2011 STUDY OF THE WATER QUALITY OF 169 METROPOLITAN AREA LAKES

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2011 Study of the Water Quality Of 169 Metropolitan Area Lakes

By

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December 2012

EXECUTIVE SUMMARY

This 2011 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 183 lake sites on 169 lakes monitored in 2011. This year's monitoring program included 2 lakes never before monitored by the Council.

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

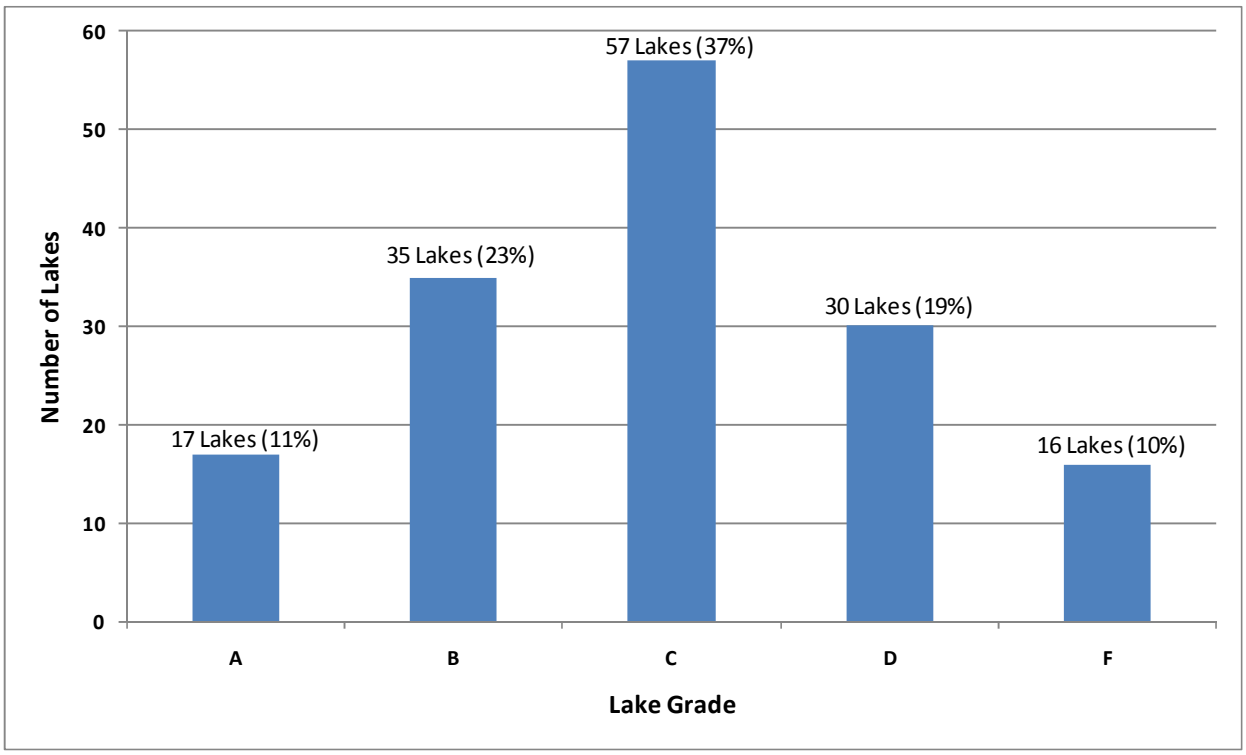
The objectives of this program are:

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

The year 2011 marked the nineteenth year that the Citizen-Assisted Monitoring Program (CAMP) was used to increase our knowledge of the water quality of TCMA lakes. CAMP volunteers visited their assigned lake on a biweekly basis from mid April to mid October. The volunteers measured surface water temperature and water transparency, documented lake and weather conditions, and collected surface water samples. The samples were analyzed for total phosphorus, total Kjeldahl nitrogen, and chlorophyll-a by the METC's analytical laboratory located at the Metropolitan Wastewater Treatment Plant in St. Paul, MN. CAMP volunteers are sponsored by a local partner. In 2011, there were 27 sponsors who consisted of a mix of municipalities, watershed management organizations (WMOs), watershed districts (WDs), counties, and a basin water resources planning team.

Most lakes were given a lake grade which was calculated on the basis of three parameters: total phosphorus, chlorophyll-a, and Secchi depth (water clarity). Not all lake sites received a lake grade because of an insufficient quantity of data during the summer-time period of May through September. The distribution of lake grades for all the lake sites monitored in 2011 is shown in the following figure.

The greatest percentage of the lakes (37%) received a lake grade of C. The water quality of these sites is considered average as compared to other lakes in the TCMA. More lakes (34%) were above average (A and B lakes) than lakes below average (D and F lakes, 29%).



Lake Grades for the 2011 Monitoring Season

Since 1980, 369 TCMA lakes have been monitored through the METC's lake monitoring program. Since some of these lakes have multiple monitoring sites, a total of 402 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) and the Minnesota Pollution Control Agencies EQuIS environmental database. 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.

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:

19 years of service
Diane and Bob Coderre – Sunset Lake

18 years of service
Washington CD – multiple lakes

17 years of service
Bill Aamodt – Wilmes Lake
Carver Co. Env. Services – multiple lakes

16 years of service
John Ritter – Lake Alimagnet
Wargo Nature Center – George Watch

15 years of service
Anoka Co. Parks – multiple lakes

14 years of service
Glen Gramse – Keller Lake
Wally Shaver – Lac Lavon Lake

13 years of service
Lakeville – Valley and Lee lakes
John Ryski – Bavaria Lake
Westwood Nature Center – Westwood Lake

12 years of service
Dave Hanson – Sweeney Lake

11 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
Terry Riley – Markgrafs Lake

10 years of service
Bonnie Juran – Klawitter Lake
Al Kettlekamp – Long Lake
Tom & Peggy Sletta – Cates Lake

9 years of service
Walt Burris – Lower Prior Lake
Kellogg Family – Cobblecrest Lake
Kitty Francy-Payton – Long Lake

8 years service
Bill Feely – Long Lake
David Florenzano – Riley Lake
Wayne Hubin – Swede Lake
Sue Morgan & Linda Scott – St. Joe Lake
Chuck Taylor – Jane Lake
Gordan & Fran Warner – Mitchell Lake

7 years service
Carpenter Nature Center – St. Croix Lake (site 7)
Roberta & Jim Harper – St. Croix Lake (sites 1, 2, & 4)
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

6 years service
David Bluhm – White Rock Lake
Robert Bruce Cornwall – Twin Lake
Minnesota DOT – Rest Area Pond
Diane Stauner – Meadow Lake
Dan Wallace – Sunset Pond
Joe Williamson – McMahon Lake

5 years service
Sandy & Mike Boyce – Lake O'Dowd
John Burton – Wing Lake
Dan Freeman – Twin Lake south
Gary Gerding – Karth Lake
Marvin Groth – Bass Lake
Jon and Teresa Hafner – Bone Lake
Jim & Tricia Hafner – Loch Ness
Doug Hennes – Rogers Lake
Tam & Dick McGehee – Langton Lake
Lynne McMullen – Reitz Lake
Bob Meier – Olson Lake
Mendota Heights – Lemay Lake
Jim Nayes – Horseshoe Lake
John Roach – Success Lake
George Schneider – Rice Lake
Steve Schreiber – Little Comfort Lake
Curt Sparks – Sylvan Lake
Dan Stanek – Scout Lake
Robert White – Northwood Lake
Marty Ziermann – Rutz Lake

4 years service
Andrew Carlson – Clear, Mays, Terrapin Lakes
Dan Carlson – Clear, Mays, Terrapin Lakes
David Dixen – Priebe Lake
Fred Fox – Little Johanna Lake
Lori Fredlund – Reshanau Lake
Todd Heruth – Armstrong Lake
Steve Iverson – DeMontreville Lake
Christy McGlocklin – Long Lake
Don Smith – Benton Lake
Jeff Sluiter – Cobblestone Lake
John & Maressia Twele – Minnetoga Lake
Warner Nature Center – Clear, Mays, Terrapin Lakes

3 years service
Jeff Christianson – Farquar Lake
Tim and Sharron McCotter – Lucy Lake
Wally Ostlie – Comfort Lake
Kurt Paulsen – Pike Lake
Joe Reithmeyer – Lake Edith
Steve Schmaltz – Forest Lake, west basin
John Steinbauer – Benton Lake
Jeff Thayer – Earley Lake
Tim Weber – La Lake
Jim Weninger – Spring Lake

Metropolitan Council Staff

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- Craig Skone for support with data presentation and for developing all the graphics for this report.

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INTRODUCTION

This 2011 report continues a series of annual lake reports from 1980 to present. Since 1980, 369 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 402 lake sites have been monitored. This report contains data from 183 lake sites on 169 lakes that were monitored in 2011, including 2 lakes that have not been previously monitored by the METC lake monitoring program. The list of lakes in the METC's monitoring database is shown in Appendix A. Refer to Appendix B for morphometry and other lake characteristic data.

METC lake monitoring data are available via:

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

The objectives of the METC lake monitoring program are:

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

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

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

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

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

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

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

The METC lake monitoring program began a volunteer annual ice-monitoring program in the winter of 2009 -2010. The purpose of this program is to monitor the duration of ice cover on the TCMA lakes over a long time period.

METC STAFF MONITORING PROGRAM

METHODS

Metropolitan Council staff monitored 10 lake sites on 9 lakes during 2011 (Figure 1). The staff monitoring program consisted of two projects in 2011. One project consisted of monitoring 4 lakes for trophic and chloride conditions. The monitoring occurred during the open water season of May through October. The four lakes were:

- Big Marine Lake, sites 1 and 2 (Washington County)
- Chub Lake (Dakota County)
- Pickerel Lake (Anoka County)
- Thole Lake (Scott County)

The other project involved monitoring 5 specific lakes in cooperation with the Minnesota Pollution Control Agency as part of their Metro Area Chloride Monitoring Project. The monitoring for this project started in November 2010. The lakes were monitored in late fall just before freeze up, in the winter during freeze up, early spring just after ice-out, and in mid-summer. The 5 lakes for this project were:

- Christmas Lake (Hennepin County)
- Crystal Lake (Dakota County)
- Holland Lake (Dakota County)
- Riley Lake (Carver County)
- Sunfish Lake (Dakota County)

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

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

Water was collected from the lake surface (0-2 m) using a two-meter PVC pipe with a two-liter capacity. Two such samples were mixed in a 4-liter plastic jug. Subsurface samples were collected using a 2-liter Van Dorn sampler. All water samples were transported on ice in a dark cooler and processed and preserved within 12 hours of collection.

The surface and subsurface samples were analyzed for the parameters according to the project for which the samples were collected (Table 1). Chlorophyll was not analyzed in the subsurface samples. Samples that were analyzed for total dissolved phosphorus (TDP) were filtered through a 0.45 µm membrane filter and then analyzed for TP. All chemical analyses were performed at the Metropolitan Council Environmental Services - Environmental Quality Assurance Department (MCES-EQA) laboratory.

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

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

The monochromatic equation gives the following parameters:

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

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

Figure 1.

2011 Monitored Lakes

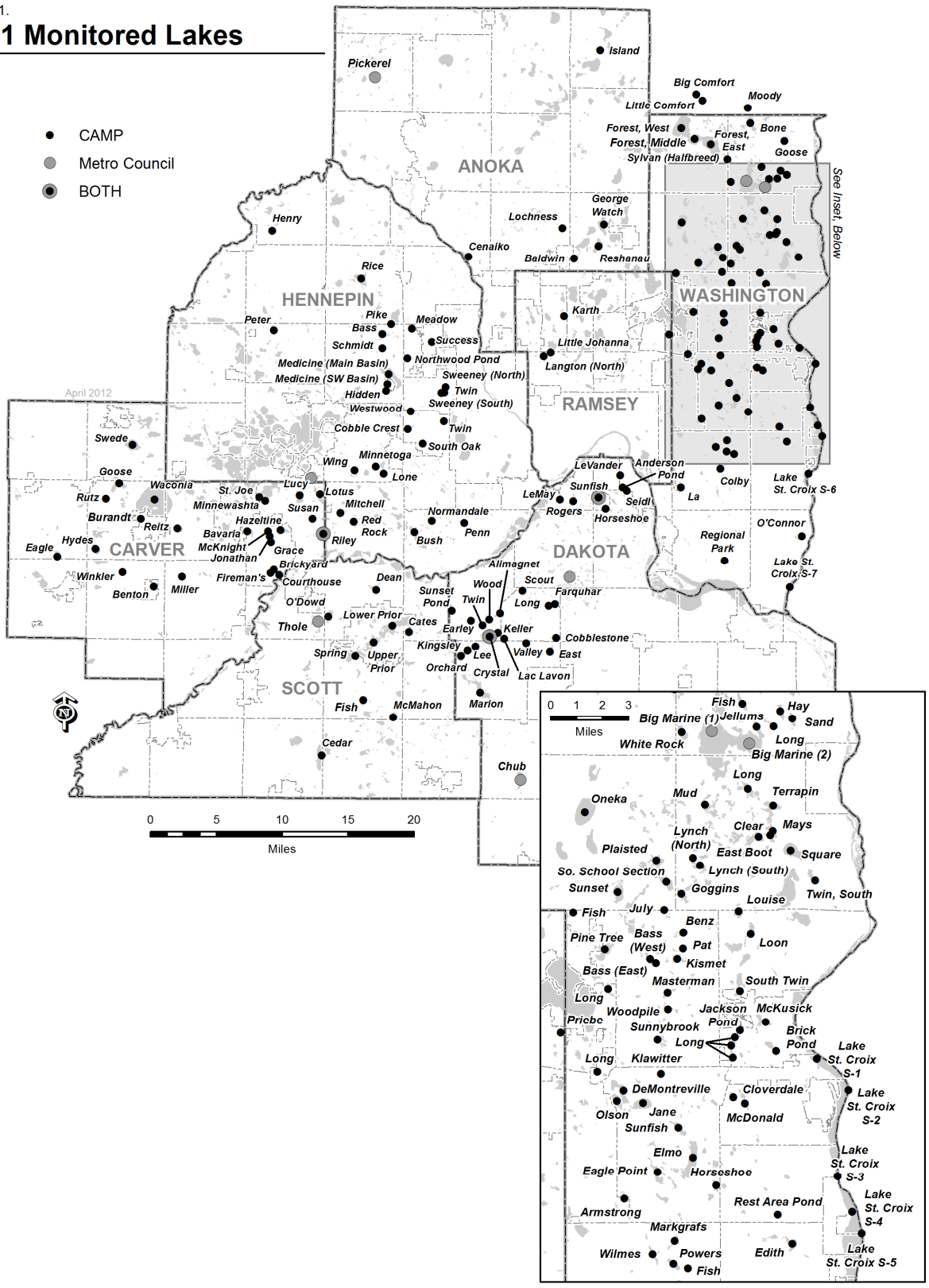


Figure 1. 2011 Monitored Lakes

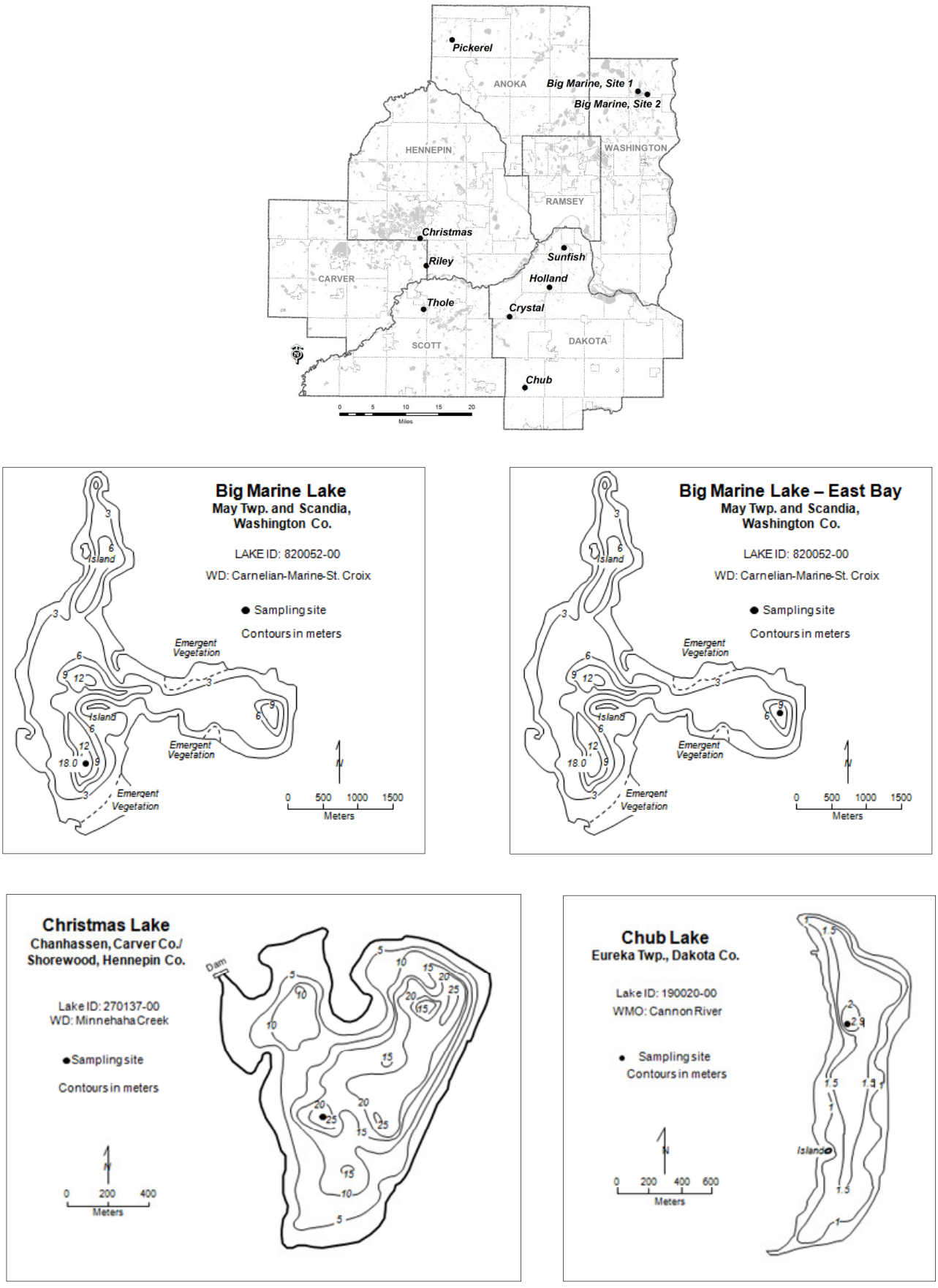
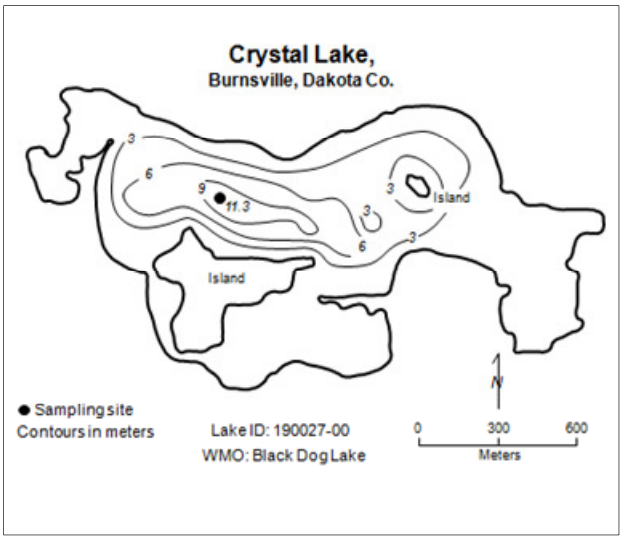
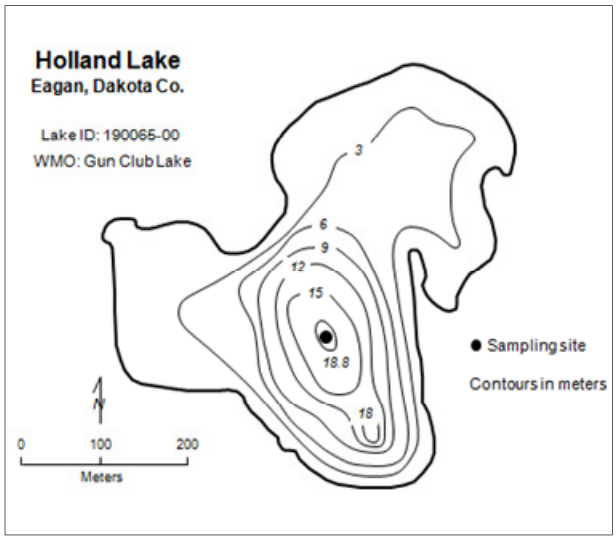
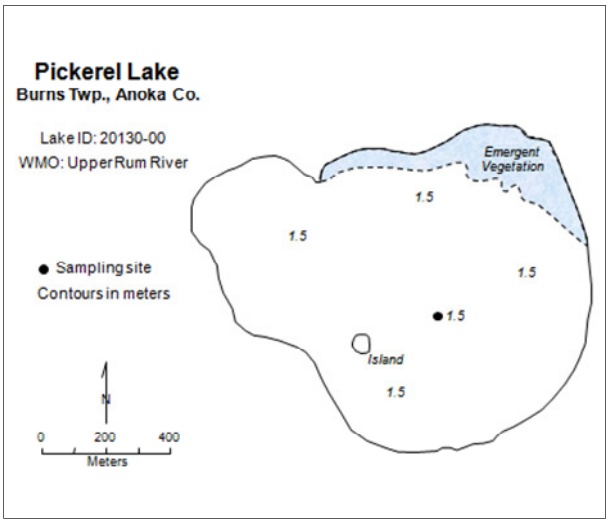
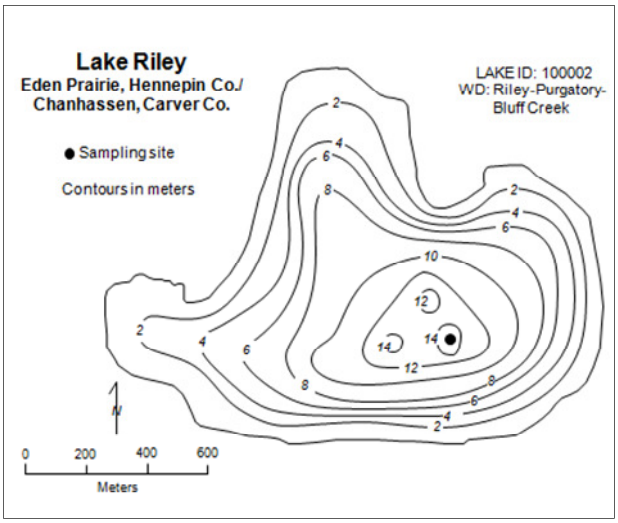


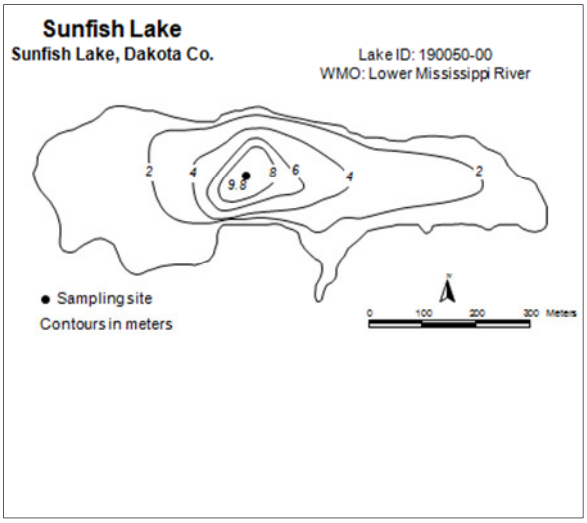
Figure 2. METC Staff Monitored Lakes











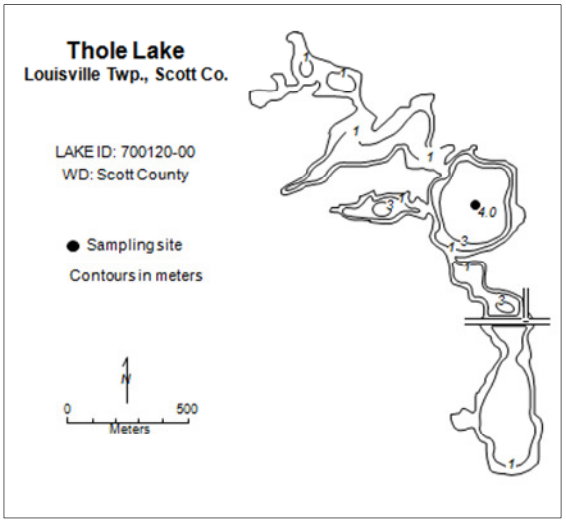


Figure 3. METC Staff Monitored Lakes

Table 1
Summary of Analytical Methods

Parameters	Analytical Method
Alkalinity [1,2]	U.S. EPA, Method 310.2 Rev. 1974
Calcium, Iron, Magnesium; total [1,2]	U.S. EPA, Method 200.8, Revision 5.4, 1994 as modified
Chloride [1,2]	Method 4500-Cl- E , (APHA 1998)
Chlorophyll [1]	ASTM Method D3731-87
Hardness [1,2]	Standard Methods for the Examination of Water and Wastewater, Method 2340 C, Online Edition
Kjeldahl Nitrogen, total (TKN) [1]	U.S. EPA Method 351.2, Rev. 2.0
Phosphorus, total (TP) [1]	U.S. EPA Method 365.4
Phosphorus, dissolved (TDP) [1]	U.S. EPA Method 365.4
Sulfate [1,2]	U.S. EPA Method 300.0

1. Trophic and Chloride Conditions Project
2. Metro Area Chloride Monitoring Project

RESULTS

Figures 4 through 8 show the 2011 surface water data for TP, TKN, chlorophyll-a (trichromatic), Secchi depth, dissolved oxygen, and temperature for the Trophic and Choride Conditions project. For data from at depth samples and depth profile data, please refer to the METC's Environmental Information Management System (EIMS) at http://es.metc.state.mn.us/eims/ to access this additional data.

Table 2 shows the 2010 and 2011 data for the Metro Area Chloride Monitoring Project. For depth profile data please refer to the METC's Environmental Information Management System (EIMS) at http://es.metc.state.mn.us/eims/ to access this data.

All of the monitoring data for both projects were sent to the MPCA for inclusion in their EQuIS database, which can be accessed via their Environmental Data Access System.

Any questions about the 2011 METC lake monitoring data should be directed to Brian Johnson at (651) 602-8743 or brian.johnson@metc.state.mn.us.

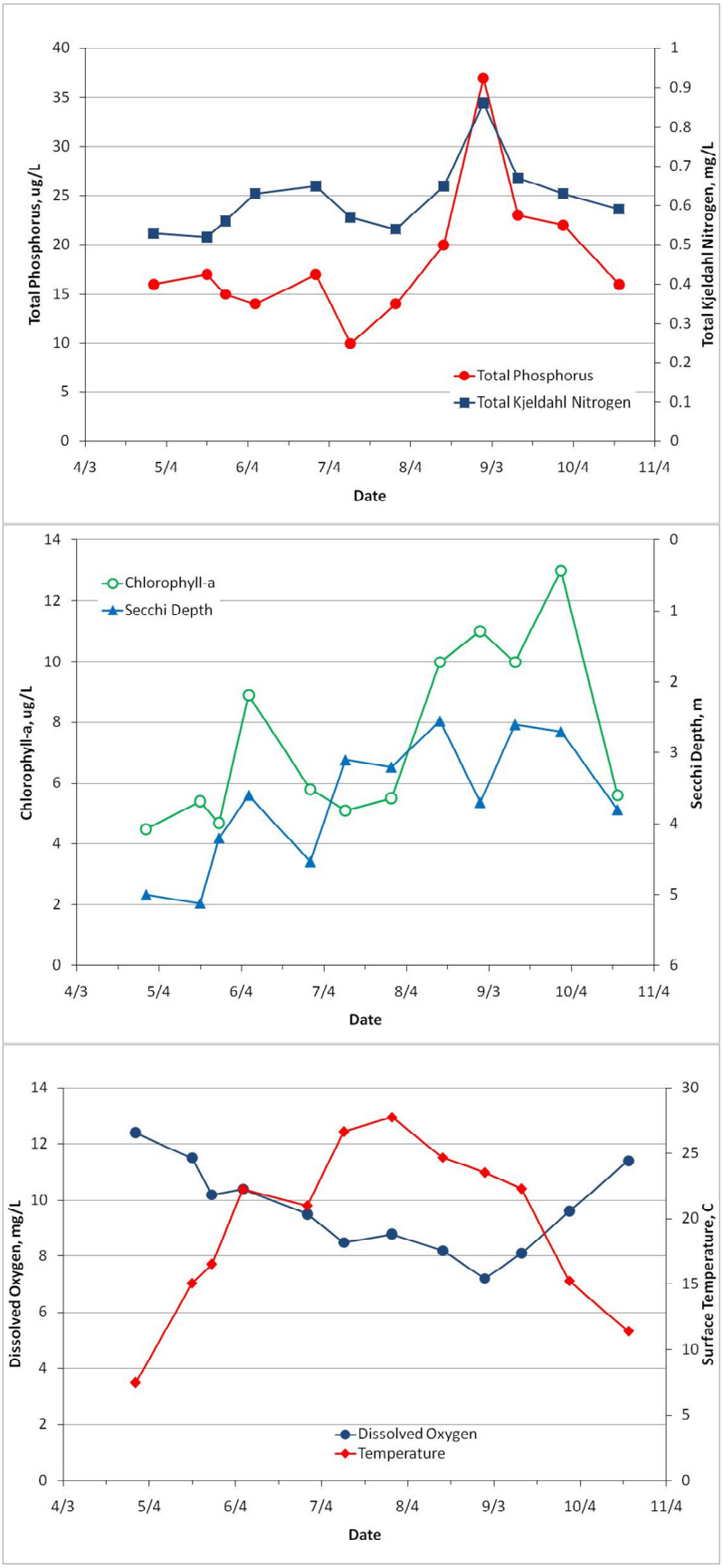


Figure 4. Big Marine Lake, site 1
2011 Surface Water Data

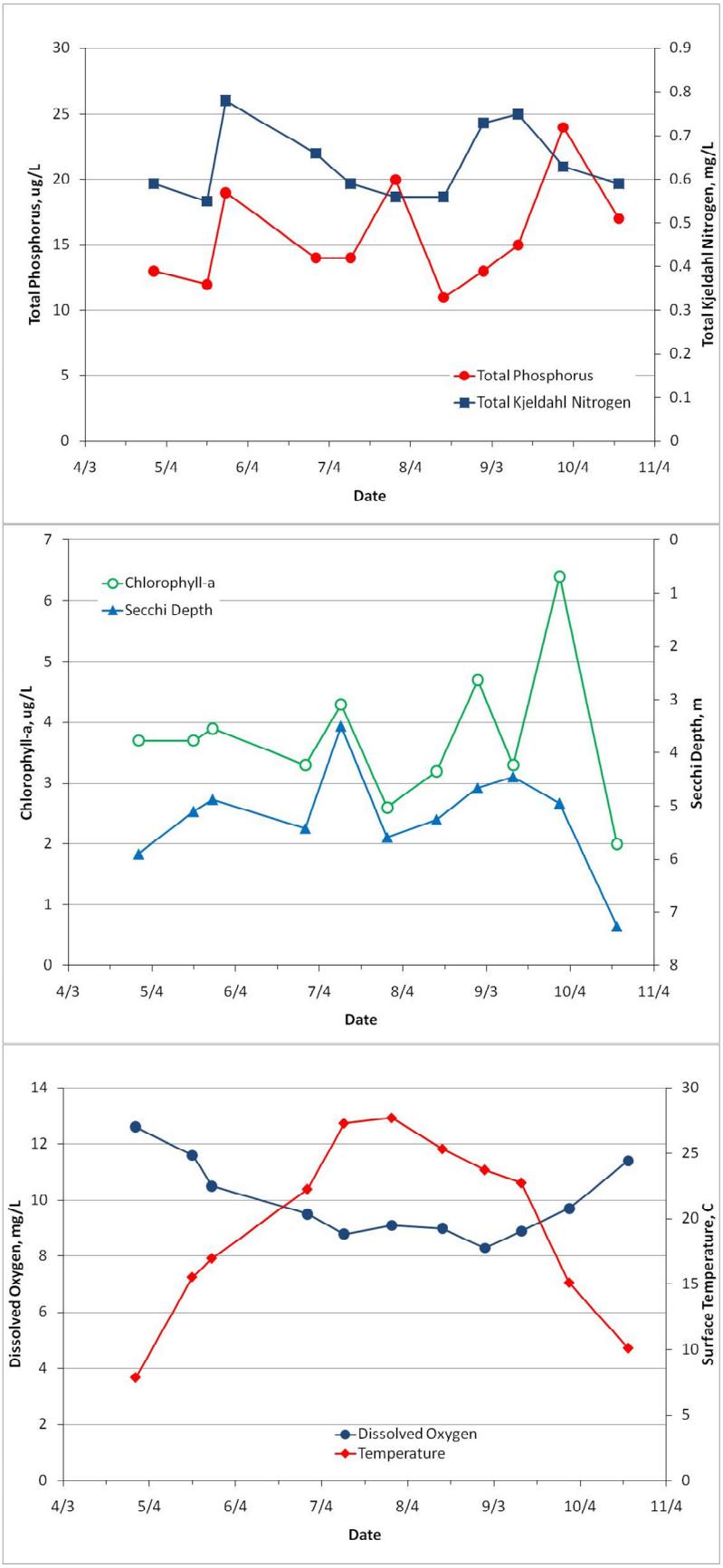


Figure 5. Big Marine Lake, site 2
2011 Surface Water Data

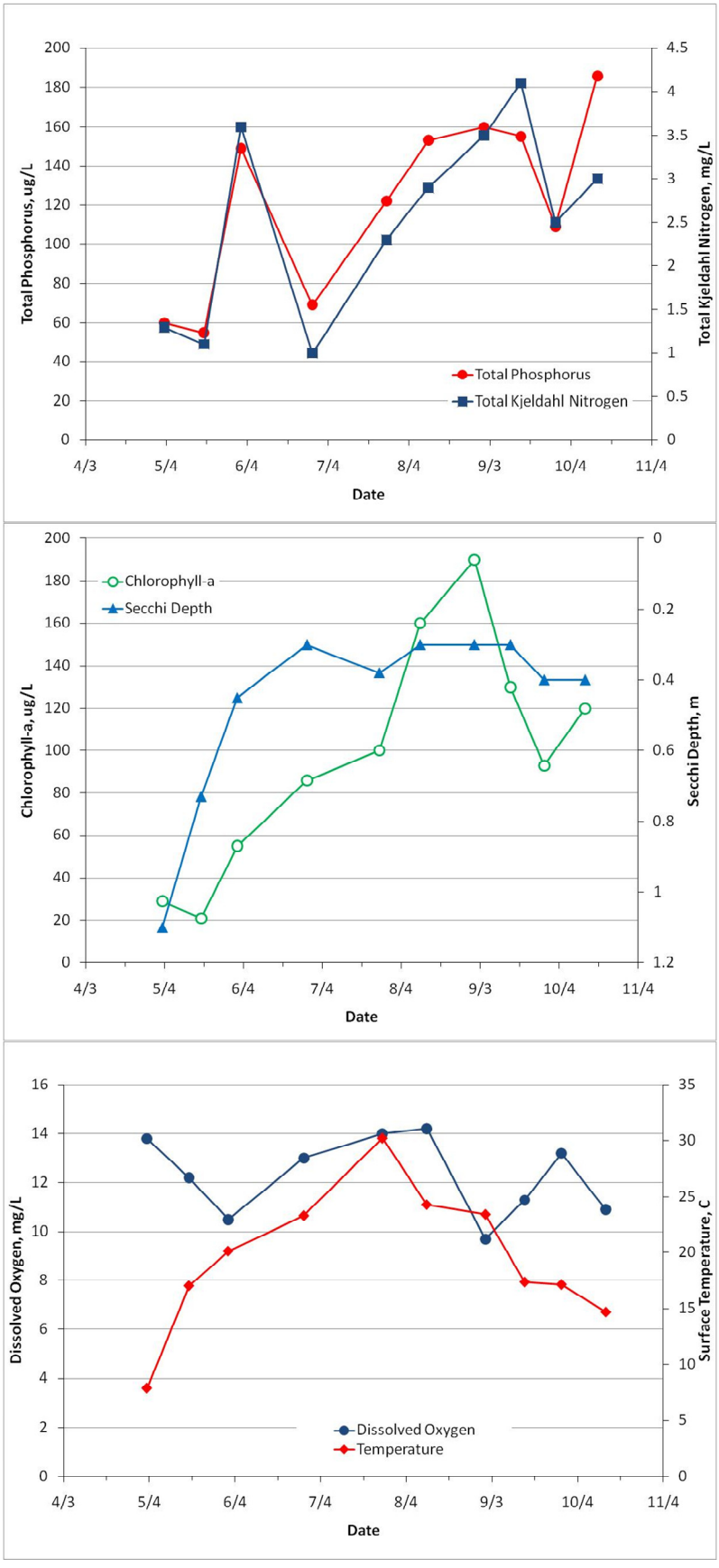


Figure 6. Chub Lake
2011 Surface Water Data

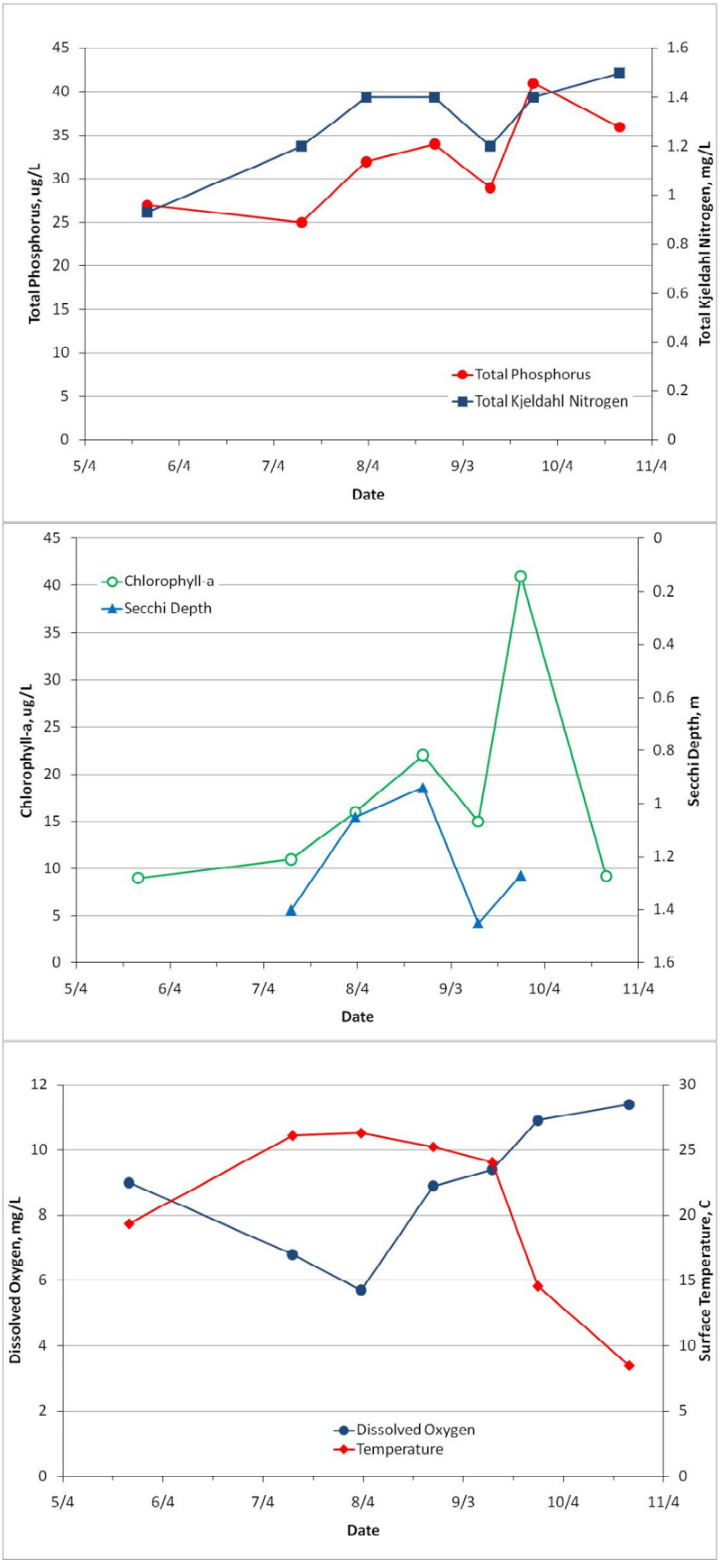


Figure 7. Pickerel Lake
2011 Surface Water Data

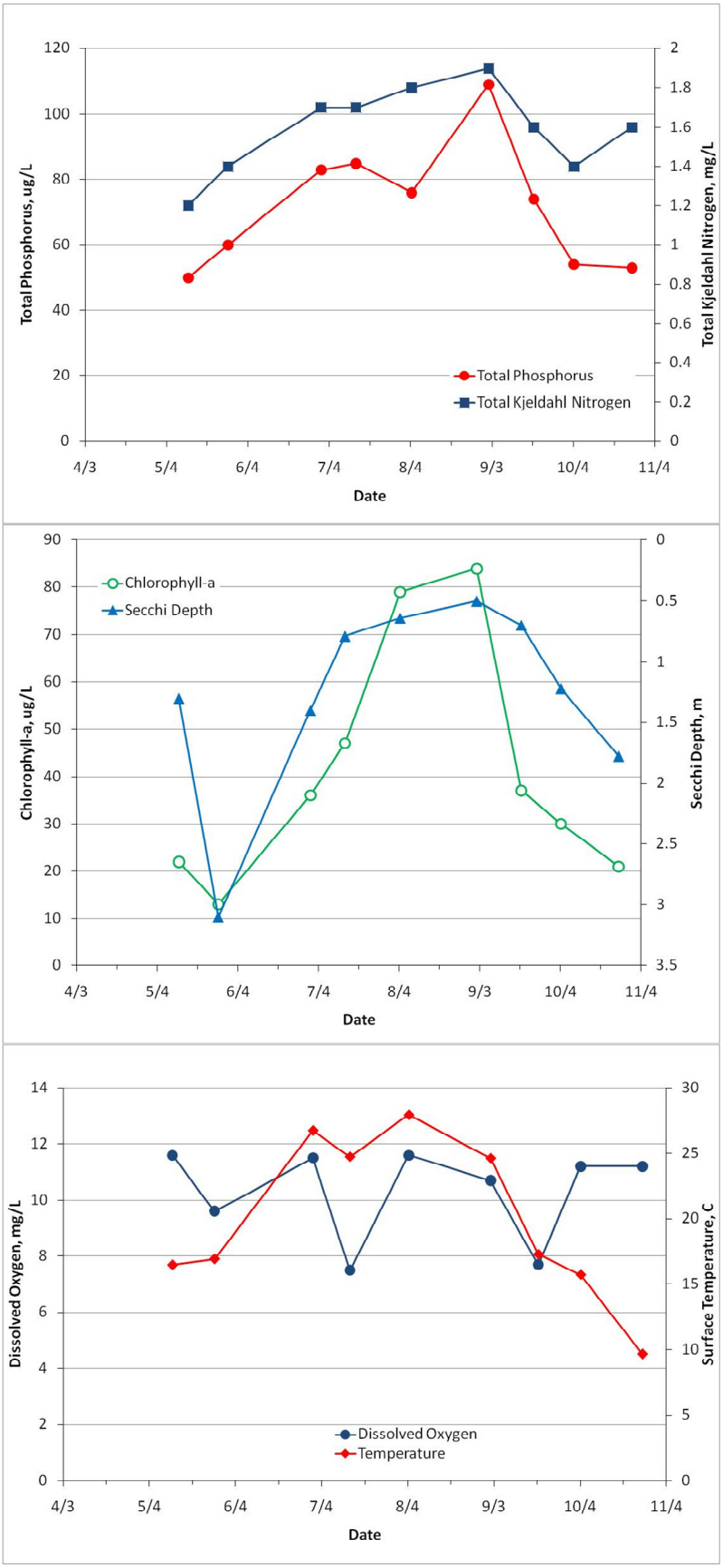


Figure 8. Thole Lake
2011 Surface Water Data

Table 2
Metro Area Chloride Monitoring Project Data 2010 & 2011

Lake	Date	Depth m	Secchi Depth m	Ca mg/L	Mg mg/L	Fe mg/L	Alkalinity mg/L as $CaCO_3$	Hardness mg/L as $CaCO_3$	Cl mg/L	SO^4 mg/L	Temp °C	SpCond uS/cm	DO mg/L
Christmas	11/23/10	surface	4.25	27.9	13.5		127	154	31		5.64	364	10.34
Christmas	11/23/10	0.4									5.64	364	10.34
Christmas	11/23/10	23.5		33.2	17.2		119	158	32				
Christmas	11/23/10	24.0									5.57	363	10.24
Christmas	2/18/11	surface	NM	33.1	16.5		114	144	35	2.67			
Christmas	2/18/11	0.4									0.89	347	10.95
Christmas	2/18/11	23.5		39.0	17.5		65	190	31	3.15			
Christmas	2/18/11	24.0									3.46	434	2.08
Christmas	4/18/11	surface	3.40	29.9	15.4		126	150	33	2.86			
Christmas	4/18/11	0.4									5.27	368	11.28
Christmas	4/18/11	22.0		36.8	18.3		143	160	36	3.09			
Christmas	4/18/11	22.1									3.76	406	2.68
Christmas	8/30/11	surface	4.00	31.5	17.9	< 0.2	121	140	36	3.38			
Christmas	8/30/11	0.5									24.18	356	8.85
Christmas	8/30/11	22.0		40.9	20.4	< 0.2	145	154	36	2.86	6.25	387	0.14
Christmas	11/21/11	surface	4.60	30.0	15.6	< 0.2	115	160	36	3.10			
Christmas	11/21/11	0.3									5.98	374	10.02
Christmas	11/21/11	23.0		30.8	16.3	< 0.2	95	152	37	3.03	5.72	375	10.02
Crystal	11/16/10	surface	2.10	34.3	11.1		114	152	76				
Crystal	11/16/10	0.3									6.03	511	9.86
Crystal	11/16/10	8.0		35.8	11.7		120	160	78		5.72	514	9.46
Crystal	2/11/11	surface	NM	47.6	16.0		155	194	96	8.08			
Crystal	2/11/11	0.3									0.34	612	5.56
Crystal	2/11/11	7.5		51.4	16.7		150	204	77	8.25	4.08	701	0.08
Crystal	4/20/11	surface	1.75	40.0	13.0		139	178	67	5.79			

Table 2
Metro Area Chloride Monitoring Project Data 2010 & 2011

Lake	Date	Depth m	Secchi Depth m	Ca mg/L	Mg mg/L	Fe mg/L	Alkalinity mg/L as $CaCO_3$	Hardness mg/L as $CaCO_3$	Cl mg/L	SO^4 mg/L	Temp °C	SpCond uS/cm	DO mg/L
Crystal	4/20/11	0.3									7.31	601	12.31
Crystal	4/20/11	7.5		40.9	13.3		142	178	68	5.97	7.01	608	11.54
Crystal	7/21/11	surface	2.15	40.2	16.1	< 0.2	22	150	91	5.92			
Crystal	7/21/11	0.5									28.58	559	8.65
Crystal	7/21/11	6.0		63.9	21.6	~ 0.81	20	178	87	5.07	19.64	604	0.13
Crystal	11/14/11	surface	3.85	45.4	17.5	< 0.2	135	180	98	5.52			
Crystal	11/14/11	0.5									6.31	613	11.58
Crystal	11/14/11	7.0		42.0	16.3	< 0.2	131	184	104	5.30	6.09	618	11.63
Holland	11/18/10	surface	4.15	17.1	6.6		66	98	33				
Holland	11/18/10	0.4									5.56	256	10.43
Holland	11/18/10	14.5		28.0	8.3		138	160	35				
Holland	11/18/10	15.0									5.13	498	0.13
Holland	2/15/11	surface	NM	25.6	8.5		75	114	39	11.90			
Holland	2/15/11	0.3									0.60	294	4.67
Holland	2/15/11	15.5		33.4	9.6		123	138	38	< 0.40			
Holland	2/15/11	16.0									5.16	509	0.06
Holland	4/25/11	surface	4.35	22.4	8.2		75	108	32	0.85			
Holland	4/25/11	0.3									10.00	263	12.26
Holland	4/25/11	17.5		30.8	9.9		72	156	37	< 0.40			
Holland	4/25/11	18.0									5.14	529	0.05
Holland	8/24/11	surface	4.28	20.0	10.1	< 0.2	51	80	33	0.59			
Holland	8/24/11	0.7									26.02	230	7.82
Holland	8/24/11	15.0		32.9	11.0	27.7	120	44	40	< 0.40	5.05	515	0.10
Holland	11/14/11	surface	2.70	25.8	10.7	< 0.2	73	112	38	0.58			
Holland	11/14/11	0.5									6.54	272	11.19
Holland	11/14/11	15.0		33.3	10.6	47.3	133	164	41	< 0.4	5.15	544	0.11

Table 2
Metro Area Chloride Monitoring Project Data 2010 & 2011

Lake	Date	Depth m	Secchi Depth m	Ca mg/L	Mg mg/L	Fe mg/L	Alkalinity mg/L as $CaCO_3$	Hardness mg/L as $CaCO_3$	Cl mg/L	SO^4 mg/L	Temp °C	SpCond uS/cm	DO mg/L
Riley	2/4/11	surface	NM	38.7	15.3		132	184	96	4.77			
Riley	2/4/11	0.5									0.38	675	10.43
Riley	2/4/11	13.0		45.9	16.7		162	204	91	6.58	3.19	733	0.54
Riley	4/18/11	surface	2.00	39.2	14.5		125	200	83	4.64			
Riley	4/18/11	0.4									6.18	643	12.48
Riley	4/18/11	13.1									5.08	653	11.56
Riley	4/18/11	13.5		46.9	17.4		122	196	86	4.74			
Riley	8/30/11	surface	0.89	30.6	16.5	< 0.2	91	152	118	4.88			
Riley	8/30/11	0.5									24.12	583	8.72
Riley	8/30/11	12.5		49.7	16.7	~ 0.41	162	196	114	1.85			
Riley	8/30/11	13.0									8.72	713	0.10
Riley	11/16/11	surface	2.45	37.8	15.4	< 0.2	117	200	124	5.70			
Riley	11/16/11	0.5									6.76	648	11.65
Riley	11/16/11	12.0		38.4	15.6	< 0.2	128	184	117	4.16	6.66	654	11.28
Sunfish	11/18/10	surface	3.85	20.1	6.5		71	98	21				
Sunfish	11/18/10	0.4									4.82	241	10.10
Sunfish	11/18/10	9.0		19.1	6.3		80	94	20		4.76	243	9.96
Sunfish	2/15/11	surface	NM	23.0	7.1		67	98	22	6.97			
Sunfish	2/15/11	0.6									0.55	162	12.37
Sunfish	2/15/11	9.0		26.8	8.0		89	110	24	6.83	4.38	275	0.44
Sunfish	4/27/11	surface	1.90	21.1	7.5		73	96	19	6.06			
Sunfish	4/27/11	0.4									8.69	230	12.98
Sunfish	4/27/11	9.0		20.6	7.3		66	94	19	6.48	6.79	235	10.18
Sunfish	8/22/11	surface	1.90	15.6	~ 7.9	< 0.2	46	78	19	4.41			
Sunfish	8/22/11	0.5									25.81	199	11.41
Sunfish	8/22/11	9.0		23.9	~ 8.0	< 0.2	95	102	20	4.75	8.54	266	0.14

Table 2
Metro Area Chloride Monitoring Project Data 2010 & 2011

Lake	Date	Depth m	Secchi Depth m	Ca mg/L	Mg mg/L	Fe mg/L	Alkalinity mg/L as $CaCO_3$	Hardness mg/L as $CaCO_3$	Cl mg/L	SO^4 mg/L	Temp °C	SpCond uS/cm	DO mg/L
Sunfish	11/7/11	surface	3.80	20.4	~ 8.0	< 0.2	74	110	22	4.33			
Sunfish	11/7/11	0.5									7.51	234	10.60
Sunfish	11/7/11	8.0		20.9	~ 8.1	< 0.2	74	102	23	4.40	7.38	234	10.47

CITIZEN-ASSISTED MONITORING PROGRAM (CAMP)

CAMP OVERVIEW

The year 2011 marked the nineteenth year of the CAMP since the program began in 1993. The CAMP monitored 176 lake-sites on 163 lakes in 2011, including 2 lakes that have not been previously monitored by the METC (Figure 1). The CAMP is jointly funded by the METC and local sponsors such as WDs, WMOs, counties, and cities.

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

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

CAMP volunteers collect surface water samples that are analyzed for total phosphorus (TP), total Kjeldahl nitrogen (TKN), and chlorophyll-a (CLA). In addition, they measure surface water temperature and water transparency, and record user perceptions. Some lakes are monitored for dissolved oxygen. Most lakes are visited biweekly from April through October (fourteen sampling dates) and are sampled at the lake's deepest open-water location. In 2011, quite a few of the lakes were not monitored on each of the desired 14 sampling weeks. The reasons for the missed sampling dates varied. However, the majority of the lakes, even with the missed sampling dates, were sampled adequately and often enough to provide an annual overview of the water quality of each lake. Water samples were submitted to METC staff and then analyzed at the MCES-EQA laboratory in St. Paul, MN.

ACKNOWLEDGMENTS

The successful performance of the 2011 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 12 cities, 10 watershed management organizations and watershed districts, 3 counties, 1 conservation district, and 1 basin planning team, were involved in volunteer recruitment, training, and occasional follow up on the progress of their volunteer lake monitors. Without this help, the program would not have been as successful.

Those deserving the greatest appreciation are the volunteers themselves. Their efforts have made this program successful. A list of the 2011 CAMP volunteers is shown in Appendix C. The METC and the local sponsors thank them for their sustained efforts, including their quality work.

CAMP METHODS

Recruiting Volunteers

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

Training Volunteers

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

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

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

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

Monitoring Methods

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

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

lake and meteorological conditions were recorded on a field data sheet (Figure 9). The form also provides space to record natural and cultural observations which may have influenced what was happening in the lake (e.g. heavy rains prior to monitoring, application of herbicide), and includes an area to document general perceptions of the lake's physical condition and suitability for recreation.

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

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

- **Temperature**. Surface water temperature was measured in the volunteer's sampling jug using a digital thermometer that is readable to 0.1°C. The temperature was measured immediately following sample collection. Special care was taken to keep the sample out of direct sunlight in order to minimize temperature change.

- **Total Phosphorus (TP) and Total Kjeldahl Nitrogen (TKN)**. Duplicate samples were decanted from the volunteer's jug in the field into their respective triple pre-rinsed, pre-labeled 50 milliliter (ml) vials. These samples were then placed in the cooler, taken home, and stored in the freezer until they were picked up and delivered to the laboratory for analysis.

- **Chlorophyll**. Chlorophyll samples from the volunteer's jug were filtered in the field *(out of direct sunlight)* using a field filtration apparatus (called a filter holder) and a hand pump. Water from the sampling jug was measured using a graduated cylinder, and then poured into the reservoir of the filter holder. The reservoir holds approximately 250 ml. By squeezing the handle of the pump, the sample water was forced through a 1 micrometer (µm) glass-fiber filter, and the suspended planktonic algae were trapped on the filter. The filtered water was then returned to the lake. If possible, this process was repeated until a total of 1,000 ml of sample water was allowed to pass through the filter. However, if the water sample contained much suspended material, and the filter became clogged without allowing more water to pass through, the amount of water that did pass through the filter was recorded on the field data sheet and sample label. The filter was then removed from the filter holder with a tweezers, and placed in a Petri dish. The Petri dish was then labeled, wrapped in aluminum foil to keep the sample in the dark, and frozen until pick-up and delivery to the laboratory for analysis.

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

CITIZEN-ASSISTED MONITORING PROGRAM

Lake Name: _____ Site #: _____

DNR ID#: _____

Sampling Date: _____ Time: _____ (military time)
(Use this same time on the sample labels.)

Name(s) of Volunteer(s):

_____ Quantity of samples collected: Nutrient: _____ CLA: _____

_____

SECCHI DISK DEPTH: _____meters

SURFACE TEMPERATURE: _____°C

VOLUME OF FILTERED LAKE WATER (CLA): _____ml

GENERAL OBSERVATIONS
(Circle the one best choice)

*** Water Color**

Clear Yellow
Green Gray
Brown Blue-Green
Comment:

*** Odor of Water**

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

*** Wind Conditions**

Calm Breezy Strong

Wind is coming from the:

North South East West

*** 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 Swimming / Boating OK (4)
No Aesthetics Possible (5)

Figure 9. CAMP Field Data Sheet

Laboratory Analytical Methods

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

Data Management

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

1. Check-in of forms and tracking of volunteer participation.
2. Entry of nutrient, Secchi, and user perception data into a database for statistical, graphical, and tabular outputs.
3. Storage of the CAMP data in the Metropolitan Council's EIMS.

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

Quality Assurance

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

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

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

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

A METC staff member performs QC monitoring throughout the monitoring season by visiting a volunteer's lake site during a scheduled monitoring week, but not necessarily on the same day as the volunteer's visit. The METC staff member monitors the lake site using the same methods and identical type of equipment as the volunteer. After the QC samples are collected, they are handled, stored, and

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

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

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

The 2011 CAMP QC data are provided in Appendix D. Figures 10, 11, and 12 show the QC data for TP, CLA, and Secchi depth. The linear regression for TP shows close agreement to a 1:1 slope between data collected by METC staff versus data collected by the volunteers. The R^2 value for TP is 0.69. The linear regression line for CLA has an R^2 of 0.66. The CLA trend line deviates from a 1:1 slope; the deviation is driven mainly by a single data point (79 vs. 61 ug/l from McMahon Lake). The trend line for the Secchi depth QC data has an R^2 value of 0.79.

The R^2 values for the QC data trend lines are lower this year as compared to the QC trend lines received in previous years. Fewer QC data points were collected in 2011 than were collected in previous years, and this was the likely cause of the lower than usual R^2 values. There were 8 to 10 QC data points in 2011 compared to 11 to 30 data points collected per year in previous years. Also, METC staff typically collect QC samples on a different day and time than the volunteer (but within no more than a 5 days difference), therefore it should be expected that there will be some variation between the METC staff- and volunteer-collected data.

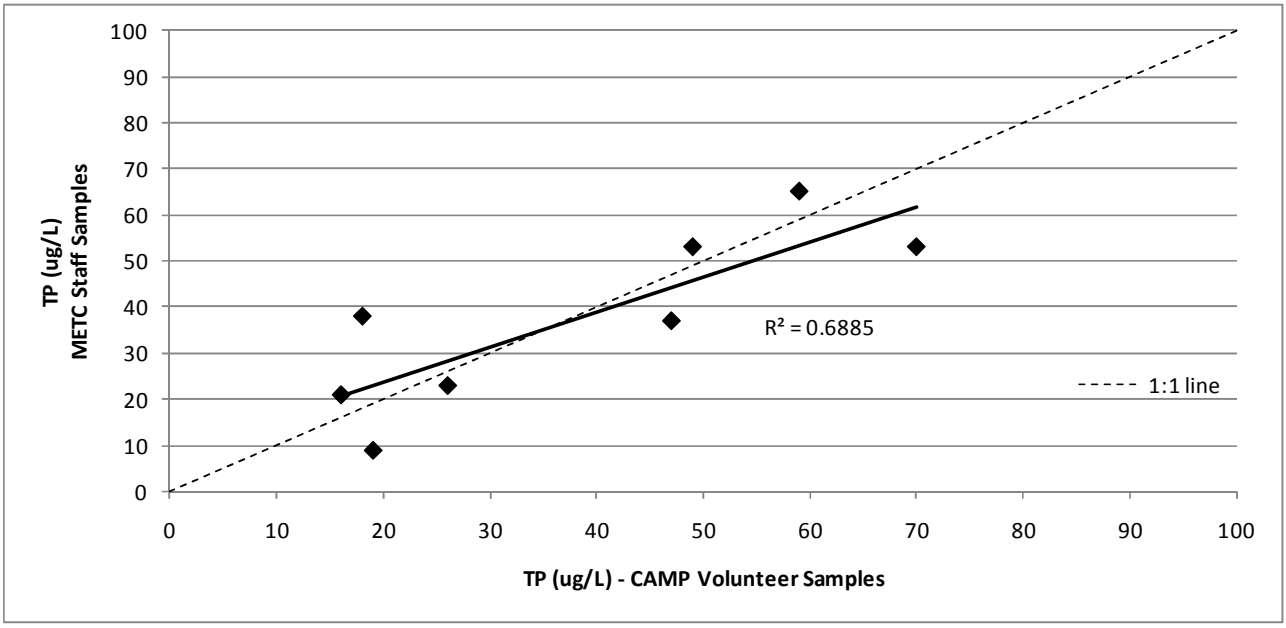


Figure 10. Total Phosphorus Quality Control Data 2011

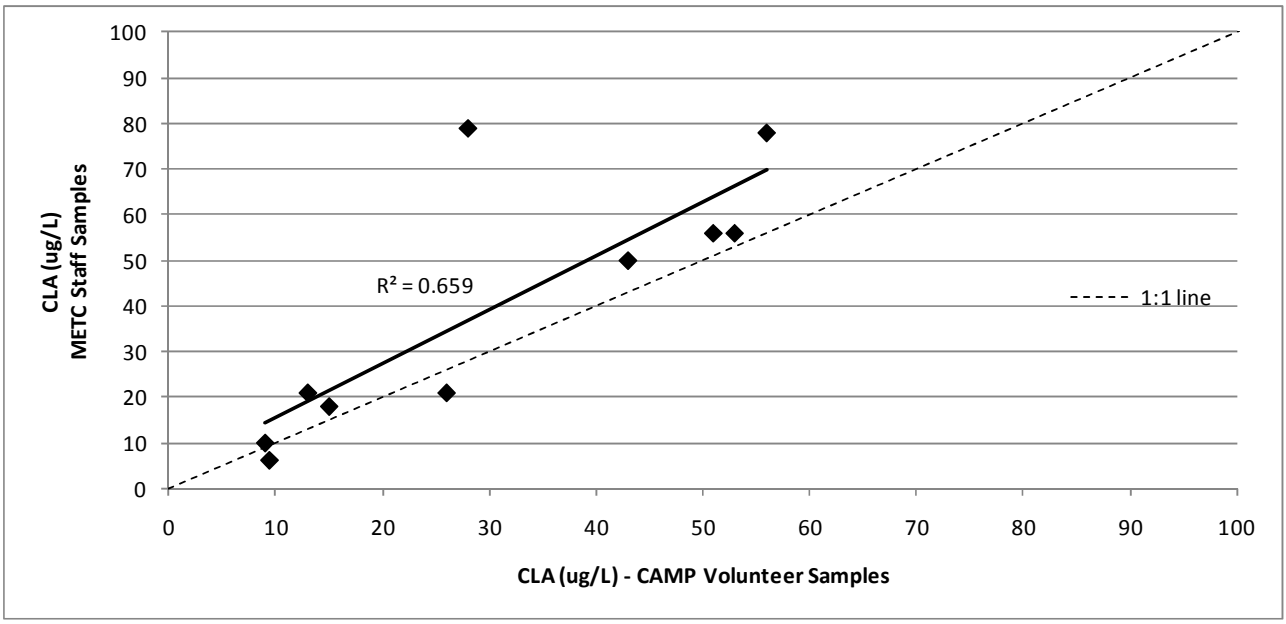


Figure 11. Chlorophyll-a Quality Control Data 2011

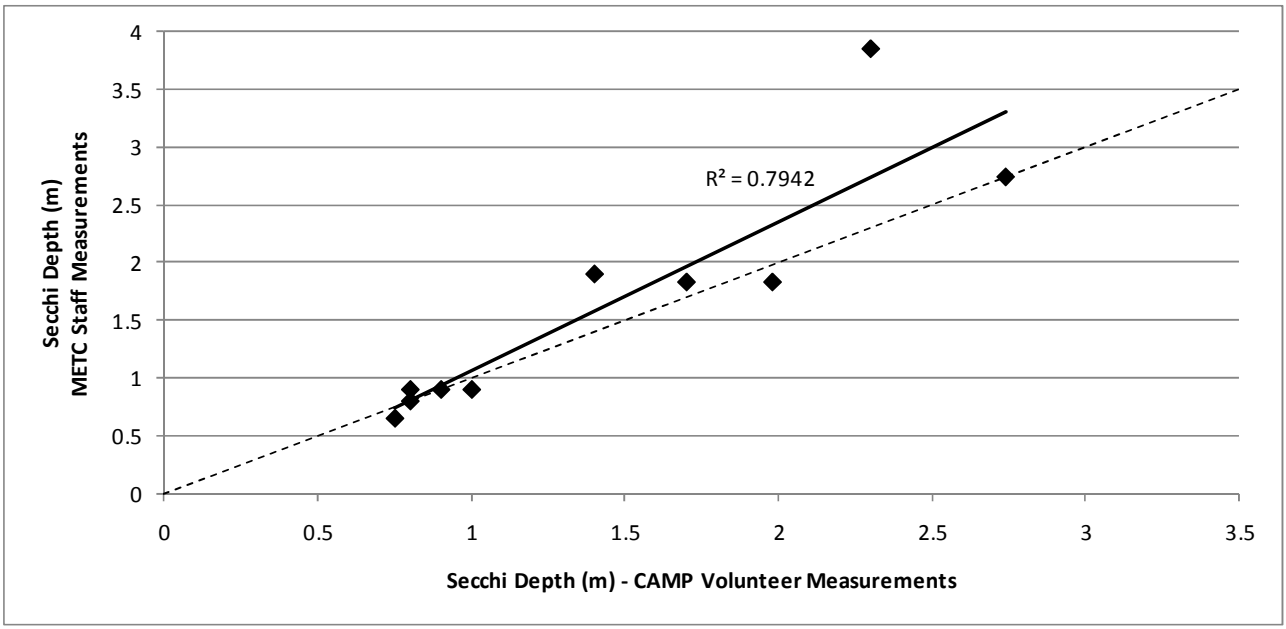


Figure 12. Secchi Depth Quality Control Data 2011

LAKE QUALITY REPORT CARD

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

Table 3. Lake Grading Curve

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

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

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

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

In 2000, the percentiles determined from the 1980-1988 water quality database of 120 lakes were compared to calculated percentiles from a more current and expanded 1980-1999 water quality database

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

2011 LAKE GRADES

Each lake monitoring site was given a lake grade if there were sufficient data to calculate the grade. At least 5 monitoring events are required to calculate a lake grade, and these 5 events must occur during the May-September (summer) period. Some lakes were not monitored sufficiently, so they did not receive a lake grade. Lakes that had more than one monitored lake site in 2011 received a single grade based on the average of the lake site grades. The distribution of lake grades for lakes monitored in 2011 is shown in Figure 13.

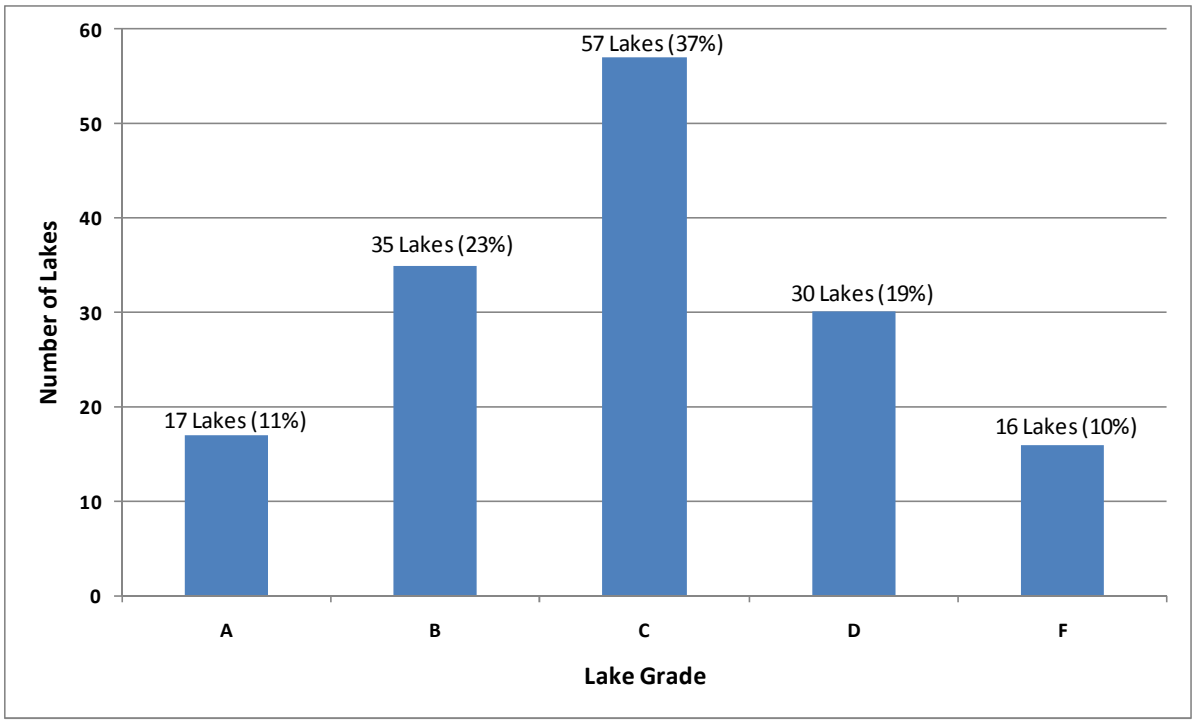


Figure 13. Distribution of 2011 Lake Grades

The greatest percentage of the lake sites (37%) received a lake grade of C. The water quality of these sites is considered average as compared to other lake sites in the TCMA. More lake sites (34%) were above average (A and B lakes) than lakes below average (D and F lakes, 29%).

Similar to past years, there is no distinct pattern as to where lakes with specific water quality were located. The lakes with below average lake grades (D's and F's) were not area specific. They were located in six of the seven TCMA counties. Common similarities between the majority of lakes with D and F grades are their size and mean depth. These lakes are generally shallow with small surface areas. Shallow lakes typically do not stratify during the summer months, allowing the potential release of phosphorus from sediments to mix through the water column and become available for plant growth

during the summer season. Also, smaller lakes generally have higher watershed-to-lake ratios. Smaller lakes with high watershed-to-lake ratios have a more difficult time handling larger pollutant loads than larger lakes in watersheds of similar size and land-use.

Similarly, the lake sites with above-average grades (A's and B's) were not area specific. They were located in all 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.

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

MONITORING RESULTS FOR CAMP LAKES 2011

The water quality of each CAMP lake is discussed in the following section. Each lake report includes a written section describing the lake's water quality condition and a lake information sheet. Each information sheet includes 2011 water quality data, shown in tables and figures, and the water quality grades from 1980 through 2011.

If you notice any errors in the lake's data or physical information, or are aware of 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 (19-0021) *City of Apple Valley*

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	55.8	31.0	99.0	C
CLA (µg/l)	23.2	3.5	78.0	C
Secchi (m)	1.3	0.5	2.5	C
TKN (mg/l)	0.95	0.48	1.30	
			Lake Grade	C

The 2011 lake grade was a C. The lake's historic lake grades indicate that the lake fluctuates between a C and D. More recently the lake's lake grade has consistently been a D (1999-2008 excluding 2006). But this year's lake grade is the second C grade in a row since 1998. The mean secchi depth for 2011 moved to grade C, which is a continued improvement compared to the last 11 years of F and D grades. Continued monitoring is recommended to determine if the recent improvement in the lake grade is a consistent trend towards improving water quality conditions.

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 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.

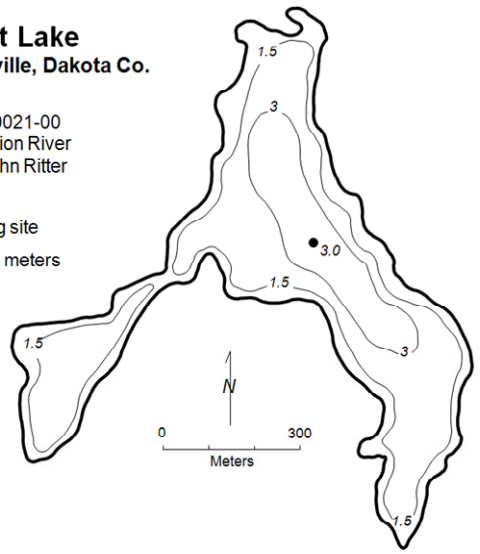
Alimagnet Lake

Apple Valley/Burnsville, Dakota Co.

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

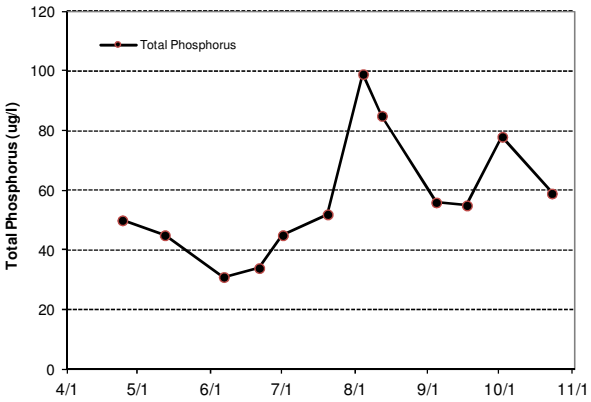
● Sampling site

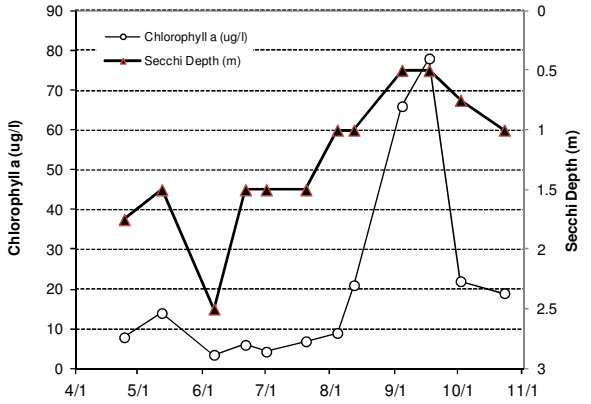
Contours in meters

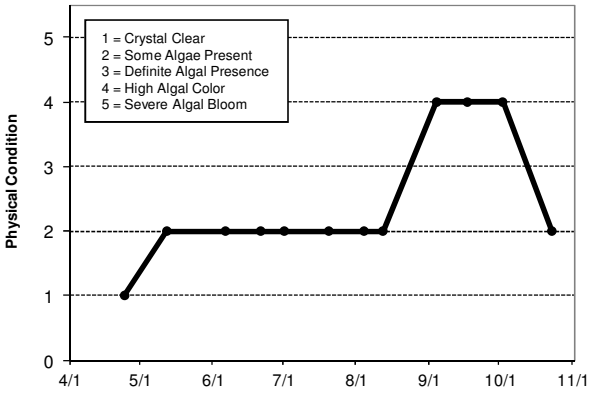


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	10.3				7.9	50		1.75	1	2
5/12/2011	16.2				14	45		1.5	2	2
6/6/2011	25.6				3.5	31		2.5	2	2
6/21/2011	21.9				6	34		1.5	2	2
7/1/2011	27.8				4.3	45		1.5	2	2
7/20/2011	31.1				6.9	52		1.5	2	3
8/4/2011	27.8				9	99		1	2	
8/12/2011	25.6				21	85		1	2	2
9/4/2011	22.8				66	56		0.5	4	3
9/17/2011	17.5				78	55		0.5	4	3
10/2/2011	17.8				22	78		0.75	4	3
10/23/2011	10				19	59		1	2	





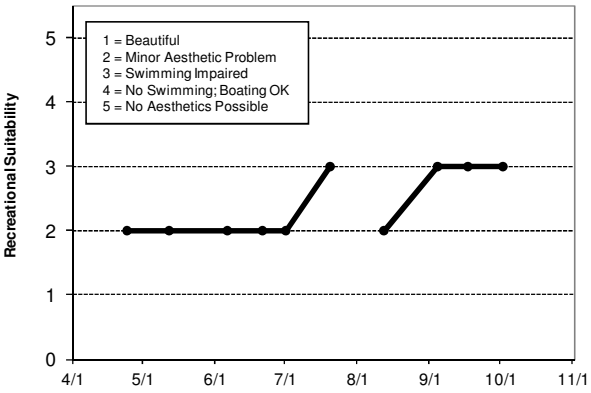


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	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	2009	2010	2011
Total Phosphorus	D	D	F	D	D	D	C	C
Chlorophyll a	D	D	D	D	D	C	C	C
Secchi Depth	F	F	F	F	F	F	D	C
Lake Grade	**D**	**D**	**F**	**D**	**D**	**D**	**C**	**C**



Source: Metropolitan Council and STORET data

Anderson Pond (19-0094) *City of South Saint Paul*

Anderson Pond is a small waterbody located in the City of South St. Paul (Dakota County). There are no bathymetric data available for the pond. This was the first year the pond was monitored via the CAMP. No known historical monitoring data area available for the pond.

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.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	99.7	32.0	189.0	D
CLA (µg/l)	22.1	1.8	62.0	C
Secchi (m)	1.2	0.8	2.2	C
TKN (mg/l)	0.97	0.66	1.50	
			Lake Grade	C

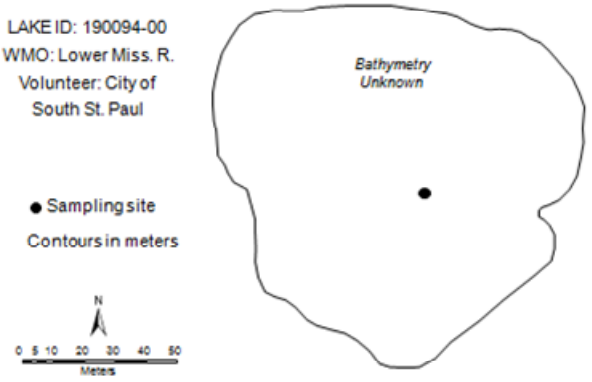
The pond received a lake grade of C for 2011, which was similar to last year's lake grade. It is recommended that monitoring be continued to build a water quality database for this pond.

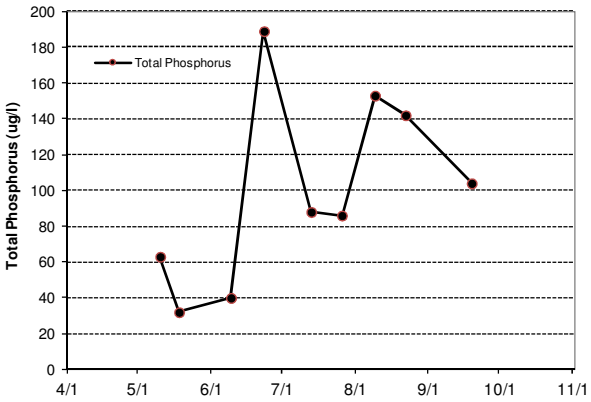
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

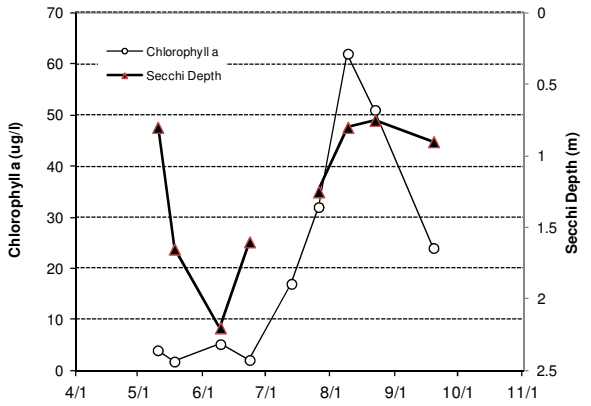
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Anderson Pond
South St. Paul, Dakota Co.

LAKE ID: 190094-00
WMO: Lower Miss. R.
Volunteer: City of South St. Paul

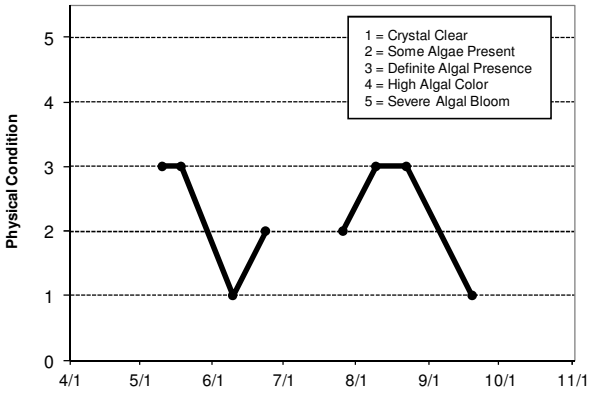






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/10/2011	19.3				4	63		0.8	3	4
5/18/2011	16.5				1.8	32		1.65	3	4
6/9/2011	23.2				5.2	40		2.2	1	4
6/23/2011	17.9				2.1	189		1.6	2	4
7/13/2011					17	88				
7/26/2011	25.7				32	86		1.25	2	4
8/9/2011	26.5				62	153		0.8	3	4
8/22/2011	23.6				51	142		0.75	3	4
9/19/2011	16				24	104		0.9	1	4

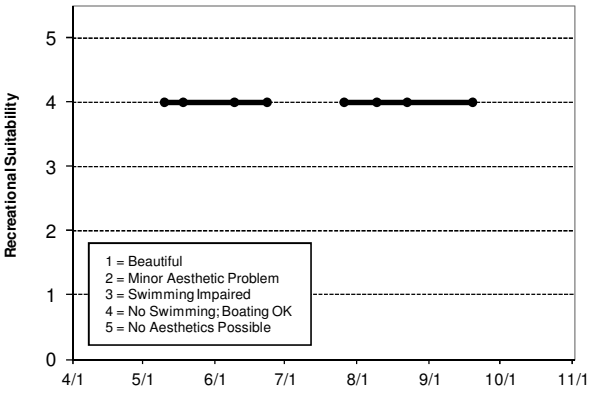


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus							C	D
Chlorophyll a							B	C
Secchi Depth							D	C
Lake Grade							**C**	**C**



Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	38.0	26.0	49.0	C
CLA (µg/l)	5.9	2.9	11.0	A
Secchi (m)	1.1	1.0	1.2	D
TKN (mg/l)	0.74	0.55	0.97	
			Lake Grade	C

The 2011 water quality lake grade was consistent with the historical water quality database. The lake water quality over the past decade has fluctuated between C and D, with a C being more frequent. The summer-time average water clarity remains in the D category, as it has been since 2000. The average summer-time concentration of CLA remains relatively low, giving an A CLA grade.

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

Throughout the monitoring period, the volunteers' opinions of the lake's physical condition were ranked on a 1-to-5 scale, as indicated on the following page. The volunteer did not record the recreational suitability ranking.

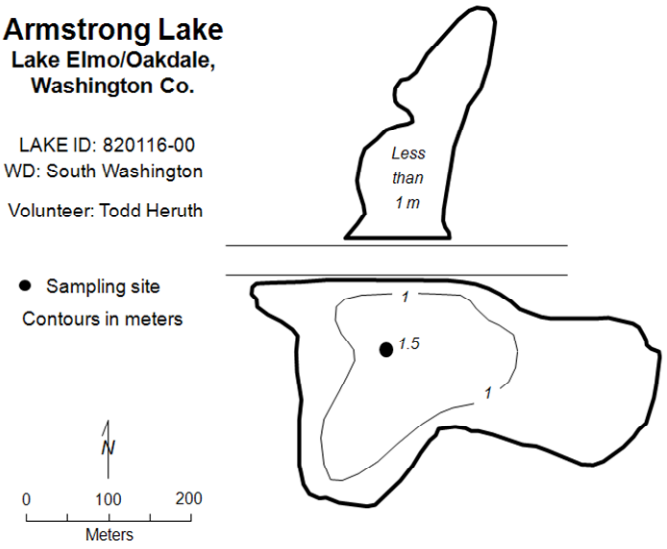
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Armstrong Lake

Lake Elmo/Oakdale, Washington Co.

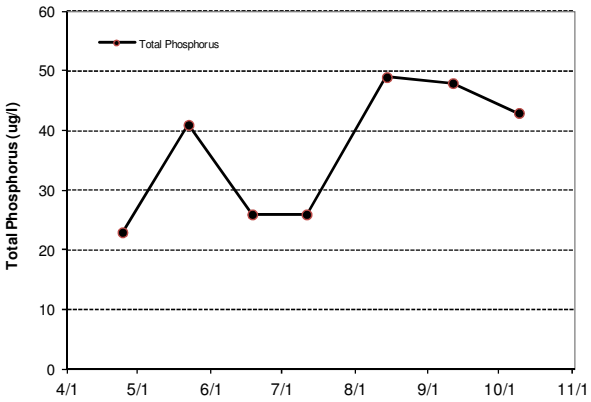
LAKE ID: 820116-00
WD: South Washington

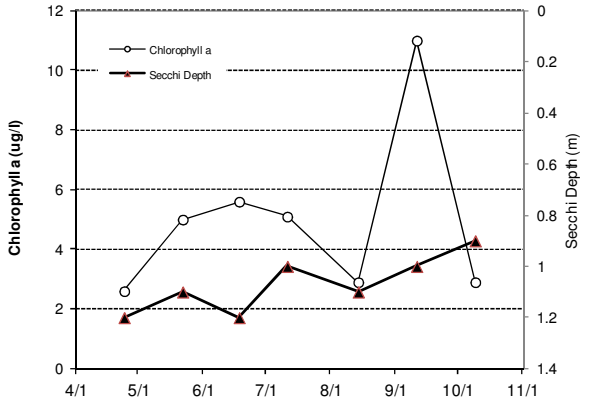
Volunteer: Todd Heruth

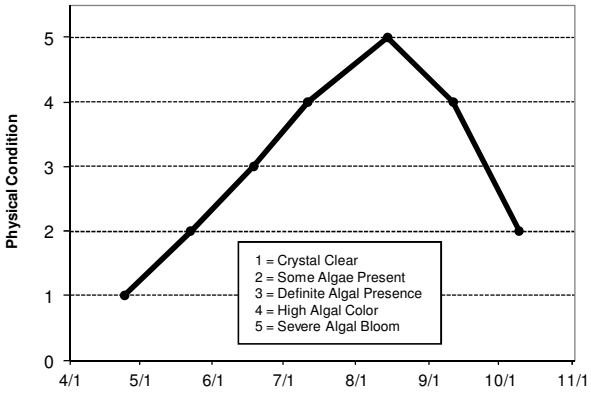


2011 Data

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 (1-5)	RS (1-5)
4/24/2011	9.7				2.6	23		1.2	1	
5/22/2011	17.7				5	41		1.1	2	
6/18/2011	22.3				5.6	26		1.2	3	
7/11/2011	29				5.1	26		1	4	
8/14/2011	25.4				2.9	49		1.1	5	
9/11/2011	21.3				11	48		1	4	
10/9/2011	20.7				2.9	43		0.9	2	





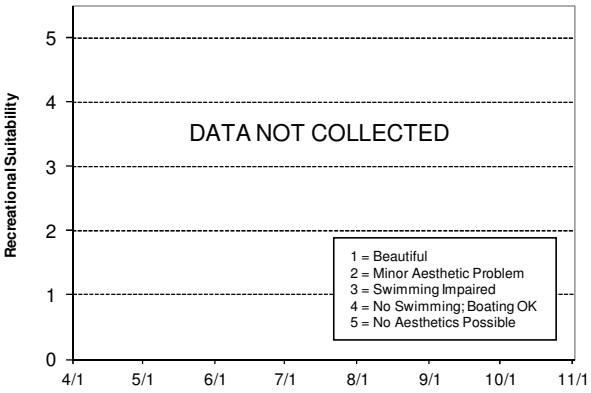


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	C	D	D	C	C	C	C
Chlorophyll a	A	A	B	C	A	B	A	A
Secchi Depth	D	D	D	D	D	D	D	D
Lake Grade	**C**	**C**	**C**	**D**	**C**	**C**	**C**	**C**



Source: Metropolitan Council and STORET data

Baldwin Lake (2-0013) *Rice Creek Watershed District*

The year 2011 was the first year that Baldwin Lake was part of the CAMP. The lake is located within the citiy of Lino Lakes (Anoka County). The lake has a surface area of 220 acres, and it maximum depth of 5.0 m. Because of the shallowness of the lake, its entire area is considered littoral, which is the shallow depth zone (0-15 feet) dominated by aquatic vegetation. It does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	91.0	83.0	99.0	
CLA (µg/l)	11.3	7.6	15.0	
Secchi (m)	0.0	0.0	0.0	
TKN (mg/l)	1.55	1.50	1.60	
			Lake Grade	NA

There was insufficient quantity of data to calculate grades.

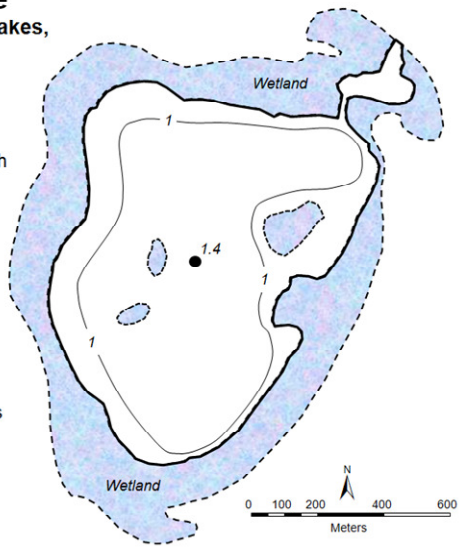
Throughout the monitoring period, the volunteers' opinions of the lake's physical condition were ranked on a 1-to-5 scale, as indicated on the following page. The volunteer did not record the recreational suitability ranking.

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.

Baldwin Lake

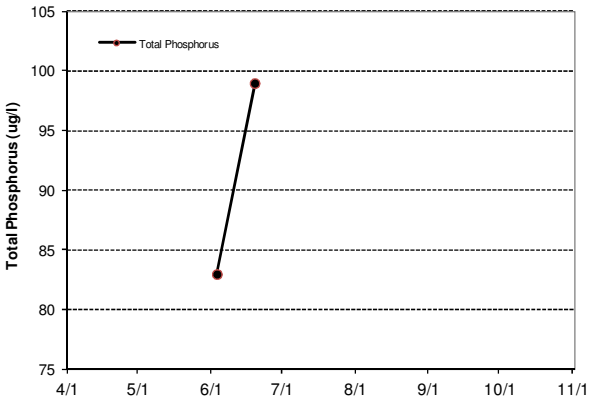
Circle Pines & Lino Lakes, Anoka Co.

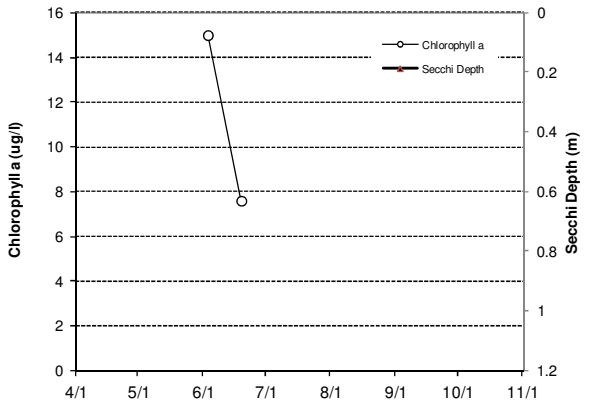
LAKE ID: 20013-00
WD: Rice Creek
Volunteer: Ken Jarosh

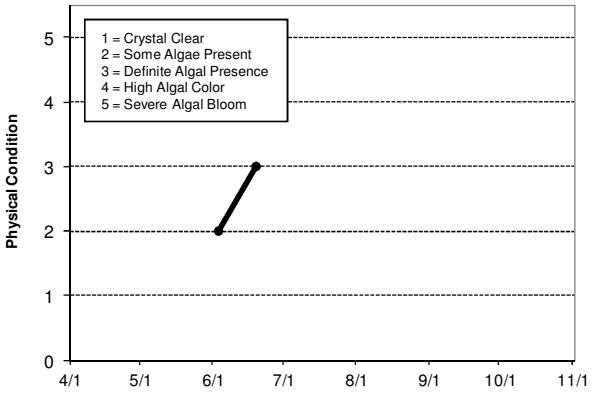


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/3/2011	22.4				15	83			2	4
6/19/2011	23.2				7.6	99			3	4





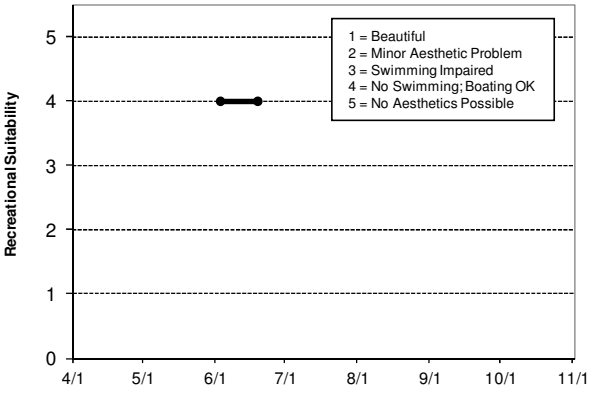


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus								
Chlorophyll a								
Secchi Depth								
Lake Grade								**NA**



Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	55.9	24.0	129.0	C
CLA (µg/l)	40.7	2.2	130.0	C
Secchi (m)	1.8	0.5	3.5	C
TKN (mg/l)	1.37	0.78	2.40	
			Lake Grade	C

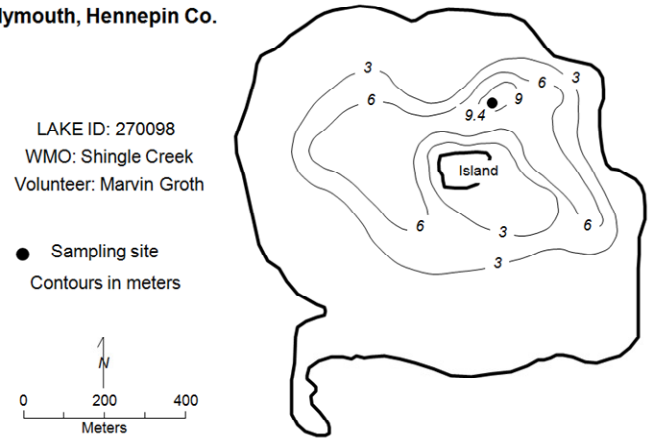
The 2011 lake grade was a C, and all three parameters were also a C, which is consistent with the historical database. Overall, the lake appears represented well by a lake grade of C since 1994.

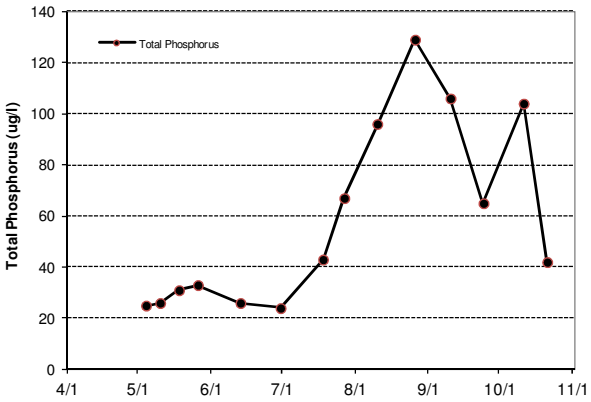
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

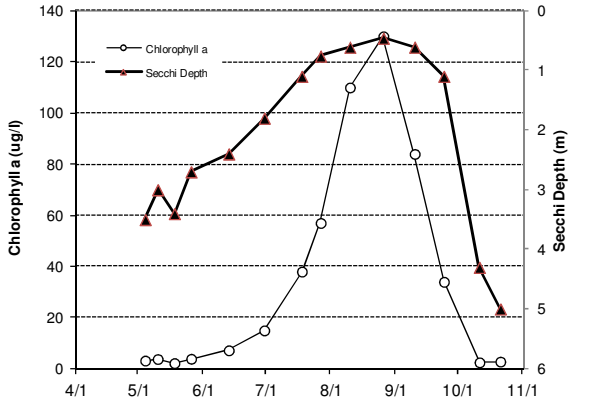
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Bass Lake
Plymouth, Hennepin Co.

