 3.0 ("definite algae present"), and the mean recreational suitability ranking was 4.5 (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.



2008 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(°C)	(°C)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
4/28	6.7		15.31		120	191		0.5	3	4
6/10	22.5		4.31		19	302		0.5	3	5
6/24	29.6	28.6	7.48	1.23	39	352		0.3	3	4



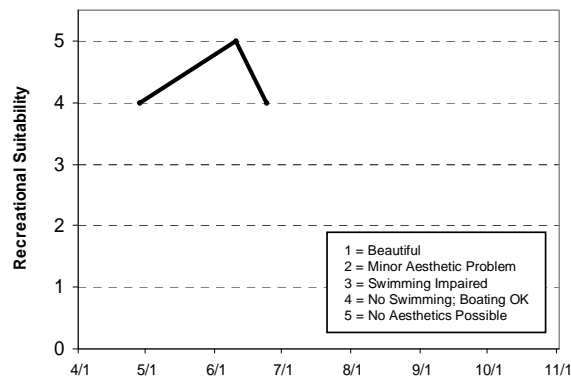
Lake Water Quality Grades Based on Summertime Averages

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												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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

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. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

The lake was monitored 7 times in 2008. 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>
TP (µg/l)	29.9	22.0	39.0	B
CLA (µg/l)	6.5	2.5	15.0	A
Secchi (m)	1.2	0.6	1.7	D
TKN (mg/l)	1.66	1.30	2.00	
Lake Grade				B

The lake received a lake grade of B in 2008, which is consistent with the lake grades received in 2000, 2003, and 2004. The lake grades have varied mainly in the Cs and Bs. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). Continued monitoring is suggested to enhance the ability to detect potential trends in water quality.

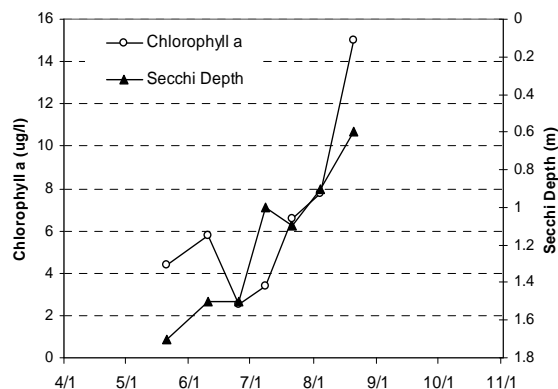
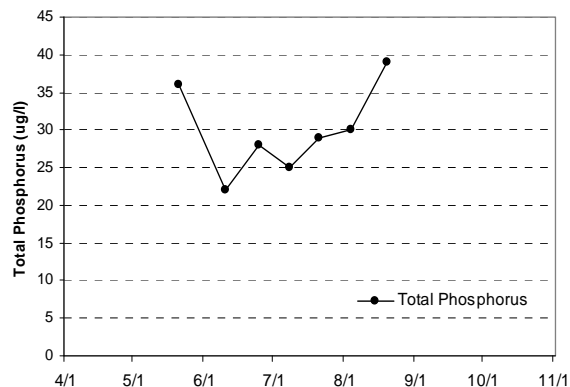
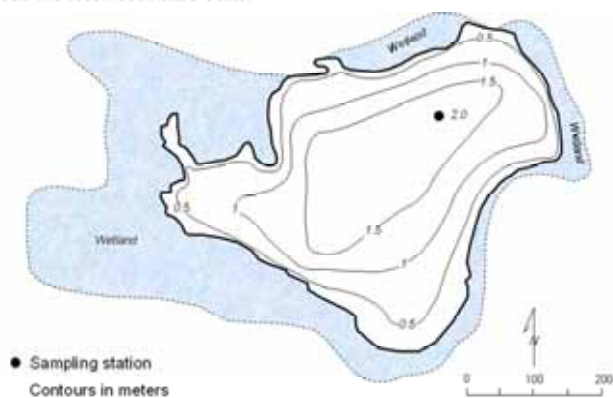
The water clarity grade of D does not correlate well with the CLA grade of A and the TP grade of B. Other years in which a poor correlation between water clarity and CLA grades existed were 2003 and 2004. A possible explanation may be that in certain years the water clarity may be affected by higher levels of total suspended solids from surface runoff from the surrounding urban watershed. It is possible for higher suspended solids loadings to decrease water clarity which would decrease light penetration thereby inhibiting algal growth. Furthermore, the relatively lower TP concentrations could possibly limit the abundance of algae.

Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The average user perception rankings, on a 1-to-5 scale, were 2.4 for physical condition (between 2- "some algae present" and 3- "definite algal color"), and 3.3 for recreational suitability (between 3- "swimming impaired" and 4- "no swimming/boating ok").

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.

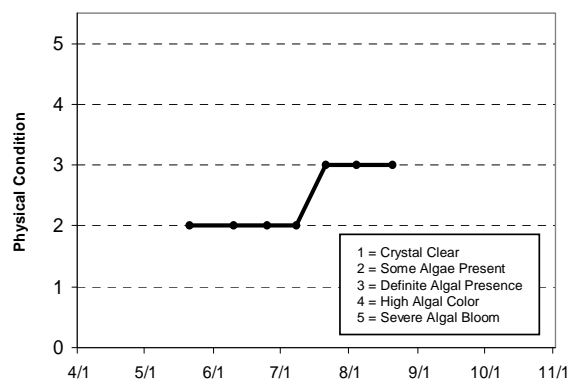
Lake ID: 270711
WMO: Bassett Creek
Volunteer: The Westwood Nature Center

Westwood Lake, St. Louis Park, Hennepin Co.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/21	17.5				4.4	36		1.7	2	2
6/10	20.4				5.8	22		1.5	2	2
6/25	27.5				2.5	28		1.5	2	4
7/8					3.4	25		1	2	3
7/21	28.4				6.6	29		1.1	3	4
8/4	26.9				7.8	30		0.9	3	4
8/20	25.8				15	39		0.6	3	4



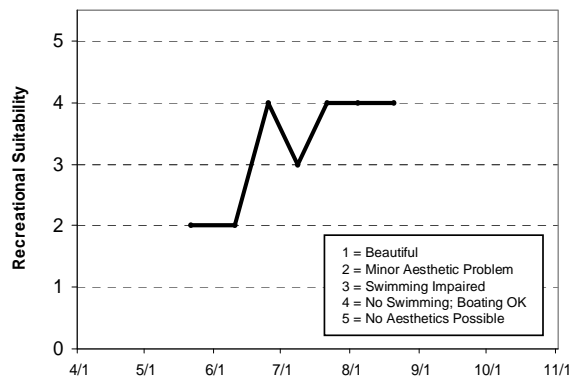
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008
Total Phosphorus	C	D	D	C	B
Chlorophyll a	A	C	B	B	A
Secchi Depth	C	C	C	C	D
Lake Grade	B	C	C	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. This was the third year that White Rock Lake has been involved in CAMP. A search through the STORET nationwide water quality database for data on the lake provided just the historical CAMP data.

The lake was monitored 13 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	78.9	65.0	120.0	D
CLA (µg/l)	36.5	11.0	98.0	C
Secchi (m)	0.7	0.5	1.2	D
TKN (mg/l)	2.28	1.50	3.20	
Lake Grade				D

The lake received a lake grade of D in 2008, which is similar to the previous two years' grades. There is limited water quality data available for White Rock Lake. Therefore, additional years of data are needed to determine potential trends in water quality.

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 2.6 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.5 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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.

White Rock Lake, New Scandia Twp., Washington Co.

Lake ID: 820072
WD: Rice Creek
Volunteer: David Bluhm

● Sampling station
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/29	10.5				15	56		1.5	1	1
5/18	18.3				12	65		1.2	2	1
5/26	18.2				27	71		1	2	2
6/12	23				68	74		0.7	2	2
6/24	21.6				23	65		0.8	2	2
7/12	25				98	120		0.5	3	3
7/22	27.3				42	90		0.5	3	3
8/5	26.8				28	85		0.5	3	3
8/18	28.5				21	67		0.6	3	3
9/1	24.1				11	75		0.6	3	3
9/18	19.9				35	77		0.6	3	3
10/4	15.6				40	96		0.5	3	3
10/18	12.7				23	65		0.7	2	2

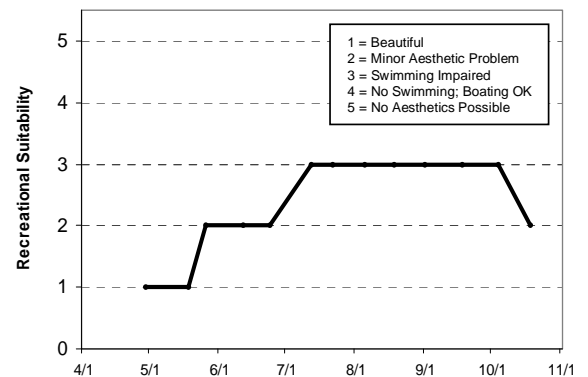
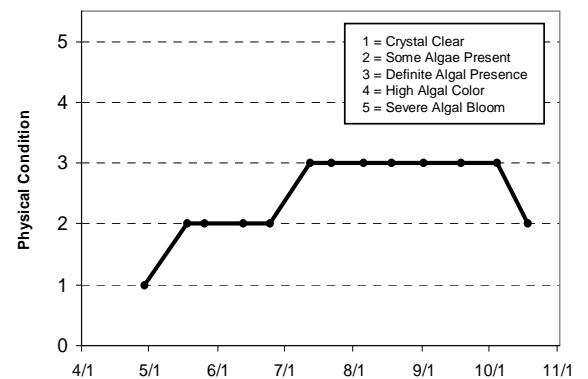
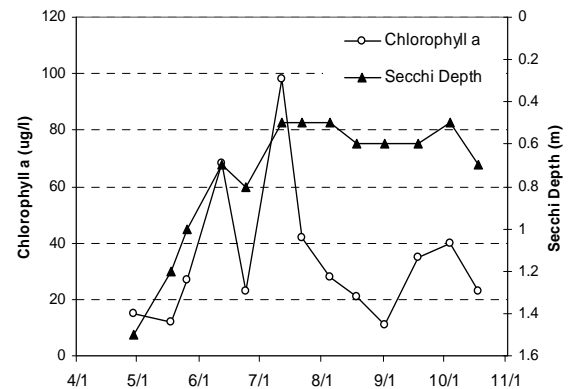
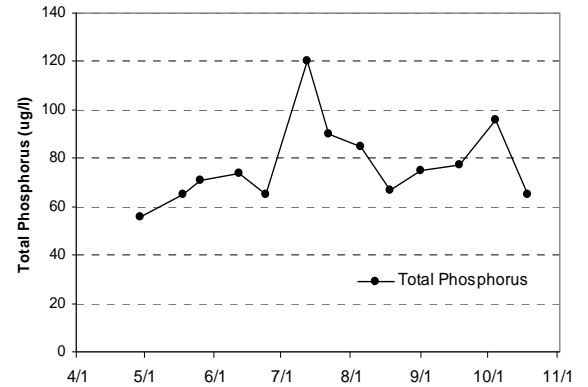
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Wilmes Lake (82-0090) City of Woodbury

Wilmes Lake is located in the City of Woodbury (Washington County). It is classified as a minnow lake that experiences frequent fish kills. The lake has a surface area of 41 acres and a maximum depth of 5.5 m (18 feet). The lake's 2,247-acre watershed translates to a 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*).

The lake was monitored 11 times between mid April and mid October. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	65.3	39.0	92.0	C
CLA (µg/l)	24.7	19.0	30.0	C
Secchi (m)	1.2	0.9	1.4	D
TKN (mg/l)	1.80	1.50	2.50	
<i>Lake Grade</i>				C

The lake received a lake grade of C for 2008, which is consistent with lake grades received in the lake's historical water quality database. The water quality of the lake varies between a lake grade of C and D on the basis of the historical database. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

The 1994 and 1995 CAMP monitoring was performed in the northern basin of Wilmes Lake, while the 1996-2008 monitoring was performed in the lake's south basin. Comparisons between the 1994-1995 data and the 1996-2006 data should not be made as they are from different basins.