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

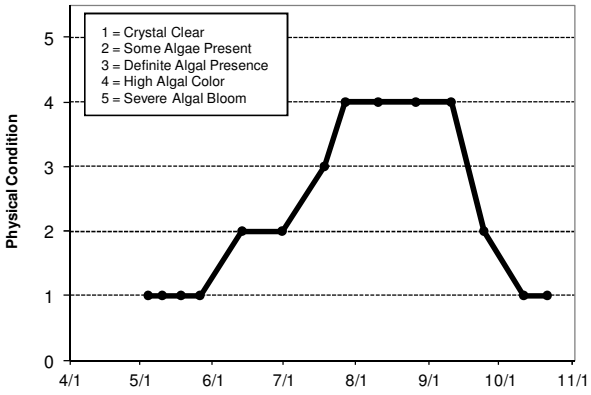






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/4/2011	6.7				3.2	25		3.5	1	1
5/10/2011	13.2				3.8	26		3	1	1
5/18/2011	15.3				2.2	31		3.4	1	1
5/26/2011	17.2				3.9	33		2.7	1	1
6/13/2011	20.7				7.2	26		2.4	2	2
6/30/2011	21.5				15	24		1.8	2	2
7/18/2011	27				38	43		1.1	3	3
7/27/2011	27.2				57	67		0.76	4	4
8/10/2011	24.6				110	96		0.61	4	4
8/26/2011	24.3				130	129		0.46	4	4
9/10/2011	22.6				84	106		0.61	4	4
9/24/2011	15.4				34	65		1.1	2	2
10/11/2011	16				2.5	104		4.3	1	1
10/21/2011	10.2				2.8	42		5	1	1

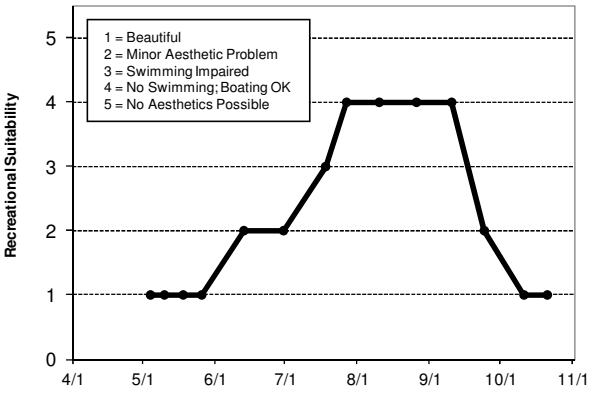


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		C		C		C		C
Chlorophyll a		D		D		C		C
Secchi Depth		C		D		C		C
Lake Grade		**C**		**D**		**C**		**C**



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 are few known morphological data available for the lake.

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

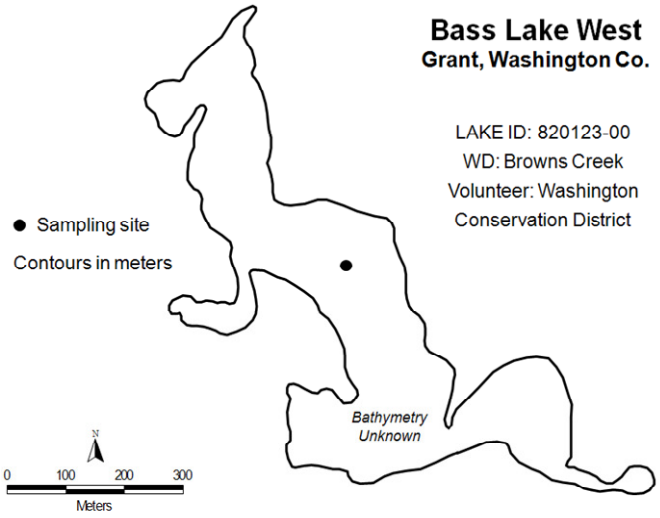
2011 summer (May-September) data summary

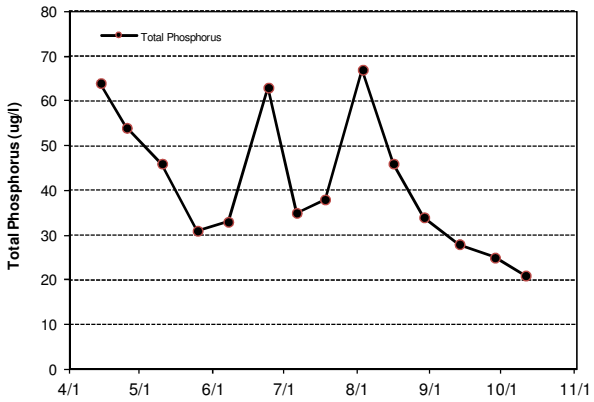
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	40.5	25.0	67.0	C
CLA (µg/l)	9.0	4.9	15.0	A
Secchi (m)	2.4	1.7	2.9	B
TKN (mg/l)	0.91	0.85	1.00	
			Lake Grade	B

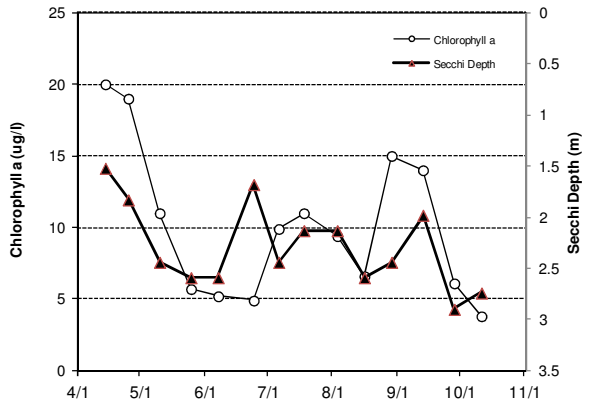
The lake received a lake grade of B for 2011. The chlorophyll and Secchi depth grades have improved as compared to the past two years. The TP grade has remained a C for the past 3 years, which is lower than the B grades received in 2006-2008.

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

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

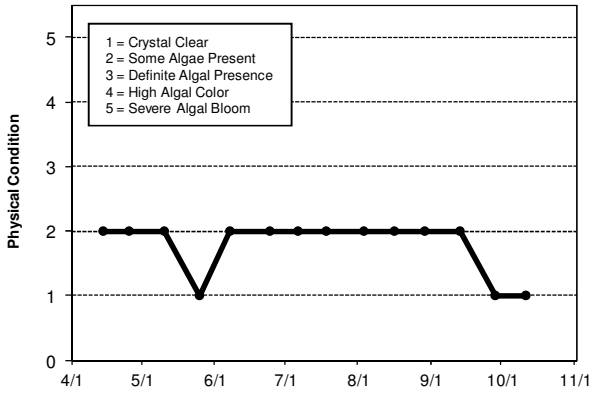






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/14/2011	11	8.8	10.3	0	20	64		1.52	2	3
4/25/2011	10.9	7.9	12.9	4.3	19	54		1.83	2	2
5/10/2011	14.5	11.1	9.6	0.2	11	46		2.44	2	3
5/25/2011	18.8	16	7.7	0.1	5.7	31		2.59	1	1
6/7/2011	26.4	19.4	8.5	0.1	5.2	33		2.59	2	2
6/24/2011	19.1	18.9	6.9	6.2	4.9	63		1.68	2	2
7/6/2011	27.9	21.3	9.5	0.2	9.9	35		2.44	2	3
7/18/2011	28.9	22.2	9.1	0.1	11	38		2.13	2	3
8/3/2011	26.5	24.8	4.8	0.2	9.4	67		2.13	2	2
8/16/2011	25.3	24.6	9.1	3.8	6.6	46		2.59	2	2
8/29/2011	24.2	23.7	6.4	0.3	15	34		2.44	2	3
9/13/2011	22.2	21	8.4	0.1	14	28		1.98	2	2
9/28/2011	15.3	15.1	9	0.1	6.1	25		2.9	1	1
10/11/2011	17.9	16.9	8.7	0.1	3.8	21		2.74	1	1



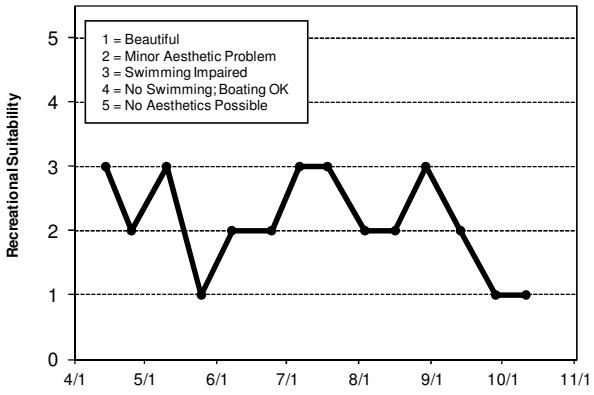
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			B	B	B	C	C	C
Chlorophyll a			A	A	B	B	B	A
Secchi Depth			A	B	B	C	C	B
Lake Grade			**A**	**B**	**B**	**C**	**C**	**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 are few known morphological data available for the lake.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	48.5	36.0	78.0	C
CLA (µg/l)	14.5	5.0	36.0	B
Secchi (m)	2.4	1.8	3.2	B
TKN (mg/l)	0.99	0.68	1.20	
			Lake Grade	B

The lake received a lake grade of B for 2011, which is similar to last year's grade. Given that there are 5 years of water quality data available, additional monitoring is necessary to determine water quality trends.

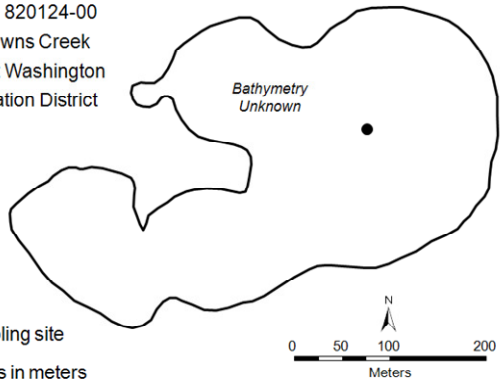
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

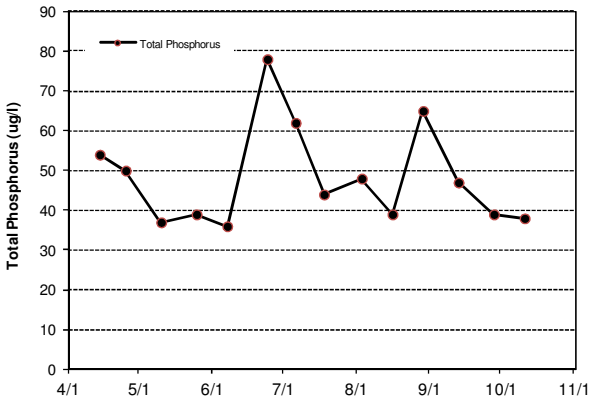
Bass Lake East
Grant, Washington Co.

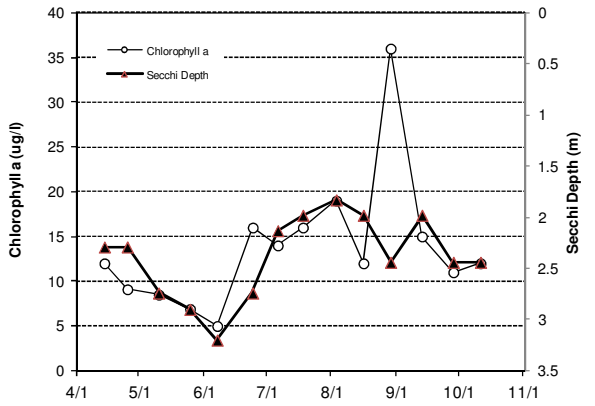
LAKE ID: 820124-00
WD: Browns Creek
Volunteer: Washington Conservation District



● Sampling site

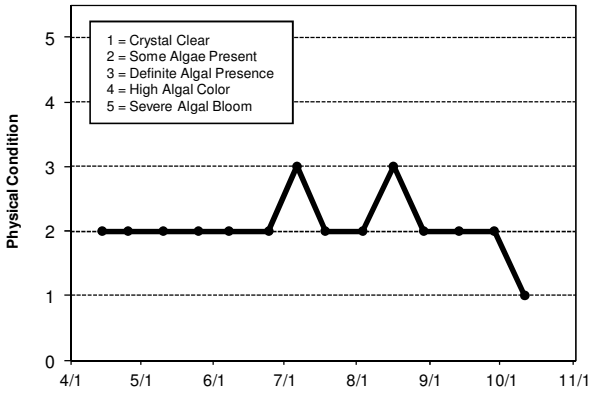
Contours in meters





2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/14/2011	10.9	7.5	10.8	0.1	12	54		2.29	2	2
4/25/2011	10.5	8.2	13.1	0.1	9.1	50		2.29	2	2
5/10/2011	15.1	9.9	10.1	0.4	8.5	37		2.74	2	2
5/25/2011	18.9	12.6	8	0.1	6.9	39		2.9	2	1
6/7/2011	27.5	15.9	8.8	0	5	36		3.2	2	2
6/24/2011	19.5	17.2	6.8	0.1	16	78		2.74	2	2
7/6/2011	28.6	16	8.8	0	14	62		2.13	3	3
7/18/2011	29.2	16.6	9.1	0.1	16	44		1.98	2	3
8/3/2011	26.7	16.4	5.1	0	19	48		1.83	2	2
8/16/2011	25.7	19.5	9.3	0.1	12	39		1.98	3	4
8/29/2011	24.5	17.7	6.2	0.1	36	65		2.44	2	2
9/13/2011	22.7	18.3	8.1	0.1	15	47		1.98	2	2
9/28/2011	15.6	14.8	9.3	0.1	11	39		2.44	2	2
10/11/2011	18.1	15	9.5	0.1	12	38		2.44	1	1

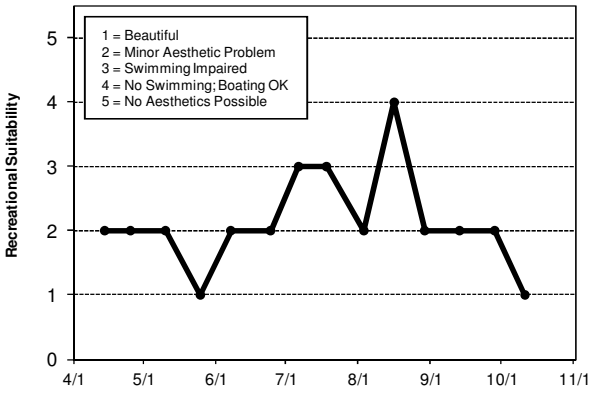


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			C	C	C	C	C	C
Chlorophyll a			B	B	C	A	A	B
Secchi Depth			C	B	C	B	B	B
Lake Grade			**C**	**B**	**C**	**B**	**B**	**B**



Source: Metropolitan Council and STORET data

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

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	31.0	19.0	41.0	B
CLA (µg/l)	15.2	1.0	75.0	B
Secchi (m)	2.6	0.8	6.5	B
TKN (mg/l)	1.10	0.85	1.40	
			Lake Grade	B

The lake received a water quality lake grade of B for 2011 which is consistent with its historical water quality database. Available data for Bavaria Lake reveal that the lake water quality has fluctuated from C to A range. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2011).

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

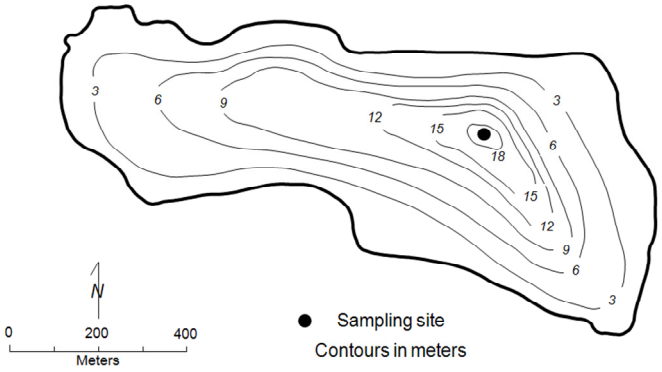
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

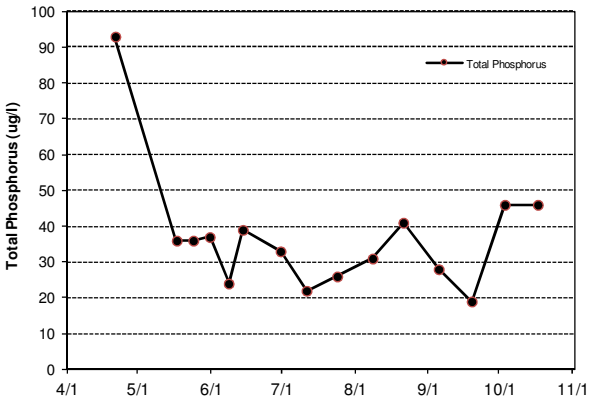
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

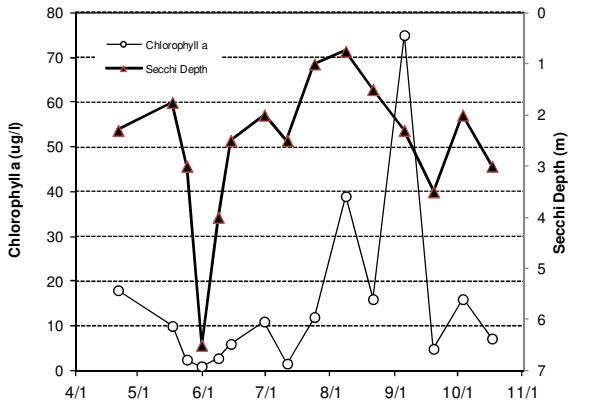
Lake Bavaria

Chaska/Laketown Twp., Carver Co.

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

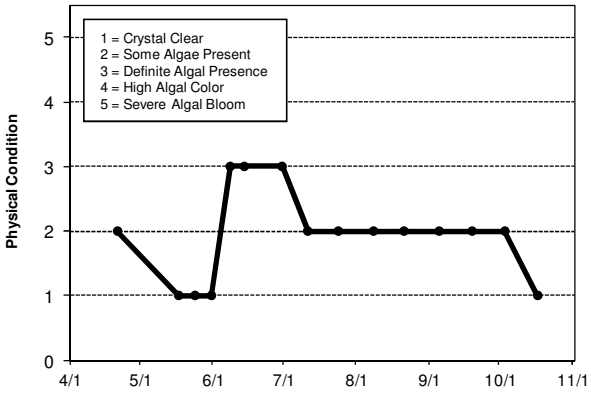






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	5.43		16.4		18	93		2.3	2	2
5/17/2011	12				10	36		1.75	1	1
5/24/2011	15				2.5	36		3	1	2
5/31/2011	17				1	37		6.5	1	2
6/8/2011	22				2.8	24		4	3	3
6/14/2011	18				6	39		2.5	3	3
6/30/2011	22				11	33		2	3	3
7/11/2011	26				1.6	22		2.5	2	2
7/24/2011	26				12	26		1	2	3
8/8/2011	25				39	31		0.75	2	2
8/21/2011	23				16	41		1.5	2	3
9/5/2011	20				75	28		2.3	2	3
9/19/2011	18				4.9	19		3.5	2	3
10/3/2011	14				16	46		2	2	3
10/17/2011	11				7.2	46		3	1	3

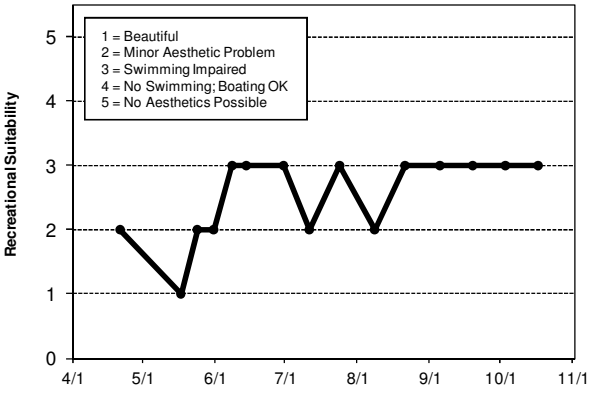


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus				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	2009	2010	2011
Total Phosphorus	B	C	B	C	C	C	B	B
Chlorophyll a	B	C	A	A	B	A	B	B
Secchi Depth	C	C	B	B	C	B	C	B
Lake Grade	**B**	**C**	**B**	**B**	**C**	**B**	**B**	**B**



Source: Metropolitan Council and STORET data

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

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	157.6	78.0	241.0	F
CLA (µg/l)	93.2	43.0	170.0	F
Secchi (m)	0.3	0.2	0.3	F
TKN (mg/l)	3.24	1.80	5.10	
			Lake Grade	F

The lake received a lake grade of F for 2011, which is consistent with its 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 2011).

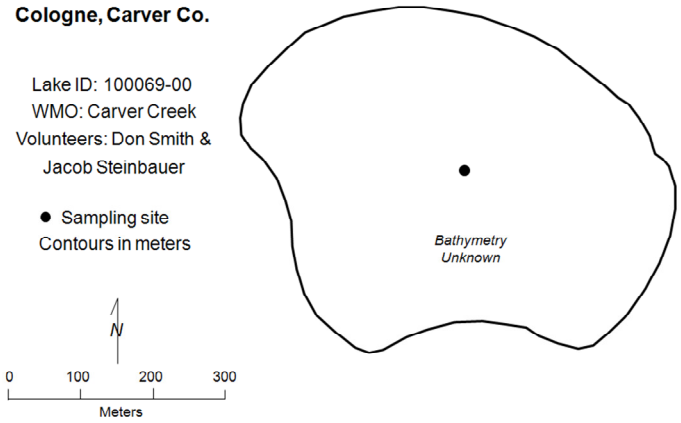
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

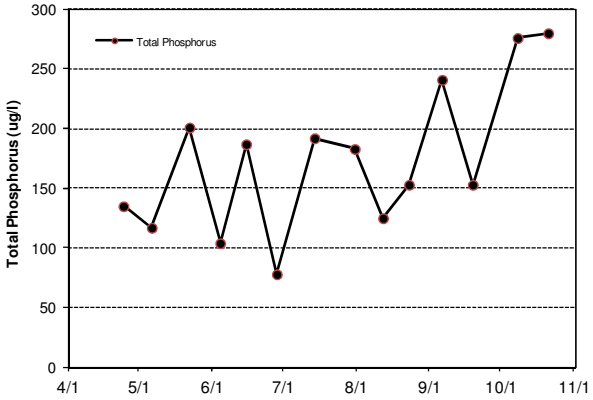
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

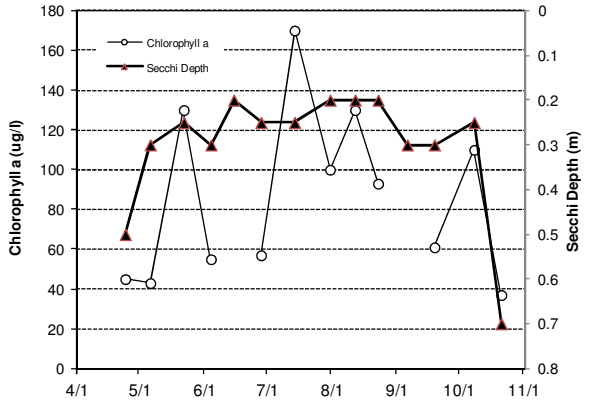
Lake Benton
Cologne, Carver Co.

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

● Sampling site
Contours in meters

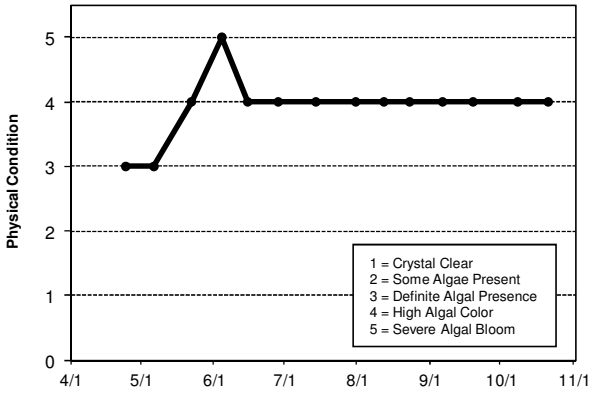






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	10				45	135		0.5	3	4
5/6/2011	10				43	117		0.3	3	4
5/22/2011	20				130	201		0.25	4	4
6/4/2011	23				55	104		0.3	5	4
6/15/2011	19					187		0.2	4	4
6/28/2011	26				57	78		0.25	4	4
7/14/2011	23				170	192		0.25	4	4
7/31/2011	23				100	183		0.2	4	4
8/12/2011	22				130	125		0.2	4	4
8/23/2011	25				93	153		0.2	4	4
9/6/2011						241		0.3	4	4
9/19/2011	19				61	153		0.3	4	4
10/8/2011	19				110	276		0.25	4	4
10/21/2011	13				37	280		0.7	4	4

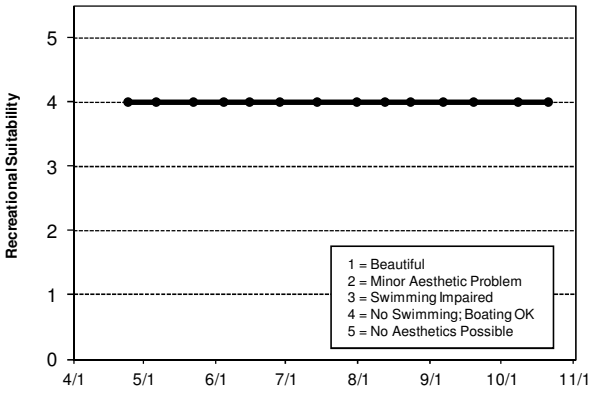


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		F		F	F	F	D	F
Chlorophyll a		F		F	F	F	D	F
Secchi Depth		F		F	F	F	F	F
Lake Grade		**F**		**F**	**F**	**F**	**D**	**F**



Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

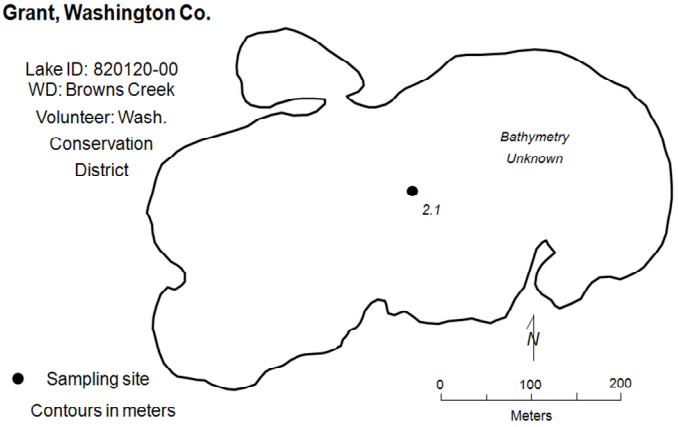
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	67.6	42.0	116.0	C
CLA (µg/l)	11.7	2.9	18.0	B
Secchi (m)	1.9	1.5	2.6	C
TKN (mg/l)	1.07	0.88	1.30	
			Lake Grade	C

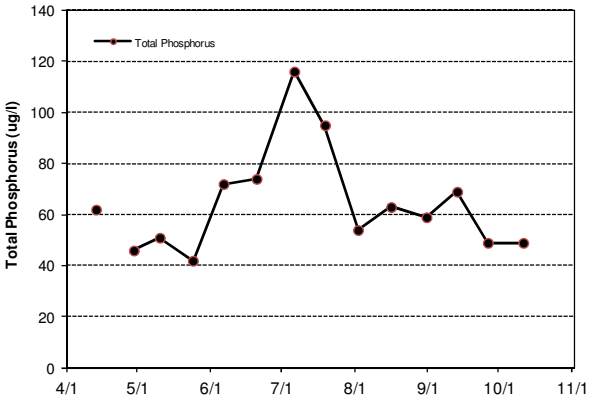
The lake received a lake grade of C in 2011 which was an improvement over the water quality observed during the period of 2005 – 2007. The lake grades have varied from Cs to Fs over the past 7 years. Additional years of monitoring are recommended to determine long term trends.

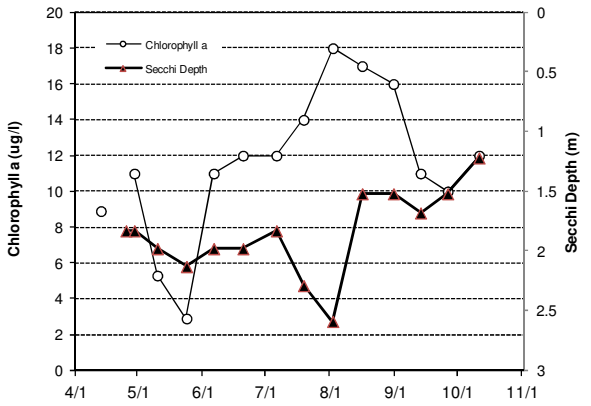
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

Benz Lake
Grant, Washington Co.

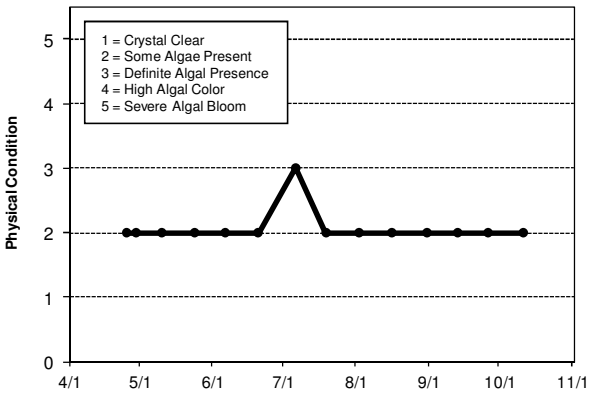






2011 Data

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 (1-5)	RS (1-5)
4/13/2011					8.9	62				
4/25/2011	11.4	8.3	11.4	12.8				1.83	2	2
4/29/2011	9	8.6	11.9	0.1	11	46		1.83	2	3
5/10/2011	16	12.2	11.2	0.2	5.3	51		1.98	2	3
5/24/2011	19.3	15.9	9.8	0.1	2.9	42		2.13	2	2
6/6/2011	24.7	19.6	9.1	2.5	11	72		1.98	2	3
6/20/2011	23.5	19.6	10.8	0.2	12	74		1.98	2	3
7/6/2011	26.7	22.3	11.9	0.3	12	116		1.83	3	5
7/19/2011	29.6	22	9.5	0.1	14	95		2.29	2	3
8/2/2011	27	23.6	7.2	0.1	18	54		2.59	2	3
8/16/2011	25.6	23.2	13	0.1	17	63		1.52	2	4
8/31/2011	22.8	22.1	6.7	0.1	16	59		1.52	2	3
9/13/2011	21.8	20.4	10.7	0.1	11	69		1.68	2	3
9/26/2011	16	14.4	13.2	1.5	10	49		1.52	2	2
10/11/2011	17.9	15.5	10.7	0.4	12	49		1.22	2	3

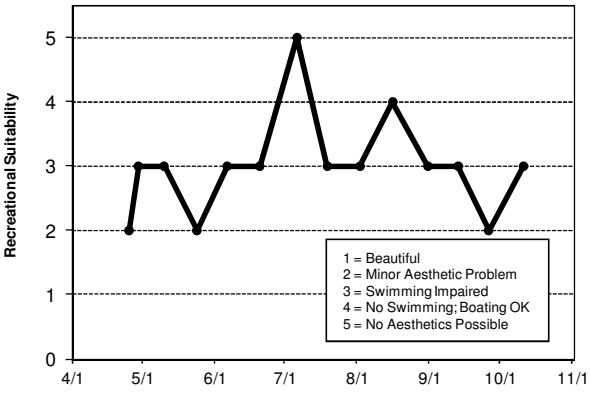


Lake Water Quality Grades Based on Summertime Averages

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							F					
Lake Grade												

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		F	F	F	D	D	D	C
Chlorophyll a		F	D	F	B	C	D	B
Secchi Depth		F	D	F	C	D	D	C
Lake Grade		**F**	**D**	**F**	**C**	**D**	**D**	**C**



Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

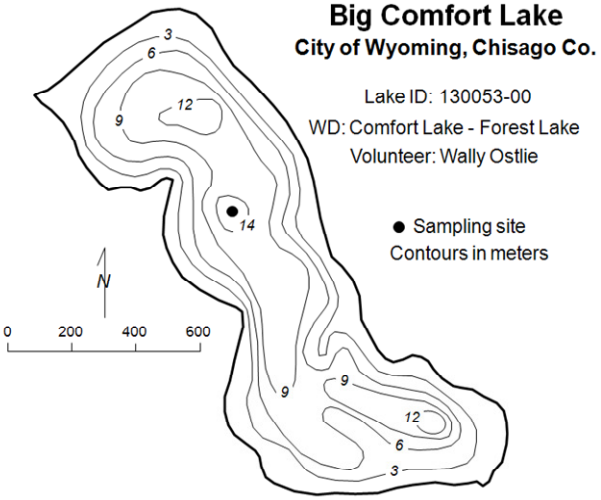
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	32.0	20.0	55.0	C
CLA (µg/l)	15.5	4.3	39.0	B
Secchi (m)	1.6	0.9	2.5	C
TKN (mg/l)	0.99	0.73	1.20	
			Lake Grade	C

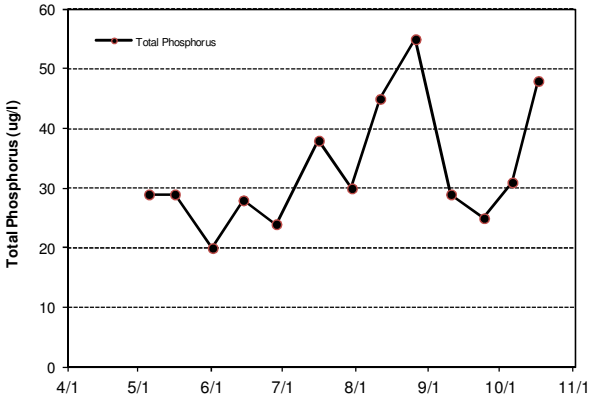
The lake received a lake grade of B this year, which is similar to grades received in some previous years. The lake typically receives a Secchi grade of C. Additional monitoring is recommended to determine the direction of potential trends in the water quality of the lake.

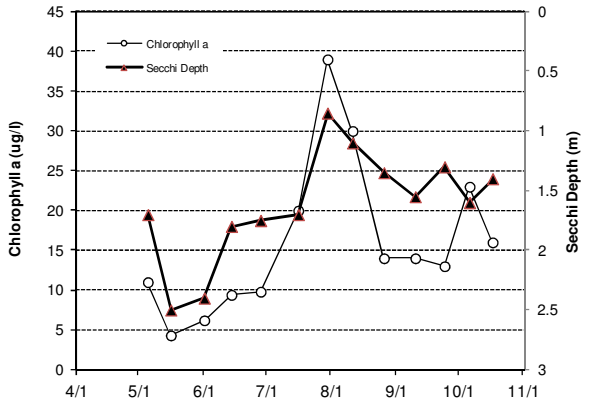
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

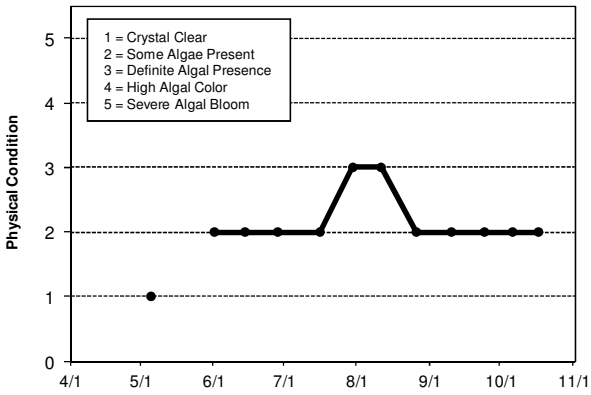
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

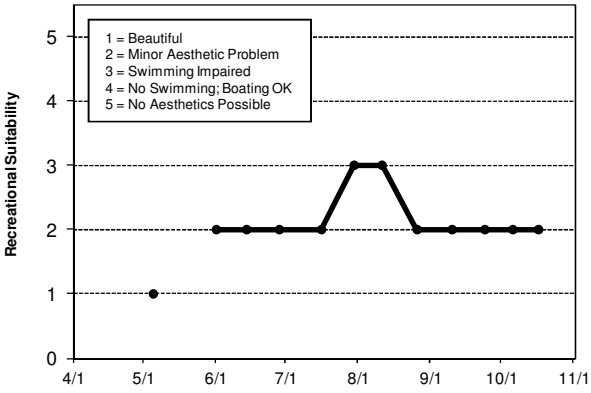
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/5/2011	9.5				11	29		1.7	1	1
5/16/2011	13.6				4.3	29		2.5		
6/1/2011	18.8				6.2	20		2.4	2	2
6/14/2011	20.3				9.4	28		1.8	2	2
6/28/2011	23				9.8	24		1.75	2	2
7/16/2011	24.5				20	38		1.7	2	2
7/30/2011	29.3				39	30		0.85	3	3
8/11/2011	25.8				30	45		1.1	3	3
8/26/2011	25.6				14	55		1.35	2	2
9/10/2011	23.4				14	29		1.55	2	2
9/24/2011	16.2				13	25		1.3	2	2
10/6/2011	16.9				23	31		1.6	2	2
10/17/2011	13.8				16	48		1.4	2	2

Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	B	C	A	B	B	B	C
Chlorophyll a	B	B	B	A	A	B	B	B
Secchi Depth	C	C	C	C	C	C	C	C
Lake Grade	**C**	**B**	**C**	**B**	**B**	**B**	**B**	**C**

Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	31.7	17.0	52.0	B
CLA (µg/l)	6.4	2.7	10.0	A
Secchi (m)	1.6	1.0	2.3	C
TKN (mg/l)	0.97	0.77	1.20	
			Lake Grade	B

The lake received a lake grade of B this year, which is the best lake grade that the lake has received in its historical database. Continued monitoring is suggested to determine if this year's improvement in water quality is a potential improving trend. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2011).

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

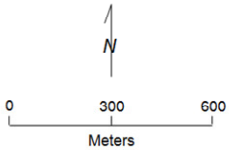
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

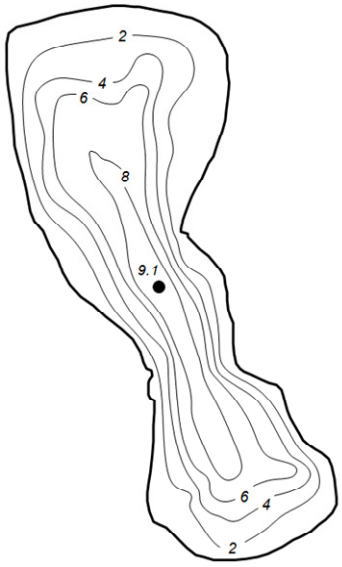
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Bone Lake
Scandia, Washington Co.

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

● Sampling site
Contours in meters





2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/9/2011	17.5				8.7	24		2.2	2	2
5/16/2011	16				7	26		2.1	2	2
6/1/2011	20.2				6.8	24		2.3	1	1
6/9/2011	23.1				2.7	28		2.2	1	1
6/19/2011	22.4				4.9	27		1.9	2	2
6/28/2011	24.5				6.6	24		1.5	3	2
7/7/2011	29.8				5	45		1.3	2	2
7/16/2011	26.3				5.9	42		1.4	3	3
7/31/2011	31					17		1.3		
8/17/2011	26				6	26		1.2	2	2
8/18/2011	26				8.3	28		1.2	2	2
8/30/2011	22.9				10	49		1.2	2	2
9/13/2011	18.9				4.4	52		1	3	3
10/9/2011	18.1				16	109		1.1		
10/22/2011	15				12	233		1	3	3

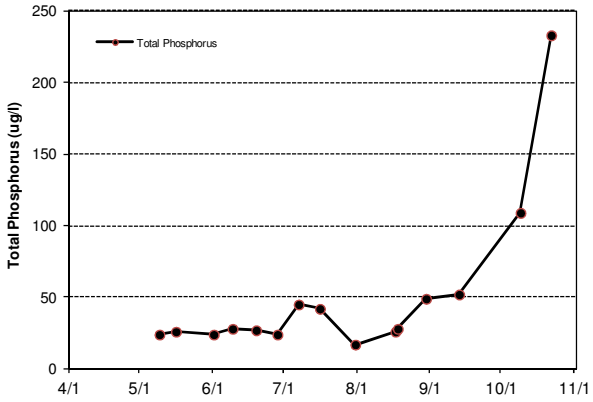
Lake Water Quality Grades Based on Summertime Averages

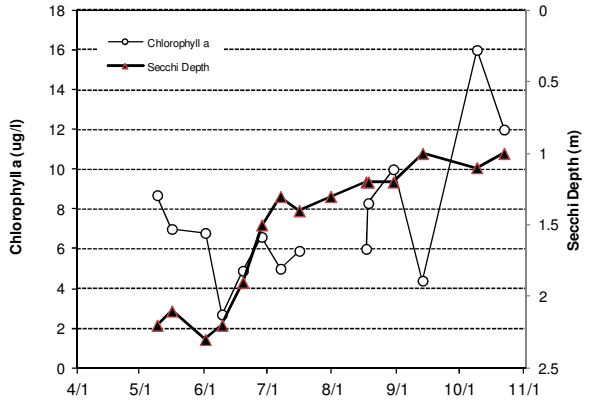
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus					D			C	C	C		D
Chlorophyll a					C			B	C	C		C
Secchi Depth					C		D	C	D	C	C	C
Lake Grade					**C**			**C**	**C**	**C**		**C**

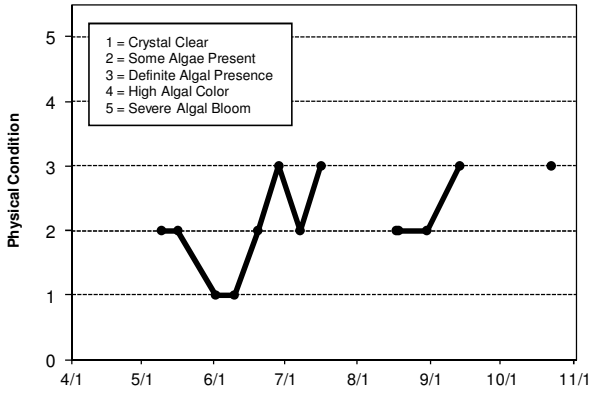
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus		C				C	C	C		C	C	D
Chlorophyll a		C				B	B	C		C	C	C
Secchi Depth		C	D	C		C	C	D		C	D	C
Lake Grade		**C**				**C**	**C**	**C**		**C**	**C**	**C**

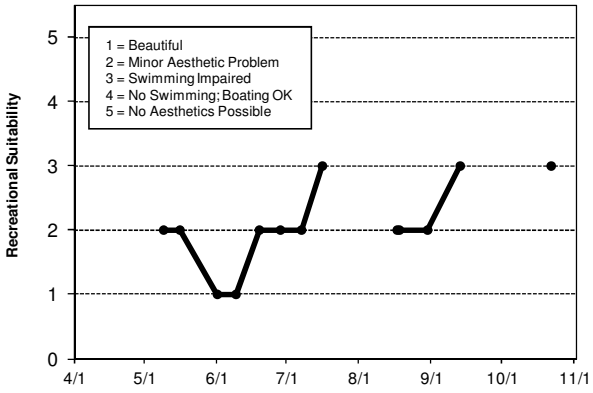
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	C	C	C	C	C	C	B
Chlorophyll a	C	B	B	B	B	B	B	A
Secchi Depth	C	C	C	C	C	C	C	C
Lake Grade	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**B**

Source: Metropolitan Council and STORET data









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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	84.8	49.0	149.0	D
CLA (µg/l)	10.5	2.6	17.0	B
Secchi (m)	0.5	0.3	0.8	F
TKN (mg/l)	0.82	0.61	1.10	
			Lake Grade	D

The lake received a lake grade of D. Usually the letter grades for each parameter are within a letter grade of each other. A comparison of the CLA grade of B to the F grade for Secchi Depth and the D grade for TP, indicate that suspended sediment may be a possible cause of the low water clarity during 2011. The relatively high TP concentrations indicate that either sediment was being resuspended in the water column or the lake received substantial amounts of particulate-laden runoff or both. In either case, the increase turbidity would decrease available light (i.e. reduced water clarity), and thereby suppress algal growth. This lake has experienced similar water quality behavior in the past few years. Additional years of data collection are needed to determine water quality trends.

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

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

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

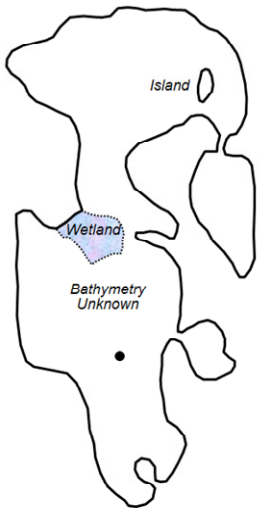
Brick Pond

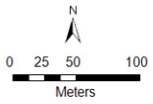
Stillwater, Washington Co.

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

● Sampling site

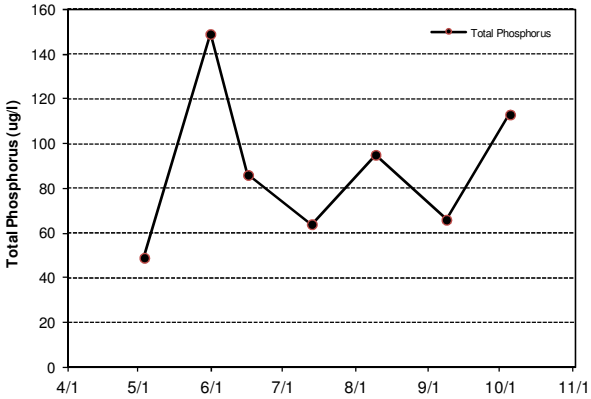
Contours in meters

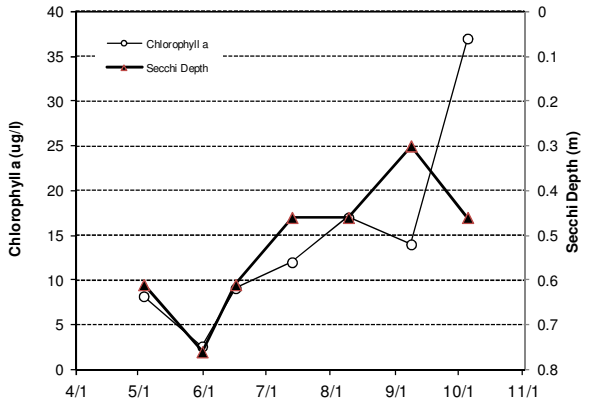


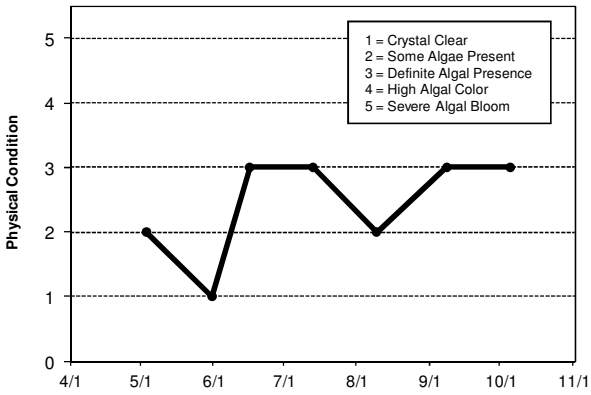


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/3/2011	7.9	7.9	13.2	0.1	8.2	49		0.61	2	4
5/31/2011	20.9		9.3		2.6	149		0.76	1	4
6/16/2011	22.8		12		9.1	86		0.61	3	5
7/13/2011	24.7		9.7		12	64		0.46	3	4
8/9/2011	25.5		11		17	95		0.46	2	4
9/8/2011	21.5		15		14	66		0.3	3	4
10/5/2011	16.7		16.3		37	113		0.46	3	4





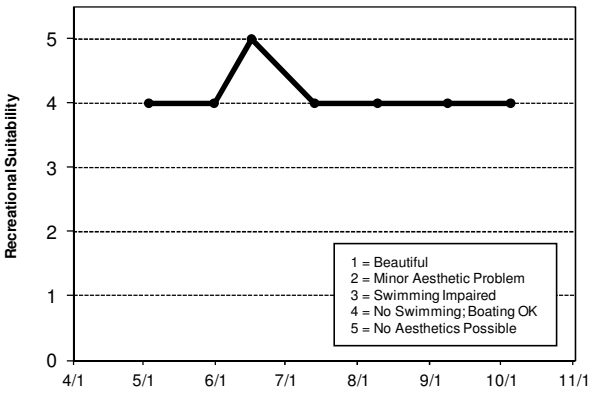


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus					D	D	C	D
Chlorophyll a					A	A	A	B
Secchi Depth					D	D	F	F
Lake Grade					**C**	**C**	**C**	**D**



Source: Metropolitan Council and STORET data

Brickyard Clayhole Lake (10-0225) *Carver County Environmental Services*

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	18.7	9.0	29.0	A
CLA (µg/l)	4.0	1.3	11.0	A
Secchi (m)	3.8	1.2	5.9	A
TKN (mg/l)	0.62	0.40	0.82	
			Lake Grade	A

The lake received a lake grade of A for 2011. The lake's water quality is well represented by a lake grade of A according to its historical water quality database. Continued monitoring is recommened to continue to build the water quality database for this lake.

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

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

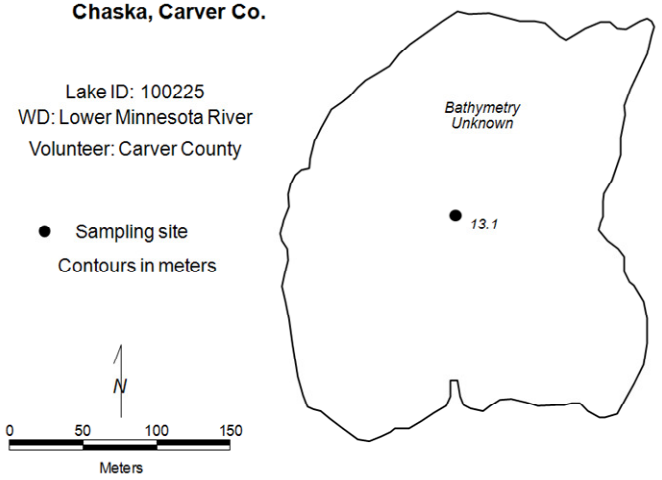
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

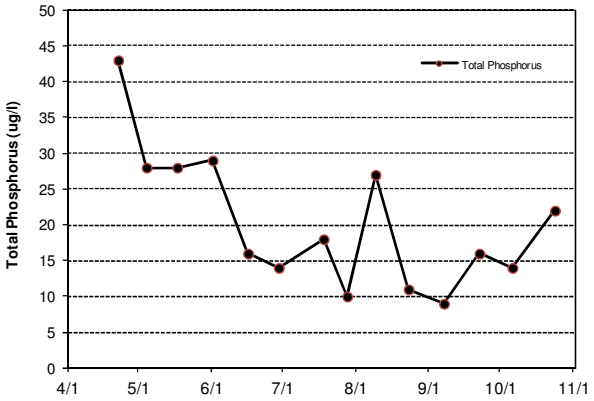
Brickyard Clayhole Lake

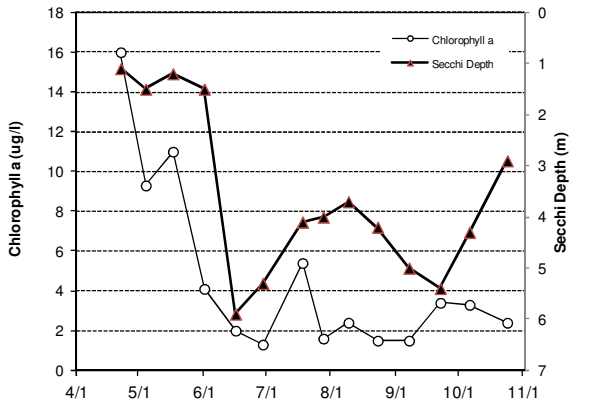
Chaska, Carver Co.

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

● Sampling site
Contours in meters

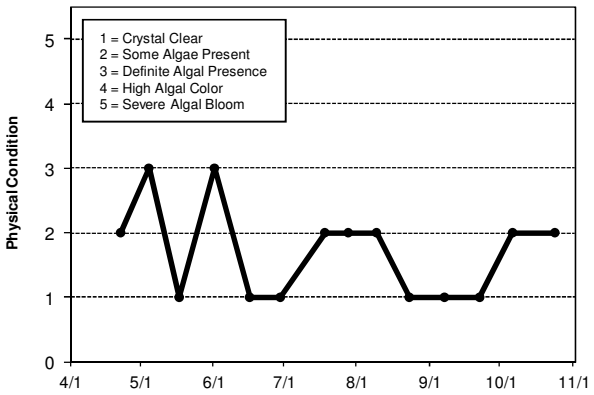






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(ºC)	(ºC)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/22/2011	7.82		16.8		16	43		1.1	2	2
5/4/2011	9.53		17.4		9.3	28		1.5	3	2
5/17/2011	14.6		11.8		11	28		1.2	1	1
6/1/2011	19.02		10.1		4.1	29		1.5	3	3
6/16/2011	21.7		9.5		2	16		5.9	1	1
6/29/2011	23.48		11.1		1.3	14		5.3	1	1
7/18/2011	27		10.2		5.4	18		4.1	2	1
7/28/2011	29.1		8.1		1.6	10		4	2	2
8/9/2011	26.18		7.7		2.4	27		3.7	2	2
8/23/2011	24.7		6.8		1.5	11		4.2	1	1
9/7/2011	23.82		8.2		1.5	9		5	1	1
9/22/2011	17.64		10		3.4	16		5.4	1	1
10/6/2011	17.12		8.1		3.3	14		4.3	2	2
10/24/2011	12.86		6.2		2.4	22		2.9	2	1

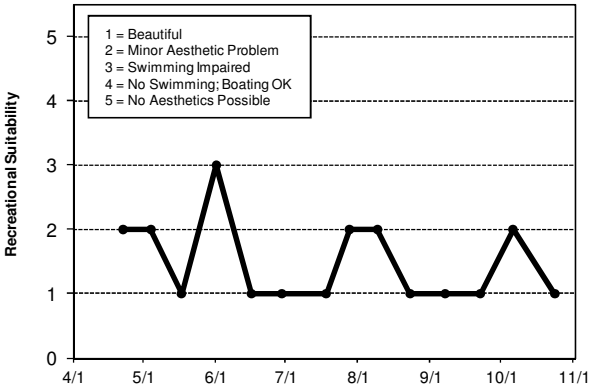


Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus	A	A	B	A	B	A	A	A
Chlorophyll a	A	A	A	A	A	A	A	A
Secchi Depth	A	A	A	A	A	A	A	A
Lake Grade	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**



Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	33.8	18.0	60.0	C
CLA (µg/l)	10.5	2.6	26.0	B
Secchi (m)	2.1	1.4	4.2	C
TKN (mg/l)	0.93	0.60	1.40	
			Lake Grade	C

The lake received a lake grade of C in 2011, which is similar to previous year's grades. Continued monitoring is recommened to continue to build the water quality database for this lake.

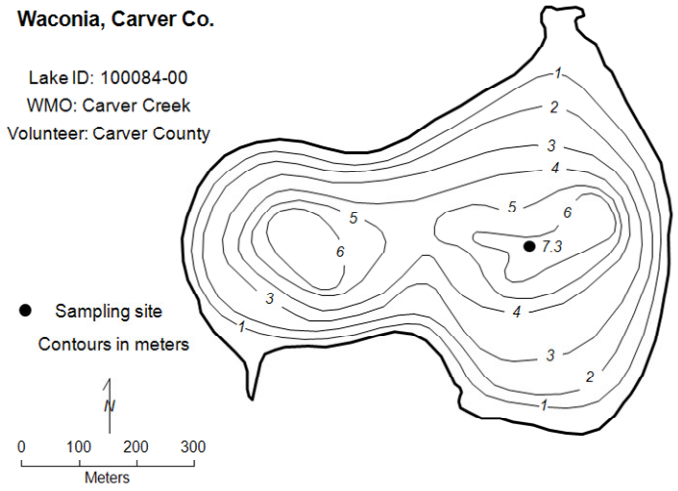
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

Burandt Lake
Waconia, Carver Co.

Lake ID: 100084-00
WMO: Carver Creek
Volunteer: Carver County



2011 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 (1-5)	RS (1-5)
4/21/2011	6.68		15.2		13	42		1.9	2	2
5/3/2011	8.5		18.3		10	31		1.8	2	2
5/17/2011	14.2		9.8		5	33		2.4	2	2
6/6/2011	23.47		10.1		3.9	28		2	3	3
6/13/2011	19.97		8.2		2.6	18		4.2	2	2
6/29/2011	22.54		11.9		6.5	23		2	2	2
7/13/2011	26.22		8.9		9.3	38		2.1	2	2
7/28/2011	27.84		9.4		26	42		1.4	3	3
8/9/2011	25.47		5.8		20	37		1.4	3	3
8/22/2011	24.45		6.6		15	30		1.7	3	3
9/7/2011	21.6		8.7		12	60		2	2	2
9/22/2011	16.67		9.4		4.8	32		2.6	2	2
10/5/2011	16.88		9.4		10	31		2	3	2
10/24/2011	10.3		8.2		7.4	29		2.2	3	3

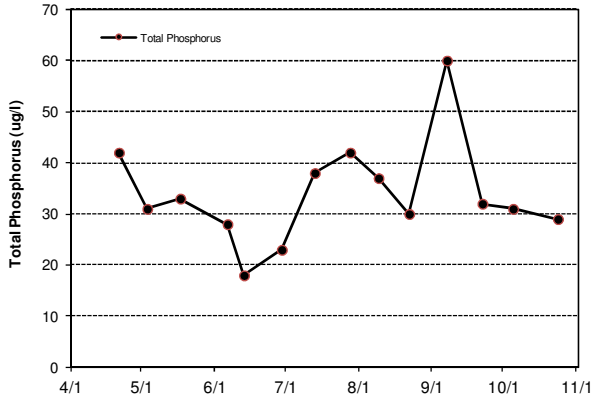
Lake Water Quality Grades Based on Summertime Averages

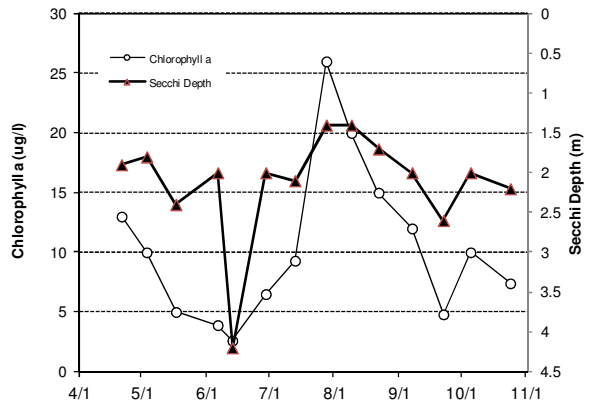
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

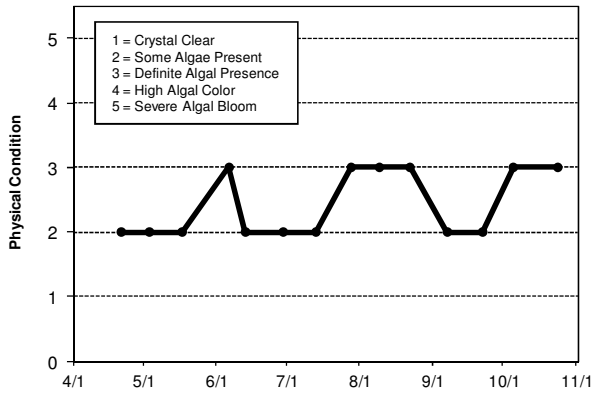
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus								D	C	C		
Chlorophyll a								C	C	C		
Secchi Depth								D	D	D		
Lake Grade								**D**	**C**	**C**		

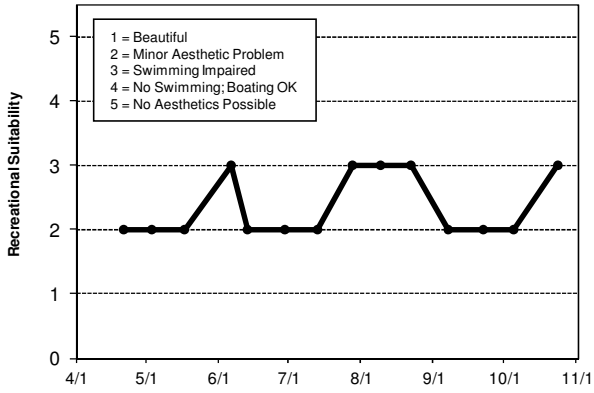
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	C					C	C
Chlorophyll a	C	C					C	B
Secchi Depth	C	C					C	C
Lake Grade	**C**	**C**				**NA**	**C**	**C**

Source: Metropolitan Council and STORET data









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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	16.0	10.0	24.0	A
CLA (µg/l)	3.9	1.8	5.4	A
Secchi (m)	2.9	2.4	3.8	B
TKN (mg/l)	0.68	0.59	0.77	
			Lake Grade	A

For 2011, the lake received a lake grade of A. The lake grades appear to fluctuate between 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 2011).

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

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

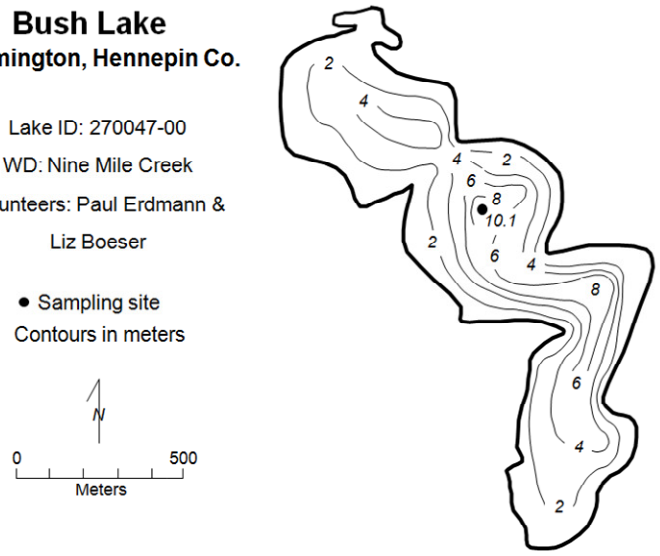
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Bush Lake
Bloomington, Hennepin Co.

Lake ID: 270047-00

WD: Nine Mile Creek

Volunteers: Paul Erdmann & Liz Boeser

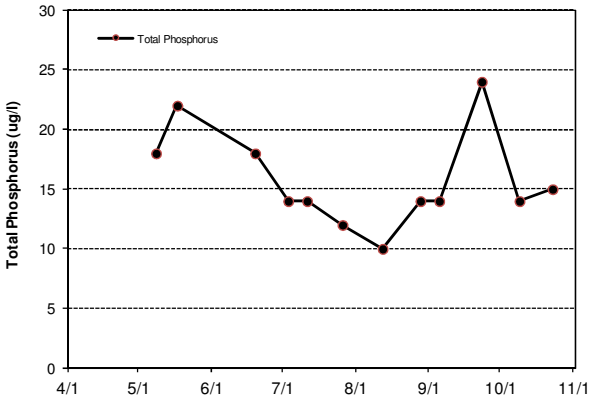


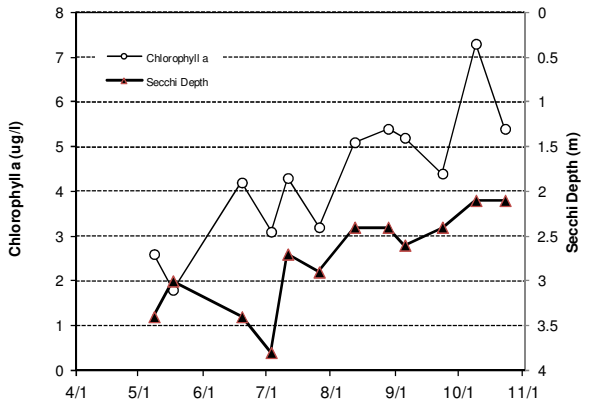
● Sampling site

Contours in meters

2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/8/2011	15.9				2.6	18		3.4	1	1
5/17/2011	16.2				1.8	22		3	1	1
6/19/2011	23.1				4.2	18		3.4	2	2
7/3/2011	29.4				3.1	14		3.8	2	2
7/11/2011	29.7				4.3	14		2.7	2	2
7/26/2011	29.3				3.2	12		2.9	2	2
8/12/2011	27				5.1	10		2.4	2	2
8/28/2011	27.1				5.4	14		2.4	2	2
9/5/2011	24.6				5.2	14		2.6	2	2
9/23/2011	18				4.4	24		2.4	2	2
10/9/2011	19.4				7.3	14		2.1	2	2
10/23/2011	12.9				5.4	15		2.1	2	2





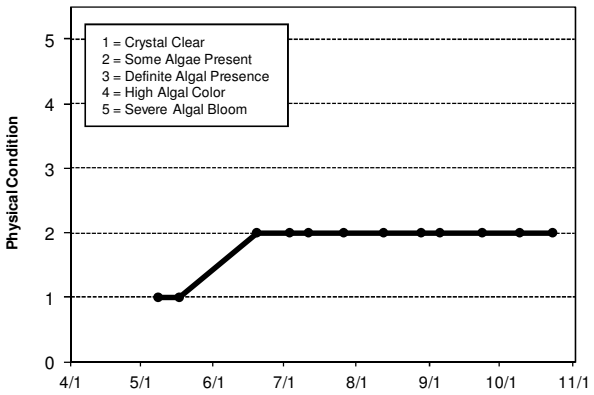
Lake Water Quality Grades Based on Summertime Averages

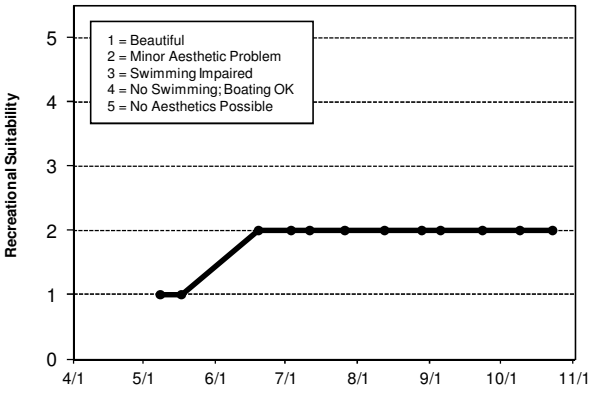
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus				B	A							
Chlorophyll a				B	A							
Secchi Depth				B	A	B	A	B	C			
Lake Grade				**B**	**A**							

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	2009	2010	2011
Total Phosphorus	A		A	A	A	A	A	A
Chlorophyll a	B		A	B	A	A	A	A
Secchi Depth	B		B	B	A	A	B	B
Lake Grade	**B**		**A**	**B**	**A**	**A**	**A**	**A**

Source: Metropolitan Council and STORET data





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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	25.6	17.0	47.0	B
CLA (µg/l)	8.7	2.6	41.0	A
Secchi (m)	2.0	1.6	2.7	C
TKN (mg/l)	0.73	0.29	0.99	
			Lake Grade	B

The lake received a lake grade of B for 2011, which is consistent with its historical database. Continued monitoring is suggested to determine if long term water clarity is changing in the lake.

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

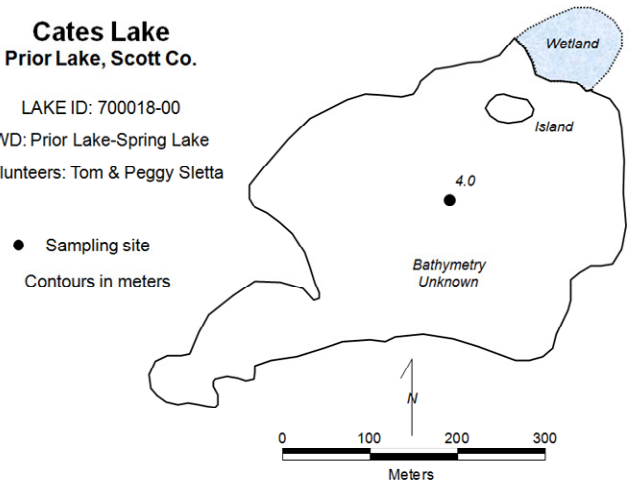
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

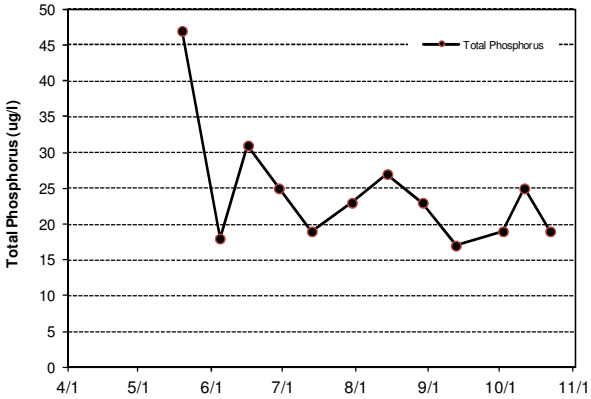
Cates Lake
Prior Lake, Scott Co.

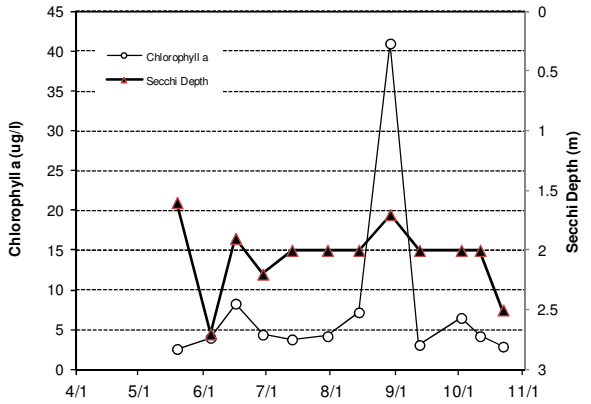
LAKE ID: 700018-00

WD: Prior Lake-Spring Lake

Volunteers: Tom & Peggy Sletta

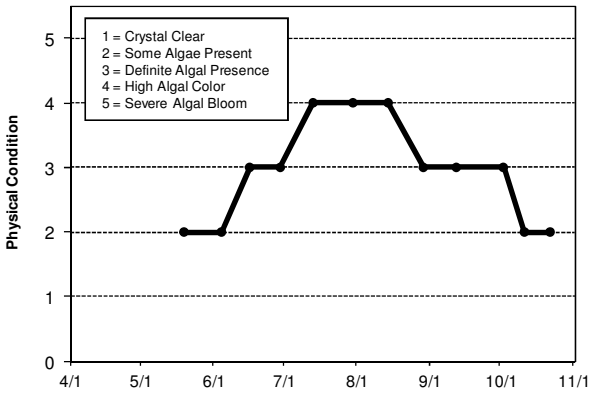






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/19/2011	18				2.6	47		1.6	2	4
6/4/2011	21.5				4	18		2.7	2	4
6/16/2011	24.2				8.3	31		1.9	3	4
6/29/2011	22.5				4.4	25		2.2	3	4
7/13/2011	26.2				3.8	19		2	4	4
7/30/2011	28.1				4.2	23		2	4	4
8/14/2011	24.3				7.2	27		2	4	4
8/29/2011	23.4				41	23		1.7	3	4
9/12/2011	22.9				3.1	17		2	3	4
10/2/2011	16.1				6.5	19		2	3	4
10/11/2011	18.6				4.2	25		2	2	4
10/22/2011	10.4				2.9	19		2.5	2	4

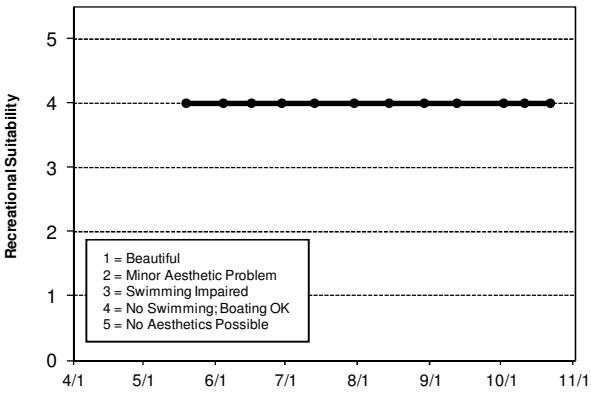


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	B	A	B	A	A	A	A	B
Chlorophyll a	A	A	A	A	A	A	A	A
Secchi Depth	C	C	C	C	C	C	B	C
Lake Grade	**B**	**B**	**B**	**B**	**B**	**B**	**A**	**B**



Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	170.6	36.0	340.0	F
CLA (µg/l)	68.1	3.5	210.0	D
Secchi (m)	1.0	0.3	2.6	D
TKN (mg/l)	1.81	1.10	3.10	
			Lake Grade	D

The lake received a lake grade of D for 2011, which is consistent with the lake's historic database. The lake's water quality seems to be best represented by a lake grade of D.

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

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

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

Cedar Lake

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

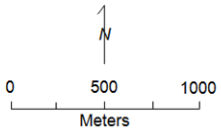
LAKE ID: 700091-00

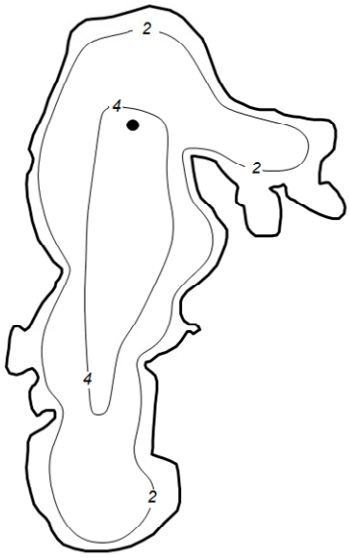
WMO: Sand Creek

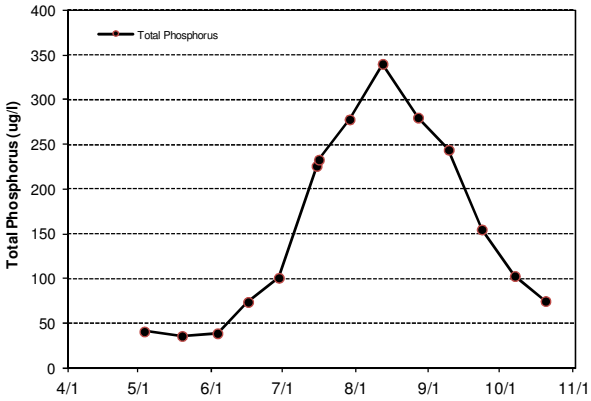
Volunteer: Jerry Edberg

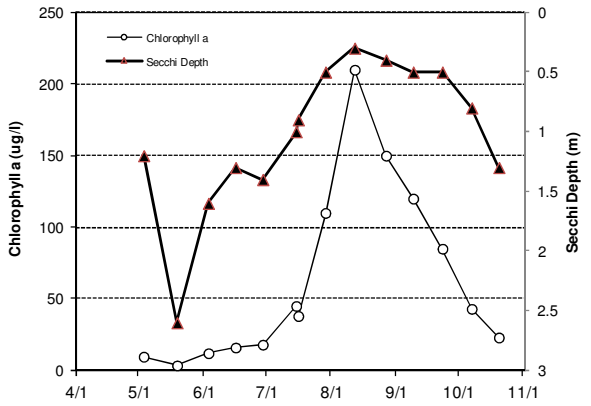
● Sampling site

Contours in meters



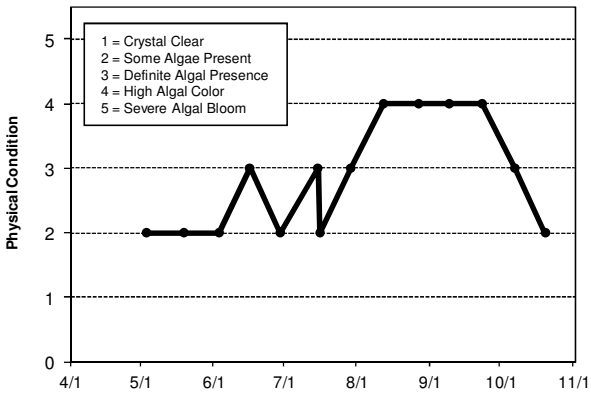






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/3/2011	9				9.6	41		1.2	2	1
5/19/2011	16.3				3.5	36		2.6	2	1
6/3/2011	19				12	39		1.6	2	1
6/16/2011	20.9				16	74		1.3	3	3
6/29/2011	22.3				18	101		1.4	2	2
7/15/2011	23				45	226		1	3	2
7/16/2011	23.7				38	233		0.9	2	2
7/29/2011	26.8				110	278		0.5	3	2
8/12/2011	24.8				210	340		0.3	4	3
8/27/2011	25.1				150	280		0.4	4	2
9/9/2011	21.6				120	244		0.5	4	2
9/23/2011	15.5				85	155		0.5	4	3
10/7/2011	15.9				43	103		0.8	3	2
10/20/2011	9.8				23	75		1.3	2	1

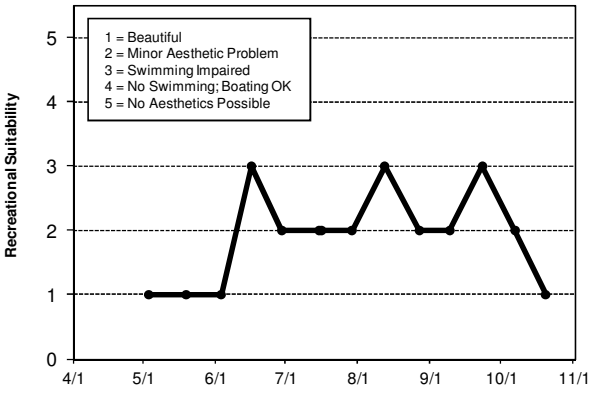


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		D	F	F	F		F	F
Chlorophyll a		C	D	D	D		D	D
Secchi Depth		C	D	D	D		D	D
Lake Grade		**C**	**D**	**D**	**D**	**NA**	**D**	**D**



Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	26.2	14.0	55.0	B
CLA (µg/l)	3.0	1.3	6.2	A
Secchi (m)	1.9	1.2	2.6	C
TKN (mg/l)	0.88	0.48	3.40	
			Lake Grade	B

The lake received a water quality lake grade of B for 2011. The lake has received A grades for CLA since 1997. This was the first year in the lake's historical database where it received a B grade for TP. The lake has received only A grades prior 2011. The annual mean summer-time water clarity grade has varied in the range of A to C.

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

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

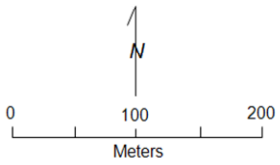
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

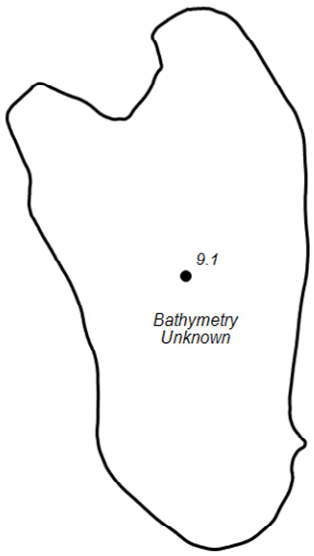
Lake Cenaiko

Coon Rapids, Anoka Co.

Lake ID: 20654-00
WD: Coon Creek
Volunteer: Anoka Co. Parks

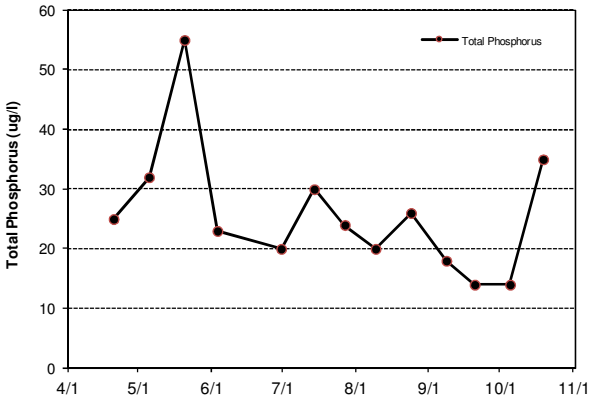
● Sampling site
Contours in meters

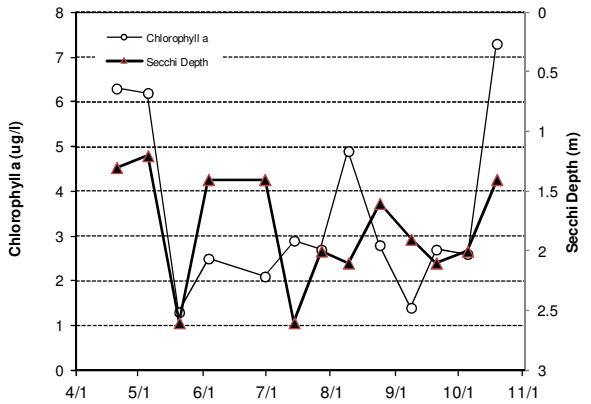


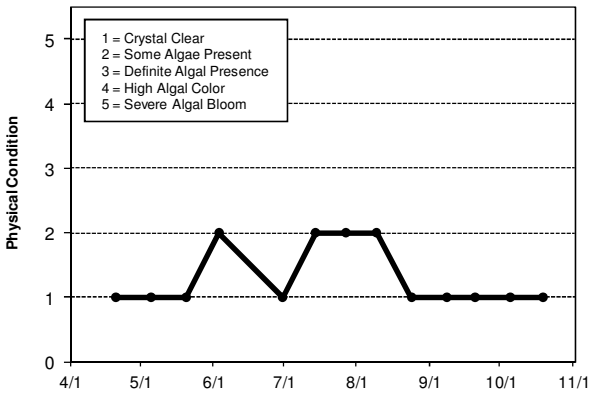


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/20/2011	7				6.3	25		1.3	1	
5/5/2011	9.4				6.2	32		1.2	1	1
5/20/2011	16.9				1.3	55		2.6	1	1
6/3/2011	19.1				2.5	23		1.4	2	
6/30/2011	26				2.1	20		1.4	1	
7/14/2011	24.5				2.9	30		2.6	2	
7/27/2011	26.9				2.7	24		2	2	
8/9/2011	25.7				4.9	20		2.1	2	
8/24/2011	25.4				2.8	26		1.6	1	1
9/8/2011	22.9				1.4	18		1.9	1	1
9/20/2011	17.1				2.7	14		2.1	1	1
10/5/2011	17.1				2.6	14		2	1	1
10/19/2011	11.6				7.3	35		1.4	1	1







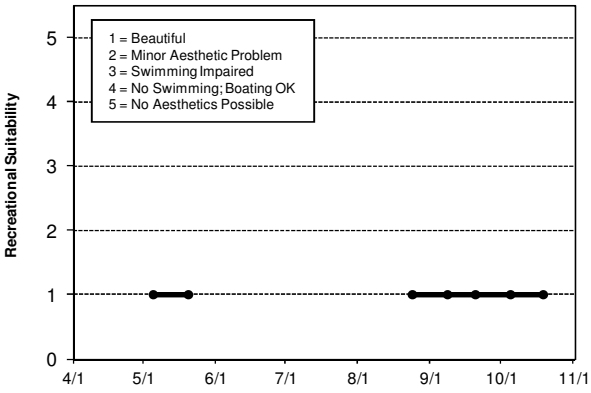
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	A	A	A	A	A	A	A	B
Chlorophyll a	A	A	A	A	A	A	A	A
Secchi Depth	B	B	A	B	C	C	C	C
Lake Grade	**A**	**A**	**A**	**A**	**B**	**B**	**B**	**B**

Source: Metropolitan Council and STORET data



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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)				
CLA (µg/l)				
Secchi (m)	6.0	4.3	6.8	A
TKN (mg/l)				
			Lake Grade	

The lake received a Secchi grade of A for 2011. TP, TKN, and CLA were not monitored in 2011. To better understand the lake's water quality and determine potential trends, additional years of data collection are needed.

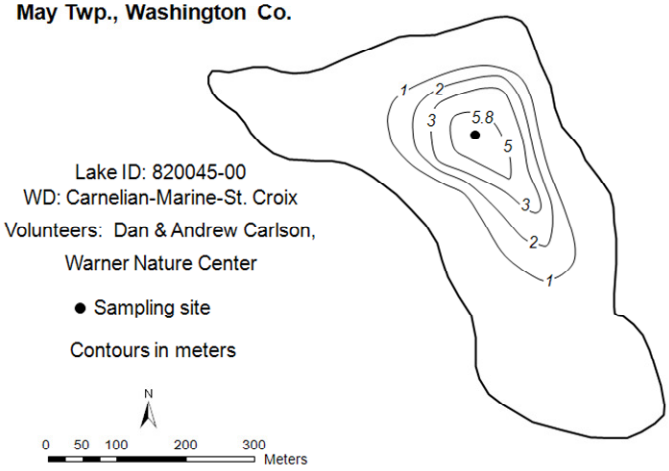
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

Clear Lake

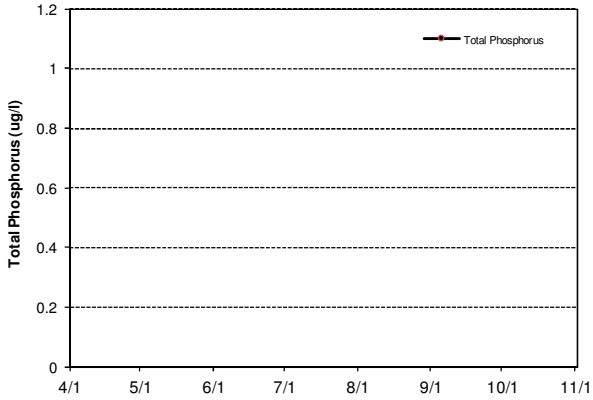
May Twp., Washington Co.

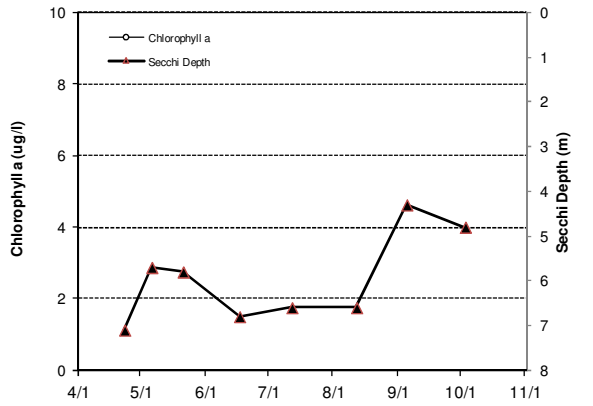


Lake ID: 820045-00
WD: Carnelian-Marine-St. Croix
Volunteers: Dan & Andrew Carlson, Warner Nature Center

● Sampling site

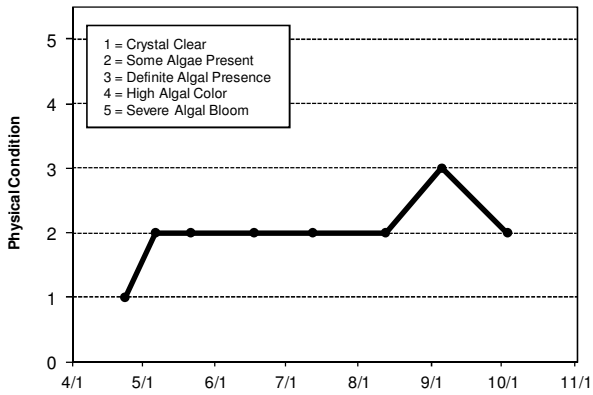
Contours in meters





2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/23/2011	7.1							7.1	1	1
5/6/2011	12.4							5.7	2	1
5/21/2011	17.8							5.8	2	1
6/17/2011	21.7							6.8	2	2
7/12/2011	28.4							6.6	2	2
8/12/2011	28.4							6.6	2	1
9/5/2011	23.9							4.3	3	2
10/3/2011	15							4.8	2	2

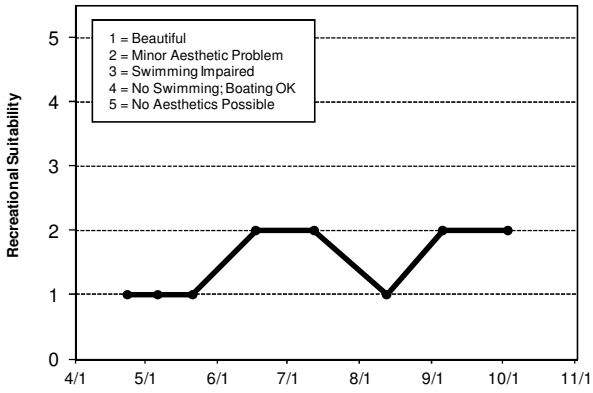


Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus					A	A	A	
Chlorophyll a					A	A	A	
Secchi Depth					A	A	A	A
Lake Grade					**A**	**A**	**A**	**NA**



Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	31.4	22.0	54.0	B
CLA (µg/l)	4.1	1.0	10.0	A
Secchi (m)	3.4	1.8	5.5	A
TKN (mg/l)	0.79	0.64	1.00	
			Lake Grade	A

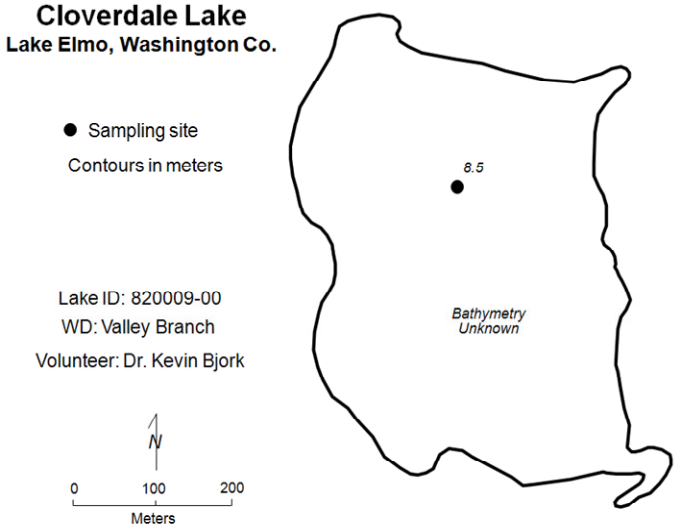
The lake received a lake grade of A for 2011, which is similar to grade received in 2005. According to its historical database, the lake has received mainly lake grades of B with the occasional C and A. The historical database suggests that the lake is represented overall by a lake grade of B.

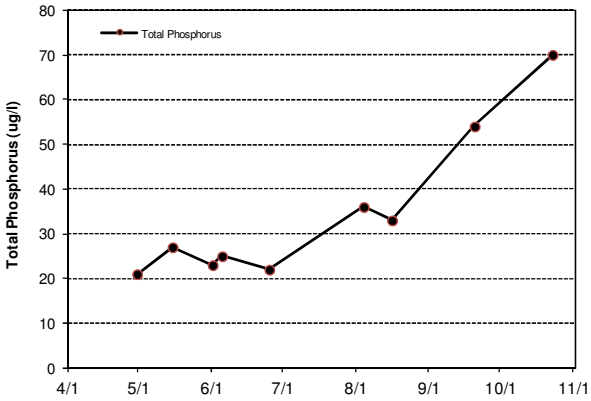
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

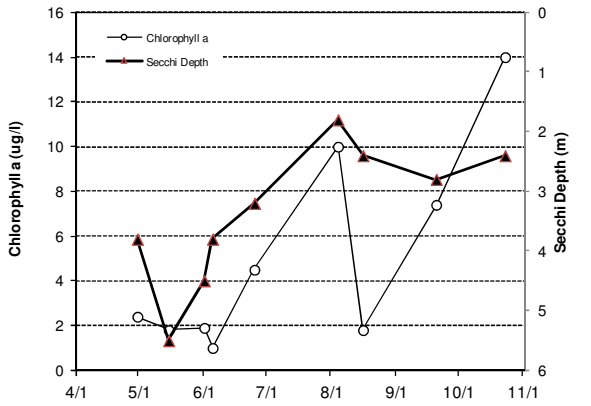
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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

Cloverdale Lake
Lake Elmo, Washington Co.

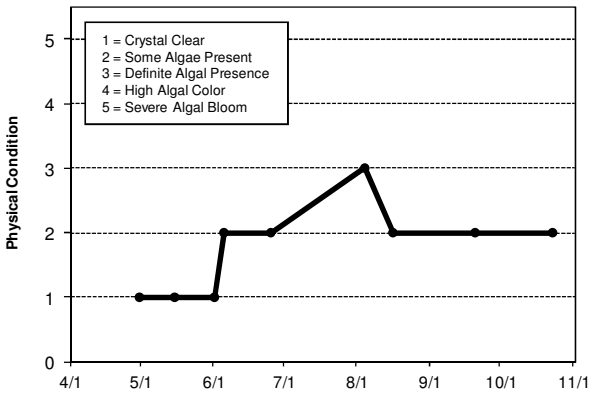






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/30/2011	10.8				2.4	21		3.8	1	1
5/15/2011	14.7				1.8	27		5.5	1	1
6/1/2011	19.6				1.9	23		4.5	1	1
6/5/2011	23.9				1	25		3.8	2	1
6/25/2011	21.4				4.5	22		3.2	2	1
8/4/2011	29				10	36		1.8	3	3
8/16/2011	28				1.8	33		2.4	2	2
9/20/2011	18.9				7.4	54		2.8	2	2
10/23/2011	12.2				14	70		2.4	2	2

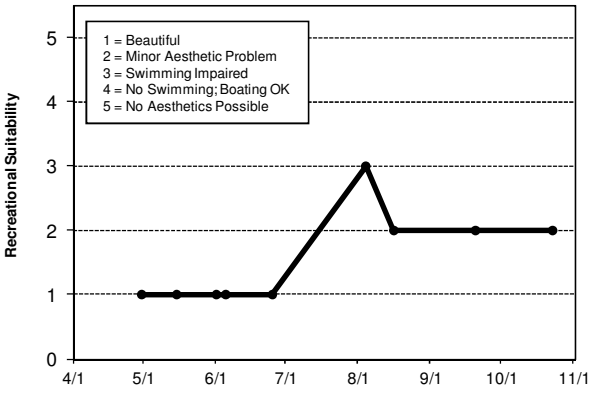


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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	2009	2010	2011
Total Phosphorus	C	B	B	B	B	C	C	B
Chlorophyll a	B	A	B	A	B	A	B	A
Secchi Depth	A	A	A	B	B	B	B	A
Lake Grade	**B**	**A**	**B**	**B**	**B**	**B**	**B**	**A**



Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	96.0	74.0	119.0	D
CLA (µg/l)	24.8	14.0	41.0	C
Secchi (m)	0.5	0.3	0.7	F
TKN (mg/l)	1.86	1.50	2.30	
			Lake Grade	D

The lake's 2011 lake grade of D is an improvement over the F grades received since 2004. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

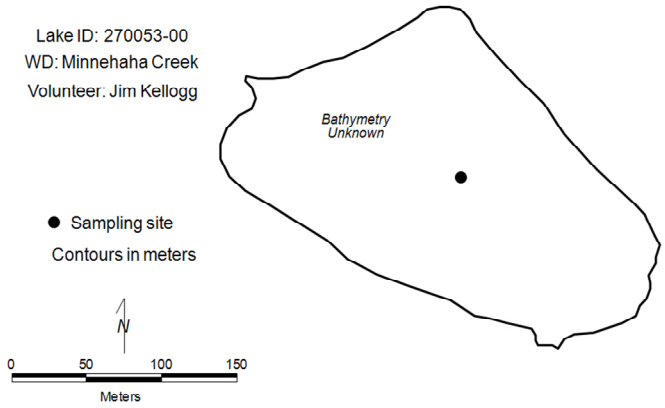
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

Cobblecrest Lake

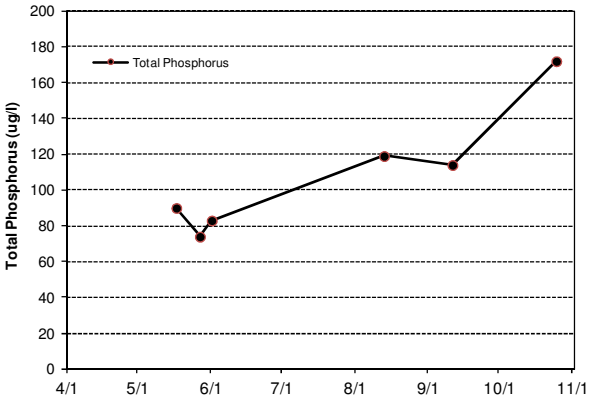
St. Louis Park, Hennepin Co.

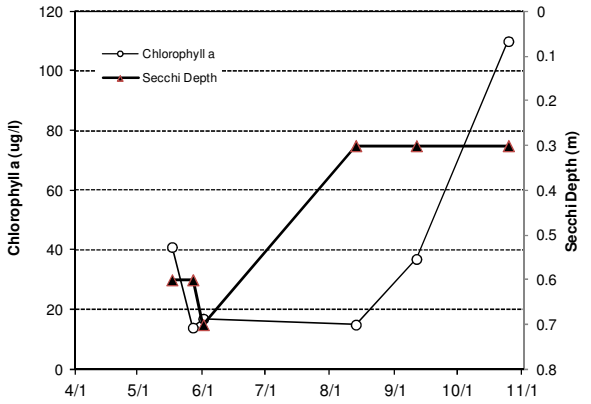
Lake ID: 270053-00
WD: Minnehaha Creek
Volunteer: Jim Kellogg

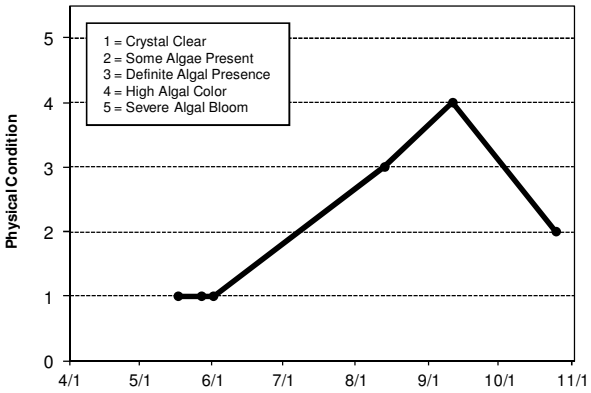


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/17/2011	18.5				41	90		0.6	1	4
5/27/2011	17.4				14	74		0.6	1	4
6/1/2011	21				17	83		0.7	1	4
8/13/2011	23.2				15	119		0.3	3	4
9/11/2011	24.3				37	114		0.3	4	4
10/25/2011	10.3				110	172		0.3	2	4





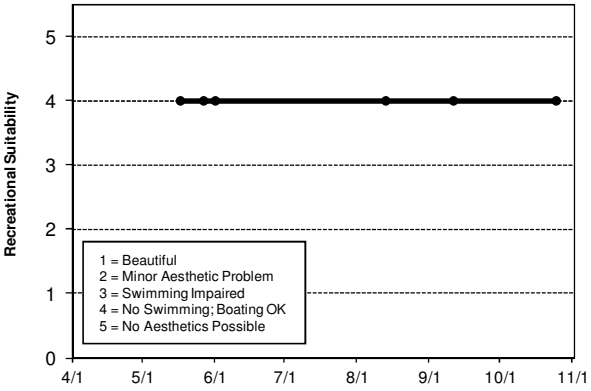


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	D	F	D	F	F	F	D	D
Chlorophyll a	F	F	F	F	F	F	F	C
Secchi Depth	F	F	F	F	F	F	F	F
Lake Grade	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**D**



Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	59.5	33.0	101.0	C
CLA (µg/l)	20.7	1.5	60.0	C
Secchi (m)	1.0	0.7	1.7	D
TKN (mg/l)	1.10	0.78	1.50	
			Lake Grade	C

The lake received a lake grade of C for 2011 which is similar to the lake grades received for the previous 5 years. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

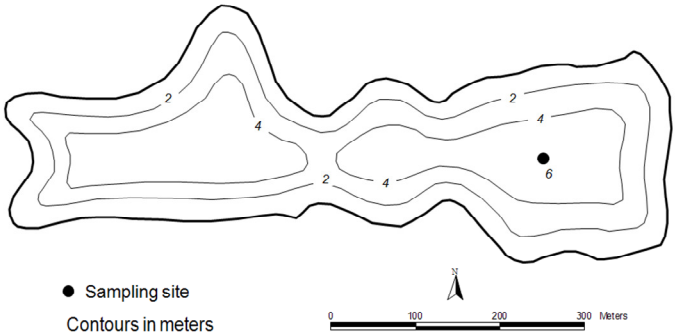
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

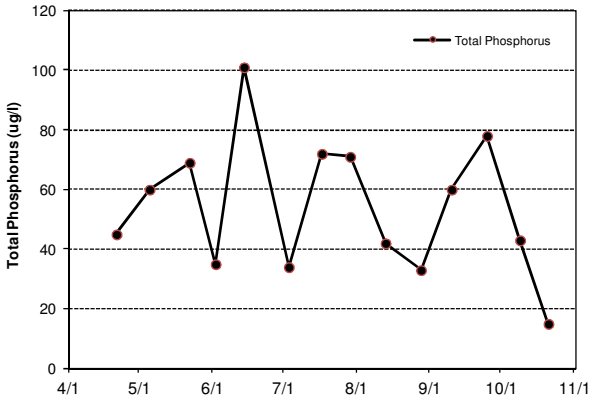
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

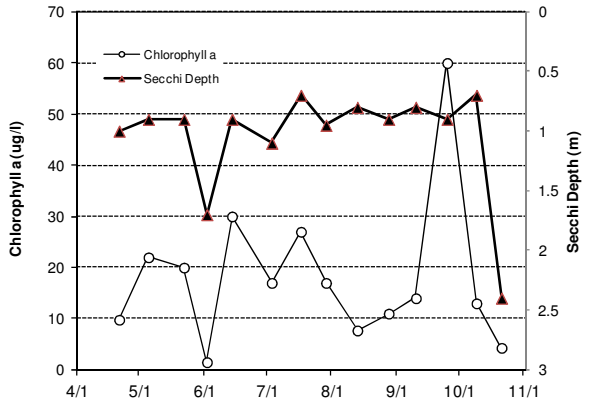
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Cobblestone Lake
Apple Valley, Dakota Co.

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

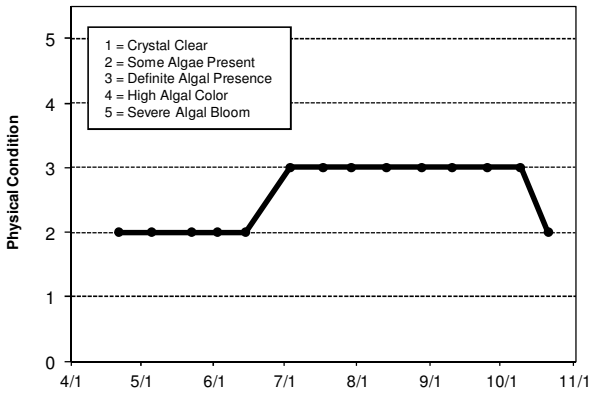






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	8.5				9.8	45		1	2	2
5/5/2011	11.7				22	60		0.9	2	2
5/22/2011	16.7				20	69		0.9	2	2
6/2/2011	18				1.5	35		1.7	2	2
6/14/2011	20.7				30	101		0.9	2	
7/3/2011	25				17	34		1.1	3	3
7/17/2011					27	72		0.7	3	2
7/29/2011	27.9				17	71		0.95	3	3
8/13/2011	22.8				7.7	42		0.8	3	
8/28/2011	24.2				11	33		0.9	3	3
9/10/2011	21.8				14	60		0.8	3	3
9/25/2011	14.3				60	78		0.9	3	3
10/9/2011	17.5				13	43		0.7	3	3
10/21/2011	10.5				4.3	15		2.4	2	1

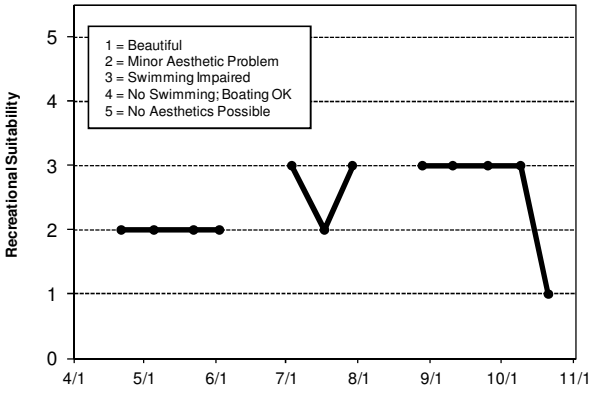


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		D	C	C	C	C	C	C
Chlorophyll a		D	C	C	C	B	C	C
Secchi Depth		F	D	D	D	D	D	D
Lake Grade		**D**	**C**	**C**	**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. The lake has a surface area of 71 acres and a maximum depth of 3.4 m (11 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has a watershed area of 8,088 acres which gives a large watershed to lake area ratio of 114:1. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	98.7	46.0	171.0	D
CLA (µg/l)	43.7	5.4	130.0	C
Secchi (m)	0.9	0.4	1.5	D
TKN (mg/l)	1.38	0.89	2.70	
			Lake Grade	D

The lake received a water quality lake grade of D for 2011, 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.

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

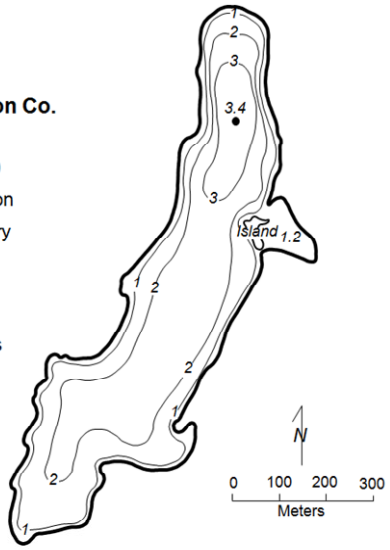
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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

Colby Lake
Woodbury, Washington Co.

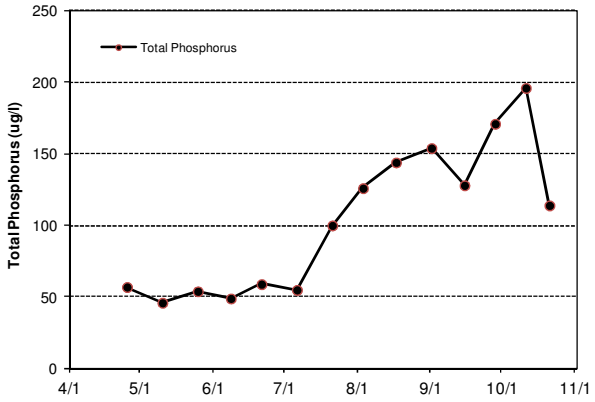
Lake ID: 820094-00
WD: South Washington
Volunteer: Bob Callery

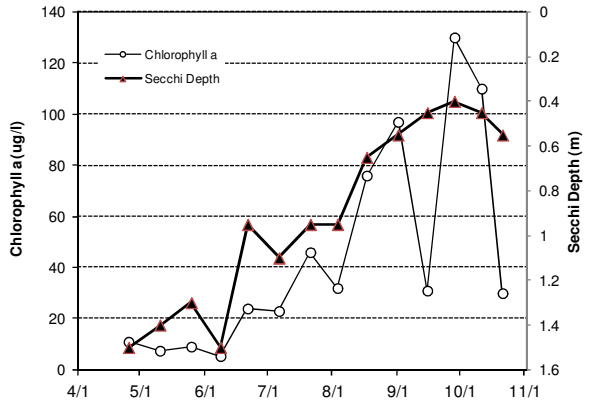
• Sampling site
Contours in meters

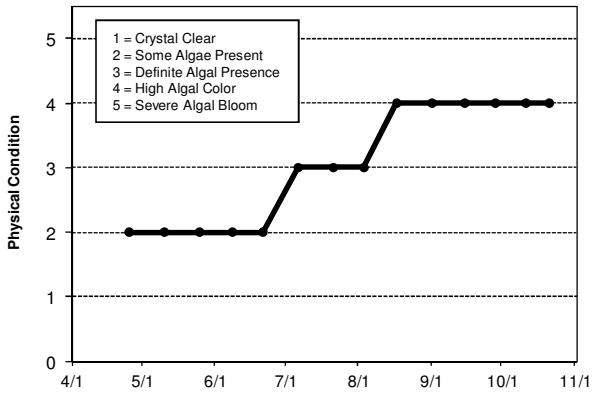


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/25/2011	10.5				11	57		1.5	2	1
5/10/2011	13.9				7.5	46		1.4	2	1
5/25/2011	17.5				9.1	54		1.3	2	1
6/8/2011	24.8				5.4	49		1.5	2	1
6/21/2011	22.1				24	59		0.95	2	1
7/6/2011	26.5				23	55		1.1	3	2
7/21/2011	28.2				46	100		0.95	3	2
8/3/2011	26.7				32	126		0.95	3	2
8/17/2011	24.8				76	144		0.65	4	2
9/1/2011	23.2				97	154		0.55	4	2
9/15/2011	19.1				31	128		0.45	4	2
9/28/2011	15.7				130	171		0.4	4	2
10/11/2011	18.3				110	196		0.45	4	2
10/21/2011	9.2				30	114		0.55	4	2





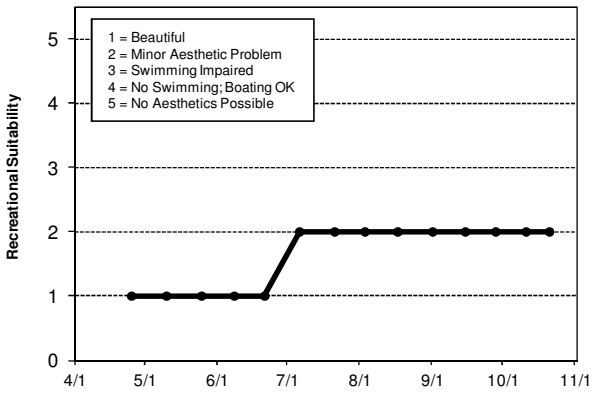


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	D	D	F	D	F		D	D
Chlorophyll a	C	F	F	D	D		C	C
Secchi Depth	F	D	F	F	F		D	D
Lake Grade	**D**	**D**	**F**	**D**	**F**	**NA**	**D**	**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 trout lake that is stocked with rainbow trout. The 10-acre lake has a maximum depth of 17.4 m (57 feet). The lake's level is maintained by groundwater. It has a very small watershed that is completely publicly owned (MDNR 1996).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	20.4	13.0	52.0	A
CLA (µg/l)	4.0	1.9	13.0	A
Secchi (m)	3.6	1.3	5.1	A
TKN (mg/l)	0.70	0.56	0.99	
			Lake Grade	A

The lake received a lake grade of A for 2011, which is consistent with the historical water quality database. The lake's water quality seems well represented by a lake grade of A.

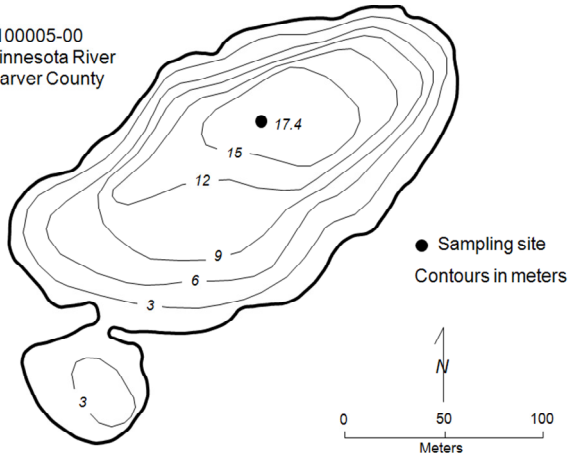
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

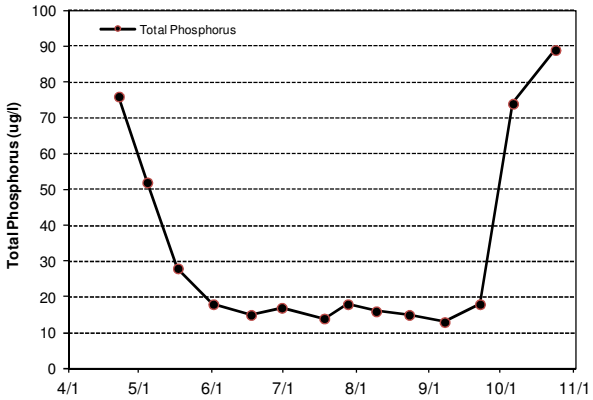
Courthouse Lake
Chaska, Carver Co.

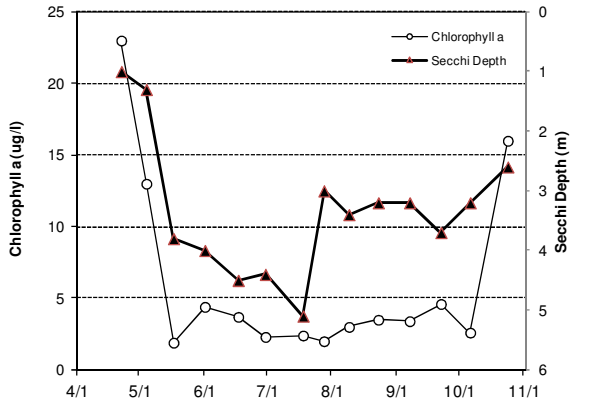
Lake ID: 100005-00
WD: Lower Minnesota River
Volunteer: Carver County

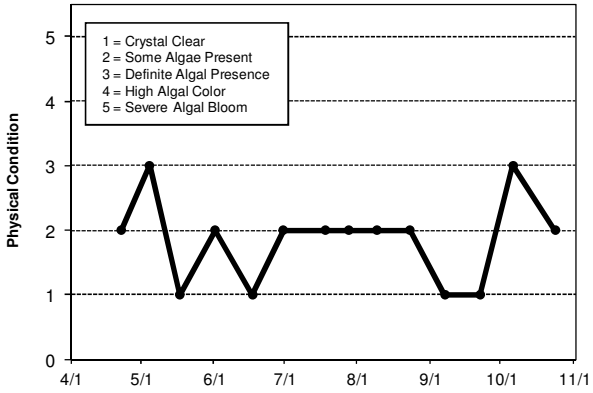


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/22/2011	7.63		19.7		23	76		1	2	3
5/4/2011	10.06		18.9		13	52		1.3	3	3
5/17/2011	14.8		10.1		1.9	28		3.8	1	1
6/1/2011	18.38		9.9		4.4	18		4	2	1
6/17/2011	22.06		10.2		3.7	15		4.5	1	1
6/30/2011	24.35		11.6		2.3	17		4.4	2	2
7/18/2011	28.38		8.8		2.4	14		5.1	2	1
7/28/2011	29.82		7.5		2	18		3	2	2
8/9/2011	27		7.2		3	16		3.4	2	2
8/23/2011	25.43		7.9		3.5	15		3.2	2	2
9/7/2011	24.33		9.9		3.4	13		3.2	1	1
9/22/2011	17.89		10		4.6	18		3.7	1	1
10/6/2011	15.16		6.2		2.6	74		3.2	3	2
10/24/2011	11.8		5.2		16	89		2.6	2	2





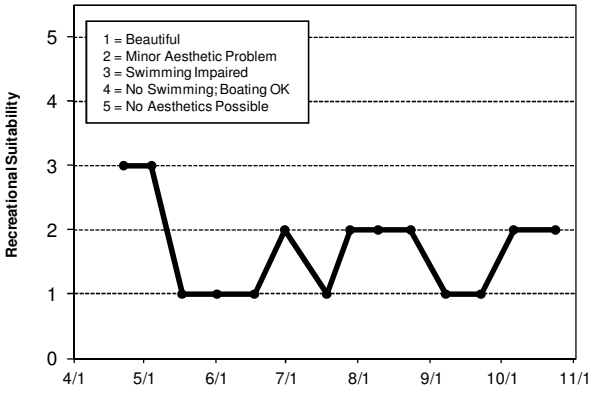


Lake Water Quality Grades Based on Summertime Averages

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					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	2009	2010	2011
Total Phosphorus	A	A	A	A	A	A	B	A
Chlorophyll a	A	A	A	A	A	A	A	A
Secchi Depth	B	A	A	A	A	A	A	A
Lake Grade	**A**	**A**	**A**	**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 (METC 2007). The lake has a surface area of 292 acres. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*). The MPCA has listed the lake as impaired for mercury content in fish.

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

2011 summer (May-September) data summary

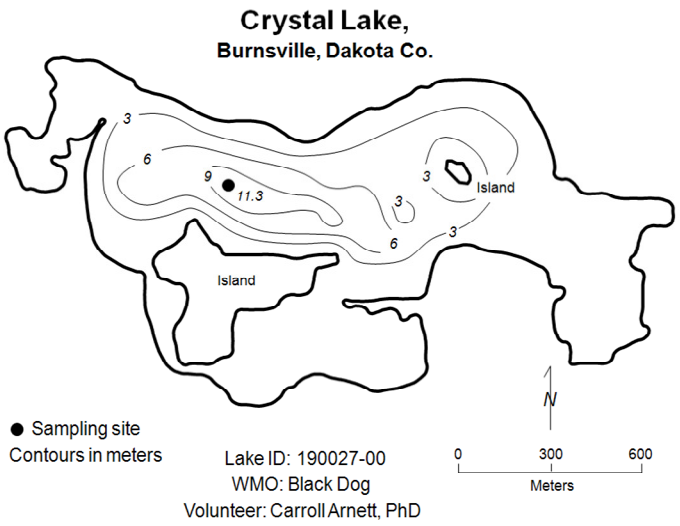
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	22.6	12.0	39.0	A
CLA (µg/l)	12.4	2.5	36.0	B
Secchi (m)	2.1	0.9	3.5	C
TKN (mg/l)	0.81	0.68	1.30	
			Lake Grade	B

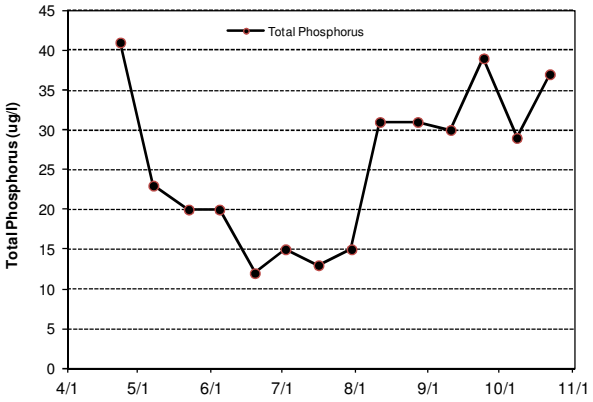
The lake received a lake grade of B for 2011. The lake typically receives a C lake grade, or the occasional B, according to its historical water quality database.

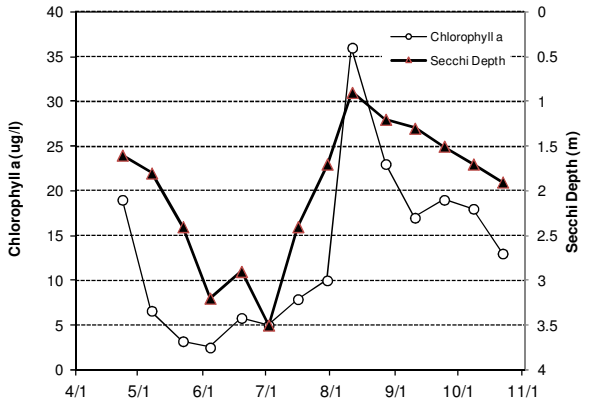
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

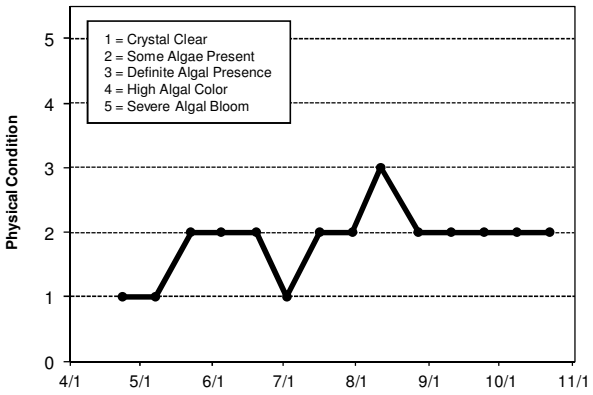






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/23/2011	7.2				19	41		1.6	1	1
5/7/2011	13.1				6.6	23		1.8	1	1
5/22/2011	17.4				3.2	20		2.4	2	1
6/4/2011	21.3				2.5	20		3.2	2	1
6/19/2011	21.8				5.8	12		2.9	2	1
7/2/2011	26.1				5	15		3.5	1	1
7/16/2011	25.2				7.9	13		2.4	2	1
7/30/2011	29.3				10	15		1.7	2	1
8/11/2011	26.2				36	31		0.9	3	2
8/27/2011	25.4				23	31		1.2	2	2
9/10/2011	24.6				17	30		1.3	2	1
9/24/2011	16.9				19	39		1.5	2	2
10/8/2011	17.7				18	29		1.7	2	2
10/22/2011	11.8				13	37		1.9	2	1

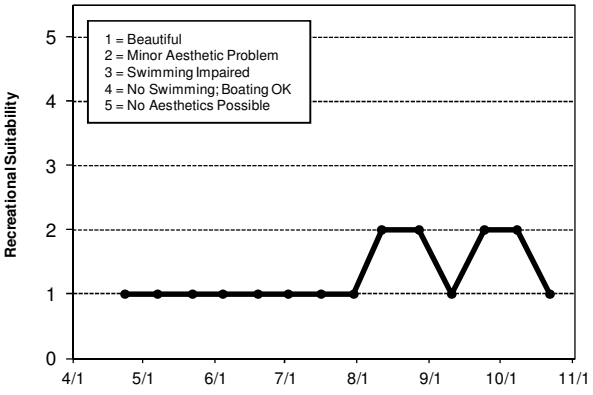


Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus	C	C	C	C	C	B	B	A
Chlorophyll a	B	C	C	C	C	B	C	B
Secchi Depth	C	C	C	C	C	C	C	C
Lake Grade	**C**	**C**	**C**	**C**	**C**	**B**	**C**	**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 are few morphological data available for the lake. Because of the shallowness of the lake, its entire area is considered littoral zone (the 0-15 foot depth area dominated by aquatic vegetation). Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

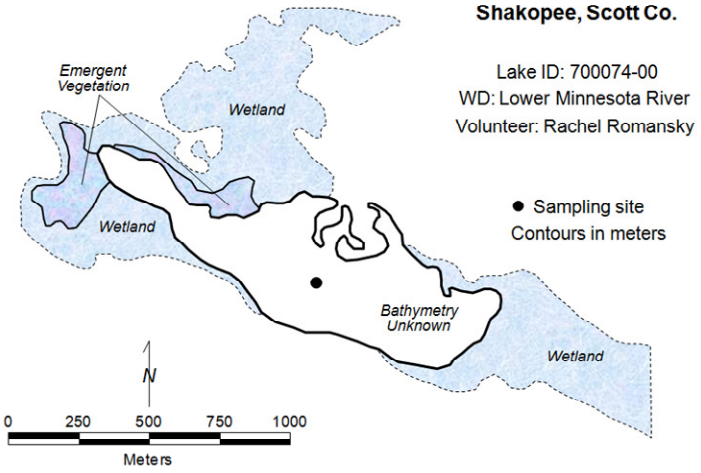
2011 summer (May-September) data summary

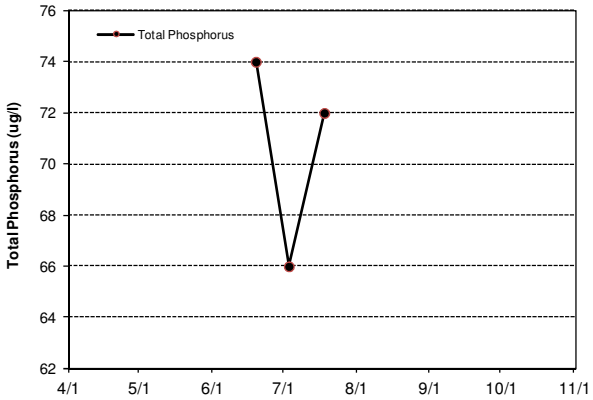
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	70.7	66.0	74.0	
CLA (µg/l)	2.5	1.3	4.3	
Secchi (m)	1.6	1.5	1.8	
TKN (mg/l)	0.89	0.82	0.95	
			Lake Grade	

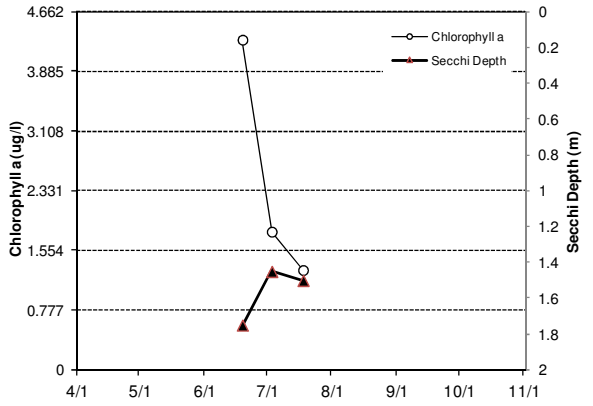
There were insufficient data this year to draw meaningful conclusions.

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

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

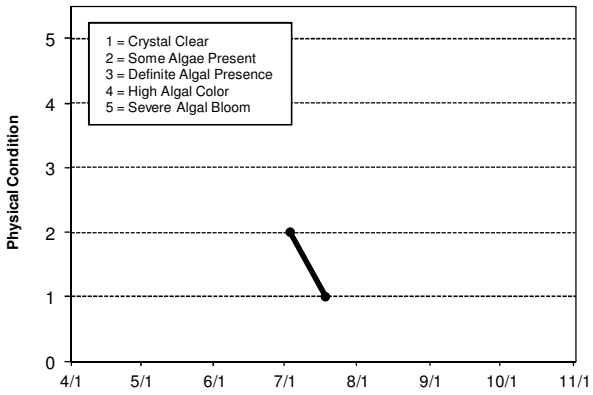






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/19/2011	21.5				4.3	74		1.75		
7/3/2011	25.1				1.8	66		1.45	2	2
7/18/2011	31				1.3	72		1.5	1	1

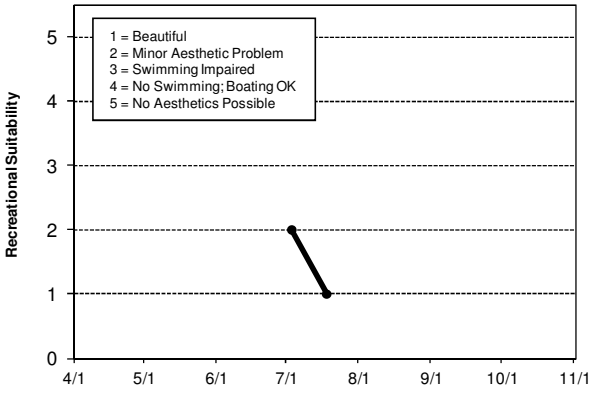


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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	2009	2010	2011
Total Phosphorus	D	F	F	F	F	F	F	
Chlorophyll a	B	C	D	D	C	D	C	
Secchi Depth	F	F	F	F	C		C*	
Lake Grade	**D**	**D**	**F**	**F**	**D**		**C**	**NA**



Source: Metropolitan Council and STORET data

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

Primary Volunteer 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 (METC 2007). The 160-acre lake has a mean and maximum depth of 2.4 m (~8 feet) and 7.3 m (24 feet). The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

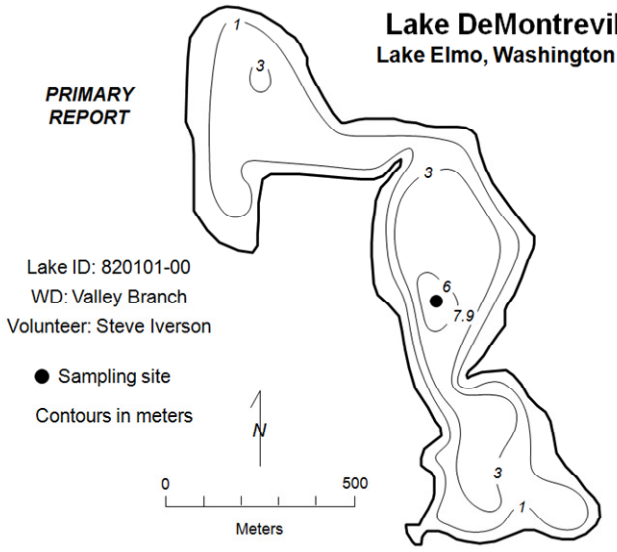
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	18.5	9.0	30.0	A
CLA (µg/l)	7.5	1.1	18.0	A
Secchi (m)	3.4	1.4	7.2	A
TKN (mg/l)	0.70	0.56	0.83	
			Lake Grade	A

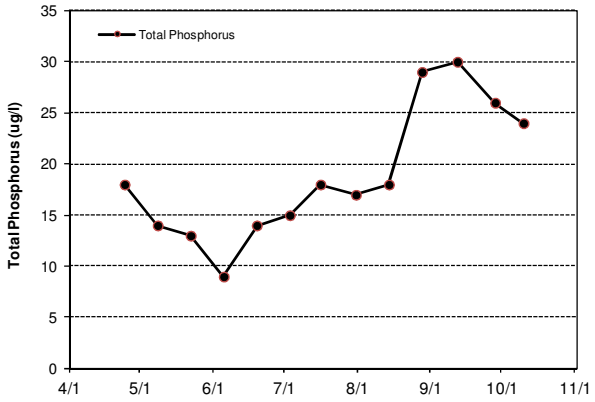
The lake received a lake grade of A for 2011. Historically, the lake grades for the years 1980 through 2010 show that the quality of the lake has improved over the past 30 years (see lake information sheet on the following page). The lake has been fluctuating between an A and B grades since the early 1990s, except for 2007.

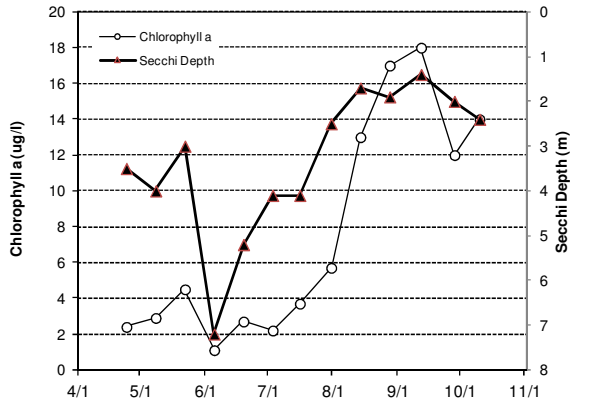
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

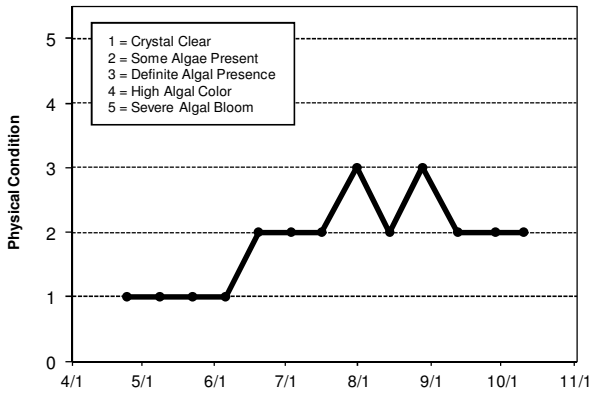






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	9.7				2.4	18		3.5	1	1
5/8/2011	13				2.9	14		4	1	1
5/22/2011	17.9				4.5	13		3	1	1
6/5/2011	23.2				1.1	9		7.2	1	1
6/19/2011	23				2.7	14		5.2	2	1
7/3/2011	27.2				2.2	15		4.1	2	1
7/16/2011	26.1				3.7	18		4.1	2	1
7/31/2011	30.6				5.7	17		2.5	3	2
8/14/2011	27				13	18		1.7	2	2
8/28/2011	25.5				17	29		1.9	3	1
9/12/2011	24.8				18	30		1.4	2	1
9/28/2011	19.8				12	26		2	2	1
10/10/2011	18.4				14	24		2.4	2	1

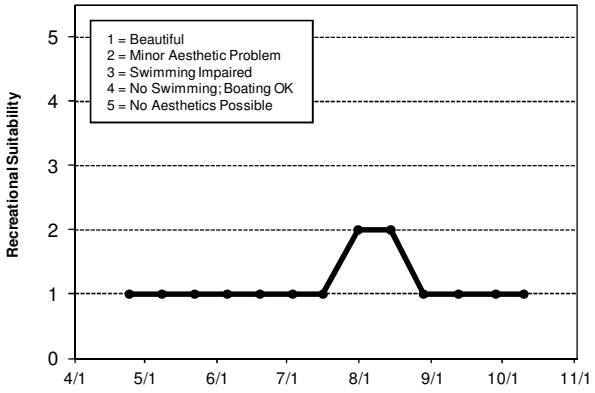


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
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	2009	2010	2011
Total Phosphorus	A	B	C	B	A	B	C	A
Chlorophyll a	A	B	B	C	A	A	B	A
Secchi Depth	B	A	B	C	A	B	A	A
Lake Grade	**A**	**B**	**B**	**C**	**A**	**B**	**B**	**A**



Source: Metropolitan Council and STORET data

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

Secondary Volunteer 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 (METC 2007). The 160-acre lake has a mean and maximum depth of 2.4 m (~8 feet) and 7.3 m (24 feet). The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

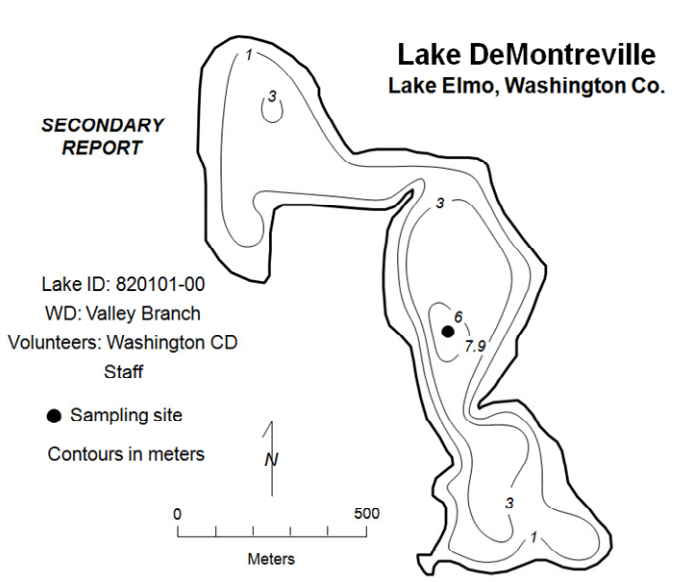
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	20.8	13.0	35.0	A
CLA (µg/l)	11.1	1.3	29.0	B
Secchi (m)	4.0	1.7	6.1	A
TKN (mg/l)	0.99	0.72	1.50	
			Lake Grade	A

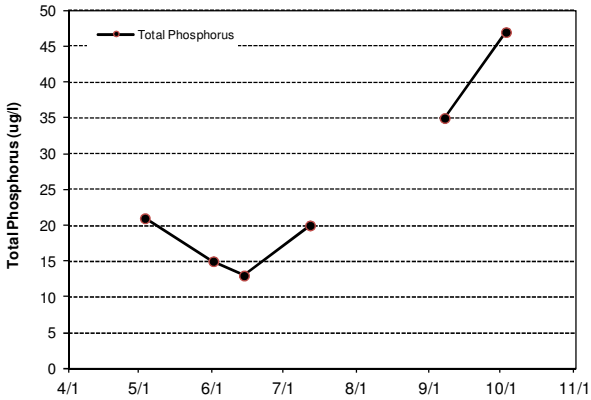
The lake received a lake grade of A for 2011. Historically, the lake grades for the years 1980 through 2010 show that the quality of the lake has improved over the past 30 years (see lake information sheet on the following page). The lake has been fluctuating between an A and B grades since the early 1990s, except for 2007.

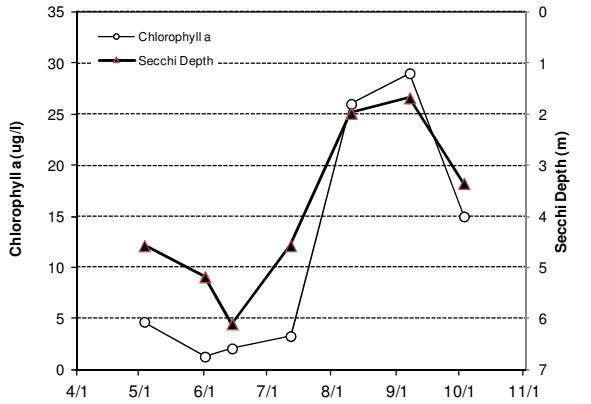
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

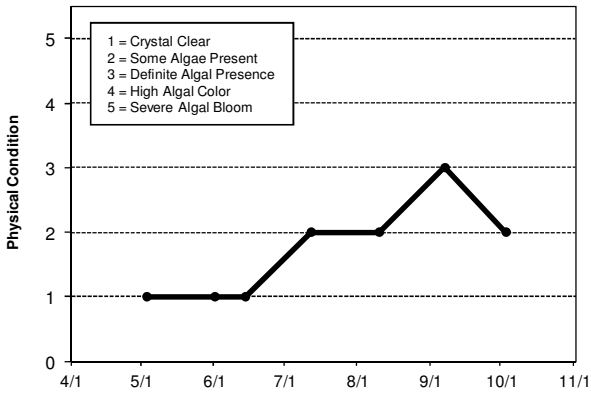
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at http://www.dnr.state.mn.us/lakefind/.

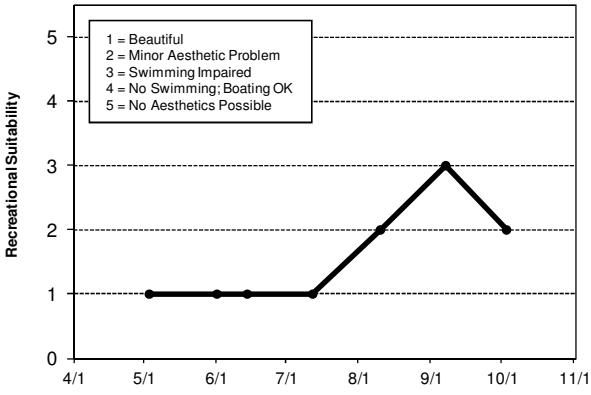
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/3/2011	8.1	7.7	11.1	0.2	4.7	21		4.57	1	1
6/1/2011	18.4	10.4	8.2	0.1	1.3	15		5.18	1	1
6/14/2011	21.2	11.3	10.6	0.1	2.1	13		6.1	1	1
7/12/2011	27.3	12.1	8.4	0.1	3.3	20		4.57	2	1
8/10/2011	25.7	12.6	7.5	0	26			1.98	2	2
9/7/2011	23.9	13	8.6	0.1	29	35		1.68	3	3
10/3/2011	16.3	15	8.8	0.1	15	47		3.35	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							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	2009	2010	2011
Total Phosphorus	A	B	C	B	A	B	C	A
Chlorophyll a	A	B	B	C	A	A	B	B
Secchi Depth	B	A	B	C	A	B	A	A
Lake Grade	**A**	**B**	**B**	**C**	**A**	**B**	**B**	**A**

Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	180.1	72.0	255.0	F
CLA (µg/l)	70.7	30.0	100.0	D
Secchi (m)	0.6	0.4	0.9	F
TKN (mg/l)	2.19	1.70	2.70	
			Lake Grade	F

The lake received a lake grade of F for 2011. The lake grades have fluctuated between D and F since 1980. The frequency of F grades appears to have increased since 2006 however. Continued monitoring is recommended to help determine if this apparent change of frequency of F grades is an indicator of potential worsening of water quality conditions.

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

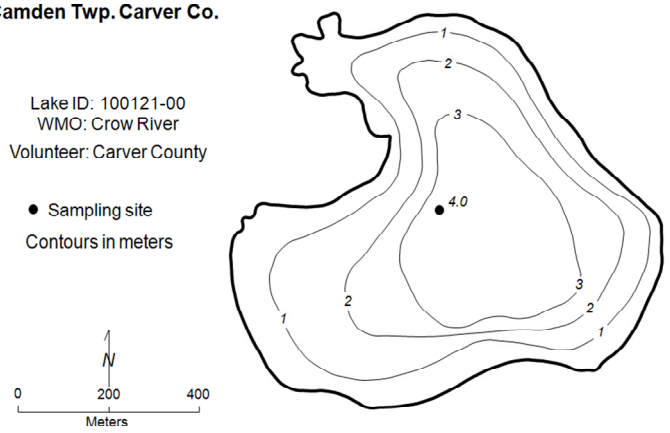
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

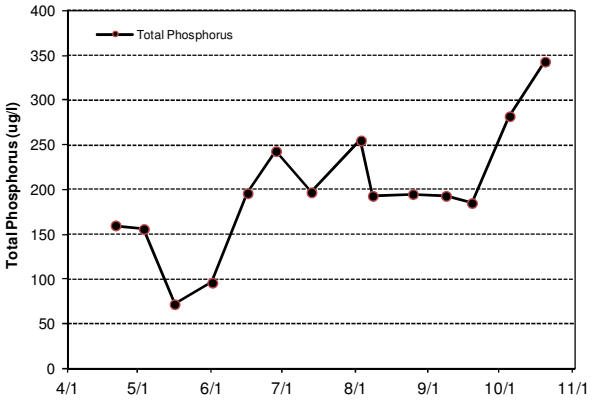
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

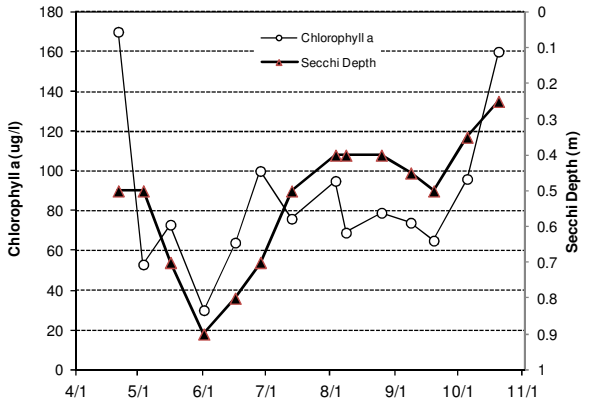
Eagle Lake,
Camden Twp. Carver Co.

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

● Sampling site
Contours in meters

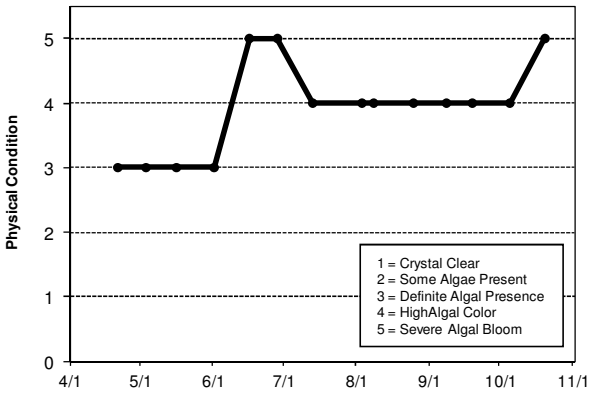






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	6.52		24.4		170	160		0.5	3	3
5/3/2011	6.71		18.1		53	156		0.5	3	3
5/16/2011	13.31		12.1		73	72		0.7	3	3
6/1/2011	17.87		7.5		30	96		0.9	3	3
6/16/2011	20.5		8.4		64	196		0.8	5	5
6/28/2011	20.48		13		100	243		0.7	5	4
7/13/2011	25.35		10.2		76	197		0.5	4	4
8/3/2011	26.34		6.1		95	255		0.4	4	4
8/8/2011	26.5		9.5		69	193		0.4	4	4
8/25/2011	25.08		9		79	195		0.4	4	4
9/8/2011	21.32		13.1		74	193		0.45	4	4
9/19/2011	16.64		10		65	185		0.5	4	4
10/5/2011	15.4		9.6		96	282		0.35	4	4
10/20/2011	9.13		9.6		160	343		0.25	5	4

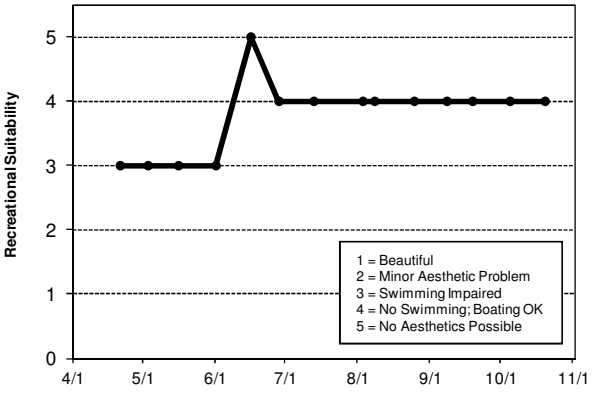


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	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	2009	2010	2011
Total Phosphorus	F	D	F	F	F	F	D	F
Chlorophyll a	C	C	F	F	F	F	D	D
Secchi Depth	D	C	D	F	F	F	F	F
Lake Grade	**D**	**C**	**F**	**F**	**F**	**F**	**D**	**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 entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake's 11,502-acre watershed translates to a large watershed-to-lake size ratio of 96:1, which is a large ratio. The greater the ratio, the greater the potential stress on the lake from surface runoff.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	106.2	60.0	214.0	D
CLA (µg/l)	68.0	19.0	210.0	D
Secchi (m)	1.0	0.6	1.7	D
TKN (mg/l)	1.52	1.00	2.00	
			Lake Grade	D

The lake received a lake grade of D for 2011. There are insufficient data to determine trends in the lake's water quality. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

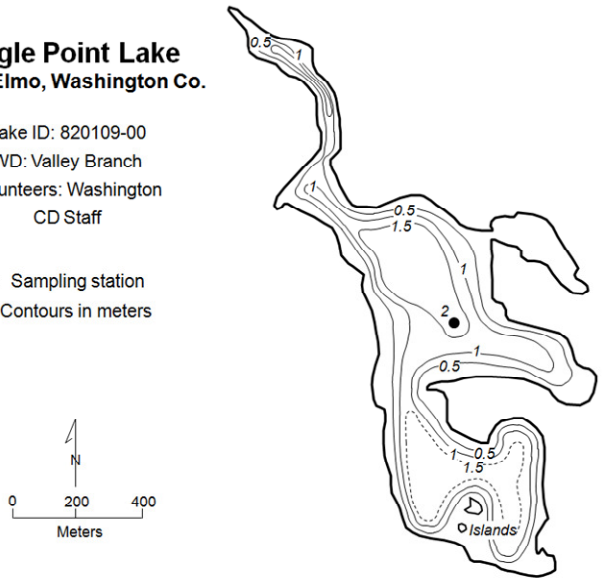
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

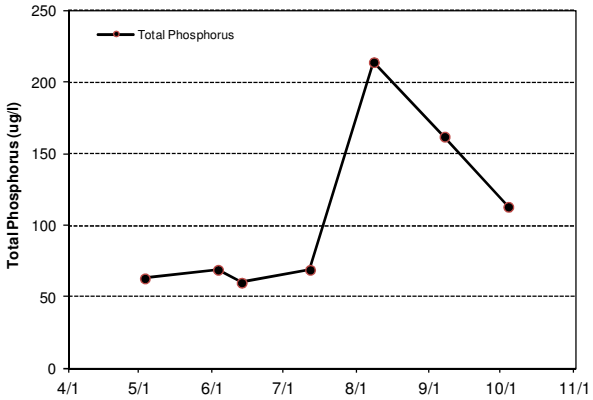
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

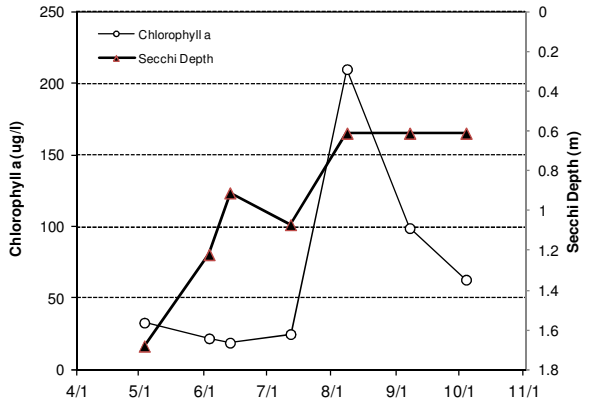
Eagle Point Lake
Lake Elmo, Washington Co.

Lake ID: 820109-00
WD: Valley Branch
Volunteers: Washington
CD Staff

● Sampling station
Contours in meters

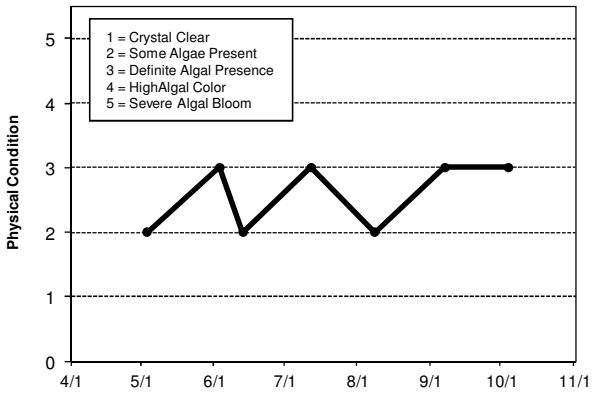






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/3/2011	6.3	6.4	11.8	0.2	33	63		1.68	2	3
6/3/2011	19.9	18.8	7.5	0.1	22	69		1.22	3	4
6/13/2011	20.1	18.9	11.4	0.1	19	60		0.91	2	4
7/12/2011	26.4	24.2	8	0.2	25	69		1.07	3	4
8/8/2011	26.9	23.6	10.2	0.1	210	214		0.61	2	3
9/7/2011	20.7	19.9	11.4	0.1	99	162		0.61	3	4
10/4/2011	16.6	15.4	13.3	0	63	113		0.61	3	3



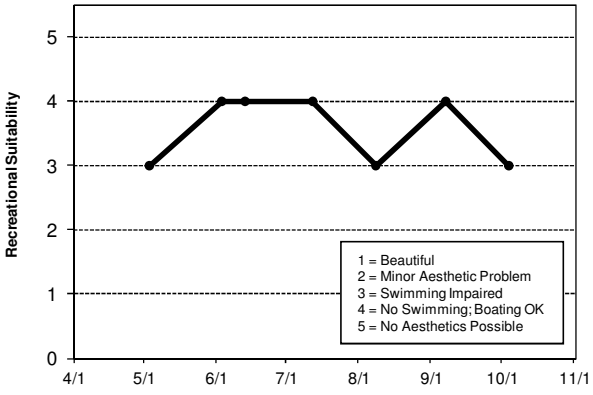
Lake Water Quality Grades Based on Summertime Averages

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		F										
Chlorophyll a												
Secchi Depth		F										
Lake Grade												

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			F	F				D
Chlorophyll a			F	A				D
Secchi Depth			F	D				D
Lake Grade			**F**	**C**		**NA**		**D**

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 Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	31.3	23.0	37.0	B
CLA (µg/l)	9.6	3.5	23.0	A
Secchi (m)	1.9	1.5	2.4	C
TKN (mg/l)	0.59	0.41	0.85	
			Lake Grade	B

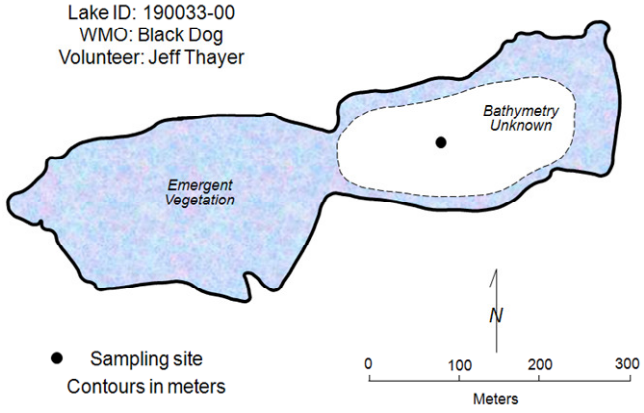
The lake received a lake grade of B for 2011, which is consistent with the lake's water quality database since 2006.

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

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

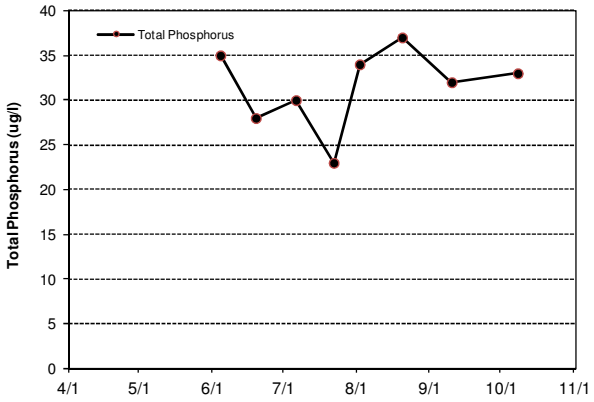
Earley Lake
Burnsville, Dakota Co.

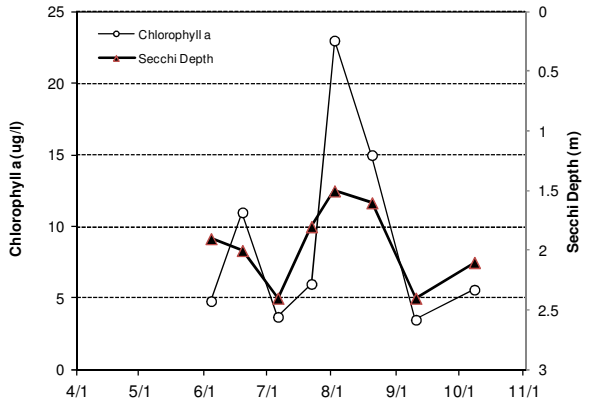
Lake ID: 190033-00
WMO: Black Dog
Volunteer: Jeff Thayer

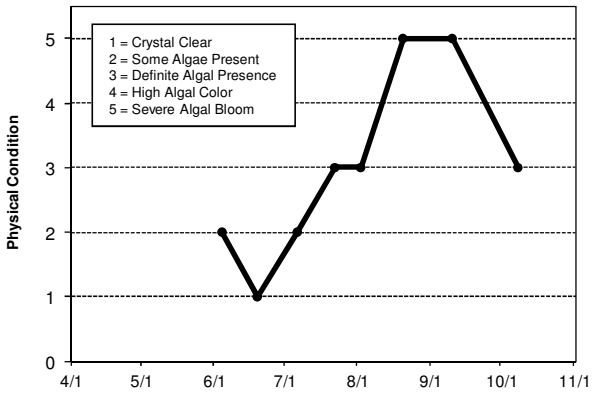


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/4/2011	26.5				4.8	35		1.9	2	4
6/19/2011	24.2				11	28		2	1	4
7/6/2011	29.5				3.7	30		2.4	2	4
7/22/2011	31.7				6	23		1.8	3	4
8/2/2011	27.7				23	34		1.5	3	4
8/20/2011	26.3				15	37		1.6	5	4
9/10/2011	24.9				3.5	32		2.4	5	5
10/8/2011	19				5.6	33		2.1	3	4





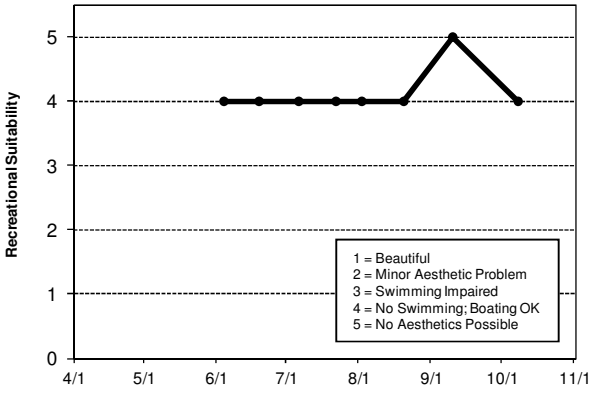


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	C	C	C	C	C	C	B
Chlorophyll a	B	B	A	B	A	A	B	A
Secchi Depth	C	C	C	C	C	C	C	C
Lake Grade	**C**	**C**	**B**	**C**	**B**	**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.

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

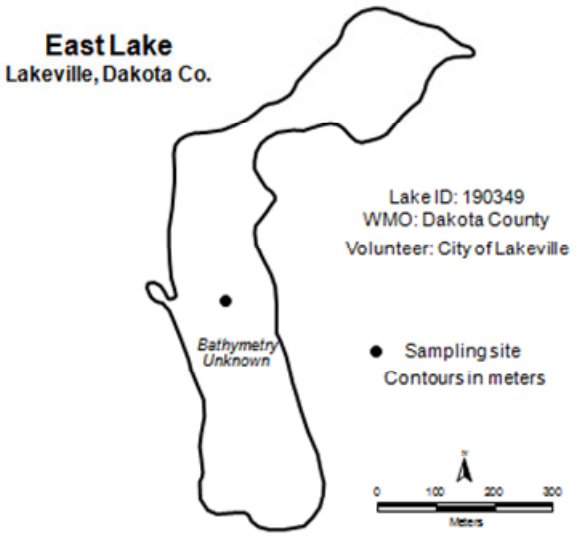
2011 summer (May-September) data summary

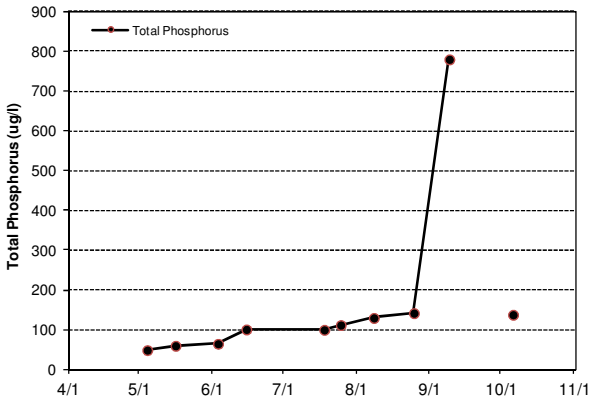
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	171.0	49.0	780.0	F
CLA (µg/l)	88.3	18.0	180.0	F
Secchi (m)	0.7	0.4	1.2	F
TKN (mg/l)	2.17	1.10	7.40	
			Lake Grade	F

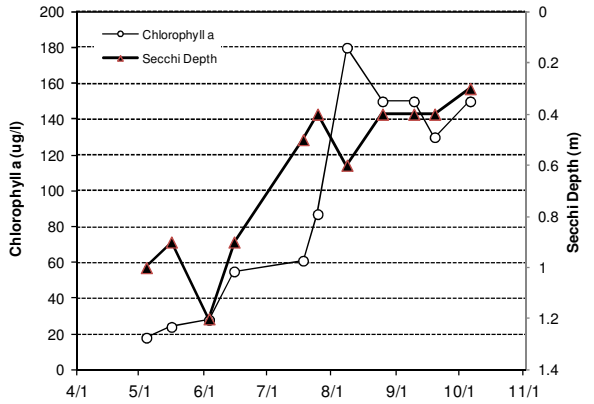
The lake received a lake grade of F for 2011. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

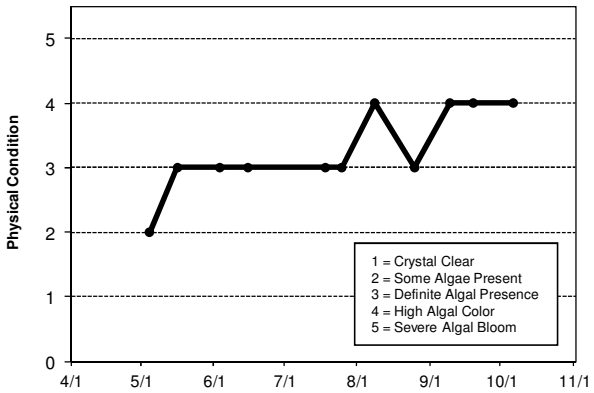
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

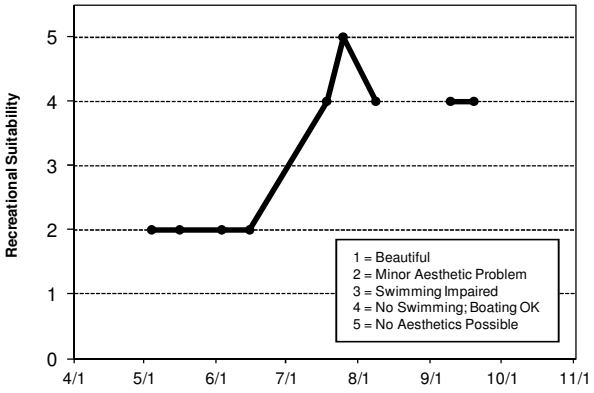
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 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 (1-5)	RS (1-5)
5/4/2011	8.9				18	49		1	2	2
5/16/2011	12				24	60		0.9	3	2
6/3/2011	21				28	65		1.2	3	2
6/15/2011	20				55	101		0.9	3	2
7/18/2011	29				61	100		0.5	3	4
7/25/2011	27				87	112		0.4	3	5
8/8/2011	27				180	130		0.6	4	4
8/25/2011	27				150	142		0.4	3	
9/9/2011	23				150	780		0.4	4	4
9/19/2011	18				130			0.4	4	4
10/6/2011	17				150	138		0.3	4	

Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		F	NA	F	D		D	F
Chlorophyll a		F	NA	F	F		D	F
Secchi Depth		F	NA	F	D		F	F
Lake Grade		**F**	**NA**	**F**	**D**		**D**	**F**

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.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	32.6	27.0	40.0	C
CLA (µg/l)	7.1	2.3	8.9	A
Secchi (m)	3.7	2.7	4.9	A
TKN (mg/l)	0.84	0.75	0.91	
			Lake Grade	B

The lake received a lake grade of B for 2011, which is consistent with recent years in its historical database. This was the third year the lake received an A grade for CLA. The lake continues to acheive better water quality than it used to receive in the period from the mid 1990s and early 2000s. Additional monitoring is suggested to help determine if the lake continues to improve.

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

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

If you notice any errors in the lake's data or physical information, or are aware of 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

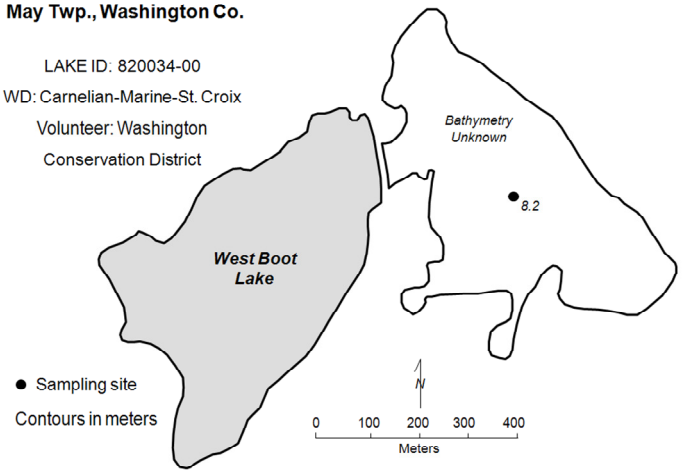
May Twp., Washington Co.

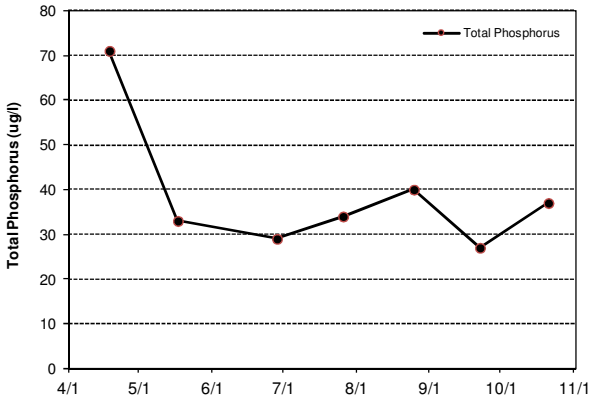
LAKE ID: 820034-00

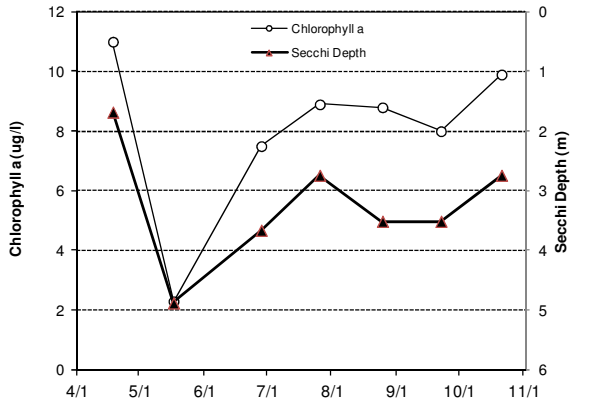
WD: Carnelian-Marine-St. Croix

Volunteer: Washington

Conservation District

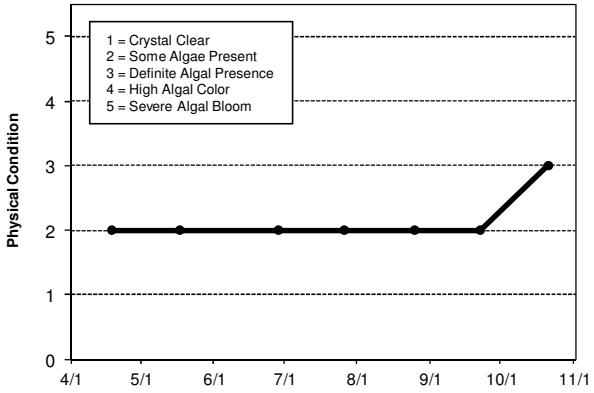






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/18/2011	7	6	10.4	0	11	71		1.68	2	4
5/17/2011	14.7	7.6	11.6	0.1	2.3	33		4.88	2	2
6/28/2011	21.8	8.1	9.3	0	7.5	29		3.66	2	2
7/26/2011	27.5	8.6	8.9	0	8.9	34		2.74	2	2
8/25/2011	25	8.5	7.8	0	8.8	40		3.51	2	2
9/22/2011	16.3	9.1	7.1	0	8	27		3.51	2	2
10/21/2011	11.1	8.8	7.3	0.1	9.9	37		2.74	3	4

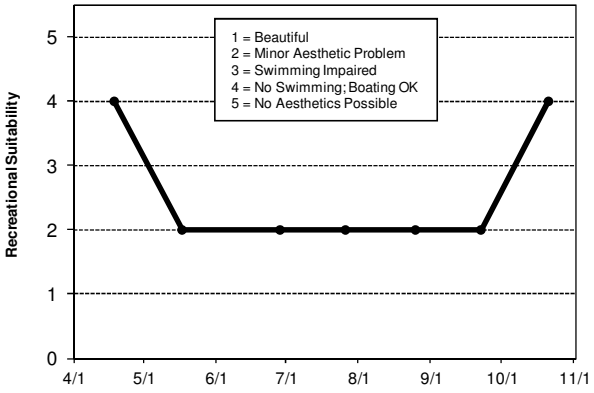


Lake Water Quality Grades Based on Summertime Averages

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					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	2009	2010	2011
Total Phosphorus	C	C	C	C	C	B	B	C
Chlorophyll a	B	B	C	B	B	A	A	A
Secchi Depth	A	A	A	A	A	A	A	A
Lake Grade	**B**	**B**	**B**	**B**	**B**	**A**	**A**	**B**



Source: Metropolitan Council and STORET data

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

Primary Volunteer Report

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

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

2011 summer (May-September) data summary

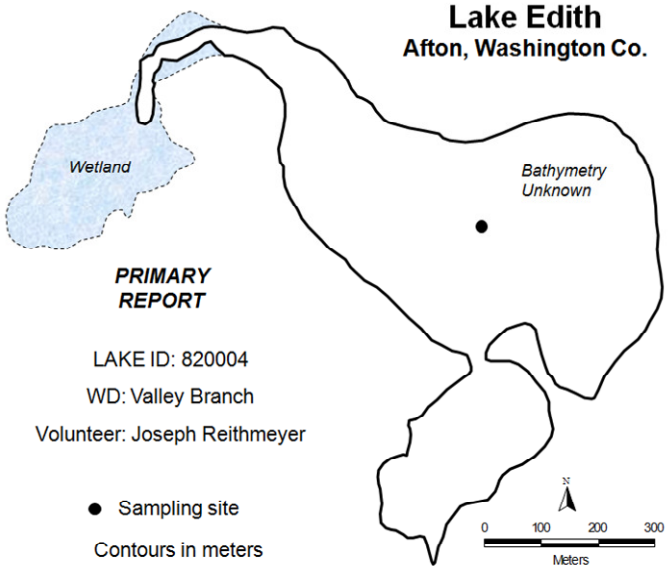
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	26.5	13.0	82.0	B
CLA (µg/l)	5.1	2.3	7.2	A
Secchi (m)	2.3	1.2	3.4	B
TKN (mg/l)	0.84	0.51	1.20	
			Lake Grade	B

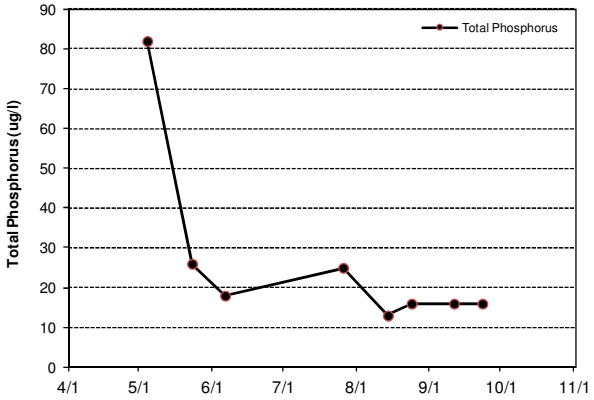
The lake received a lake grade of B for 2011, which is consistent with its limited historical database. For the 6 years that the lake has been monitored via the CAMP, the lake has fluctuated between a lake grade of A and B. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

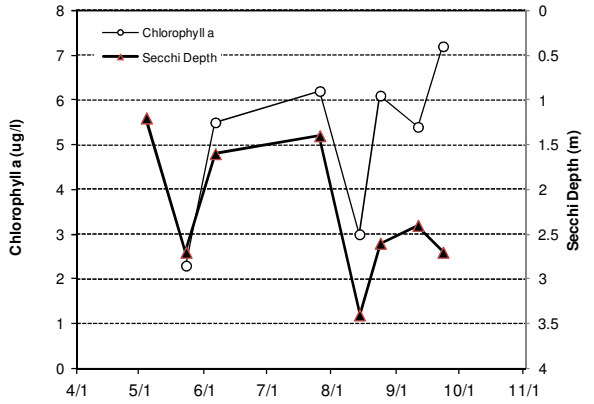
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

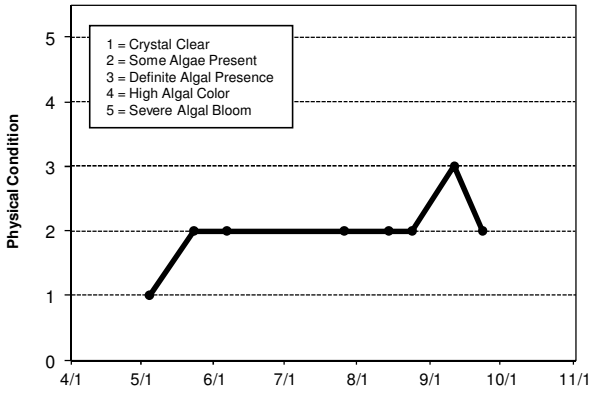
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at http://www.dnr.state.mn.us/lakefind/.

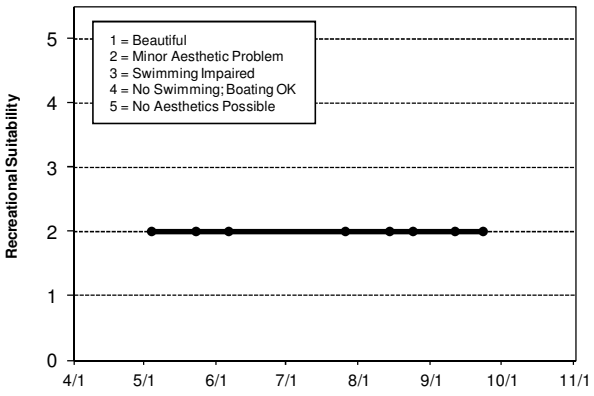
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/4/2011	9.9					82		1.2	1	2
5/23/2011	19.8				2.3	26		2.7	2	2
6/6/2011	23.3				5.5	18		1.6	2	2
7/26/2011	29				6.2	25		1.4	2	2
8/14/2011	29.1				3	13		3.4	2	2
8/24/2011	26.4				6.1	16		2.6	2	2
9/11/2011	23.8				5.4	16		2.4	3	2
9/23/2011	16.1				7.2	16		2.7	2	2

Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		A	B	A	B	B		B
Chlorophyll a		A	A	A	A	A		A
Secchi Depth		B	C	B	C	C		B
Lake Grade		**A**	**B**	**A**	**B**	**B**		**B**

Source: Metropolitan Council and STORET data

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

Secondary Volunteer Report

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

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

2011 summer (May-September) data summary

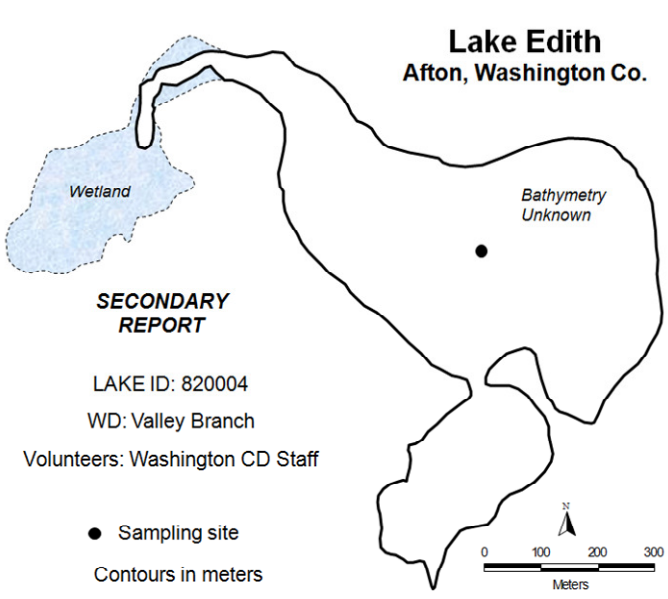
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	25.5	10.0	55.0	B
CLA (µg/l)	12.5	4.1	32.0	B
Secchi (m)	2.4	0.8	3.7	B
TKN (mg/l)	0.79	0.57	1.10	
			Lake Grade	B

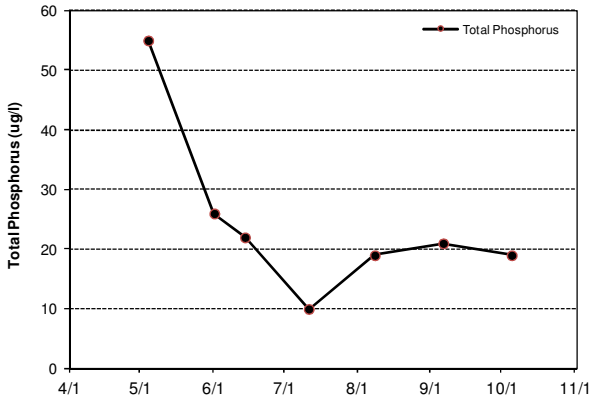
The lake received a lake grade of B for 2011, which is consistent with its limited historical database. For the 6 years that the lake has been monitored via the CAMP, the lake has fluctuated between a lake grade of A and B. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

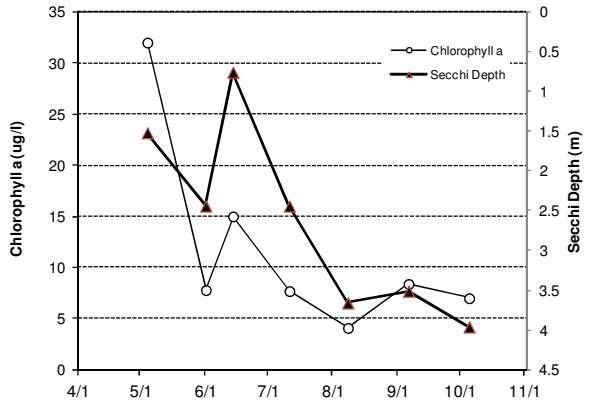
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (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.

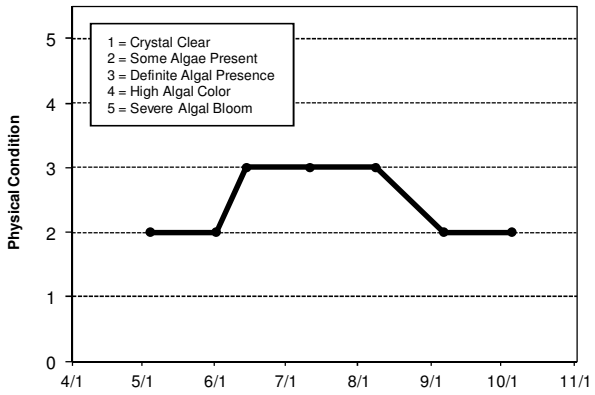






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/4/2011	9	6.1	14	0.4	32	55	53	1.52	2	3
6/1/2011	18.5	6.5	9.6	0.1	7.8	26	46	2.44	2	2
6/14/2011	20.2	6.6	14.5	0	15	22	123	0.76	3	3
7/11/2011	28	6.5	9.4	0	7.7	10	216	2.44	3	3
8/8/2011	26.6	6.6	7.1	0	4.1	19	271	3.66	3	2
9/6/2011	21.1	6.8	8.4	0	8.4	21	319	3.51	2	3
10/5/2011	15.9	7.2	11.9	0	7	19	278	3.96	2	2

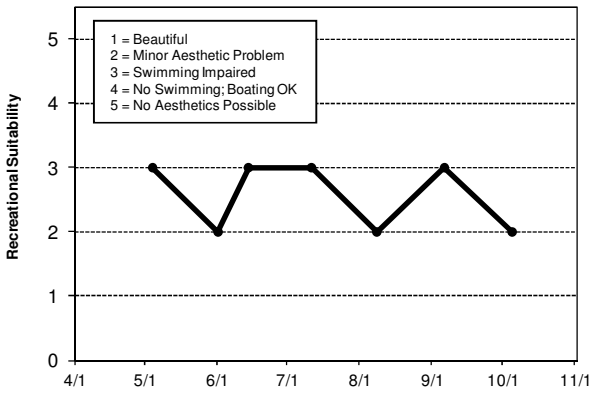


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		A	B	A	B	B		B
Chlorophyll a		A	A	A	A	A		B
Secchi Depth		B	C	B	C	C		B
Lake Grade		**A**	**B**	**A**	**B**	**B**		**B**



Source: Metropolitan Council and STORET data

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

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	47.0	14.0	122.0	C
CLA (µg/l)	2.6	1.7	4.0	A
Secchi (m)	4.7	2.8	6.5	A
TKN (mg/l)	0.90	0.50	1.60	
			Lake Grade	B

The lake received a lake grade of B for 2011. The lake has typically received A lake grades since the late 1980s. The elevated concentrations of TP during 2011 are a striking contrast to the historical TP concentrations. There were notable differences in the mean, minimum, and maximum TP concentrations in 2011 compared to the last 20 to 30 years of monitoring. Continued monitoring is recommended to determine if this increase in TP is transient or an indication of potential changes in surface water quality.

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

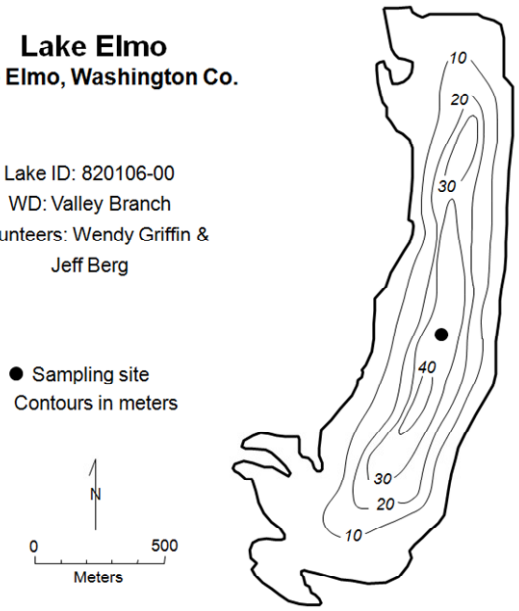
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at http://www.dnr.state.mn.us/lakefind/.

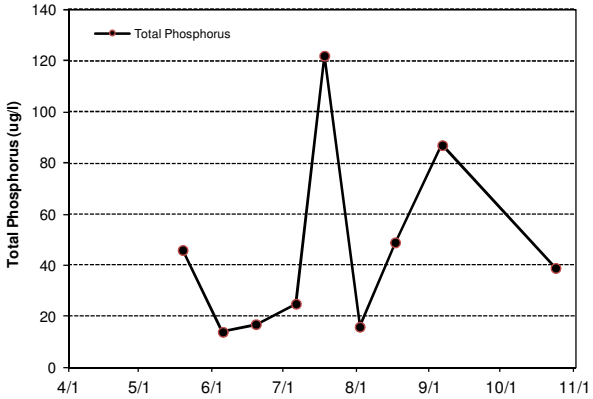
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

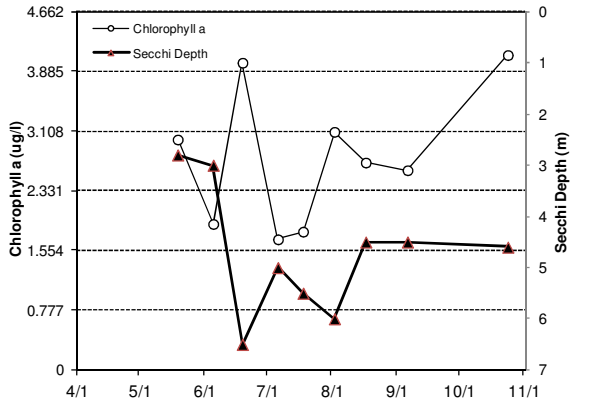
Lake Elmo

Lake Elmo, Washington Co.

Lake ID: 820106-00
WD: Valley Branch
Volunteers: Wendy Griffin & Jeff Berg

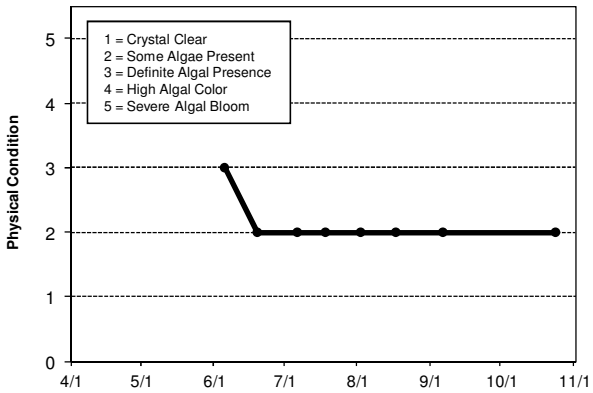






2011 Data

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 (1-5)	RS (1-5)
5/19/2011	15.4				3	46		2.8		1
6/5/2011	21.5				1.9	14		3	3	3
6/19/2011	21.1				4	17		6.5	2	1
7/6/2011	26.9				1.7	25		5	2	1
7/18/2011	27.7				1.8	122		5.5	2	2
8/2/2011	27.3				3.1	16		6	2	2
8/17/2011	25.3				2.7	49		4.5	2	2
9/6/2011	23.3				2.6	87		4.5	2	2
10/24/2011	12.2				4.1	39		4.6	2	1

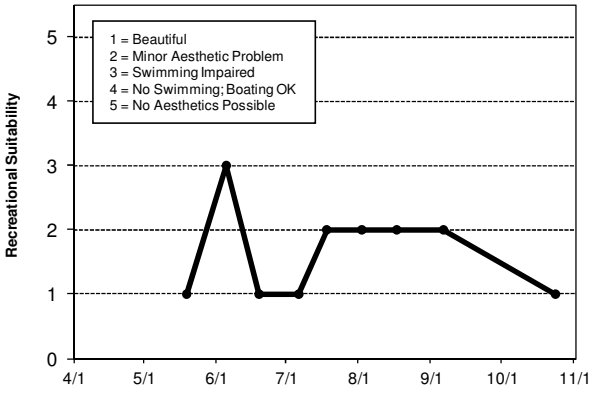


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	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	2009	2010	2011
Total Phosphorus		A	A	A	A	A	A	C
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**	**B**



Source: Metropolitan Council and STORET data

Farquhar Lake (19-0023) *City of Apple Valley*

Farquhar Lake is located in the City of Apple Valley (Dakota County). The lake covers an area of 67 acres and has a maximum depth of 3.0 m (10 feet). The lake's mean depth of 1.4 m (4.6 feet) and surface area translates to an approximate lake volume of 290 ac-ft. Because the maximum depth is only 3.0 m, the entire lake area is considered littoral (the area of aquatic plant dominance), and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	97.7	64.0	135.0	D
CLA (µg/l)	91.8	16.0	210.0	F
Secchi (m)	0.5	0.3	0.9	F
TKN (mg/l)	2.62	1.10	4.20	
			Lake Grade	F

The lake received a lake grade of F for 2011, which is consistent with the lake grades received for the past 14 years.

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

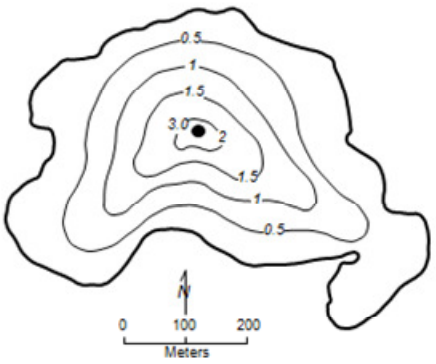
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

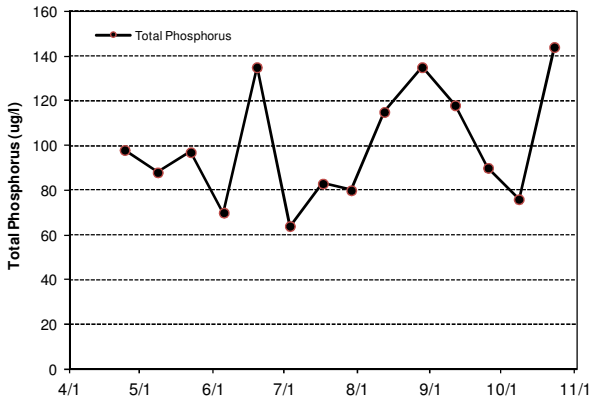
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

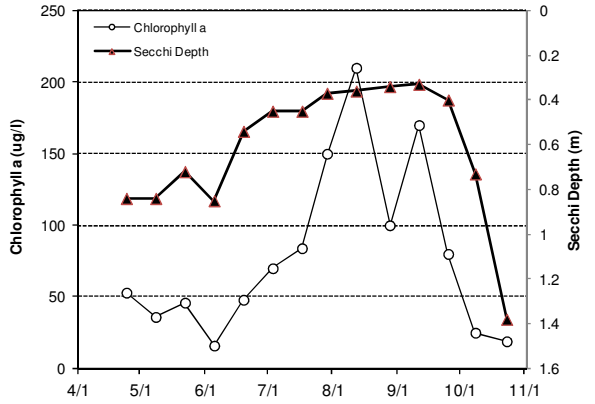
Farquar Lake
Apple Valley, Dakota Co.

Lake ID: 190023-00
WMO: Vermillion River
Volunteer: Jeff Christianson

● Sampling site
Contours in meters

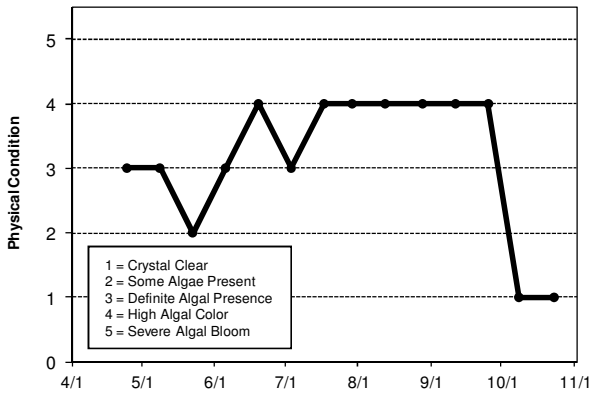






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	8.1				53	98		0.84	3	1
5/8/2011	19.3				36	88		0.84	3	1
5/22/2011	19.3				46	97		0.72	2	2
6/5/2011	25.9				16	70		0.85	3	2
6/19/2011	22				48	135		0.54	4	3
7/3/2011	29.9				70	64		0.45	3	3
7/17/2011	31.2				84	83		0.45	4	3
7/29/2011	31.1				150	80		0.37	4	3
8/12/2011	26.4				210	115		0.36	4	3
8/28/2011	24.1				100	135		0.34	4	3
9/11/2011	23.8				170	118		0.33	4	3
9/25/2011	16.3				80	90		0.4	4	3
10/8/2011	18.3				25	76		0.73	1	2
10/23/2011	12.4				19	144		1.38	1	1

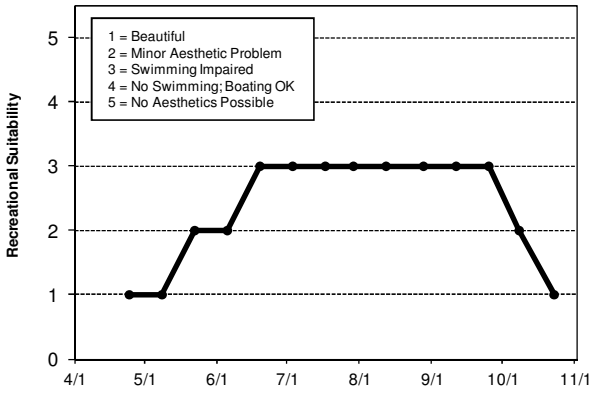


Lake Water Quality Grades Based on Summertime Averages

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	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	2009	2010	2011
Total Phosphorus	F	F	F	F	D	F	D	D
Chlorophyll a	F	D	C	D	F	F	D	F
Secchi Depth	F	F	F	F	D	F	F	F
Lake Grade	**F**	**F**	**D**	**F**	**D**	**F**	**D**	**F**



Source: Metropolitan Council and STORET data

Fireman's Clayhole Lake (10-0226) *Carver County Environmental Services*

Fireman's Lake is located within the City of Chaska. This lake has an area of 8 acres and a maximum depth of 7.0 m (23 feet). Roughly 88 percent of the lake's surface area is considered littoral zone (area of aquatic plant dominance). The DNR has designated the lake as being infested with Eurasian Water Milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

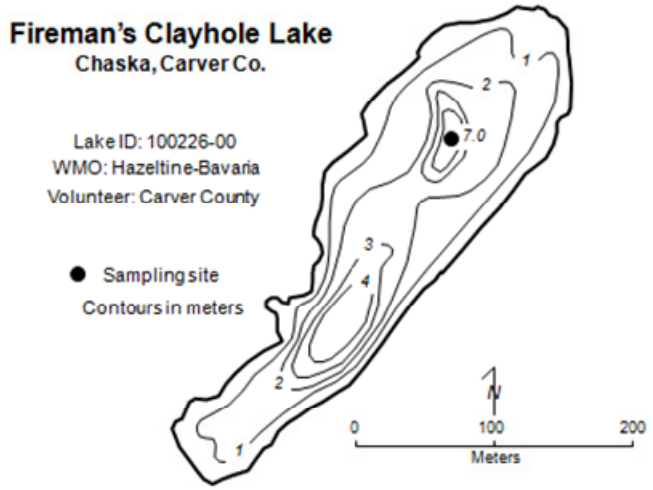
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	22.8	13.0	32.0	A
CLA (µg/l)	4.4	2.0	8.2	A
Secchi (m)	2.5	1.8	3.9	B
TKN (mg/l)	0.57	0.33	1.10	
			Lake Grade	A

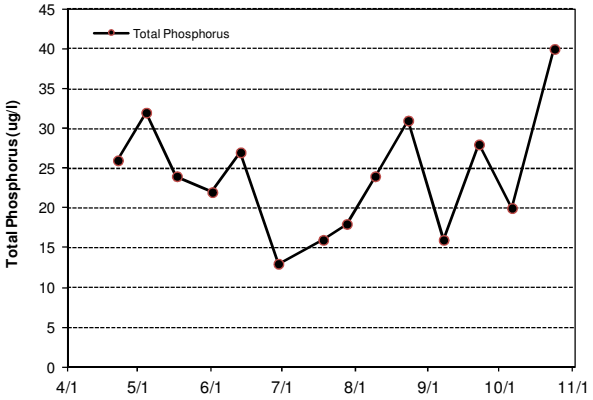
The lake received a lake grade of A for 2011, which is the most common lake grade received in the past 11 years. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

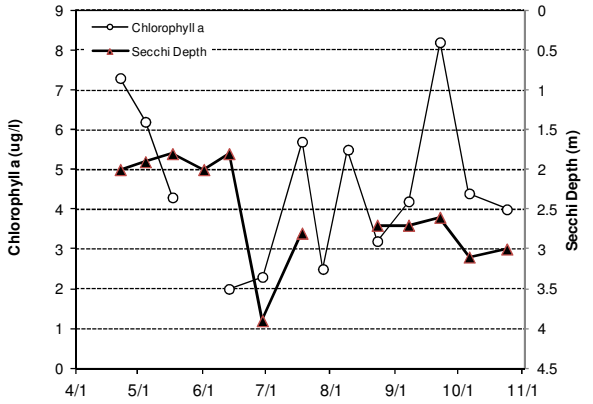
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

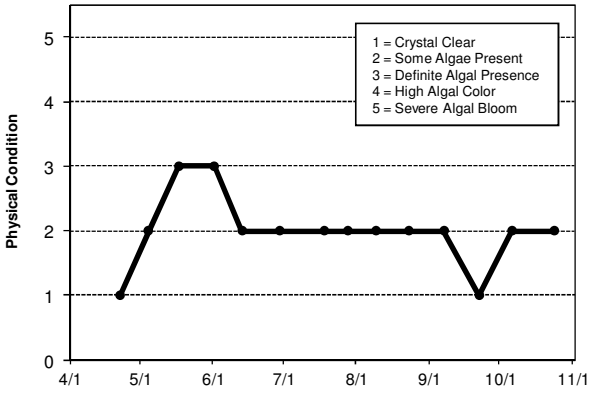






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/22/2011	7.78		12.6		7.3	26		2	1	1
5/4/2011	10.49		16		6.2	32		1.9	2	2
5/17/2011	14.69		9.6		4.3	24		1.8	3	2
6/1/2011	20.2		8.9			22		2	3	2
6/13/2011	21.75		9.3		2	27		1.8	2	3
6/29/2011	24.44		12.3		2.3	13		3.9	2	1
7/18/2011	28.46		11		5.7	16		2.8	2	1
7/28/2011	29.8		11.1		2.5	18			2	2
8/9/2011	26.78		8.4		5.5	24			2	2
8/23/2011	24.88		6.9		3.2	31		2.7	2	2
9/7/2011	23.1		8.9		4.2	16		2.7	2	2
9/22/2011	17.01		6.9		8.2	28		2.6	1	1
10/6/2011	17.48		8.3		4.4	20		3.1	2	2
10/24/2011	12.05		5.3		4	40		3	2	2

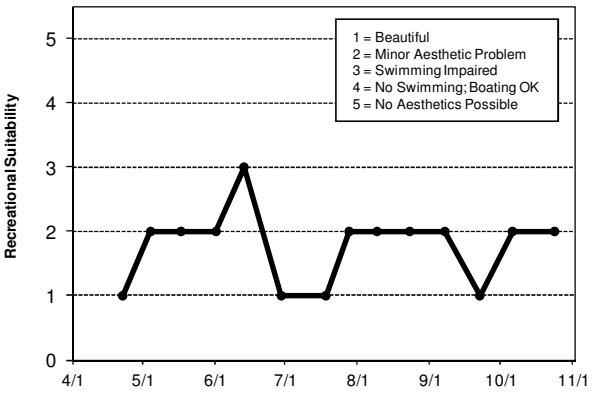


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	A	B	B	A	A	C	B	A
Chlorophyll a	A	A	A	A	A	A	A	A
Secchi Depth	A	A	B	B	A	A	B	B
Lake Grade	**A**	**A**	**B**	**A**	**A**	**B**	**B**	**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 (METC 2007). The lake has a surface area of 171 acres. The lake has a mean and a maximum depth of 4.4 m (14 feet) and 8.5 m (28 feet). The MPCA has listed the lake as impaired for mercury content in fish.