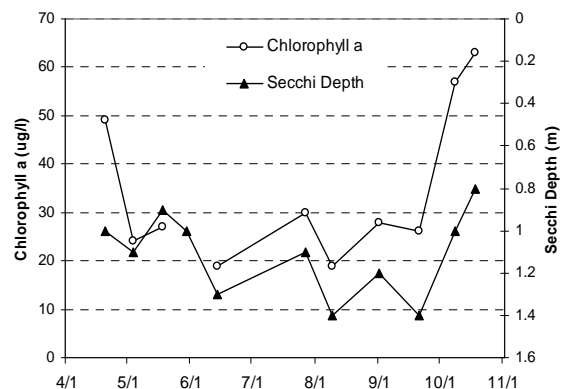
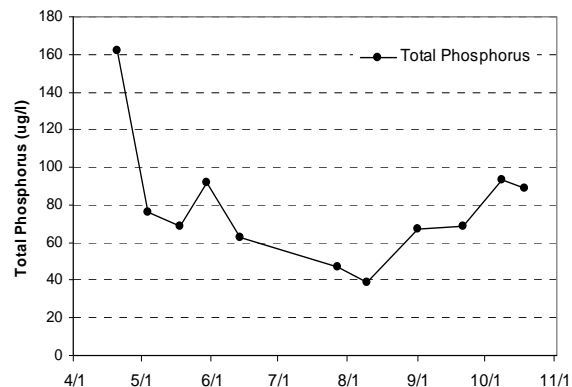
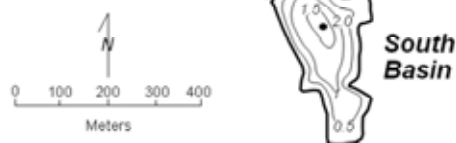
Throughout the monitoring period, the perceived physical condition and recreational suitability of the lake were ranked on a 1-to-5 scale by the volunteer monitors. These user perception rankings are presented in data tables and graphs on the information sheet. The mean physical condition ranking was 2.5 (between 2- "some algae present" and 3- "definite algae present"). The mean recreational suitability ranking was 2.4 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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.

Wilmes Lake, South Basin Woodbury, Washington Co.

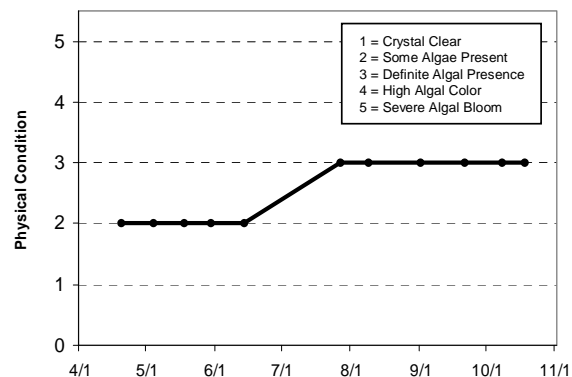
Lake ID: 820090
WD: South Washington
Volunteer: Bill Aamodt

● Sampling site
Contours in meters



2008 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	8.9				49	162		1	2	2
5/4	14.4				24	76		1.1	2	2
5/18	17.6				27	69		0.9	2	2
5/30	18.6					92		1	2	2
6/14	22.5				19	63		1.3	2	2
7/27	26.4				30	47		1.1	3	3
8/9	26.4				19	39		1.4	3	3
9/1	24.1				28	67		1.2	3	2
9/21	21.8				26	69		1.4	3	3
10/8	16.6				57	93		1	3	3
10/18	13.7				63	89		0.8	3	3



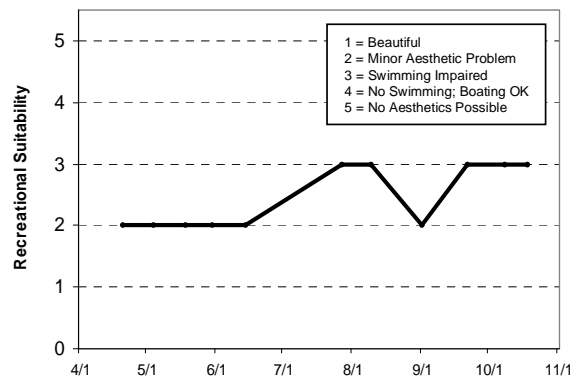
Lake Water Quality Grades Based on Summertime Averages

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

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
Lake Grade			B	C	C	D	D	C	C	D	D	C

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

Source: Metropolitan Council and STORET data



Wing Lake (27-0091) Nine Mile Creek Watershed District

Wing Lake is a small 11-acre lake located within the City of Minnetonka (Hennepin County). There is little known morphological data available for the lake.

This was the third year that Wing Lake has been involved in the CAMP. A search through the STORET nationwide water quality database for data on the lake provided no data other than the historical CAMP data.

The lake was monitored 12 times in 2008. 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.

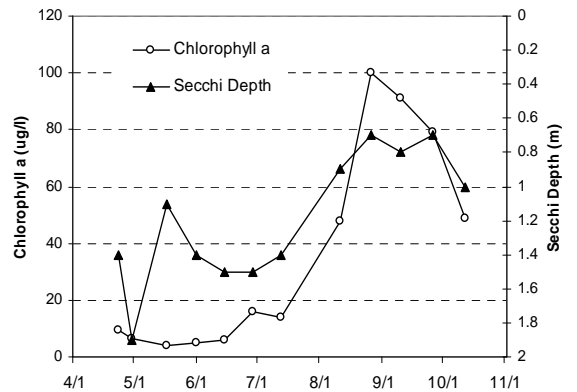
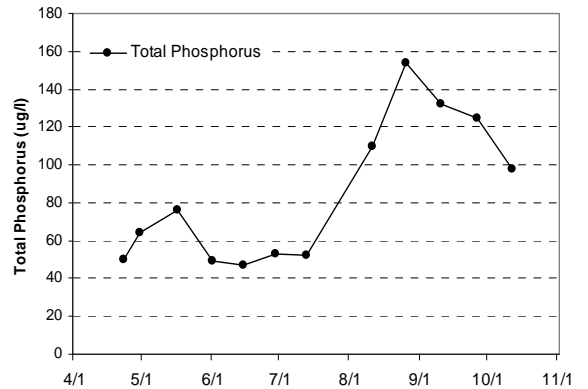
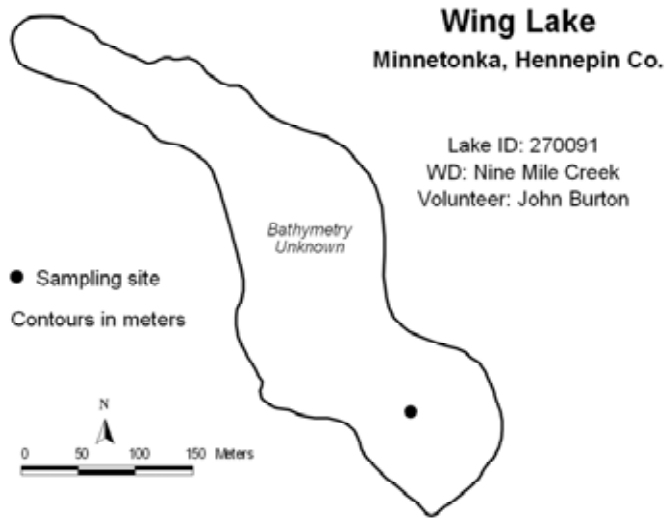
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	88.7	47.0	154.0	D
CLA (µg/l)	40.3	4.1	100.0	C
Secchi (m)	1.1	0.7	1.5	D
TKN (mg/l)	1.77	1.30	2.00	
Lake Grade				D

The lake received a lake grade of D for 2008, which is consistent with the previous two years' of data. The individual parameter grades have remained unchanged for the past 3 years as well. Since only 3 years of data are available, additional years of monitoring are needed to determine potential trends in water quality.

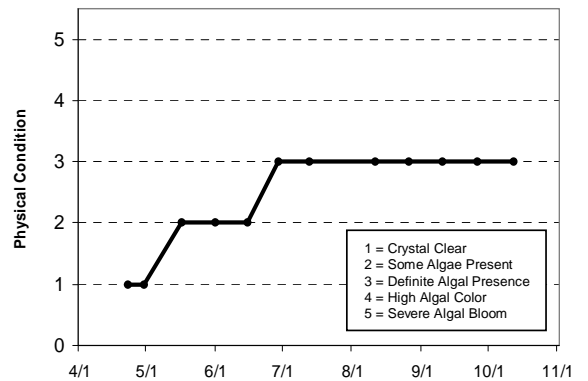
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.7 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 4.8 (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.



2008 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
4/23	15.7				9.6	50		1.4	1	1
4/30	12				6.6	64		1.9	1	1
5/17	19				4.1	76		1.1	2	4
6/1	25				5.2	49		1.4	2	5
6/15	24				5.8	47		1.5	2	4
6/29	24				16	53		1.5	3	5
7/13	23				14	52		1.4	3	5
8/11	25				48	110		0.9	3	5
8/26	21				100	154		0.7	3	5
9/10	16.4				91	132		0.8	3	5
9/26	19.6				79	125		0.7	3	5
10/12	16.7				49	98		1	3	5



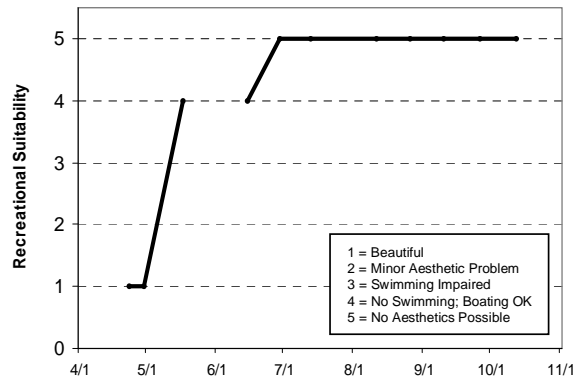
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus					
Chlorophyll a					
Secchi Depth					
Lake Grade					

Source: Metropolitan Council and STORET data



Winkler Lake (10-0066) Carver County Environmental Services

Winkler Lake is a 129-acre lake located within Benton Township (Carver County). The lake has a 2,758-acre immediate watershed, which translates to a watershed-to-lake area ratio of 21:1 (the larger the ratio the greater the potential stress put on the lake from surface runoff). The lake is the receiving waterbody for the Bongard's wastewater treatment plant.

The DNR has designated the lake as being infested with Eurasian Water Milfoil (*Myriophyllum spicatum*).

A search through the STORET nationwide water quality database provided one additional year of data (1995) besides historical CAMP data.

The lake was monitored 13 times between mid April and mid October. 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.