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

2011 summer (May-September) data summary

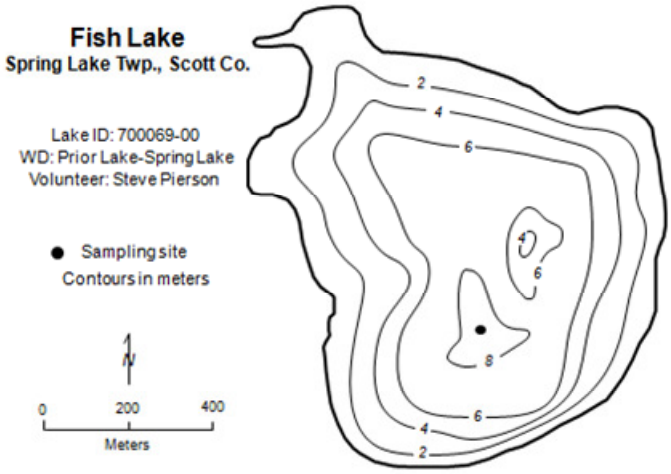
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	26.6	16.0	44.0	B
CLA (µg/l)	13.6	7.1	28.0	B
Secchi (m)	1.5	0.9	2.6	C
TKN (mg/l)	1.16	0.98	1.40	
			Lake Grade	B

The lake received a lake grade of B for 2011. The lake appears to be represented overall by a lake grade of C given the historical water quality database.

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

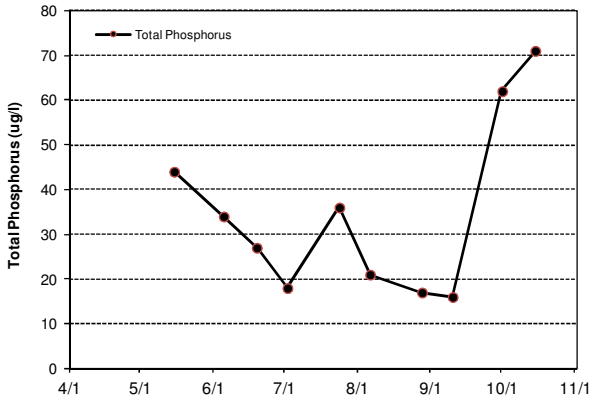
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

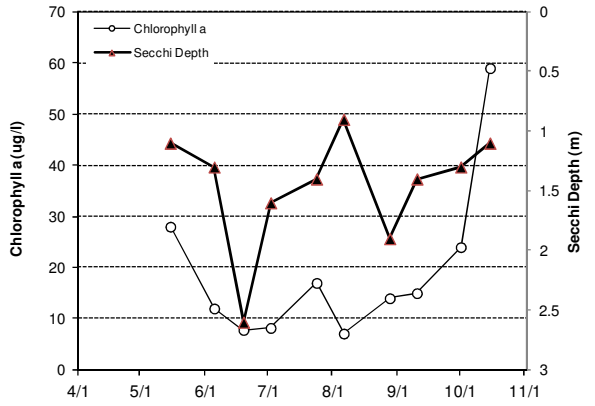
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

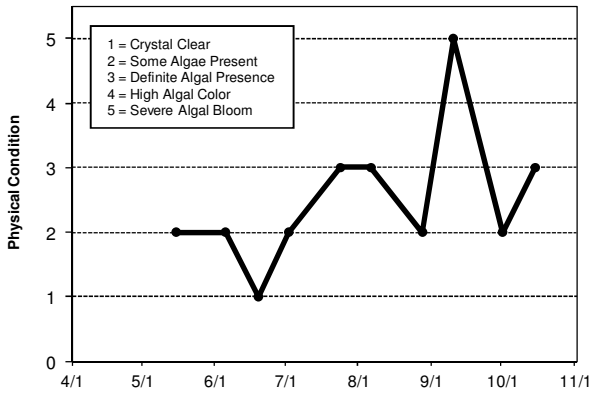


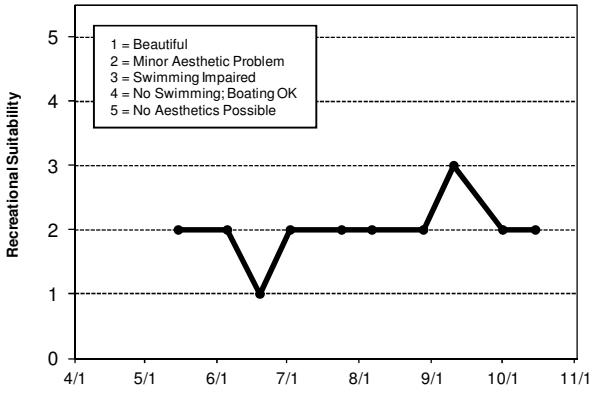
2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/15/2011	13				28	44		1.1	2	2
6/5/2011	23.1				12	34		1.3	2	2
6/19/2011	22.5				7.8	27		2.6	1	1
7/2/2011	26.6				8.2	18		1.6	2	2
7/24/2011	29				17	36		1.4	3	2
8/6/2011	29				7.1	21		0.9	3	2
8/28/2011	24.6				14	17		1.9	2	2
9/10/2011	24.3				15	16		1.4	5	3
10/1/2011	16				24	62		1.3	2	2
10/15/2011	15.3				59	71		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	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	D	C
Chlorophyll a				C		C	C	C	C	B	C	C
Secchi Depth				D		C	C	C	B	B	D	B
Lake Grade				**C**		**C**	**C**	**C**	**C**	**B**	**D**	**C**

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	C	C	C	C	C	C	B
Chlorophyll a	C	C	B	C	B	C	B	B
Secchi Depth	C	C	C	C	C	C	C	C
Lake Grade	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**B**

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. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	57.8	34.0	80.0	C
CLA (µg/l)	41.4	5.2	67.0	C
Secchi (m)	1.6	0.8	2.7	C
TKN (mg/l)	1.35	0.68	2.00	
			Lake Grade	C

The lake received a lake grade of C for 2011, which continues the improvement in water quality that this lake has been experiencing for the past 14 years. This was the fifth 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 an on-going trend.

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

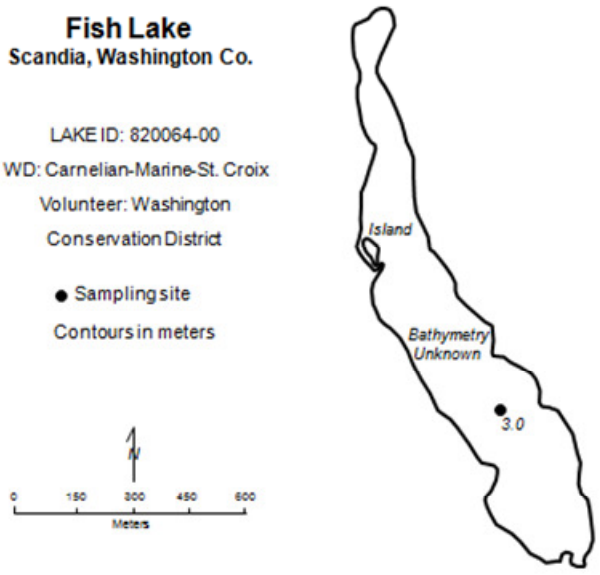
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

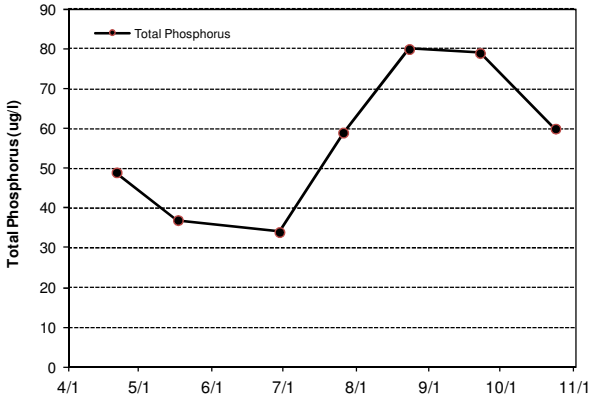
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

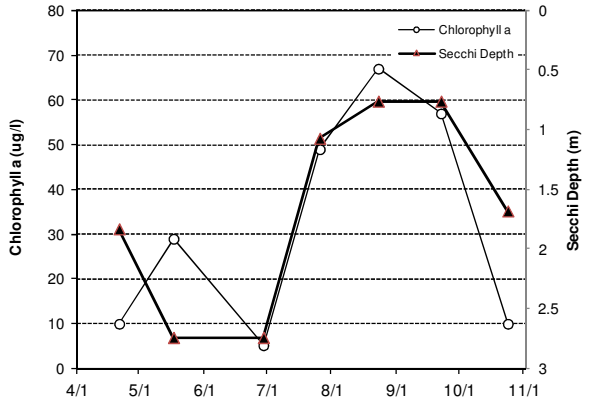
Fish Lake
Scandia, Washington Co.

LAKE ID: 820064-00
WD: Carnelian-Marine-St. Croix
Volunteer: Washington Conservation District

● Sampling site
Contours in meters

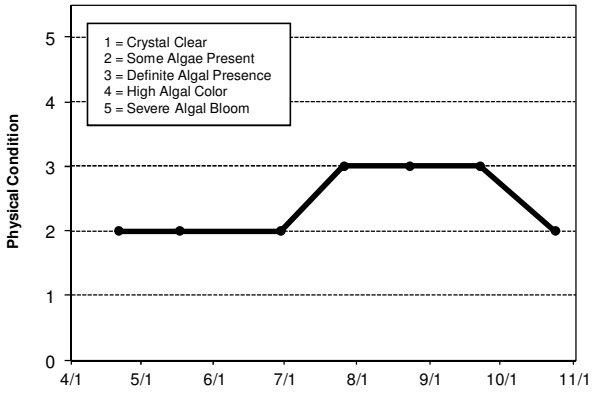






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	7.8	7.5	11	2.9	10	49		1.83	2	3
5/17/2011	14.8	14.5	10.2	2.2	29	37		2.74	2	2
6/29/2011	22.6	21.1	9	0.7	5.2	34		2.74	2	3
7/26/2011	26.8	23.7	10.4	0.1	49	59		1.07	3	4
8/23/2011	25.4	23.2	10.6	0.1	67	80		0.76	3	3
9/22/2011	14.7	14.7	8.8	0.1	57	79		0.76	3	3
10/24/2011	8.9	8.9	10.7	0.1	10	60		1.68	2	2

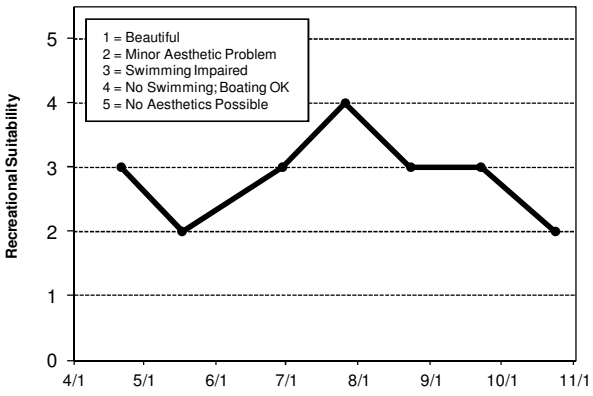


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	D	D	D	D	D	D	D	C
Chlorophyll a	F	C	D	C	C	C	C	C
Secchi Depth	D	D	D	C	C	C	C	C
Lake Grade	**D**	**D**	**D**	**C**	**C**	**C**	**C**	**C**



Source: Metropolitan Council and STORET data

Fish Lake [Woodbury] (82-0093) *Washington Conservation District*

Fish Lake is located in the City of Woodbury (Washington County). It has a surface area of approximately 5 acres. 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.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	111.6	86.0	152.0	D
CLA (µg/l)	51.7	13.0	180.0	D
Secchi (m)	0.9	0.5	1.5	D
TKN (mg/l)	1.46	1.10	2.00	
			Lake Grade	D

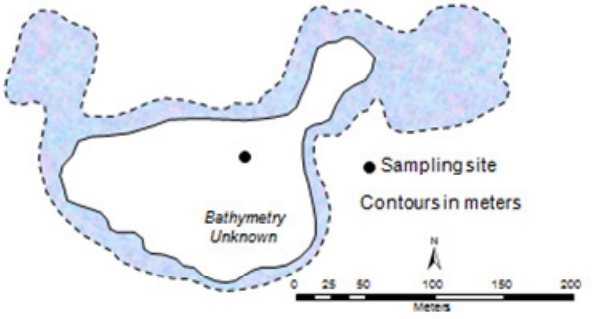
The lake received a lake grade of D in 2011. Additional monitoring is suggested to build the water quality database of this lake.

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

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

Fish Lake
Woodbury, Washington Co.

LAKE ID: 820093-00
WMO: South Washington County
Volunteer: Washington Conservation District



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	7.1	6.9	10.4	0.1	21	102		1.22	3	4
5/4/2011	9.7	9.5	11.3	0.1	18	86		1.22	3	4
5/16/2011	13.8	13.5	7.8	0.1	16	97		1.22	2	4
5/31/2011	19.2	18.5	5.9	0.1	13	93		1.52	2	4
6/13/2011	18.9	18.4	5.9	0	33	117		0.76	3	4
6/27/2011	21.4	18.4	9.5	0.1	35	88		1.07	3	4
7/11/2011	28.4	22.1	7.7	0.1	72	110		0.91	3	4
7/25/2011	26.4	21.7	7	0.1	36	109		0.91	3	4
8/8/2011	25.2	21.7	3.5	0.1	60	132		0.46	2	4
8/22/2011	22.3	20.5	2.7	0.1	32	139		0.76	3	4
9/7/2011	18.4	18.2	4.8	0.1	74	105		0.61	3	4
9/19/2011	14.6	14.6	6.5	0.1	180	152		0.91	3	4
10/3/2011	14.3	13.8	10	0.5	42	106		1.07	3	4
10/17/2011	9.3	9.8	9.8	0.6	24	85		1.37	3	4

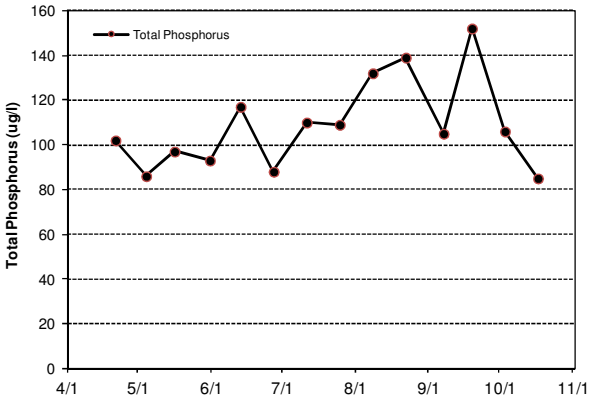
Lake Water Quality Grades Based on Summertime Averages

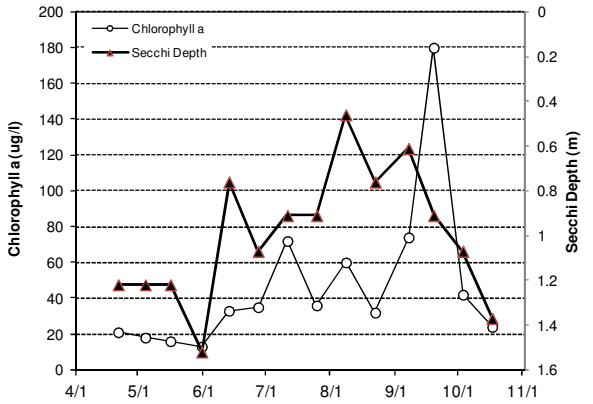
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

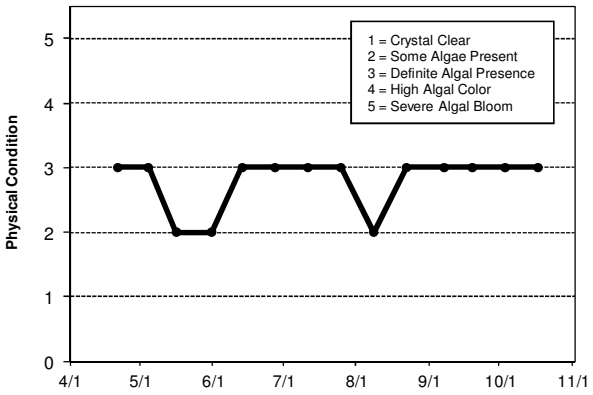
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

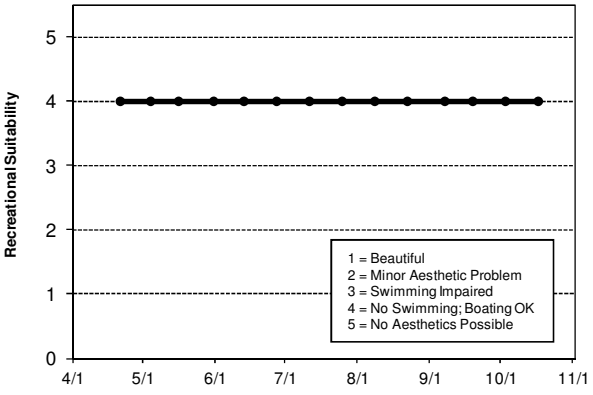
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus							F	D
Chlorophyll a							F	D
Secchi Depth							F	D
Lake Grade							**F**	**D**

Source: Metropolitan Council and STORET data









Fish Lake (82-0137) *Rice Creek Watershed District*

Fisht Lake is located in the Township of Grant (Washington County). It has a surface area of 21 acres and a maximum depth of 10.4 meters.

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.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	54.1	31.0	107.0	C
CLA (µg/l)	14.3	1.0	50.0	B
Secchi (m)	2.9	1.2	6.4	B
TKN (mg/l)	1.23	0.94	1.50	
			Lake Grade	B

The lake received a lake grade of B for 2011, which is an indication of better water quality than about 10 years ago (2002, 2003). Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

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

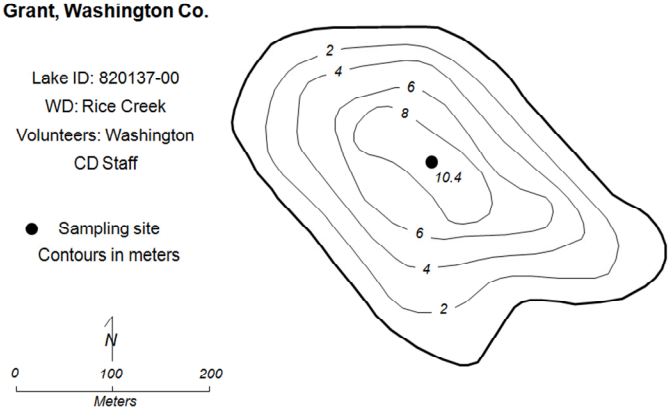
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

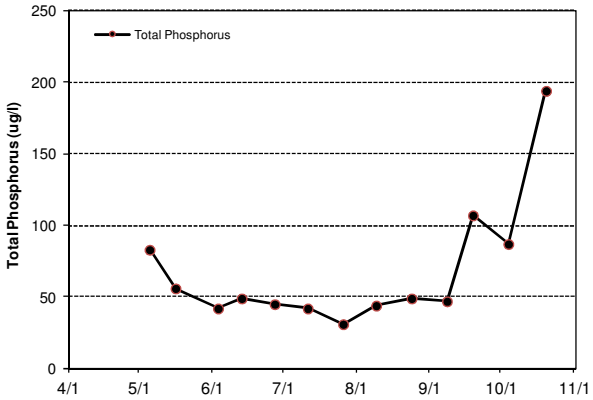
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

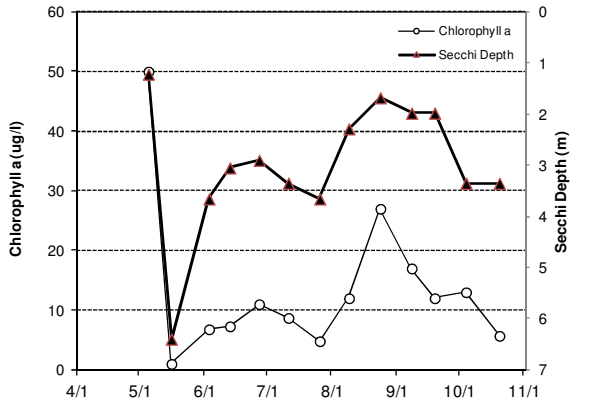
Fish Lake
Grant, Washington Co.

Lake ID: 820137-00
WD: Rice Creek
Volunteers: Washington
CD Staff

● Sampling site
Contours in meters

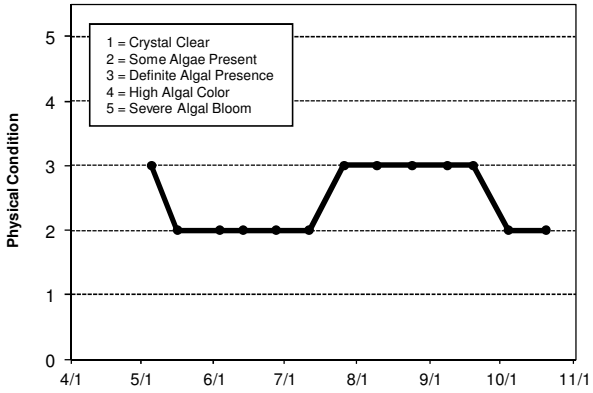






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/5/2011	9.7	6.3	14.4	0.1	50	83		1.22	3	3
5/16/2011	13.3	7	8.6	0	1	56		6.4	2	2
6/3/2011	19.1	7.1	8.2	0	6.8	42		3.66	2	2
6/13/2011	20.5	7.3	9.4	0	7.3	49		3.05	2	2
6/27/2011	21.9	7.2	12.1	0	11	45		2.9	2	3
7/11/2011	28.9	7.5	9.5	0	8.7	42		3.35	2	3
7/26/2011	27.6	8.8	7.8	0	4.8	31		3.66	3	4
8/9/2011	25.9	8	7.5	0	12	44		2.29	3	4
8/24/2011	25.3	8.1	10.6	0	27	49		1.68	3	4
9/8/2011	21.7	8	8.6	0	17	47		1.98	3	3
9/19/2011	17.4	8	5.3	0	12	107		1.98	3	3
10/4/2011	15.6	8.2	8.5	0	13	87		3.35	2	3
10/20/2011	11	9.1	5.6	0.1	5.7	194		3.35	2	3

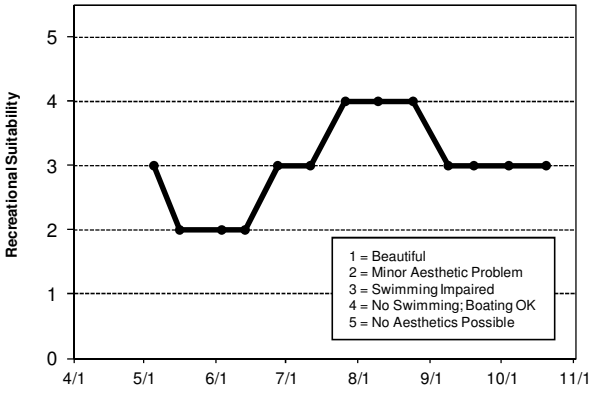


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus								C
Chlorophyll a								B
Secchi Depth								B
Lake Grade	**NA**							**B**



Source: Metropolitan Council and STORET data

Forest Lake [East Basin] (82-0159) *Comfort Lake-Forest Lake Watershed District*

Forest Lake is located in the City of Forest Lake (Washington County). It is divided into three distinct basins. The entire lake is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The MN DNR has designated the lake as being infested with Flowering rush (*Butomus umbellatus*). The MPCA has listed the lake as impaired for polychlorinated biphenyl (PCB) content in fish.

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

2011 summer (May-September) data summary

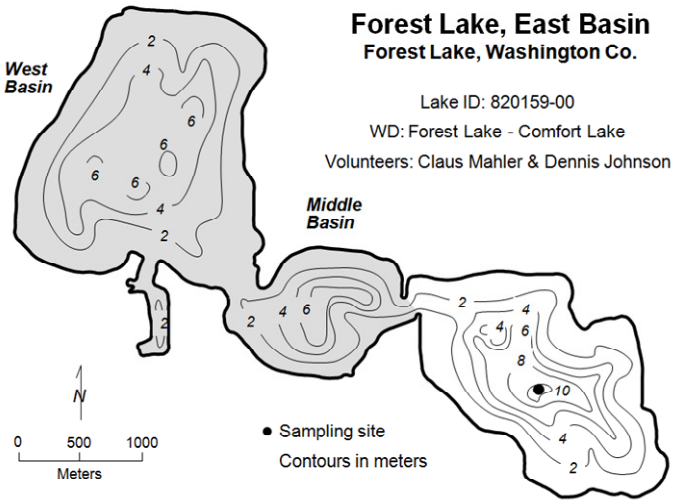
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	40.5	22.0	61.0	C
CLA (µg/l)	28.1	7.4	39.0	C
Secchi (m)	1.2	0.9	1.9	D
TKN (mg/l)	0.96	0.70	1.20	
			Lake Grade	C

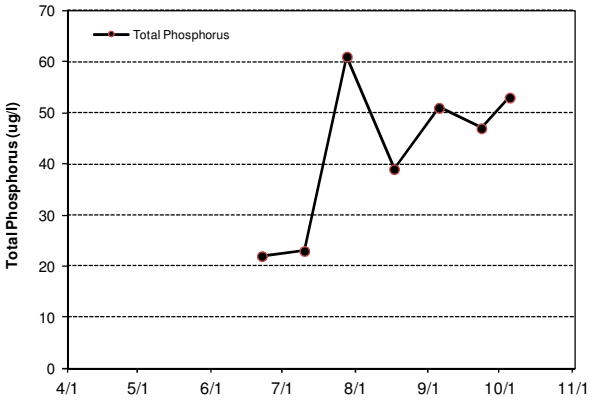
The east basin received a lake grade of C for 2011. The east typically basin has received a C grade since 1980, although this was the first year that the lake has received a D grade for Secchi depth; it has typically received a C grade.

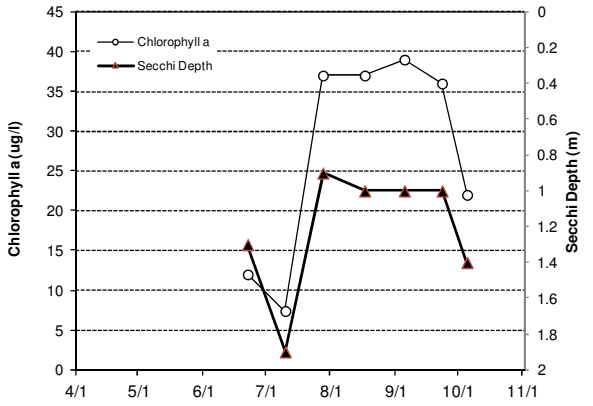
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

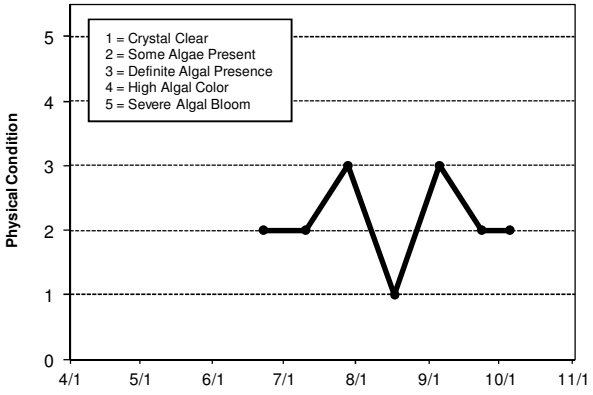
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

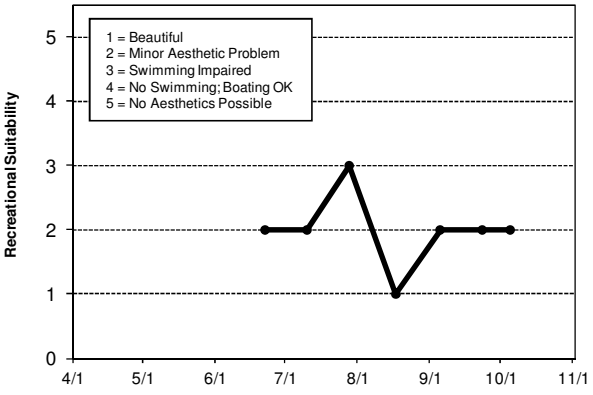
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/22/2011	21.4				12	22		1.3	2	2
7/10/2011	27.1				7.4	23		1.9	2	2
7/28/2011	26.3				37	61		0.9	3	3
8/17/2011	26.3				37	39		1	1	1
9/5/2011	24.2				39	51		1	3	2
9/23/2011	16.7				36	47		1	2	2
10/5/2011	17.7				22	53		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				C		D	C		B		B
Chlorophyll a	D				C		C			B	B	C
Secchi Depth	C				C		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	
Chlorophyll a		B			B						B	
Secchi Depth		C			C						C	
Lake Grade		**C**			**C**						**B**	

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		C	C					C
Chlorophyll a		C	B					C
Secchi Depth		C	C			C	C	D
Lake Grade		**C**	**C**					**C**

Source: Metropolitan Council and STORET data

Forest Lake [middle basin] (82-0159) *Comfort Lake-Forest Lake Watershed District*

Forest Lake is located in the City of Forest Lake (Washington County). It is divided into three distinct basins. The entire lake is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The MN DNR has designated the lake as being infested with Flowering rush (*Butomus umbellatus*). The MPCA has listed the lake as impaired for polychlorinated biphenyl (PCB) content in fish.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	33.5	21.0	53.0	C
CLA (µg/l)	16.5	2.9	39.0	B
Secchi (m)	1.6	0.9	2.5	C
TKN (mg/l)	0.86	0.63	1.10	
			Lake Grade	C

The middle basin received a lake grade of C for 2011. The middle basin typically has received a C grade since 1984, with the occasional B.

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

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

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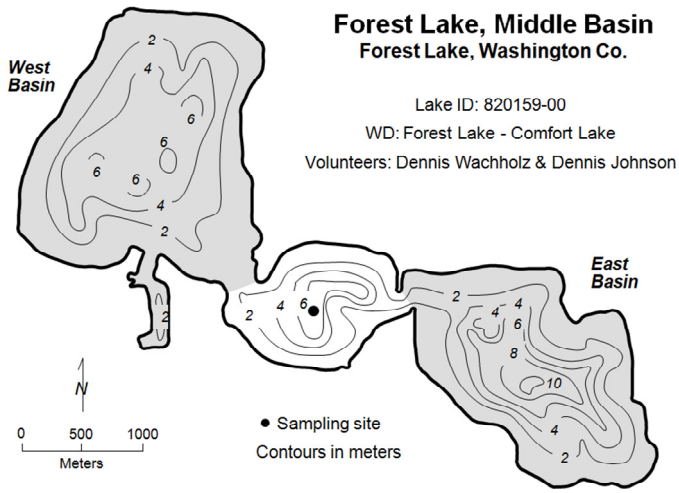
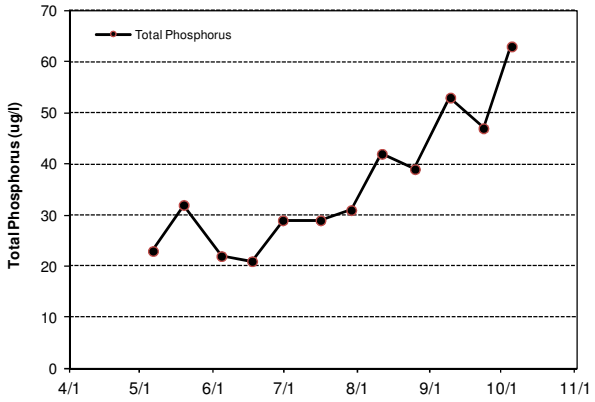
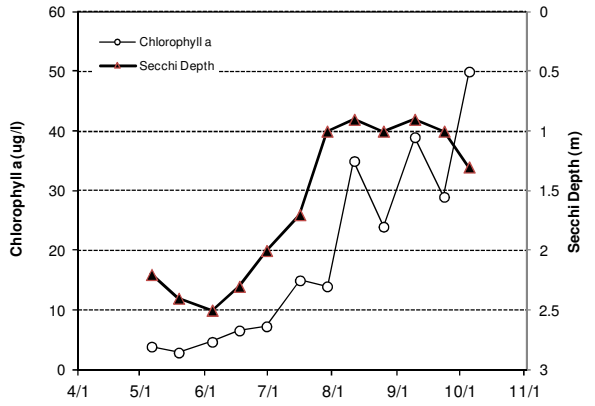
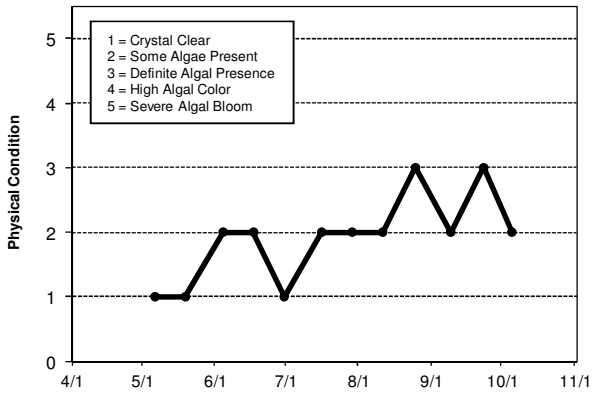






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/6/2011	13				3.9	23		2.2	1	1
5/19/2011	17.4				2.9	32		2.4	1	1
6/4/2011	21.4				4.7	22		2.5	2	1
6/17/2011	20.5				6.6	21		2.3	2	1
6/30/2011	25.3				7.3	29		2	1	1
7/16/2011	24.5				15	29		1.7	2	1
7/29/2011	29.8				14	31		1	2	2
8/11/2011	26.3				35	42		0.9	2	1
8/25/2011	27.3				24	39		1	3	2
9/9/2011	24.8				39	53		0.9	2	1
9/23/2011	16.7				29	47		1	3	2
10/5/2011	17.7				50	63		1.3	2	2

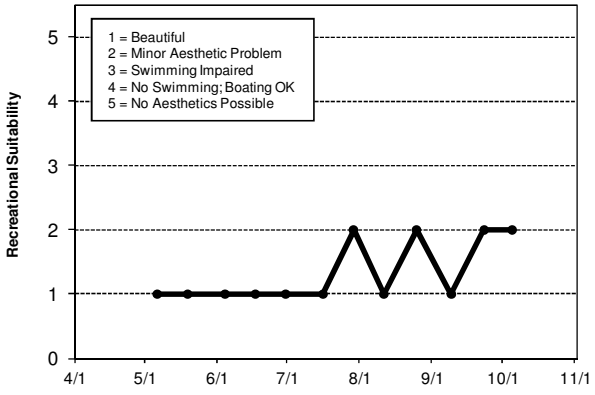


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		C	C					C
Chlorophyll a		C	B					B
Secchi Depth		C	C			B		C
Lake Grade		**C**	**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. The entire lake is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The MN DNR has designated the lake as being infested with Flowering rush (*Butomus umbellatus*). The MPCA has listed the lake as impaired for polychlorinated biphenyl (PCB) content in fish.

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

2011 summer (May-September) data summary

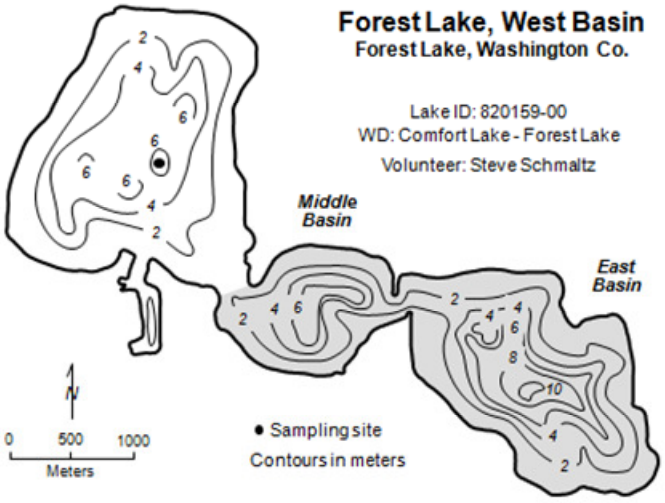
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	35.3	19.0	58.0	C
CLA (µg/l)	18.2	1.9	50.0	B
Secchi (m)	1.8	0.7	4.0	C
TKN (mg/l)	0.84	0.53	1.30	
			Lake Grade	C

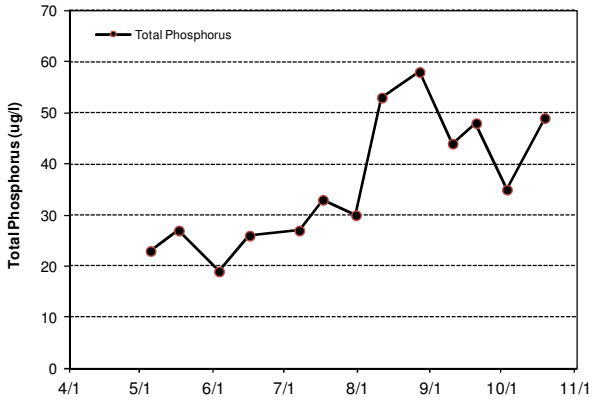
The lake received a lake grade of C for 2011. The water quality of the west basin has fluctuated between lake grades of B and C according to its historical water quality database.

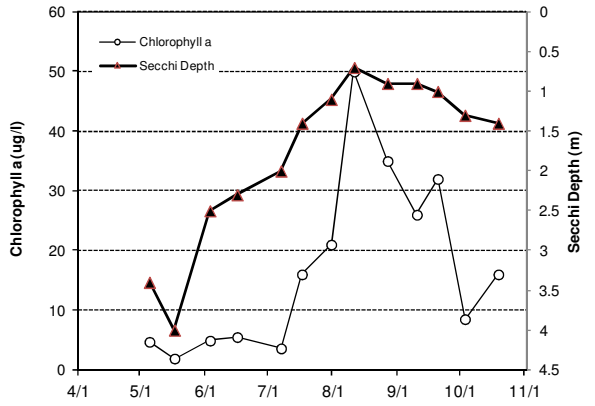
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

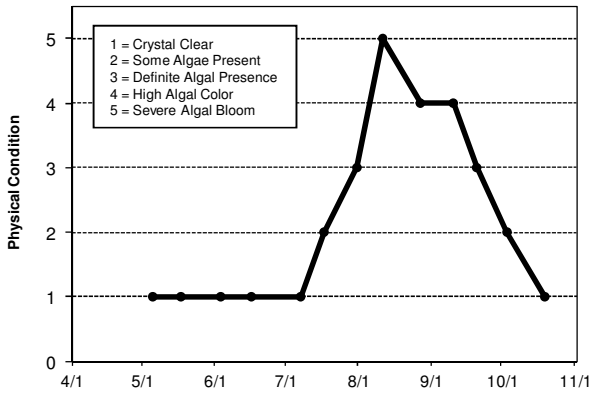
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

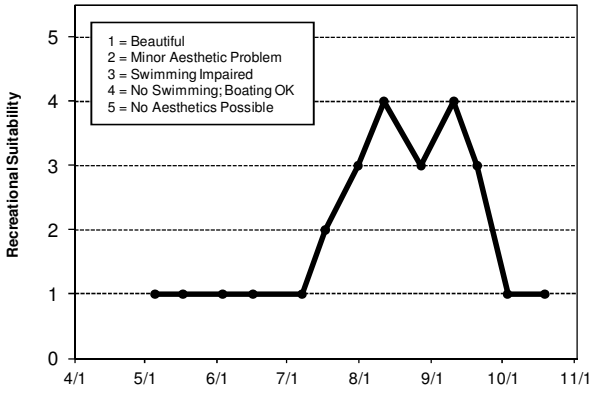
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/5/2011	8.9				4.7	23		3.4	1	1
5/17/2011	13.7				1.9	27		4	1	1
6/3/2011	18				4.9	19		2.5	1	1
6/16/2011	20.6				5.5	26		2.3	1	1
7/7/2011	28.9				3.6	27		2	1	1
7/17/2011	29.2				16	33		1.4	2	2
7/31/2011	30.4				21	30		1.1	3	3
8/11/2011	25.6				50	53		0.7	5	4
8/27/2011	25.1				35	58		0.9	4	3
9/10/2011	23.9				26	44		0.9	4	4
9/20/2011	16.9				32	48		1	3	3
10/3/2011	15.9				8.5	35		1.3	2	1
10/19/2011	10.6				16	49		1.4	1	1

Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus					C		C	C	C	B		C
Chlorophyll a					C		C		C	B	C	B
Secchi Depth					C		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	2009	2010	2011
Total Phosphorus	B	C	C	C	C	B	B	C
Chlorophyll a	A	C	B	C	A	A	B	B
Secchi Depth	B	C	C	C	C	C	C	C
Lake Grade	**B**	**C**	**C**	**C**	**B**	**B**	**B**	**C**

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 entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The major land uses within the lake's immediate watershed are undeveloped and park land.

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

2011 summer (May-September) data summary

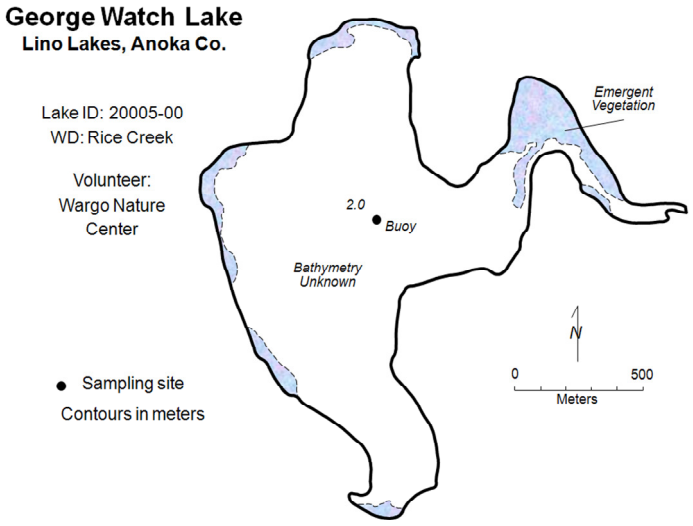
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	126.1	60.0	200.0	D
CLA (µg/l)	23.9	7.6	72.0	C
Secchi (m)	1.0	0.5	1.3	D
TKN (mg/l)	1.56	1.30	1.90	
			Lake Grade	D

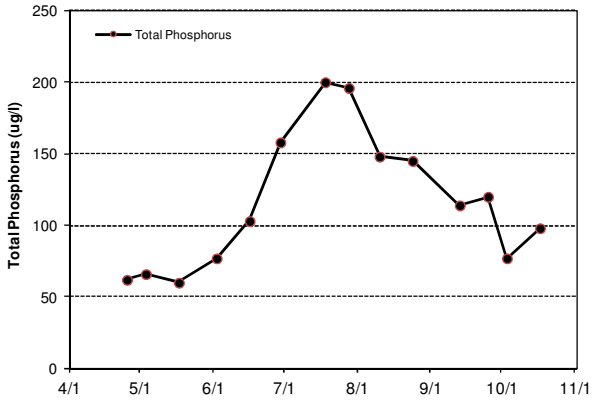
The lake received a lake grade of D for 2011, which is consistent with previous lake grades received in the past. The historical lake grades seem to indicate that the lake water quality has fluctuated between an F and D lake grade throughout the 20+ years of data. The TP and Secchi grades have remained fairly consistent throughout the monitoring years with respect to the more variable CLA grades.

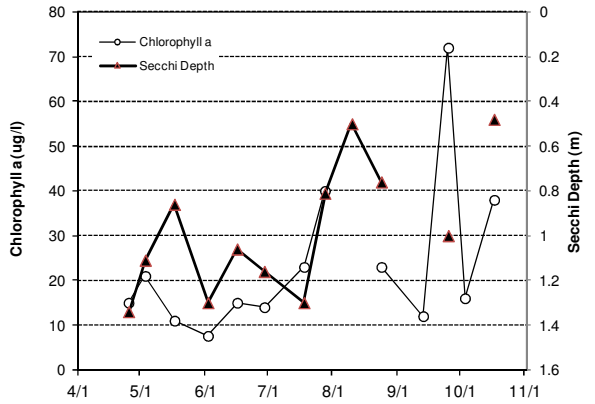
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

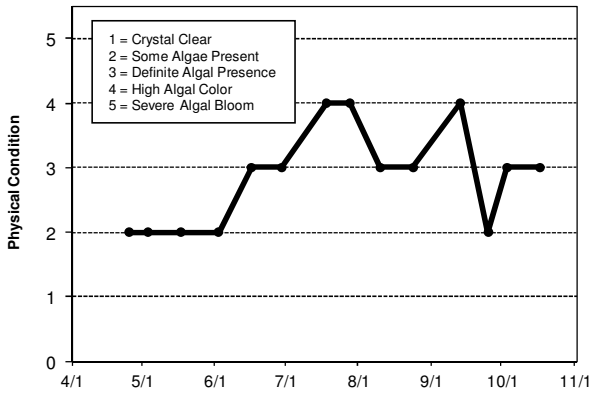






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/25/2011	12.1				15	62		1.34	2	2
5/3/2011	8.8				21	66		1.11	2	2
5/17/2011	17.2				11	60		0.86	2	3
6/2/2011	20.1				7.6	77		1.3	2	4
6/16/2011	19.8				15	103		1.06	3	4
6/29/2011	24.5				14	158		1.16	3	4
7/18/2011	27.8				23	200		1.3	4	4
7/28/2011	30.3				40	196		0.81	4	4
8/10/2011	27					148		0.5	3	4
8/24/2011	24.7				23	145		0.76	3	4
9/13/2011	21.3				12	114			4	5
9/25/2011	15.4				72	120		1	2	2
10/3/2011	17.4				16	77			3	4
10/17/2011	7.8				38	98		0.48	3	4

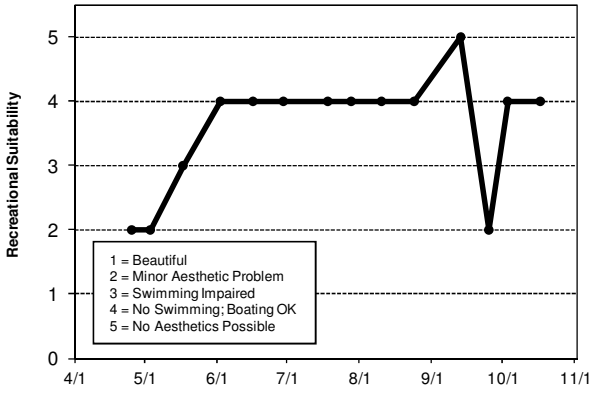


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	F	F	F	F	F	D	D	D
Chlorophyll a	D	C	F	D	C	B	C	C
Secchi Depth	F	F	F	F	F	F	F	D
Lake Grade	**F**	**D**	**F**	**F**	**D**	**D**	**D**	**D**



Source: Metropolitan Council and STORET data

Goggins Lake (82-0077) *Browns Creek Watershed District*

Goggins Lake is located within May Township (Washington County). It has a surface area of a 11 acres. Little bathymetric information is available for the lake but the maximum depth is approximately 4.0 m (13 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

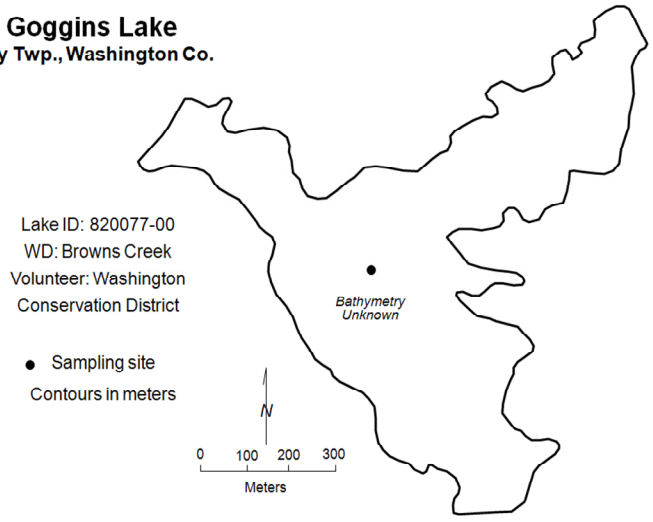
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	107.4	79.0	134.0	D
CLA (µg/l)	26.9	4.2	47.0	C
Secchi (m)	1.4	0.6	2.6	C
TKN (mg/l)	2.26	1.40	3.20	
			Lake Grade	C

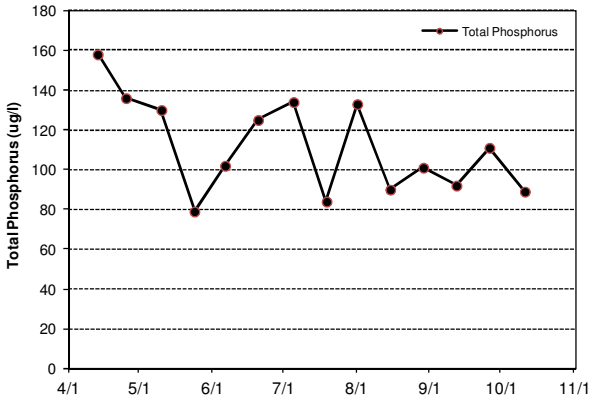
The lake received a lake grade of C for 2011 which is consistent with those received in some previous years. The lake's water quality seems to be represented by a lake grade of C or D, depending on the year. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

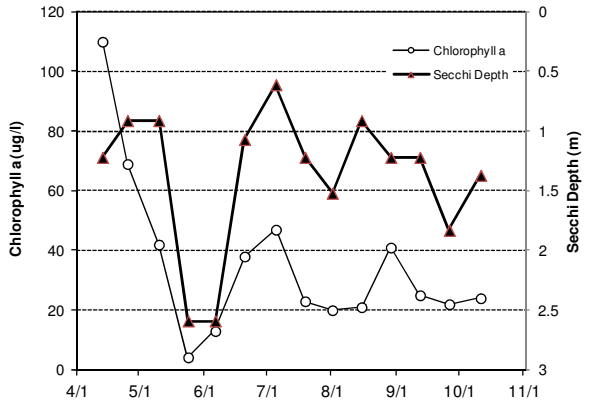
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

If you notice any errors in the lake's data or physical information, or are aware of 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.

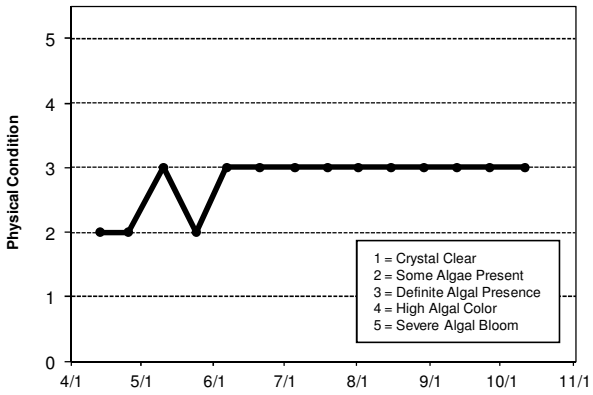






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/13/2011	11.1	9	14.2	0.1	110	158		1.22	2	2
4/25/2011	9.9	7.7	15.6	0.1	69	136		0.91	2	3
5/10/2011	13.6	12.9	9.6	0.1	42	130		0.91	3	4
5/24/2011	18.9	17.9	7.9	0.1	4.2	79		2.59	2	3
6/6/2011	23.7	20	7.3	0.1	13	102		2.59	3	3
6/20/2011	21.7	20	8.5	0.1	38	125		1.07	3	4
7/5/2011	27.7	19.9	12.6	0.1	47	134		0.61	3	4
7/19/2011	30.4	21.9	8.7	0.1	23	84		1.22	3	4
8/1/2011	28.8	24.6	6.9	0.1	20	133		1.52	3	4
8/15/2011	26.2	24.3	10.1	2.7	21	90		0.91	3	4
8/29/2011	24	23.4	7.2	0.1	41	101		1.22	3	4
9/12/2011	23.5	20.8	9.8	0.1	25	92		1.22	3	4
9/26/2011	15	14.8	10.2	0.1	22	111		1.83	3	4
10/11/2011	18.4	17.3	10	0.1	24	89		1.37	3	4

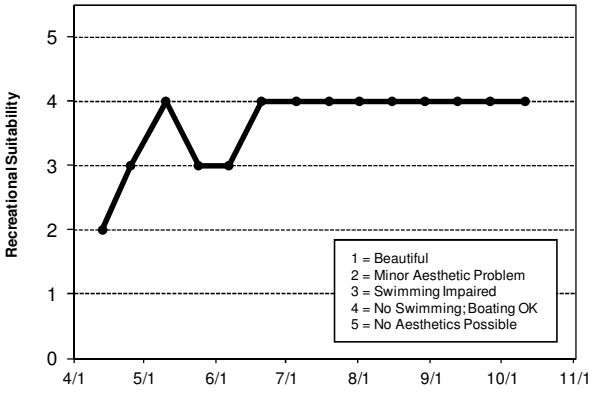


Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus								D	D	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	2009	2010	2011
Total Phosphorus	C	D	D	D	D	D	D	D
Chlorophyll a	C	C	C	D	C	C	D	C
Secchi Depth	D	C	D	D	D	D	D	C
Lake Grade	**C**	**C**	**D**	**D**	**D**	**D**	**D**	**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. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

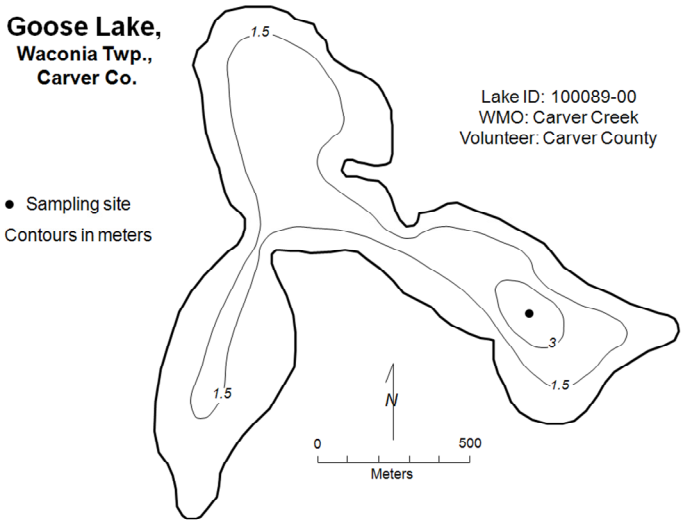
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	112.2	85.0	151.0	D
CLA (µg/l)	108.9	80.0	140.0	F
Secchi (m)	0.5	0.3	0.7	F
TKN (mg/l)	2.95	2.40	3.50	
			Lake Grade	F

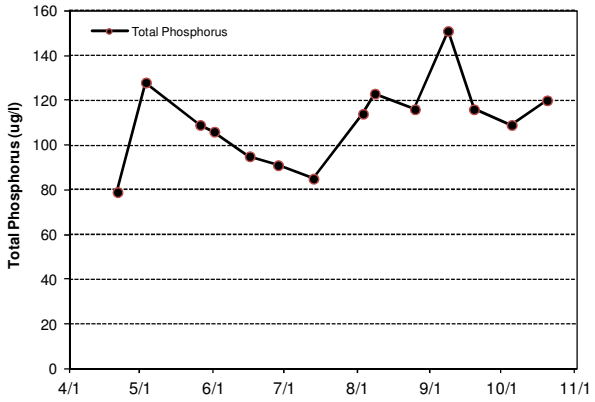
The lake received a lake grade of F for 2011 which is consistent with its historical database. The lake has experienced variability in water quality over the long term (i.e. grades ranging from C to F), with F grades being predominant for the past 7 years. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

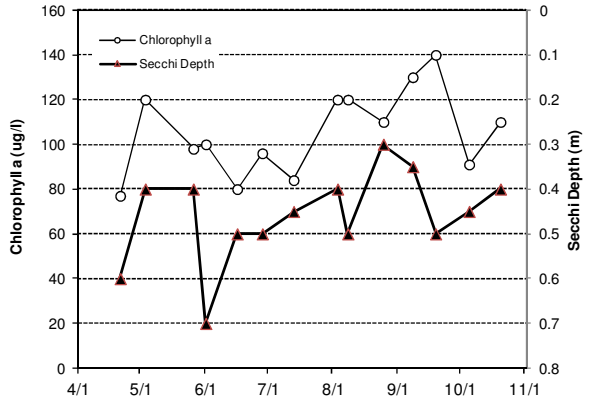
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

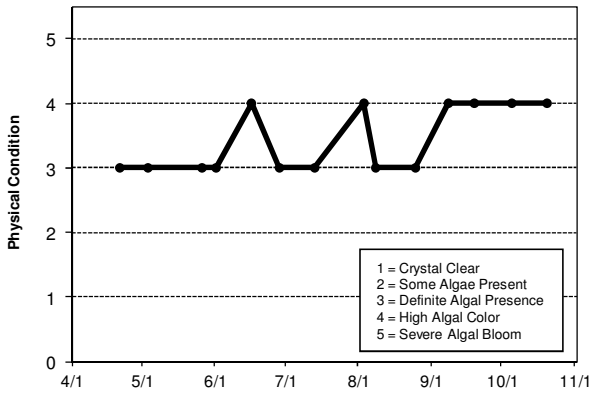






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	6.86		20.5		77	79		0.6	3	3
5/3/2011	6.9		18.3		120	128		0.4	3	4
5/26/2011	17.68		11.6		98	109		0.4	3	3
6/1/2011	17.9		9.2		100	106		0.7	3	4
6/16/2011	19.81		8.7		80	95		0.5	4	3
6/28/2011	20.94		13.5		96	91		0.5	3	3
7/13/2011	25.79		9		84	85		0.45	3	4
8/3/2011	26.63		6.6		120	114		0.4	4	4
8/8/2011	26.58		8.5		120	123		0.5	3	4
8/25/2011	25.4		10.8		110	116		0.3	3	3
9/8/2011	22.51		13.3		130	151		0.35	4	4
9/19/2011	17.36		13.1		140	116		0.5	4	4
10/5/2011	15.68		9.7		91	109		0.45	4	4
10/20/2011	8.12		9.8		110	120		0.4	4	4

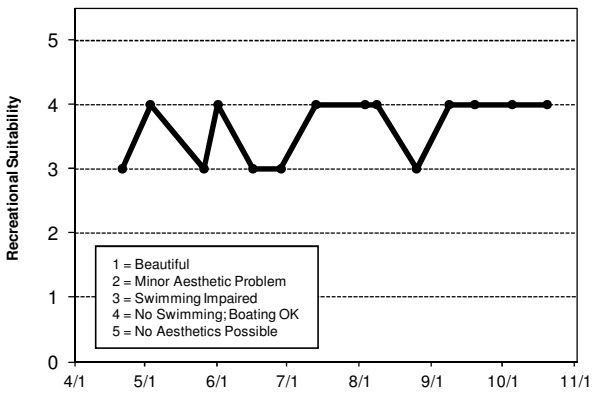


Lake Water Quality Grades Based on Summertime Averages

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				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	2009	2010	2011
Total Phosphorus		D	D	D	D	D	D	D
Chlorophyll a		F	F	F	F	F	F	F
Secchi Depth		F	F	F	F	F	F	F
Lake Grade		**F**	**F**	**F**	**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. The lake has a maximum and mean depth of 7.6 m (25 feet) and 2.4 m (8 feet), respectively.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	54.4	35.0	79.0	C
CLA (µg/l)	40.6	12.0	94.0	C
Secchi (m)	2.0	0.6	3.4	C
TKN (mg/l)	1.46	1.00	2.00	
			Lake Grade	C

The lake received a lake grade of C for 2011, which is similar to the lake grades received in the past.. The lake's overall water quality seems to be represented by a lake grade of C given the historical water quality database.

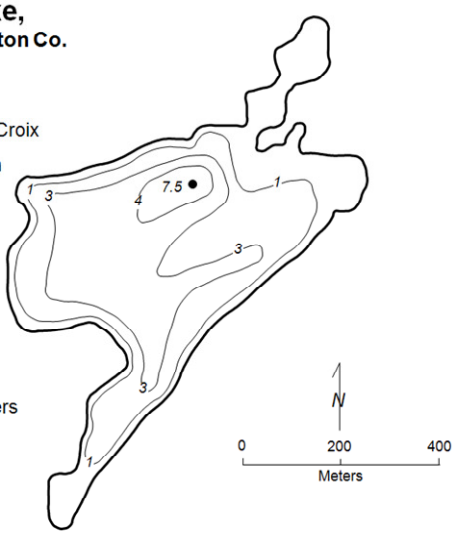
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

Goose Lake,
Scandia, Washington Co.

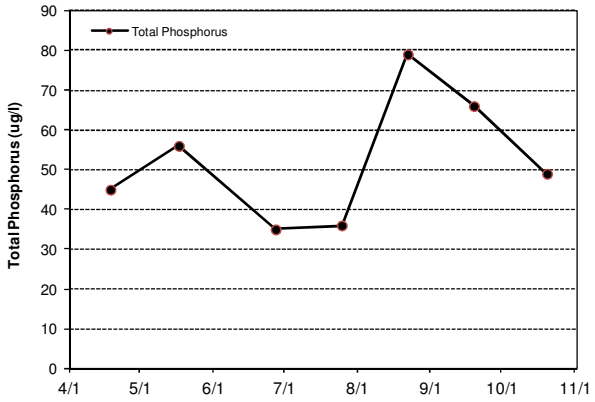
Lake ID: 820059-00
WD: Carnelian-Marine-St. Croix
Volunteer: Washington
Conservation District

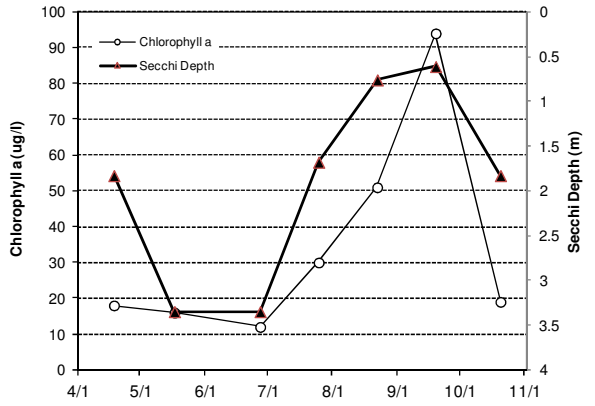


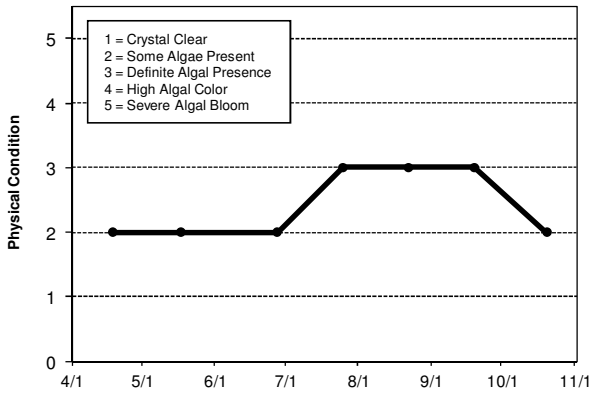
● Sampling site
Contours in meters

2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/18/2011	7.4	6.5	11.8	0.1	18	45		1.83	2	2
5/17/2011	14	13.1	10.9	0.1	16	56		3.35	2	2
6/27/2011	21.1	15.5	11.2	0.1	12	35		3.35	2	2
7/25/2011	27.8	16.7	9.4	0	30	36		1.68	3	3
8/22/2011	25.9	18.6	9.7	0	51	79		0.76	3	3
9/19/2011	17.7	17.3	7.3	0	94	66		0.61	3	4
10/20/2011	11.1	11.1	9	0.1	19	49		1.83	2	3





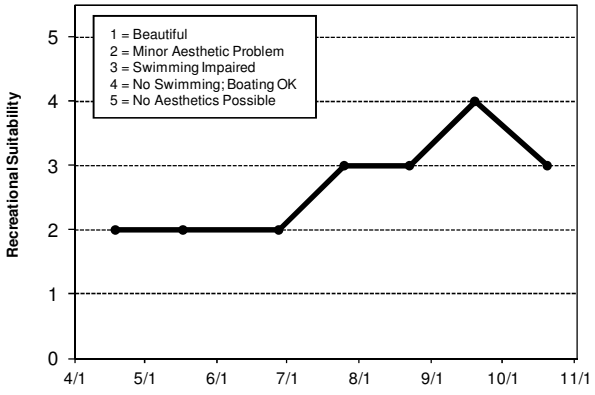


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	C	D	C	C	C	C	C
Chlorophyll a	C	C	C	C	C	C	B	C
Secchi Depth	B	C	C	C	C	C	C	C
Lake Grade	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**



Source: Metropolitan Council and STORET data

Grace Lake (10-0218) *Carver County Environmental Services*

Grace Lake is a 22-acre lake located near the City of Chaska (Carver County). The lake has a maximum depth of 6.7 m (22 feet). A search through the STORET nationwide water quality database for historical data provided no data other than CAMP data.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	117.3	32.0	276.0	D
CLA (µg/l)	57.5	6.2	160.0	D
Secchi (m)	0.8	0.3	1.5	D
TKN (mg/l)	1.76	0.87	2.70	
			Lake Grade	D

The lake received a lake grade of D for 2011 which is consistent with its historical database. Further monitoring is suggested for this lake to develop an historical water quality database.

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

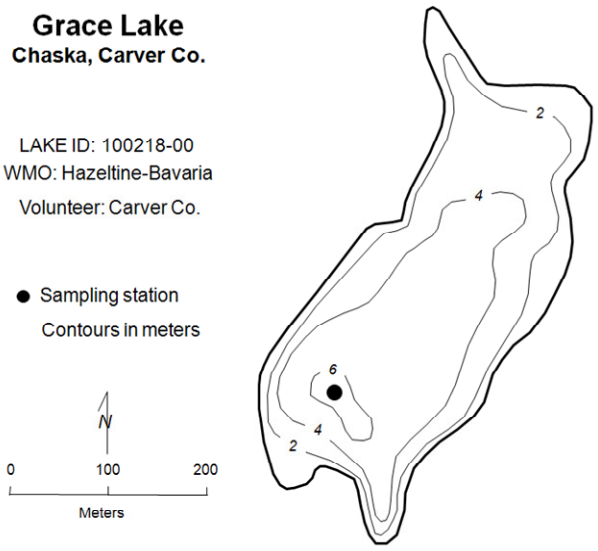
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 297-4916 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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

Grace Lake
Chaska, Carver Co.

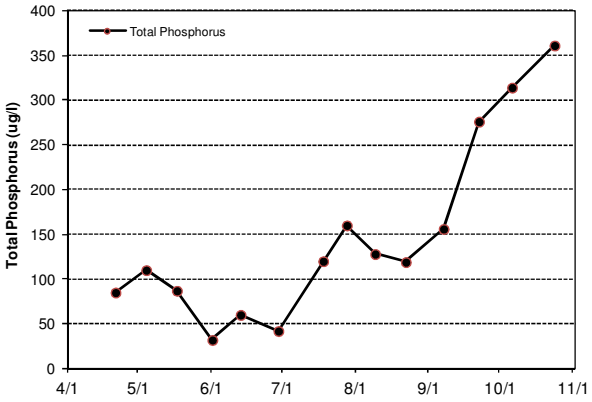
LAKE ID: 100218-00
WMO: Hazeltine-Bavaria
Volunteer: Carver Co.

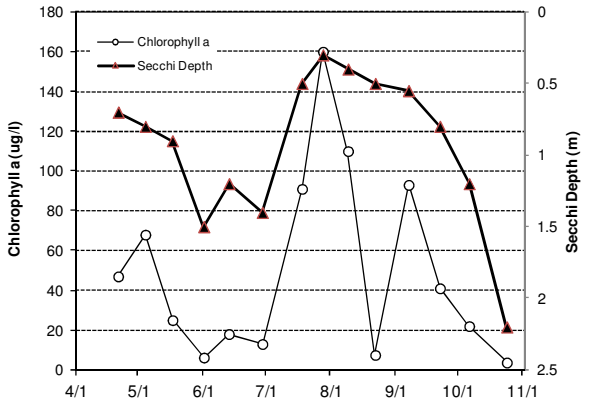
● Sampling station
Contours in meters

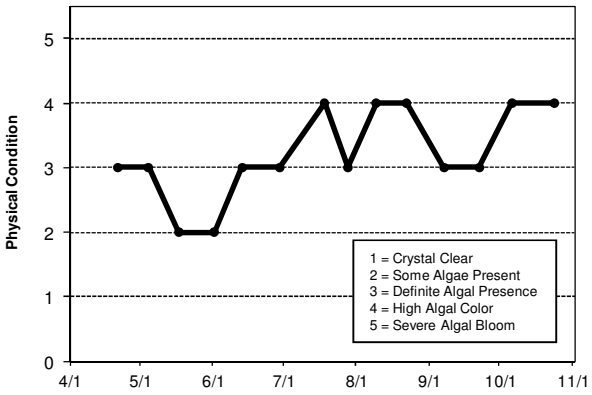


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	7.69		18		47	85		0.7	3	3
5/4/2011	9.84		22		68	110		0.8	3	3
5/17/2011	13.99		9.4		25	87		0.9	2	3
6/1/2011	20		8.9		6.2	32		1.5	2	3
6/13/2011	20.87		9.9		18	60		1.2	3	3
6/29/2011	25.52		13.6		13	42		1.4	3	3
7/18/2011	27.02		14.2		91	120		0.5	4	4
7/28/2011	29.22		15		160	160		0.3	3	3
8/9/2011	25.33		7.9		110	128		0.4	4	4
8/22/2011	24.82		8.9		7.5	119		0.5	4	4
9/7/2011	24.24		11.4		93	156		0.55	3	3
9/22/2011	16.34		6		41	276		0.8	3	3
10/6/2011	16.7		7.4		22	314		1.2	4	4
10/24/2011	11.62		4.4		3.7	361		2.2	4	4





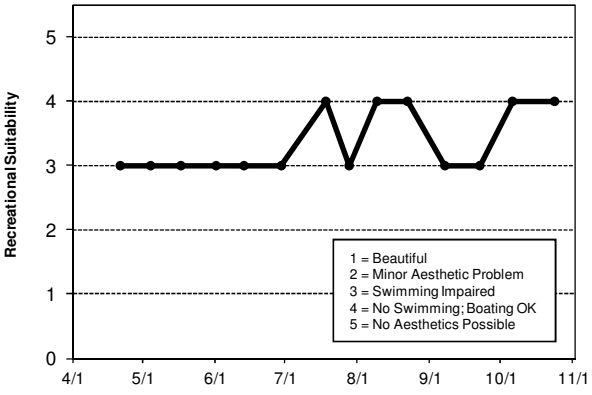


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	D	D		D	D	D	D	D
Chlorophyll a	C	B		C	C	D	D	D
Secchi Depth	D	D		D	D	D	C	D
Lake Grade	**D**	**C**		**D**	**D**	**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).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	62.0	20.0	96.0	C
CLA (µg/l)	20.4	3.8	39.0	C
Secchi (m)	1.8	1.2	2.3	C
TKN (mg/l)	1.06	0.92	1.30	
			Lake Grade	C

The lake received a lake grade of C for 2011, which is consistent with the grades received since 2006, and a continued improvement compared to the grades received in the late 1990s and early 2000s. Continued monitoring is suggested to determine if the improving trend continues.

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

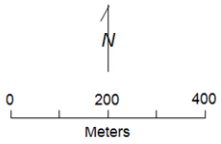
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

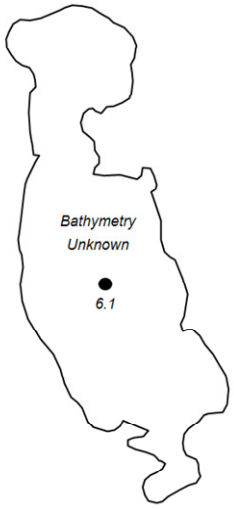
Hay Lake

Scandia,
Washington Co.

LAKE ID: 820065-00
WD: Carnelian-Marine-St. Croix
Volunteer: Washington Conservation District

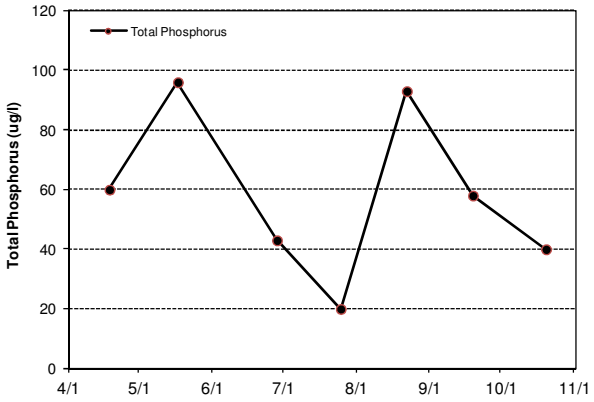
● Sampling site
Contours in meters

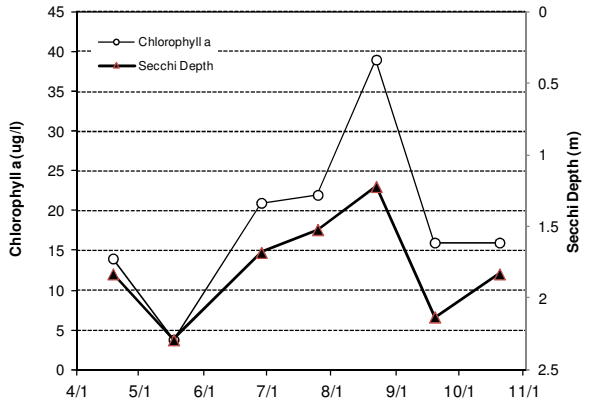


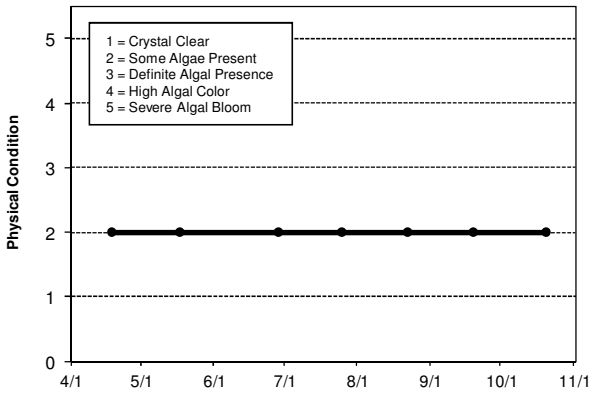


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/18/2011	8.7	7.4	11	2.2	14	60		1.83	2	3
5/17/2011	15.9	14.6	9.9	8.9	3.8	96		2.29	2	2
6/28/2011	22.7	19.5	7.5	2.9	21	43		1.68	2	2
7/25/2011	28.7	22.4	7.1	0.1	22	20		1.52	2	2
8/22/2011	25.4	22.2	5.7	0.1	39	93		1.22	2	2
9/19/2011	16.2	15.4	5.7	0.2	16	58		2.13	2	3
10/20/2011	8.4		9.7		16	40		1.83	2	2





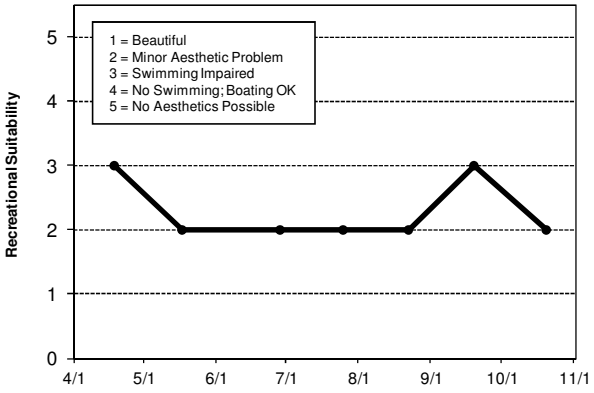


Lake Water Quality Grades Based on Summertime Averages

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	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	2009	2010	2011
Total Phosphorus	D	D	D	D	C	C	C	C
Chlorophyll a	D	F	B	C	C	C	B	C
Secchi Depth	D	D	C	C	C	C	C	C
Lake Grade	**D**	**D**	**C**	**C**	**C**	**C**	**C**	**C**



Source: Metropolitan Council and STORET data

Hazeltine Lake (10-0014) *Carver County Environmental Services*

Hazeltine Lake is located in the City of Chaska (Carver County). The lake has a surface area of 236 acres, and a maximum depth of 2.0 m (6.6 ft). The entire lake is considered littoral zone, which is the shallow 0 to 15 feet depth zone that is typically dominated by aquatic plants.

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

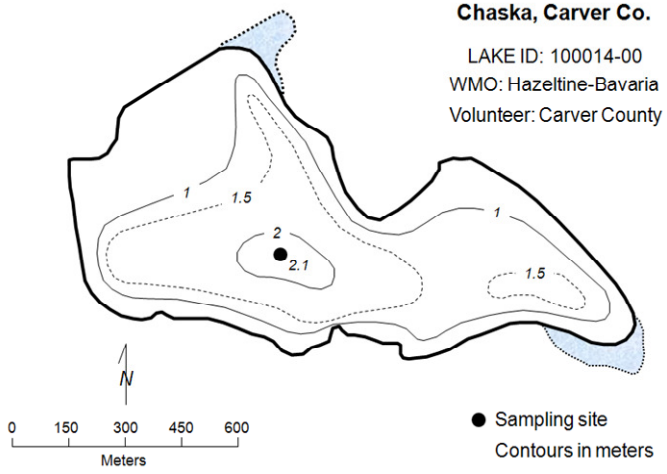
2011 summer (May-September) data summary

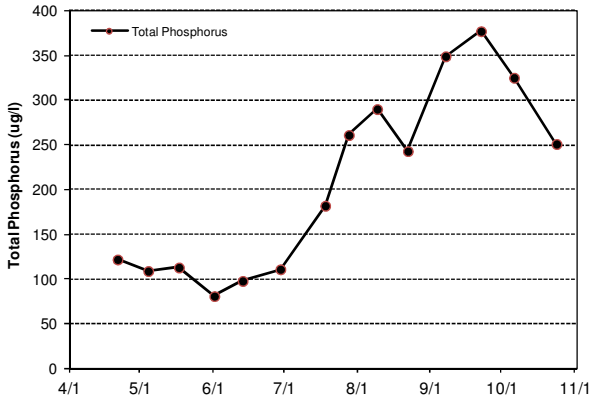
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	201.3	81.0	377.0	F
CLA (µg/l)	170.7	35.0	400.0	F
Secchi (m)	0.4	0.1	0.7	F
TKN (mg/l)	3.31	0.96	7.00	
			Lake Grade	F

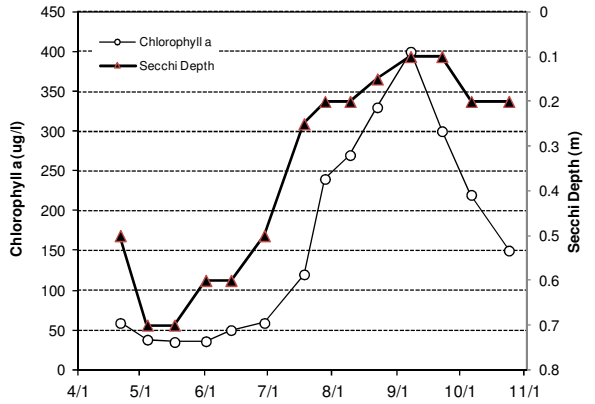
The lake received a lake grade of F for 2011, which is consistent with its limited historical database. Continued monitoring is suggested to continue to build the water quality database for this lake.

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

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

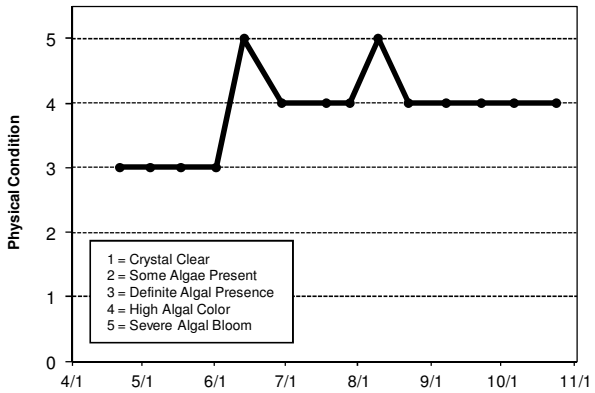






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	7.44		20.5		59	122		0.5	3	4
5/4/2011	9.53		21.2		38	109		0.7	3	4
5/17/2011	15.16		10.4		35	113		0.7	3	4
6/1/2011	19.67		9.7		36	81		0.6	3	4
6/13/2011	20.17		7		50	98		0.6	5	4
6/29/2011	23.86		16.5		59	111		0.5	4	4
7/18/2011	27.36		15.4		120	182		0.25	4	4
7/28/2011	28.4		13.4		240	261		0.2	4	4
8/9/2011	24.4		7.1		270	290		0.2	5	5
8/22/2011	25.48		13.1		330	243		0.15	4	5
9/7/2011	20.6		12.4		400	349		0.1	4	4
9/22/2011	14.1		10.1		300	377		0.1	4	5
10/6/2011	16.63		9.4		220	325		0.2	4	4
10/24/2011	9.43		9.2		150	251		0.2	4	4

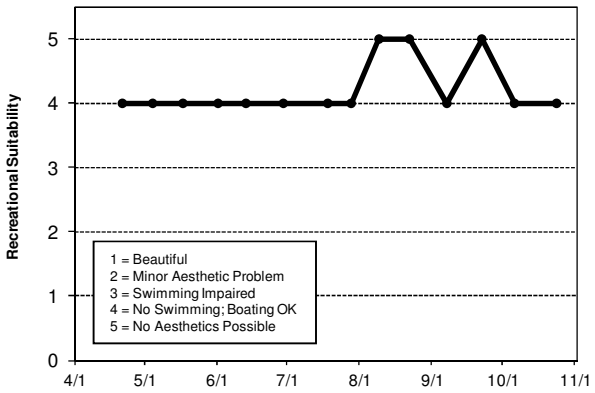


Lake Water Quality Grades Based on Summertime Averages

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									F	F		
Chlorophyll a									F	F		
Secchi Depth									F	F		
Lake Grade									**F**	**F**		

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		F	F			F	D	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

Henry Lake (27-0175) *Elm Creek Watershed Management Commission*

Henry Lake is a 77-acre lake located within Hassan Township (Hennepin County). The maximum depth of the lake is 1.5 m (5 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

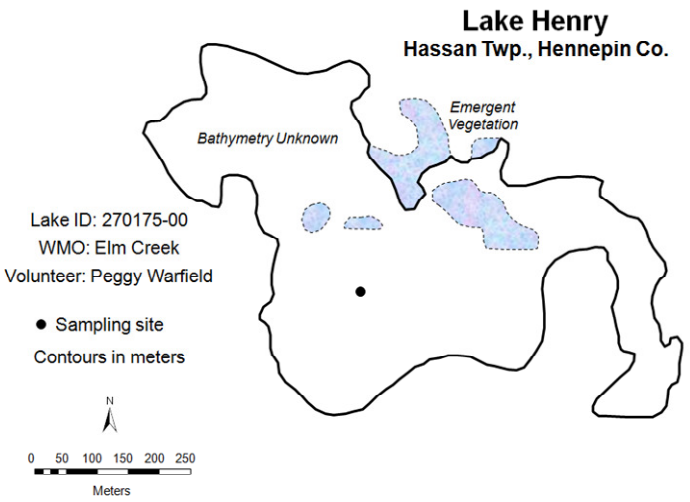
2011 summer (May-September) data summary

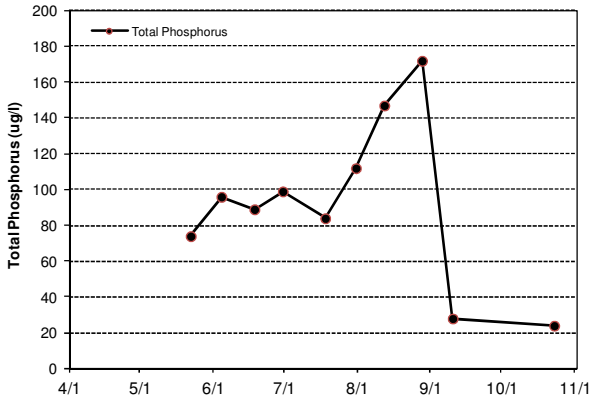
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	100.1	28.0	172.0	D
CLA (µg/l)	24.1	4.8	55.0	C
Secchi (m)	0.8	0.5	1.6	D
TKN (mg/l)	1.30	0.86	1.60	
			Lake Grade	D

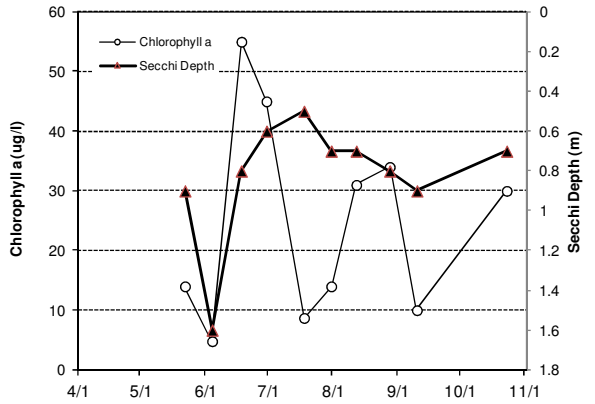
The lake received a lake grade of D for 2011 which is an improvement over the F grades for the previous two years. Prior to 2009, the lake typically received a D grade. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

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

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

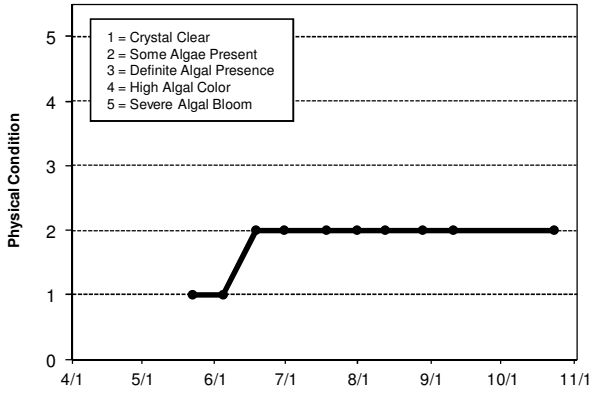






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/22/2011	17.3				14	74		0.9	1	2
6/4/2011	25.5				4.8	96		1.6	1	2
6/18/2011	22.1				55	89		0.8	2	2
6/30/2011	26.7				45	99		0.6	2	3
7/18/2011	31.2				8.7	84		0.5	2	3
7/31/2011	29.6				14	112		0.7	2	3
8/12/2011	25.8				31	147		0.7	2	3
8/28/2011	25.4				34	172		0.8	2	2
9/10/2011	26.8				10	28		0.9	2	2
10/23/2011	11.5				30	24		0.7	2	2



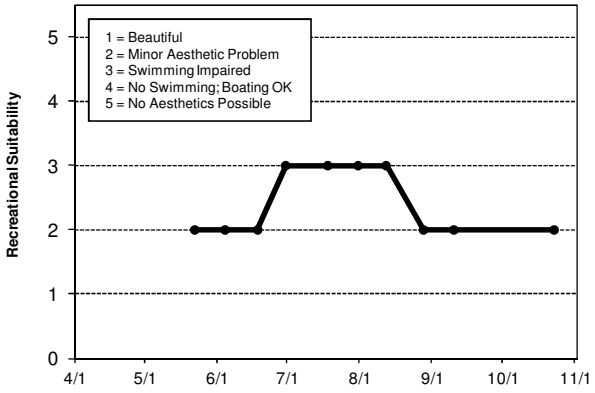
Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		D	F	C	F	F	F	D
Chlorophyll a		C	B	D	C	F	D	C
Secchi Depth		D	C	D	D	F	F	D
Lake Grade		**D**	**C**	**D**	**D**	**F**	**F**	**D**

Source: Metropolitan Council and STORET data



Hidden Lake (27-0693) *Bassett Creek Watershed Management Organization*

Henry Lake is located within the City of Plymouth (Hennepin County). It has a surface area of approximately 9 acres, and a maximum depth of 8.5 m.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	30.6	16.0	47.0	B
CLA (µg/l)	8.5	4.4	11.0	A
Secchi (m)	1.8	1.4	2.0	C
TKN (mg/l)	1.18	0.90	1.40	
			Lake Grade	B

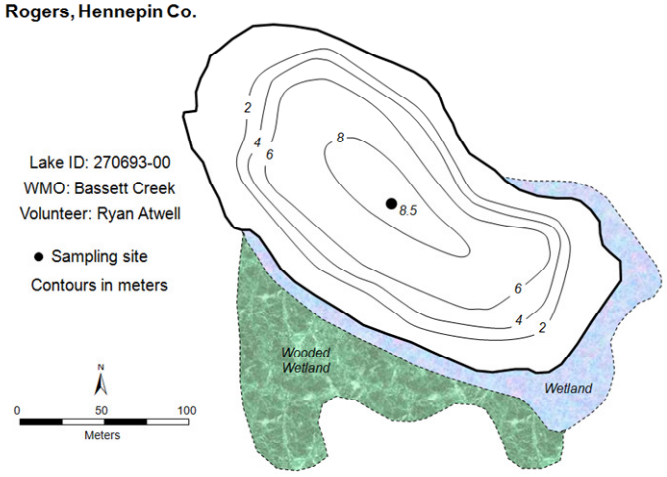
This was the first year the lake was enrolled in the CAMP, and it received a lake grade of B. Continued monitoring is recommended to increase the power for determining trends, and to build the water quality database for this lake.

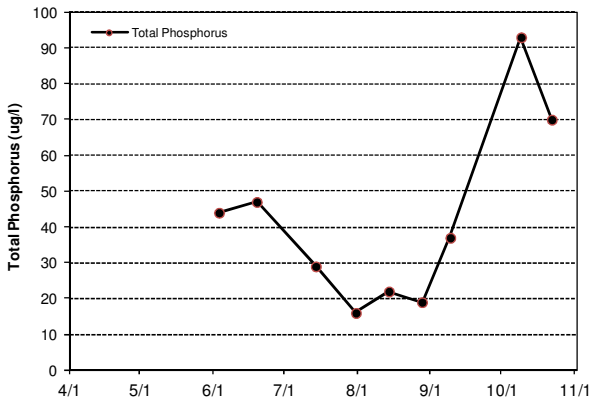
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

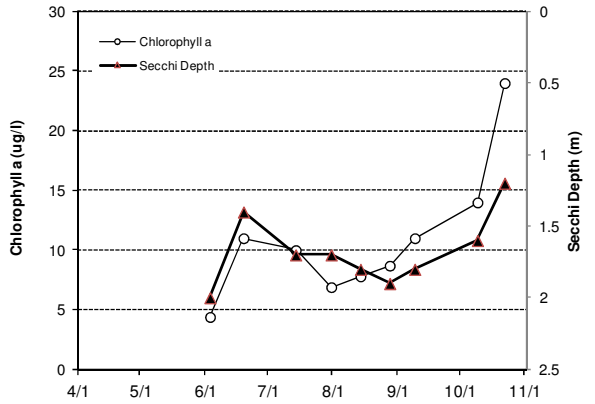
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 297-4916 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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.

Hidden Lake
Rogers, Hennepin Co.

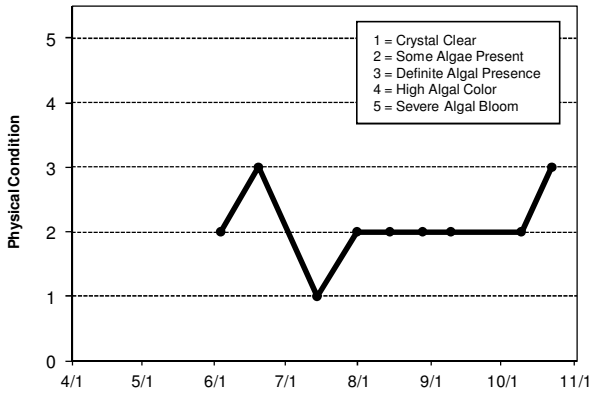






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/3/2011	23.7				4.4	44		2	2	1
6/19/2011	23				11	47		1.4	3	1
7/14/2011	24.7				10	29		1.7	1	1
7/31/2011	28.9				6.9	16		1.7	2	1
8/14/2011	26				7.8	22		1.8	2	1
8/28/2011	22.5				8.7	19		1.9	2	1
9/9/2011	21.8				11	37		1.8	2	2
10/9/2011	17.5				14	93		1.6	2	1
10/22/2011	12.7				24	70		1.2	3	1

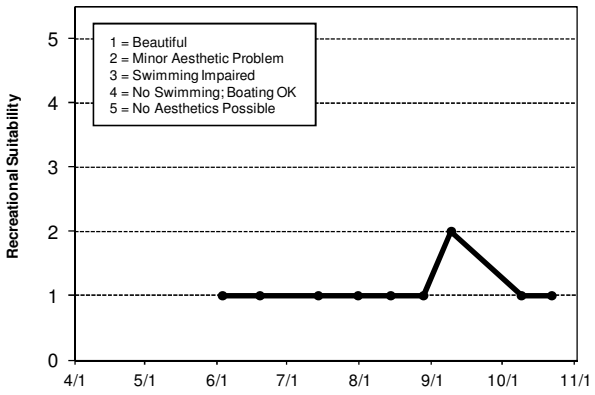


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus								B
Chlorophyll a								A
Secchi Depth								C
Lake Grade								**B**



Source: Metropolitan Council and STORET data

Horseshoe Lake [Sunfish Lake] (19-0051) *City of Sunfish Lake*

Horseshoe Lake is a 16-acre lake located within the City of Sunfish Lake (Dakota County). There is very little morphological information available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data and graphs appear on the next page.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	22.6	18.0	28.0	A
CLA (µg/l)	4.3	2.2	7.5	A
Secchi (m)	+3.2	3.1	+3.2	A
TKN (mg/l)	0.60	0.50	0.68	
			Lake Grade	A

The lake received a lake grade of A in 2011. However, the water clarity was better than the Secchi depth data would suggest since most of the measurements were made with the Secchi disk visible on the lake bottom. Therefore the Secchi depth mean is actually greater than shown above, and falls above the threshold for an A grade. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

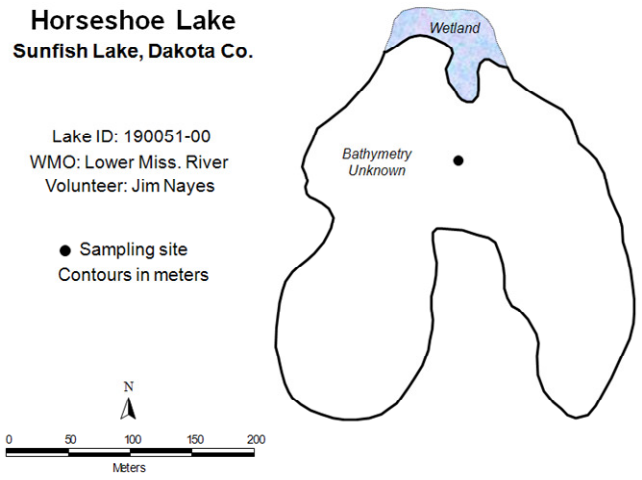
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

Horseshoe Lake
Sunfish Lake, Dakota Co.

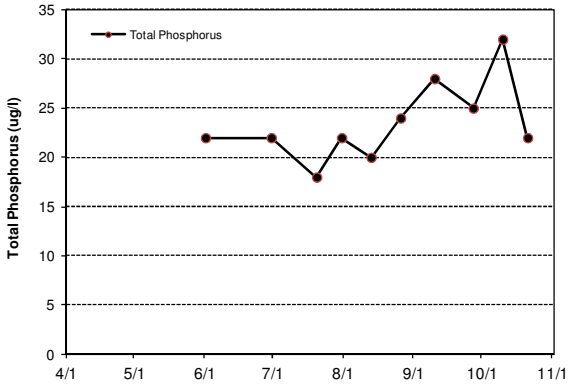
Lake ID: 190051-00
WMO: Lower Miss. River
Volunteer: Jim Nayes

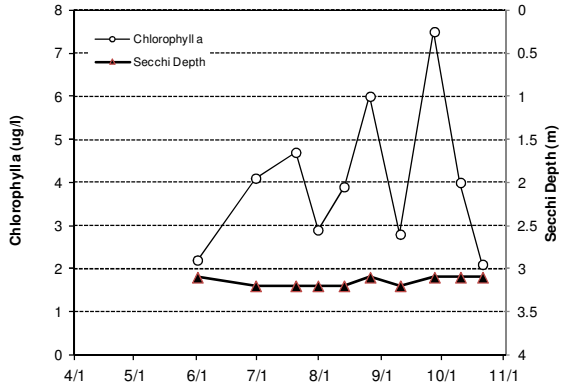
● Sampling site
Contours in meters

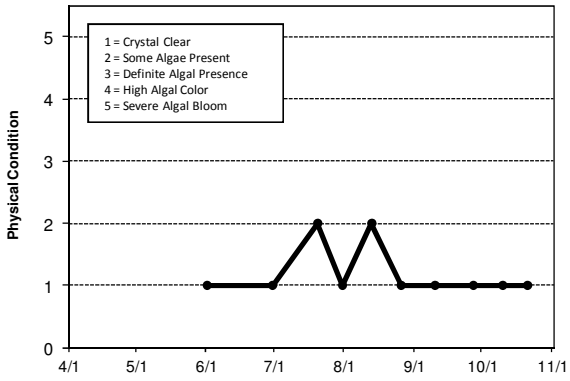


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/1/2011	22.2				2.2	22		3.1	1	1
6/30/2011	25.8				4.1	22		3.2	1	1
7/20/2011	31.5				4.7	18		>3.2	2	1
7/31/2011	30.8				2.9	22		>3.2	1	1
8/13/2011	25.3				3.9	20		>3.2	2	1
8/26/2011	26				6	24		>3.1	1	1
9/10/2011	25.5				2.8	28		>3.2	1	1
9/27/2011	16.3				7.5	25		>3.1	1	1
10/10/2011	19.5				4	32		>3.1	1	1
10/21/2011	10.5				2.1	22		>3.1	1	1







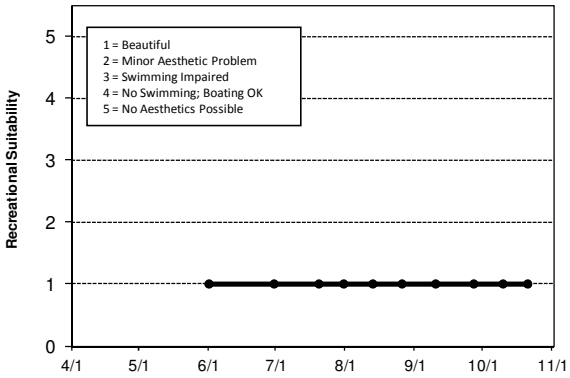
Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus			C	C	A	B	C	A
Chlorophyll a			A	A	A	A	A	A
Secchi Depth			C	C	C	B	B*	A*
Lake Grade			**B**	**B**	**B**	**B**	**B**	**A**

* Secchi Disk visible on lake bottom



Source: Metropolitan Council and STORET data

Horseshoe Lake [site 3] (82-0074) *Washington Conservation District*

Horseshoe Lake is located in the City of Lake Elmo and West Lakeland Township (Washington County). The lake has a surface area of 53 acres. The lake has a surface area of 53 acres and a maximum depth 3.4 m (11 ft).

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

2011 summer (May-September) data summary

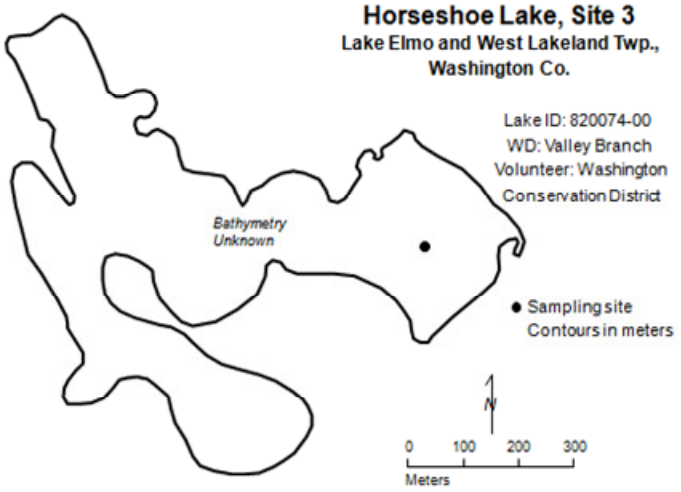
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	48.3	6.0	83.0	C
CLA (µg/l)	15.6	6.3	24.0	B
Secchi (m)	2.1	1.5	2.9	C
TKN (mg/l)	1.45	1.10	2.40	
			Lake Grade	C

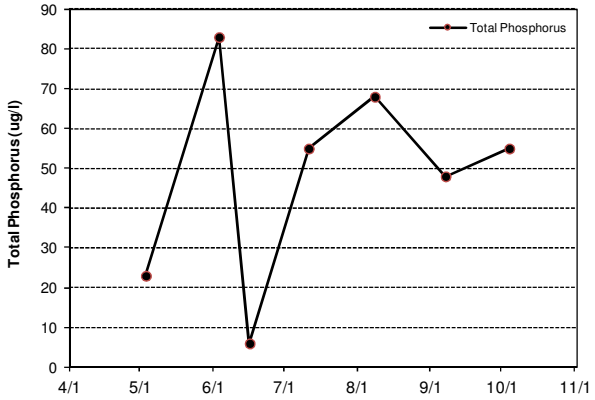
The lake site received a lake grade of C for 2011. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

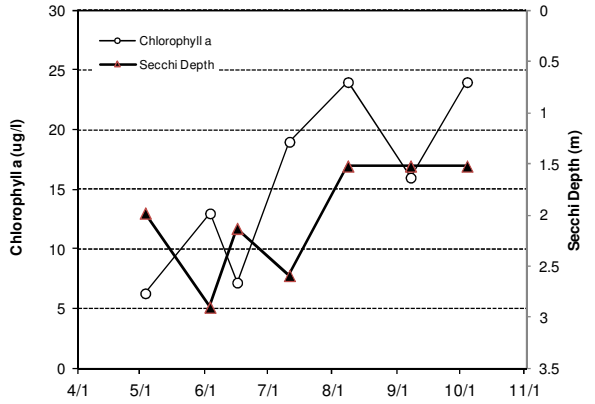
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

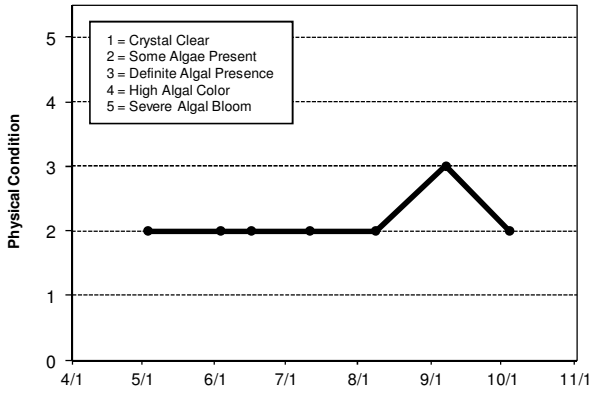






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/3/2011	7.4	7.4	12	1.4	6.3	23		1.98	2	3
6/3/2011	19.7	15	6.8	0.1	13	83		2.9	2	2
6/16/2011	22	17.7	10.2	0.1	7.2	6		2.13	2	2
7/11/2011	29.3	19.4	7.3	0.1	19	55		2.59	2	3
8/8/2011	27.8	23.4	7.7	0	24	68		1.52	2	2
9/7/2011	22	21	5.6	0.1	16	48		1.52	3	4
10/4/2011	16.8	14.9	11	0.1	24	55		1.52	2	3



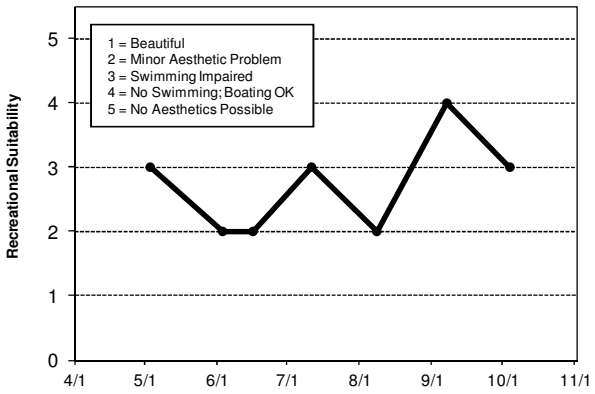
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus						C	C	C
Chlorophyll a						B	C	B
Secchi Depth						C	D	C
Lake Grade						**C**	**C**	**C**

Source: Metropolitan Council and STORET data



Hydes Lake (10-0088) *Carver County Environmental Services*

Hydes Lake is located within Waconia Township (Carver County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a surface area of 215 acres. The mean and maximum depth of the lake is 3.0 (10 feet) and 5.5 m (18 feet). Most of the lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

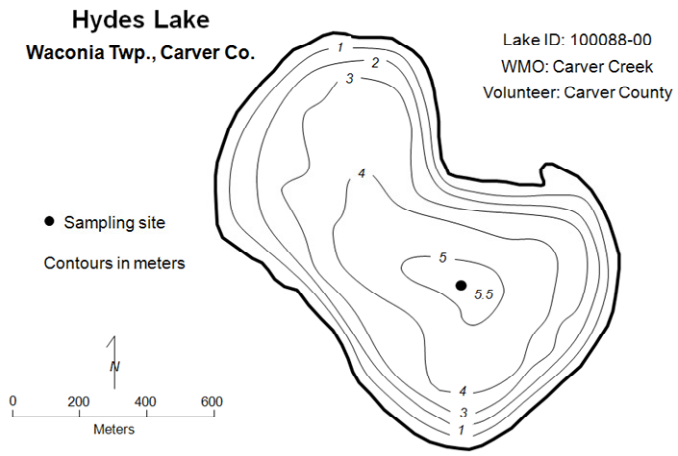
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	128.6	79.0	195.0	D
CLA (µg/l)	19.5	3.9	41.0	B
Secchi (m)	1.9	0.8	3.3	C
TKN (mg/l)	1.44	1.20	1.70	
			Lake Grade	C

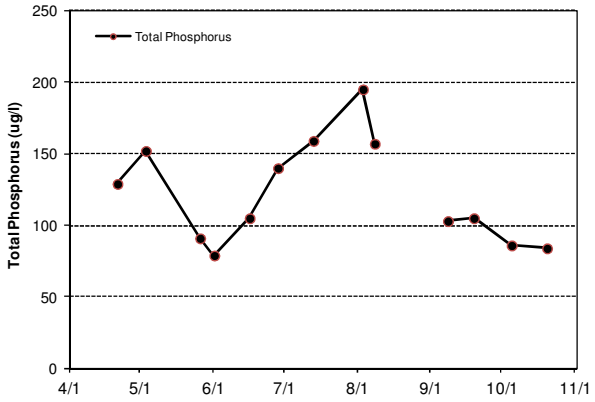
The lake received a lake grade of C for 2011, which is consistent with its historical database (the lake received similar grades in 2001 and 2003). The lake seems to fluctuate between C and F grades.

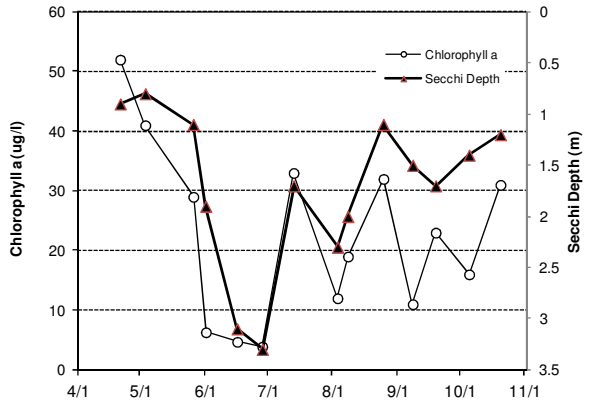
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

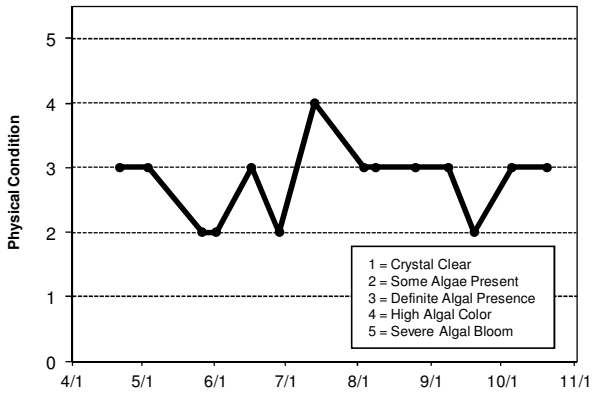
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

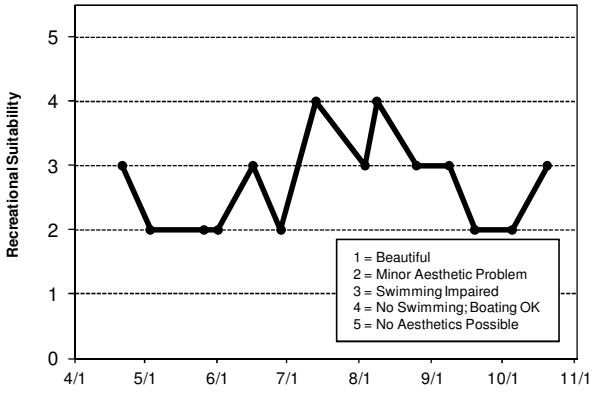
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	6.28		18.7		52	129		0.9	3	3
5/3/2011	7.09		17.5		41	152		0.8	3	2
5/26/2011	16.29		9.2		29	91		1.1	2	2
6/1/2011	17.4		8		6.3	79		1.9	2	2
6/16/2011	20.24		7.2		4.7	105		3.1	3	3
6/28/2011	20.65		8.9		3.9	140		3.3	2	2
7/13/2011	25.84		9.9		33	159		1.7	4	4
8/3/2011	26.6		4.6		12	195		2.3	3	3
8/8/2011	26.72		5.9		19	157		2	3	4
8/25/2011	25.24		9.7		32			1.1	3	3
9/8/2011	21.78		9.9		11	103		1.5	3	3
9/19/2011	18.21		2		23	105		1.7	2	2
10/5/2011	15.74		9.1		16	86		1.4	3	2
10/20/2011	9.89		8.6		31	84		1.2	3	3

Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	D	F	F	D	F	F	D	D
Chlorophyll a	D	D	C	D	F	C	C	B
Secchi Depth	D	C	C	C	D	C	C	C
Lake Grade	**D**	**D**	**D**	**D**	**F**	**D**	**C**	**C**

Source: Metropolitan Council and STORET data

Island Lake (2-0022) *Anoka County Parks*

Island Lake is located in Linwood Township (Anoka County). The lake has a surface area of 67 acres and a maximum depth of 6.7 m (22 feet). Roughly 87 percent of the lake's surface area is considered littoral zone, which is the zone of aquatic plant dominance.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	33.9	22.0	54.0	C
CLA (µg/l)	10.6	2.3	23.0	B
Secchi (m)	1.4	1.1	1.8	C
TKN (mg/l)	0.97	0.45	1.30	
			Lake Grade	C

The lake received a lake grade of C for 2011, which is consistent with its historical database. The annual lake grades have varied among B's and C's. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

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

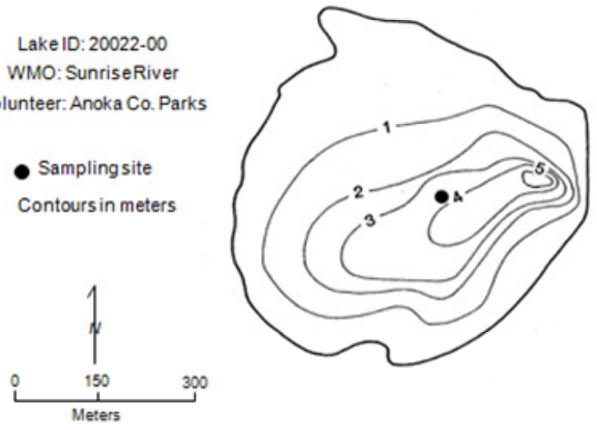
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

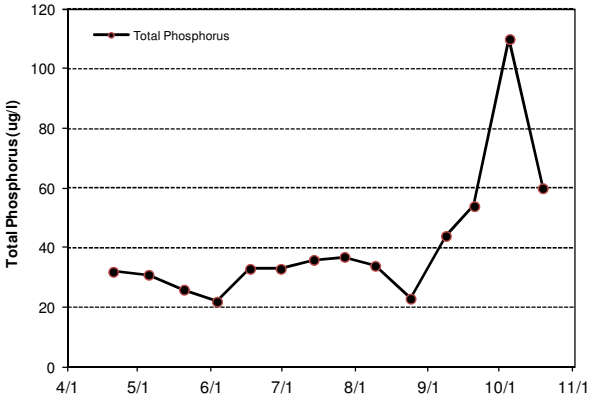
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

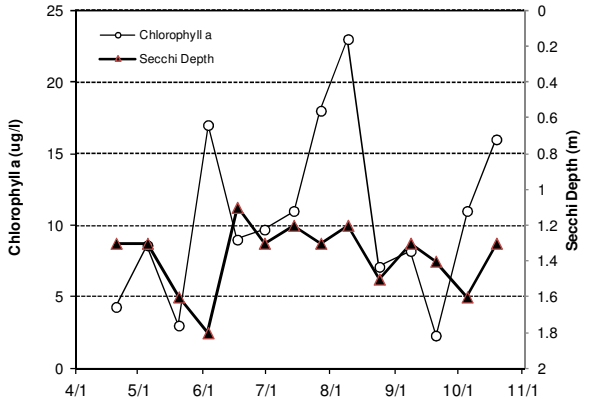
Island Lake
Linwood Twp., Anoka Co.

Lake ID: 20022-00
WMO: Sunrise River
Volunteer: Anoka Co. Parks

● Sampling site
Contours in meters

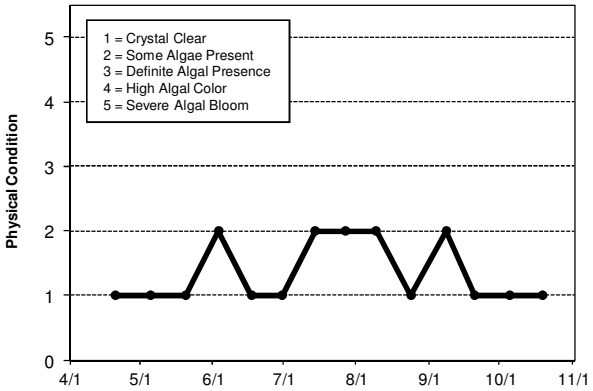






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/20/2011	7.1				4.3	32		1.3	1	
5/5/2011					8.6	31		1.3	1	1
5/20/2011	17.4				3	26		1.6	1	1
6/3/2011	20.7				17	22		1.8	2	
6/17/2011	21.7				9	33		1.1	1	1
6/30/2011	23.8				9.7	33		1.3	1	1
7/14/2011	23.5				11	36		1.2	2	
7/27/2011	25.7				18	37		1.3	2	
8/9/2011	24.3				23	34		1.2	2	
8/24/2011	24.5				7.1	23		1.5	1	1
9/8/2011	21.3				8.2	44		1.3	2	1
9/20/2011	16.1				2.3	54		1.4	1	1
10/5/2011	15.4				11	110		1.6	1	1
10/19/2011	10				16	60		1.3	1	1

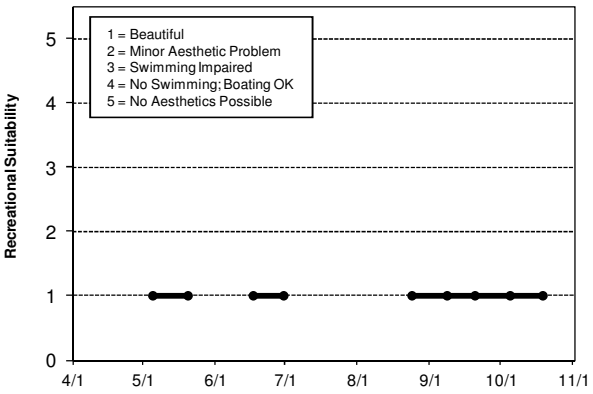


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus				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	2009	2010	2011
Total Phosphorus	C	C	C	B	B	B	C	C
Chlorophyll a	A	B	B	B	B	B	B	B
Secchi Depth	C	C	C	C	C	D	C	C
Lake Grade	**B**	**C**	**C**	**B**	**B**	**C**	**C**	**C**



Source: Metropolitan Council and STORET data

Jackson Wildlife Management Area Wetland (82-0305)

Washington Conservation District

The Jackson Wildlife Management Area (WMA) wetland is located in the City of Stillwater (Washington County). The wetland has a surface area of 14.3 acres. The entire surface area is considered littoral zone, which is the zone of aquatic plant dominance. A search through the MPCA's EDA system provided no historical monitoring information for the wetland.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	65.0	37.0	174.0	C
CLA (µg/l)	15.1	3.6	33.0	B
Secchi (m)	1.9	1.4	2.6	C
TKN (mg/l)	1.14	0.79	2.60	
			Lake Grade	C

The lake received a lake grade of C for 2011. Continued monitoring is suggested to continue to build the water quality database for this lake.

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

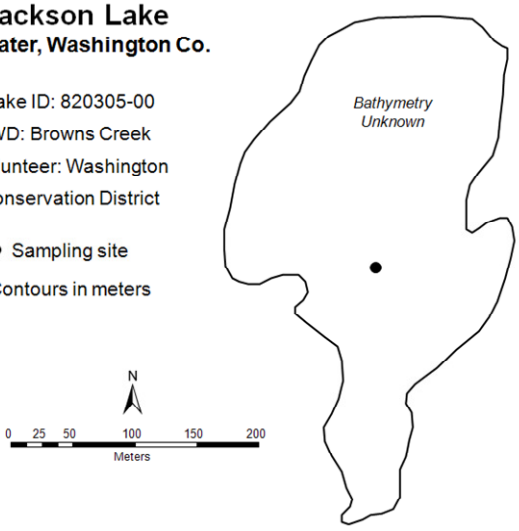
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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.

Jackson Lake
Stillwater, Washington Co.

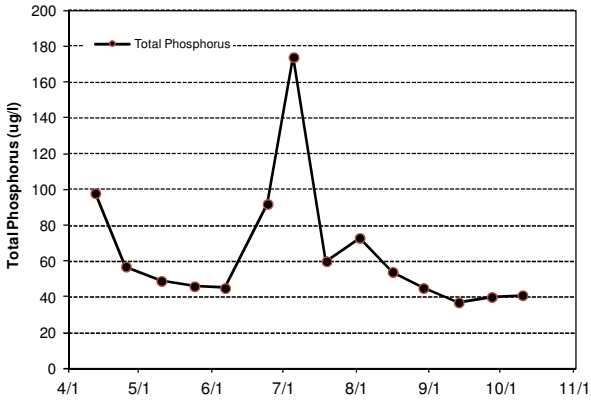
Lake ID: 820305-00
WD: Browns Creek
Volunteer: Washington Conservation District

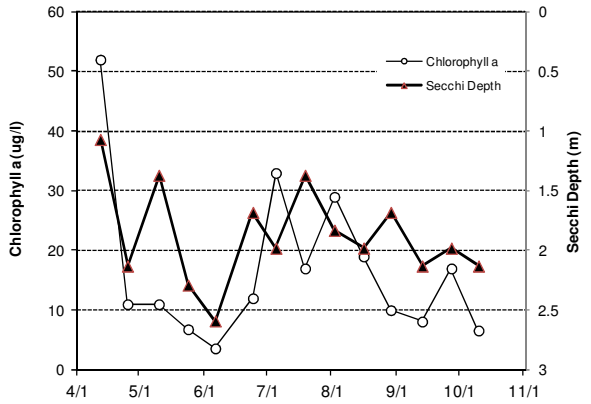
● Sampling site
Contours in meters

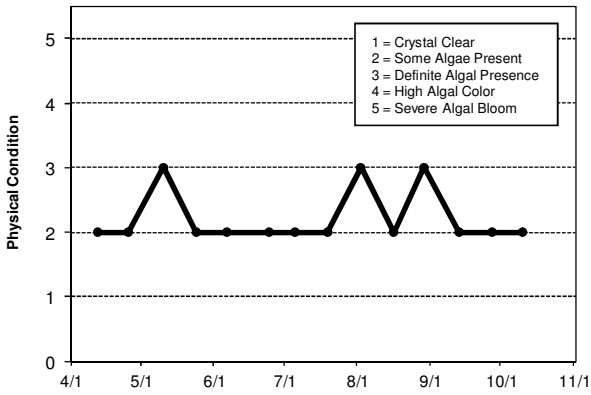


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/12/2011	9	7.1	8.3	0.2	52	98		1.07	2	3
4/25/2011	12.5	8.6	11.9	0.1	11	57		2.13	2	3
5/10/2011	17.8	12.4	9.8	2.2	11	49		1.37	3	3
5/24/2011	20	15.4	8.4	0.3	6.8	46		2.29	2	3
6/6/2011	25.3	20.3	7.9	0.7	3.6	45		2.59	2	3
6/24/2011	20.4	19.3	7.4	3	12	92		1.68	2	3
7/5/2011	28.9	20.8	11.2	0.4	33	174		1.98	2	3
7/19/2011	30.3	21.3	6.6	0.1	17	60		1.37	2	3
8/2/2011	26.7	21.7	2.6	0	29	73		1.83	3	4
8/16/2011	27.2	22.9	11.2	0.2	19	54		1.98	2	4
8/29/2011	25.1	21	9.6	0	10	45		1.68	3	4
9/13/2011	24	20.4	11.3	0.2	8.1	37		2.13	2	4
9/27/2011	15.4	15.3	10.2	0.7	17	40		1.98	2	2
10/10/2011	18.9	18.7	10	9	6.6	41		2.13	2	3







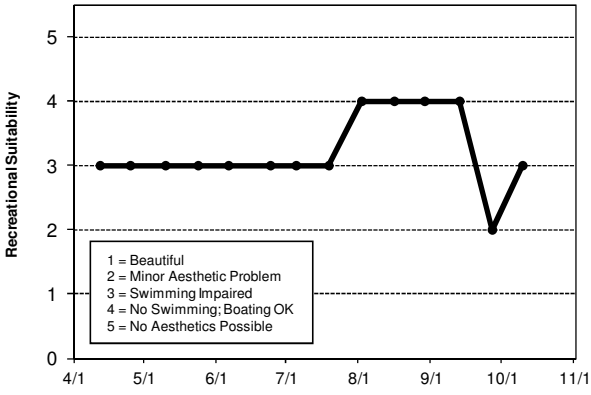
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus							C	C
Chlorophyll a							B	B
Secchi Depth							C	C
Lake Grade							**C**	**C**

Source: Metropolitan Council and STORET data



Jane Lake (82-0104) *Valley Branch Watershed District*

Lake Jane is located in the northwest corner of the City of Lake Elmo (Washington County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value and exceptional water clarity (METC 2007). The MPCA has listed the lake as impaired for mercury content in fish.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	22.2	11.0	77.0	A
CLA (µg/l)	4.0	1.1	13.0	A
Secchi (m)	4.0	2.8	5.2	A
TKN (mg/l)	0.59	0.52	0.74	
			Lake Grade	A

The lake received a lake grade of A for 2011, which is consistent with the lake grades received since the year 2000.

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

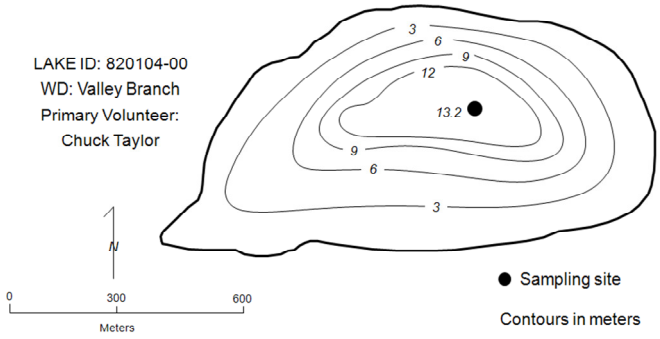
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

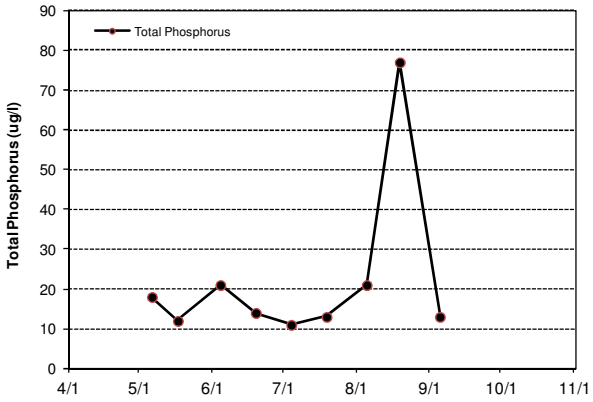
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

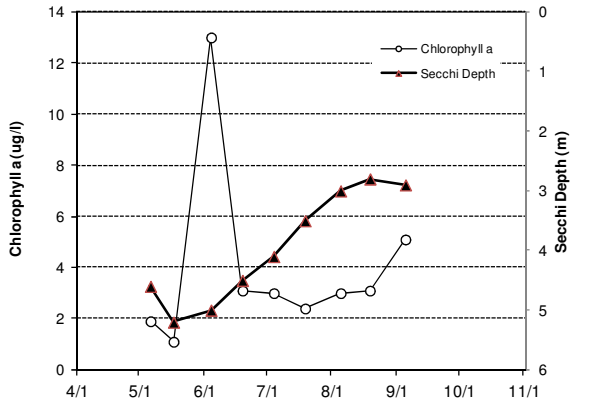
Lake Jane

Lake Elmo, Washington Co.

LAKE ID: 820104-00
WD: Valley Branch
Primary Volunteer:
Chuck Taylor

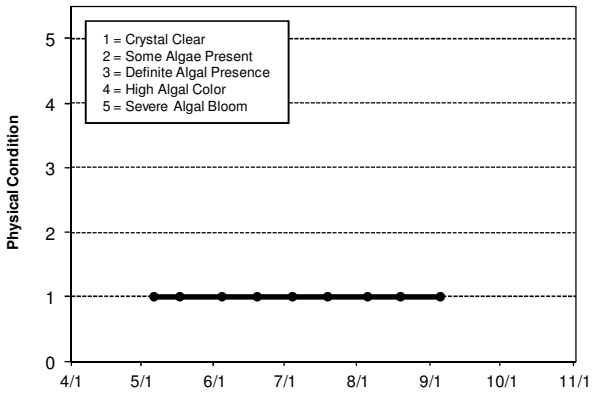






2011 Data

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 (1-5)	RS (1-5)
5/6/2011	13.2				1.9	18		4.6	1	1
5/17/2011	16.4				1.1	12		5.2	1	
6/4/2011	20				13	21		5	1	1
6/19/2011	22.7				3.1	14		4.5	1	
7/4/2011	27.2				3	11		4.1	1	1
7/19/2011	28.9				2.4	13		3.5	1	
8/5/2011	29.2				3	21		3	1	
8/19/2011	26.3				3.1	77		2.8	1	
9/5/2011	23				5.1	13		2.9	1	1

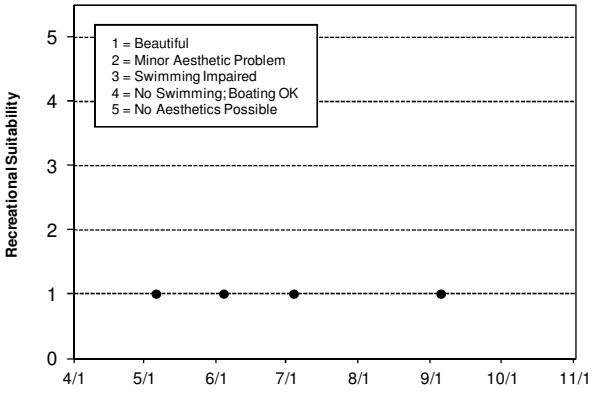


Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
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
Lake Grade	**A**	**A**	**A**	**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.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	81.6	46.0	128.0	D
CLA (µg/l)	29.0	8.2	48.0	C
Secchi (m)	1.9	1.1	4.0	C
TKN (mg/l)	1.19	0.73	1.50	
			Lake Grade	C

The lake received a lake grade of C for 2011. The open water quality for the period since 2007 appears better than the water quality before 2007 based on historical lake grade database. Further monitoring is suggested to determine if the recent improvements are indication of an improving trend.

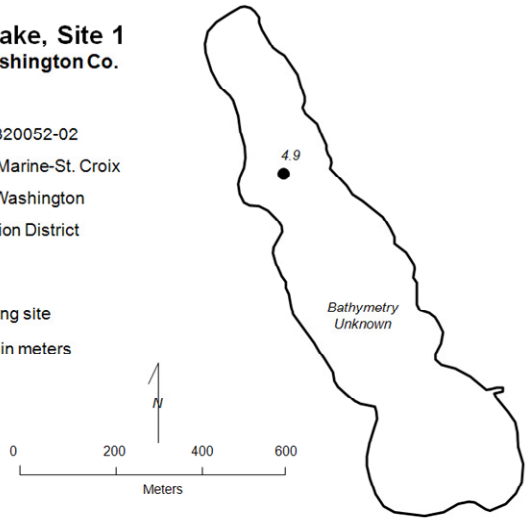
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

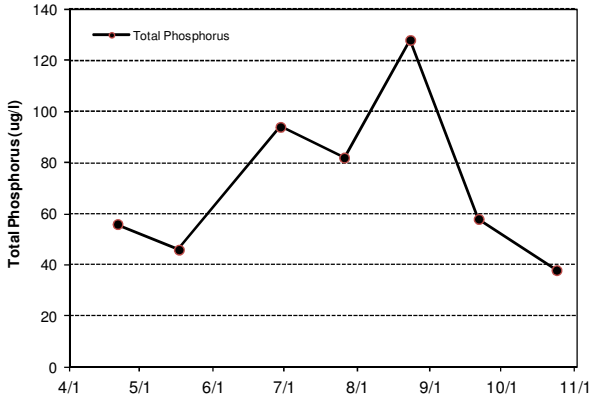
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

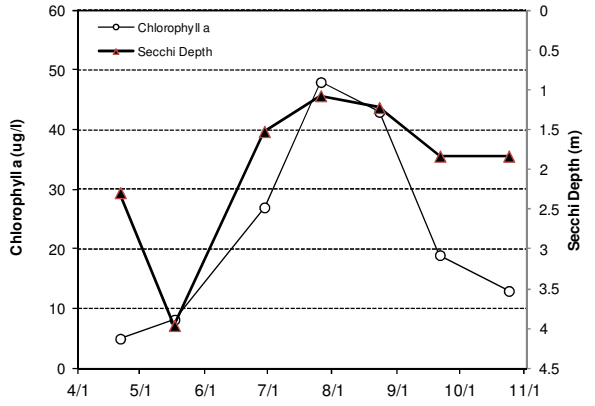
Jellum's Lake, Site 1
Scandia, Washington Co.

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

● Sampling site
Contours in meters

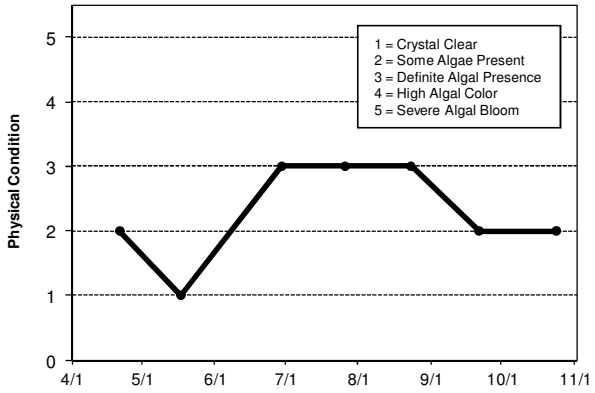






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	8.1	7.8	10.2	0.1	5	56		2.29	2	2
5/17/2011	14.9	14.3	9.4	0.1	8.2	46		3.96	1	1
6/29/2011	22.8	19	10	0.1	27	94		1.52	3	4
7/26/2011	26.9	21.5	9.1	0	48	82		1.07	3	3
8/23/2011	25.5	22.1	9.7	0	43	128		1.22	3	3
9/21/2011	16.3	16.4	7.6	0.1	19	58		1.83	2	2
10/24/2011	9.7	9.8	9.4	1.1	13	38		1.83	2	2

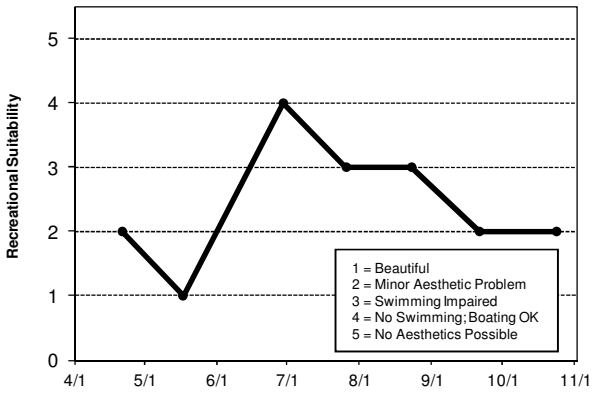


Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus	D	D	D	C	C	C	C	D
Chlorophyll a	C	D	C	C	C	A	C	C
Secchi Depth	D	D	D	C	C	B	C	C
Lake Grade	**D**	**D**	**D**	**C**	**C**	**B**	**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 are few known morphological data available for the lake.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	157.8	76.0	264.0	F
CLA (µg/l)	67.5	20.0	160.0	D
Secchi (m)	0.5	0.2	0.7	F
TKN (mg/l)	1.89	1.10	2.70	
			Lake Grade	F

The lake received a lake grade of F for 2011, which is consistent with its limited database. Additional monitoring is suggested to develop a historical water quality database for this lake.

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

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

Jonathan Lake
Chaska, Carver Co.

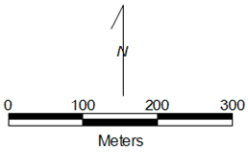
LAKE ID: 100217-00

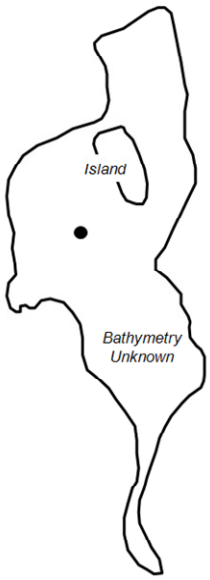
WMO: Hazeltine-Bavaria

Volunteer: Carver Co.

● Sampling site

Contours in meters





2011 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 (1-5)	RS (1-5)
4/21/2011	8.09		17.5		43	130		0.6	3	3
5/4/2011	10.56		22.8		45	104		0.7	3	3
5/17/2011	14.99		10.5		30	112		0.7	3	3
6/1/2011	20.63		9.2		20	76		0.7	3	3
6/13/2011	20.3		9.3		46	127		0.4	3	3
6/29/2011	24.4		13.3		26	85		0.7	4	3
7/18/2011	27.38		13.5		100	162		0.4	4	4
7/28/2011	29.36		11.8		160	227		0.2	4	3
8/9/2011	24.84		6.8		97	264		0.4	4	4
8/22/2011	25.07		8.2		100	218		0.35	4	4
9/7/2011	24.95		11.8		76	188		0.45	4	3
9/22/2011	15.11		11		43	173		0.6	4	4
10/6/2011	16.57		8.6		28	141		0.7	4	4
10/24/2011	9.29		8.3		32	96		0.9	4	4

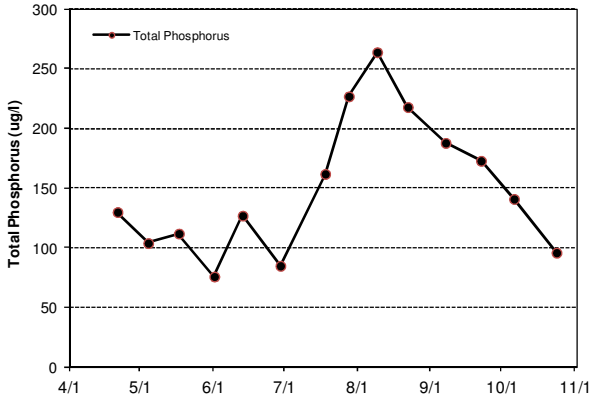
Lake Water Quality Grades Based on Summertime Averages

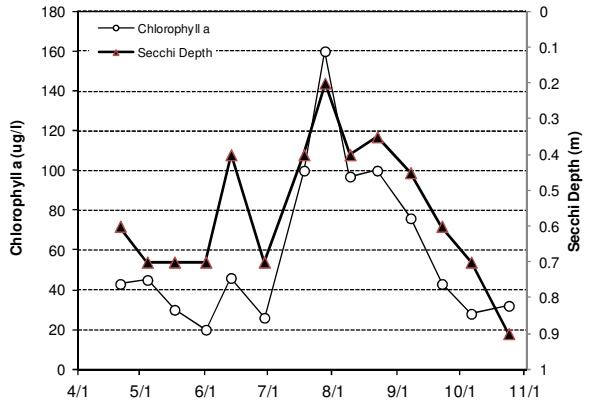
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

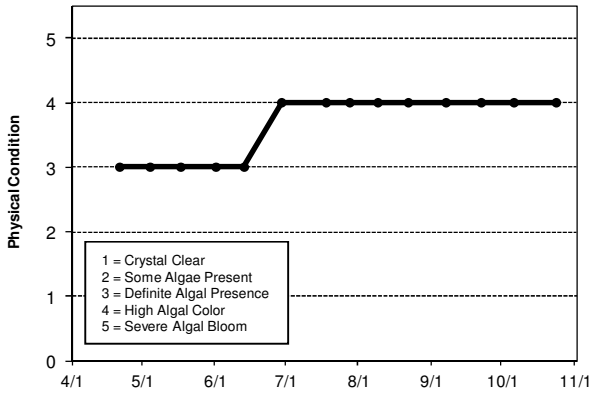
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus											F	
Chlorophyll a											C	
Secchi Depth											F	
Lake Grade											**D**	

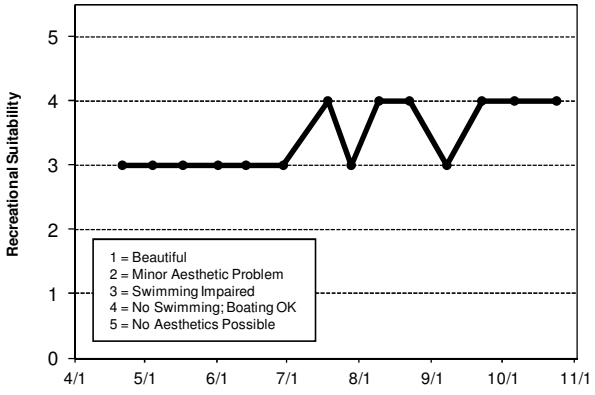
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			F		F	F	D	F
Chlorophyll a			D		D	F	F	D
Secchi Depth			F		F	F	F	F
Lake Grade			**F**		**F**	**F**	**F**	**F**

Source: Metropolitan Council and STORET data









July Lake (10-0217) *Carver County Environmental Services*

Jonathan Lake is a small lake located in Washington County. There are few known morphological data available for the lake.

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

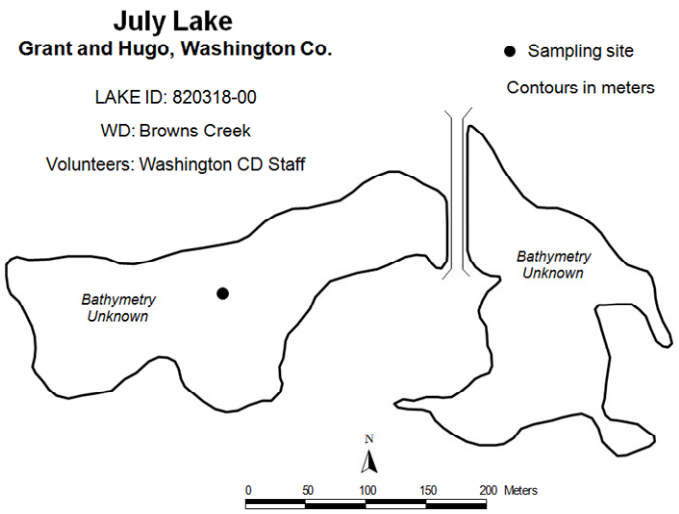
2011 summer (May-September) data summary

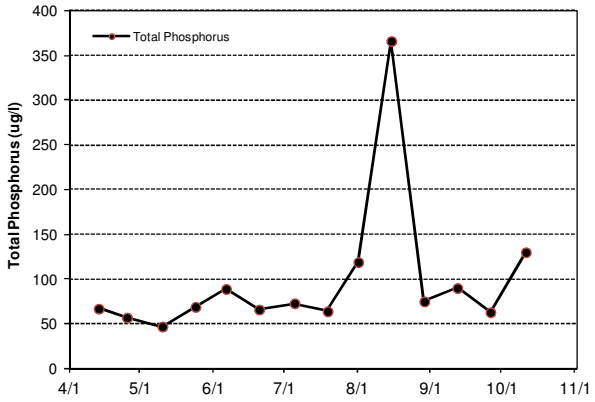
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	101.9	47.0	366.0	D
CLA (µg/l)	54.5	3.1	260.0	D
Secchi (m)	1.5	1.1	2.4	C
TKN (mg/l)	1.31	0.81	1.90	
			Lake Grade	D

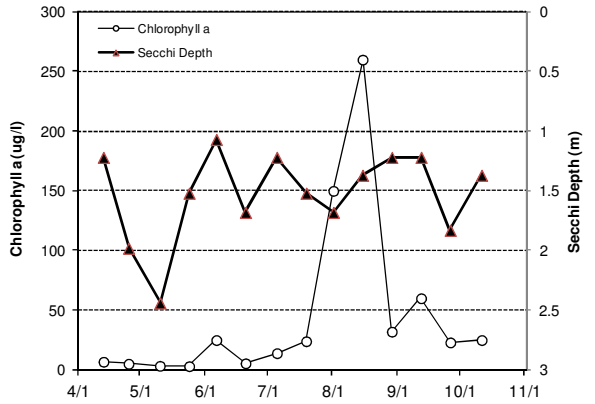
The lake received a lake grade of D for 2011, which is consistent with its limited database. The lake has received lake grades ranging from C to F since 2006. Additional monitoring is suggested to develop the historical water quality database for this lake.

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

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

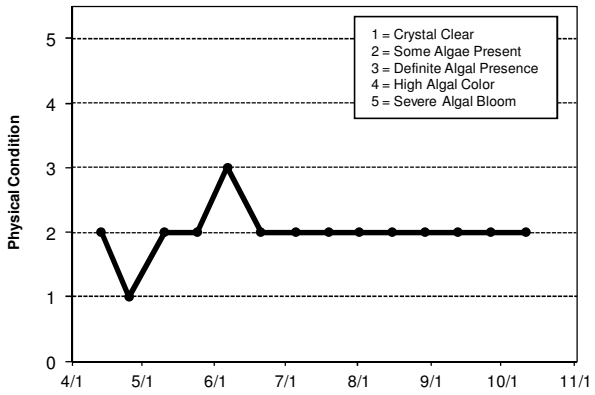






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/13/2011	14.2	13.3	8.9	8.7	6.8	67		1.22	2	3
4/25/2011	10.9	8.9	10.1	0.6	5.1	57		1.98	1	2
5/10/2011	14.3	9.5	8	0.2	3.4	47		2.44	2	2
5/24/2011	19.3	14.1	6.5	0.5	3.1	69		1.52	2	2
6/6/2011	24.6	16.5	10.2	0.1	25	89		1.07	3	4
6/20/2011	22.8	15.7	4.3	0.1	5.5	66		1.68	2	2
7/5/2011	27.1	18.4	6.1	0.1	14	73		1.22	2	2
7/19/2011	29.9	18.1	7.9	0.1	24	64		1.52	2	3
8/1/2011	28.3	20.7	8.4	0.1	150	119		1.68	2	3
8/15/2011	27.7	21.2	9.9	0.2	260	366		1.37	2	4
8/29/2011	23	19.1	6.1	0	32	75		1.22	2	4
9/12/2011	22.8	18.7	7.6	0	60	90		1.22	2	3
9/26/2011	14.8	14.2	7.3	3.2	23	63		1.83	2	2
10/11/2011	17.8	15.9	7.3	0.3	25	130		1.37	2	2



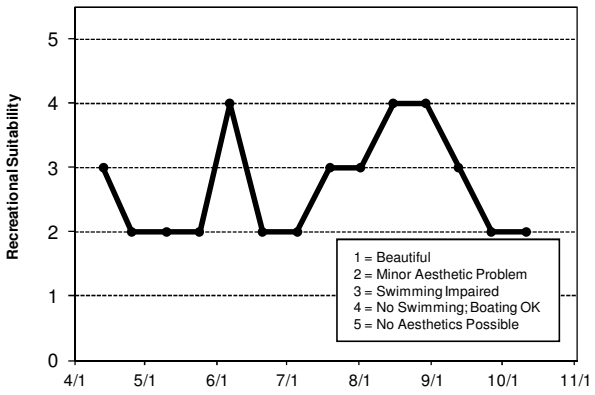
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			F	F	C			D
Chlorophyll a			F	F	B			D
Secchi Depth			F	F	C			C
Lake Grade			**F**	**F**	**C**	**NA**		**D**

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 are few physical information available for this lake. A search in STORET showed that the lake was monitored for a variety of parameters on three different dates. Monitoring occurred on one day in July in each of the following years: 1988, 1990, and 1991.

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

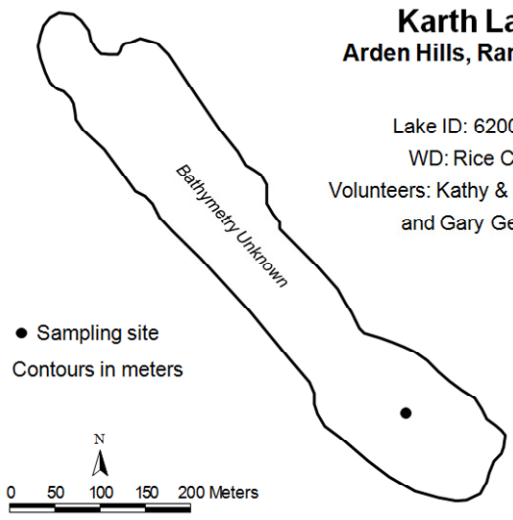
2011 summer (May-September) data summary

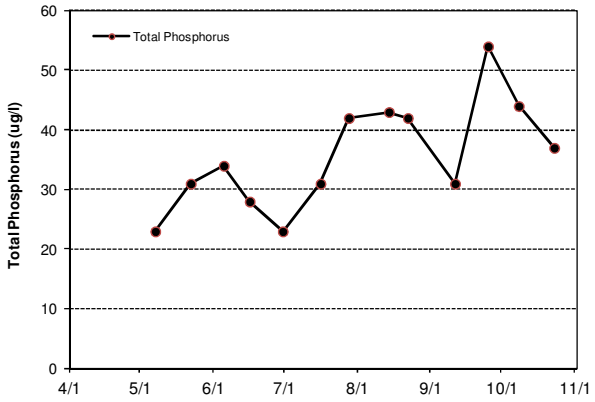
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	34.7	23.0	54.0	C
CLA (µg/l)	10.1	2.3	20.0	B
Secchi (m)	2.6	1.3	4.8	B
TKN (mg/l)	0.85	0.72	0.94	
			Lake Grade	B

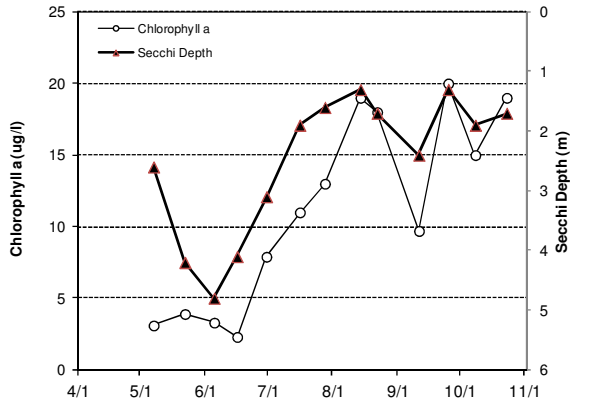
The lake received a lake grade of B for 2011, which is better than grades received in the previous 4 years. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

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

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

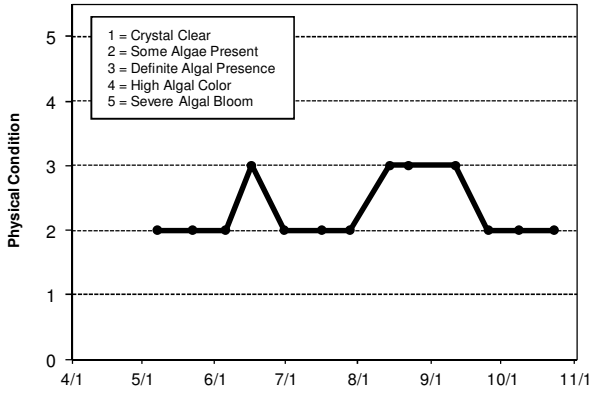






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/7/2011	15.6				3.1	23		2.6	2	2
5/22/2011	18.3				3.9	31		4.2	2	2
6/5/2011	24.8				3.3	34		4.8	2	2
6/16/2011	22.3				2.3	28		4.1	3	2
6/30/2011	26				7.9	23		3.1	2	2
7/16/2011	24				11	31		1.9	2	3
7/28/2011	28				13	42		1.6	2	3
8/14/2011	28.2				19	43		1.3	3	3
8/22/2011	26.7				18	42		1.7	3	3
9/11/2011	25.7				9.7	31		2.4	3	2
9/25/2011	17				20	54		1.3	2	2
10/8/2011	18.2				15	44		1.9	2	2
10/23/2011	11.3				19	37		1.7	2	1

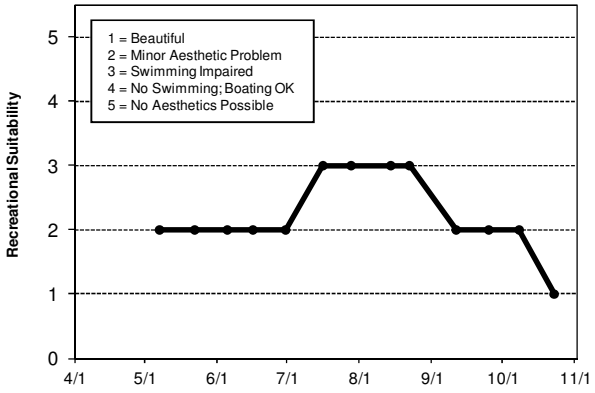


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus				C	C	C	C	C
Chlorophyll a				C	C	C	C	B
Secchi Depth				D	C	D	C	B
Lake Grade				**C**	**C**	**C**	**C**	**B**



Source: Metropolitan Council and STORET data

Keller Lake [Burnsville] (19-0025) *Black Dog Watershed Management Commission*

Keller Lake is located in the cities of Apple Valley and Burnsville (Dakota County). The surface area of the lake is 55 acres. It has a maximum depth of 3.0 m (10 feet) and a mean depth of 1.1 m (3.7 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	73.8	32.0	112.0	D
CLA (µg/l)	55.6	4.2	140.0	D
Secchi (m)	0.8	0.2	2.2	D
TKN (mg/l)	1.63	0.77	2.30	
			Lake Grade	D

The lake received a lake grade of D for 2011. The water quality of 2011 continues the trend of poorer water quality that started in 2009. Continued monitoring is suggested to determine if the shifting water quality may be a continuing trend.

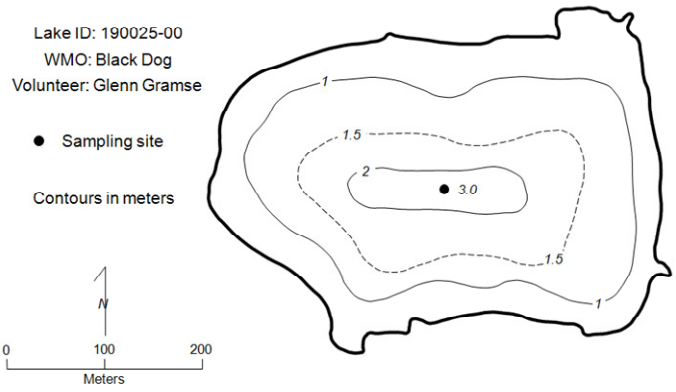
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

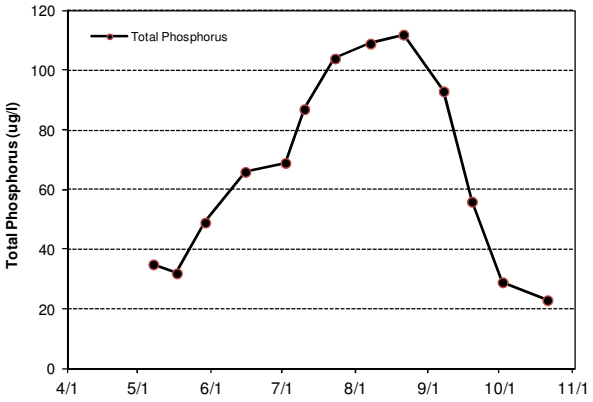
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading Internet information at http://www.dnr.state.mn.us/lakefind/.

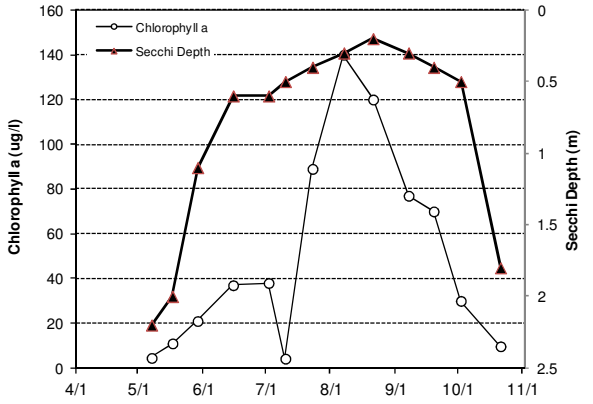
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Keller Lake
Burnsville, Dakota Co.

Lake ID: 190025-00
WMO: Black Dog
Volunteer: Glenn Gramse

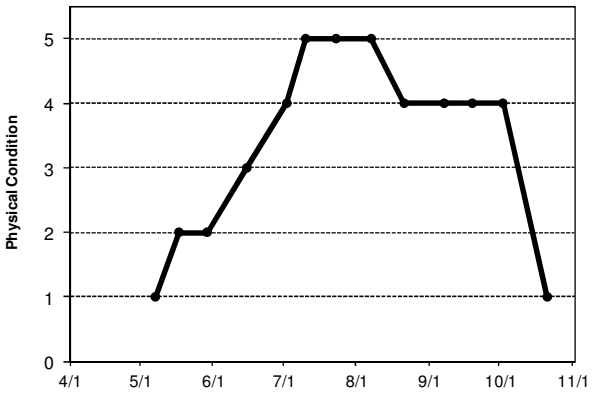






2011 Data

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 (1-5)	RS (1-5)
5/7/2011	15.9				4.5	35		2.2	1	1
5/17/2011	17.9				11	32		2	2	1
5/29/2011	18.5				21	49		1.1	2	4
6/15/2011	20.8				37	66		0.6	3	4
7/2/2011	27.4				38	69		0.6	4	4
7/10/2011	30.8				4.2	87		0.5	5	4
7/23/2011	29.3				89	104		0.4	5	4
8/7/2011	27.3				140	109		0.3	5	4
8/21/2011	24.3				120	112		0.2	4	4
9/7/2011	23.5				77	93		0.3	4	4
9/19/2011	17.3				70	56		0.4	4	4
10/2/2011	15.8				30	29		0.5	4	4
10/21/2011	9.9				9.7	23		1.8	1	2

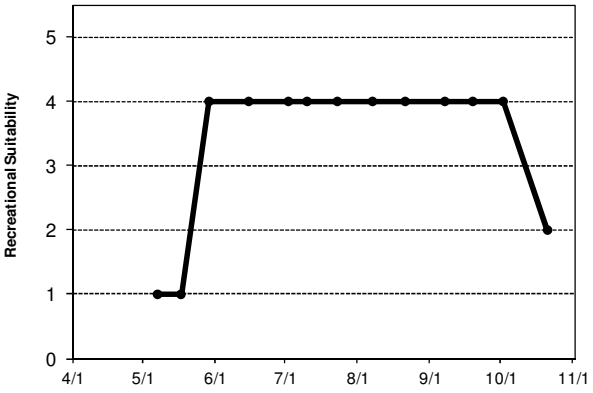


Lake Water Quality Grades Based on Summertime Averages

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					D	D	C	D	D	D	C	D
Chlorophyll a					F	C	A	C	C	C	B	C
Secchi Depth					D	D	C	D	D	D	D	D
Lake Grade					**D**	**D**	**B**	**D**	**D**	**D**	**C**	**D**

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	C	D	D	C	D	D	D
Chlorophyll a	B	B	D	B	A	F	D	D
Secchi Depth	C	C	D	C	C	D*	F	D
Lake Grade	**C**	**C**	**D**	**C**	**B**	**D**	**D**	**D**



Source: Metropolitan Council and STORET data

Kingsley Lake (19-0030) *Black Dog Watershed Management Commission*

Kingsley Lake is located in the northwestern corner of the City of Lakeville in Dakota County. The lake has a surface area of 44 acres, and a maximum depth of 4.0 m (13 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

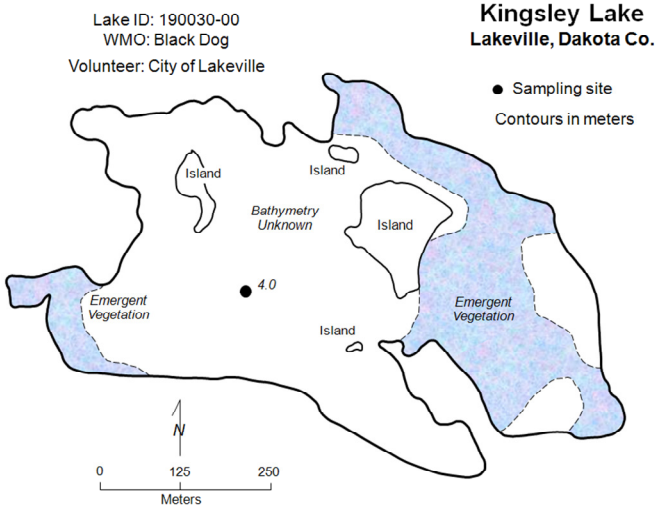
2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	17.1	11.0	26.0	A
CLA (µg/l)	2.5	1.6	4.1	A
Secchi (m)	+2.8	+2.7	+3.0	A (estimated)
TKN (mg/l)	0.52	0.45	0.58	
			Lake Grade	A (estimated)

Similar to past years, the Secchi transparency in 2011 would have been greater than indicated in the table above. During most monitoring events either the lake's excessive submergent macrophyte growth obscured the secchi disk, or the secchi was visible while resting on the lake bottom. According to the volunteer's judgement, the Secchi depths in these instances would have likely been in excess of 3 meters. Also, the other two water quality parameter received A grades. Therefore, giving a Secchi depth grade of A may be justified.

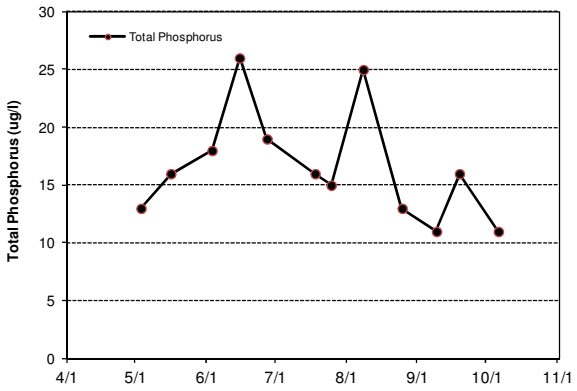
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

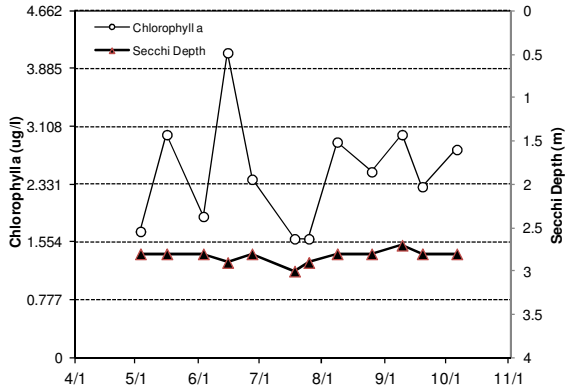
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

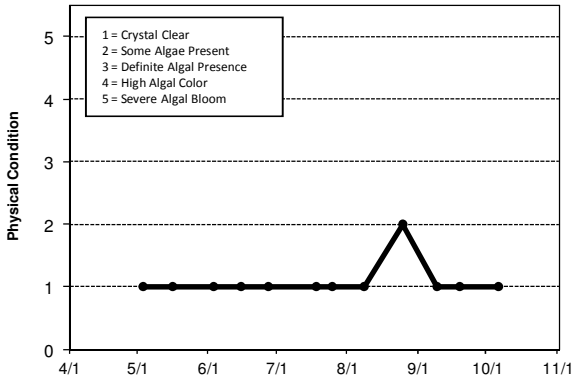


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/3/2011	7.2				1.7	13		>2.8	1	1
5/16/2011	12				3	16		>2.8	1	1
6/3/2011	20				1.9	18		>2.8	1	1
6/15/2011	20				4.1	26		>2.9	1	1
6/27/2011	20				2.4	19		>2.8	1	1
7/18/2011	27				1.6	16		>3.0	1	1
7/25/2011	27				1.6	15		>2.9	1	1
8/8/2011	26				2.9	25		>2.8	1	1
8/25/2011	26				2.5	13		>2.8	2	1
9/9/2011	22				3	11		>2.7	1	1
9/19/2011	16				2.3	16		>2.8	1	1
10/6/2011	17				2.8	11		>2.8	1	1







Lake Water Quality Grades Based on Summertime Averages

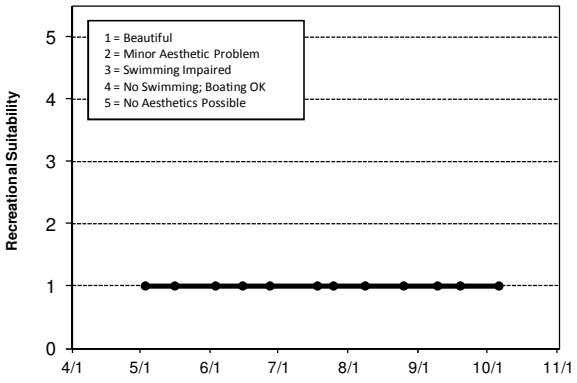
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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	2009	2010	2011
Total Phosphorus	A	A	B	A	A	A	A	A
Chlorophyll a	A	A	A	A	A	A	A	A
Secchi Depth	B	B	B	B	B	A*	A*	A*
Lake Grade	**A**	**A**	**B**	**A**	**A**	**A**	**A**	**A**

* Secchi Disk visible on lake bottom

Source: Metropolitan Council and STORET data



Kismet Lake (82-0333) *Browns Creek Watershed District*

Kismet Lake is located in Washington County. This relatively small lake has a maximum depth of approximately 3.7 m (12 feet). Because of the shallowness of the lake the whole lake is considered littoral zone, which is the 0 – 15 feet depth zone dominated by aquatic vegetation. TSince the lake is relatively shallow, it does not maintain a thermocline which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

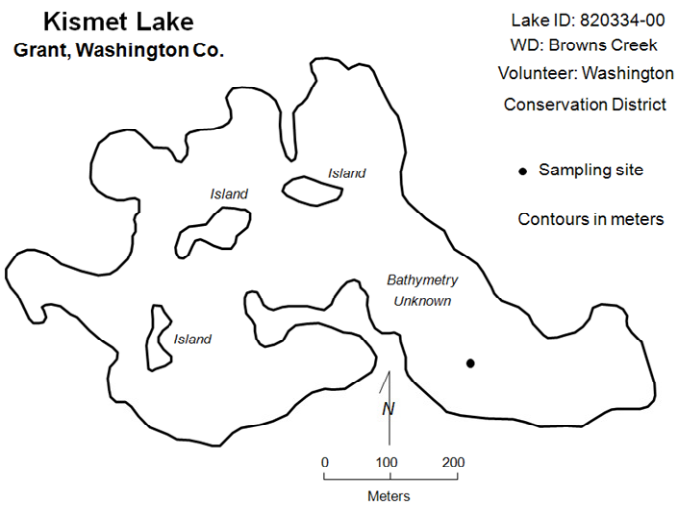
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	43.9	19.0	77.0	C
CLA (µg/l)	16.5	4.1	34.0	B
Secchi (m)	1.8	1.4	2.1	C
TKN (mg/l)	0.79	0.61	0.95	
			Lake Grade	C

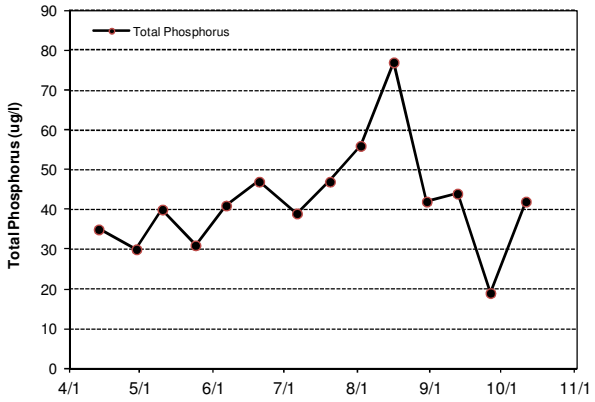
The lake received a lake grade of C for 2011, which is consistent with its historical water quality database.

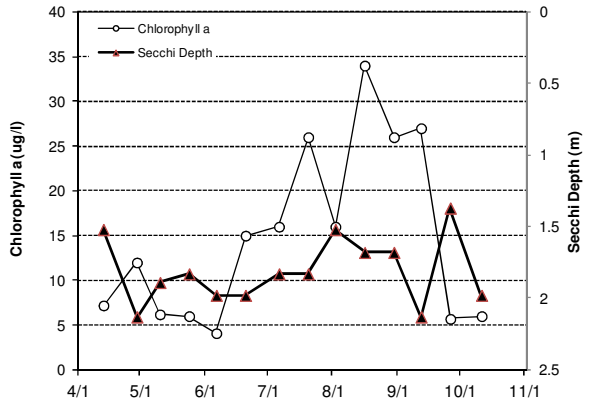
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

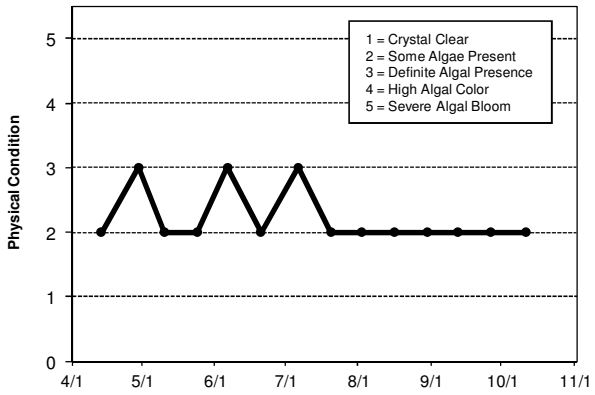






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/13/2011	10.8	10.2	10.4	10.9	7.2	35		1.52	2	2
4/29/2011	8.5	8.5	10.6	9.6	12	30		2.13	3	4
5/10/2011	17.5	16.1	8.9	8.1	6.2	40		1.89	2	2
5/24/2011	19.9	19.6	7.6	1	6	31		1.83	2	2
6/6/2011	25.7	22.1	7.8	3.1	4.1	41		1.98	3	4
6/20/2011	23.3	20.4	7.5	2.9	15	47		1.98	2	3
7/6/2011	26.2	24.7	8.9	0.7	16	39		1.83	3	4
7/20/2011	28.2	22.1	6.5	0.2	26	47		1.83	2	3
8/2/2011	25.7	22.7	2.5	0	16	56		1.52	2	2
8/16/2011	24.9	22.1	5.4	0.1	34	77		1.68	2	3
8/30/2011	22.7	21.3	3.5	0.1	26	42		1.68	2	2
9/12/2011	24	20.8	8.2	0.3	27	44		2.13	2	2
9/26/2011	15	14.5	7.7	3.2	5.7	19		1.37	2	3
10/11/2011	17.4	16.6	9.2	0.2	6	42		1.98	2	2

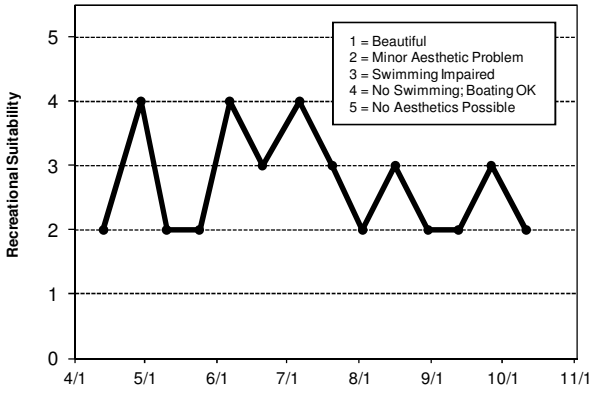


Lake Water Quality Grades Based on Summertime Averages

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	C	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	2009	2010	2011
Total Phosphorus	B	C	C	C	C	C	C	C
Chlorophyll a	A	B	C	C	D	A	C	B
Secchi Depth	B	C	C	C	C	D	C	C
Lake Grade	**B**	**C**	**C**	**C**	**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.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	94.3	59.0	160.0	D
CLA (µg/l)	36.2	7.8	170.0	C
Secchi (m)	0.7	0.4	1.1	D
TKN (mg/l)	1.45	1.10	2.50	
			Lake Grade	D

The lake received a lake grade of D for 2011, which is similar to previous years' lake grades. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

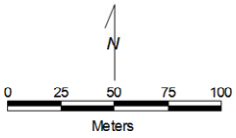
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

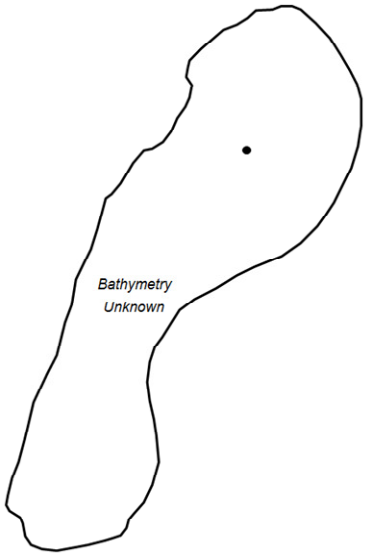
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Klawitter Pond
Lake Elmo, Washington Co.

Lake ID: 820368-00
WD: Valley Branch
Volunteers: Bonnie Juran,
Pat Barrett & Steve Chlebeck

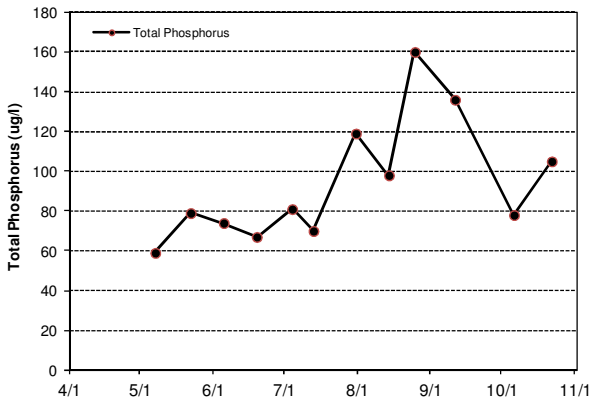
• Sampling site
Contours in meters

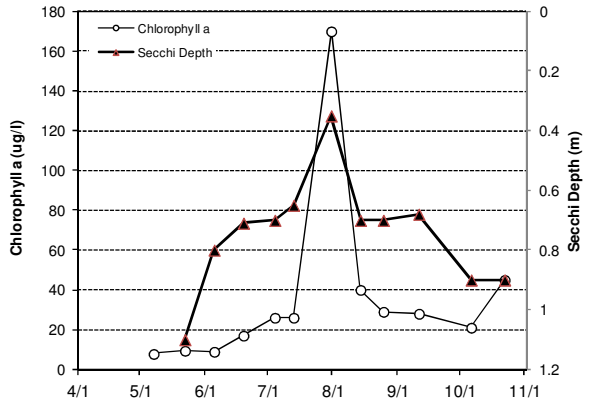


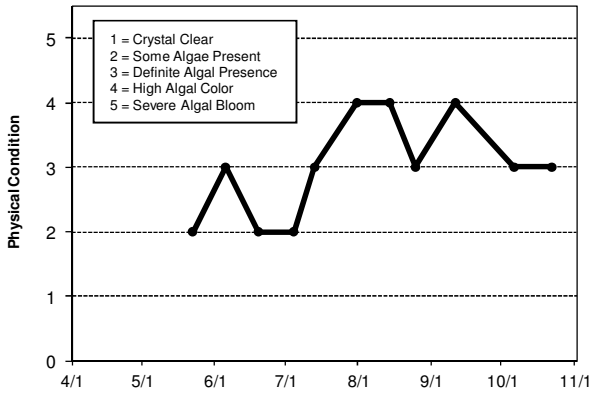


2011 Data

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 (1-5)	RS (1-5)
5/7/2011					7.8	59				
5/22/2011	19.5				9.4	79		1.1	2	2
6/5/2011	26.9				8.9	74		0.8	3	4
6/19/2011	24.5				17	67		0.71	2	4
7/4/2011	27.5				26	81		0.7	2	4
7/13/2011	27.5				26	70		0.65	3	4
7/31/2011	28.7				170	119		0.35	4	5
8/14/2011	25.3				40	98		0.7	4	4
8/25/2011	27				29	160		0.7	3	2
9/11/2011	23.9				28	136		0.68	4	4
10/6/2011	18.3				21	78		0.9	3	4
10/22/2011	12.2				45	105		0.9	3	3





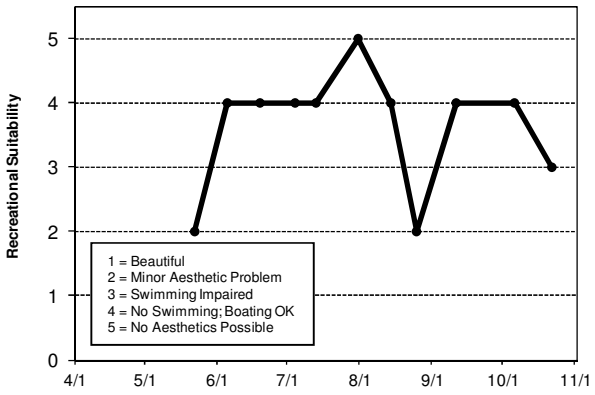


Lake Water Quality Grades Based on Summertime Averages

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											B	C
Secchi Depth											D	F
Lake Grade											**C**	**D**

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	D	D	D	D	D	D	D	D
Chlorophyll a	C	C	C	C	C	D	D	C
Secchi Depth	D	D	F	F	F	F	F	D
Lake Grade	**D**	**D**	**D**	**D**	**D**	**D**	**D**	**D**



Source: Metropolitan Council and STORET data

La Lake (82-0097) *City of Woodbury*

La Lake is located in the City of Woodbury (Washington County). The lake has a surface area of approximately 35 acres and a maximum depth of 3.5 m (11 feet). Because of the shallowness of the lake, it is considered littoral zone, which is the 0-15 feet depth zone of the lake dominated by aquatic vegetation. Furthermore, the lake does not maintain a thermocline which is a density gradient caused by changing water temperatures throughout the lake's water column.

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

2011 summer (May-September) data summary

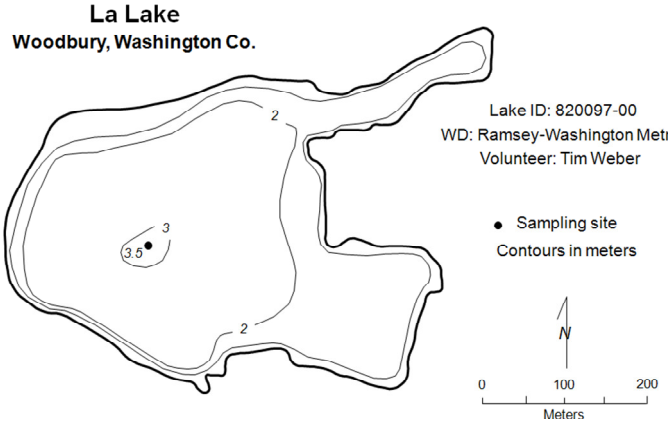
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	87.4	50.0	141.0	D
CLA (µg/l)	15.0	1.9	61.0	B
Secchi (m)	2.3	1.0	3.0	B
TKN (mg/l)	1.10	0.71	1.90	
			Lake Grade	C

The lake received an lake grade of C for 2011, which is consistent with its historical database. Water quality for the lake has experienced intra-annual variability in which the lake grades have varied from Bs and Cs.

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

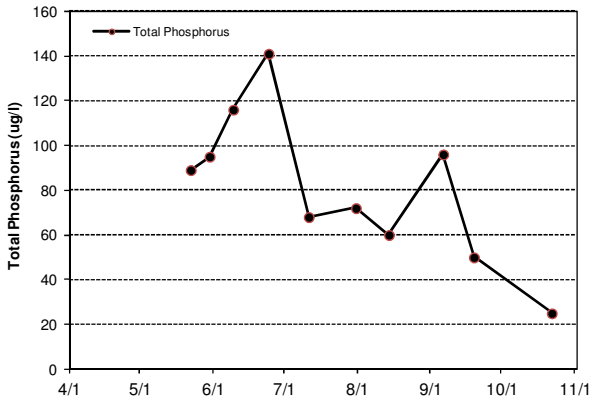
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

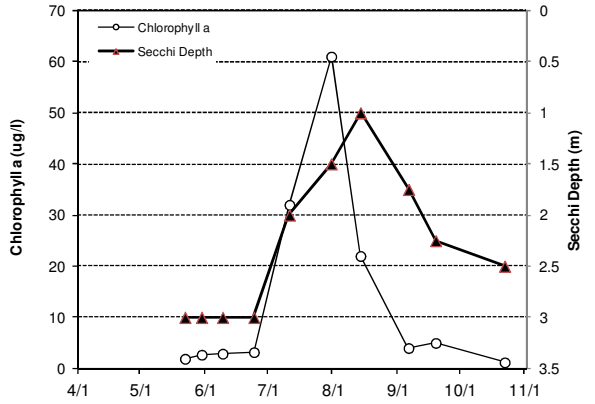
La Lake
Woodbury, Washington Co.

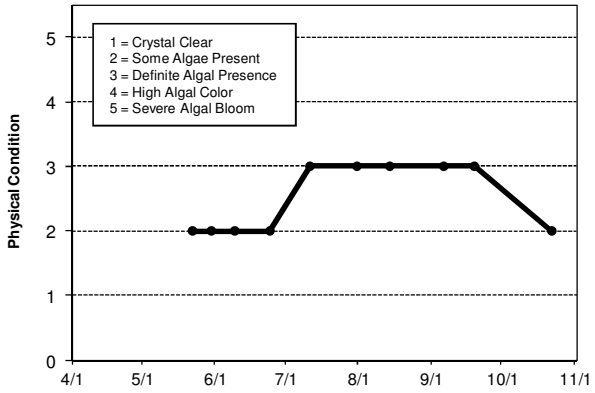


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/22/2011	17.5				1.9	89		3	2	2
5/30/2011	17.7				2.7	95		3	2	2
6/9/2011	22				2.9	116		3	2	2
6/24/2011	19				3.2	141		3	2	2
7/11/2011	29				32	68		2	3	4
7/31/2011	27				61	72		1.5	3	4
8/14/2011	27.7				22	60		1	3	4
9/6/2011	22.2				4	96		1.75	3	4
9/19/2011	18.2				5	50		2.25	3	4
10/22/2011	10.6				1.2	25		2.5	2	4





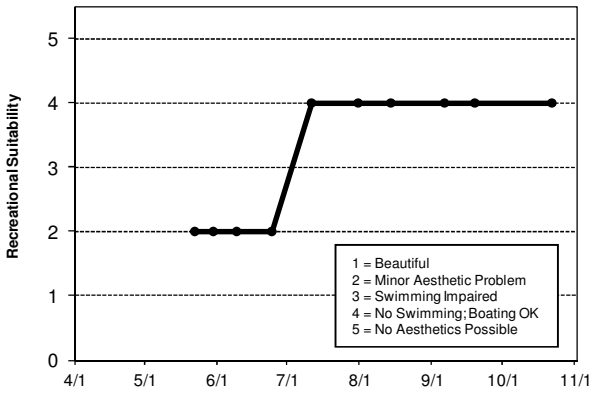


Lake Water Quality Grades Based on Summertime Averages

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			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	2009	2010	2011
Total Phosphorus		C	D	D	D	D	D	D
Chlorophyll a		B	C	D	B	C	C	B
Secchi Depth		C	C	D	C	C*	C*	B
Lake Grade		**C**	**C**	**D**	**C**	**C**	**C**	**C**



Source: Metropolitan Council and STORET data

Lac Lavon Lake (19-0446) *Black Dog Watershed Management Commission*

Lac Lavon is located within the City of Apple Valley (Dakota County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007). The lake is an abandoned gravel pit maintained by groundwater (MDNR 1996). The lake has been designated by the Minnesota DNR as being infested with the aquatic plants Eurasian Water Milfoil (*Myriophyllum spicatum*) and Brittle Naiad (*Najas minor*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	38.6	9.0	218.0	C
CLA (µg/l)	4.4	1.4	11.0	A
Secchi (m)	3.5	2.1	4.4	A
TKN (mg/l)	0.78	0.54	1.60	
			Lake Grade	B

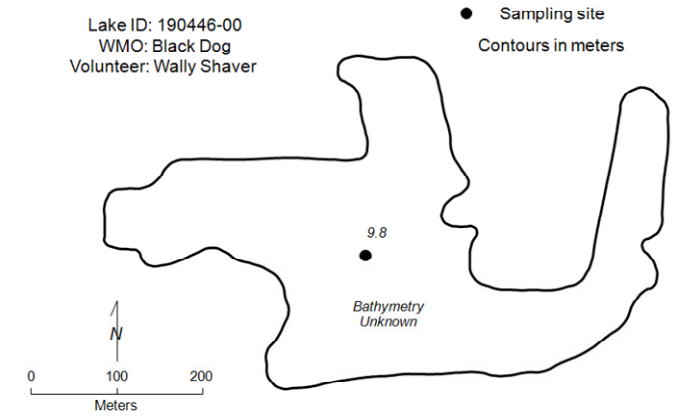
The lake received a lake grade of B for 2011. The lake grade was skewed towards a B grade because the TP grade was a C. The TP grade was heavily influenced by one high TP concentration observed on September 25. If this one datum was removed from the analysis then the summer TP mean concentration would be similar to other summer TP means in its historical database.

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

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

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

Lac Lavon
Apple Valley/Burnsville, Dakota Co.



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	10.2				12	22		2.2	1	1
5/7/2011	14.2				11	24		2.1	1	1
5/22/2011	17.7				6.8	16		2.6	1	1
6/5/2011	25.3				1.4	9		4.4	1	1
6/17/2011	22				5.3	15		3.6	1	1
7/1/2011	27.6				2.5	23		3.4	1	1
7/31/2011	30.3				1.6	17		4.2	1	1
8/13/2011	25.6				3.1	12		3.9	1	1
8/28/2011	24.8				3.6	40		3.5	1	1
9/11/2011	24.1				2.8	12		3.8	1	1
9/25/2011	17.5				5.4	218		3.1	1	1
10/9/2011	18.6				4.3	80		3.7	1	1
10/25/2011	11.6				6.5	98		2.4	1	1

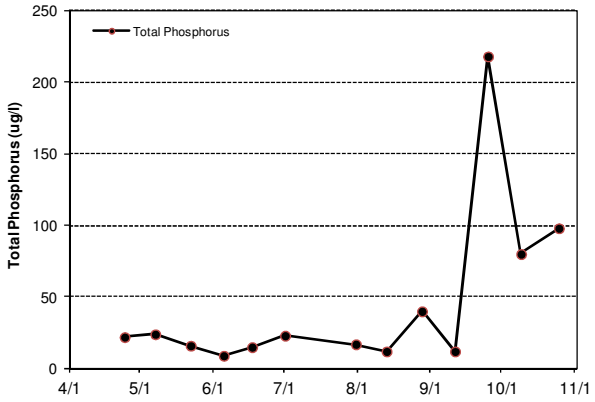
Lake Water Quality Grades Based on Summertime Averages

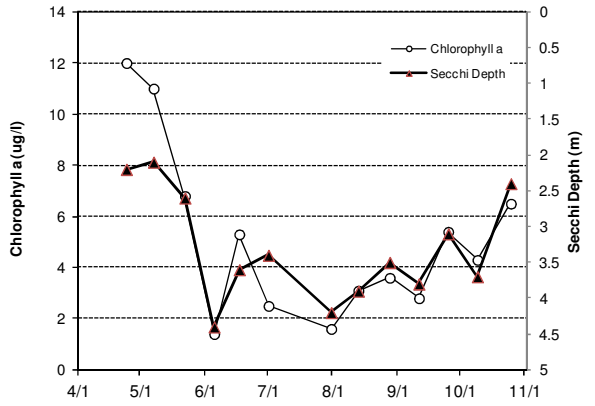
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth										A	A	A
Lake Grade												

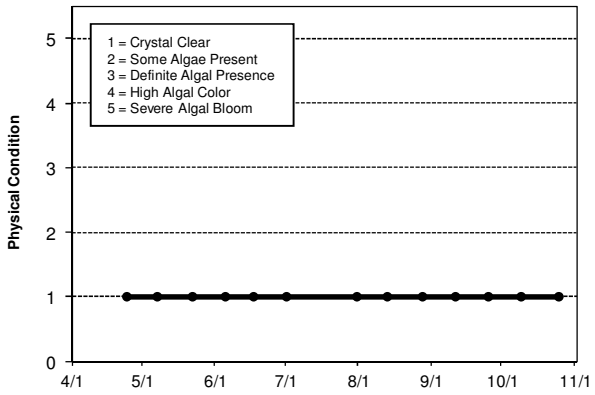
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus						A	A	A	A	B	A	A
Chlorophyll a						A	A	A	A	A	A	A
Secchi Depth						A	A	A	A	A	A	A
Lake Grade						**A**	**A**	**A**	**A**	**A**	**A**	**A**

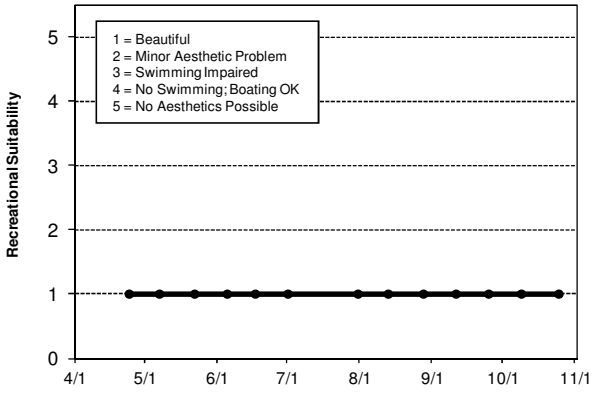
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	A	A	A	A	C	A	A	C
Chlorophyll a	A	A	A	A	A	A	A	A
Secchi Depth	A	A	A	A	A	A	A	A
Lake Grade	**A**	**A**	**A**	**A**	**B**	**A**	**A**	**B**

Source: Metropolitan Council and STORET data









Langton Lake [north basin, site-1] (62-0049-01) *Rice Creek Watershed District*

Langton Lake is divided into two basins. This report discusses the monitoring results for Site 1. The entire 30-acre lake is located within the City of Roseville (Ramsey County). The maximum depth of the lake is 1.5 m (4.9 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	54.9	34.0	107.0	C
CLA (µg/l)	18.6	6.1	43.0	B
Secchi (m)	1.1	0.7	1.4	D
TKN (mg/l)	1.05	0.85	1.40	
			Lake Grade	C

The basin received a lake grade of C for 2011, which is similar to past years of lake grades. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

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

The Fisheries Section of the Minnesota Department of Natural Resources (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.