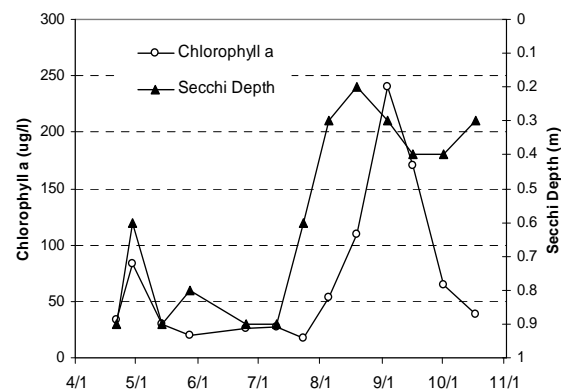
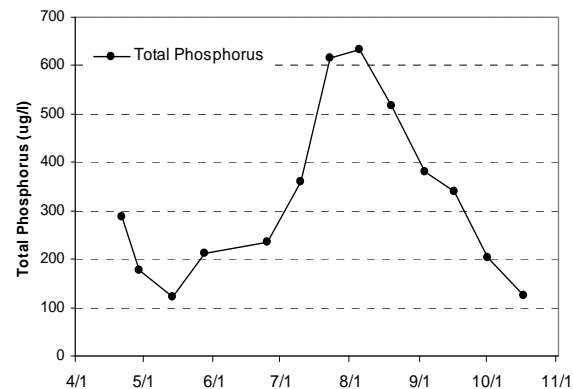
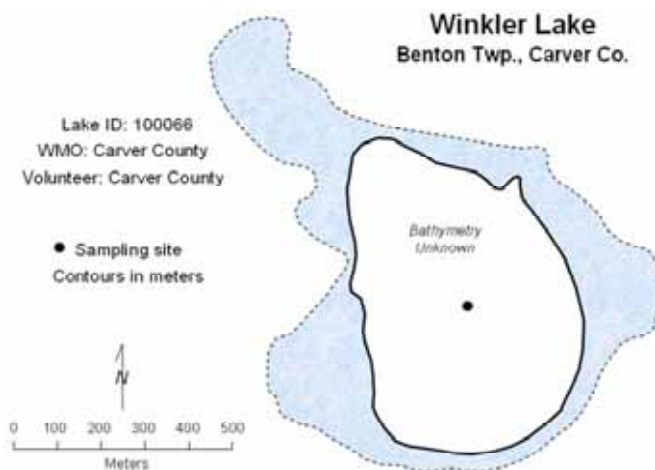
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	379.6	122.0	633.0	F
CLA (µg/l)	77.2	18.0	240.0	F
Secchi (m)	0.6	0.2	0.9	F
TKN (mg/l)	3.28	1.40	5.20	
Lake Grade				F

The lake received a lake grade of F for 2008. The lake appears to fluctuate between lake grades of D and F, except that F lake grades are more common. The lake received a lake grade of C in 1995, so to better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

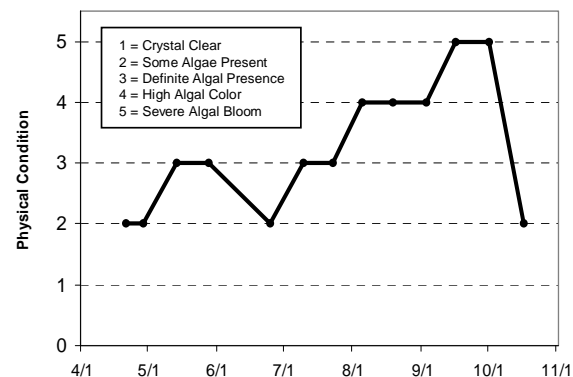
The average user perception rankings, on a 1-to-5 scale, were 3.4 for physical condition (between 3- "definite algae present" and 4- "high algal color") and 4.6 for recreational suitability ranking (between 4- "no swimming - boating ok" and 5- "no aesthetics possible").

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.



2008 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	11.12		10.7		34	287		0.9	2	4
4/29	4.2		21.8		83	176		0.6	2	4
5/14	12.44		10.56		30	122		0.9	3	4
5/28	16		7.79		20	212		0.8	3	5
6/25	24.48		7.35		26	235		0.9	2	4
7/10	25.87		8.98		27	359		0.9	3	4
7/23	27.26		4.03		18	616		0.6	3	4
8/5	26.74		12.36		54	633		0.3	4	5
8/19	25.69		9.88		110	518		0.2	4	5
9/3	17.84		13.42		240	381		0.3	4	5
9/16	16.61		10.53		170	340		0.4	5	5
10/1	12.86		6.8		65	202		0.4	5	5
10/17	10.47		6.56		38	126		0.3	2	3



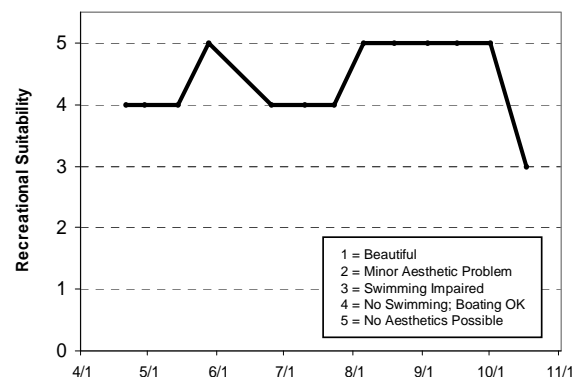
Lake Water Quality Grades Based on Summertime Averages

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				F				F	F	F		F
Chlorophyll a				A				D	F	C		F
Secchi Depth				C				F	F	F		F
Lake Grade				C				F	F	D		F

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

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. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The majority of the land within the lake's 157-acre immediate watershed is urban/developed. The resulting watershed-to-lake area ratio is 17:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 12 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	59.7	35.0	109.0	C
CLA (µg/l)	14.1	1.8	33.0	B
Secchi (m)	2.1	0.8	5.0	C
TKN (mg/l)	1.81	1.50	2.10	
Lake Grade				C

The lake received a lake grade of C for 2008, which is consistent with most of lake grades received in previous years. The lake appears to be represented by a lake grade of C, on the basis of the water quality database. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

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 2.4 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 3.6 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

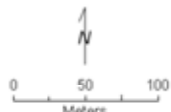
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Wood Lake Burnsville, Dakota Co.

Lake ID: 190024
WMO: Black Dog
Volunteers: David Bess;
Burnsville City Staff

● Sampling site
Contours in meters



2008 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	11.4				13	68		1.5	2	4
5/12	14.8				8.4	85		1.8	2	4
5/29	17.6				6.4	36		3.2	1	4
6/9	21.3				9.7	109		5	2	2
6/24	25				1.8	35		3.5	2	3
7/11	27.2				10	73		1.3	3	3
7/23	27.8				33	40		1.1	2	4
8/7	26.3				22	56		0.8	4	4
8/21	25.7				15	53		0.8	3	4
9/18	20.7				21	50		1	3	4
10/4	17.2				21	51		0.8	3	4
10/19	13.9				13	36		1.3	3	4

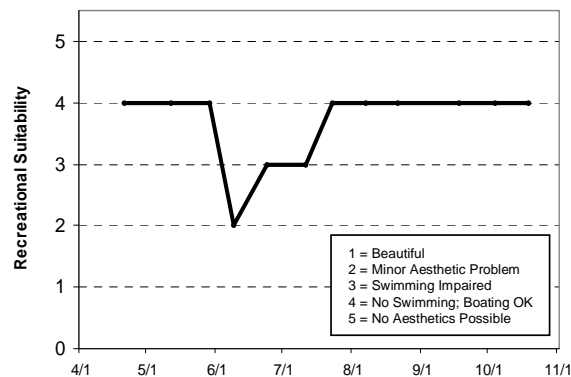
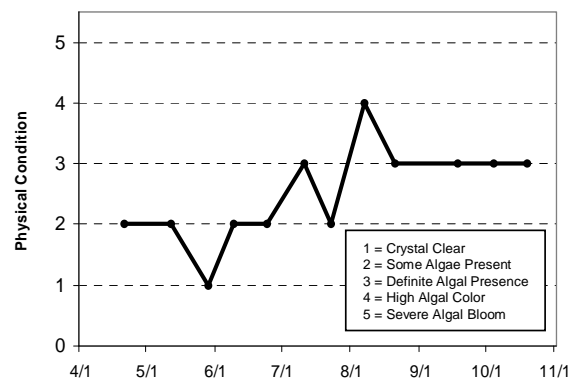
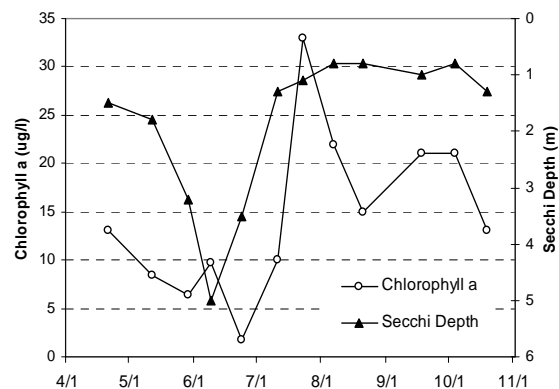
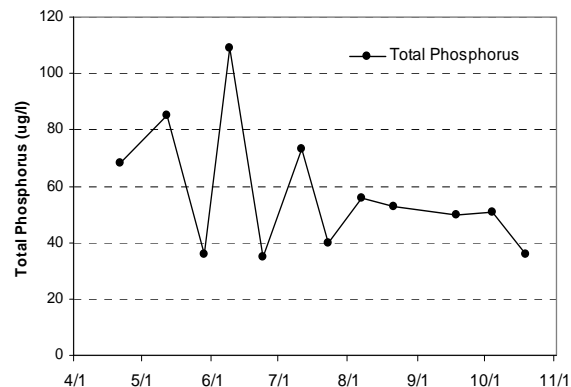
Lake Water Quality Grades Based on Summertime Averages

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					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
Lake Grade					C	C	B	C	C	C	C	C

Year	2004	2005	2006	2007	2008
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



Woodpile Lake (82-0132) Browns Creek Watershed District

Woodpile Lake is a small 15-acre lake located in Washington County. The maximum depth of the lake is 8.2 m (27 ft). This was the third year that Woodpile Lake has been involved in the CAMP. A search through the STORET nationwide water quality database for data on the lake provided only the historical CAMP data.

The lake was monitored 14 times in 2008. 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.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	41.8	12.0	68.0	C
CLA (µg/l)	20.9	3.5	74.0	C
Secchi (m)	2.0	0.9	3.5	C
TKN (mg/l)	1.27	0.71	2.60	
<i>Lake Grade</i>				C

The lake received a lake grade of C for 2008, which is similar to the lake grade received in 2006, but worse than the B lake grade received last year. The quantity of data in the water quality database is limited, so additional years of data are needed to determine potential trends in water quality.

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 2.9 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 3.8 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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.

Woodpile Lake Grant, Washington Co.

Lake ID: 820132
WD: Browns Creek
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



Bathymetry
Unknown

2008 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
4/23	12.1	5	12.82	1.47	15	30		1.5	3	3
5/5	13.9	5	11.69	0.86	8.3	30		2	3	4
5/19	16.1	5.3	9.71	0.34	3.5	20		3.2	2	3
6/3	19.4	5.8	9.23	0.2	6.6	30		3.5	2	3
6/18	22.1	6.1	11.4	0.26	21	55		1.7	3	4
6/30	25.5	6.3	10.89	0.77	35	38		2.1	3	4
7/8										
7/14	25	7	8.53	0.44	74	68		0.9	3	4
7/28	27.4	6.7	8.66	0.39	19	59		1.4	3	4
8/11	25.5	7	6.88	0.26	15	48		2	4	4
8/27	22.7	7.2	7.31	0.49	14	12		2	3	4
9/8	20.4	7.5	6.67	0.21	19	60		1.4	3	4
9/23	20.5	7.7	8.66	0.35	14	40		1.5	3	4
10/9	14.4	7.9	7.79	0.3	16	45		1.8	3	3
10/22	11.1	8.3	7.78	0.53	15	45		2.1	2	3