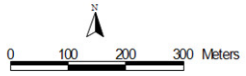
Lake ID: 620049-01

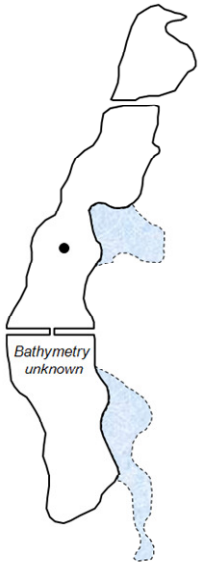
WD: Rice Creek

Volunteers: Tam & Dick McGehee

● Sampling site

Contours in meters





2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/7/2011	18.7				8.5	39		1.35		
5/22/2011	19.6				9.6	44		1.25		
6/5/2011	27.5				6.6	42				
6/19/2011	23.7				17	45		1.4		
7/3/2011	29.8				6.1	42		1.3		
7/17/2011	25.5				11	52		1.15		
7/31/2011	30.1				24	62		0.9		
8/12/2011	25.3				43	70		0.7		
8/28/2011	22.2				34	107		1		
9/11/2011	23.8				14	34				
9/24/2011	15.5				31	67				
10/9/2011	21				4.6	34		1.05		
10/22/2011	11.3				4.9	46				

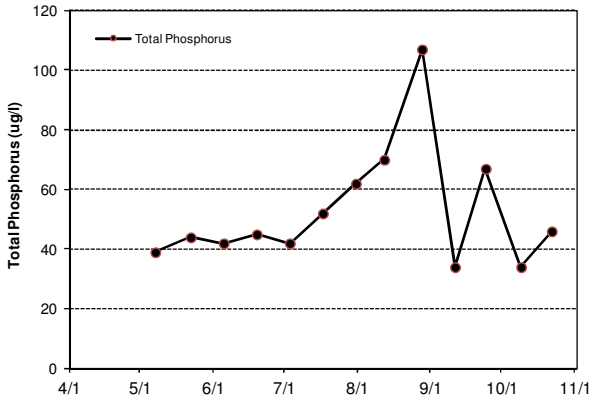
Lake Water Quality Grades Based on Summertime Averages

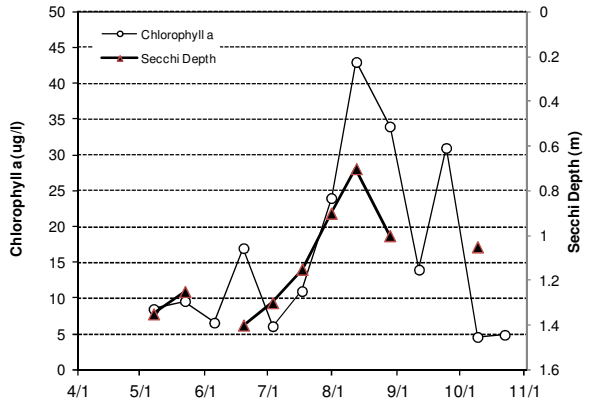
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

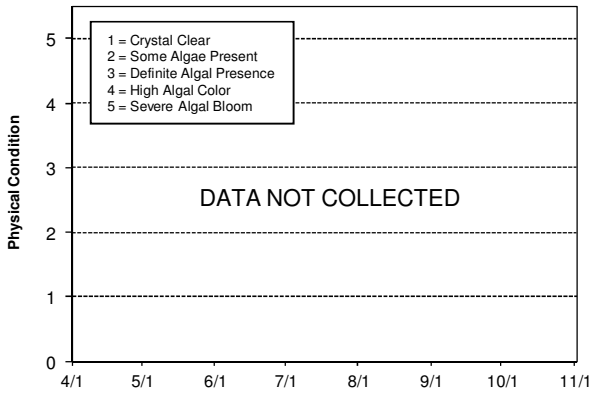
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

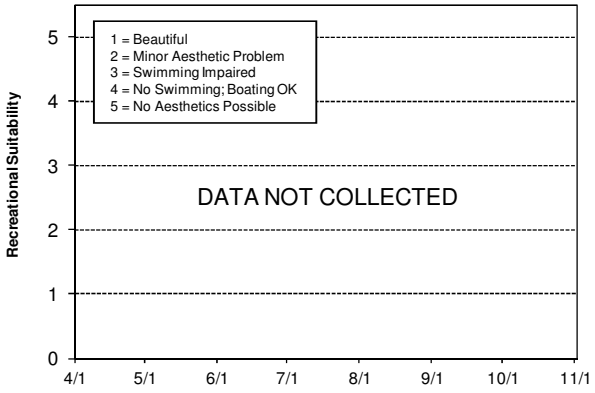
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		C	C	C	C	C	C	C
Chlorophyll a		C	B	A	C	A	C	B
Secchi Depth		D	D	D	D	D	D	D
Lake Grade		**C**	**C**	**C**	**C**	**C**	**C**	**C**

Source: Metropolitan Council and STORET data









Lee Lake (19-0029) *City of Lakeville*

Lee Lake is located in Lakeville (Dakota County). The lake has a surface area of 25 acres with a maximum depth of 5.2 m (17 ft). The lake is landlocked with no natural outlet. Curlyleaf pondweed has been a continuing problem in the lake (McComas and Stuckert 2008). Not only is it an aesthetic and recreational problem, but the decaying of these plants in late-summer contributes to algal blooms.

Barley straw has been added to this lake in the past to study the potential inhibition of algal populations within the lake (McComas and Stuckert 2009a).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	37.1	22.0	58.0	C
CLA (µg/l)	8.4	3.9	17.0	A
Secchi (m)	2.4	1.2	3.1	B
TKN (mg/l)	0.68	0.39	0.76	
			Lake Grade	B

The lake received a lake grade of B for 2011. The summer TP mean appears to have increased this year compared to 2009 and 2010. The TP grade of C received in 2011 is a return to the type of grades received in years prior to 2009. Continued monitoring is suggested to determine the trend direction, if any, of the varying water quality of this lake.

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

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/.

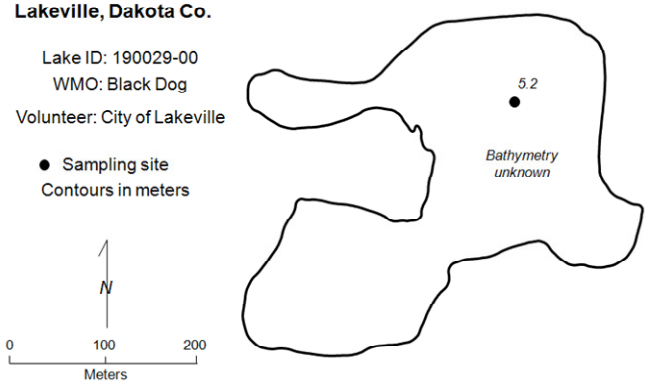
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lee Lake

Lakeville, Dakota Co.

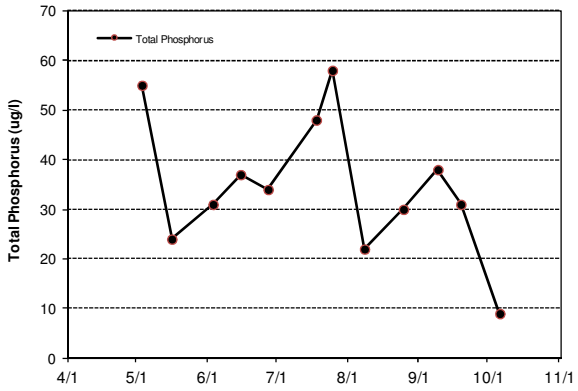
Lake ID: 190029-00
WMO: Black Dog
Volunteer: City of Lakeville

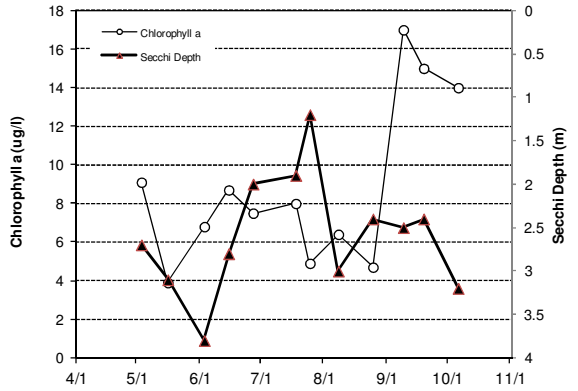
● Sampling site
Contours in meters

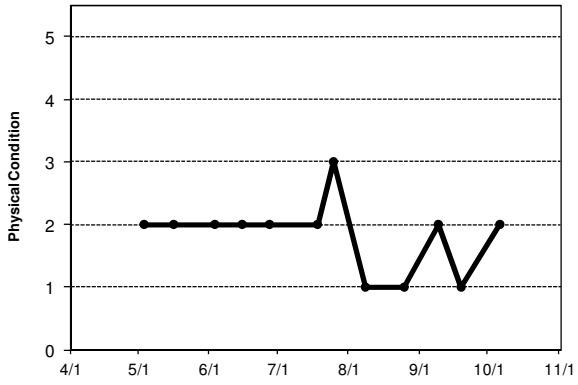


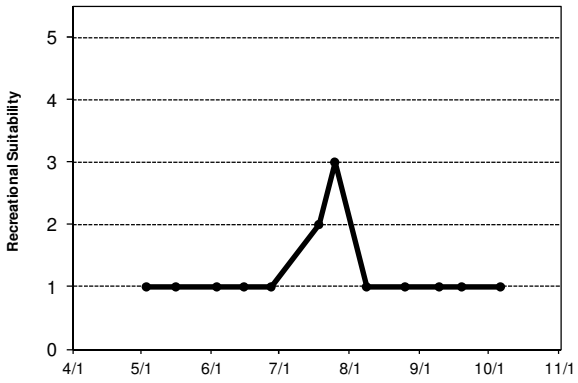
2011 Data

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 (1-5)	RS (1-5)
5/3/2011	7.2				9.1	55		2.7	2	1
5/16/2011	14				3.9	24		3.1	2	1
6/3/2011	20				6.8	31		>3.8	2	1
6/15/2011	20				8.7	37		2.8	2	1
6/27/2011	22				7.5	34		2	2	1
7/18/2011	27				8	48		1.9	2	2
7/25/2011	28				4.9	58		1.2	3	3
8/8/2011	26				6.4	22		3	1	1
8/25/2011	26				4.7	30		2.4	1	1
9/9/2011	23				17	38		2.5	2	1
9/19/2011	18				15	31		2.4	1	1
10/6/2011	17				14	9		>3.2	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			C	C	C	C			D	C	C	C
Chlorophyll a			C	B	B	B			C	B	B	C
Secchi Depth			C	C	C	C			D	C	C	C
Lake Grade			**C**	**C**	**C**	**C**			**D**	**C**	**C**	**C**

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	D	D	C	C	A	B	C
Chlorophyll a	C	B	B	C	B	A	A	A
Secchi Depth	D	C	C	C	C	A	A	B
Lake Grade	**C**	**C**	**C**	**C**	**C**	**A**	**A**	**B**

Source: Metropolitan Council and STORET data

LeMay Lake (19-0082) *Gun Club Lake Watershed Management Organization*

LeMay Lake is located in the City of Mendota Heights. It has a surface area of 34 acres and an average depth of 1.6 m (5.1 ft). The maximum depth is 4.0 m (13 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	33.6	19.0	75.0	C
CLA (µg/l)	5.5	3.5	8.8	A
Secchi (m)	1.9	1.3	2.8	C
TKN (mg/l)	0.97	0.71	1.10	
			Lake Grade	B

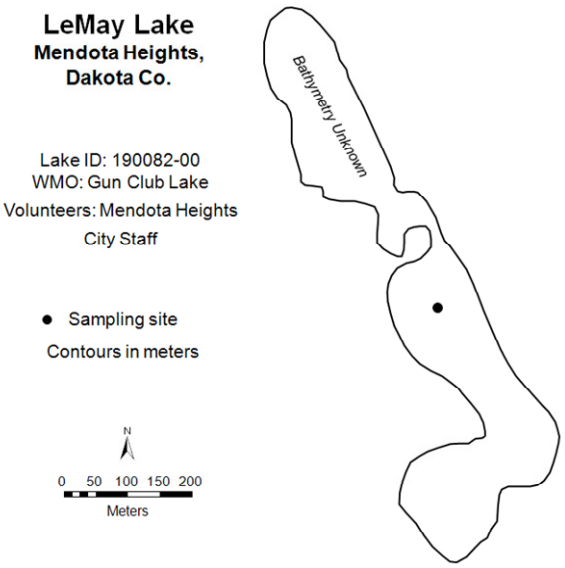
The lake received a lake grade of B for 2011 which is consistent with its limited database. Additional years of monitoring are suggested for continuing to build the water quality database.

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

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

LeMay Lake
Mendota Heights, Dakota Co.

Lake ID: 190082-00
WMO: Gun Club Lake
Volunteers: Mendota Heights City Staff



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/10/2011	17.3				3.8	21		2.8	1	3
5/23/2011	19.4				5.9	34		2.3	2	3
6/9/2011	24.1				4.1	75		1.9	4	5
6/17/2011	24.5				3.5	34		1.8	3	5
7/12/2011					3.9	23		1.8	4	5
8/3/2011					7	19		1.8	4	5
8/9/2011					8.8	22		1.4	5	5
9/6/2011	23.2				6.7	41		1.3	3	5
10/17/2011	14.2				3.7	21		2.2	2	4
10/26/2011	10				3.1	36		2.8	2	4

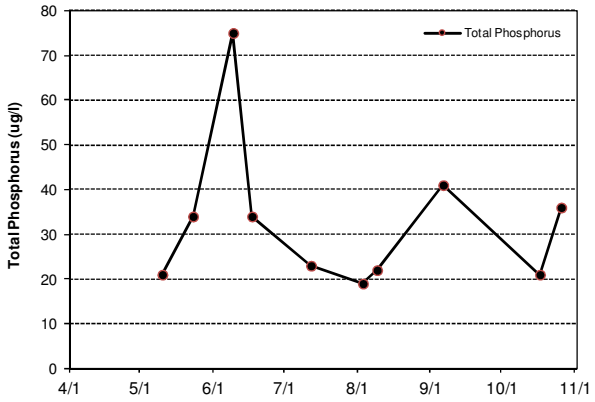
Lake Water Quality Grades Based on Summertime Averages

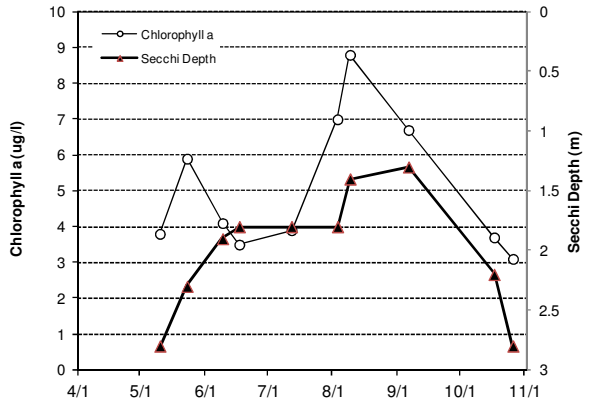
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

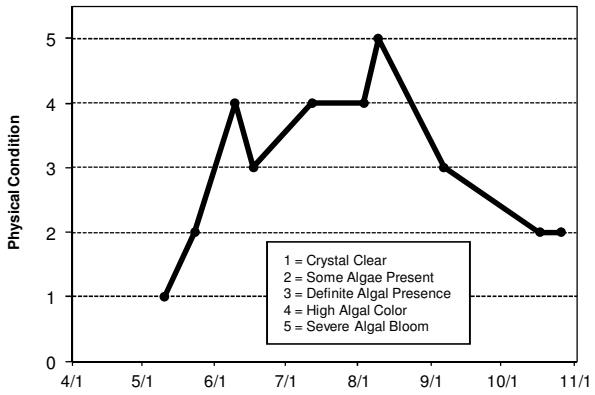
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth							F					
Lake Grade												

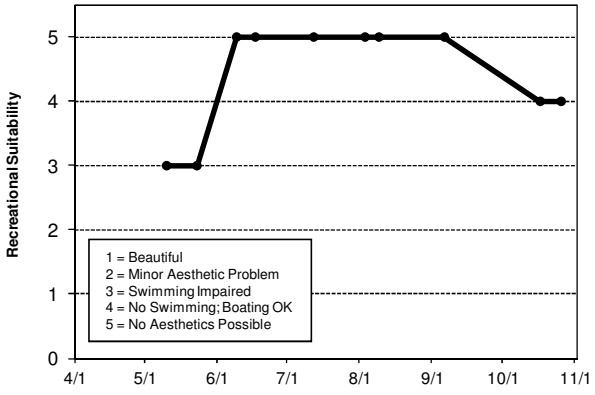
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus				C	B	C	B	C
Chlorophyll a				B	A	A	A	A
Secchi Depth				D	C	C	C	C
Lake Grade				**C**	**B**	**B**	**B**	**B**

Source: Metropolitan Council and STORET data









LeVander Pond (19-0088) *City of South St. Paul*

LeVander pond is located in the City of St. Paul. There is no known morphological information for the pond. A search through the MPCA's EDA system provided no historical information for the pond.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	214.1	18.0	391.0	F
CLA (µg/l)	54.4	1.3	110.0	D
Secchi (m)	0.6	0.3	0.9	F
TKN (mg/l)	1.39	0.76	2.10	
			Lake Grade	F

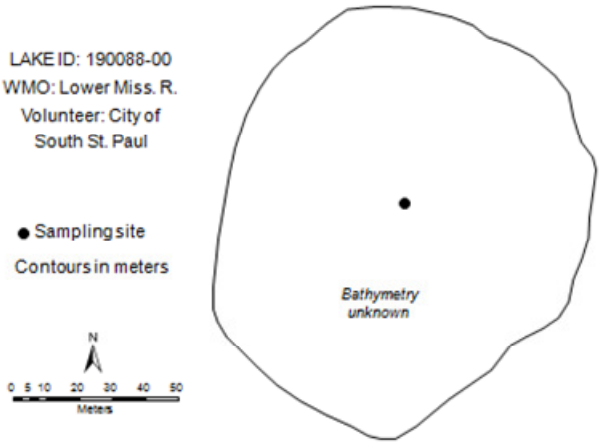
The pond received a lake grade of F for 2011. This was the second year the pond was involved in the CAMP. Continued monitoring is suggested to continue to build the historical database.

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

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

LeVander Pond
South St. Paul, Dakota Co.

LAKE ID: 190088-00
WMO: Lower Miss. R.
Volunteer: City of South St. Paul



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/10/2011	20.4				3.2	35		0.9	3	4
5/18/2011	18.3				1.3	18		0.85		4
6/9/2011	21.2				12	127		0.3		4
6/23/2011	17.1				47	247		0.5	4	4
7/13/2011	22.4				42	315		0.3	1	4
7/26/2011	24.3				89			0.4	2	4
8/9/2011	20.7				93	391		0.55		4
8/22/2011	21.6				110	290		0.6	1	4
9/19/2011	17				92	290		0.7	1	4

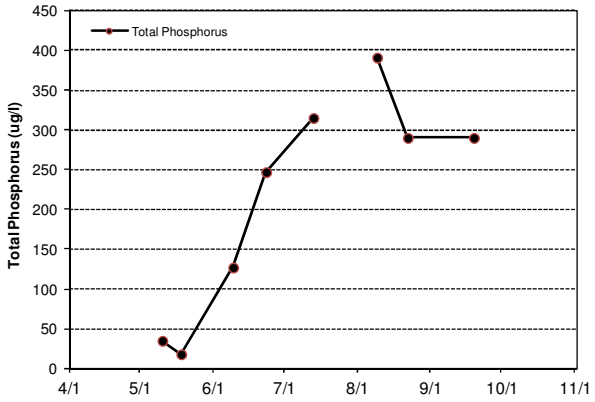
Lake Water Quality Grades Based on Summertime Averages

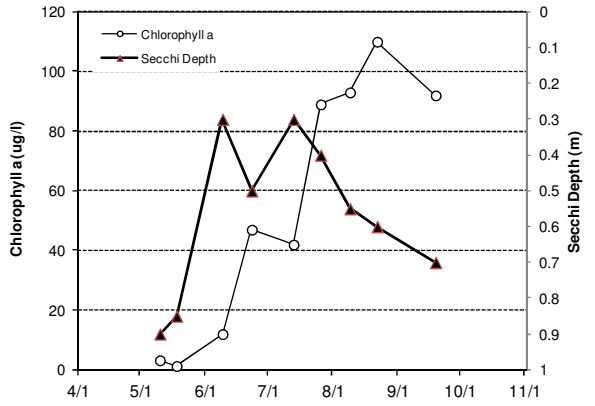
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

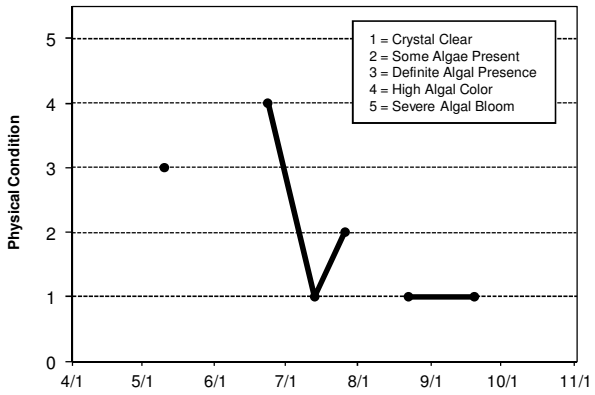
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

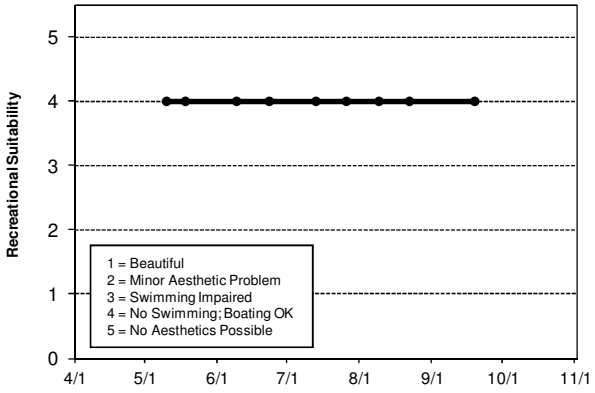
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus							F	F
Chlorophyll a							D	D
Secchi Depth							F	F
Lake Grade							**F**	**F**

Source: Metropolitan Council and STORET data









Little Comfort Lake (13-0054) *Comfort Lake - Forest Lake Watershed District*

Little Comfort Lake is located near the City of Wyoming (Chisago County). The lake has a maximum depth of 17.0 m (56 feet).

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

2011 summer (May-September) data summary

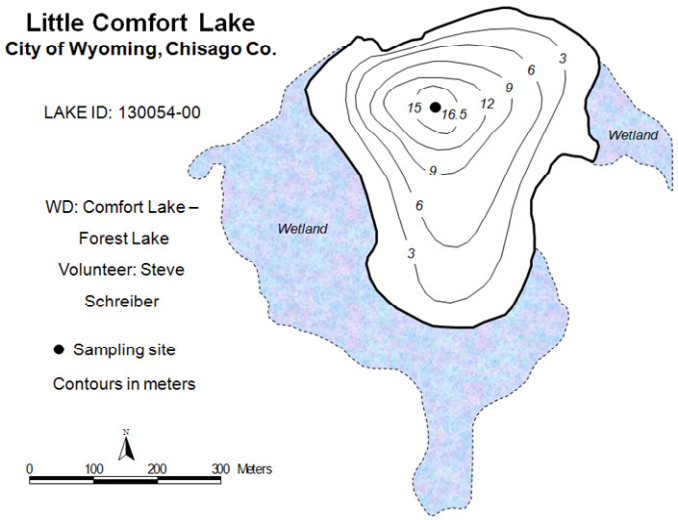
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	45.6	30.0	67.0	C
CLA (µg/l)	10.5	3.3	39.0	B
Secchi (m)	1.7	1.0	3.1	C
TKN (mg/l)	1.06	0.60	1.40	
			Lake Grade	C

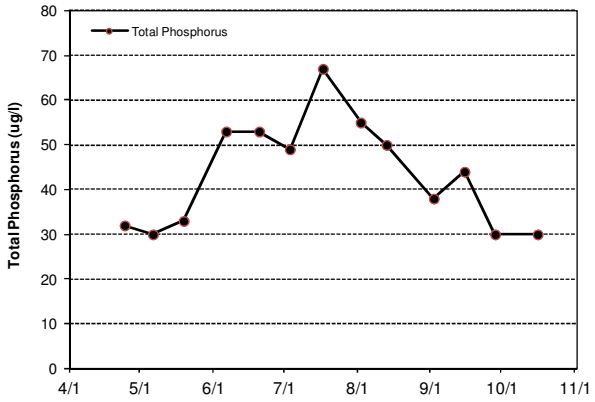
The lake received a lake grade of C for 2011 which is consistent with its varying historical water quality database. Additional annual monitoring is recommended to continue to build the water quality database for this lake.

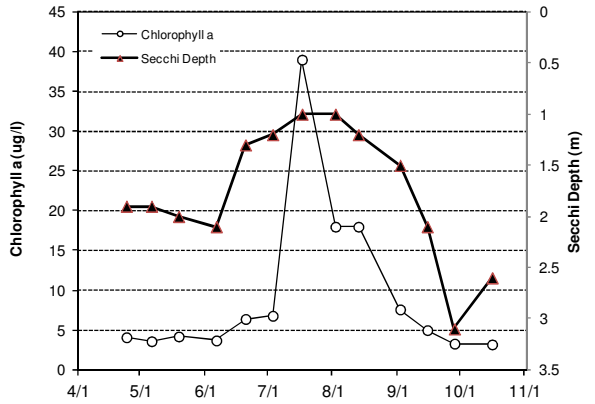
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) 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.

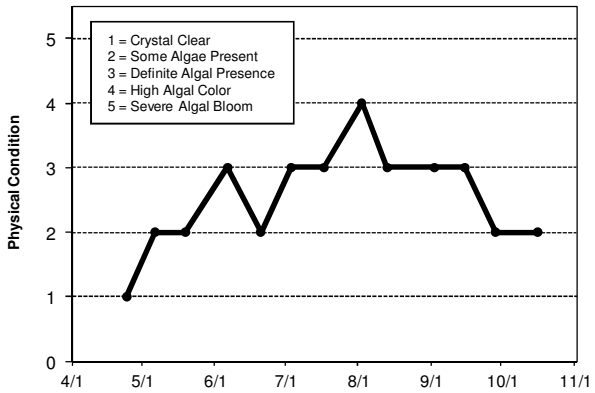






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	12				4.1	32		1.9	1	1
5/6/2011	13.3				3.6	30		1.9	2	2
5/19/2011	17.3				4.2	33		2	2	2
6/6/2011	24.5				3.7	53		2.1	3	3
6/20/2011	24.6				6.4	53		1.3	2	3
7/3/2011	25.9				6.8	49		1.2	3	3
7/17/2011	26.7				39	67		1	3	4
8/2/2011	27.7				18	55		1	4	4
8/13/2011	25.9				18	50		1.2	3	4
9/2/2011	21.2				7.6	38		1.5	3	4
9/15/2011	18.8				5	44		2.1	3	4
9/28/2011	18.8				3.3	30		3.1	2	2
10/16/2011	12.6				3.2	30		2.6	2	2

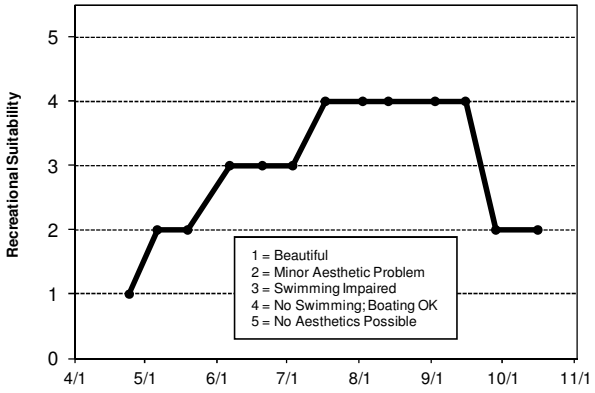


Lake Water Quality Grades Based on Summertime Averages

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									
Chlorophyll a			C									
Secchi Depth			C									
Lake Grade			**C**									

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			D	C	C	A	B	C
Chlorophyll a			C	A	B	A	B	B
Secchi Depth			C	C	C	C	C	C
Lake Grade			**C**	**B**	**C**	**B**	**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).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	61.9	51.0	69.0	C
CLA (µg/l)	10.4	1.0	16.0	B
Secchi (m)	1.4	1.1	1.9	C
TKN (mg/l)	0.96	0.64	1.40	
			Lake Grade	C

The lake received a lake grade of C for 2011, which is consistent with its historical water quality database. The lake appears well represented by a lake grade of C. Continued monitoring is recommended to increase the power for determining trends, and to continue to build the water quality database for this lake.

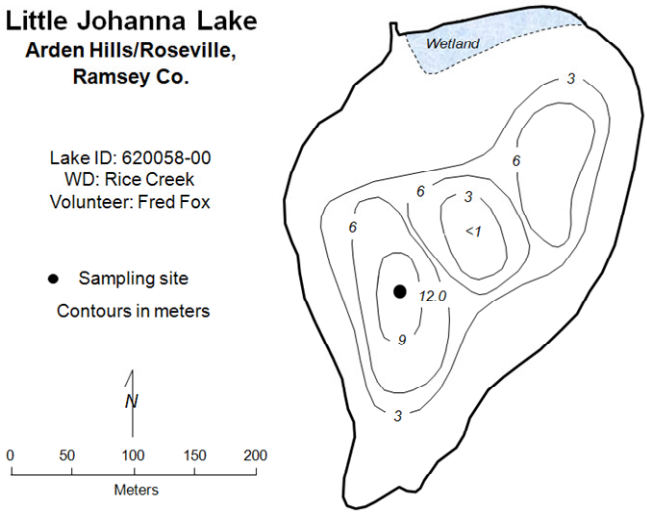
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

Little Johanna Lake
Arden Hills/Roseville, Ramsey Co.

Lake ID: 620058-00
WD: Rice Creek
Volunteer: Fred Fox



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/18/2011	19.2				9.1	68		1.7	2	2
6/4/2011	25.2				5.1	65		1.9	2	3
6/12/2011	20.8				1	51		1.1	2	3
6/25/2011	21				8	59		1.5	3	3
7/17/2011	28.8				15	68		1.45	3	3
7/31/2011	30.9				15	53		1.3	3	3
8/14/2011	27.2				16	69		1.1	4	3
8/26/2011	25.9				14	62		1.3	3	3
10/4/2011	17.4				120	68		0.8	2	3
10/22/2011	11.8				4.1	52		1.6	2	2

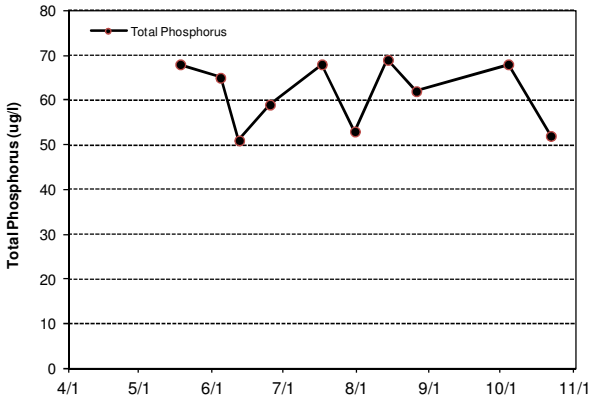
Lake Water Quality Grades Based on Summertime Averages

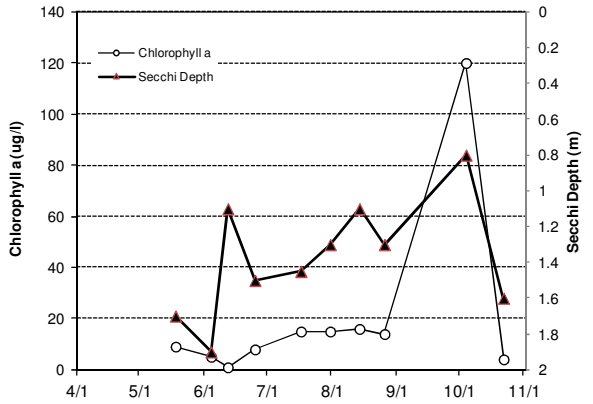
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

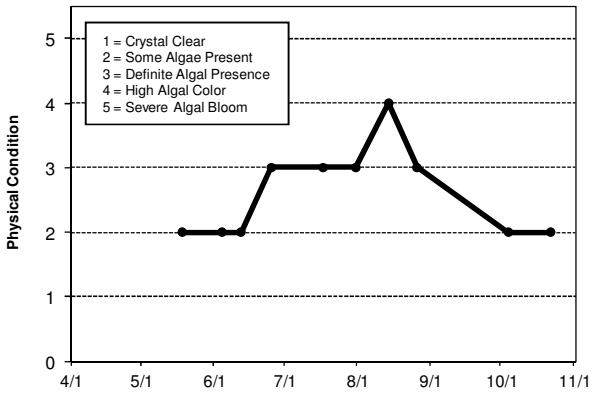
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus										C	D	D
Chlorophyll a										C	C	C
Secchi Depth										C	C	C
Lake Grade										**C**	**C**	**C**

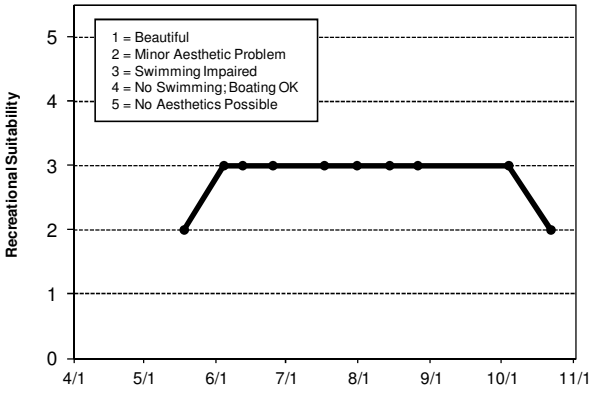
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	C	D		C	C	C	C
Chlorophyll a	B	C	C		B	B	C	B
Secchi Depth	C	C	C		C	C	D	C
Lake Grade	**C**	**C**	**C**		**C**	**C**	**C**	**C**

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 are few known morphological data available for the lake other than it has a maximum depth of 4.9 m (16 ft). Because of the shallowness of the lake, the entire area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. Also the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

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

2011 summer (May-September) data summary

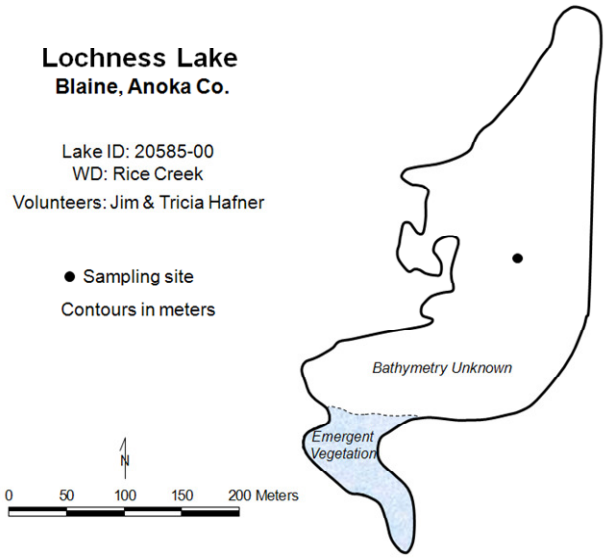
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	43.4	28.0	58.0	C
CLA (µg/l)	14.2	3.7	32.0	B
Secchi (m)	1.4	0.9	2.2	C
TKN (mg/l)	1.59	1.30	1.90	
			Lake Grade	C

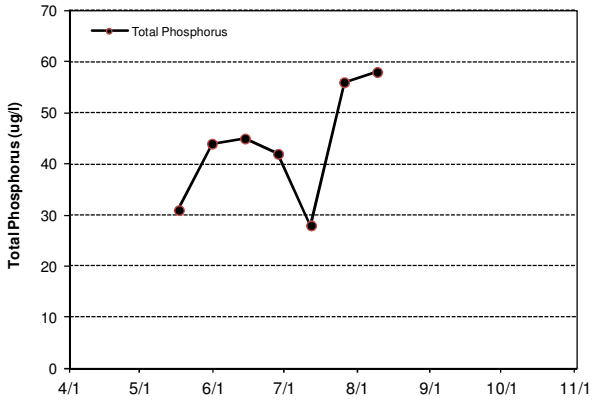
The lake received a lake grade of C for 2011, which is similar to water quality observed in 2009. Continued monitoring is suggested to determine the trend direction, if any, of the varying water quality of this lake. Continued monitoring is recommended to continue to build the water quality database for this lake. Also continued monitoring is suggested to determine the trend direction, if any, of the varying water quality of this lake.

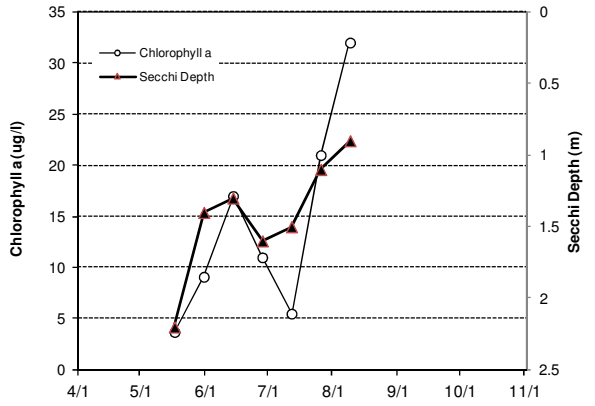
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

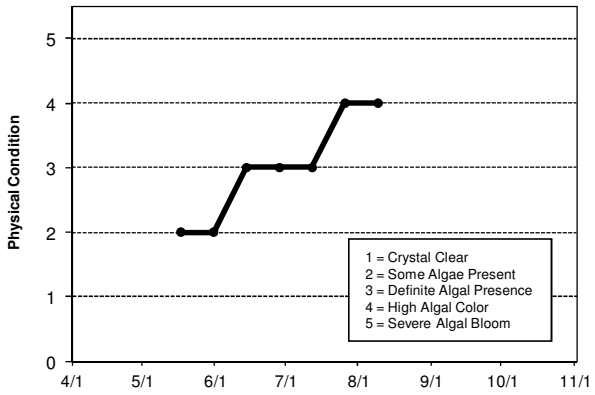






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/17/2011	13.9				3.7	31		2.2	2	4
5/31/2011	19.2				9.1	44		1.4	2	4
6/14/2011	20.2				17	45		1.3	3	4
6/28/2011	21.3				11	42		1.6	3	4
7/12/2011	26.9				5.5	28		1.5	3	4
7/26/2011	26				21	56		1.1	4	4
8/9/2011	24.7				32	58		0.9	4	4



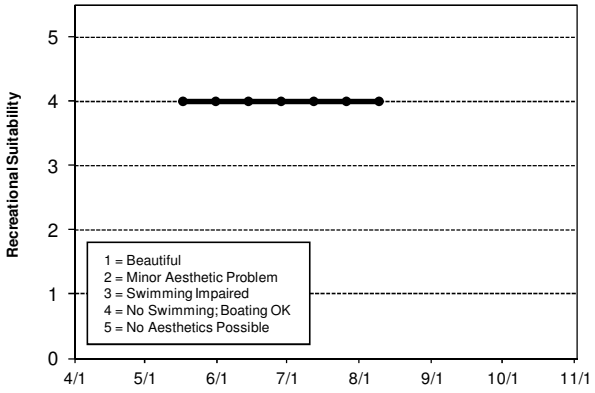
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus				A	B	C	B	C
Chlorophyll a				A	A	B	A	B
Secchi Depth				B	B	C	B	C
Lake Grade				**A**	**B**	**C**	**B**	**C**

Source: Metropolitan Council and STORET data



Lone Lake (27-0094) *City of Minnetonka*

Lone Lake is located within the City of Minnetonka (Hennepin County). The maximum depth of the lake is 8.2 m (27 feet). The lake is characterized by two distinct basins. This was the first year that the lake was part of the CAMP.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	31.6	24.0	43.0	B
CLA (µg/l)	6.7	2.0	16.0	A
Secchi (m)	2.9	1.7	4.5	B
TKN (mg/l)	0.63	0.57	0.66	
			Lake Grade	B

The lake received a lake grade of B for 2011, similar to last year's grade. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

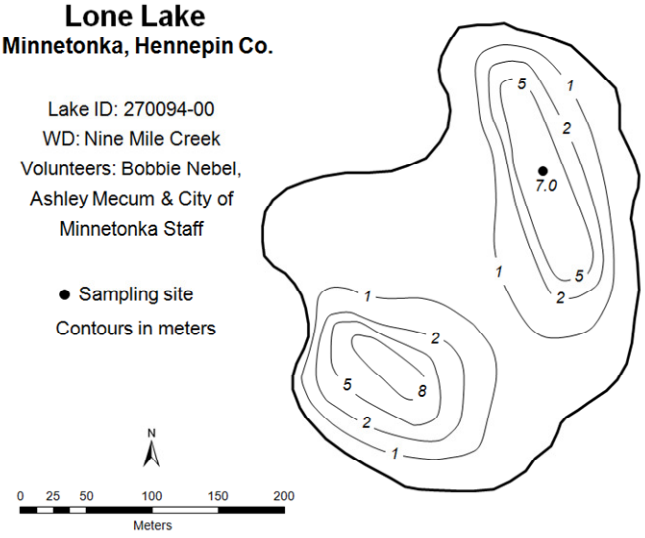
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 297-4916 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

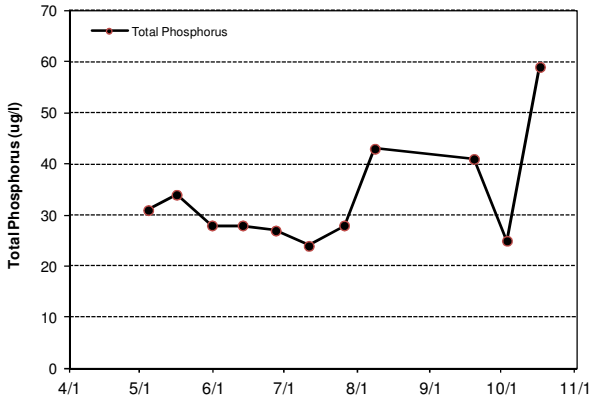
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

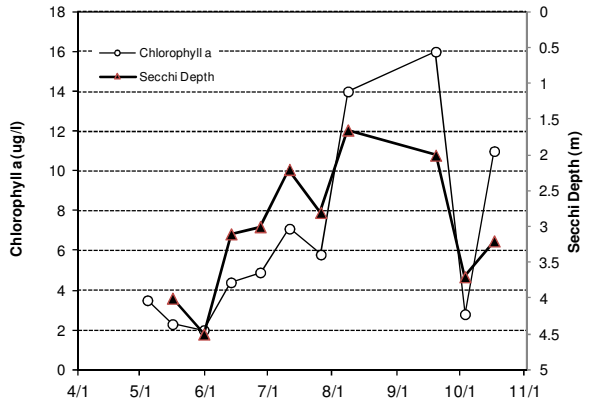
Lone Lake
Minnetonka, Hennepin Co.

Lake ID: 270094-00
WD: Nine Mile Creek
Volunteers: Bobbie Nebel, Ashley Mecum & City of Minnetonka Staff

● Sampling site
Contours in meters

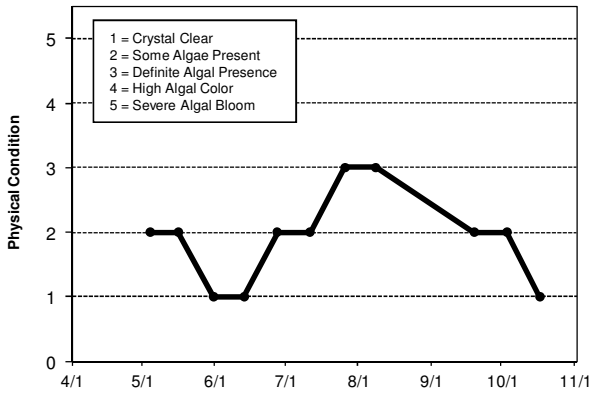






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/4/2011	11.4				3.5	31			2	4
5/16/2011	14.4				2.3	34		4	2	1
5/31/2011	21.2				2	28		4.5	1	4
6/13/2011	20.8				4.4	28		3.1	1	4
6/27/2011	22.3				4.9	27		3	2	4
7/11/2011	27.6				7.1	24		2.2	2	4
7/26/2011	28.6				5.8	28		2.8	3	4
8/8/2011	26.6				14	43		1.65	3	4
9/19/2011	16.9				16	41		2	2	4
10/3/2011	15.2				2.8	25		3.7	2	4
10/17/2011	13				11	59		3.2	1	4

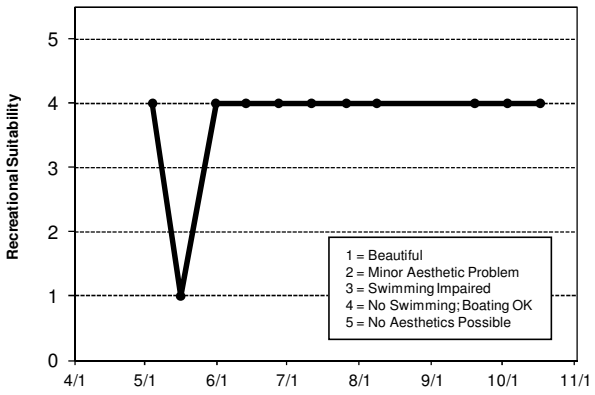


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus						B	B	B
Chlorophyll a						A	B	A
Secchi Depth						B	B	B
Lake Grade						**B**	**B**	**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 1.5 m (5 feet). TThe entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	242.7	54.0	614.0	F
CLA (µg/l)	88.8	8.4	220.0	F
Secchi (m)	0.3	0.1	1.2	F
TKN (mg/l)	3.68	1.00	9.30	
			Lake Grade	F

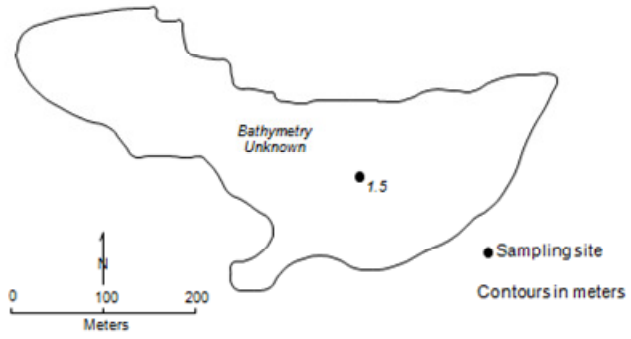
The lake received a lake grade of F for 2011, which is similar to those recorded in the past decade.

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

If you notice any errors in the lake's data or physical information, or are aware of 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: 190022-00
WMO: Vermillion River
Volunteers: Christy & Jake McGlocklin, Al Kettlekamp



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/22/2011	11.2					42		1	1	1
5/7/2011	16.3				8.4	54		1.15	2	3
5/22/2011	19				29	138		0.5	2	3
6/11/2011	21.3				100	206		0.3	4	4
6/19/2011	22				18	160		0.3	5	5
7/10/2011	30.3				18	133		0.2	4	4
7/17/2011	29.6				140	157		0.2	3	4
7/30/2011	31.5				160	159		0.2	5	5
8/7/2011	26.5				220	614		0.1	5	5
8/28/2011	24.6				75	316		0.05	2	4
9/11/2011	22				120	395		0.1	5	
9/19/2011	20					338		0.15	5	4
10/9/2011	21				15	511		0.2	4	3
10/22/2011	10.6				94	547		0.2		

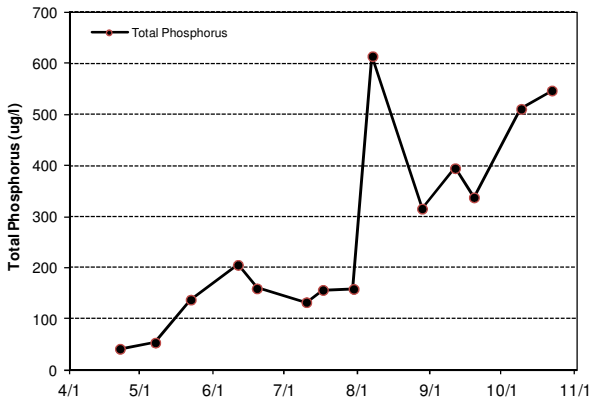
Lake Water Quality Grades Based on Summertime Averages

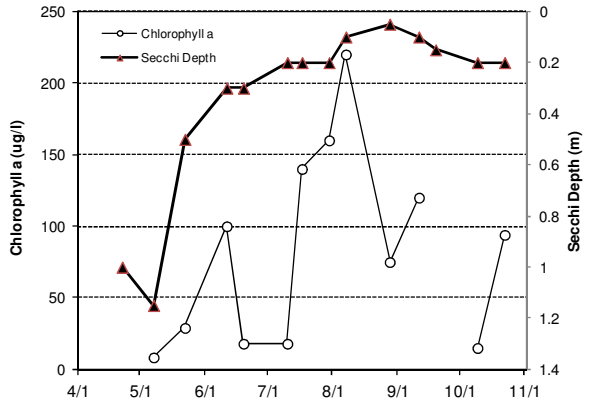
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

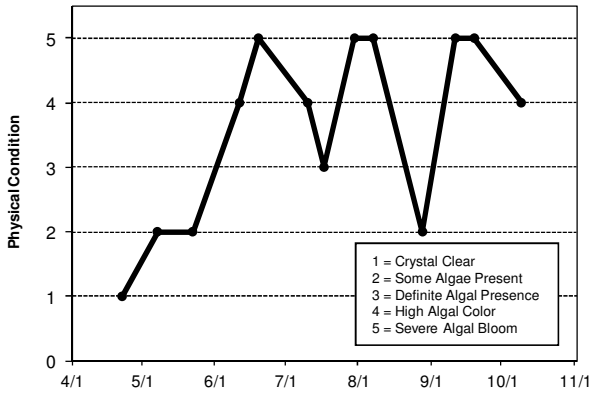
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus						D					F	F
Chlorophyll a						D					F	F
Secchi Depth						F					F	F
Lake Grade						**D**					**F**	**F**

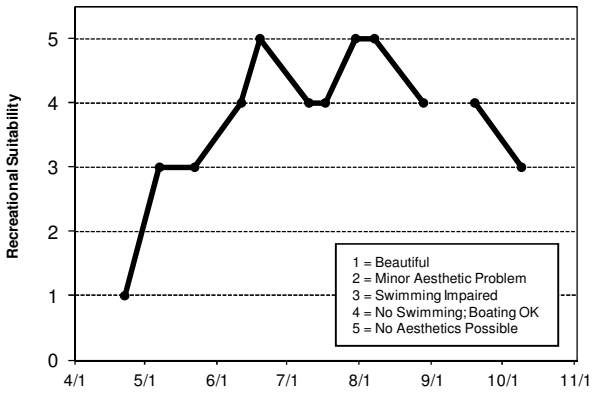
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	F	F	F	F	F	F	F	F
Chlorophyll a	F	F	F	F	F	F	D	F
Secchi Depth	F	F	F	F	F	F	F	F
Lake Grade	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**

Source: Metropolitan Council and STORET data









Long Lake [Site 1, north basin] [Stillwater] (82-0021) *Browns Creek Watershed District*

Long Lake is located on the western boundary of the City of Stillwater (Washington County). It has a surface area of 96 acres, and its maximum depth is 6.7 m (22 feet). Approximately 95 percent of the surface area is considered littoral zone, which is the 0-15 feet depth zone dominated by aquatic vegetation. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	63.6	41.0	89.0	C
CLA (µg/l)	23.7	5.5	64.0	C
Secchi (m)	1.9	1.2	3.7	C
TKN (mg/l)	1.10	0.78	1.50	
			Lake Grade	C

The lake received a lake grade of C for 2011. The lake has experienced varying lake grades from D to B since 2004. Prior to 2004 the lake grades were constant Ds and Fs. Continued monitoring is suggested to determine if the improved water quality that started around 2004 is sustained into the future.

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

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/.

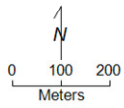
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Long Lake, Site 1
Stillwater, Washington Co.

Lake ID: 820021-00
WD: Browns Creek
Volunteer: Washington Conservation District

● Sampling site

Contours in meters



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/12/2011	7.2	5.2	3.9	0	66	237		0.61	2	4
4/25/2011	11.6	5.2	11.6	0.1	18	65		1.52	2	3
5/10/2011	14.9	6.7	10.4	0.1	12	55		1.83	3	3
5/24/2011	19.3	7.7	8.7	0.1	9.2	43		2.74	2	2
6/6/2011	26.8	8.7	7.8	0.1	5.5	56		3.66	2	3
6/21/2011	22.7	8.1	8.7	0	10	89		2.13	2	2
7/5/2011	28.3	11	10	0	22	41		1.22	2	2
7/19/2011	29.4	9.7	8.2	0.1	23	59		1.37	2	3
8/2/2011	27.2	9.7	6	0	64	79		1.37	2	3
8/18/2011	24.6	9.2	7.7	0	30	65		1.37	2	3
8/29/2011	25.6	13.3	7.3	0.1	19	58		2.13	3	3
9/13/2011	23.1	10.7	10	0.1	31	68		1.22	3	4
9/27/2011	15.4	13.2	6.1	0	35	87		1.37	3	3
10/10/2011	18.9	14.1	9.7	0	34	90		1.37	2	3

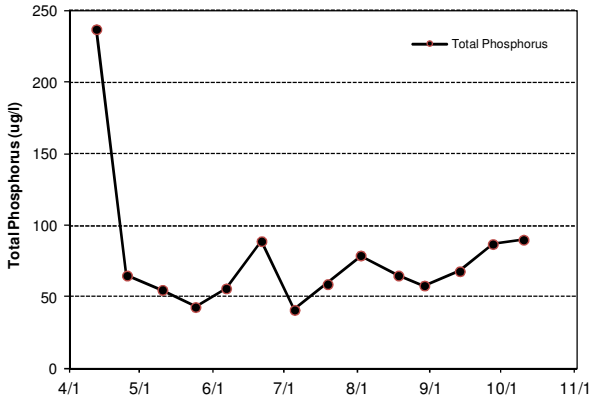
Lake Water Quality Grades Based on Summertime Averages

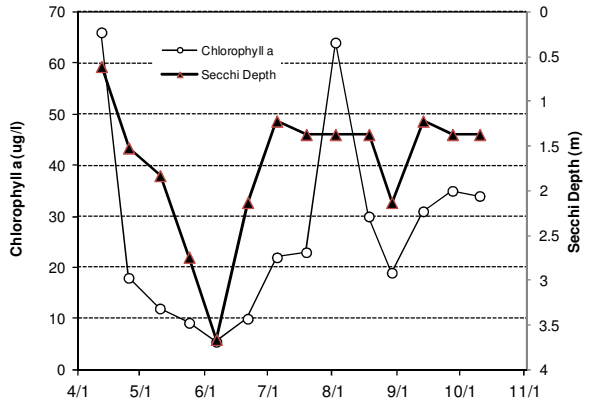
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth								F		D		F
Lake Grade												

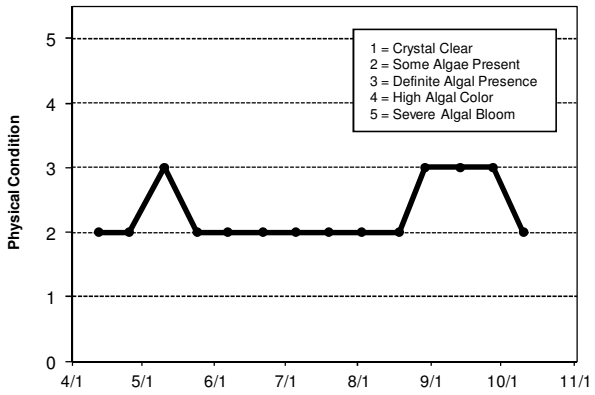
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus				D	D		D	D	F	D	D	D
Chlorophyll a				D	D		F	F	F	F	D	D
Secchi Depth	F	F	F	F	D		F	F	F	F	F	F
Lake Grade				**D**	**D**		**F**	**F**	**F**	**F**	**D**	**D**

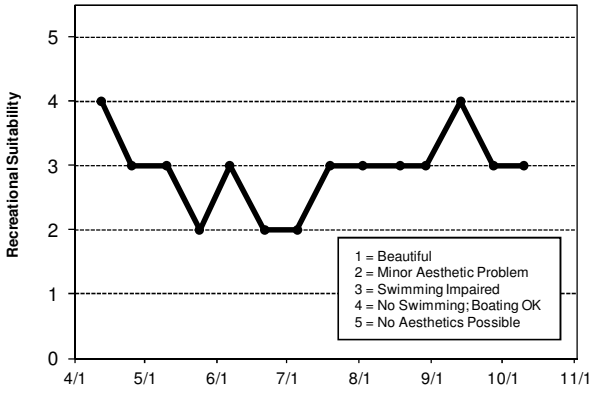
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	D	D	C	C	C	C	C
Chlorophyll a	C	D	C	C	B	B	B	C
Secchi Depth	C	D	D	D	C	C	B	C
Lake Grade	**C**	**D**	**D**	**C**	**C**	**C**	**B**	**C**

Source: Metropolitan Council and STORET data









Long Lake [Site 2, middle basin] [Stillwater] (82-0021) *Browns Creek Watershed District*

Long Lake is located on the western boundary of the City of Stillwater (Washington County). It has a surface area of 96 acres, and its maximum depth is 6.7 m (22 feet). Approximately 95 percent of the surface area is considered littoral zone, which is the 0-15 feet depth zone dominated by aquatic vegetation. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	118.5	105.0	139.0	
CLA (µg/l)	36.8	26.0	45.0	
Secchi (m)	1.2	1.1	1.4	
TKN (mg/l)	1.33	1.10	1.80	
			Lake Grade	

There was an insufficient quantity of data to calculate grades for this monitoring site in 2011. There were 4 montiroing events in 2011; at least 5 monitoring events during the summer-time period (May – September) are needed to calculate grades.

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

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

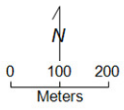
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Long Lake, Site 2
Stillwater, Washington Co.

Lake ID: 820021-00
WD: Browns Creek
Volunteer: Washington Conservation District

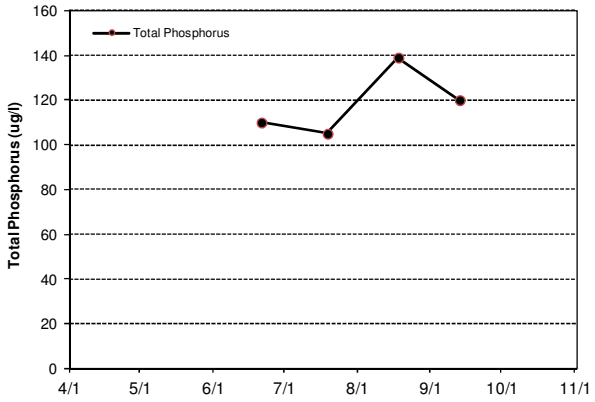
● Sampling site

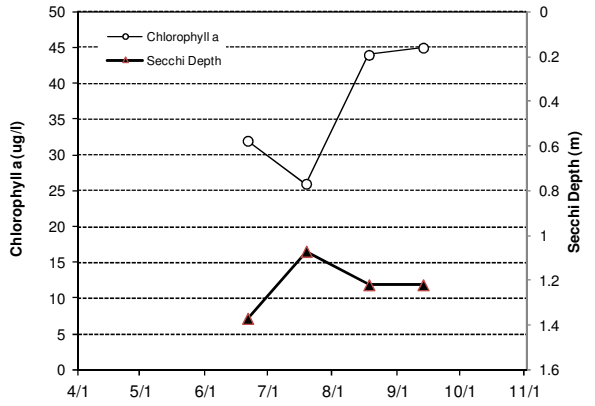
Contours in meters

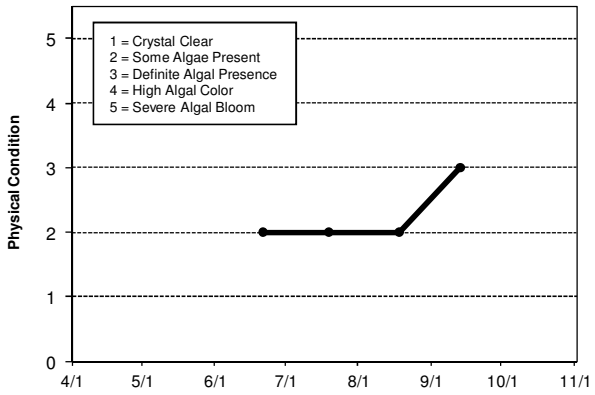


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/21/2011	22.2	22.1	7.6	0.1	32	110		1.37	2	3
7/19/2011	29.2	23.3	8.1	0.2	26	105		1.07	2	3
8/18/2011	23.4	23.4	4.8	4.4	44	139		1.22	2	3
9/13/2011	21.3	21.2	5.3	0.2	45	120		1.22	3	4





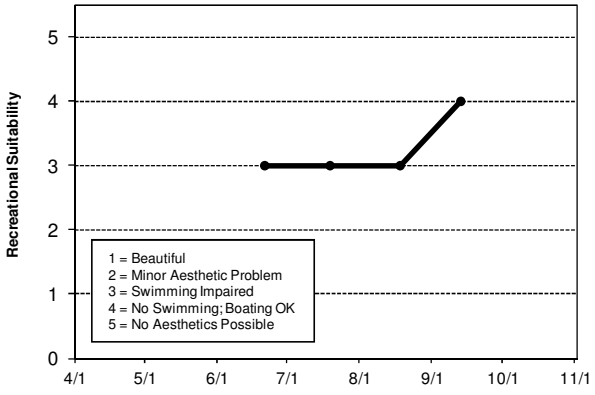


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus								
Chlorophyll a								
Secchi Depth								
Lake Grade						**NA**	**NA**	**NA**



Source: Metropolitan Council and STORET data

Long Lake [Site 3, south basin] [Stillwater] (82-0021) *Browns Creek Watershed District*

Long Lake is located on the western boundary of the City of Stillwater (Washington County). It has a surface area of 96 acres, and its maximum depth is 6.7 m (22 feet). Approximately 95 percent of the surface area is considered littoral zone, which is the 0-15 feet depth zone dominated by aquatic vegetation. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	171.8	136.0	205.0	
CLA (µg/l)	118.0	28.0	280.0	
Secchi (m)	1.0	0.6	1.5	
TKN (mg/l)	1.23	1.10	1.40	
			Lake Grade	

There was an insufficient quantity of data to calculate grades for this monitoring site in 2011. There were 4 montiroing events in 2011; at least 5 monitoring events during the summer-time period (May – September) are needed to calculate grades.

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

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

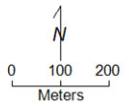
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Long Lake, Site 3
Stillwater, Washington Co.

Lake ID: 820021-00
WD: Browns Creek
Volunteer: Washington
Conservation District

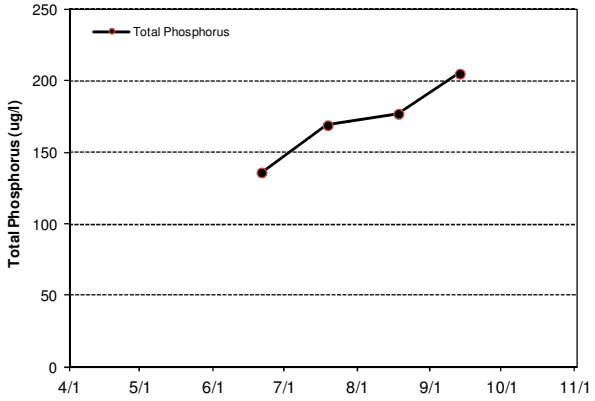
● Sampling site

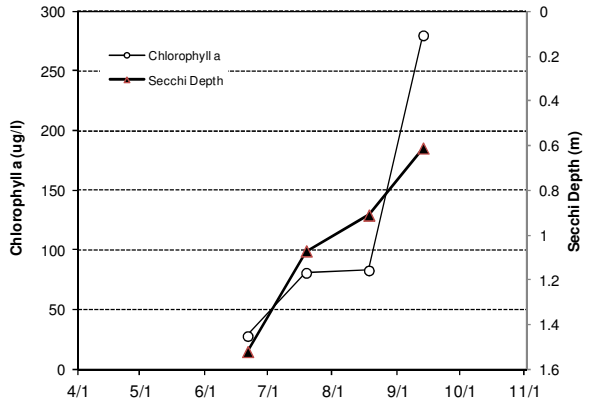
Contours in meters

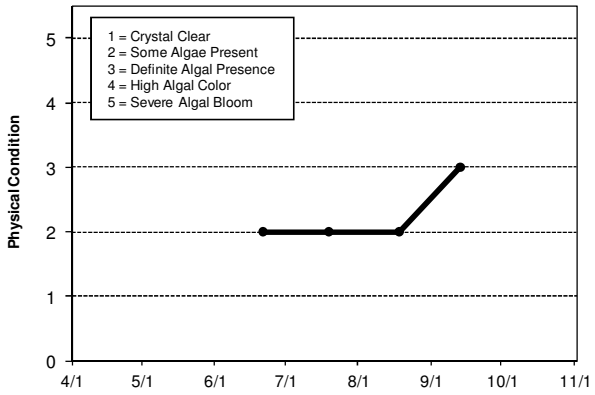


2011 Data

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 (1-5)	RS (1-5)
6/21/2011	22	21.8	8.2	0.7	28	136		1.52	2	3
7/19/2011	29.4	21.9	6.9	0	81	169		1.07	2	4
8/18/2011	22.5	22.3	4.79	2.7	83	177		0.91	2	4
9/13/2011	21.4	19.9	12.32	0.8	280	205		0.61	3	4





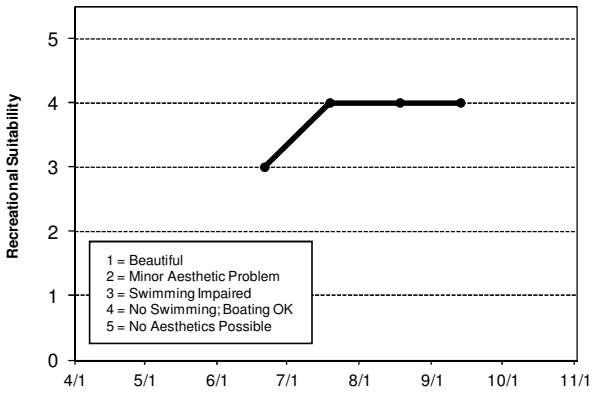


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus								
Chlorophyll a								
Secchi Depth								
Lake Grade						**NA**	**NA**	**NA**



Source: Metropolitan Council and STORET data

Long Lake [May Township] (82-0030) *Marine on St. Croix WMO*

Long Lake is located in May Township (Washington County). It has a surface area of 88 acres. The maximum depth is 3.7 m (12 feet). The entire lake area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The lake does not maintain a thermocline which is a density gradient caused by changing water temperatures throughout the lake's water column.

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

2011 summer (May-September) data summary

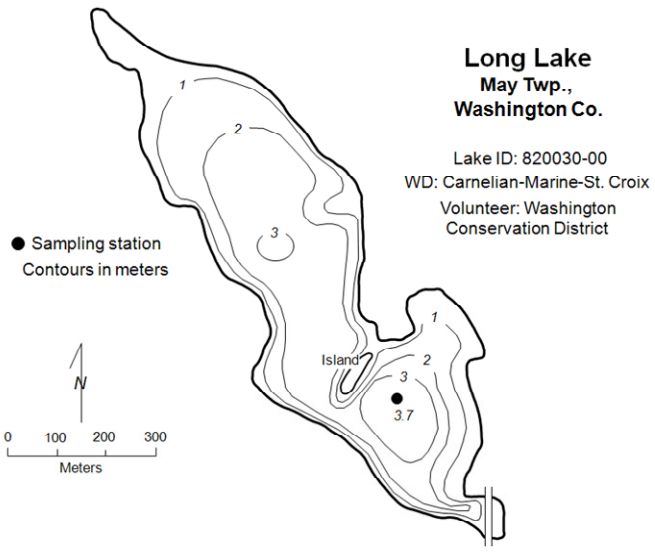
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	32.6	22.0	45.0	C
CLA (µg/l)	4.8	2.9	7.7	A
Secchi (m)	2.9	2.7	3.1	B
TKN (mg/l)	0.71	0.66	0.82	
			Lake Grade	B

The lake received a lake grade of B for 2011. This grade is consistent with the lake grades received since 2003, and an apparent improvement over the C grades typically received in the 1990s. Notable is the change in typical CLA grades received in the mid 1990s (C's) compared to the CLA grades received since 2003 (A's).

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

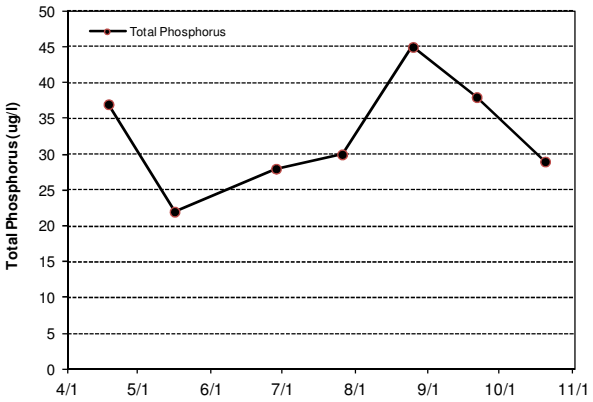
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

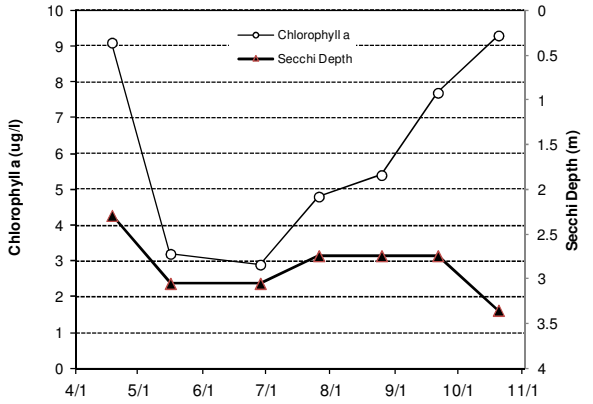
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

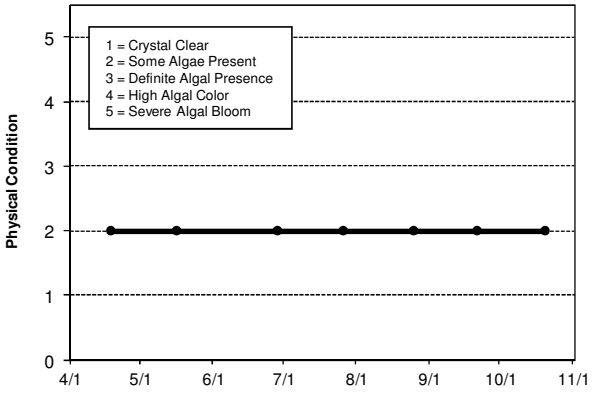


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/18/2011	7.1	6.8	10.3	0.7	9.1	37		2.29	2	2
5/16/2011	14.8	12.6	9.8	0.8	3.2	22		3.05	2	2
6/28/2011	21.3	18.6	9.6	0.2	2.9	28		3.05	2	2
7/26/2011	26.2	20.5	9.5	0.1	4.8	30		2.74	2	2
8/25/2011	24.2	20	6.6	0.1	5.4	45		2.74	2	2
9/21/2011	16	16.2	4.2	0.8	7.7	38		2.74	2	2
10/20/2011	9.8	9.7	9.2	8.6	9.3	29		3.35	2	2





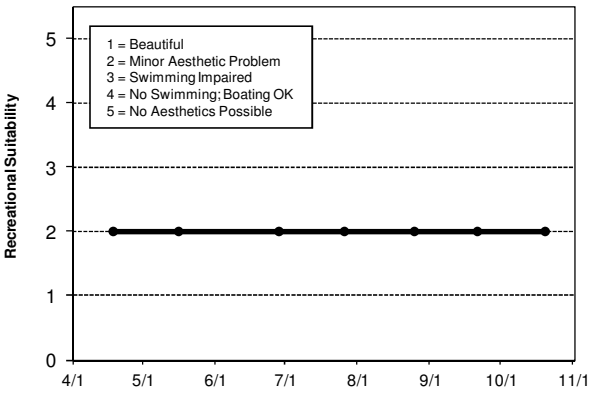


Lake Water Quality Grades Based on Summertime Averages

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		C	C	C	C	C
Chlorophyll a		C	C	C	B	C		B	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	2009	2010	2011
Total Phosphorus	B	C	C	C	C	B	B	C
Chlorophyll a	A	B	A	B	A	A	A	A
Secchi Depth	B	B	B	C	B	B	B	B
Lake Grade	**B**	**B**	**B**	**C**	**B**	**B**	**B**	**B**



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 entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	81.2	31.0	147.0	D
CLA (µg/l)	39.1	4.4	94.0	C
Secchi (m)	1.2	0.5	1.8	D
TKN (mg/l)	1.42	0.67	2.40	
			Lake Grade	D

The lake received a lake grade of D for 2011. The lake grades have fluctuated in the range of F to B to D since 1998, which is quite variable. However, the F grades were received prior to 2004, suggesting that the lake's water quality is better than it was about 10 years ago.

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

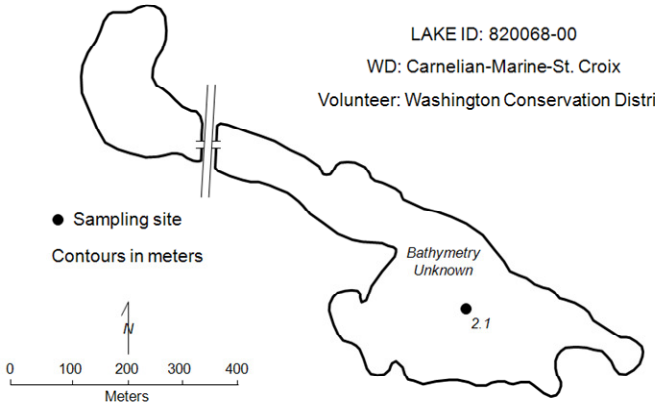
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Long Lake
Scandia, Washington Co.

LAKE ID: 820068-00

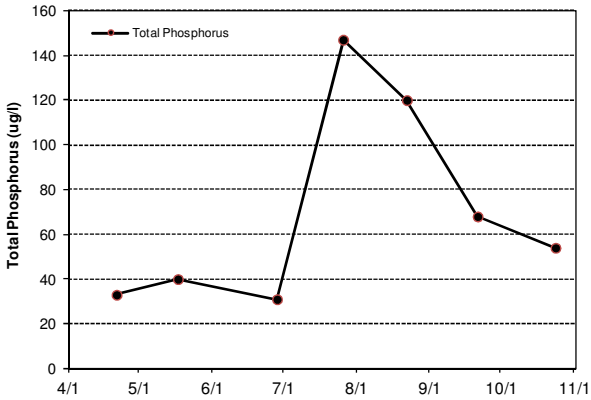
WD: Carnelian-Marine-St. Croix

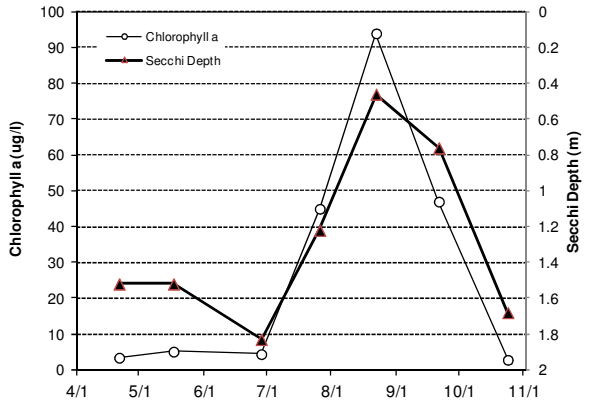
Volunteer: Washington Conservation District

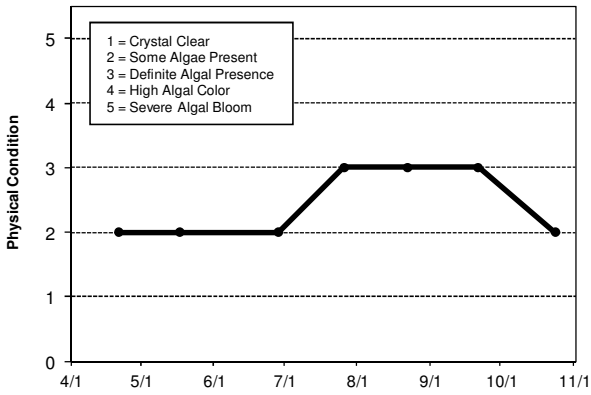


2011 Data

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 (1-5)	RS (1-5)
4/21/2011	10.8	8.5	10.6	10.3	3.4	33		1.52	2	2
5/17/2011	17.1	16.9	9.7	3.1	5.1	40		1.52	2	2
6/28/2011	23.8	22.5	7.5	0.1	4.4	31		1.83	2	3
7/26/2011	27.3	27.1	8.9	1.1	45	147		1.22	3	4
8/22/2011	28	24.2	9.6	0.2	94	120		0.46	3	4
9/21/2011	15.6	15.7	7.8	0.3	47	68		0.76	3	4
10/24/2011	8.5	8.5	8.5	0.9	2.8	54		1.68	2	2





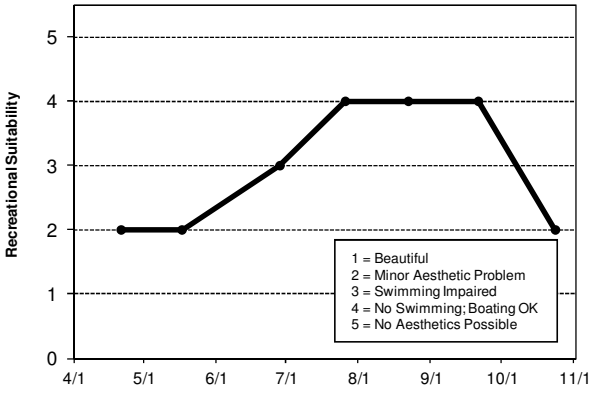


Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus	D	D	D	C	C	D	C	D
Chlorophyll a	D	C	B	C	A	C	C	C
Secchi Depth	D	D	C	C	C	D	D	D
Lake Grade	**D**	**D**	**C**	**C**	**B**	**D**	**C**	**D**



Source: Metropolitan Council and STORET data

Long Lake [Pine Springs] (82-0118) *Valley Branch Watershed District*

Primary Volunteer Report

Long Lake is located in Pine Springs Township (Washington County). It has a surface area of 62 acres. The mean and maximum depths of the lake are 3.6 m (12 feet) and 10.4 m (34 feet), respectively. The lake's surface area and watershed area of 2,060 acres translates to a 33:1 watershed-to-lake area ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	27.3	13.0	74.0	B
CLA (µg/l)	9.1	1.1	16.0	A
Secchi (m)	2.3	1.4	4.0	B
TKN (mg/l)	0.81	0.54	1.10	
			Lake Grade	B

The lake received a lake grade of B for 2011, which is similar to grades received in 2007 and 2008, but an indication of reduced open water quality compared to the year 2009. The good water quality year of 2009 follows an alum treatment that occurred in 2008. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

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

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

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

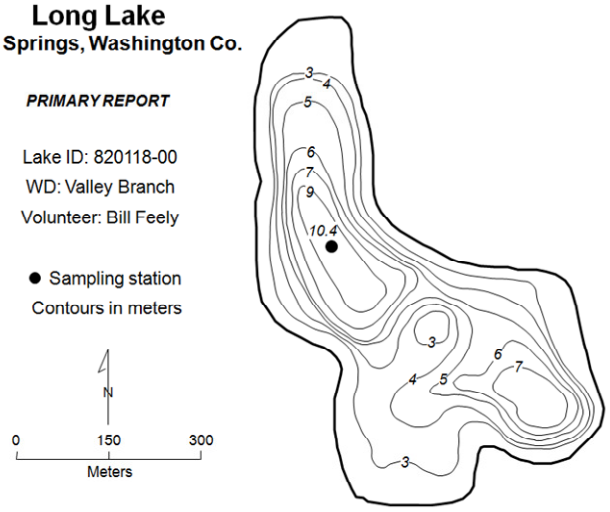
Long Lake

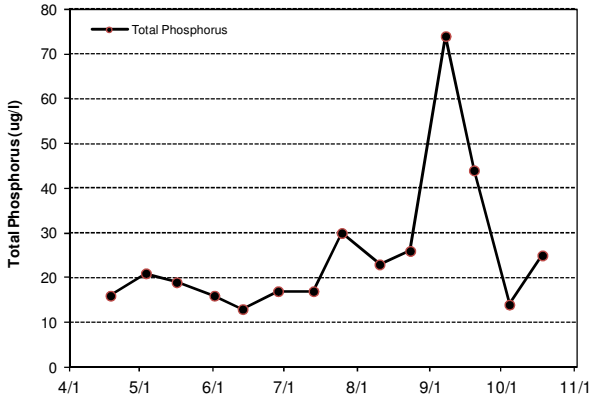
Pine Springs, Washington Co.

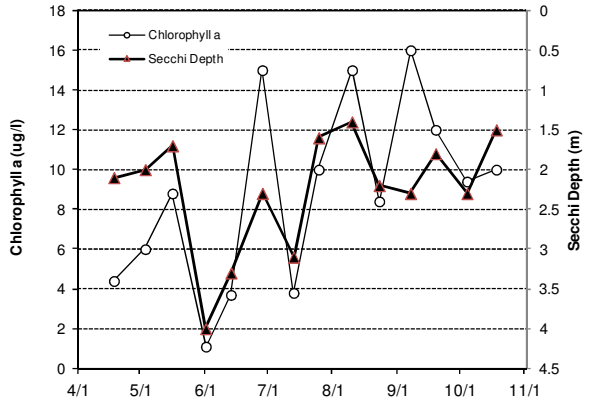
PRIMARY REPORT

Lake ID: 820118-00
WD: Valley Branch
Volunteer: Bill Feely

● Sampling station
Contours in meters

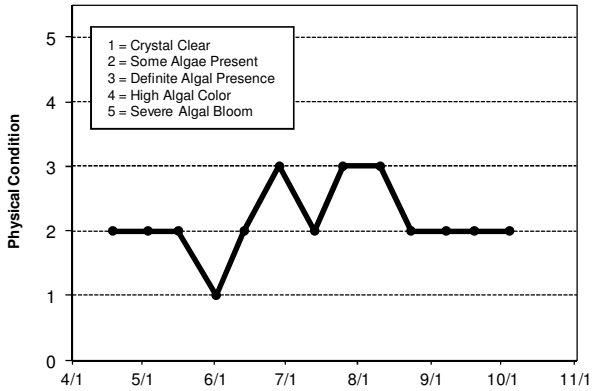






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/18/2011	7.8				4.4	16		2.1	2	1
5/3/2011	8.3				6	21		2	2	1
5/16/2011	13.6				8.8	19		1.7	2	1
6/1/2011	19.7				1.1	16		4	1	1
6/13/2011	20.7				3.7	13		3.3	2	1
6/28/2011	22				15	17		2.3	3	3
7/13/2011	26.3				3.8	17		3.1	2	1
7/25/2011	28.8				10	30		1.6	3	3
8/10/2011	25.1				15	23		1.4	3	3
8/23/2011	26.7				8.4	26		2.2	2	1
9/7/2011	22.2				16	74		2.3	2	2
9/19/2011	18				12	44		1.8	2	2
10/4/2011	16.2				9.4	14		2.3	2	2
10/18/2011	13.4				10	25		1.5		

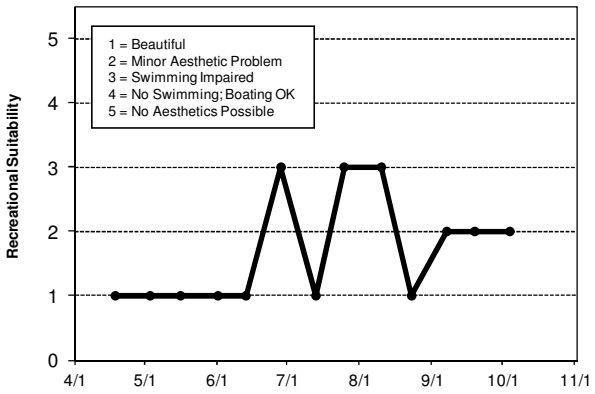


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	C	C	B	B	A		B
Chlorophyll a	B	B	C	A	A	A		A
Secchi Depth	C	C	C	B	B	A		B
Lake Grade	**C**	**C**	**C**	**B**	**B**	**A**		**B**



Source: Metropolitan Council and STORET data

Long Lake [Pine Springs] (82-0118) *Valley Branch Watershed District*

Secondary Volunteer Report

Long Lake is located in Pine Springs Township (Washington County). It has a surface area of 62 acres. The mean and maximum depths of the lake are 3.6 m (12 feet) and 10.4 m (34 feet), respectively. The lake's surface area and watershed area of 2,060 acres translates to a 33:1 watershed-to-lake area ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

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

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	28.0	21.0	34.0	B
CLA (µg/l)	8.8	2.1	20.0	A
Secchi (m)	3.0	1.8	4.1	B
TKN (mg/l)	1.08	0.87	1.30	
			Lake Grade	B

The lake received a lake grade of B for 2011, which is similar to grades received in 2007 and 2008, but an indication of reduced open water quality compared to the year 2009. The good water quality year of 2009 follows an alum treatment that occurred in 2008. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

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

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

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

Long Lake

Pine Springs, Washington Co.

SECONDARY REPORT

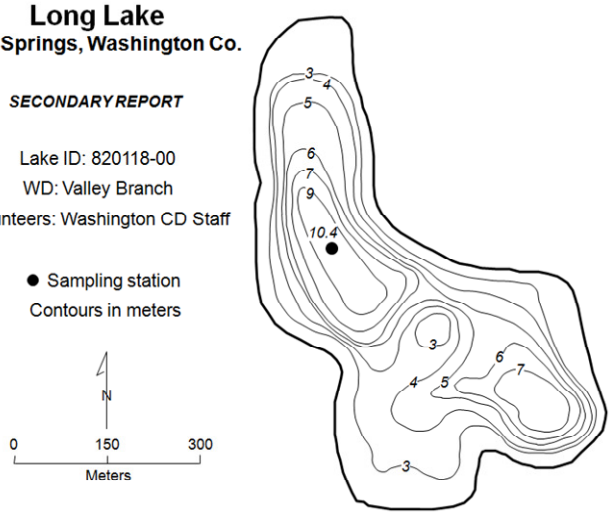
Lake ID: 820118-00

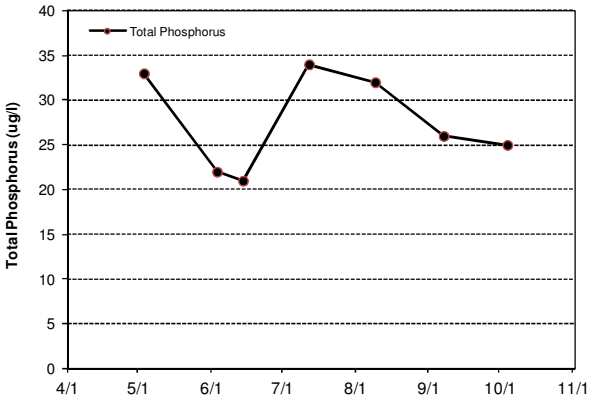
WD: Valley Branch

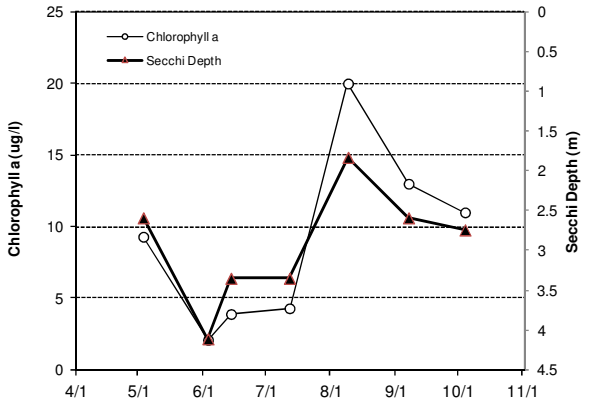
Volunteers: Washington CD Staff

● Sampling station

Contours in meters

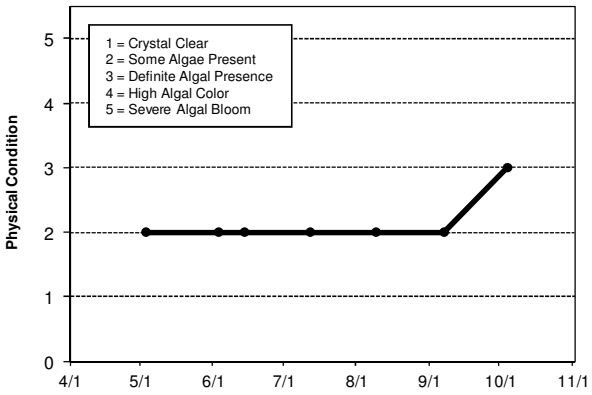






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/3/2011	7.5	4.1	11.1	0.1	9.3	33		2.59	2	2
6/3/2011	18.8	4.3	7.2	0.1	2.1	22		4.11	2	2
6/14/2011	20.4	4.9	8.9	0	3.9	21		3.35	2	2
7/12/2011	27.1	7.1	6.5	0.1	4.3	34		3.35	2	2
8/9/2011	26.1	6.8	7.4	0	20	32		1.83	2	3
9/7/2011	23.5	9.3	7.9	0.1	13	26		2.59	2	3
10/4/2011	15.8	6.9	8.9	0	11	25		2.74	3	3

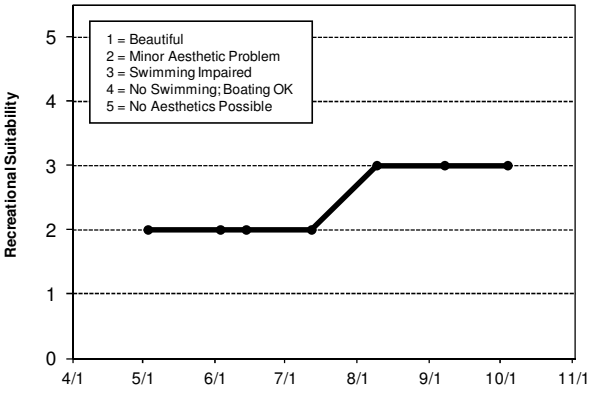


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	C	C	B	B	A		B
Chlorophyll a	B	B	C	A	A	A		A
Secchi Depth	C	C	C	B	B	A		B
Lake Grade	**C**	**C**	**C**	**B**	**B**	**A**		**B**



Source: Metropolitan Council and STORET data

Long Lake [Mahtomedi] (82-0130) *Rice Creek Watershed District*

Long Lake is located within the City of Mahtomedi (Washington County). It has a surface area of 48 acres and a maximum depth of 7.7 m (25 feet). The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

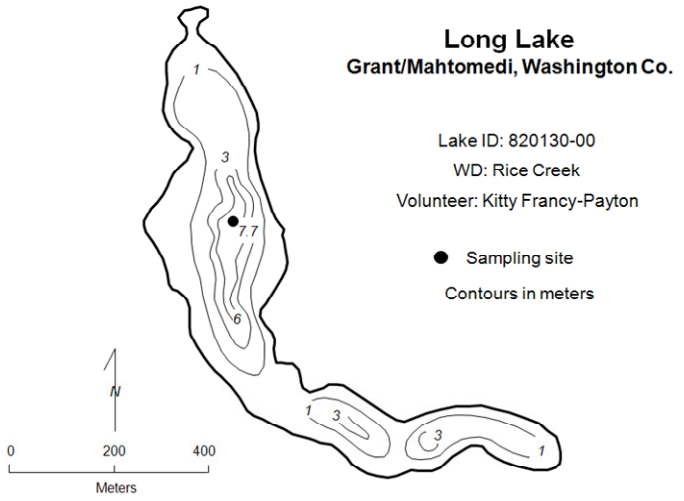
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	28.4	22.0	40.0	B
CLA (µg/l)	4.9	1.2	9.5	A
Secchi (m)	2.2	1.8	2.9	B
TKN (mg/l)	0.66	0.49	0.75	
			Lake Grade	B

The lake received a lake grade of B for 2011, which is consistent with its historical database. The lake grades for the past 9 years have varied between B's and A's. Additional years of monitoring are suggested to continue to build the water quality database so as to increase statistical power in determining potential water quality trends.

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

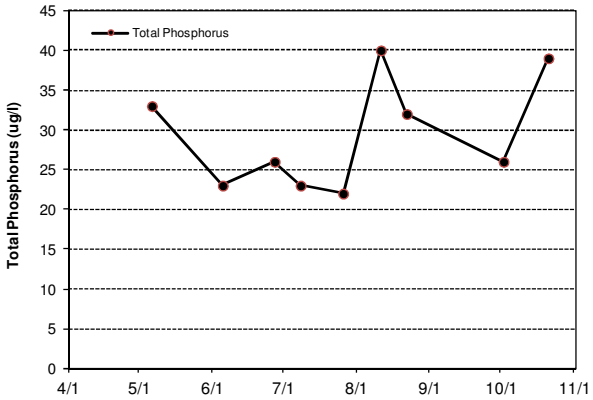
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake in 2005. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

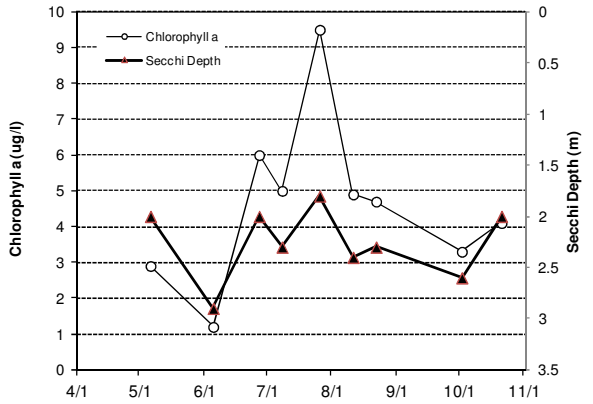
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

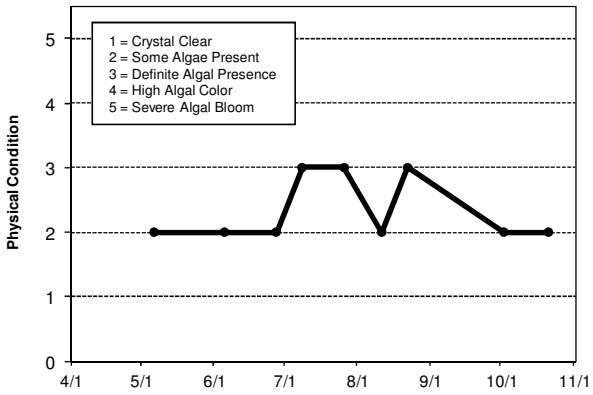


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/6/2011	12.5				2.9	33		2	2	2
6/5/2011	23.1				1.2	23		2.9	2	2
6/27/2011	21.1				6	26		2	2	5
7/8/2011	26.9				5	23		2.3	3	4
7/26/2011	26.3				9.5	22		1.8	3	3
8/11/2011	24.4				4.9	40		2.4	2	2
8/22/2011	24.5				4.7	32		2.3	3	3
10/2/2011	14.3				3.3	26		2.6	2	2
10/21/2011	10.1				4.1	39		2	2	3







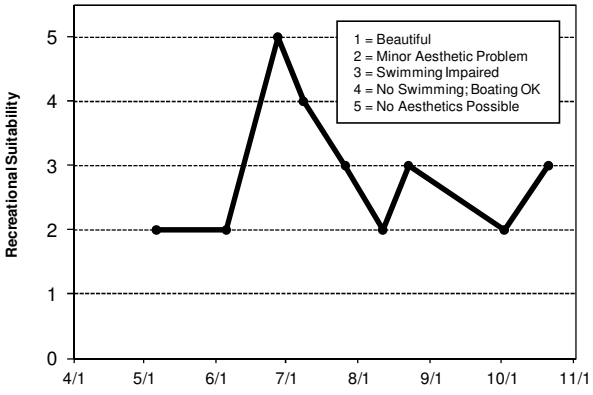
Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	A	C	B	C	A	A	A	B
Chlorophyll a	A	A	A	A	A	A	A	A
Secchi Depth	B	B	B	B	B	A	A	B
Lake Grade	**A**	**B**	**B**	**B**	**A**	**A**	**A**	**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 entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)				
CLA (µg/l)				
Secchi (m)				
TKN (mg/l)				
			Lake Grade	

The lake was monitored only once during 2011 via the CAMP. A lake grade was not assigned because of the lack of sufficient data and the sole monitoring event did not occur during the summer time period.

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

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

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

Loon Lake
Stillwater Twp., Washington Co.