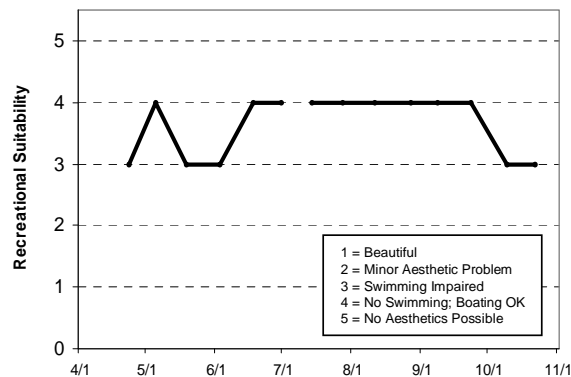
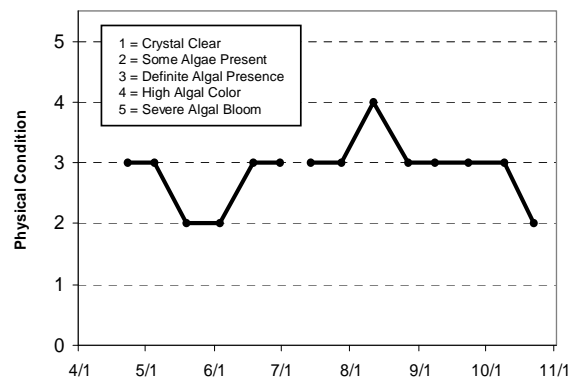
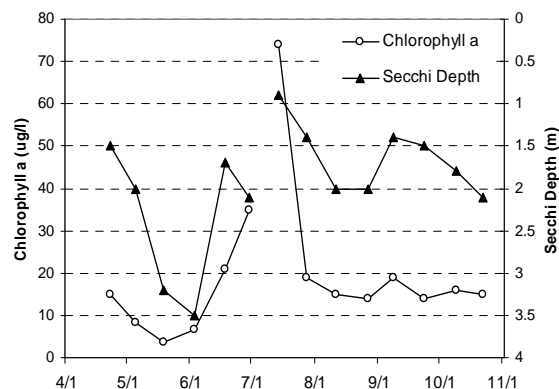
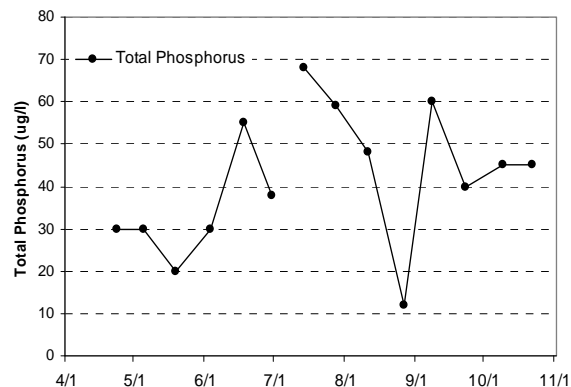
Lake Water Quality Grades Based on Summertime Averages

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
Total Phosphorus			D	C	C
Chlorophyll a			B	B	C
Secchi Depth			C	B	C
Lake Grade			C	B	C

Source: Metropolitan Council and STORET data



REFERENCES

- American Public Health Association. 1992. *Standard Methods for the Examination of Water and Wastewater*. 18th ed.
- Anhorn, R.J. 1993. *Handbook for the Citizen-Assisted Lake Monitoring Program*. Metropolitan Council. St. Paul, MN.
- Anhorn, R.J. 1994. *A 1993 Study of the Water Quality of 43 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 32-94-012.
- Anhorn, R.J. 1995. *A 1994 Study of the Water Quality of 51 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 32-95-011.
- Anhorn, R.J. 1996. *A 1995 Study of the Water Quality of 59 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 32-96-014.
- Anhorn, R.J. 1997. *A 1996 Study of the Water Quality of 66 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 32-97-004.
- Anhorn, R.J. 1998. *A 1997 Study of the Water Quality of 71 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 32-98-007.
- Anhorn, R.J. 1999. *A 1998 Study of the Water Quality of 70 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 32-99-008.
- Anhorn, R.J. 2000. *A 1999 Study of the Water Quality of 113 Metropolitan Area Lakes*. Metropolitan Council Publ. No. EPE-00-479.
- Anhorn, R.J. 2001. *A 2000 Study of the Water Quality of 124 Metropolitan Area Lakes*. Metropolitan Council Publ. No. EPE-01-502.
- Anhorn, R.J. 2002. *A 2001 Study of the Water Quality of 132 Metropolitan Area Lakes*. Metropolitan Council Publ. No. EPE-02-516.
- Anhorn, R.J. 2003. *A 2002 Study of the Water Quality of 137 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 32-03-019.
- Anhorn, R.J. 2004. *A 2003 Study of the Water Quality of 140 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 32-04-015.
- Anhorn, R.J. 2005. *A 2004 Study of the Water Quality of 145 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 32-05-037.
- Anhorn, R.J. 2006. *A 2005 Study of the Water Quality of 172 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 32-06-017.
- Anhorn, R.J. and Sventek, J. 2007. *A 2006 Study of the Water Quality of 186 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 32-07-02.

- Barr Engineering. 1993. *1993 Marcott Lakes Water Quality Study: EP-78 and EP-80*. Barr Engineering. Minneapolis, MN.
- Barr Engineering. 1993. *1990 and 1991 Lake water Quality Inventory and Historical Water Quality Trend Analysis: Lakes Ann, Duck, Hyland, Lotus, Lucy, Mitchell, Red Rock, Rice Marsh, Riley, Round, Staring and Susan*. Barr Engineering. Minneapolis, MN.
- Barr Engineering. 1994. *Sweeney Lake: Watershed and Lake Management Plan*. Barr Engineering. Minneapolis, MN.
- Barr Engineering. 1997. *Project Assessment and Evaluation for the Crystal/Keller Lake Water Quality Improvement Project*. Barr Engineering. Minneapolis, MN.
- Barr Engineering. 1997. *North Rice, South Rice, and Grimes Ponds Watershed and Lake Management Plan*. Barr Engineering. Minneapolis, MN.
- Barr Engineering. 2001. *2000 Lake Water Quality Study: Northwood Lake, Parkers Lake, Sweeney Lake, and Twin Lake*. Barr Engineering. Minneapolis, MN.
- Barr Engineering. *Personal Communication*. Barr Engineering. Minneapolis, MN.
- Beduhn, R.J. 1993. *LCMR Lake Monitoring Study: The Effects of Aeration/Circulation on Lake and Reservoirs*. Prepared for the Legislative Commission on Minnesota Resources.
- Black Dog Watershed Management Commission. 1987. *Watershed Management Plan*. Orr, Schelen, Mayeron and Associates. St. Paul, MN.
- Blue Water Science and Bonestroo, Rosene, Anderlik and Assoc. 2005. *Lake Management Plan for Alimagnet Lake, Dakota County, Minnesota*. Blue Water Science, St. Paul, MN.
- Bokenmeier, D. 1989. *Staying Ahead of the Game*. North American Lake Management Society: Lake Line. 9(8): 2-16.
- Browns Creek Watershed District. 1990. *Watershed Management Plan*. Washington County Soil and Water Conservation District.
- Carlson, R.E. 1977. *Trophic Status Index Indicator of Lakes*. Limnology Oceanography 22:361-369.
- Capital Region Watershed District. 2003. *Lake McCarrons Management Plan*. The Osgood Group. Shorewood, MN.
- Carver County Planning and Zoning Department. 1999. *Carver County 1999 Water Quality Report*. Carver County Planning and Zoning Department.
- Carver Creek Watershed Management Organization. 1990. *Water Management Plan*. Carver County Soil and Water Conservation District.
- City of Inver Grove Heights. 1993. *Simley Lake Water Quality Study*. Orr, Schelen, Mayeron and Associates.

- City of Woodbury. 1994. *Surface Water Management Plan*. Bonestroo Rosene Anderlik & Associates. St. Paul, MN.
- Cole, G.A. 1983. *Textbook of Limnology: 3rd ed.* C.V. Mosby Company. St. Louis, MI.
- Coon Creek Watershed District. 1985. *MSA-509 Plan*. Israelson and Associates, Inc Bloomington, MN.
- Environmental Research Group, Inc. 1986. *Management Alternatives Report on the Diagnostic-Feasibility Study for Golden Lake. Anoka County, MN*. Environmental Research Group, Inc.
- Forest Lake Watershed Management Organization. 1988. *Surface Water Management Plan*. Washington County Soil and Water Conservation District.
- Gersmehl, C., J. Drake and D. Brown. 1986. *Minnesota Water: A Geographical Perspective*. Water Resources Research Center. Public Report Series No. 4.
- Gun Club Lake WMO. 1989. *Management Plan*. James M. Montgomery Engineers (Montgomery, Watson). Wayzata, MN.
- Hartsoe, J.A. and R.A Osgood. 1991. *A 1991 Study of the Water Quality of 17 Metropolitan Area Lakes*. Metropolitan Council Publ. 590-92-006.
- Hanson, K. 1995. *Personal Communication*. City of Inver Grove Heights, MN.
- Kernik, S. 1995-1999. *Personal Communication*. City of Woodbury, MN.
- Ludvig, M. 1994. *Lake Waconia Surface Water Report*. Carver County Environmental Services. Chaska, MN.
- Maloney, T.E. (ed.). 1979. *Lake and Reservoir Classification Systems*. U.S. EPA Environmental Research Lab. Corvallis, OR. EPA-600/3-79-074.
- Marine on St. Croix Watershed Management Organization. 1991. *Water Management Plan*. Washington County Soil and Water Conservation District.
- McComas, S. 2003. *Using Barley Straw to Improve Water Clarity in Valley Lake, in 2002, Lakeville, Minnesota*. Blue Water Science. St. Paul, MN.
- McComas, S. and Anhorn, R. 2004. *The Use of Barley Straw as an Organic Carbon Amendment to Enhance Heterotrophic Processes and Increase Water Clarity on Valley Lake*. Unpublished study.
- McComas, S. 2005. *Personal Communication*. Blue Water Science. St. Paul, MN.
- Metropolitan Council. 1986. *Water Resources Management: Development Guide/Policy Plan*. St. Paul, MN.
- Metropolitan Council. 1997. *Lake McCarrons Wetland Treatment System—Phase III Study Report*. St. Paul, MN.

- Middle St. Croix Watershed Management Organization. 1991. *Watershed Management Plan*. Washington County Soil and Water Conservation District.
- Minnehaha Creek Watershed District. 1987. *Water Resources Management Plan*. James M. Montgomery Engineers (Montgomery Watson). Wayzata, MN.
- Minnehaha Creek Watershed District. 1996. *Water Resources Management Plan*. Wenck Associates. Maple Plain, MN.
- Minnesota Department of Conservation. 1967. *Metropolitan Lake Inventory*. Minnesota Department of Conservation. St. Paul, MN.
- Minnesota Department of Conservation. 1968. *Inventory of Minnesota Lakes*. Minnesota Department of Conservation. St. Paul, MN.
- Minnesota Department of Natural Resources. Various years. *Lake Fishery Surveys*. Minnesota Department of Natural Resources. St. Paul, MN.
- Minnesota Department of Natural Resources. 1996. *Report on the Status of the DNR Metro Region Trout Resources*. A Metro Region Trout Committee Report. Minnesota Department of Natural Resources. St. Paul, MN.
- Minnesota Department of Natural Resources. 2004. *Draft: Evaluation of the potential to selectively control Eurasian water milfoil with fluridone herbicide in Minnesota 2001-2003*. Minnesota Department of Natural Resources. St. Paul, MN.
- Minnesota Pollution Control Agency. 1985. *A Citizens' Guide to Lake Protection*. Minnesota Pollution Control Agency. St. Paul, MN.
- Minnesota Pollution Control Agency. 1994. *Lake Assessment Program: Lake Waconia*. Minnesota Pollution Control Agency. St. Paul, MN.
- Minnesota Pollution Control Agency. 2003. *Fact Sheets on Lake Transparency Trends*. Minnesota Pollution Control Agency. St. Paul, MN.
- Montgomery Watson. 1990. *Lake Alimagnet Diagnostic - Feasibility Study*. Montgomery Watson. Wayzata, MN.
- Montgomery Watson. 1994-1998. *Personal Communication*. Montgomery Watson. Wayzata, MN.
- Newman, R.M., D.W. Ragsdale, and D.D. Biesboer. 1996. *Can Eurasian Water milfoil be Managed in Minnesota by Biological Control with Native or Naturalized Insects?* Third progress report to the Minnesota Department of Natural Resources, Ecological Services, St. Paul, MN.
- Nichols, A.B. 1992. *Citizens Monitor Water Quality*. Water Environment and Technology. March, 1993. pp.55-59.

- Oberts, G.L. 1982. *Nonpoint Source Pollution in the Metropolitan Area: Technical Completion Report*. Metropolitan Council Publ. No. 10-82-016.
- Oberts, G.L and R.A Osgood. 1988. *Lake McCarrons Wetland Treatment System: Final Report the Function of the Wetland Treatment System and the Impacts on Lake McCarrons*. Metropolitan Council Publ. No. 590-88-095.
- Osgood, R. 1981. *A Study of the Water Quality of 60 Lakes in the Seven-County Metropolitan Area*. Metropolitan Council Publ. No. 01-81-047.
- Osgood, R. 1982a. *A 1981 Study of the Water Quality of 30 Lakes in the Seven-County Metropolitan Area*. Metropolitan Council Publ. No. 10-82-005.
- Osgood, R.A. 1982b. *Using Carlson's Trophic State Indices in Regional Water Quality Assessment*. Water Resources Bulletin 18:67-74.
- Osgood, R.A. 1983. *Diagnostic-Feasibility Study of Seven Metropolitan Area Lakes. Part One: General Overview*. Metropolitan Council Publ. No. 10-83-092. *Part Two: Bryant, Elmo, Fish, George, Riley, Spring and Square Lakes*. Metropolitan Council Publ. Nos. 10-83-093 a-g.
- Osgood, R.A. 1984a. *A 1983 Study of the Water Quality of 28 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 10-84-037.
- Osgood, R.A. 1984b. *A 1984 Study of the Water Quality of 43 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 10-84-172.
- Osgood, R.A. 1985. *A 1985 Study of the Water Quality of 32 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 10-85-156.
- Osgood, R.A. 1988a. *A 1986/1987 Study of the Water Quality of 10 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 590-88-037.
- Osgood, R.A. 1988b. *The Limnology, Ecology and Management of Twin Cities Metropolitan Area Lakes*. Metropolitan Council Publ. No. 590-88-123.
- Osgood, R.A. 1989a. *An Evaluation of the Effects of Watershed Treatment Systems on the Summertime Phosphorus Concentration in Metropolitan Area Lakes*. Metropolitan Council Publ. No. 590-89-062b.
- Osgood, R.A. 1989b. *A 1989 Study of the Water Quality of 20 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 590-89-129.
- Osgood, R.A. 1989c. *An Evaluation of Lake and Stream Monitoring Programs in the Twin Cities Metropolitan Area*. Metropolitan Council Publ. 590-89-128.
- Osgood, R.A. 1989d. *Assessment of Lake Use-Impairment in the Twin Cities Metropolitan Area*. Metropolitan Council Publ. No. 590-89-130.
- Osgood, R.A. 1990. *A 1990 Study of the Water Quality of 21 Lakes in the Twin Cities Metropolitan Area*. Metropolitan Council Publ. No. 590-90-182.

- Osgood, R.A. and J.E. Stiegler. 1990. *The Effects of Artificial Circulation on a Hypereutrophic Lake*. Water Resource Bulletin 26:209-217.
- Osgood, R.A. 2000. *City of Victoria Local Water Resources Management Plan: Victoria Lakes – 2000*. Ecosystem Strategies. Shorewood, MN.
- Prior Lake - Spring Lake Watershed District. 1991. *Water Resources Management Plan*. James M. Montgomery Engineers (Montgomery Watson). Wayzata, MN.
- Prior Lake - Spring Lake Watershed District. 1998. *Draft-Water Resources Management Plan*. James M. Montgomery Engineers (Montgomery Watson). Wayzata, MN.
- Prior Lake - Spring Lake Watershed District. 2001. *Final Report on the Prior-Spring Lake Improvement Project*. James M. Montgomery Engineers (Montgomery Watson). Wayzata, MN.
- Prior Lake - Spring Lake Watershed District. 2004. *A Sustainable Water Quality Management Plan for Spring and Prior Lakes*. PLSLWD, Prior Lake, MN.
- Rice Creek Watershed District. 1987. *Water Resources Management Plan*. James M. Montgomery Engineers (Montgomery Watson). Wayzata, MN.
- Riley-Purgatory-Bluff Creek Watershed District. 1982. *Management Plan*. Barr Engineering. Minneapolis, MN.
- Short Elliot Hendrickson Inc. 1998. *How's the Water? Plymouth, Minnesota Water Resources Management Plan*. Short Elliot Hendrickson. St. Paul, MN.
- Shingle Creek Watershed Management Organization. 2003. *Watershed Management Plan*. Wenck Associates, Inc. Maple Plain, MN.
- Simpson, J.T. 1991. *Volunteer Lake Monitoring: A Methods Manual*. EPA 440/4-91-002.
- Six Cities Watershed Management Organization. 1988. *Water Management Plan*. Barr Engineering. Minneapolis, MN.
- South Washington Watershed District. 1997. *Watershed Management Plan*. Bonestroo, Rosene, Anderlik and Associates. St. Paul, MN.
- Square Lake Clean Water Partnership Report. 2001. *Square Lake, Washington County Phase I Resource Investigation*. Washington County Soil and Water Conservation District. Stillwater, MN.
- Square Lake Clean Water Partnership Report. 2001. *Square Lake, Washington County Phase I Resource Investigation*. Washington County Soil and Water Conservation District. Stillwater, MN.
- St. Croix Basin Water Resources Planning Team. 2004. *St. Croix Basin Phosphorus-Based Water Quality Goals*.
- U.S. Environmental Protection Agency. 1997. *Watershed Protection: Clean Lakes Case Study. Use of Aquatic Weevils to Control a Nuisance Weed in Lake Bomoseen, Vermont*. EPA-841-F-97-002.

- U.S. Geological Survey. 1976. *Hydrology of the Lakes in the Minneapolis-St. Paul Metropolitan Area: A Summary of Available Data*. Water-Resources Investigations 76-85.
- U.S. Geological Survey. 2001. *Response of the St. Croix River Pools, Wisconsin and Minnesota, to Various Phosphorus-Loading Scenarios*. Water-Resources Investigations Report 02-4181.
- Valley Branch Watershed District. 2005. *Watershed Management Plan*. Barr Engineering Company. Minneapolis, MN.
- Vermillion River Watershed Management Commission. 1989. *Watershed Management Plan*. James M. Montgomery Engineering. Wayzata, MN.
- Washington Conservation District. 2002. *August 2001-July 2002 Zooplankton Monitoring Summary Report for Square Lake in Washington County, MN*. Washington Conservation District. Stillwater, MN.
- Wenck Associates, Inc. 1987. *Lake Diagnostic/Feasibility Study: Prepared for Forest Lake Watershed Management Organization*. Wenck Associates Inc. Wayzata, MN.
- Wenck Associates, Inc. 1987. *Diagnostic/Feasibility Study for Crooked Lake, Anoka County*. Wenck Associates Inc. Wayzata, MN.
- Wetzel, R.G. 1983. *Limnology*. Saunders College Publishing. Chicago, IL.
- Wilson, B. 1990. *Lake Water Quality Summary of Shields, Bone, Half Breed, and Forest Lakes*. Forest Lake Watershed Management Organization.

APPENDIX A

Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2008

(Numbers indicate sampling events per year. Sampling by volunteers is indicated by a "v".)

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	
Acorn Lake	82010200																												v14		v 6	
Alimagnet Lake	19002100																	v 12	v10	v10	v10	v10	v10	v8	v9	v12	v10	v10	v8	v10	v 12	
Ann Lake	10001200							5				13													13							
Ardmore Lake	27015300																													v4	v 11	
Armstrong Lake	82011602	south basin																			v15	v10	v13	v14	v15	v14	v14	v14	v7	v7	v 7	
Assumption Lake	10006300																					v1										
Auburn Lake	10004401	west				10			17	18				12			13															
Auburn Lake	10004402	east				10																										
Aue Lake	10002800																					v1										
Bald Eagle Lake	62000200	site 1	4	5		5																					13	13				
Bald Eagle Lake	62000200	site 2																									13	13				
Barker Lake	82007600																						v5	v5	v7	v7	v7	v7	v7	v7	v 7	
Barnes Lake	10010900																					v1										
Bass Lake	27001500	St. Louis Park																							v12			v12	v2			
Bass Lake	27009800	Plymouth	4														v16			v15		v15		v13		v9		v15		v14		
Bass Lake	82003500	May Township																					v14	v5	v7	v7	v7	v7	v7	v7	v 7	
Bass Lake	82012300	west [Grant Twnshp]																											v7	v8	v 7	
Bass Lake	82012400	east [Grant Twnshp]																											v7	v7	v 7	
Battle Creek Lake	82009100																v14	v13	v11	v13												
Bavaria Lake	10001900					5			17	18							13		v11	v12	v15	v12	v14	v14	v14	v19	v16	v18	v16	v14	v 14	
Bay Pond	82001100																												v14	v14	v 11	
Benton Lake	10006900																						v13	v14	v14		v15		v14		v13	v 14
Benz Lake	82012000																				v8							v14	v14	v14	v 14	
Berliner Lake	10010300																					v1										
Beutel Pond	82039900																														v 7	
Big Carnelian Lake	82004900					5						13					13			13			v14	v7	v14	v14	v14	v14	v7	v7	v 6	
Big Comfort Lake	13005300																			v3			v14	v14	v14	v14	v14	v13	v14	v14	v 14	
Big Marine Lake	82005200		4	5			5					13					13			13			v14	v7	v14	v14	v14	v14	v7	v7	v 7	
Birch Lake	13004200																											v10	v7	v7		
Birch Lake	62002400		2																									v14				
Bluebill Bay Lake	19044900																			v8												
Bone Lake	82005400						5					13					v7		v14		v14	v14	v14		v14	v14	v14	v14	13	v10	v 15	
Brand Lake	10011000																					v1										

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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
Braunworth Lake	10010700																				v1										
Brick Pond	82030800																														v 7
Brickyard Clayhole Lake	10022500																							v14	v13	v14	v14	v14	v13	v 14	
Bryant Lake	27006700		2	5	16		5					13	13	12																	
Burandt Lake	10008400																				v7	v13	v9				v18	v22			
Bush Lake	27004700						5									13	13				13		13				13		v13	v15	v 13
Byllesby Lake	19000600															v14	v14	v13													
Calhoun Lake	27003100			5			5																								
Campbell Lake	10012700																				v2	v14		v10				v14	v14		
Capaul Pond	82036500	east basin																													v 7
Capaul Pond	82036500	west basin																													v 7
Carol Lake	82001700																					v5	v5	v7	v7	v7	v7	v7	v7	v7	v 7
Carver Lake	82016600									20						v15	v15	v16	v9												
Cates Lake	70001800																							v14	v13	v15	v13	v14	v13	v 12	
Cedar Island Lake	27011900																v13						v13		v11			v9			
Cedar Lake	27003900	Minneapolis					5																								
Cedar Lake	70009100	Scott Co.	4	5			5						13			14					13			13				13	v14	v14	v 14
Cenaiko Lake	2065400																			v12	v11	v13	v11	v13	v12	v12	v14	v14	v14	v12	v 13
Centerville Lake	2000600		4	5		5																	13	13/v4	v1	13	13				
Charley Lake	62006200							5																							
Christmas Lake	27013700		4	5			5													13	13	13			13	13					
Chub Lake	19002000		2													v14	v14	v11													
Clear Lake	82004500	May Township																													v 14
Clear Lake	82016300	Forest Lake	4				5						13			v11	v12	v12	v11	v10	v11	v10	v9	v12	v12	v12	v6		13		
Cleary Lake	70002200						5																								
Cloverdale Lake	82000900																							v10	v10	v11	v13	v12	v11	v10	v 9
Cobblecrest Lake	27005300																								v4		v14	v16	v13	v13	v 13
Cobblestone Lake	19045600																											v14	v14	v12	v 14
Cody Lake	66006100																													v3	
Colby Lake	82009400																v13	v14	v13	v13	v12	v12	v9	v10	v10	v10	v10	v6	v7	v7	v 9
Coon Lake	2004200		4				5										13			13											
Cornelia Lake	27002800																									v7		v11	v14	v14	v 13
Courthouse Lake	10000500	Chaska																	v2	v14	v13	v13	v14	v14	v14	v14	v14	v14	v13	v13	v 14

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(Numbers indicate sampling events per year. Sampling by volunteers is indicated by a "v".)