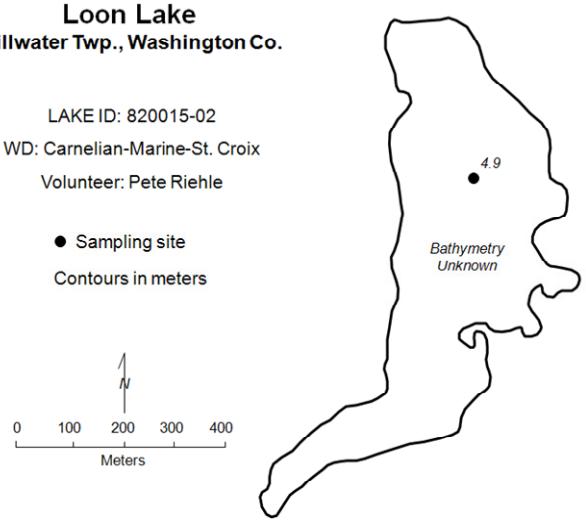
LAKE ID: 820015-02

WD: Carnelian-Marine-St. Croix

Volunteer: Pete Riehle

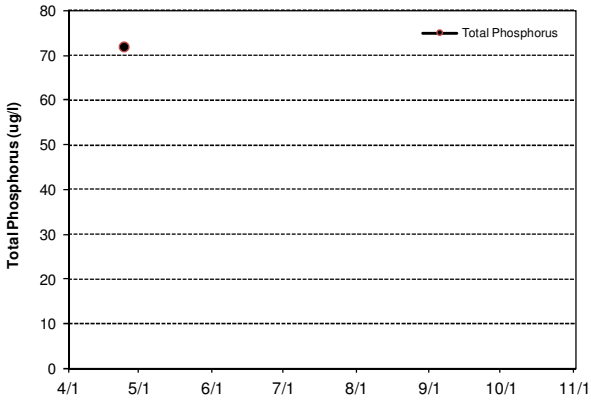
● Sampling site

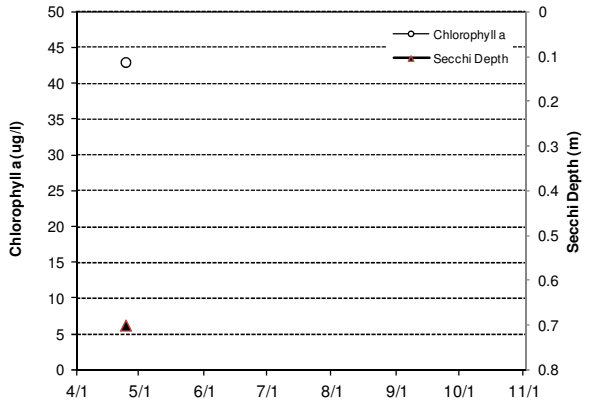
Contours in meters

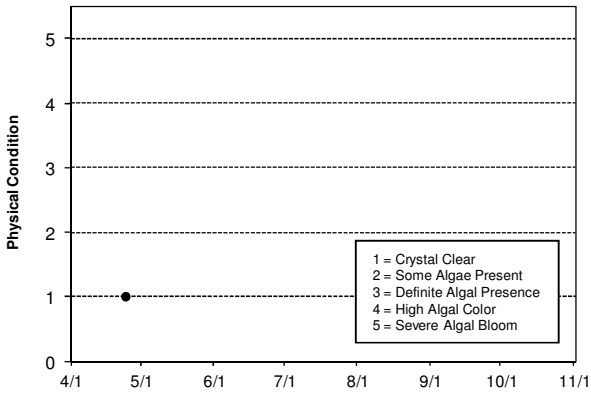


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	10.6				43	72		0.7	1	2





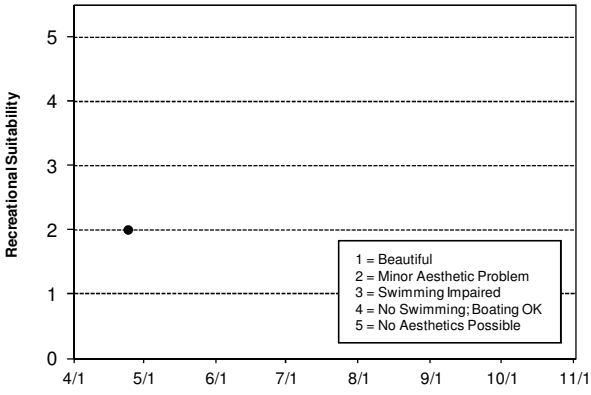


Lake Water Quality Grades Based on Summertime Averages

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					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	2009	2010	2011
Total Phosphorus	D	D	F	D	D	F	D	
Chlorophyll a	F	F	F	F	F	F	F	
Secchi Depth	F	F	F	F	F	F	F	
Lake Grade	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**NA**



Source: Metropolitan Council and STORET data

Lotus Lake (10-0006) *City of Chanhassen*

Lotus Lake is located within the City of Chanhassen (Carver County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a surface area of 246 acres. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	40.8	24.0	70.0	C
CLA (µg/l)	23.8	4.6	53.0	C
Secchi (m)	1.8	0.8	2.8	C
TKN (mg/l)	3.50	0.88	11.00	
			Lake Grade	C

The lake received a lake grade of C for 2011, which is consistent with previous years of lake grades, except for the D lake grade received in 2003. On the basis of the historical water quality database, the water quality of this lake appears well represented by a lake grade of C.

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

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

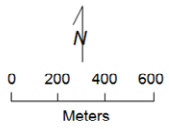
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lotus Lake
Chanhassen, Carver Co.

Lake ID: 100006-00
WD: Riley-Purgatory-Bluff Creek
Volunteers: Laurie Susla &
City of Chanhassen Staff

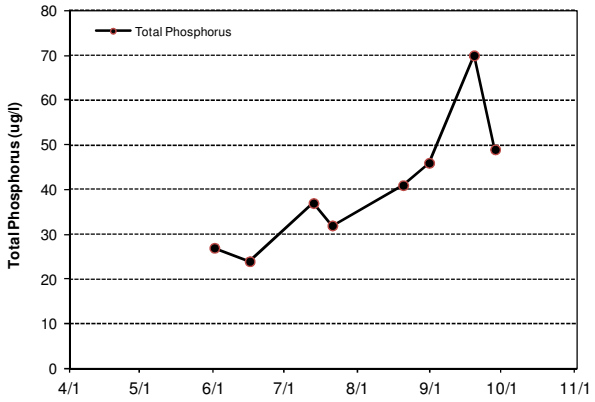
● Sampling site

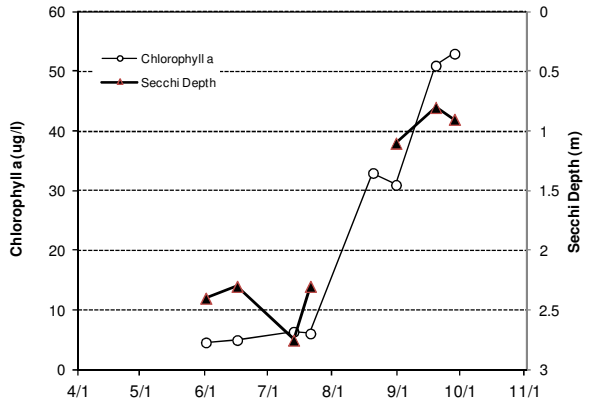
Contours in meters

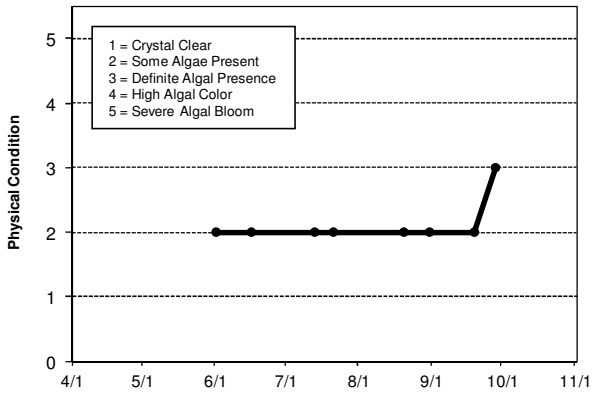


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/1/2011	18.8				4.6	27		2.4	2	1
6/16/2011	22.2				5	24		2.3	2	1
7/13/2011	26.9				6.4	37		2.75	2	2
7/21/2011	29.7				6.1	32		2.3	2	2
8/20/2011	25.7				33	41			2	2
8/31/2011	24.3				31	46		1.1	2	2
9/19/2011	20.7				51	70		0.8	2	2
9/28/2011	20.1				53	49		0.9	3	2





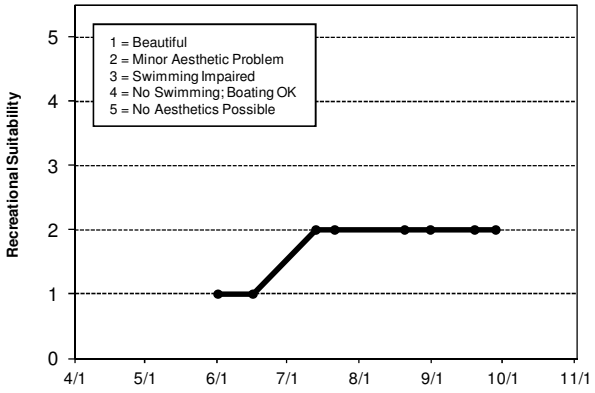


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus						C						
Chlorophyll a						C					C	
Secchi Depth	D					C			D	C	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	2009	2010	2011
Total Phosphorus	C	C	C	C	C	C	B	C
Chlorophyll a	C	C	C	C	C	B	C	C
Secchi Depth	C	C	C	C	C	C	C	C
Lake Grade	**C**	**C**	**C**	**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 48 acres. It has a maximum and mean depth of the lake are 3.7 m (12 ft) and 1.8 m (6 ft), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	112.0	66.0	165.0	D
CLA (µg/l)	27.0	5.1	99.0	C
Secchi (m)	2.0	1.2	2.4	C
TKN (mg/l)	1.42	1.20	1.80	
			Lake Grade	C

The lake received a lake grade of C for 2011. The historical water quality database shows that the annual lake grades have varied from Cs to Ds.

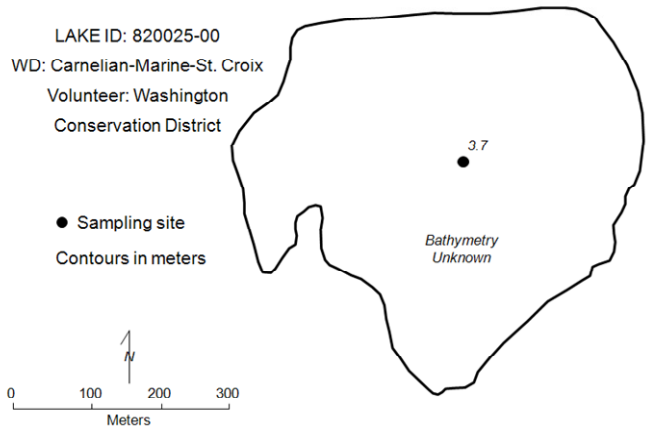
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

Lake Louise

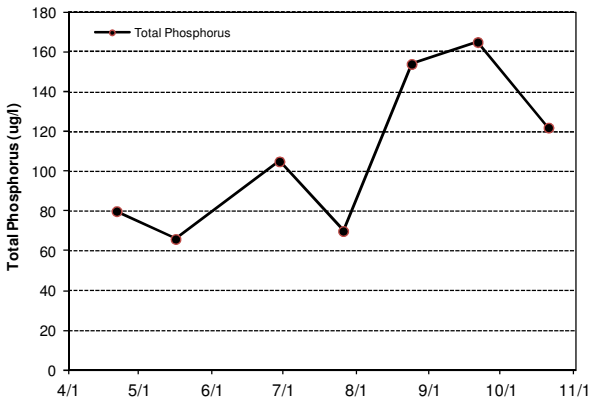
Stillwater Twp., Washington Co.

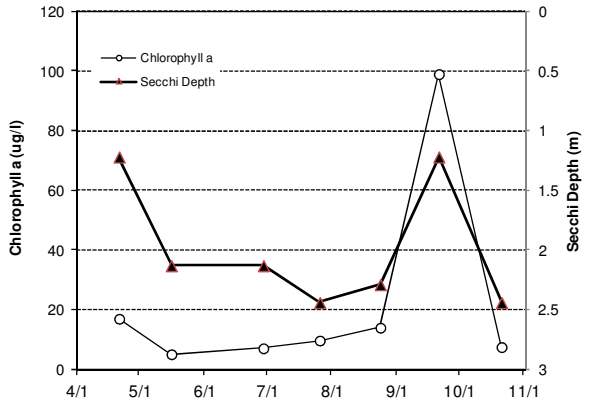
LAKE ID: 820025-00
WD: Carnelian-Marine-St. Croix
Volunteer: Washington
Conservation District

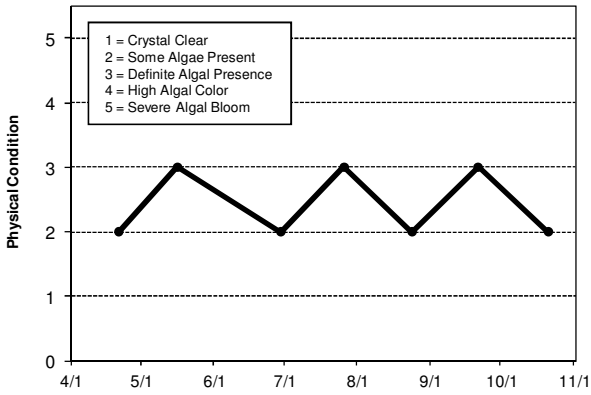


2011 Data

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 (1-5)	RS (1-5)
4/21/2011	7.7	7.6	12.7	0.1	17	80		1.22	2	3
5/16/2011	13.8	13.4	10.5	0.6	5.1	66		2.13	3	3
6/29/2011	23.5	19	10.6	0.1	7.1	105		2.13	2	4
7/26/2011	26	22.3	5.5	0.1	9.7	70		2.44	3	4
8/24/2011	24.9	22.5	5.4	0.1	14	154		2.29	2	3
9/21/2011	15.8	15.9	9.1	0.1	99	165		1.22	3	4
10/21/2011	8.6	8.1	9	8	7.5	122		2.44	2	3







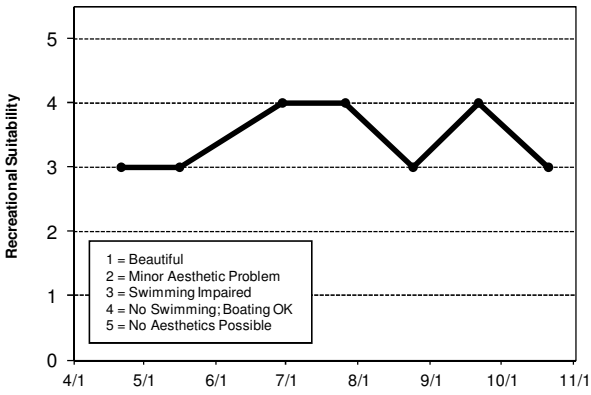
Lake Water Quality Grades Based on Summertime Averages

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	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	2009	2010	2011
Total Phosphorus					D	F	D	D
Chlorophyll a					C	F	C	C
Secchi Depth	C	D	D	D	D	C	D	C
Lake Grade				**D**	**D**	**D**	**D**	**C**

Source: Metropolitan Council and STORET data



Lucy Lake (10-0007) *City of Chanhassen*

Lucy Lake is located within the City of Chanhassen (Carver County). It has a surface area of 87 acres and a maximum depth of 6.4 m (21 ft). Ninety nine percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	42.5	19.0	91.0	C
CLA (µg/l)	15.7	3.0	34.0	B
Secchi (m)	2.0	0.8	4.5	C
TKN (mg/l)	1.26	0.97	1.60	
			Lake Grade	C

The lake received a lake grade of C for 2011. Further monitoring is suggested to continue to build the water quality database for this lake.

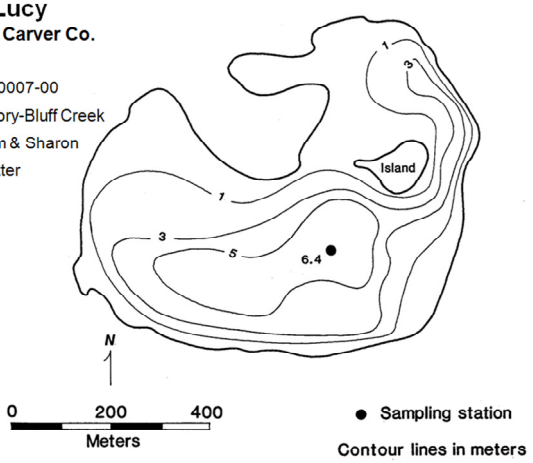
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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 Lucy
Chanhassen, Carver Co.

Lake ID: 100007-00
WD: Riley-Purgatory-Bluff Creek
Volunteers: Tim & Sharon McCotter



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	9.1				23	58		1.5		2
5/7/2011	15				6.7	47		1.4		2
5/30/2011	17.7				5.3	45		4.5	2	2
6/5/2011	25.2				9.8	34		2.3	3	2
6/19/2011	22.9				3	20		3.9	2	1
7/4/2011	28.3				4.2	19		2.7	2	1
7/17/2011	28				9.9	30		1.7	2	1
7/31/2011	31.1				26	40		1.2	3	2
8/21/2011	25.6				34	41		0.9	2	2
9/6/2011	22.6				29	58		0.8	2	2
9/20/2011	17.4				29	91		0.9	2	2
10/9/2011	19.2				10	79		1.6	2	2
10/23/2011	10.8					86		1.9	1	1

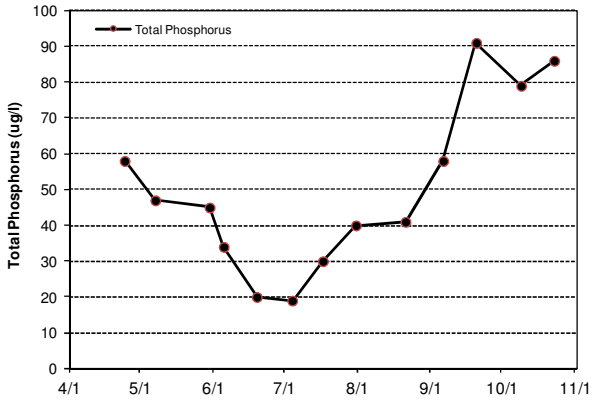
Lake Water Quality Grades Based on Summertime Averages

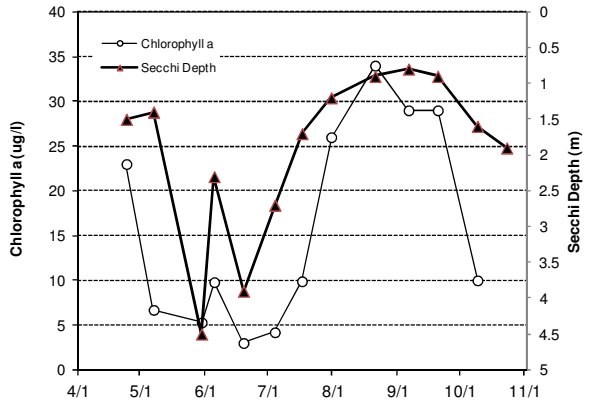
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus						C						
Chlorophyll a						C						
Secchi Depth						C					C	C
Lake Grade						**C**						

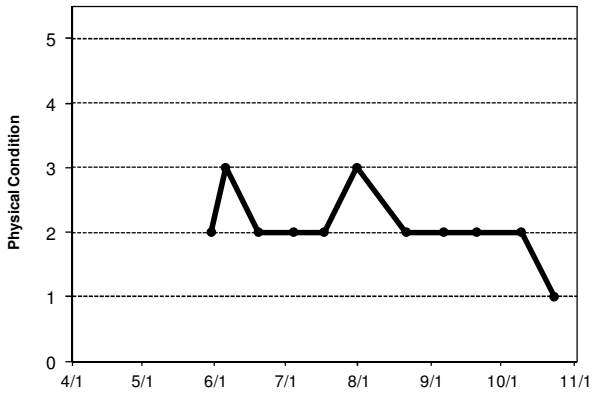
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth	C	C	C	C	C	C	D	C	C	C	C	C
Lake Grade												

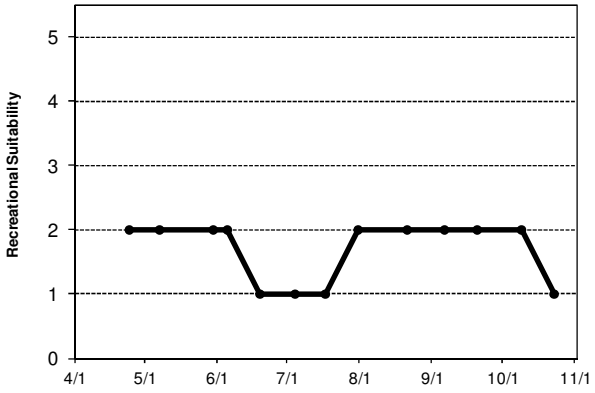
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus						C	C	C
Chlorophyll a						C	C	B
Secchi Depth	D	D	C	C	D	C	C	C
Lake Grade						**C**	**C**	**C**

Source: Metropolitan Council and STORET data









Lynch Lake [Site 1, north basin] (82-0042) *Browns Creek Watershed District*

Lynch Lake is located in Washington County. It has a surface area of 43 acres. The depth of the lake at the north basin site was approximately 0 – 2 m. There are few known morphological data available for the lake. Note that some previous Annual lake reports (2006 – 2009) erroneously placed site #1 in the south basin. The monitoring actually took place in the north basin during the 2006 – 2009 monitoring seasons.

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

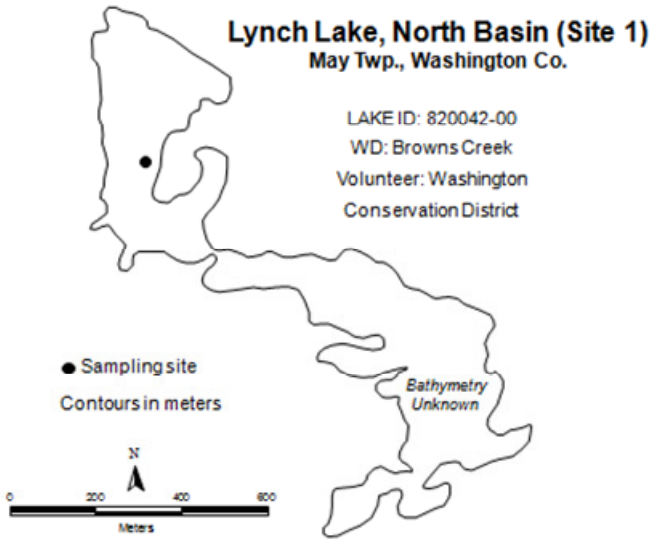
2011 summer (May-September) data summary

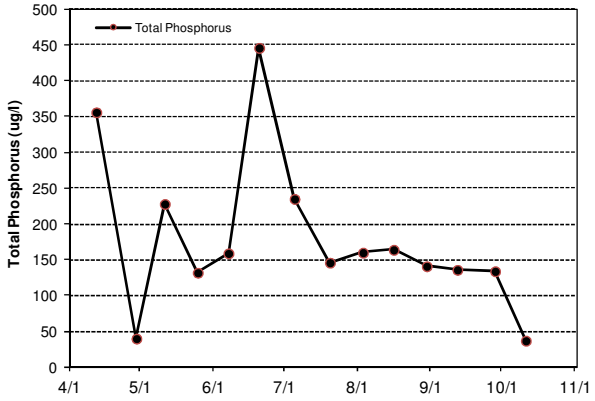
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	189.2	132.0	446.0	F
CLA (µg/l)	69.0	14.0	170.0	D
Secchi (m)	0.5	0.3	0.9	F
TKN (mg/l)	2.73	2.20	4.60	
			Lake Grade	F

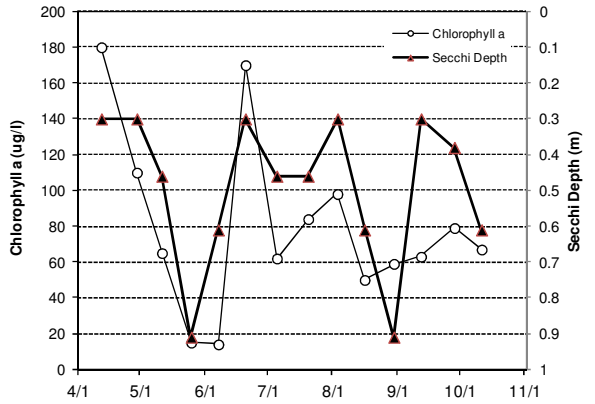
The north basin received a lake grade of F for 2011. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

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

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

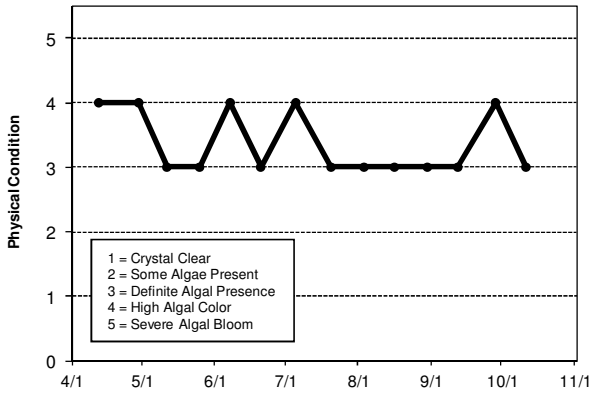






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/12/2011	14.4	12.1	13.6	0.2	180	356		0.3	4	5
4/29/2011	12.6	7.9	14.1	0	110	40		0.3	4	5
5/11/2011	17.9	16.3	9.8	0.2	65	228		0.46	3	4
5/25/2011	18.2	18.2	5.6	0.2	15	132		0.91	3	4
6/7/2011	26.5	21.7	9.5	0.1	14	159		0.61	4	5
6/20/2011	21.6	21.3	7.4	0.1	170	446		0.3	3	4
7/5/2011	27.4	25.2	8.4	0.1	62	235		0.46	4	5
7/20/2011	28.9	25.2	6.8	0.1	84	146		0.46	3	4
8/3/2011	24.6	24.6	5.5	0.1	98	160		0.3	3	4
8/16/2011	26	26	10.6	10.3	50	164		0.61	3	4
8/30/2011	23.3	22.9	8.8	0.1	59	141		0.91	3	4
9/12/2011	23.2	22.2	10	0.2	63	136		0.3	3	4
9/28/2011	15.6	14.9	9	2.5	79	134		0.38	4	4
10/11/2011	18.6	18.3	10.5	0.2	67	37		0.61	3	4

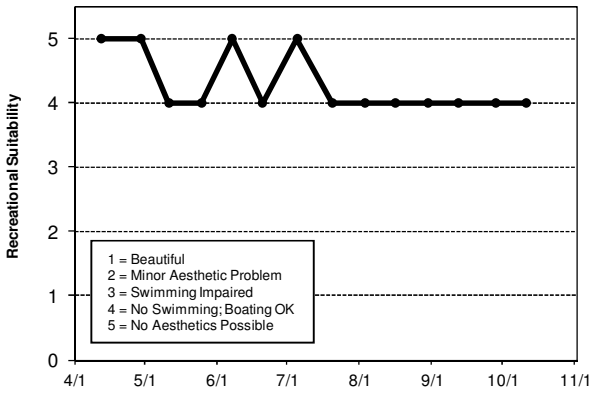


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			F	F	F	F	F	F
Chlorophyll a			F	F	F	F	F	D
Secchi Depth			F	F	F	F	F	F
Lake Grade			**F**	**F**	**F**	**F**	**F**	**F**



Source: Metropolitan Council and STORET data

Lynch Lake [Site 2, south basin] (82-0042) *Browns Creek Watershed District*

Lynch Lake is located in Washington County. It has a surface area of 43 acres. The depth of the lake at the south site was approximately 5 to 6 m.There are little known morphological data available for the lake.

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

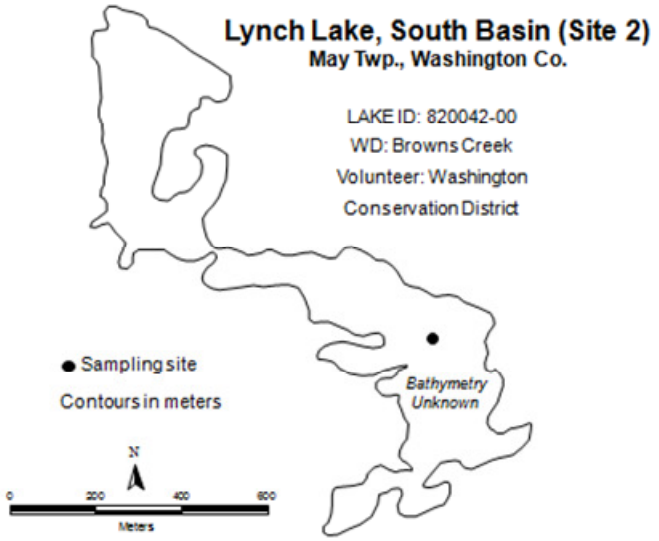
2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	86.1	44.0	170.0	D
CLA (µg/l)	65.5	19.0	200.0	D
Secchi (m)	1.1	0.8	1.8	D
TKN (mg/l)	1.89	1.20	3.40	
			Lake Grade	D

This was the second year that site #2 was monitored via the CAMP. The south site received a lake grade of D for 2011. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

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

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



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/12/2011	9.9	7.2	9.3	0.1	54	110		0.76	2	3
4/29/2011	8.6	7.9	13.2	0	180	420		0.61	3	2
5/11/2011	16.6	9.7	10.9	0.2	130	170		0.76	3	3
5/25/2011	18.3	11.1	7.6	0	50	86		1.07	3	3
6/7/2011	24.7	15	8.2	0	20	56		1.83	2	2
6/24/2011	19.3	18.7	6.5	5.8	58	108		0.76	3	3
7/6/2011	26.7	17.9	7.4	0	28	64		0.91	3	4
7/20/2011	29	17.7	7	0.1	44	86		1.22	3	3
8/3/2011	25.7	18.5	4.6	0.1	52	75		0.91	3	3
8/18/2011	24.6	17.3	6.6	0	69	96		1.07	2	3
8/30/2011	23.8	18.7	8.1	0	200	98		1.07	2	3
9/13/2011	21.9	19.1	5.5	0.1	19	44		1.68	2	3
9/28/2011	15.5	14.7	9.6	0.3	51	64		1.07	3	4
10/11/2011	17.9	15.8	9	0.1	46	67		1.07	3	3

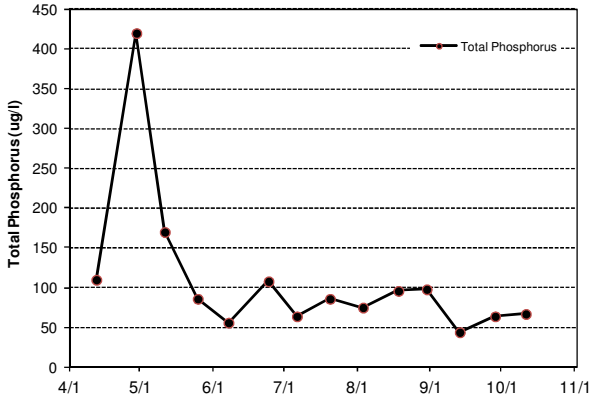
Lake Water Quality Grades Based on Summertime Averages

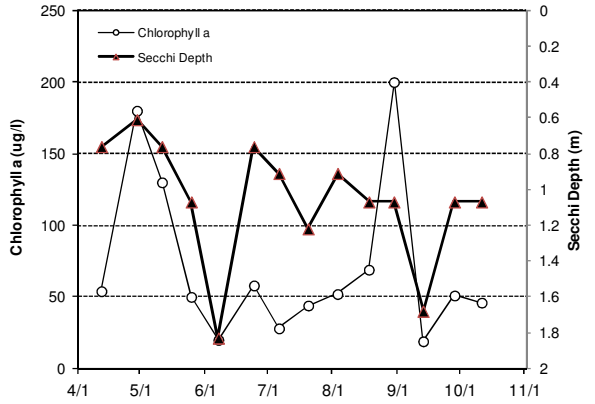
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

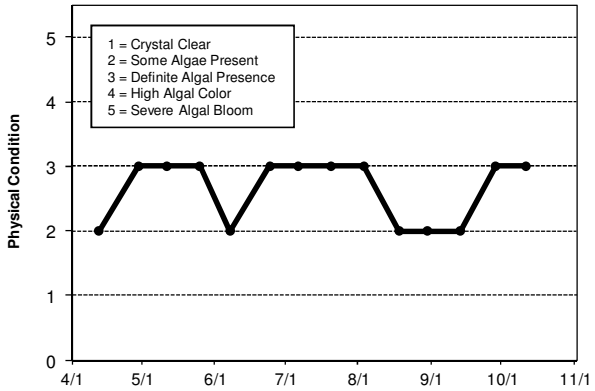
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

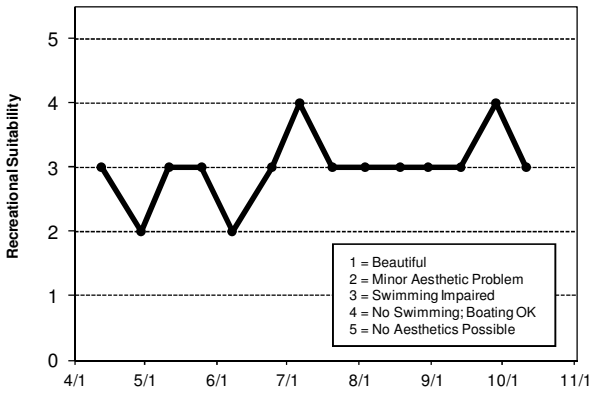
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus							D	D
Chlorophyll a							F	D
Secchi Depth							F	D
Lake Grade							**F**	**D**

Source: Metropolitan Council and STORET data









Marion Lake (19-0026) *City of Lakeville*

Marion Lake is located in the City of Lakeville (Dakota County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a surface area of approximately 560 acres, and has a maximum depth of 6.4 m (21 feet). The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*). The lake gets heavy use by area fishermen and other lake users during the winter and summer months.

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

2011 summer (May-September) data summary

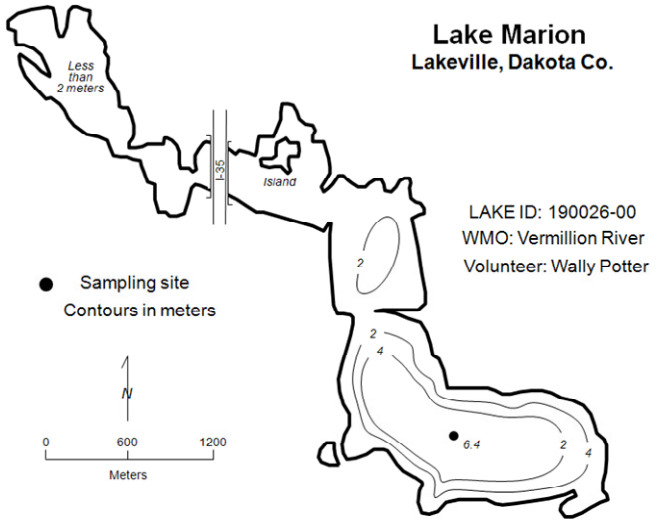
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	29.5	14.0	47.0	B
CLA (µg/l)	17.3	3.5	45.0	B
Secchi (m)	2.1	1.0	3.0	C
TKN (mg/l)	0.95	0.68	1.40	
			Lake Grade	B

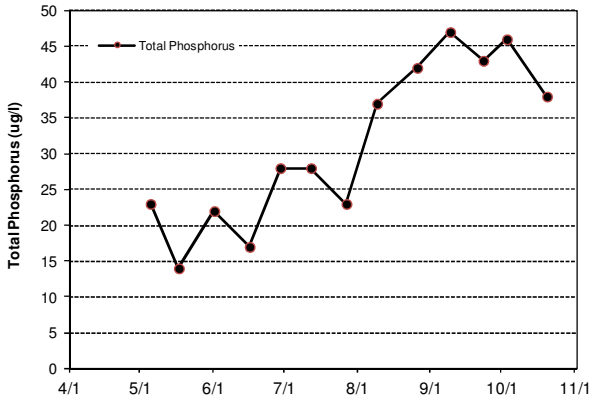
The lake received a lake grade of B for 2011. On the basis of the historical water quality database, the surface water quality of the lake has varied from Bs to a D, with Cs being most common. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

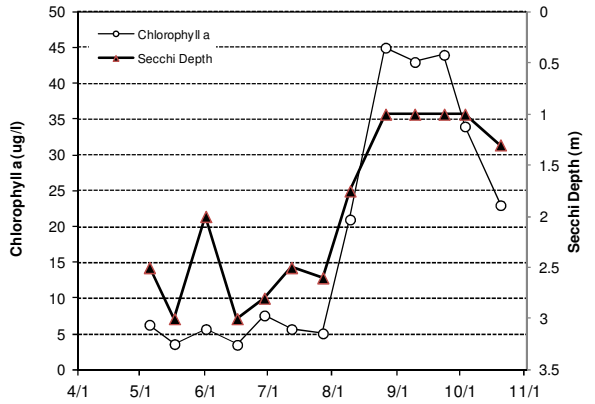
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

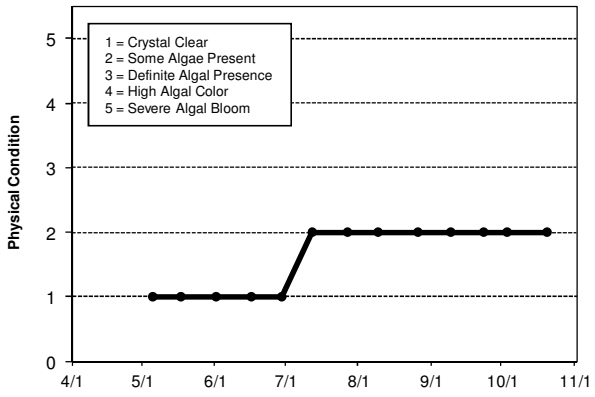
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

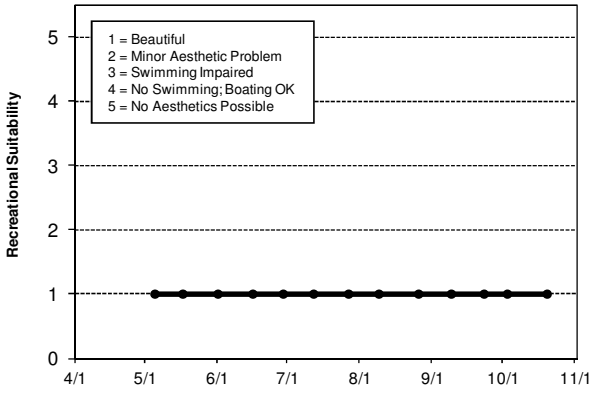
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/5/2011	9				6.3	23		2.5	1	1
5/17/2011	14.6				3.6	14		3	1	1
6/1/2011	18.8				5.7	22		2	1	1
6/16/2011	20.8				3.5	17		3	1	1
6/29/2011	22.8				7.6	28		2.8	1	1
7/12/2011	27.3				5.7	28		2.5	2	1
7/27/2011	28.1				5.1	23		2.6	2	1
8/9/2011	27.4				21	37		1.75	2	1
8/26/2011	24.9				45	42		1	2	1
9/9/2011	24.3				43	47		1	2	1
9/23/2011	17.5				44	43		1	2	1
10/3/2011	16.6				34	46		1	2	1
10/20/2011	11.2				23	38		1.3	2	1

Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	C	C		C				C		C		
Chlorophyll a	C	D		C				C		C		
Secchi Depth	C	D		B				C		C	C	C
Lake Grade	**C**	**D**		**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	2009	2010	2011
Total Phosphorus	C	C	C	C	C	C	C	B
Chlorophyll a	C	C	C	C	C	C	C	B
Secchi Depth	C	C	C	C	B	C	C	C
Lake Grade	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**B**

Source: Metropolitan Council and STORET data

Markgrafs Lake (82-0089) *City of Woodbury*

Markgrafs Lake is located within the City of Woodbury (Washington County). It has a surface area of approximately 46 acres, and a maximum depth of 2.4 m (8 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has a piped outlet on the southern end. Downstream from the outlet is a valve that can direct the overflow to either Powers or Wilmes lakes. The lake is used by the MDNR Fisheries as a rearing pond for walleyes.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	120.9	77.0	182.0	D
CLA (µg/l)	48.4	21.0	100.0	D
Secchi (m)	0.5	0.4	0.6	F
TKN (mg/l)	1.88	1.40	2.30	
			Lake Grade	D

The lake received a lake grade of D for 2011. Over the past decade, the lake grades have varied back and forth in the D and F range.

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

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

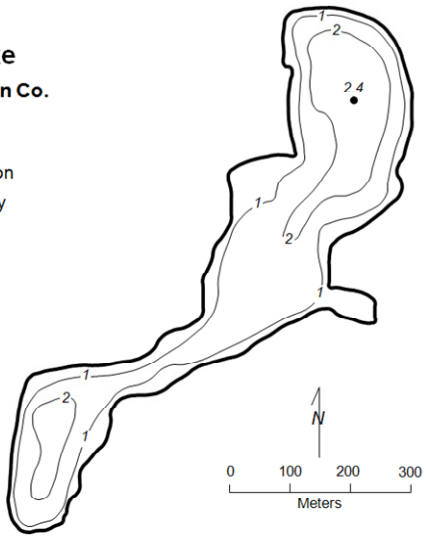
Markgrafs Lake

Woodbury, Washington Co.

Lake ID: 820089-00
WD: South Washington
Volunteer: Terry Riley

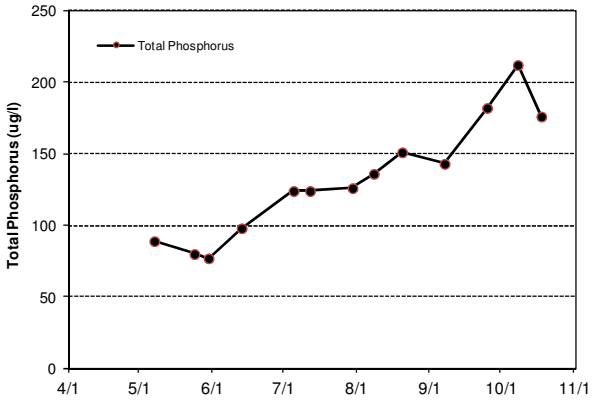
- Sampling site

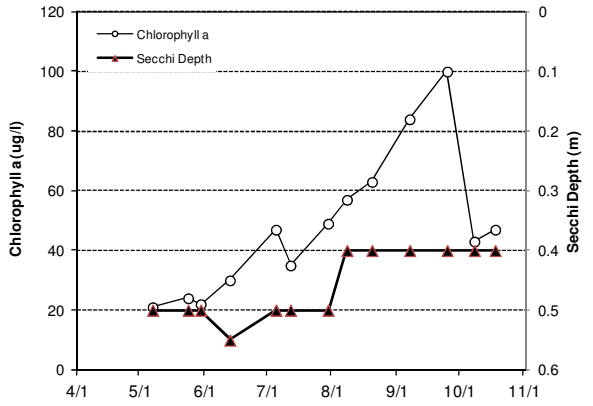
Contours in meters

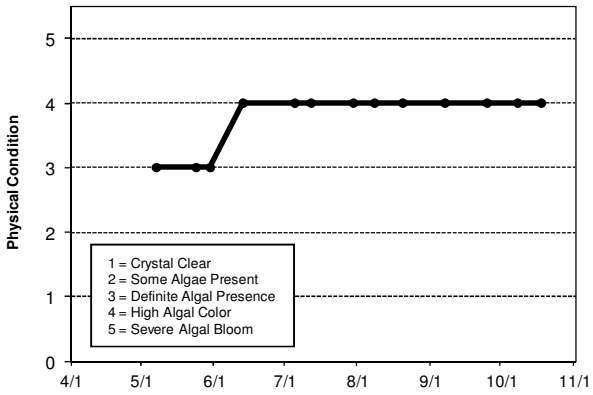


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/7/2011	14.9				21	89		0.5	3	4
5/24/2011	16.1				24	80		0.5	3	4
5/30/2011	17.9				22	77		0.5	3	4
6/13/2011	20.9				30	98		0.55	4	4
7/5/2011	28.3				47	124		0.5	4	4
7/12/2011	29.7				35	124		0.5	4	4
7/30/2011	28.3				49	126		0.5	4	4
8/8/2011	28.7				57	136		0.4	4	4
8/20/2011	26.5				63	151		0.4	4	4
9/7/2011	23.7				84	143		0.4	4	4
9/25/2011	18.2				100	182		0.4	4	4
10/8/2011	17.1				43	212		0.4	4	4
10/18/2011	16.5				47	176		0.4	4	4





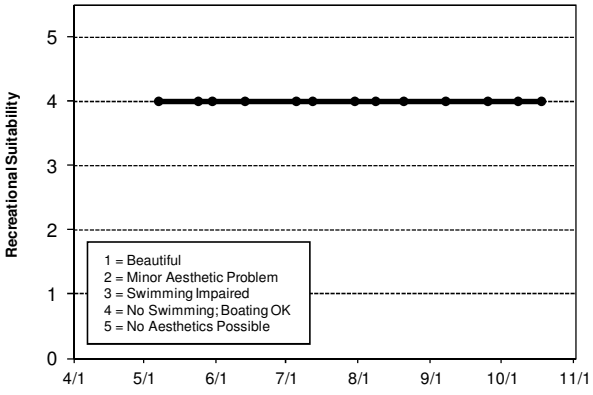


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	D	D	F	D	D	F	F	D
Chlorophyll a	D	C	D	D	D	F	F	D
Secchi Depth	F	F	F	F	F	F	F	F
Lake Grade	**D**	**D**	**F**	**D**	**D**	**F**	**F**	**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.

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

2011 summer (May-September) data summary

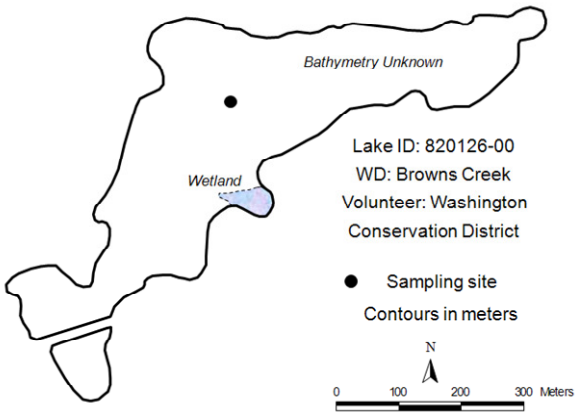
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	47.7	30.0	84.0	C
CLA (µg/l)	10.8	5.2	23.0	B
Secchi (m)	2.2	1.8	2.4	C
TKN (mg/l)	0.87	0.70	1.10	
			Lake Grade	C

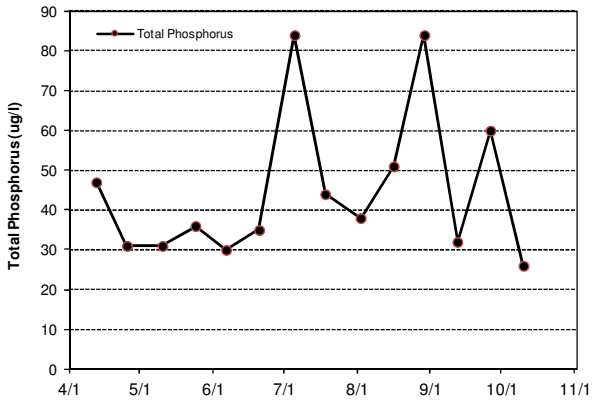
The lake received a lake grade of C for 2011, which is similar to the lake grades received in previous years. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

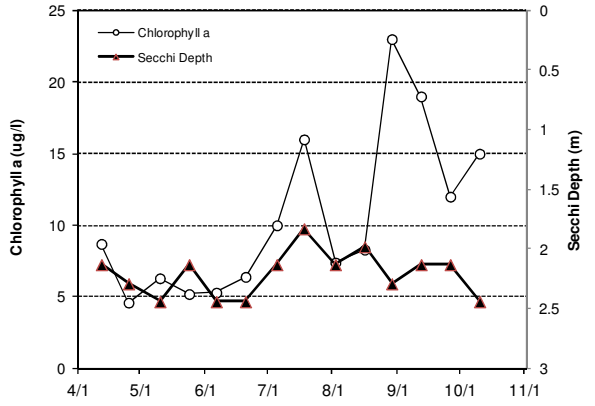
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

Masterman Lake
Grant, Washington Co.

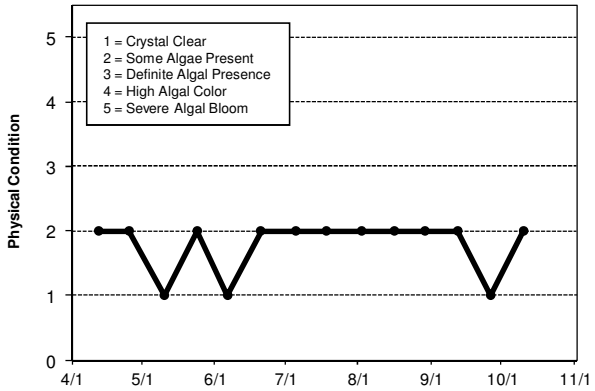






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/12/2011	9.2	4.4	11.4	8.1	8.7	47		2.13	2	3
4/25/2011	11.1	9.6	11.8	7.2	4.6	31		2.29	2	2
5/10/2011	14.9	14	9.9	3.2	6.3	31		2.44	1	1
5/24/2011	19.8	18.5	8.4	6.6	5.2	36		2.13	2	2
6/6/2011	28.3	21.1	7.3	2.8	5.3	30		2.44	1	2
6/20/2011	22.3	21	7.3	0.6	6.4	35		2.44	2	2
7/5/2011	28.9	23.1	8.3	0.5	10	84		2.13	2	2
7/18/2011	28.2	24.1	7.1	0.2	16	44		1.83	2	3
8/2/2011	27	25.7	3.9	0.2	7.4	38		2.13	2	2
8/16/2011	25.2	24.5	6.6	1.2	8.3	51		1.98	2	3
8/29/2011	24.2	23.9	6.3	0.8	23	84		2.29	2	3
9/12/2011	23.7	21.9	8.6	0.4	19	32		2.13	2	2
9/26/2011	15.1	14.8	7.8	1.9	12	60		2.13	1	1
10/10/2011	18.6	16.8	8.2	0.4	15	26		2.44	2	2

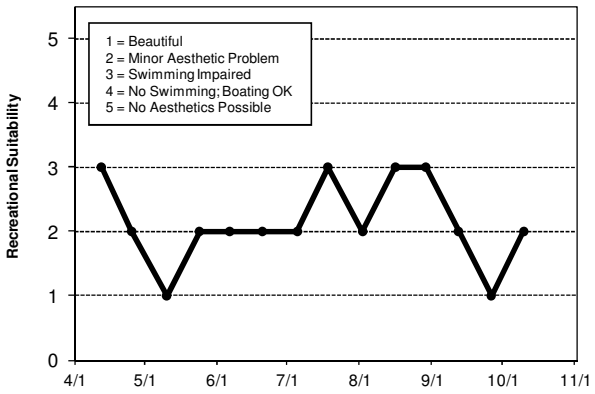


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			C	C	C	C	C	C
Chlorophyll a			B	B	B	B	C	B
Secchi Depth			C	C	C	C	C	C
Lake Grade			**C**	**C**	**C**	**C**	**C**	**C**



Source: Metropolitan Council and STORET data

Mays Lake (82-0033) *Carnelian-Marine Watershed District*

Mays Lake is located in Mays Township (Washington County). The lake has a surface area of 25 acres, and a maximum depth of 7.6 m (25 ft). Approximately 92 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance.

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

2011 summer (May-September) data summary

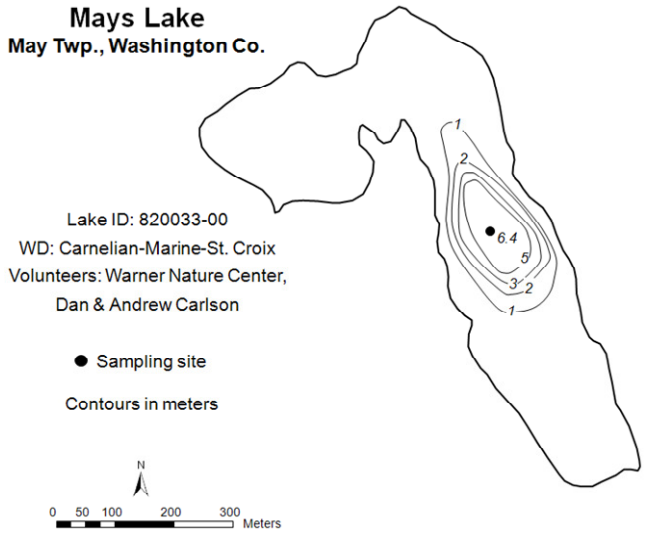
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)				
CLA (µg/l)				
Secchi (m)	6.3	5.5	7.1	A
TKN (mg/l)				
			Lake Grade	

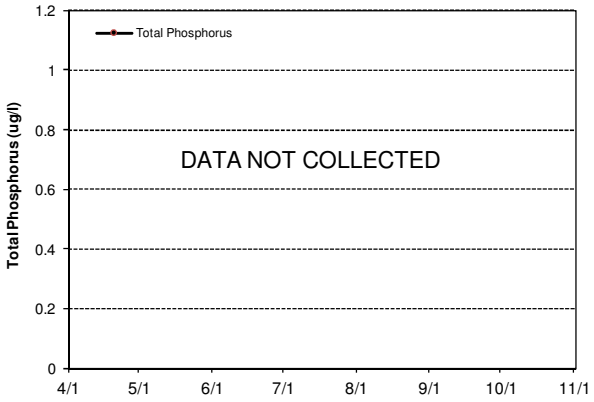
The lake received a Secchi grade of A for 2011. TP, TKN, and CLA were not monitored in 2011.

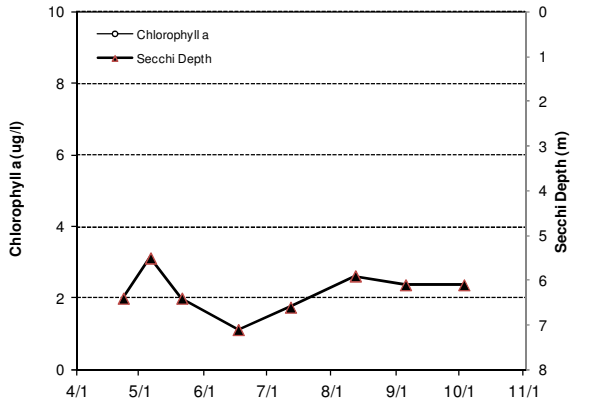
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

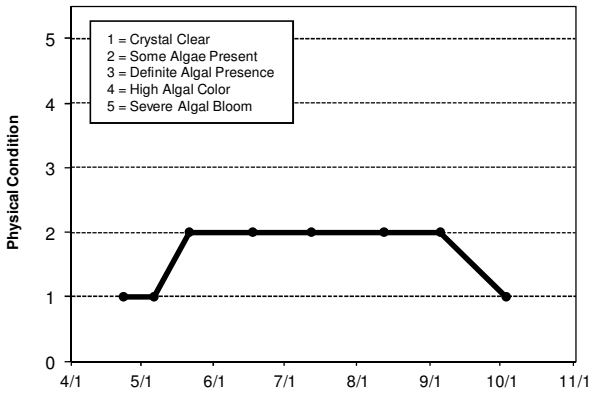






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/23/2011	6.9							6.4	1	1
5/6/2011	12.3							5.5	1	1
5/21/2011	17.9							6.4	2	1
6/17/2011	21.8							7.1	2	2
7/12/2011	28							6.6	2	1
8/12/2011	26							5.9	2	1
9/5/2011	24.2							6.1	2	2
10/3/2011	15							6.1	1	1

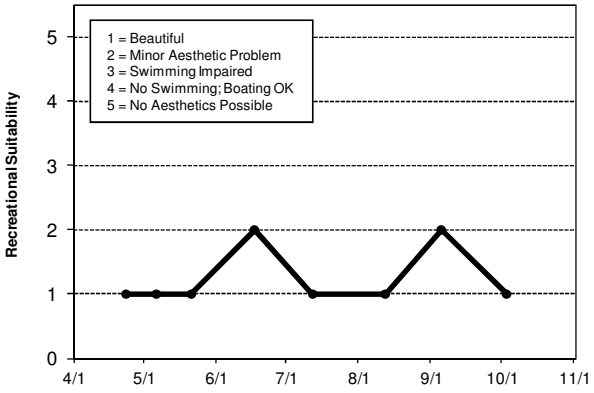


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus					A	A	A	
Chlorophyll a					A	A	A	
Secchi Depth					A	A	A	A
Lake Grade					**A**	**A**	**A**	**NA**



Source: Metropolitan Council and STORET data

McDonald Lake (82-0010) *Valley Branch Watershed District*

McDonald Lake is a 54-acre land-locked (no outlet) lake located within Baytown Township (Washington County). The mean and maximum depth of the lake is 1.8 m (nearly 6 feet) and 3.7 m (roughly 12 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	110.5	54.0	328.0	D
CLA (µg/l)	42.9	1.5	100.0	C
Secchi (m)	1.2	0.9	1.7	D
TKN (mg/l)	1.83	1.00	4.10	
			Lake Grade	D

The lake received a lake grade of D for 2011, which is worse than most of the years in its historical database. The lake's water quality has been typically represented by a lake grade of C, with some variation from year to year.

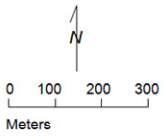
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

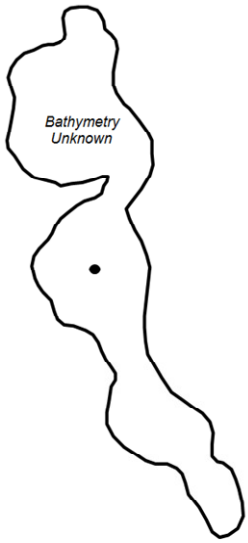
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

McDonald Lake
Baytown Twp., Washington Co.

Lake ID: 820010-00
WD: Valley Branch
Volunteers: Washington CD Staff

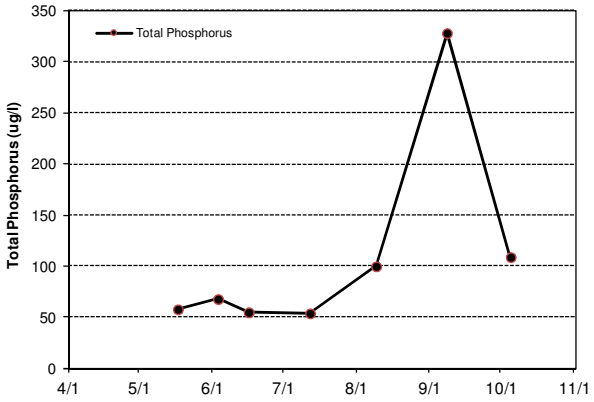
● Sampling site
Contours in meters

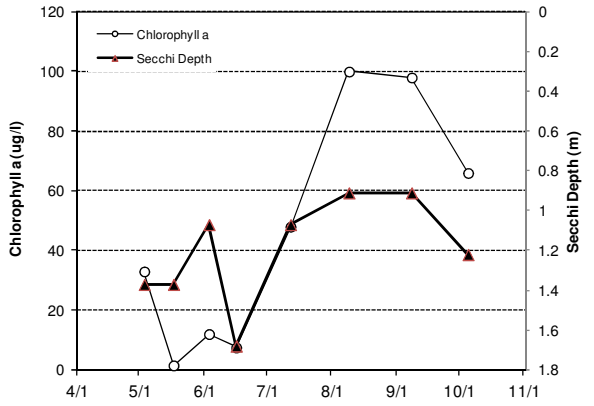


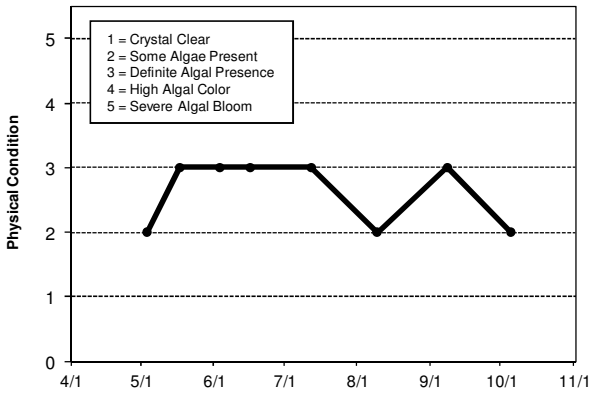


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/3/2011	8.2	7.9	10.9	0.2	33			1.37	2	2
5/17/2011	14.7	11	9.9	0.1	1.5	58		1.37	3	4
6/3/2011	20.2	13.3	8.3	0.1	12	68		1.07	3	3
6/16/2011	22.3	14.1	8.1	0.1	7.5	55		1.68	3	3
7/12/2011	26.7	16.7	9.3	0.1	48	54		1.07	3	4
8/9/2011	25.2	19.6	5	0	100	100		0.91	2	3
9/8/2011	20.9	17.6	5.3	0	98	328		0.91	3	4
10/5/2011	15.8	14.3	9.9	0.1	66	109		1.22	2	3





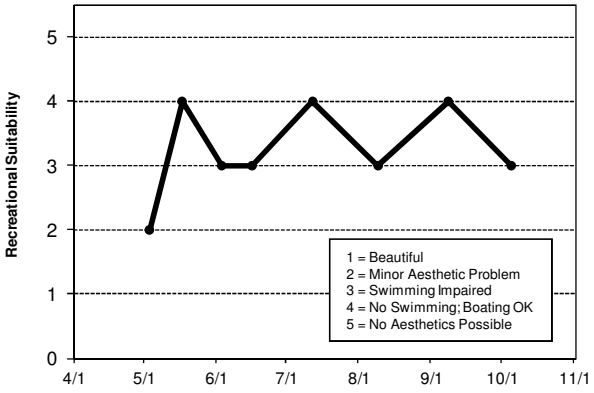


Lake Water Quality Grades Based on Summertime Averages

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
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	2009	2010	2011
Total Phosphorus	C	C	C	C	C	C		D
Chlorophyll a	B	B	C	F	C	B		C
Secchi Depth	B	C	C	C	C	C		D
Lake Grade	**B**	**C**	**C**	**D**	**C**	**C**		**D**



Source: Metropolitan Council and STORET data

McKnight Lake (10-0216) *Carver County Environmental Services*

McKnight Lake is a small lake located in Carver County. There is very little known morphological data available for the lake.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	170.8	77.0	381.0	F
CLA (µg/l)	67.5	19.0	130.0	D
Secchi (m)	0.6	0.3	0.9	F
TKN (mg/l)	1.97	1.10	3.00	
			Lake Grade	F

The lake received a lake grade of F for 2011, which is consistent with its historical water quality database. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

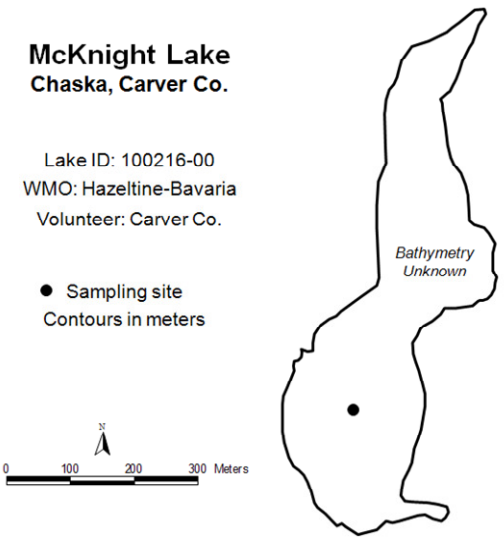
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

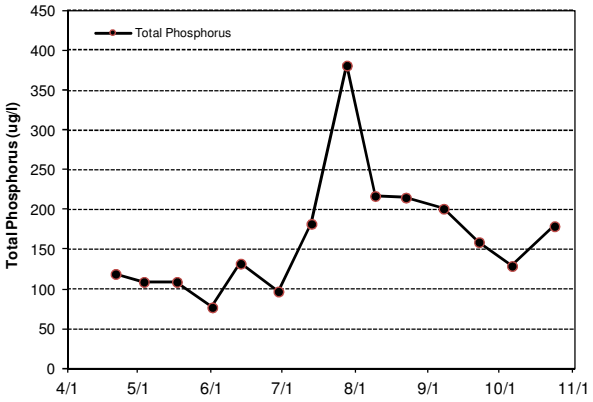
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

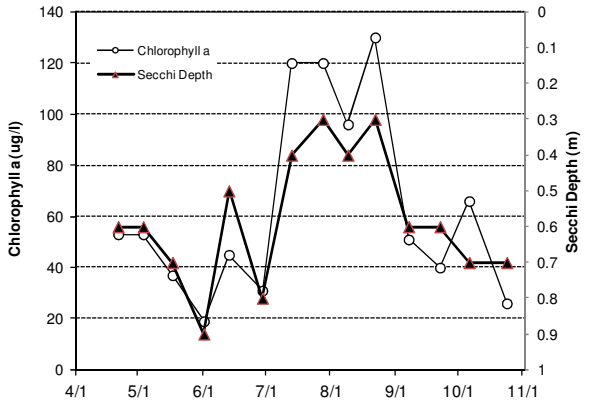
McKnight Lake
Chaska, Carver Co.

Lake ID: 100216-00
WMO: Hazeltine-Bavaria
Volunteer: Carver Co.

● Sampling site
Contours in meters

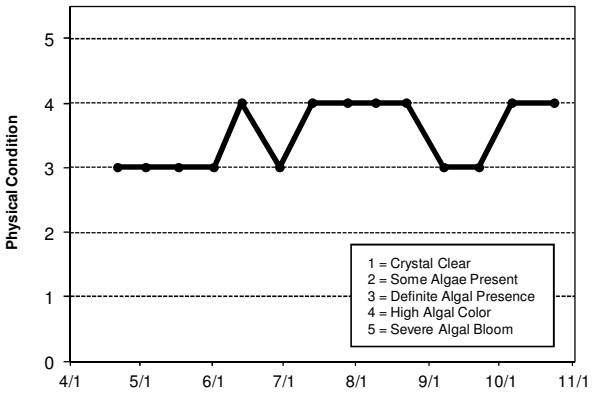






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	7.84		18.8		53	119		0.6	3	3
5/3/2011	9.93		20.7		53	109		0.6	3	3
5/17/2011	16.57		10.3		37	109		0.7	3	3
6/1/2011	22.23		10.6		19	77		0.9	3	3
6/13/2011	20.95		8.8		45	132		0.5	4	4
6/29/2011	24.36		15.5		31	97		0.8	3	3
7/13/2011	26.55		12.5		120	182		0.4	4	4
7/28/2011	28.24		8.9		120	381		0.3	4	3
8/9/2011	25.31		6.1		96	217		0.4	4	4
8/22/2011	25.82		9.7		130	215		0.3	4	4
9/7/2011	21.9		8.3		51	201		0.6	3	3
9/22/2011	15.64		9		40	159		0.6	3	3
10/6/2011	16.89		9.7		66	129		0.7	4	4
10/24/2011	9.5		6.3		26	179		0.7	4	4

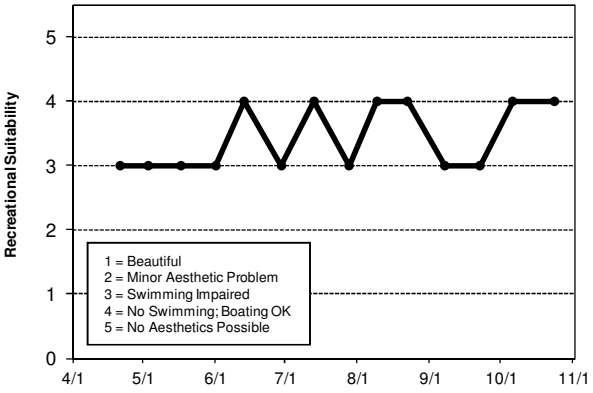


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			F		F	F	D	F
Chlorophyll a			D		F	F	F	D
Secchi Depth			F		F	F	F	F
Lake Grade			**F**		**F**	**F**	**F**	**F**



Source: Metropolitan Council and STORET data

McKusick Lake (82-0020) *Middle St. Croix Watershed Management Organization*

Lake McKusick is located in the City of Stillwater (Washington County). The lake has surface area of 46 acres, and a maximum depth of 4.7 m (15 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

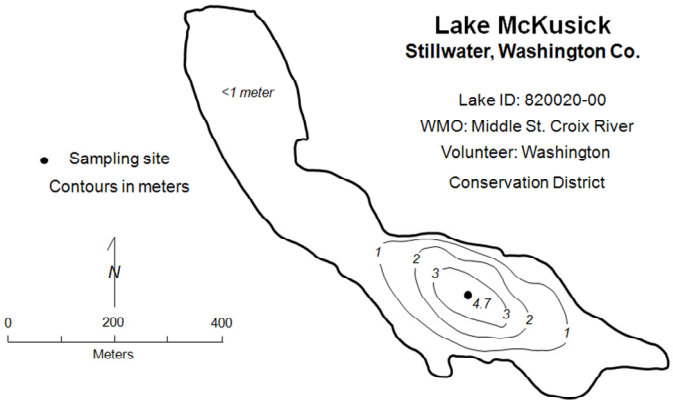
2011 summer (May-September) data summary

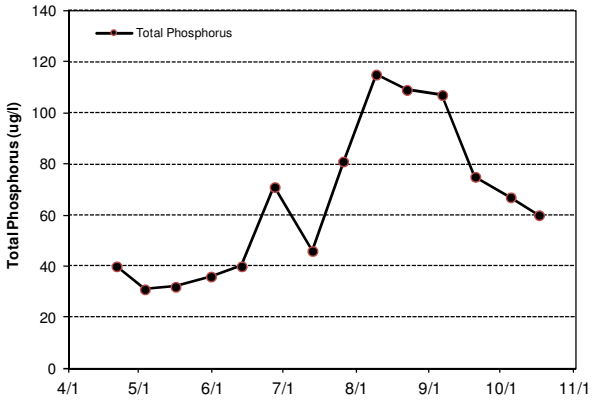
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	67.5	31.0	115.0	C
CLA (µg/l)	21.1	4.2	87.0	C
Secchi (m)	2.3	0.9	3.4	B
TKN (mg/l)	0.96	0.52	1.40	
			Lake Grade	C

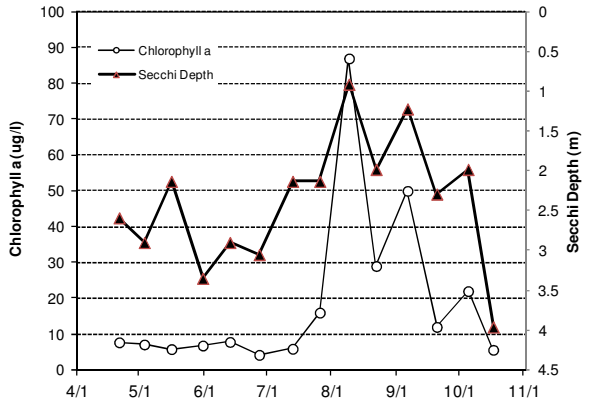
The lake received a lake grade of C for 2011, which is consistent with its historical database. The lake grades over the past 17 years have varied in the B to D range. The historical water quality database suggests that the lake has been represented by a lake grade of C or B for the past 10 years. The lake has not received a D lake grade since 1999.

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

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

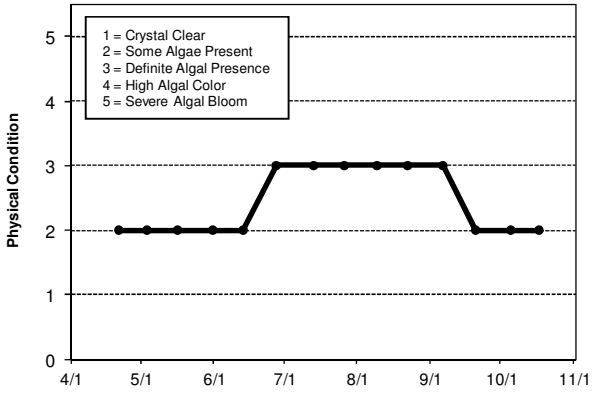






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(ºC)	(ºC)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	7.6	6.9	11	6.3	7.7	40		2.59	2	2
5/3/2011	7.4	7	11.1	8.4	7.1	31		2.9	2	2
5/16/2011	14.6	8.5	9.5	0.2	5.8	32		2.13	2	2
5/31/2011	19.8	11.9	7.5	0.1	6.8	36		3.35	2	2
6/13/2011	19.7	11.3	7.9	0.1	7.8	40		2.9	2	2
6/27/2011	22.2	13.2	14.3	0.1	4.2	71		3.05	3	4
7/13/2011	24.3	13.8	3	0	5.9	46		2.13	3	4
7/26/2011	25.7	14.6	0.5	0	16	81		2.13	3	4
8/9/2011	23.6	21.9	1	0.1	87	115		0.91	3	4
8/22/2011	23.4	20.6	4.1	0.1	29	109		1.98	3	4
9/6/2011	21.1	13.9	3	0	50	107		1.22	3	4
9/20/2011	15.7	14.9	2.9	0.1	12	75		2.29	2	3
10/5/2011	15.7	13.9	10.1	0.5	22	67		1.98	2	2
10/17/2011	11.1	11.4	8.1	0.4	5.6	60		3.96	2	2

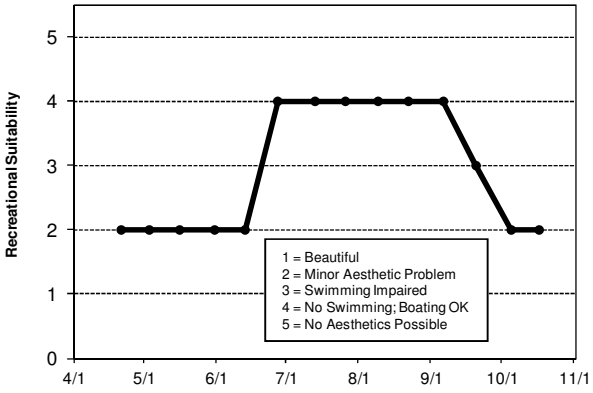


Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus	C	C	C	C	C	C	B	C
Chlorophyll a	A	B	B	B	B	A	A	C
Secchi Depth	B	C	C	C	C	B	B	B
Lake Grade	**B**	**C**	**C**	**C**	**C**	**B**	**B**	**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). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	70.9	46.0	164.0	D
CLA (µg/l)	28.2	1.5	93.0	C
Secchi (m)	1.4	0.5	2.3	C
TKN (mg/l)	1.44	1.00	2.20	
			Lake Grade	C

The lake received a lake grade of C for 2011, which is the third year in a row that the lake received a C grade. The lake historically has been characterized as a D lake. But recent monitoring has shown improvements to the C grade on occasion. Continued monitoring is suggested to determine if there is an improving trend in the lake's water quality.

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

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.

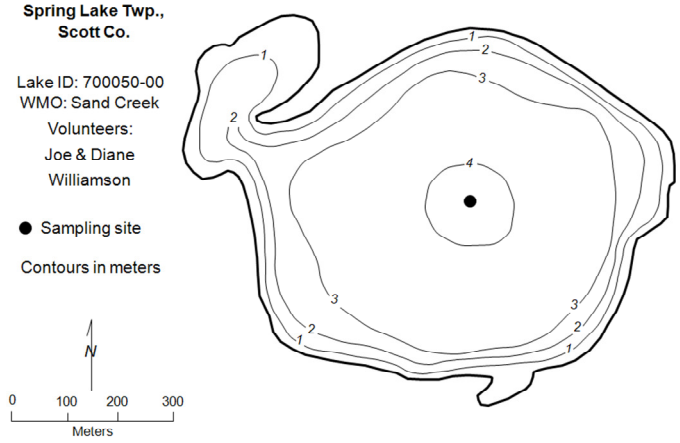
McMahon Lake

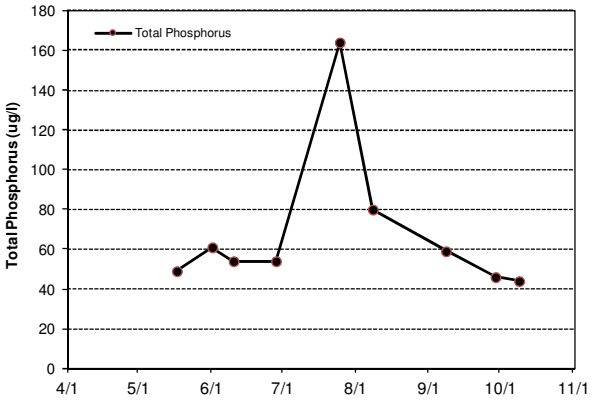
Spring Lake Twp., Scott Co.

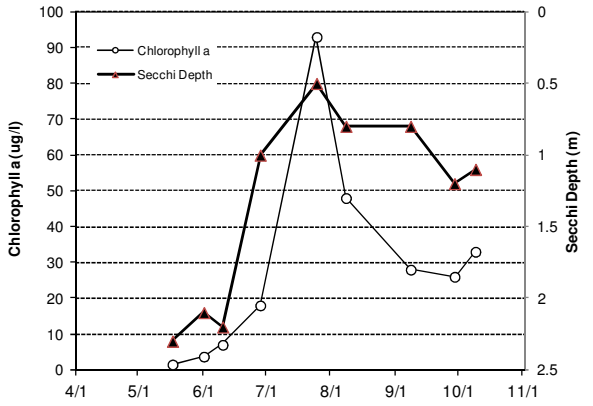
Lake ID: 700050-00
WMO: Sand Creek
Volunteers:
Joe & Diane
Williamson

● Sampling site

Contours in meters

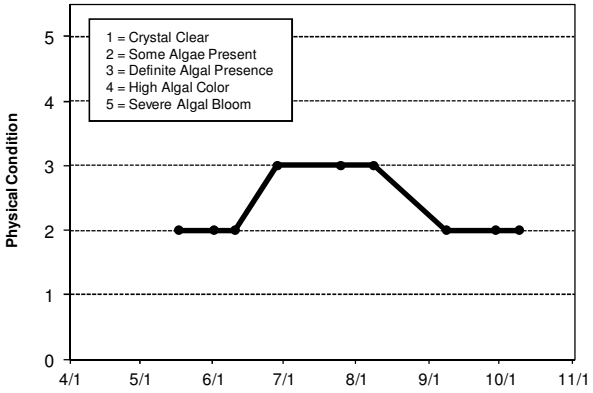






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/17/2011	15				1.5	49		2.3	2	1
6/1/2011	19.7				3.7	61		2.1	2	1
6/10/2011	22				7	54		2.2	2	1
6/28/2011	22.9				18	54		1	3	2
7/25/2011	29.4				93	164		0.5	3	2
8/8/2011	28				48	80		0.8	3	1
9/8/2011	24.1				28	59		0.8	2	2
9/29/2011	18.4				26	46		1.2	2	2
10/9/2011					33	44		1.1	2	1

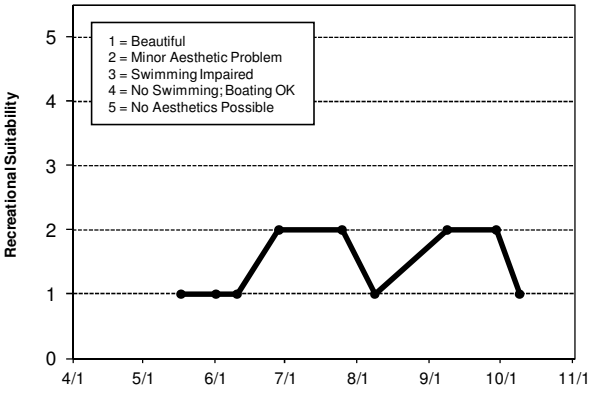


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	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	2009	2010	2011
Total Phosphorus		D	C	C	D	C	C	D
Chlorophyll a		F	D	C	C	C	B	C
Secchi Depth		D	D	D	D	D	C	C
Lake Grade		**D**	**D**	**C**	**D**	**C**	**C**	**C**



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.

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

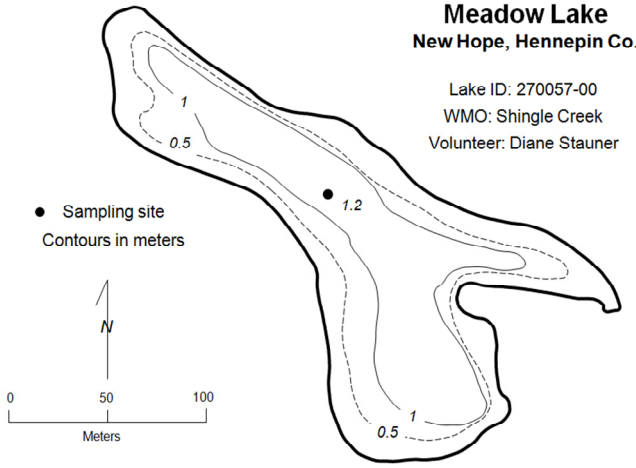
2011 summer (May-September) data summary

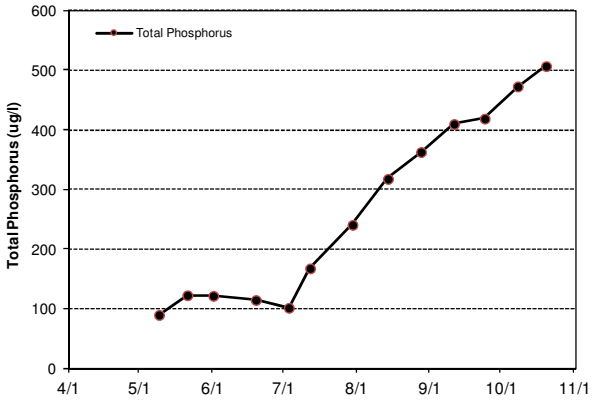
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	224.6	90.0	419.0	F
CLA (µg/l)	157.8	19.0	470.0	F
Secchi (m)	0.5	0.2	0.9	F
TKN (mg/l)	3.18	1.20	5.50	
			Lake Grade	F

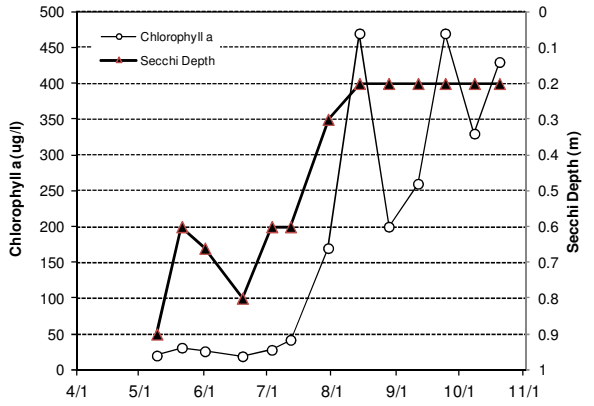
The lake received a lake grade of F for 2011, which is consistent with its historical database. The lake has been monitored once every 3 years via the CAMP since 1996. In each of those years the lake has received an F lake grade.

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 2.9 (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.

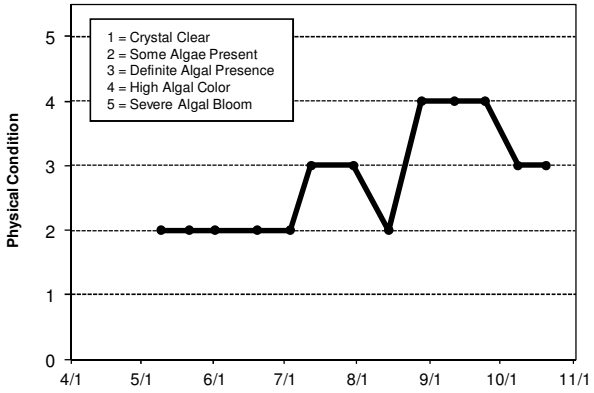






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/9/2011	15.9				20	90		0.9	2	
5/21/2011	20.4				31	123		0.6	2	1
6/1/2011					26	122		0.66	2	2
6/19/2011	22.9				19	115		0.8	2	2
7/3/2011	26.7				28	102		0.6	2	2
7/12/2011	27.2				42	168		0.6	3	4
7/30/2011	31				170	241		0.3	3	4
8/14/2011	27				470	318		0.2	2	2
8/28/2011	23				200	363		0.2	4	2
9/11/2011	27				260	410		0.2	4	2
9/24/2011	16				470	419		0.2	4	1
10/8/2011	21				330	473		0.2	3	4
10/20/2011	7.8				430	507		0.2	3	4

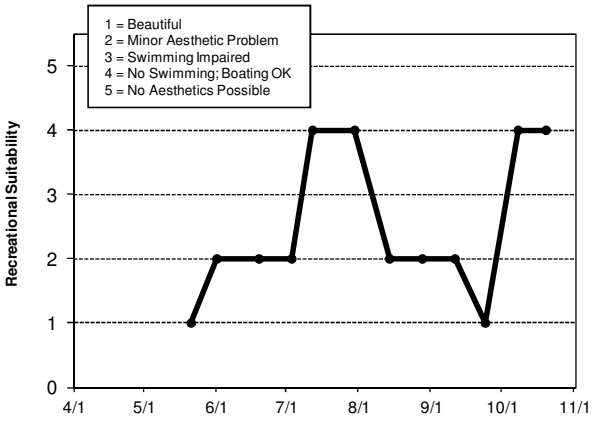


Lake Water Quality Grades Based on Summertime Averages

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					F			F			F	
Chlorophyll a					F			F			F	
Secchi Depth					F			F			F	
Lake Grade					**F**			**F**			**F**	

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	F			F			F	
Chlorophyll a	D			F			F	
Secchi Depth	F			F			F	
Lake Grade	**F**			**F**			**F**	



Source: Metropolitan Council and STORET data

Medicine Lake [Site 1, southwest bay] (27-0104) *Bassett Creek WMC*

Medicine Lake is located mainly in the City of Plymouth (Hennepin County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a surface area of 886 acres. The maximum depth of the lake is 14.9 m (49 ft). Approximately 45 percent of the surface area of the lake is littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

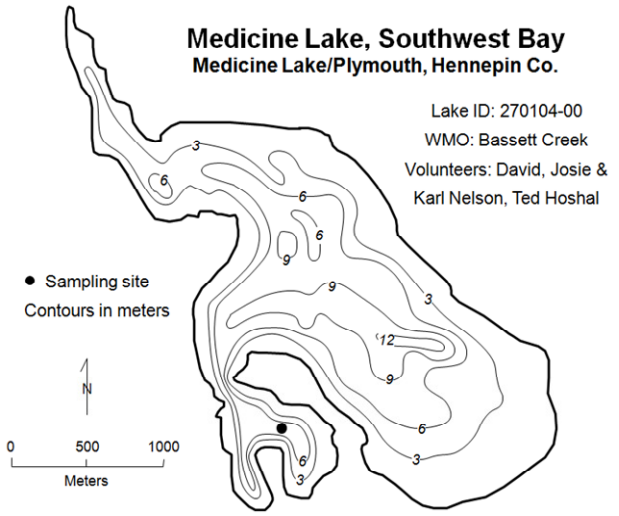
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	42.0	16.0	67.0	C
CLA (µg/l)	22.0	2.0	61.0	C
Secchi (m)	1.8	0.7	4.1	C
TKN (mg/l)	1.09	0.67	1.80	
			Lake Grade	C

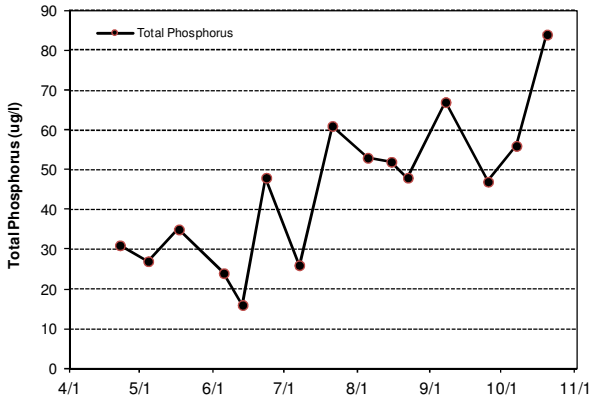
This lake site received a lake grade of C for 2011. This lake site has received C grades for the individual parameter grades since the early 1980s. Additional monitoring is recommended to continue to build the water quality database for this lake site.

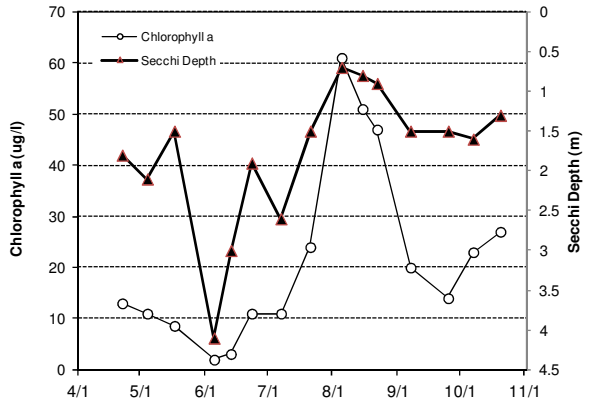
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

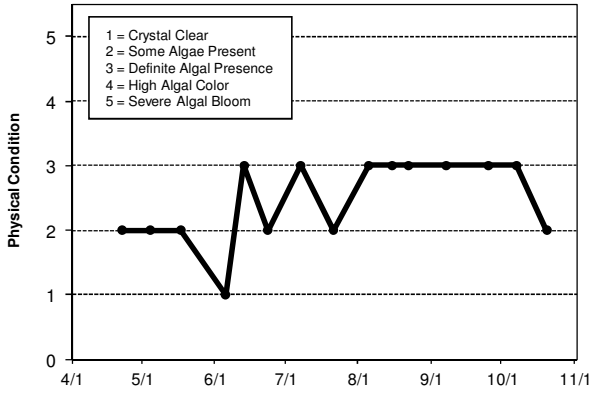
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

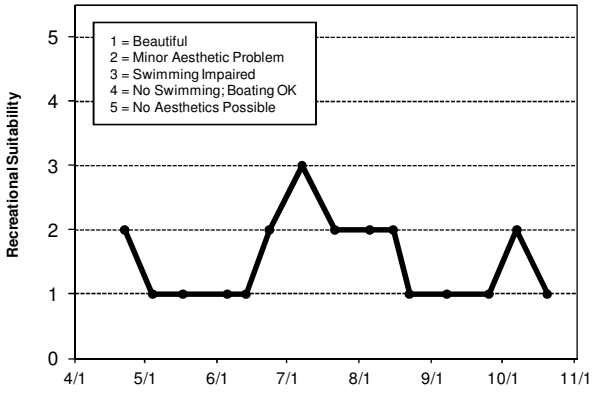
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/22/2011	6.6				13	31		1.8	2	2
5/4/2011	9				11	27		2.1	2	1
5/17/2011	14.7				8.6	35		1.5	2	1
6/5/2011	21.5				2	24		4.1	1	1
6/13/2011	20.8				3.1	16		3	3	1
6/23/2011	20.4				11	48		1.9	2	2
7/7/2011	27				11	26		2.6	3	3
7/21/2011	27.6				24	61		1.5	2	2
8/5/2011	27.5				61	53		0.7	3	2
8/15/2011	25.1				51	52		0.8	3	2
8/22/2011	23.5				47	48		0.9	3	1
9/7/2011	22.1				20	67		1.5	3	1
9/25/2011	16.7				14	47		1.5	3	1
10/7/2011	16.5				23	56		1.6	3	2
10/20/2011	12.1				27	84		1.3	2	1

Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			C		C		C	C
Chlorophyll a							C	C
Secchi Depth			C		C		C	C
Lake Grade							**C**	**C**

Source: Metropolitan Council and STORET data

Medicine Lake [Site 2, main lake] (27-0104) *Bassett Creek WMC*

Medicine Lake is located mainly in the City of Plymouth (Hennepin County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a surface area of 886 acres. The maximum depth of the lake is 14.9 m (49 ft). Approximately 45 percent of the surface area of the lake is littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

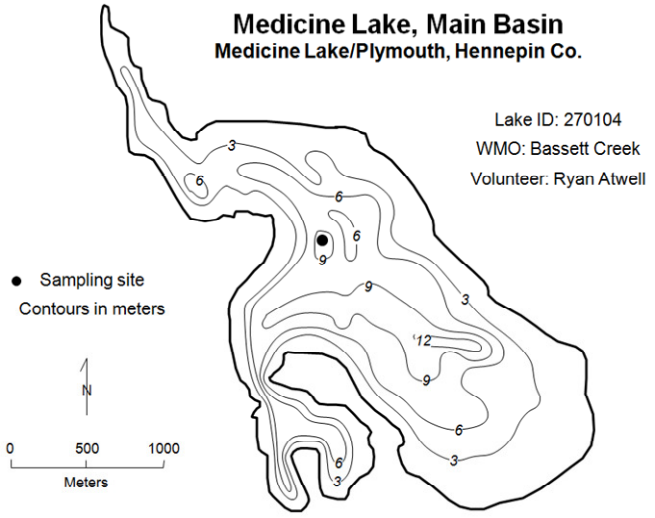
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	41.4	27.0	60.0	C
CLA (µg/l)	30.1	2.8	58.0	C
Secchi (m)	1.8	0.7	3.6	C
TKN (mg/l)	1.03	0.45	1.50	
			Lake Grade	C

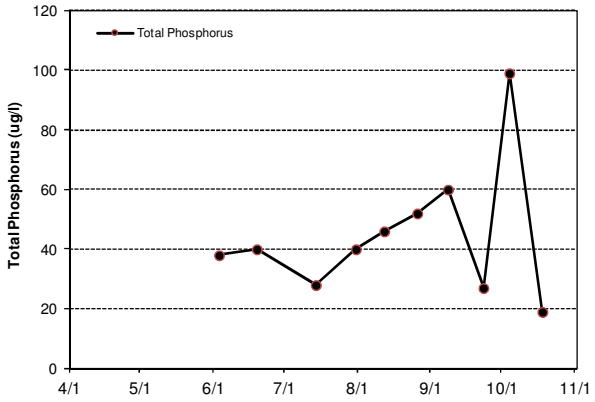
This lake site received a lake grade of C for 2011. This lake site has received mainl C grades for the individual parameter grades since the early 1980s. Additional monitoring is recommended to continue to build the water quality database for this lake site.

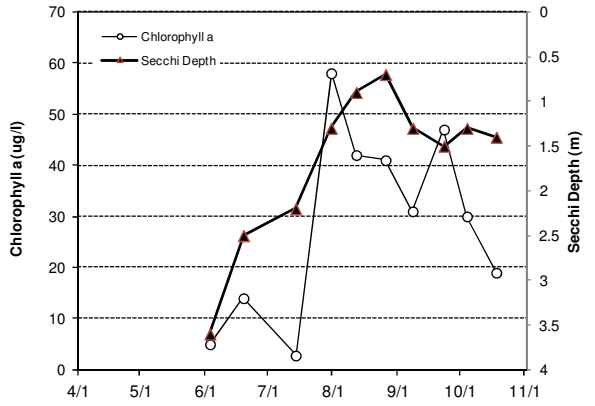
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

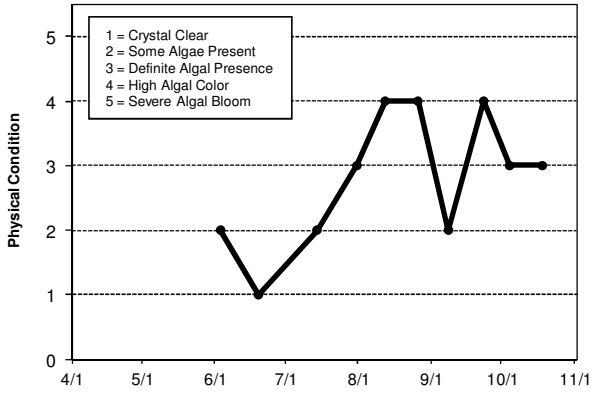
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

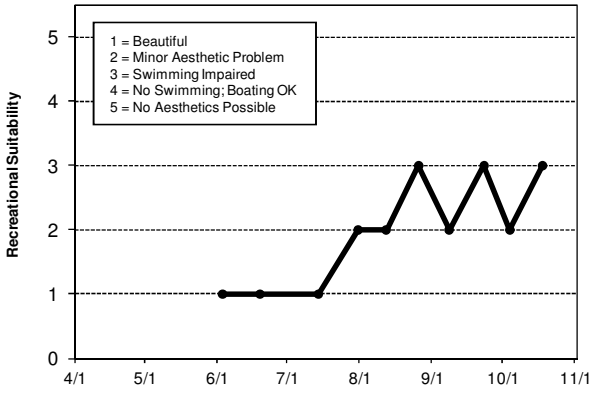
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/3/2011	20.3				5	38		3.6	2	1
6/19/2011	21.3				14	40		2.5	1	1
7/14/2011	22.3				2.8	28		2.2	2	1
7/31/2011	27.4				58	40		1.3	3	2
8/12/2011	24.4				42	46		0.9	4	2
8/26/2011	25				41	52		0.7	4	3
9/8/2011	22				31	60		1.3	2	2
9/23/2011	16.3				47	27		1.5	4	3
10/4/2011	18				30	99		1.3	3	2
10/18/2011	11.8				19	19		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		C		C							C	C
Chlorophyll a		D		C							D	C
Secchi Depth		C		C							C	C
Lake Grade		**C**		**C**							**C**	**C**

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C		C	C	C	C	C	C
Chlorophyll a								C
Secchi Depth	C		C	C	C	C	C	C
Lake Grade								**C**

Source: Metropolitan Council and STORET data

Miller Lake (10-0029) *Carver County Environmental Services*

Miller Lake is located within Dahlgren Township (Carver County). It has a surface area of 145 acres. The mean and maximum depths of the lake are 3.1 m (10 feet) and 4.3 m (roughly 14 feet), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

The lake has a 16,701-acre immediate watershed, which translates to a large watershed-to-lake area ratio of 115:1 (Carver County Planning 1999). The larger the ratio the greater the potential stress put on the lake from surface runoff.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	230.9	103.0	420.0	F
CLA (µg/l)	76.9	31.0	140.0	D
Secchi (m)	0.8	0.5	1.2	D
TKN (mg/l)	2.00	1.30	2.80	
			Lake Grade	D

The lake received a lake grade of D for 2011 which is consistent with its historical database. The historical lake grades typically fall in the range of D to F.