[illegible]

APPENDIX A

Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2008

(Numbers indicate sampling events per year. Sampling by volunteers is indicated by a "v".)

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
Fish Lake	70006900	Scott Co.	4				5						13					13		v2	v13	v8	v12	v9	v14	v13	v11	v13	v11	v13	v 11
Fish Lake	82006400	Washington Co.																					v5	v14	v7	v7	v7	v7	v7	v7	v 7
Fish Lake	82013700	Grant Township																							v5	v5	v4				
Forest Lake	82015900	east basin	4				5						13			v7			v12						13			13	13		
Forest Lake	82015900	middle basin					5						13			v7			v12						13			13	13		
Forest Lake	82015900	west basin					5						13			v7			v12	v14	v15	v14	v14	v14	v14	v14	v14	v14	13	v14	v 14
French Lake	27012700																							v11	v10	v7	v7				
Friedrich's Pond	82010800																												v13	v14	v 11
Gables Lake	82008200																				v8	v5									
Gaystock Lake	10003100																					v2	v14	v14				v14	v14		
George Lake	2009100		4	5	16		5					13					13					13									
George Watch Lake	2000500																		v14	v12	v11	v11	v6	v7	v8	v9	v10	v12	v7	v8	v 12
German Lake	82005600																								v7	v7	v7	v7	v7	v7	v 7
Gervais Lake	62000700							5																							
Glen Lake	27009300																												v13	v7	v 4
Goetschel Lake	82031300																							v11	v9	v4	v15	v9	v5	v 7	
Goggins Lake	82007700																					v13	v14	v14	v14	v14	v14	v14	v14	v14	v 14
Golden Lake	2004500		2											12		14			v13	v11	v15	v13	v13	v12	v11	v11	v10	v11	v11	v10	v 9
Goose Lake	10008900	Waconia																v9	v7	v15	v15	v14	v11	v14	v14	v14	v14	v14	v14	v13	v 14
Goose Lake	19036000	Lakeville																v13	v13												
Goose Lake	82005900	New Scandia															v15	v15	v13	v13	v15						v7	v7	v7	v7	v 14
Goose Lake	82011301	north basin [Lake Elmo]																													v 7
Goose Lake	82011302	south basin [Lake Elmo]																													v 7
Grace Lake	10021800																								v11	v14	v14		v14		v 14
Grass Lake	27068100																			v12											
Hafften Lake	27019900																						13	13			13	v15	v13		
Ham Lake	2005300						5									v15	v13		v13	v9	v14										
Harriet Lake	27001600						5																								
Hart Lake	2008100																										v6	v4	v8		
Harvey Lake	27067000																										v10				
Haughey Lake	27018700																								v4						
Hay Lake	82006500																				v14	v13	v14	v14	v4	v7	v7	v7	v7	v7	v 14
Hazeltine Lake	10001400																					v1	v14	v14				v14	v14		

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Henry Lake	27017500																	v10										v11	v11	v6	v 7	
Herber Pond	82001501																										v14	v14	v7	v7		
Highland Lake	2007900																					v13	v11	v13	v12	v12	v14	v14	v14	v12		
Holland Lake	19006500					10	16	15			20					13						13										
Hornbeam Lake	19004700																												v11	v8	v 7	
Horseshoe Lake	19003200	Dakota Co.																v11	v10												v 1	
Horseshoe Lake	19005100	Sunfish Lake																											v11	v11	v 8	
Horseshoe Lake	82007400	Washington Co.																				v1										
Hydes Lake	10008800							5						12		13			12			v11	v4	v9	v14	v15	v14	v14	v14	v13	v 13	
Independence Lake	27017600		4	5		5							13			v14	v15															
Isabelle Lake	19000400																v14															
Island Lake	2002200	Linwood				7																				v12	v14	v14	v14	v13	v 13	
Jane Lake	82010400						5			17	18			12			v12						13				v15	v13	v10	v12	v 16	
Jellums Lake	82005202	Site 1																					v14	v14	v12	v14	v14	v14	v7	v7	v 7	
Jellums Lake	82005202	Site 2																							v11	v11						
Johanna Lake	62007800			5				5				13																				
Jonathan Lake	10021700																												v14		v 14	
Josephine Lake	62005700							5				13																				
Jubert Lake	27016500																						v11									
July Lake	82031800																												v7	v7	v 7	
Karth Lake	62007200																													v11	v 13	
Keller Lake	19002500	Burnsville																	13	13	v13	v15	v14	v12	v13	v15	v15	v14	\14	v12	v 8	
Keller Lake	62001000	Maplewood						5																								
Kingsley Lake	19003000															5		v11	v10	v9				v14	v14	v15	v14	v15	v16	v14	v14	v 13
Kismet Lake	82033400																					v14	v13	v14	v14	v14	v14	v13	v14	v14	v 14	
Klawitter Pond	82036800																								v13	v13	v14	v13	v12	v12	v 13	
Kohlman Lake	62000600							5																								
Kramer Pond	82011700																														v 7	
La Lake	82009700																v13	v11	v13	v11	v10	v10	v8	v6	v5	v6	v3	v13	v12	v14	v 11	
Lac Lavon Lake	19044600																			v11	v10	v10	v9	v2	v7	v12	v12	v12	v12	v13	v 12	
Laddie Lake	2007200		4													v13	v14	v12					v13	v13	v14	v10						
Lake Forest	82018700																														v 12	
Lake Minnetonka	27013302	lower	4	5																												

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Lake Minnetonka	27013305	upper	2	5																												
Langdon Lake	27018200						5																									
Langton Lake	62004901	site 1																										v14	v7	v13	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	
Legion Pond	82046200																											v14	v10		v 7	
Lemay Lake	19008200																													v11	v 11	
Libbs Lake	27008500																										v10					
Lily Lake	82002300																	v15	v14	v14	v15	v13	v14	v14	v14	v7	v7	v7	v7	v7	v 14	
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	
Little Comfort Lake	13005400																												v14	v13	v 12	
Little Johanna Lake	62005800																							v12	v16	v15	v8	v6	v3		v 14	
Little Long Lake	27017901		4				5						13								13			13		13			v11	v2		
Lochness Lake	2058500																													v12	v 11	
Long Lake	10001600	Carver Co.																				v2		v13		v5						
Long Lake	19002200	Apple Valley																	v16						v11	v13	v12	v15	v14	v13	v 14	
Long Lake	27016000	Orono				5																										
Long Lake	62006700	north site [New Brighton]						5																								
Long Lake	62006700	south site [New Brighton]						5																								
Long Lake	82002100	Stillwater																v14	v7		v14	v13	v14	v14	v14	v14	v14	v14	v14	v14	v 14	
Long Lake	82003000	May Township														v14	v14	v14	v13	v14		v14	v14	v14	v14	v14	v7	v7	v7	v7	v 7	
Long Lake	82006800	Scandia																					v5	v14	v7	v7	v7	v7	v7	v7	v 8	
Long Lake	82011800	Pine Springs														v14											13	v15	v14	v14	v 14	
Long Lake	82013000	Mahtomedi																								v11	v9	v12	v10	v10	v 10	
Loon Lake	82001502																						v14	v14	v7	v7	v7	v7	v7	v7	v 14	
Lost Lake	27010300															v13																
Lost Lake	82013401	north basin																											v13	v13	v 11	
Lotus Lake	10000600							5					13										13	13			v5	v10	v8	v11	v9	v 11
Louise Lake	82002500																						v5	v5	v7	v7	v7	v7	v7	v7	v 14	
Lower Prior Lake	70002600	Site 1					5						13						13	v15	v14	v13	v9	v14	v16	v13	v12	v12	v12	v12	v 12	

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Lower Prior Lake	70002600	Site 2																			v14	v13	v9	v14	v15						
Lucy Lake	10000700							5																							
Lynch Lake	82004200																												v7	v 14	
MacDonald Lake	82006200																									v14	v14	v7	v7		
Magda Lake	27006500																				v14	v13			v11			v12			
Maple Marsh Lake	82003800																					v5	v5	v7	v7	v7	v7	v7	v7		
Marcott Lakes	19004100	south															v15	v13	v10	v10	v12	v10	v6	v5							
Marcott Lakes	19026300	north															v15														
Maria Lake	10005800																					v2	v14	v14				v13			
Marion Lake	19002601		2	5		5						13					v15					v15	v14	v13	v14	v14	v15	v16	v15	v14	v 13
Markgraf Lake	82008900																v15	v11	v12	v10	v15	v10	v10	v9	v13	v14	v14	v14	v15	v14	v 14
Markley Lake	70002100																			v11	v13	v12	v14	v13	v9	v6	v4		v10	v7	
Marsh Lake	10005400																					v1									
Marshan Lake	2000700																	v10	v13	v10	v9	v8	v7								
Martin Lake	2003400					7															13									v 13	
Masterman Lake	82012600																											v14	v14	v 14	
Mays Lake	82003300																													v 14	
McCarrons Lake	62005400						12	20	17	18	19	13	13	12		14	13	16	13			18	13	13	13		13	13			
McDonald Lake	82001000																					v11		v14	v9	v12	v12	v14	v10	v9	v 15
McDonough Lake	19007600							5														13									
McKnight Lake	10021600																											v14		v 14	
McKusick Lake	82002000																v14	v14	v14	v14	v14	v13	v14	v14	v14	v14	v14	v14	v14	v14	v 15
McMahon Lake	70005000		2				5											13			13			13				13	v14	v10	v 11
Meadow Lake	27005700																	v12				v12			v9			v10			v 14
Medicine Lake	27010400		4	5		10							13	12																	
Mergens Pond	82048200																						v10			v3	v2	v6			v 6
Meuwissen Lake	10007000																					v1									v 11
Miller Lake	10002900																	v6	v13			v12	v14	v13	v13	v14	v14	v14	v12	v13	v 14
Minnetoga Lake	27008800																												v14	v 12	
Minnewashta Lake	10000900						5						13			13				13	13	13			13	13					
Mitchell Lake	27007000																	13					13	13		13	v14	v14	v14	v13	v 13
Moody Lake	13002300																											v14	v14	v14	
Mooney Lake	27013400															v14	v10														

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Moore Lake	2007502																				v14										
Mud Lake	82002602																					v5	v5	v7	v7	v7	v7	v7	v7	v7	
Myers Lake	10006800																				v1										
Nokomis Lake	27001900		4				5																								
Normandale Lake	27104500																												v5	v3	
North Twin Lake	82001800																					v5	v5	v7	v7	v7	v7	v7	v7	v7	v 7
Northwood Lake	27062700																					v12	v10	v13	v12	v12	v10	v10	v10	v 9	
Oak Lake	10009300	site 1																			v2		v14	v13	v12	v14	v14	v14		v 15	
Oak Lake	10009300	site 2																											v10		
Oak Lake	10009300	site 3																											v10		
O'Connor Lake	82000200																											v8	v15	v12	v 15
O'dowd Lake	70009500						5										13			13			13		13			13	v12	v13	v 14
Olson Lake	82010300												12		v15		14						13			13	v14	v7	v7	v11	v 19
Oneka Lake	82014000																					v13	v11	v11	v9	v6	v5				
Orchard Lake	19003100		4	5		5						13				13					13	v15	v13	v13		v14	v14	v14	v14	v14	v 12
Otter Lake	2000300		2			5																									
Owasso Lake	62005600		4			5																									
Ox Yoke Lake	27017800																														v 1
Pamela Lake	27067500																												v10		
Parkers Lake	27010700		4										13				13					13	v12		v14	v15	v15	v15	v14	v14	v 13
Parley Lake	10004200						5		17	18				12				12				13		13		13				13	
Pat Lake	82012500																												v7	v7	v 8
Patterson Lake	10008600																					v2									
Peltier Lake	2000400					5										v14	v16	v15	v14	v14	v13	v13	v14	v13	v17	v15	v15	v16	v17	v16	
Pepin Lake	40002800																													v13	
Phalen Lake	62001300		4	5				5																							
Pickerel Lake	2013000		2														13														
Pierson Lake	10005300		2	5		5						13						13						13	13	13				13	
Pike Lake	27011102	Maple Grove																v14	v15	v13		v13								v4	
Pike Lake	62006900	Ramsey Co.																				v14	v10	v14	v14	v14	v15	v15	v11	v14	v 13
Pike Lake	70007600	site 1 [Scott Co.]																	v9			v10	v9	v9	v11	v15	v15	v13			
Pike Lake	70007600	site 2 [Scott Co.]																							v11						
Pine Tree Lake	82012200							5								v14	v14	v16	v14	v15	v15	v13	v14	v9	v12	v7	v8	v12	v10	v9	v 7

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Plaisted Lake	82014800																														v 7	
Pleasant Lake	62004600	North Oaks						5																								
Pleasant Lake	70009800	New Prague														13																
Pomerleau Lake	27010000																		v9			v10		v6		v3						
Powers Lake	82009200																v12	v13	v13	v12	v9	v10	v8	v5	v7	v14	v14	v14	v14	v14	v 1	
Priebe Lake	62003600																														v 13	
Raven Lake	19036900																	v13	v6	v8												
Rebecca Lake	27019200					10	12	12																								
Red Rock Lake	27007600																					12	13			13	13		13			
Regional Park Lake	82008700																				v12	v14	v12	v13	v14	v15	v15	v14	v7	v7	v 7	
Reitz Lake	10005200							5						12		13							v15	v13	v7	v13	v14	v14	15	v14	v14	v 11
Reshanau Lake	2000900		2																			v7	v1	v6						v13	v9	v 7
Rest Area Pond	82051400																												v13	v10	v 13	
Rice Lake	10007800	Carver Co.	2																			v1										
Rice Lake	27011600	Maple Grove																												v10	v 10	
Riley Lake	10000200		2	5	16			5	17	18			13	12		13				13			13		13	v14	v15	v14	v10	v15	v 12	
Rogers Lake	19008000																													v12	v 9	
Rose Lake	27009200	Minnetonka																											v14	v13	v 13	
Rose Lake	82011200	north basin [Lake Elmo]																													v 7	
Rose Lake	82011200	south basin [Lake Elmo]																													v 7	
Rutz Lake	10008000																					v1	v14	v14	v14				v14	v7	v 5	
Ryan Lake	27005800																	v14		v5		v9		v4	v6						v 13	
Sanborn Lake	40002700																													v2		
Sand Lake	82006700															v7	v14	v14	v13						v14	v7	v7	v7	v7	v7	v 14	
Sarah Lake	27019100		4			5																										
Scheuble Lake	10008500																					v1										
Schmidt Lake	27010200																	v14			v12		v12	v9			v14	v9		v9		
School Lake	13005700																											v14	v7	v7		
Schroeder Pond	82030100																										v14	v14	v7	v7		
Schultz Lake	19007500						5	5														13										
Schutz Lake	10001800					5																	v6	v10	v6	v8	v9	v11				
Scout Lake	19019800																													v14	v 14	
Sea Lake	82005300																														v 12	

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Seidl Lake	19009500																	v15	v14	v14	v15	v16	v14	v14	v15	v8	v14	v14	v14	v8	v 4	
Shavers Lake	27008600	east basin																									v14	v13				
Shavers Lake	27008600	west basin																											v6			
Shields Lake	82016200															v6	v14	v14	v13	v13	v14	v14	v14	v14	v14	v14	v14	v14	v14	v7		
Silver Lake	62000100	North St. Paul																											v12			
Silver Lake	82001600	Washington Co.																				v14	v5	v7	v7	v7	v7	v7	v7	v7	v 7	
Simley Lake	19003700																	v10	v16	v14	v15	v16	v14	v12	v14							
Snail Lake	62007300		4					5																								
South Oak Lake	27066100																								v12	v15			v9	v8	v 5	
South Rice Lake	27064500																					v9	v14	v15	v14	v14	v15	v14	v12	v 6		
South School Section Lake	82015100																	v14	v7		v14							v14	v14	v14	v 14	
South Twin Lake	82001900																					v5	v5	v7	v7	v7	v7	v7	v7	v7	v 7	
Spring Lake	2007100	Anoka Co.																						v11								
Spring Lake	70005400	Prior Lake	4	5	16		5						13						13	v12			v6	v11	v13	v14	v14	v13	v9	v8	v 5	
Square Lake	82004600		4	5	16	6	7	7				13				v11	v14	v14	v13	v14	19	v14	v14	v15	v14	v14	v14	v14	v14	v14	v 7	
St. Croix Lake	82000100	S-1 upper basin																											v2			
St. Croix Lake	82000100	S-2 upper basin																										v10	v10	v9	v 9	
St. Croix Lake	82000100	S-3 mid basin																										v11	v9	v9	v 10	
St. Croix Lake	82000100	S-5 mid basin																										v8	v10	v7	v 8	
St. Croix Lake	82000100	S-6 lower basin																										v11	v10	v10	v 9	
St. Croix Lake	82000100	S-7 lower basin																										v8	v8	v10	v 5	
St. Joe Lake	10001100																										v17	v8	v9	v9	v 9	
Staples Lake	82002800																						v14	v5	v7	v7	v7	v7	v7	v7	v 7	
Staring Lake	27007800		4					5										13				13		13			13		13			
Stieger Lake	10004500						12					13						13														
Success Lake	27063400																		v10							v11			v11		v 10	
Sucker Lake	62002800							5																								
Sullivan Lake	2008000															v14	v14	v15		v15	v14	v13	v11	v11	v12	v12						
Sunfish Lake	19005000	Sunfish Lake																												v13	v13	v 13
Sunfish Lake	82010700	Lake Elmo																					v10					v13	v11		v 7	
Sunnybrook Lake	82013300																					v14		v13	v10	v12	v10	v16	v14	v14	v 14	
Sunset Lake	82015300							5									v14	v14	v12	v13	v16	v12	v10	v13	v13	v18	v20	v15	v17	v12	v10	v 9
Sunset Pond	19045100																v14	v14	v14	v12	v10		v13	v11	v10	v12	v11		v14	v14	v 14	

APPENDIX A

Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2008

(Numbers indicate sampling events per year. Sampling by volunteers is indicated by a "v".)

[illegible]

APPENDIX A

Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2008

(Numbers indicate sampling events per year. Sampling by volunteers is indicated by a "v".)

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
West Lakeland Storage Site	82048800	north basin																					v2								v 7
West Lakeland Storage Site	0	south basin																													v 3
Westwood Lake	27071100															v13							v15	v14	v10	v9	v7	v7	v8	v8	v 7
Whaletail Lake	27018401																										13	13			
Whaletail Lake	27018402		4				5													13				13			13	13			
White Bear Lake	82016700		4	5			5																								
White Rock Lake	82007200																												v11	v14	v 13
Wilmes Lake	82009000																v14	v15	v14	v15	v15	v14	v13	v13	v10	v12	v12	v10	v12	v11	v 11
Windsor Lake	27008200																										v12	v14			
Wing Lake	27009100																												v14	v14	v 12
Winkler Lake	10006600																				v8	v6	v6		v13		v14		v13	v 13	
Wolsfeld Lake	27015700		4																												
Wood Lake	19002400																	v10	v14	v15	v15	v14	v13	v14	v14	v14	v14	v13	v13	v 12	
Woodpile Lake	82013200																												v7	v7	v 15
Young America Lake	10010500																				v1										
Zumbra Lake	10004100						5						13												13						

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		

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
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		

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
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		

Lake Characteristics

[illegible]

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
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		

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
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

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
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

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
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 Characteristic

[illegible]

Lake Characteristics

[illegible]

APPENDIX C
2008 CAMP Volunteers

<u>Enrolling Group</u>	<u>Lake</u>	<u>DNR ID</u>	<u>Volunteer</u>
Anoka County	Cenaiko	2065400	Anoka County Parks
Anoka County	Island	2002200	Anoka County Parks
Anoka County	Linwood	2002600	Anoka County Parks
Anoka County	Martin	2003400	Anoka County Parks
Apple Valley, City of	Cobblestone	19045600	Jeff Sluiter
Apple Valley, City of	Farquar	19002300	Bill Sherry
Apple Valley, City of	Long	19002200	Cristy McGlocklin & Al Kettelkamp
Apple Valley, City of	Scout	19019800	Dan Stanek
Bassett Creek WMO	Northwood	27062700	Robert White
Bassett Creek WMO	Parkers	27010700	Bob Videen
Bassett Creek WMO	South Rice	27064500	Steve Streff
Bassett Creek WMO	Sweeney	27003501	Dave Hanson
Bassett Creek WMO	Westwood	27071100	Westwood Nature Center
Black Dog WMO	Crystal	19002700	Carroll Armett, PhD
Black Dog WMO	Keller	19002500	Glen Gramse
Black Dog WMO	Kingsley	19003000	City of Lakeville
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	Alimagnet	19002100	John Ritter
Burnsville, City of	Earley	19003300	Brian Lee
Burnsville, City of	Twin, South	19002800	Dan Freeman
Burnsville, City of	Wood Pond	19002400	David Bess and City Staff
Carver County	Bavaria	10001900	John Ryski
Carver County	Benton	10006900	Don Smith
Carver County	Brickyard	10022500	Carver County
Carver County	Burandt	10008400	Carver County
Carver County	Courthouse	10000500	Carver County
Carver County	Eagle	10012100	Carver County
Carver County	Firemens	10022600	Carver County
Carver County	Goose	10008900	Carver County
Carver County	Grace	10021800	Carver County
Carver County	Hydes	10008800	Carver County
Carver County	Jonathan	10021700	Carver County
Carver County	McKnight	10021600	Carver County
Carver County	Meuwissen	10007000	Mark & Jacob Stienbauer & Don Smith
Carver County	Miller	10002900	Carver County
Carver County	Oak	10009300	Carver County
Carver County	Reitz	10005200	Lynne McMullen
Carver County	Rutz	10008000	Marty Ziermann
Carver County	Swede	10009500	Wayne Hubin

APPENDIX C
2008 CAMP Volunteers

<u>Enrolling Group</u>	<u>Lake</u>	<u>DNR ID</u>	<u>Volunteer</u>
Carver County	Waconia	10005900	Carver County
Carver County	Winkler	10006600	Carver County
Chanhassen, City of	Lotus	10000600	Shelley Strohmaier
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	Big Comfort	13005300	Chuck Rheault
Comfort Lake - Forest Lake WD	Bone	82005400	Jon Hafner & Don Jack
Comfort Lake - Forest Lake WD	Forest, west	82015900	Jack Beckman
Comfort Lake - Forest Lake WD	Sylvan	82008000	Curt Sparks
Eden Prairie, City of	Mitchell	27007000	Gordon & Fran Warner
Elm Creek WMC	Henry	27017500	George & Pam Christ
Elm Creek WMC	Rice	27011600	George Schneider
Elm Creek WMC	Sylvan	27017100	Dirk Colby
Lake St. Croix Planning Team	Lake St. Croix - Bayport (site 2)	82000100	Roberta and Jim Harper
Lake St. Croix Planning Team	Lake St. Croix - Black Bass (site 6)	82000100	Rick Meierotto
Lake St. Croix Planning Team	Lake St. Croix - Kinnickinnic (site 7)	82000100	Carpenter Nature Center
Lake St. Croix Planning Team	Lake St. Croix - Troy Beach (site 3)	82000100	Cecilia and Harry Martin
Lake St. Croix Planning Team	Lake St. Croix - Troy Beach (site 5)	82000100	Sheryl and Rich Lindholm
Lakeville, City of	East	19034900	City of Lakeville
Lakeville, City of	Lee	19002900	City of Lakeville
Lakeville, City of	Marion	19002600	Wally Potter
Lakeville, City of	Valley	19034800	City of Lakeville
Lower St. Croix WMO	O'Connors	82000200	Jeff Keene
Mahtomedi, City of	Lost	82013400	Martha Popp
Mendota Heights, City of	LeMay	19008200	City of Mendota Heights
Mendota Heights, City of	Rogers	19008000	Doug Hennes
Minnehaha Creek WD	Tamarack	10001000	Mike Shouldice
Minnetonka, City of	Minnetoga	27008800	Maressia & John Twele
Minnetonka, City of	Rose	27009200	Mark Storck
Minnetonka, City of	Wing	27009100	John Burton

APPENDIX C
2008 CAMP Volunteers

<u>Enrolling Group</u>	<u>Lake</u>	<u>DNR ID</u>	<u>Volunteer</u>
Nine Mile Creek WD	Bush	27004700	Gregg Thompson
Nine Mile Creek WD	Cornelia	27002800	Jon Moon & Heidi Dorfmeister
Nine Mile Creek WD	Glen	27009300	Christine Peterson
Pioneer-Sarah WMC	Ardmore	27015300	Greg Durand
Prior Lake-Spring Lake WD	Cates	70001800	Tom & Peggy Sletta
Prior Lake-Spring Lake WD	Fish	70006900	Steve Pierson
Prior Lake-Spring Lake WD	Prior, lower	70002600	Walt Burris
Prior Lake-Spring Lake WD	Prior, upper	70007200	Frank Fourre
Prior Lake-Spring Lake WD	Spring	70005400	Lisa Kallberg
Rice Creek WD	George Watch	2000500	Wargo Nature Center
Rice Creek WD	Golden	2004500	Dave Phipps - City of Circle Pines
Rice Creek WD	Karth	62007200	Gary Gerding
Rice Creek WD	Lake Forest (New Brighton)	62018700	Bruce Adelsman
Rice Creek WD	Langton (site 1)	62004901	Tam & Dick McGehee, Yul Yost
Rice Creek WD	Langton (site 2)	62004902	Tam & Dick McGehee, Yul Yost
Rice Creek WD	Little Johanna	62005800	Fred Fox
Rice Creek WD	Lochness	2058500	Jim & Tricia Hafner
Rice Creek WD	Long	82013000	Kitty Francy-Payton
Rice Creek WD	Pike	62006900	Phil Goodrich
Rice Creek WD	Pine Tree	82012200	Gene Berwald
Rice Creek WD	Priebe	62003600	David Dixon
Rice Creek WD	Reshanau	2000900	Lori Fredlund
Rice Creek WD	Sunset	82015300	Diane Coderre
Rice Creek WD	Valentine	62007100	Bob Kistler
Rice Creek WD	White Rock	82007200	David Bluhm
Scott WMO	Cedar	70009100	Jerry Edberg
Scott WMO	McMahon	70005000	Joe Williamson
Shakopee, City of	Dean	70007400	Andy Voit
Shakopee, City of	O'Dowd	70009500	Sandy Boyce
Shingle Creek WMC	Crystal	27003400	Wayne, Luke, & Leif Sicora
Shingle Creek WMC	Meadow	27005700	Diane Stauner
Shingle Creek WMC	Ryan	27005800	Paul Brenna
Shingle Creek WMC	Success	27063400	John Roach & Stuart Ruud
Shingle Creek WMC	Twin, middle	27004202	Janet Moore
Shingle Creek WMC	Twin, upper	27004201	Kris Mann
South St. Paul (share with IGH)	Seidl's	19009500	Randy Bjorklund
St. Louis Park, City of	Cobblecrest	27005300	Jim Kellogg
St. Louis Park, City of	South Oak	27066100	Aaron Patterson

APPENDIX C
2008 CAMP Volunteers

<u>Enrolling Group</u>	<u>Lake</u>	<u>DNR ID</u>	<u>Volunteer</u>
St. Louis Park, City of	Twin	27065600	Bruce Cornwall
Sunfish Lake, City of	Hornbeam	19004700	Dave Johnson
Sunfish Lake, City of	Horseshoe	19005100	Jim Nayes
Sunfish Lake, City of	Sunfish	19005000	Dick Bancroft
Valley Branch WD	Bay Pond	82001100	Folz, Freeman, Erickson, Inc.
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	Dave Nimmer, Guy & Kim Reithmeyer.
Valley Branch WD	Elmo	82010600	Scott Knudson
Valley Branch WD	Friedrich's Pond	82010800	Folz, Freeman, Erickson, Inc.
Valley Branch WD	Goetschel Pond	82031300	Rolf Larson
Valley Branch WD	Jane	82010400	Chuck Taylor
Valley Branch WD	Klawitter Pond	82036800	Bonnie Juran
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	82051400	MnDOT
Valley Branch WD	Sunnybrook	82013300	Arnie Johnson
Washington SWCD	Acorn	82010200	Washington Conservation District
Washington SWCD	Armstrong	82011600	Todd Heruth
Washington SWCD	Barker	82007600	Washington Conservation District
Washington SWCD	Bass	82003500	Washington Conservation District
Washington SWCD	Bass East	82012400	Washington Conservation District
Washington SWCD	Bass West	82012300	Washington Conservation District
Washington SWCD	Benz	82012000	Washington Conservation District
Washington SWCD	Beutel Pond	82039900	Washington Conservation District
Washington SWCD	Big Carnelian	82004900	Washington Conservation District
Washington SWCD	Big Marine	82005200	Washington Conservation District
Washington SWCD	Brick Pond	82030800	Washington Conservation District
Washington SWCD	Capaul's Pond (east basin)	82036500	Washington Conservation District
Washington SWCD	Capaul's Pond (west basin)	82036500	Washington Conservation District
Washington SWCD	Carol	82001700	Washington Conservation District
Washington SWCD	Clear	82004500	Warner Nature Center
Washington SWCD	DeMontreville	82010100	Washington Conservation District
Washington SWCD	East Boot	82003400	Washington Conservation District
Washington SWCD	Edith	82000400	Washington Conservation District

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2008 CAMP Volunteers

<u>Enrolling Group</u>	<u>Lake</u>	<u>DNR ID</u>	<u>Volunteer</u>
Washington SWCD	Elmo	82010600	Washington Conservation District
Washington SWCD	Fahlstrom Pond (east basin)	82000500	Washington Conservation District
Washington SWCD	Fahlstrom Pond (west basin)	82000500	Washington Conservation District
Washington SWCD	Fish	82006400	Washington Conservation District
Washington SWCD	German	82005600	Washington Conservation District
Washington SWCD	Goggins	82007700	Washington Conservation District
Washington SWCD	Goose	82005900	Washington Conservation District
Washington SWCD	Goose (north basin)	82011301	Washington Conservation District
Washington SWCD	Goose (south basin)	82011302	Washington Conservation District
Washington SWCD	Hay	82006500	Washington Conservation District
Washington SWCD	Jane	82010400	Washington Conservation District
Washington SWCD	Jellums	82005202	Washington Conservation District
Washington SWCD	July Ave	82031800	Washington Conservation District
Washington SWCD	Kismet	82033300	Washington Conservation District
Washington SWCD	Kramer Pond	82011700	Washington Conservation District
Washington SWCD	Legion Pond	82046200	Washington Conservation District
Washington SWCD	Lily	82002300	Washington Conservation District
Washington SWCD	Little Carnelian	82001400	Washington Conservation District
Washington SWCD	Little Comfort	13005400	Steve Schrieber
Washington SWCD	Long	82003000	Washington Conservation District
Washington SWCD	Long	82002100	Washington Conservation District
Washington SWCD	Long	82006800	Washington Conservation District
Washington SWCD	Loon	82-001502	Washington Conservation District
Washington SWCD	Louise	82002500	Washington Conservation District
Washington SWCD	Lynch	82004200	Washington Conservation District
Washington SWCD	Masterman	82012600	Washington Conservation District
Washington SWCD	Mays	82003300	Warner Nature Center
Washington SWCD	McDonald	82001000	Washington Conservation District
Washington SWCD	McKusick	82002000	Washington Conservation District
Washington SWCD	Mergens Pond	82048200	Washington Conservation District
Washington SWCD	North Twin	82001800	Washington Conservation District
Washington SWCD	Olson	82010300	Washington Conservation District
Washington SWCD	Pat	82012500	Washington Conservation District
Washington SWCD	Plaisted	82014800	Washington Conservation District
Washington SWCD	Powers	82009200	Washington Conservation District
Washington SWCD	Regional Park Lake (Cottage Grove Park)	82008700	Washington Conservation District
Washington SWCD	Rose Lake (north basin)	82011200	Washington Conservation District
Washington SWCD	Rose Lake (south basin)	82011200	Washington Conservation District
Washington SWCD	Sand	82006700	Washington Conservation District
Washington SWCD	Sea Lake	82005300	Greg Duren
Washington SWCD	Silver	82001600	Washington Conservation District
Washington SWCD	South School Section	82015100	Washington Conservation District
Washington SWCD	South Twin	82001900	Washington Conservation District

APPENDIX C
2008 CAMP Volunteers

<u>Enrolling Group</u>	<u>Lake</u>	<u>DNR ID</u>	<u>Volunteer</u>
Washington SWCD	Square	82004600	Washington Conservation District
Washington SWCD	Staples	82002800	Washington Conservation District
Washington SWCD	Sunfish	82010700	Washington Conservation District
Washington SWCD	Terrapin	82003100	Washington Conservation District
Washington SWCD	Turtle	82003600	Washington Conservation District
Washington SWCD	Twin	82004800	Washington Conservation District
Washington SWCD	Weber Pond	82011900	Washington Conservation District
Washington SWCD	West Boot	82004400	Washington Conservation District
Washington SWCD	West Lakeland Storage Site (north basin)	82048800	Washington Conservation District
Washington SWCD	West Lakeland Storage Site (south basin)	NA	Washington Conservation District
Washington SWCD	Wood Pile	82013200	Washington Conservation District
Woodbury, City of	Colby	82009400	Annie Gustafson
Woodbury, City of	La	82009700	Simon Fung
Woodbury, City of	Markgrafs	82008900	Terry Riley
Woodbury, City of	Wilmes	82009000	Bill Aamodt

Appendix D
2008 CAMP Quality Control Data

Lake Name	DNR ID#	Date	CLA ug/L	TP mg/L	Secchi Depth m
Bavaria Lake	10001900	10/2/2008	19	0.024	1.9
Bone Lake	82005400	9/18/2008	33	0.038	1.3
Cedar Lake	70009100	9/19/2008	65	0.194	0.7
Crystal Lake	19002700	7/25/2008	30	0.041	1.5
Crystal Lake	19002700	9/30/2008	31	0.041	1.4
Demontreville Lake	82010100	7/8/2008	2.9	0.03	4.7
Demontreville Lake	82010100	9/29/2008	13	0.018	2.8
Elmo Lake	82010600	7/8/2008	2.9	0.013	2.7
Goose Lake	82005900	9/18/2008	90	0.082	1.1
Jane Lake	82010400	7/9/2008	2.7	0.056	5.6
Linwood Lake	2002600	9/16/2008	50	0.061	0.7
Lower Prior Lake	70002600	8/19/2008	20	0.027	1.9
Lower Prior Lake	70002600	10/3/2008	24	0.03	1.6
Marion Lake	19002601	7/25/2008	28	0.037	1.7
Marion Lake	19002601	9/30/2008	36	0.049	1.4
McMahon Lake	70005000	9/19/2008	78	0.12	0.5
O'dowd Lake	70009500	8/19/2008	70	0.051	0.6
Olson Lake	82010300	7/9/2008	3.6	0.022	3.8
Olson Lake	82010300	9/29/2008	11	0.018	3.0
Orchard Lake	19003100	7/25/2008	7.2	0.02	3.0
Orchard Lake	19003100	9/30/2008	28	0.039	2.0
Reitz Lake	10005200	10/2/2008	17	0.029	2.0
Riley Lake	10000200	8/8/2008	22	0.034	1.2
Riley Lake	10000200	10/3/2008	25	0.036	1.3
Susan Lake	10001300	8/8/2008	72	0.059	0.5
Susan Lake	10001300	10/3/2008	110	0.15	0.5
Swede Lake	10009500	10/2/2008	350	0.432	0.3
Upper Prior Lake	70007200	8/19/2008	92	0.076	0.5
Upper Prior Lake	70007200	10/3/2008	57	0.085	0.6