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

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

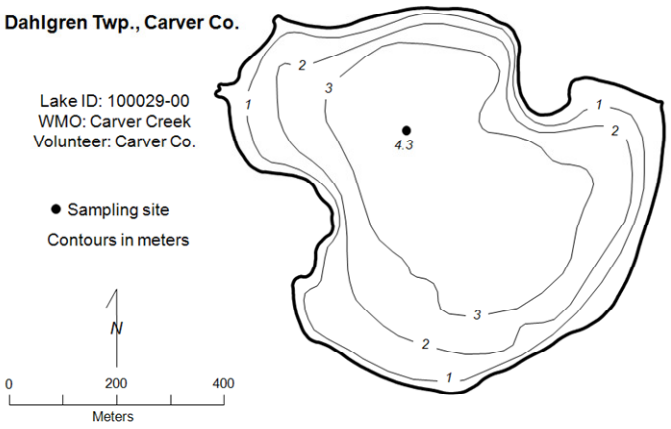
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

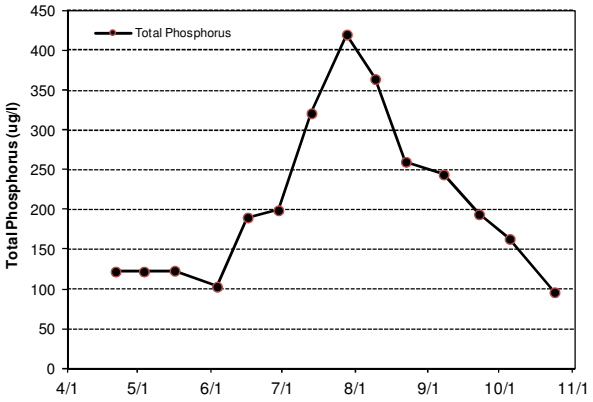
Miller Lake

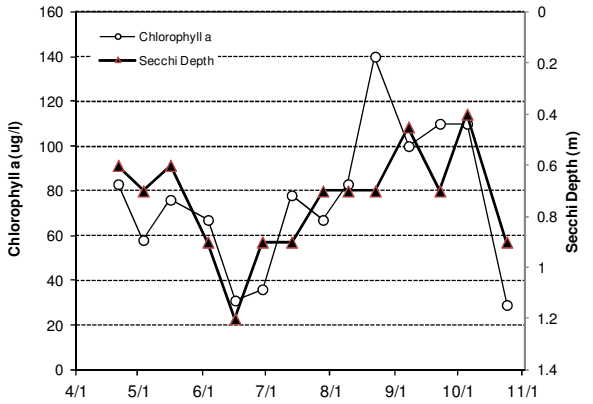
Dahlgren Twp., Carver Co.

Lake ID: 100029-00
WMO: Carver Creek
Volunteer: Carver Co.

● Sampling site
Contours in meters

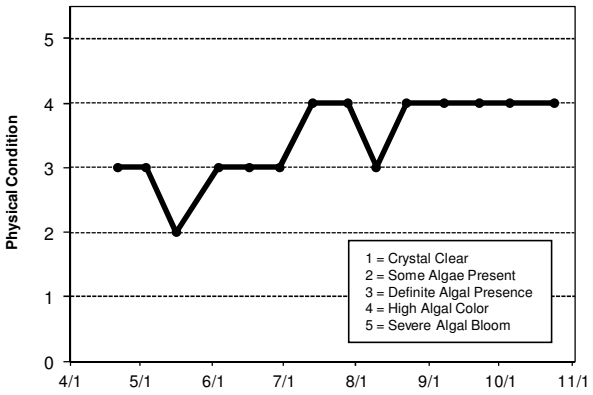






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	7.15		20.2		83	122		0.6	3	3
5/3/2011	7.72		21.1		58	122		0.7	3	4
5/16/2011	14.62		16.8		76	123		0.6	2	2
6/3/2011	19.57		9.3		67	103		0.9	3	3
6/16/2011	21.54		9.9		31	190		1.2	3	3
6/29/2011	21.44		11.5		36	199		0.9	3	3
7/13/2011	25.1		10.1		78	321		0.9	4	4
7/28/2011	26.72		5.1		67	420		0.7	4	4
8/9/2011	24.78		6.6		83	364		0.7	3	3
8/22/2011	23.99		9.2		140	260		0.7	4	4
9/7/2011	21.21		8.5		100	244		0.45	4	4
9/22/2011	15.07		9.6		110	194		0.7	4	4
10/5/2011	16.28		11.1		110	163		0.4	4	4
10/24/2011	9.7		11.6		29	96		0.9	4	4

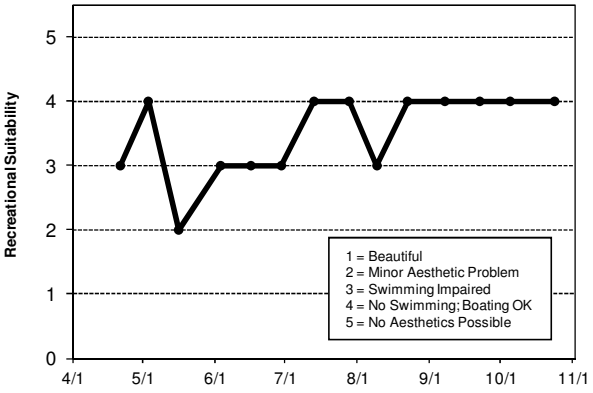


Lake Water Quality Grades Based on Summertime Averages

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	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	2009	2010	2011
Total Phosphorus	F	D	F	F	F	F	F	F
Chlorophyll a	D	D	D	F	D	F	D	D
Secchi Depth	F	D	F	F	D	F	D	D
Lake Grade	**F**	**D**	**F**	**F**	**D**	**F**	**D**	**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. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants.Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	36.5	24.0	62.0	C
CLA (µg/l)	15.9	2.3	35.0	B
Secchi (m)	1.7	0.8	3.1	C
TKN (mg/l)	1.43	1.10	2.00	
			Lake Grade	C

The lake received a lake grade of C for 2011. The lake grades have varied in the B to C range since 2007. Further monitoring is suggested to continue to build the water quality database for this lake.

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

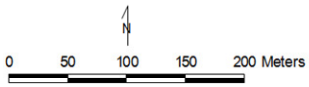
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

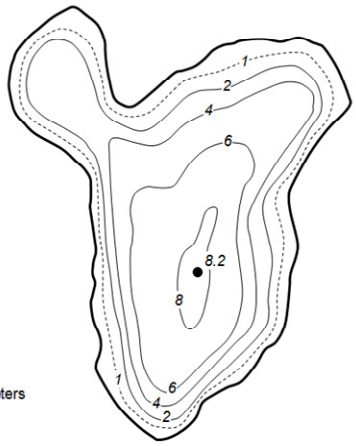
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lake Minnetoga
Minnetonka, Hennepin Co.

Lake ID: 270088-00
WD: Nine Mile Creek
Volunteer: John Twele

● Sampling site
Contours in meters





2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	9.9				39	107		0.9	4	5
5/4/2011	9.6				23	62		1.3	4	4
5/15/2011	13.6				8.6	41		2	1	1
6/5/2011	20.6				2.3	28		1.8	2	1
6/19/2011	16				5.3	28		3.1	2	1
7/3/2011	26				5	31		3	1	1
7/17/2011	28.8				35	45		1	3	
7/29/2011	30.7				19	33		1.2	4	3
8/14/2011	27.2				31	43		0.8	4	4
8/26/2011	25.6				12	30		1.8	2	2
9/25/2011	16.1				18	24		1.3	3	4
10/8/2011	17.5				13	34		2	1	1
10/25/2011	10.6				20	75		2.5	1	1

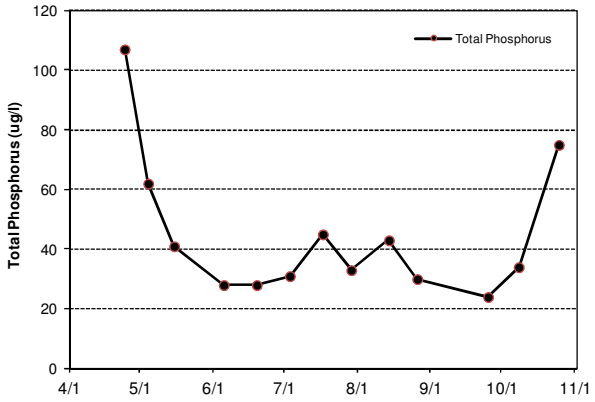
Lake Water Quality Grades Based on Summertime Averages

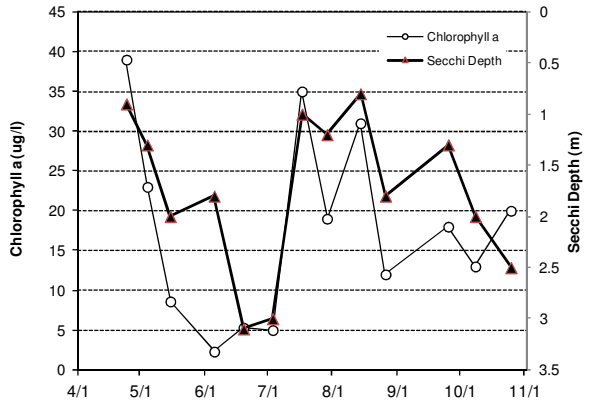
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

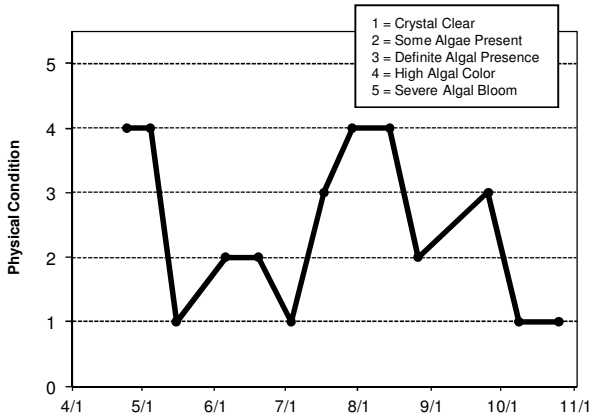
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

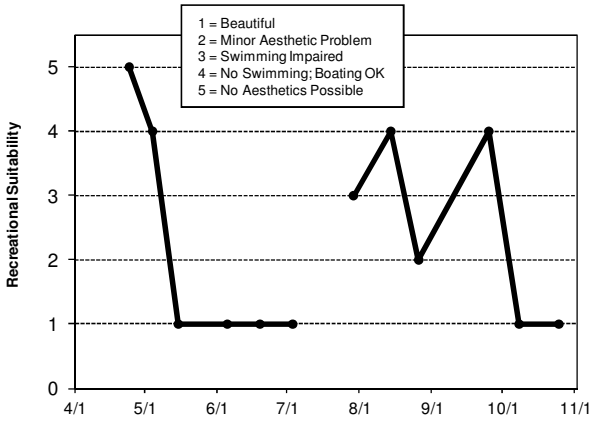
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus				C	B		B	C
Chlorophyll a				C	A		A	B
Secchi Depth				C	B		B	C
Lake Grade				**C**	**B**		**B**	**C**

Source: Metropolitan Council and STORET data









Minnewashta Lake [Site 2, south bay] (10-0009) *City of Chanhassen*

Minnewashta Lake is located in the City of Chanhassen (Carver County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value. It is a relatively large lake with a surface area of 677 acres. The maximum depth of the lake is 21.3 m (70 feet). The Minnesota DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	20.7	15.0	35.0	A
CLA (µg/l)	8.2	3.7	12.0	A
Secchi (m)	4.7	3.2	6.8	A
TKN (mg/l)	0.82	0.71	0.92	
			Lake Grade	A

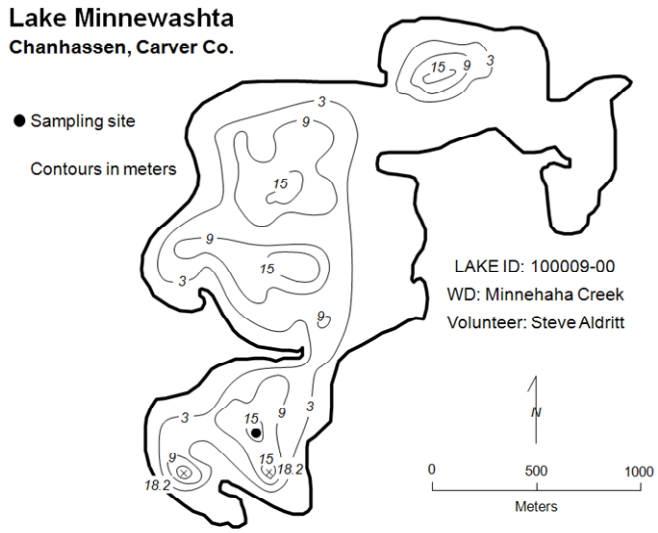
The south bay received a lake grade of A for 2011. Except for this year and last year, only Secchi data has been collected at this lake site. Additional monitoring is recommended to continue to build the water quality database for this lake site.

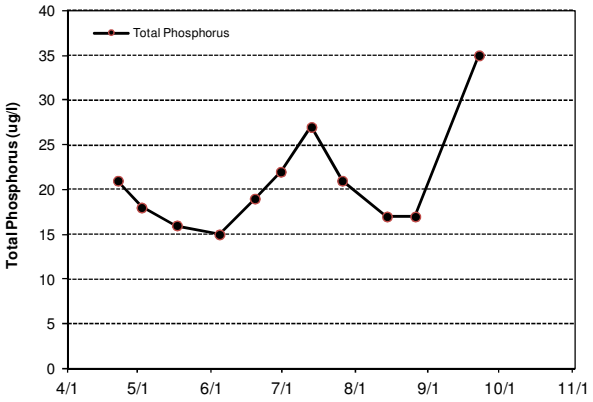
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

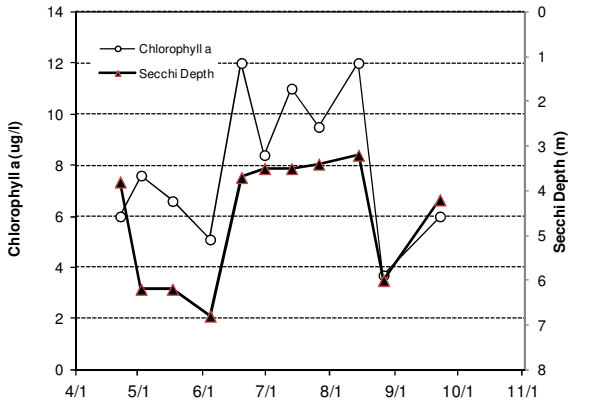
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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 Minnewashta
Chanhassen, Carver Co.

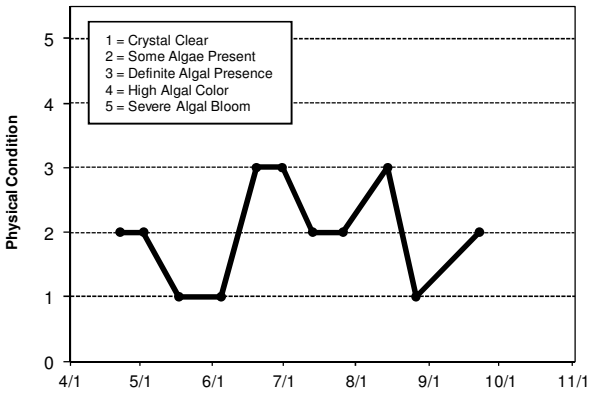






2011 Data

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 (1-5)	RS (1-5)
4/22/2011	16.2				6	21		3.8	2	1
5/2/2011	16.7				7.6	18		6.2	2	1
5/17/2011	18.2				6.6	16		6.2	1	1
6/4/2011	22.6				5.1	15		6.8	1	1
6/19/2011	22.3				12	19		3.7	3	1
6/30/2011	26.3				8.4	22		3.5	3	2
7/13/2011	26.4				11	27		3.5	2	1
7/26/2011	29.5				9.5	21		3.4	2	1
8/14/2011	27.9				12	17		3.2	3	2
8/26/2011					3.7	17		6	1	1
9/22/2011					6	35		4.2	2	1



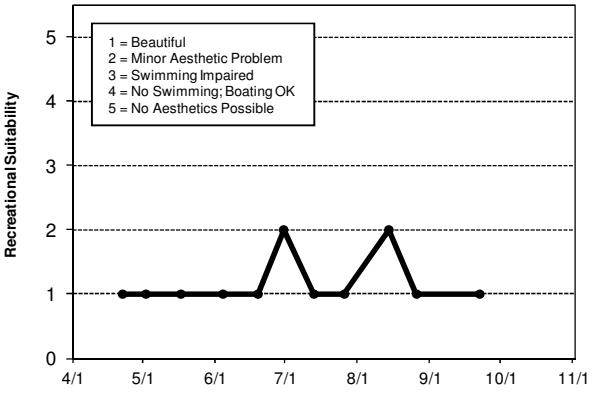
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus							A	A
Chlorophyll a							B	A
Secchi Depth			A				B	A
Lake Grade							**B**	**A**

Source: Metropolitan Council and STORET data



Mitchell Lake (27-0070) *City of Eden Prairie*

Mitchell Lake is located in the City of Eden Prairie (Hennepin County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a surface area of 112 acres. The maximum depth of the lake is 5.8 m (19 feet). Approximately 97 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a substantial thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The Minnesota DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	40.3	21.0	70.0	C
CLA (µg/l)	11.1	1.6	34.0	B
Secchi (m)	2.1	0.8	4.8	C
TKN (mg/l)	1.03	0.79	1.50	
			Lake Grade	C

The lake received a lake grade of C which is consistent with its historical database. The lake's water quality seems represented by lake grades between C and D. Further monitoring is suggested to continue to build the water quality database for increasing statistical power to detect water quality trends.

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

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

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

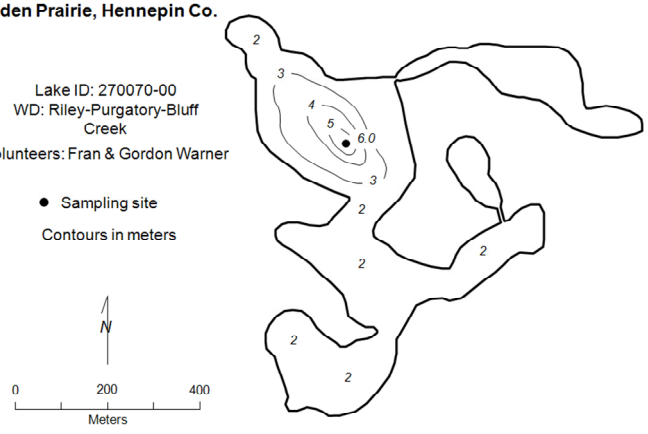
Lake Mitchell

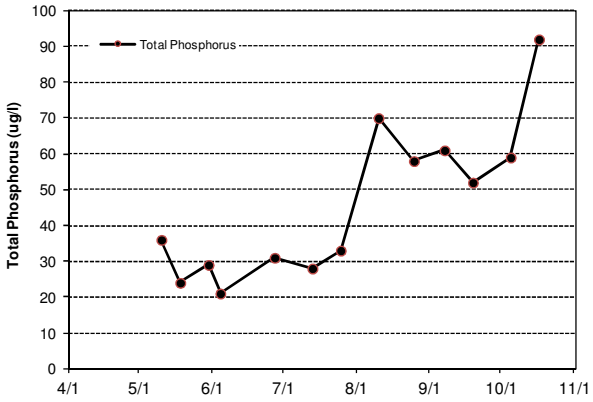
Eden Prairie, Hennepin Co.

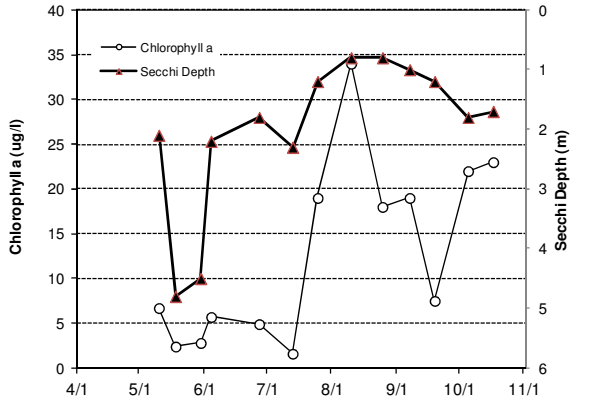
Lake ID: 270070-00
WD: Riley-Purgatory-Bluff Creek
Volunteers: Fran & Gordon Warner

● Sampling site

Contours in meters

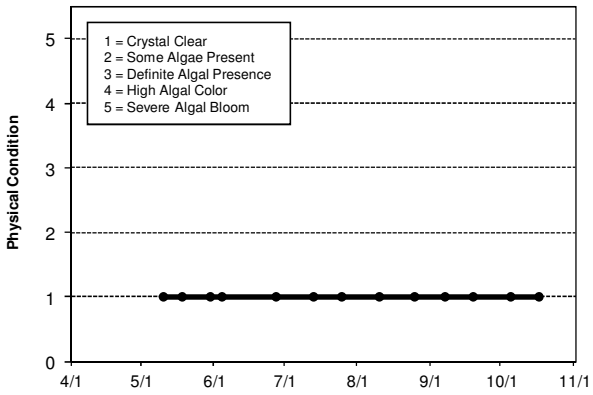






2011 Data

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 (1-5)	RS (1-5)
5/10/2011	16.4				6.7	36		2.1	1	1
5/18/2011	16				2.4	24		4.8	1	1
5/30/2011	18.4				2.8	29		4.5	1	1
6/4/2011	23				5.7	21		2.2	1	1
6/27/2011	21.8				4.9	31		1.8	1	1
7/13/2011	27.3				1.6	28		2.3	1	1
7/25/2011	29.6				19	33		1.2	1	1
8/10/2011	26.2				34	70		0.8	1	1
8/25/2011	27.6				18	58		0.8	1	1
9/7/2011	24.3				19	61		1	1	1
9/19/2011	18.1				7.5	52		1.2	1	1
10/5/2011	17.7				22	59		1.8	1	1
10/17/2011	14.5				23	92		1.7	1	2

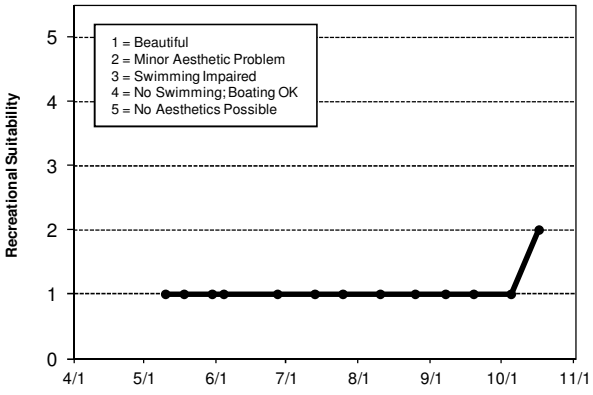


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												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	2009	2010	2011
Total Phosphorus	C	D	D	C	C	C	C	C
Chlorophyll a	C	C	C	C	B	C	C	B
Secchi Depth	C	C	D	C	C	C	C	C
Lake Grade	**C**	**C**	**D**	**C**	**C**	**C**	**C**	**C**



Source: Metropolitan Council and STORET data

Moody Lake (13-0023) *Comfort Lake-Forest Lake Watershed District*

Moody Lake is a 35-acre lake located near Chisago City (Chisago County). The lake has a maximum depth of depth of approximately 14.6 m (48 feet). Roughly 63 percent of the lake's surface area is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants.

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

2011 summer (May-September) data summary

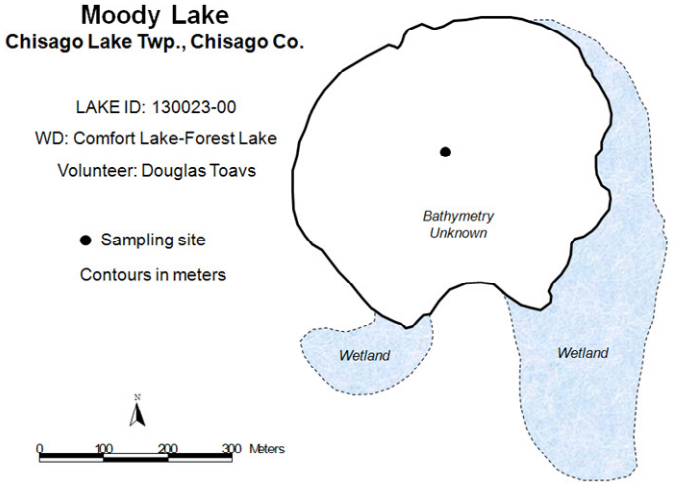
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	128.0	63.0	188.0	D
CLA (µg/l)	86.6	11.0	190.0	F
Secchi (m)	0.8	0.4	1.9	D
TKN (mg/l)	2.11	1.20	3.00	
			Lake Grade	D

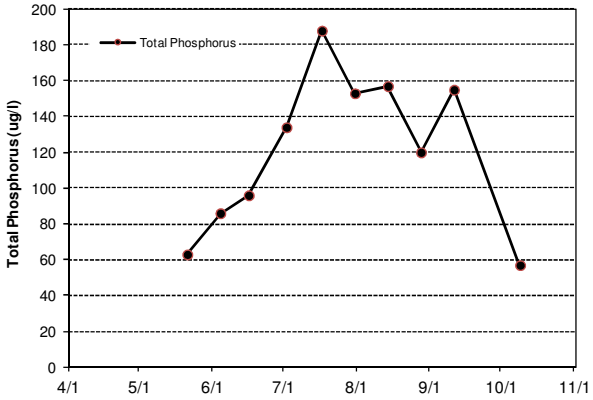
The lake received a D grade for 2011, which is consistent with its limited historical water quality database. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

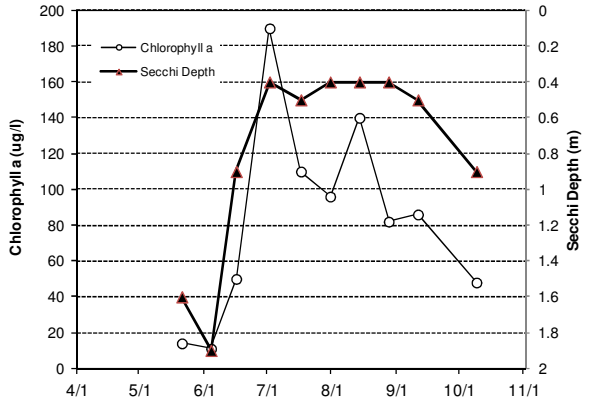
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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) 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.

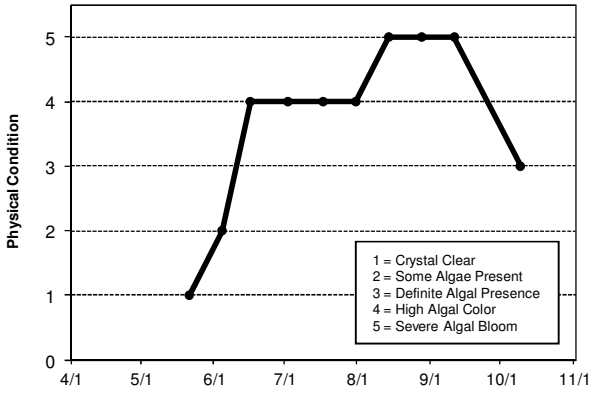






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/21/2011	18.4				14	63		1.6	1	1
6/4/2011	22.3				11	86		1.9	2	2
6/16/2011	22.3				50	96		0.9	4	4
7/2/2011	26.9				190	134		0.4	4	4
7/17/2011	28.9				110	188		0.5	4	4
7/31/2011	32.5				96	153		0.4	4	4
8/14/2011	28.1				140	157		0.4	5	4
8/28/2011	26				82	120		0.4	5	5
9/11/2011	24.7				86	155		0.5	5	5
10/9/2011	18.6				48	57		0.9	3	4



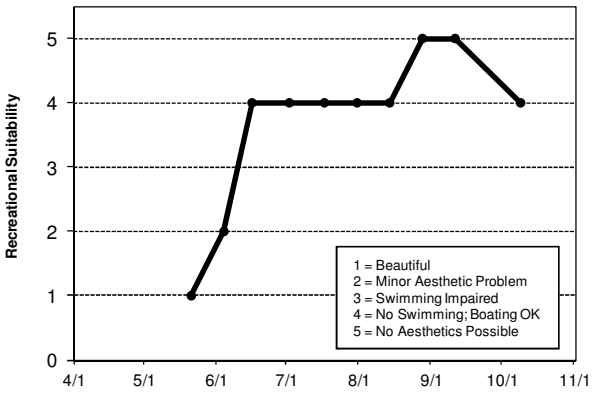
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		D	D				D	D
Chlorophyll a		D	C				D	F
Secchi Depth		D	D				D	D
Lake Grade		**D**	**D**				**D**	**D**

Source: Metropolitan Council and STORET data



Mud Lake (82-0026) *Carnelian - Marine Watershed District*

Mud Lake is a 62-acre lake located within May Township (Washington County). The maximum and mean depths of the lake are 2.1 m (6.9 ft) and 1.1 m (3.6 ft), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	124.8	58.0	163.0	D
CLA (µg/l)	72.4	19.0	110.0	D
Secchi (m)	0.6	0.5	0.9	F
TKN (mg/l)	2.20	1.20	2.80	
			Lake Grade	D

The lake received a D grade for 2011, which seems to be an improvement compared to the water quality of F grades in the late 1990s and early 2000s. Further monitoring is suggested to continue to build the water quality database for increasing power to detect potential water quality trends.

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

The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR 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.

Mud Lake
May Twp., Washington Co.

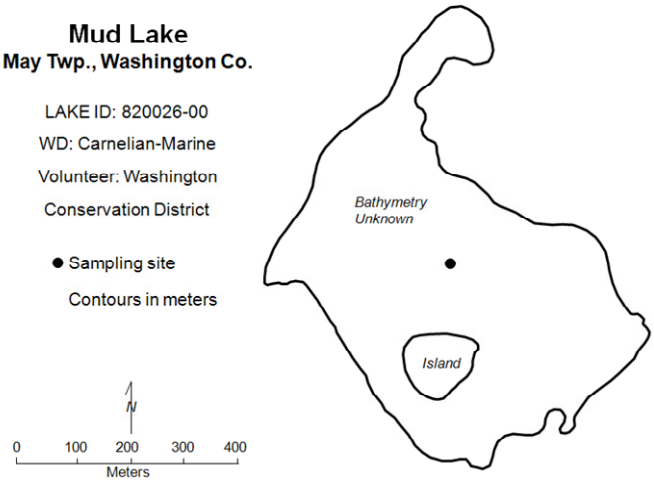
LAKE ID: 820026-00

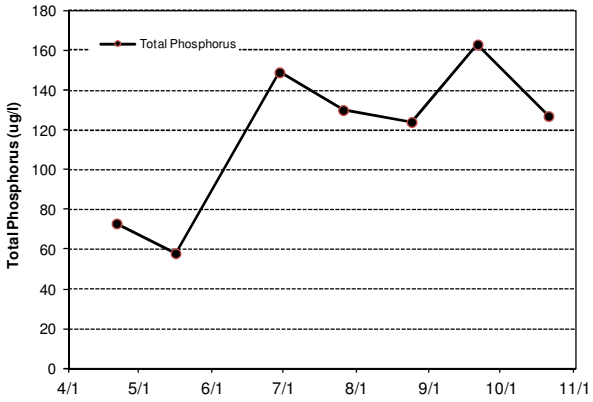
WD: Carnelian-Marine

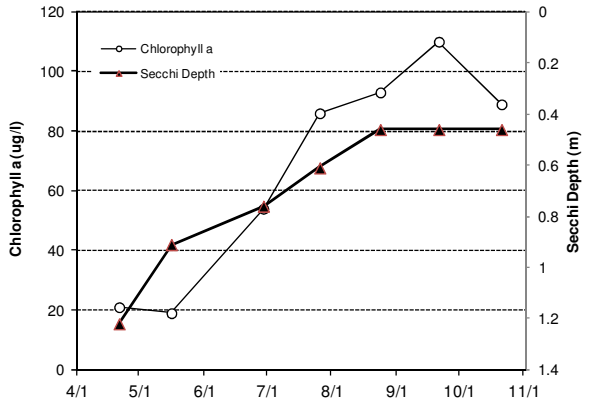
Volunteer: Washington Conservation District

● Sampling site

Contours in meters

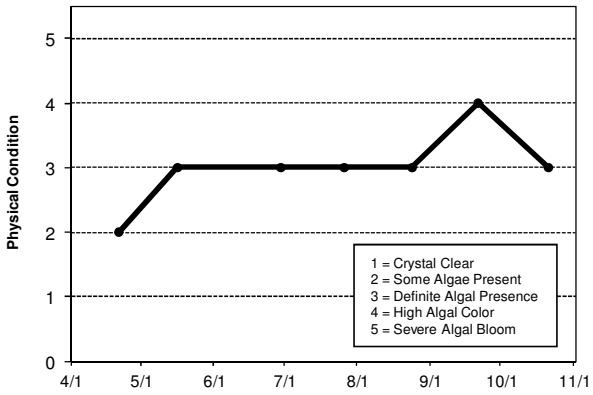






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	7.8	7.8	12.3	11.4	21	73		1.22	2	2
5/16/2011	15.4	15	10.4	0.1	19	58		0.91	3	4
6/29/2011	23.5	21	12.2	0.6	54	149		0.76	3	4
7/26/2011	27.1	26.4	9.4	0.2	86	130		0.61	3	4
8/24/2011	24.9	24.2	9	0.1	93	124		0.46	3	4
9/21/2011	15	15	10.7	0.3	110	163		0.46	4	4
10/21/2011	8.5	8.2	12.7	5.2	89	127		0.46	3	4

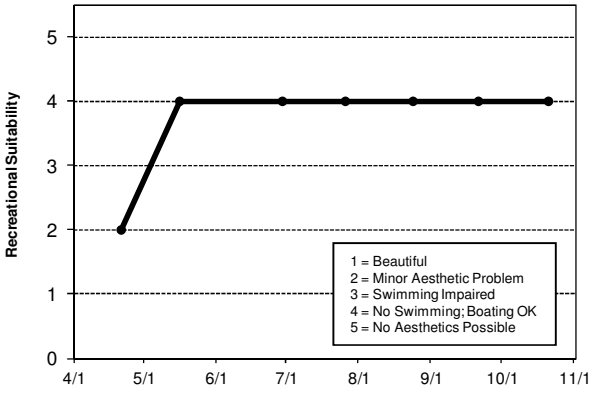


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus							D	D
Chlorophyll a							C	D
Secchi Depth	C	D	D				D	F
Lake Grade							**D**	**D**



Source: Metropolitan Council and STORET data

Normandale Lake (27-1045) *Nine Mile Creek Watershed District*

Normandale Lake is located in the City of Bloomington (Hennepin County). The lake is considered a METC Priority Lake for its high regional recreational value (METC 2007). It has a surface area of 103 acres. The maximum depth of the lake is 3.7 m (12 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	62.0	31.0	105.0	C
CLA (µg/l)	14.4	8.5	19.0	B
Secchi (m)	1.4	0.8	2.5	C
TKN (mg/l)	0.83	0.60	1.10	
			Lake Grade	C

The lake received a lake grade of C in 2011, which is consistent with its historical water quality database. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

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

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

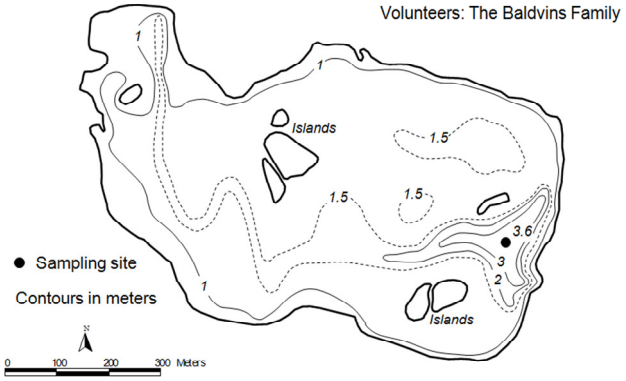
Normandale Lake (Nordmyr Lake)

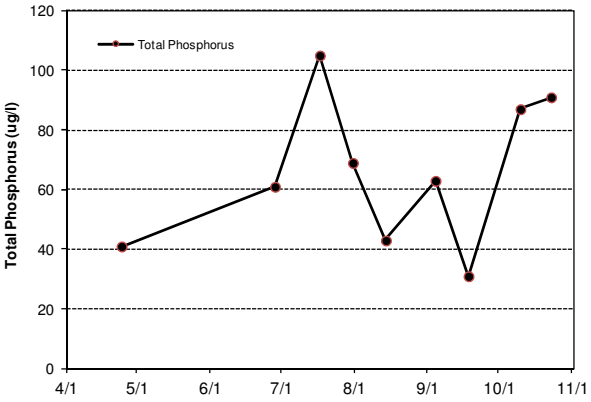
Bloomington, Hennepin Co.

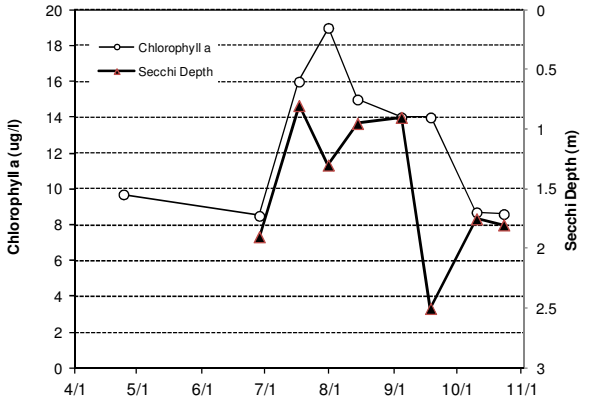
LAKE ID: 271045-00

WD: Nine Mile Creek

Volunteers: The Baldvins Family

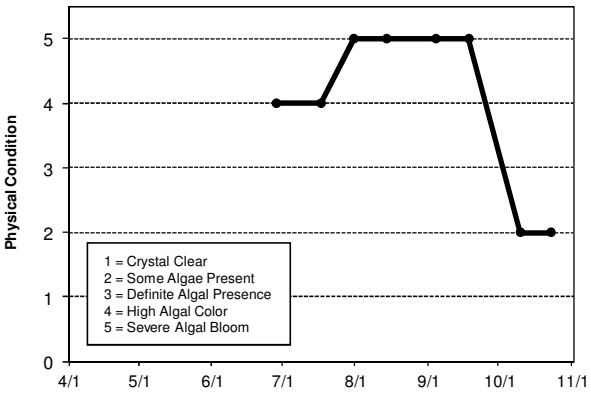






2011 Data

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 (1-5)	RS (1-5)
4/24/2011					9.7	41				
6/28/2011	21.8				8.5	61		1.9	4	4
7/17/2011	26.3				16	105		0.8	4	5
7/31/2011	28.1				19	69		1.3	5	5
8/14/2011	24.6				15	43		0.95	5	5
9/4/2011	21.5				14	63		0.9	5	5
9/18/2011	16.2				14	31		2.5	5	5
10/10/2011	19.5				8.7	87		1.75	2	4
10/23/2011	10.6				8.6	91		1.8	2	4

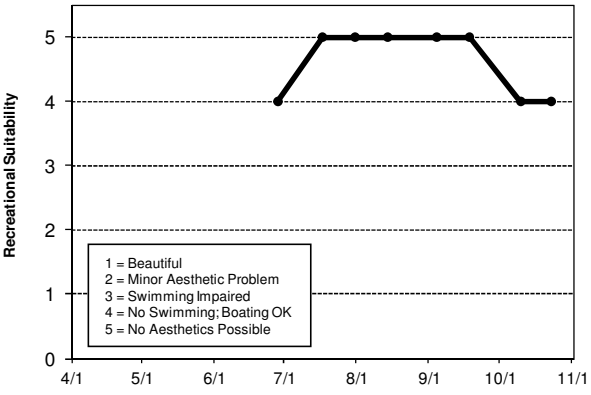


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			C	C		C	C	C
Chlorophyll a			B	A		A	B	B
Secchi Depth			D	C		B	C	C
Lake Grade			**C**	**B**		**B**	**C**	**C**



Source: Metropolitan Council and STORET data

Northwood Lake (27-0627) *Bassett Creek Watershed Management Organization*

Northwood Lake is a 15-acre lake located within the City of New Hope (Hennepin County). The mean and maximum depths of the lake are 0.8 m (2.5 ft) and 1.5 m (4.9 ft), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake's 1,341-acre immediate watershed translates to a large watershed-to-lake area ratio of 89:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

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

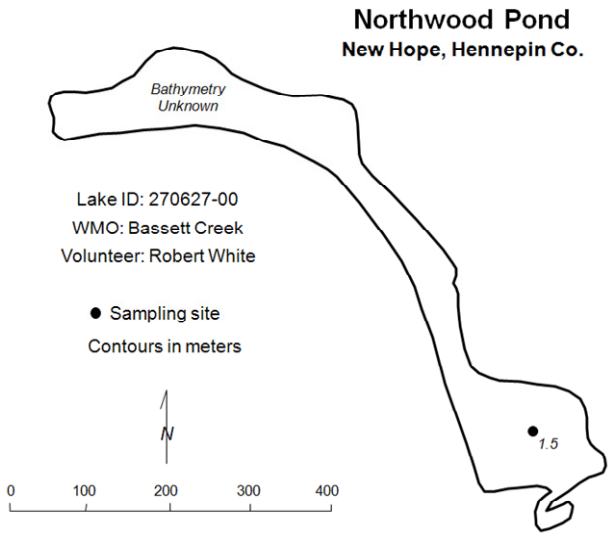
2011 summer (May-September) data summary

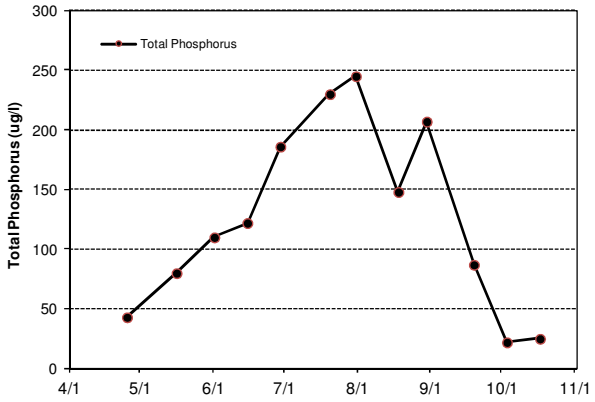
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	157.2	80.0	245.0	F
CLA (µg/l)	28.7	14.0	54.0	C
Secchi (m)	0.9	0.4	1.1	D
TKN (mg/l)	0.98	0.48	1.40	
			Lake Grade	D

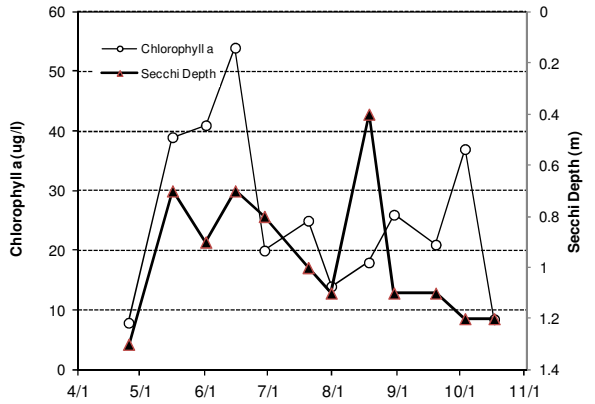
The lake received a lake grade of D in 2011 which is consistent with its historical database. Over the past 10 years, the lake grades have varied in the D and C range. Further monitoring is suggested to continue to build the water quality database for increasing power to detect potential water quality trends.

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

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

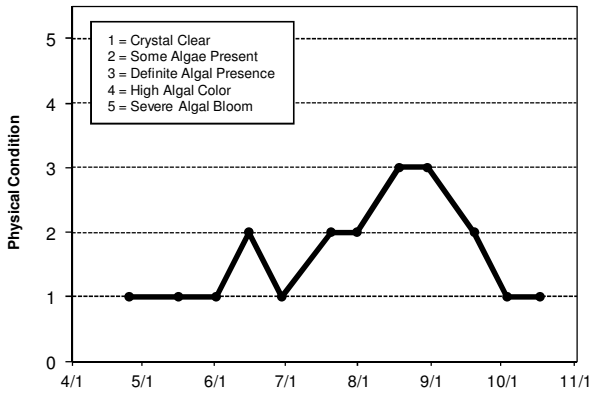






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/25/2011	12.9				7.9	43		1.3	1	1
5/16/2011	15.2				39	80		0.7	1	4
6/1/2011	25.2				41	110		0.9	1	4
6/15/2011	24.4				54	122		0.7	2	4
6/29/2011	26.3				20	186		0.8	1	4
7/20/2011	30.3				25	230		1	2	4
7/31/2011	31.8				14	245		1.1	2	4
8/18/2011	24.7				18	148		0.4	3	5
8/30/2011	22.6				26	207		1.1	3	5
9/19/2011	14.7				21	87		1.1	2	5
10/3/2011	17				37	22		1.2	1	4
10/17/2011	11.3				8.5	25		1.2	1	4

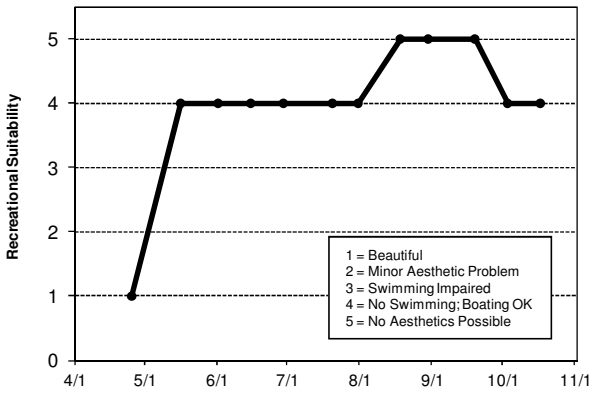


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	D	D	F	F	D	F	D	F
Chlorophyll a	B	B	B	C	C	B	C	C
Secchi Depth	D	D	D	D	D	D	D	D
Lake Grade	**C**	**C**	**D**	**D**	**D**	**D**	**D**	**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 are few known morphological data available for the lake.

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

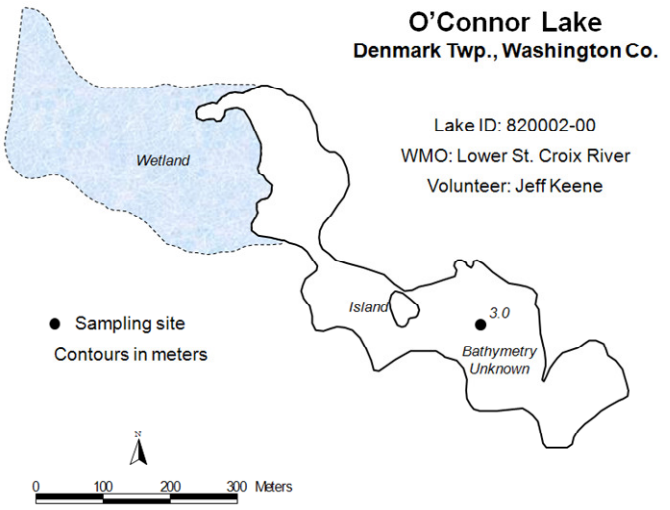
2011 summer (May-September) data summary

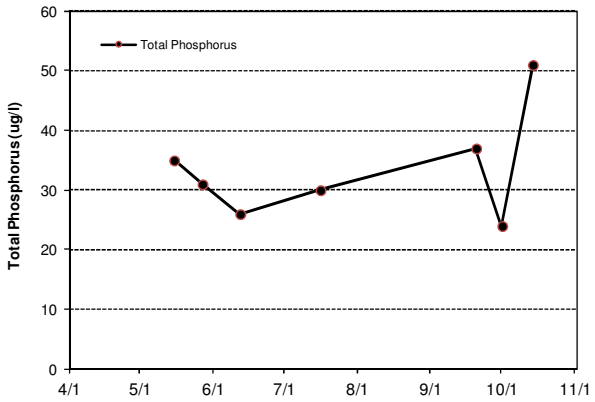
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	31.8	26.0	37.0	B
CLA (µg/l)	5.5	3.0	8.9	A
Secchi (m)	1.4	1.1	1.7	C
TKN (mg/l)	0.59	0.51	0.63	
			Lake Grade	B

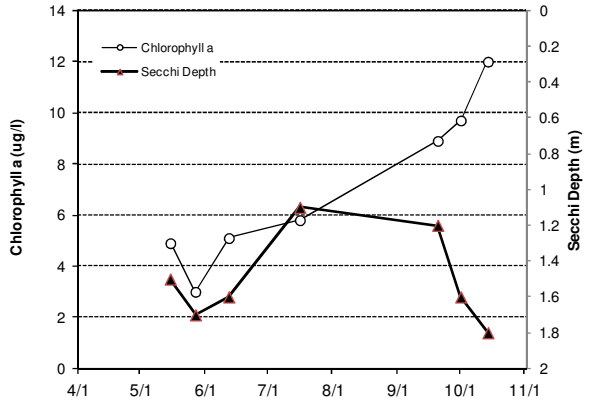
The lake received a lake grade of B for 2011, which is an improvement compared to the previous two years. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

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

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

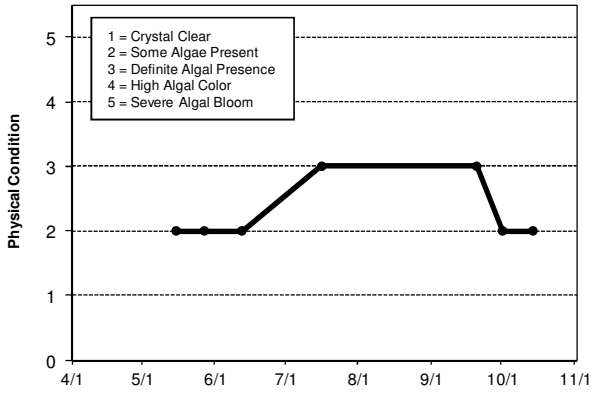






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/15/2011	15.8				4.9	35		1.5	2	4
5/27/2011	17.1				3	31		1.7	2	4
6/12/2011	20.4				5.1	26		1.6	2	4
7/16/2011	26.1				5.8	30		1.1	3	4
9/20/2011	25.6				8.9	37		1.2	3	4
10/1/2011	18.5				9.7	24		1.6	2	4
10/14/2011	16.9				12	51		1.8	2	4



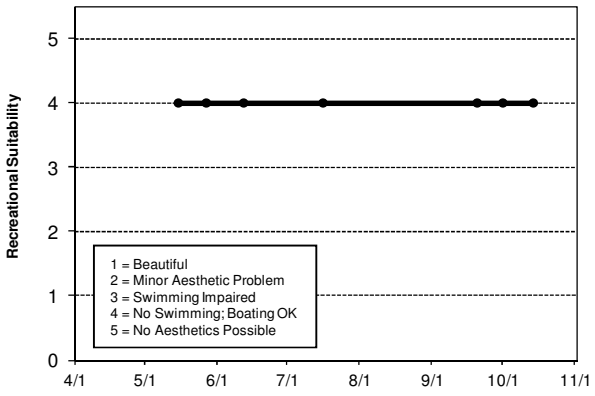
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		C	C	C	C	D	D	B
Chlorophyll a		B	A	A	B	D	C	A
Secchi Depth		C	C	F	C	D	D	C
Lake Grade		**C**	**B**	**C**	**C**	**D**	**D**	**B**

Source: Metropolitan Council and STORET data



O'Dowd Lake (70-0095) *City of Shakopee*

O'Dowd Lake is located in both Louisville Township and the City of Shakopee (Scott County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake's surface area is 258 acres and has a maximum depth of 6.7 m (roughly 22 feet). Approximately 63 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	32.2	18.0	51.0	C
CLA (µg/l)	23.9	2.6	57.0	C
Secchi (m)	1.6	0.7	2.7	C
TKN (mg/l)	1.10	0.76	1.70	
			Lake Grade	C

The lake received a lake grade of C for 2011. The lake's water quality seems to be represented by a lake grade of C with the occassional D according to its historical CAMP database.

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

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

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

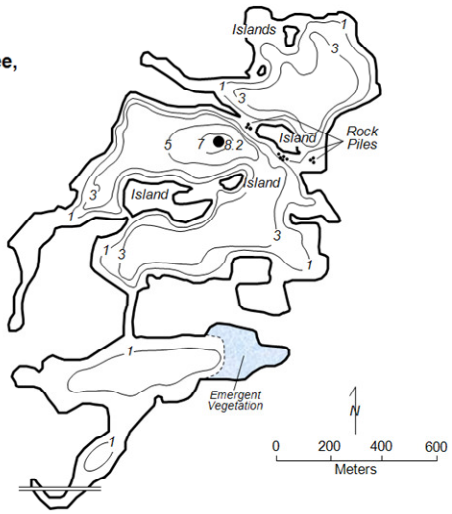
O'Dowd Lake

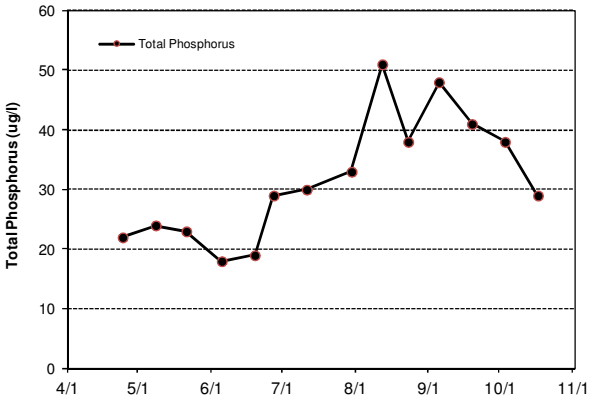
Louisville Twp./Shakopee, Scott Co.

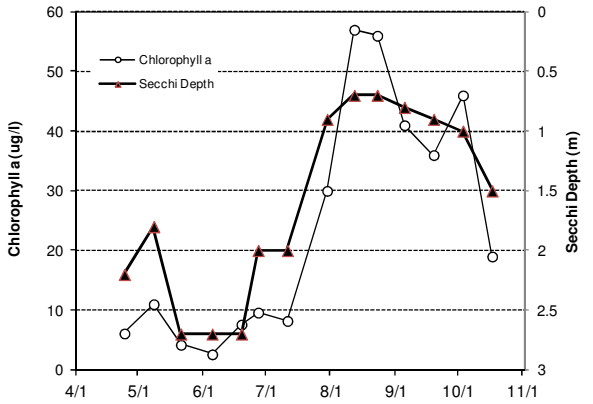
LAKE ID: 700095-00
WMO: Shakopee Basin
Volunteers: Sandy & Mike Boyce

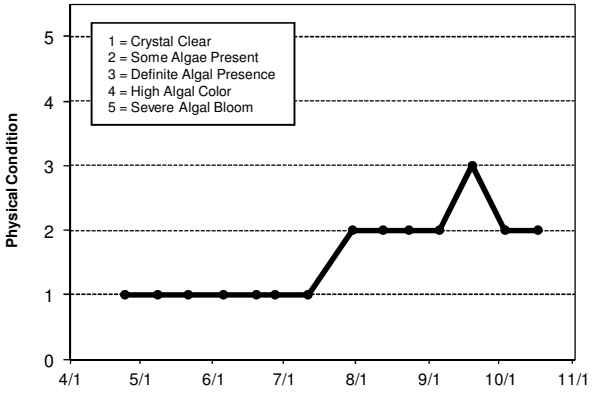
● Sampling site

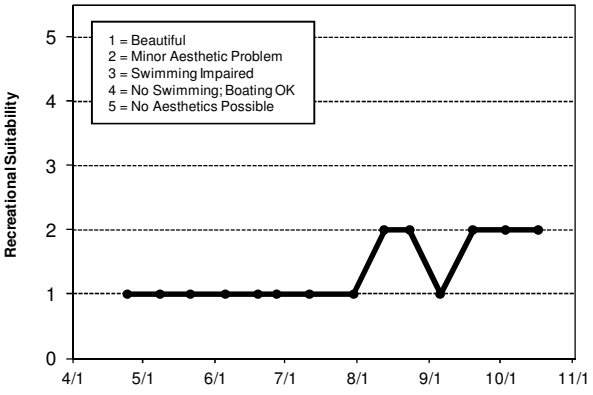
Contours in meters











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	7.9				6.1	22		2.2	1	1
5/8/2011	12.9				11	24		1.8	1	1
5/21/2011	17.6				4.2	23		2.7	1	1
6/5/2011	23.5				2.6	18		2.7	1	1
6/19/2011	22.4				7.6	19		2.7	1	1
6/27/2011	21.7				9.6	29		2	1	1
7/11/2011	27.8				8.2	30		2	1	1
7/30/2011	29.6				30	33		0.9	2	1
8/12/2011	26.5				57	51		0.7	2	2
8/23/2011	26.7				56	38		0.7	2	2
9/5/2011	24.6				41	48		0.8	2	1
9/19/2011	19				36	41		0.9	3	2
10/3/2011	16.6				46	38		1	2	2
10/17/2011	14.7				19	29		1.5	2	2

Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus					C							
Chlorophyll a					C							
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	2009	2010	2011
Total Phosphorus		C	D	C	C	C	C	C
Chlorophyll a		D	C	D	C	C	C	C
Secchi Depth		C	D	C	C	C	C	C
Lake Grade		**C**	**D**	**C**	**C**	**C**	**C**	**C**

Source: Metropolitan Council and STORET data

Olson Lake (82-0103) *Valley Branch Watershed District*

Primary Volunteer Report

Olson Lake is located in the City of Lake Elmo (Washingon County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007). The lake has a surface area of 89 acres and a mean and maximum depth of 2.1 (6.9 feet) and 4.5 m (14.8 feet). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	18.9	12.0	31.0	A
CLA (µg/l)	8.0	2.1	23.0	A
Secchi (m)	3.5	1.8	5.0	A
TKN (mg/l)	0.80	0.59	1.10	
			Lake Grade	A

The lake received a lake grade of A for 2011 according to the primary volunteer's data. This grade is consistent with much of its historical water quality database. Also, the historical water quality database 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. For the past decade, the lake has recorded lake grades varying between A and B.

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

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

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

Lake Olson

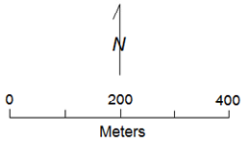
Lake Elmo, Washington Co.

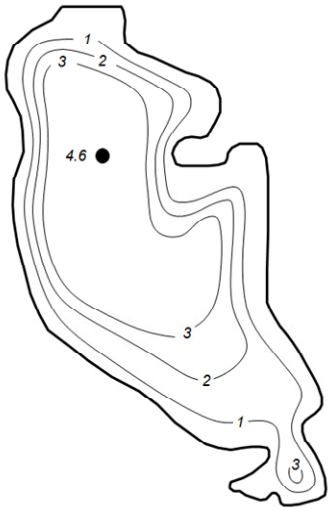
Primary Report

Lake ID: 820103-00
WD: Valley Branch
Volunteer: Bob Meier

● Sampling site

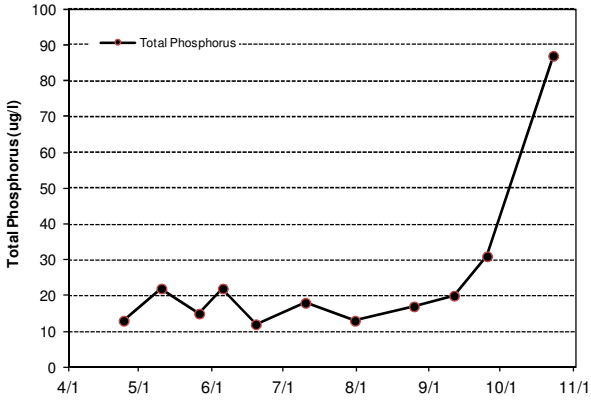
Contours in meters

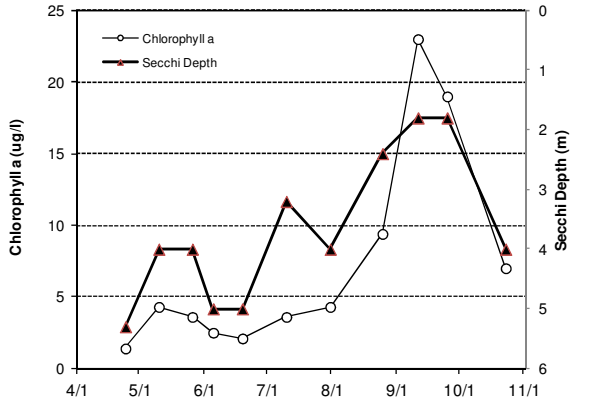


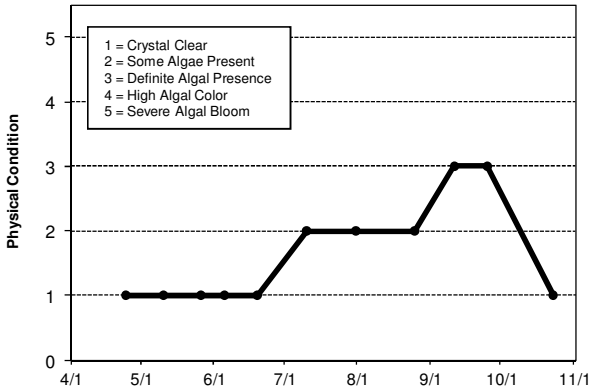


2011 Data

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 (1-5)	RS (1-5)
4/24/2011	10.8				1.4	13		5.3	1	1
5/10/2011	15.6				4.3	22		4	1	
5/26/2011	19.1				3.6	15		4	1	1
6/5/2011	24.2				2.5	22		5	1	1
6/19/2011	23.1				2.1	12		5	1	1
7/10/2011	29.8				3.6	18		3.2	2	1
7/31/2011	28.9				4.3	13		4	2	
8/25/2011	27.6				9.4	17		2.4	2	2
9/11/2011	25.9				23	20		1.8	3	2
9/25/2011	17.9				19	31		1.8	3	
10/23/2011	12.4				7	87		4	1	





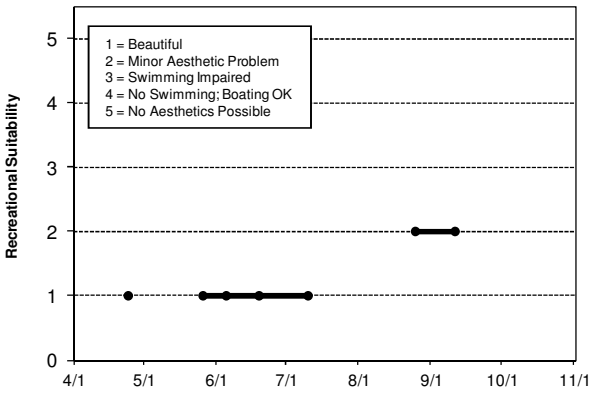


Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus	A	B	C	B	A	A	B	A
Chlorophyll a	A	B	B	A	A	A	B	A
Secchi Depth	A	B	B	B	B	A	B	A
Lake Grade	**A**	**B**	**B**	**B**	**A**	**A**	**B**	**A**



Source: Metropolitan Council and STORET data

Olson Lake (82-0103) *Valley Branch Watershed District*

Secondary Volunteer Report

Olson Lake is located in the City of Lake Elmo (Washingon County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007). The lake has a surface area of 89 acres and a mean and maximum depth of 2.1 (6.9 feet) and 4.5 m (14.8 feet). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	22.2	12.0	32.0	A
CLA (µg/l)	7.1	2.3	20.0	A
Secchi (m)	4.1	2.0	5.8	A
TKN (mg/l)	0.99	0.80	1.20	
			Lake Grade	A

The lake received a lake grade of A for 2011 according to the secondary volunteer's data. This grade is consistent with much of its historical water quality database. Also, the historical water quality database 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. For the past decade, the lake has recorded lake grades varying between A and B.

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

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

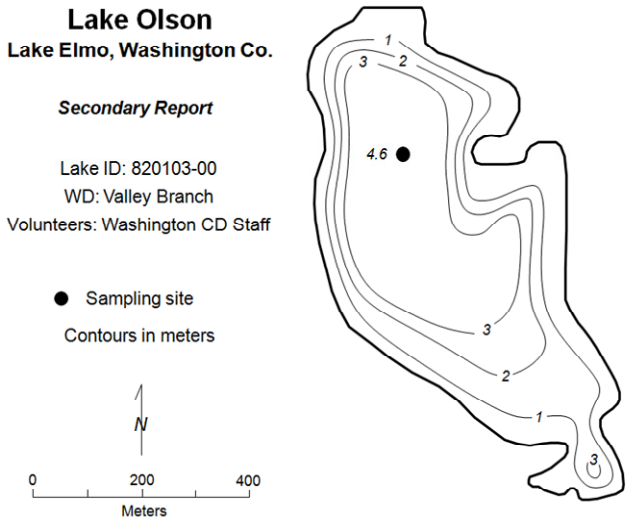
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lake Olson

Lake Elmo, Washington Co.

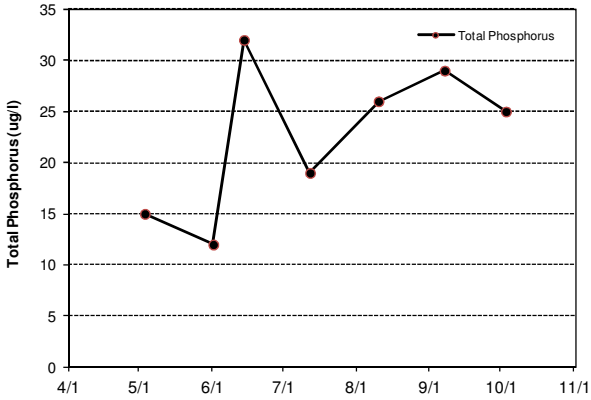
Secondary Report

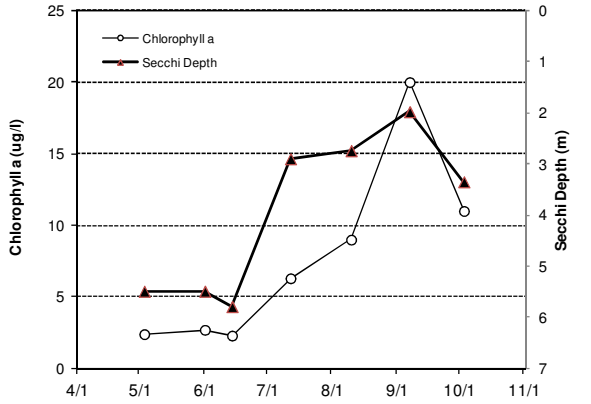
Lake ID: 820103-00
WD: Valley Branch
Volunteers: Washington CD Staff

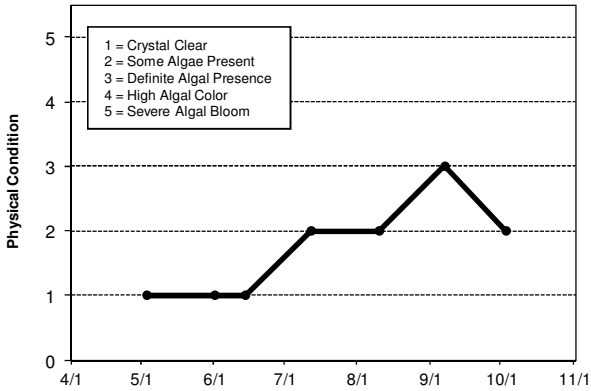


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/3/2011	8.3	7.8	10.8	11.1	2.4	15		5.49	1	1
6/1/2011	18.6	13.9	8.2	0.2	2.7	12		5.49	1	1
6/14/2011	21.1	17.7	9.6	0.1	2.3	32		5.79	1	1
7/12/2011	27.5	21.2	9.8	0.2	6.3	19		2.9	2	2
8/10/2011	26.1	22.3	6.9	0	9	26		2.74	2	2
9/7/2011	24.1	22.1	8.2	0.1	20	29		1.98	3	3
10/3/2011	16.6	15.3	9.1	0.1	11	25		3.35	2	3





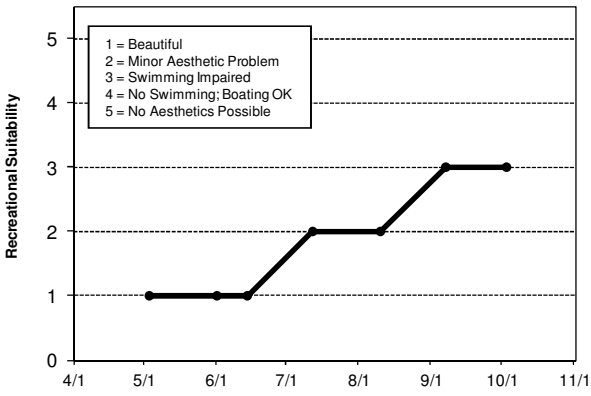


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus					C							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	2009	2010	2011
Total Phosphorus	A	B	C	B	A	A	B	A
Chlorophyll a	A	B	B	A	A	A	B	A
Secchi Depth	A	B	B	B	B	A	B	A
Lake Grade	**A**	**B**	**B**	**B**	**A**	**A**	**B**	**A**



Source: Metropolitan Council and STORET data

Oneka Lake (82-0140) *Rice Creek Watershed District*

Oneka Lake is located in the City of Hugo (Washingon County). It is considered a Priority Lake by the Metropolitan Council for its recreational value. The lake has a surface area of 381 acres, and a maximum depth of 2.1 (6.9 feet). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	35.8	20.0	79.0	C
CLA (µg/l)	4.3	1.6	13.0	A
Secchi (m)				
TKN (mg/l)	1.29	0.97	1.50	
			Lake Grade	

Secchi depth measurements were not made in 2011 mainly due to the heavy macrophyte density which blocked the view of the Secchi disk. The grades for TP and CLA are consistent with the grades received for the past decade. TP has varied between A and C for the past 13 years.

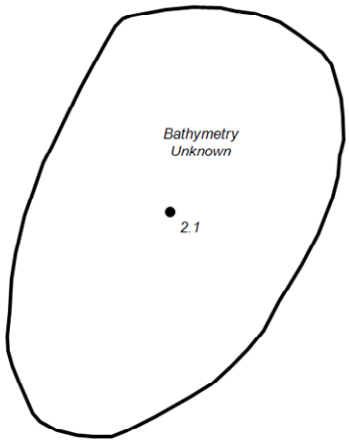
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

Oneka Lake
Hugo, Washington Co.

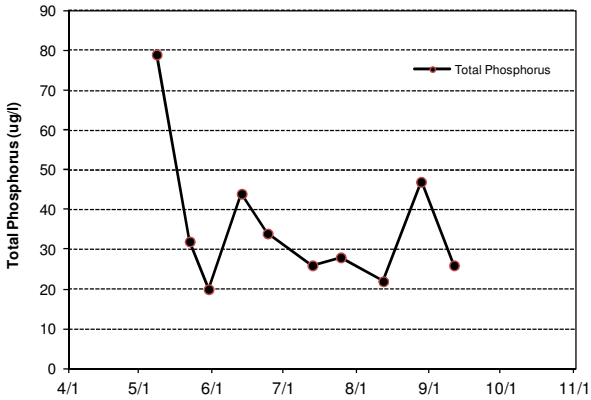
Lake ID: 820140-00
WD: Rice Creek
Volunteer: Paul Bolstad

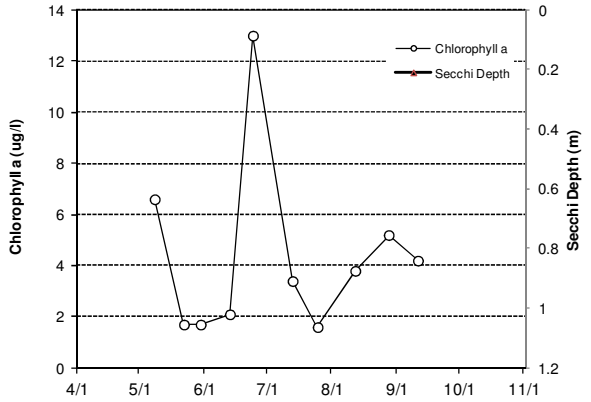
● Sampling site
Contours in meters

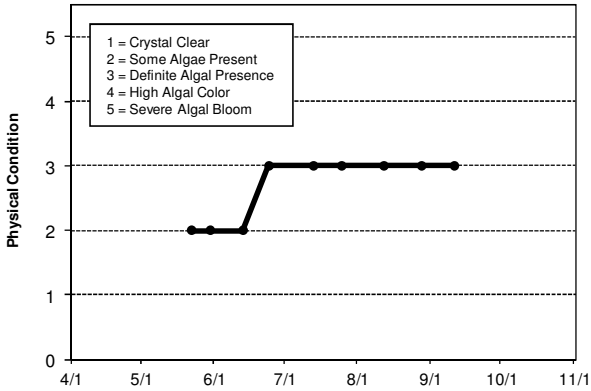


2011 Data

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 (1-5)	RS (1-5)
5/8/2011	10.7				6.6	79				
5/22/2011	15.4				1.7	32			2	1
5/30/2011	15.7				1.7	20			2	1
6/13/2011	19.1				2.1	44			2	1
6/24/2011	21.2				13	34			3	
7/13/2011	29.5				3.4	26			3	1
7/25/2011	28.9				1.6	28			3	
8/12/2011	25.9				3.8	22			3	2
8/28/2011	25.1				5.2	47			3	2
9/11/2011	26.2				4.2	26			3	3





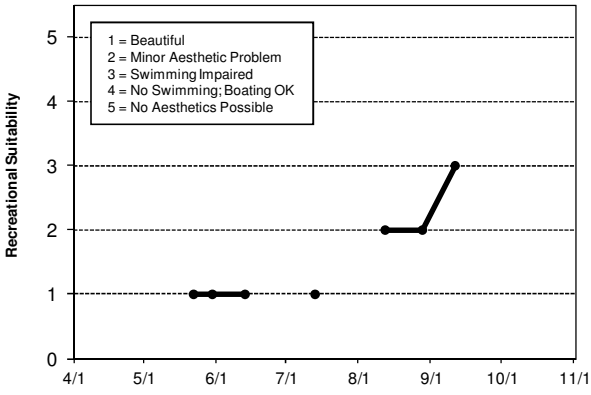


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	A						A	C
Chlorophyll a	A						A	A
Secchi Depth	C							
Lake Grade	**B**							**NA**



Source: Metropolitan Council and STORET data

Orchard Lake (19-0031) *Black Dog Lake Watershed Management Organization*

Orchard Lake is located in the City of Lakeville (Dakota County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a surface area of 250 acres.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	29.7	13.0	115.0	B
CLA (µg/l)	5.6	2.2	9.7	A
Secchi (m)	2.7	1.6	4.4	B
TKN (mg/l)	0.80	0.50	1.30	
			Lake Grade	B

The lake received a lake grade of B for 2011. The CLA grade continues the A grades received in 2009 and 2010.

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

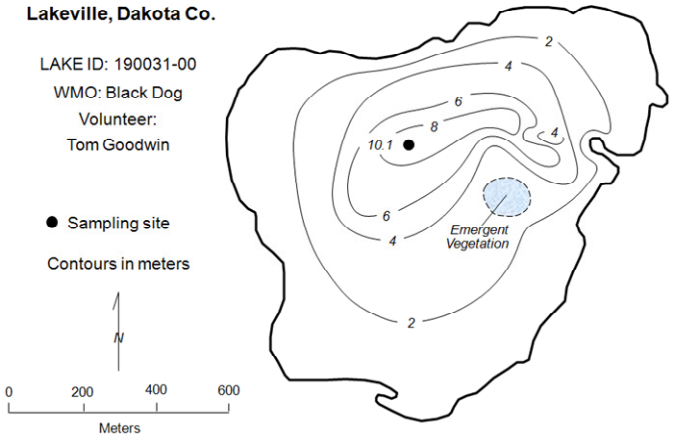
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

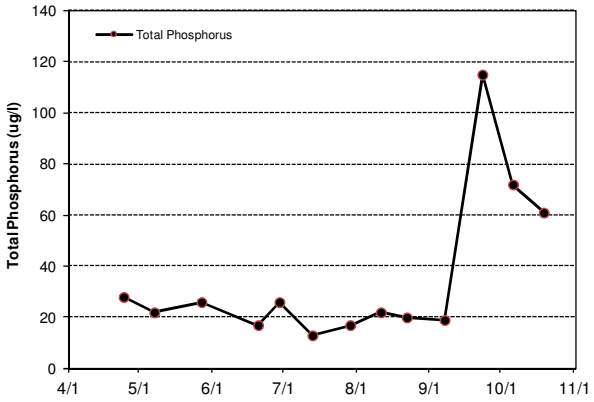
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

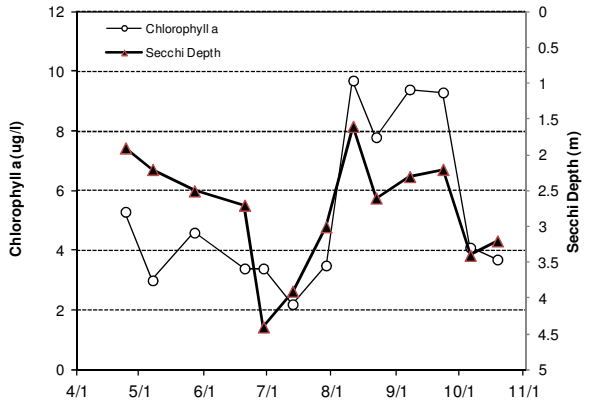
Orchard Lake

Lakeville, Dakota Co.

LAKE ID: 190031-00
WMO: Black Dog
Volunteer:
Tom Goodwin

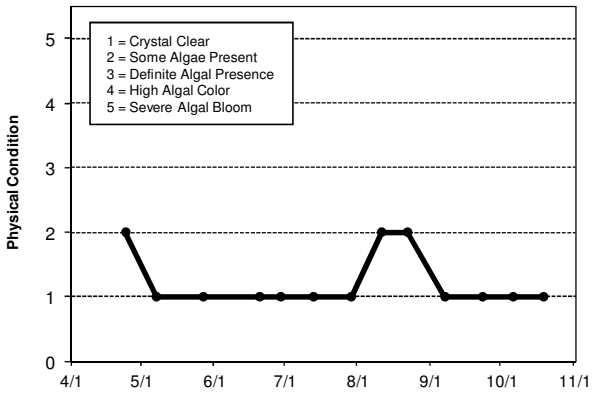






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(ºC)	(ºC)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	8.6				5.3	28		1.9	2	1
5/7/2011	15				3	22		2.2	1	1
5/27/2011	17.7				4.6	26		2.5	1	1
6/20/2011	22.3				3.4	17		2.7	1	1
6/29/2011	23.7				3.4	26		4.4	1	1
7/13/2011	27.4				2.2	13		3.9	1	2
7/29/2011	30.4				3.5	17		3	1	1
8/11/2011	26.8				9.7	22		1.6	2	1
8/22/2011	25.3				7.8	20		2.6	2	2
9/7/2011	25.3				9.4	19		2.3	1	1
9/23/2011	17.4				9.3	115		2.2	1	1
10/6/2011	17.8				4.1	72		3.4	1	1
10/19/2011	12.9				3.7	61		3.2	1	1

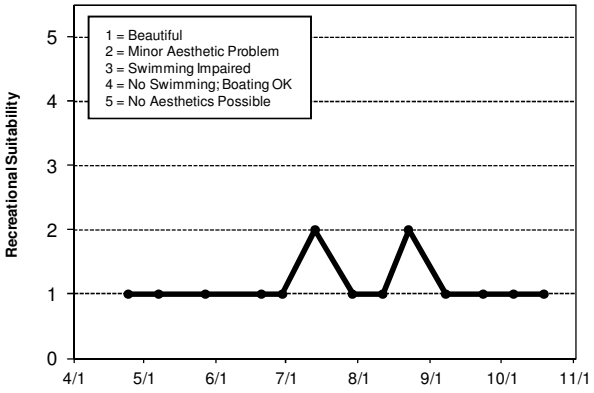


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	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	2009	2010	2011
Total Phosphorus	C	B	C	C	A	A	B	B
Chlorophyll a	B	B	B	C	B	A	A	A
Secchi Depth	B	B	B	C	A	A	A	B
Lake Grade	**B**	**B**	**B**	**C**	**A**	**A**	**A**	**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 are few known morphological data available for the lake.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	60.3	40.0	97.0	C
CLA (µg/l)	17.4	4.0	64.0	B
Secchi (m)	2.5	0.9	4.3	B
TKN (mg/l)	1.07	0.72	1.60	
			Lake Grade	B

The lake received a lake grade of B. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

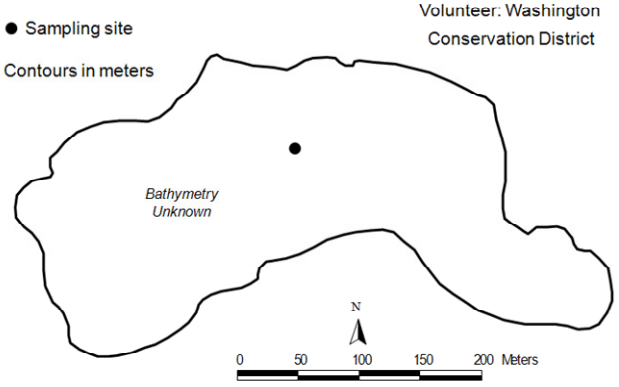
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

Pat Lake

Grant, Washington Co.

Lake ID: 820125-00
WD: Browns Creek
Volunteer: Washington Conservation District



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/12/2011	12	7.3	11.3	0.1	18	59		1.22	2	4
4/29/2011	9	8.2	10.5	0.1	7.5	48		2.44	2	4
5/10/2011	16.7	8.3	10	0.2	7.2	40		2.9	2	3
5/24/2011	19.6	9.9	8.3	0.1	11	46		2.74	2	2
6/6/2011	25.1	13.2	7.8	0.1	4	47		3.66	2	2
6/24/2011	19.4	16.5	6.8	0	17	86		2.29	3	3
7/6/2011	27.2	15.1	11.4	0	25	73		0.91	3	4
7/20/2011	29.5	15	8.4	0.1	26	55		1.52	3	4
8/2/2011	27.3	15.4	5.1	0	64	97		1.52	3	3
8/16/2011	26.3	14.8	8.7	0	4	56		2.44	2	3
8/30/2011	24	16.1	7.4	0.1	18	50		2.44	2	2
9/12/2011	24.5	15.9	9.6	0.1	6.9	68		2.44	3	2
9/26/2011	15.8	14.2	10.9	7.8	7.8	45		4.27	2	2
10/11/2011	17.8	14.7	9.3	0.1	5.7	25		3.51	1	1

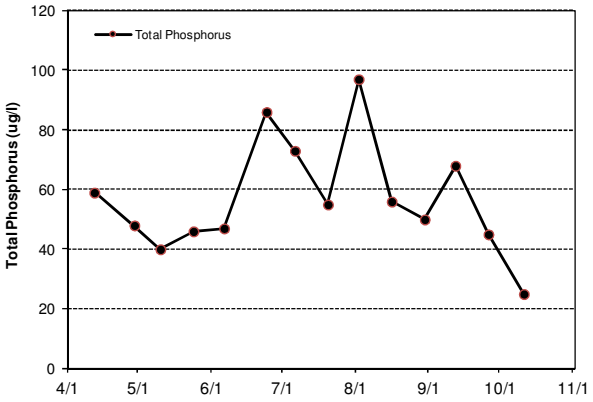
Lake Water Quality Grades Based on Summertime Averages

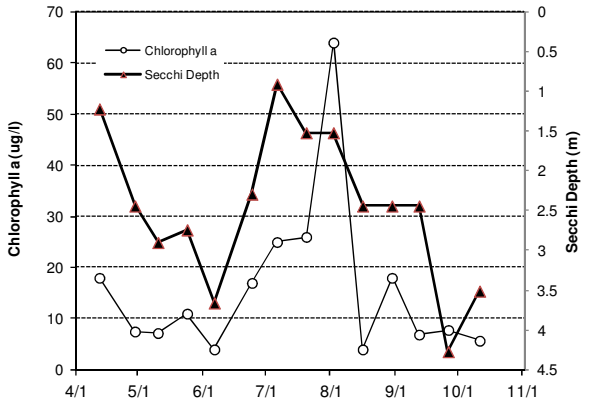
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

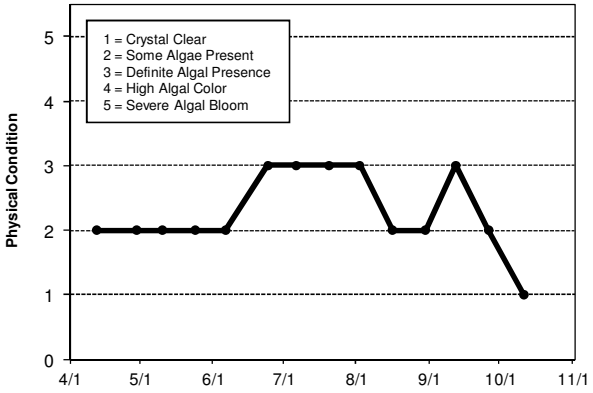
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

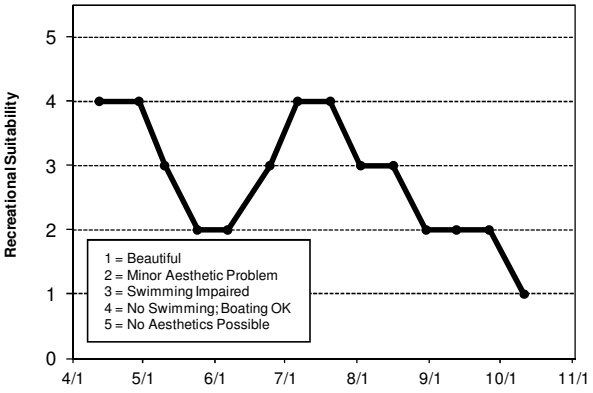
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			D	C	C	C	C	C
Chlorophyll a			C	A	B	B	B	B
Secchi Depth			C	C	C	C	C	B
Lake Grade			**C**	**B**	**C**	**C**	**C**	**B**

Source: Metropolitan Council and STORET data









Penn Lake (27-0004) *Nine Mile Creek Watershed District*

Penn Lake is located in the City of Bloomington (Hennepin County). It has a maximum depth of 2.1 m (7.0 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

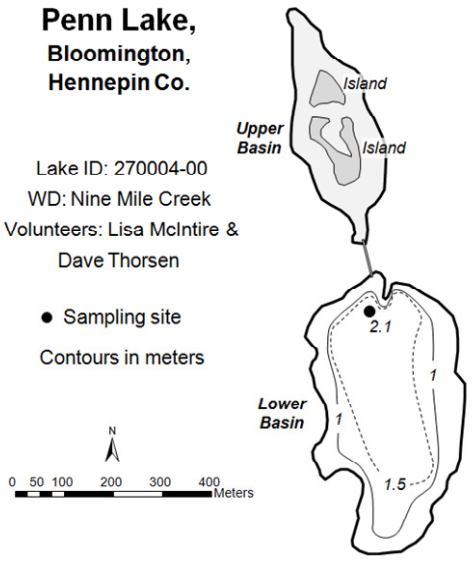
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	139.3	50.0	367.0	D
CLA (µg/l)				
Secchi (m)	0.5	0.3	1.0	F
TKN (mg/l)	1.82	0.90	4.80	
			Lake Grade	

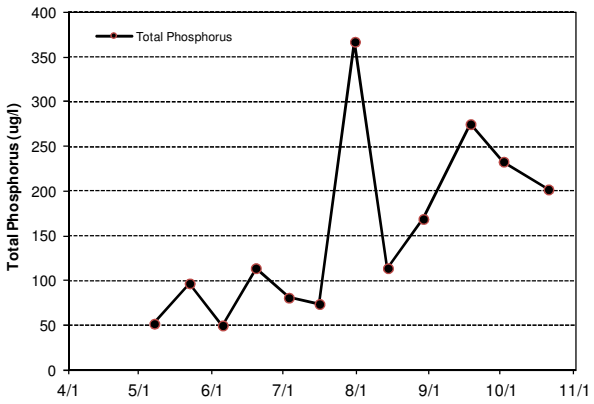
This lake did not receive a lake grade for 2011 because there was no CLA data to calculate the CLA grade. At least 5 monitoring events are needed during the summer time period to calculate a parameter grade. All three parameter grades are needed to calculate a lake grade. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

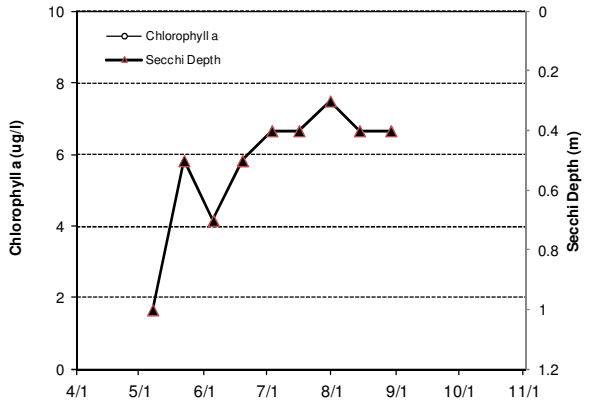
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

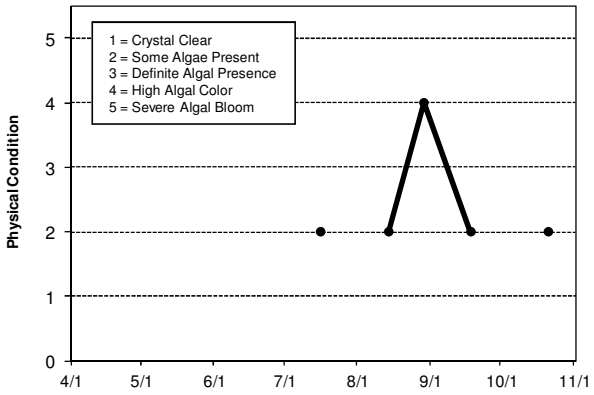






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/7/2011	18.2					52		1		4
5/22/2011	18.8					97		0.5		4
6/5/2011	28.4					50		0.7		4
6/19/2011	24.5					114		0.5		4
7/3/2011	31					81		0.4		4
7/16/2011	25.2					74		0.4	2	4
7/31/2011	31.4					367		0.3		4
8/14/2011	28.5					114		0.4	2	4
8/29/2011	27					169		0.4	4	4
9/18/2011	14.7					275			2	4
10/2/2011	15.4					233				4
10/21/2011	6.4					202			2	4

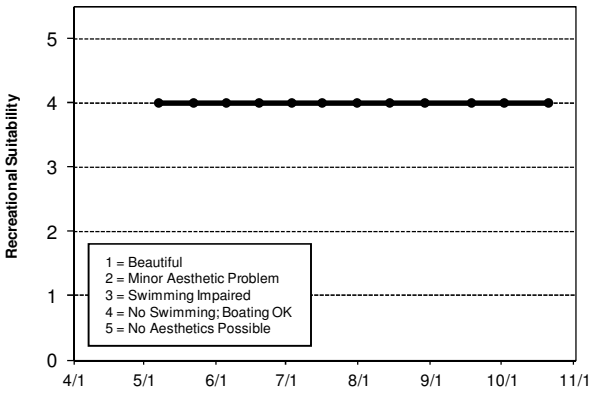


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus						F	F	D
Chlorophyll a						F	F	
Secchi Depth	F					F	F	F
Lake Grade						**F**	**F**	**NA**



Source: Metropolitan Council and STORET data

Peter Lake (27-0147-02) *Pioneer Sarah Creek Watershed Management Commission*

Peter Lake is located in the City of Medina (Hennepin County). It has a maximum depth of 20.7 m (68 ft). This was the first year that the lake was part of the CAMP.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	50.0	29.0	71.0	
CLA (µg/l)	8.6	2.1	15.0	
Secchi (m)	4.2	4.2	4.2	
TKN (mg/l)	0.97	0.63	1.30	
			Lake Grade	

There was an insufficient quantity of data to calculate grades for the lake . At least 5 monitoring events during the summer-time period (May – September) are needed. Only 2 monitoring events occurred during that period. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

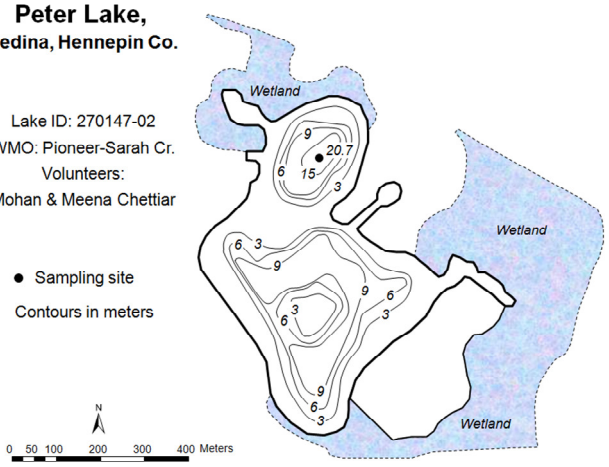
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

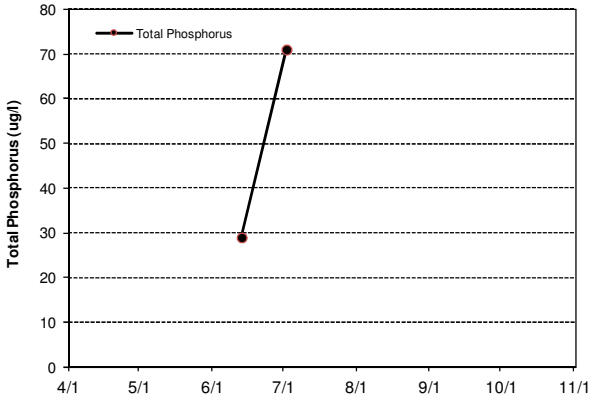
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

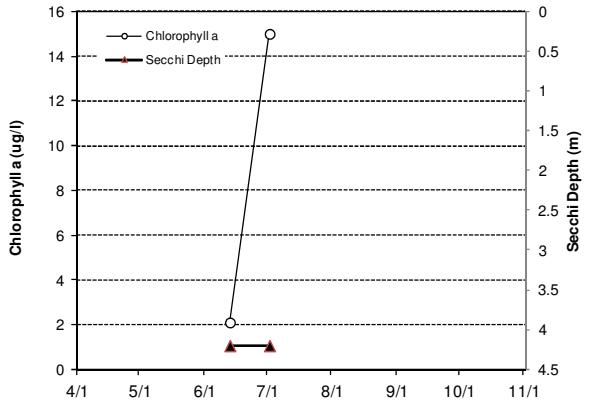
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Peter Lake,
Medina, Hennepin Co.

Lake ID: 270147-02
WMO: Pioneer-Sarah Cr.
Volunteers:
Mohan & Meena Chettiar

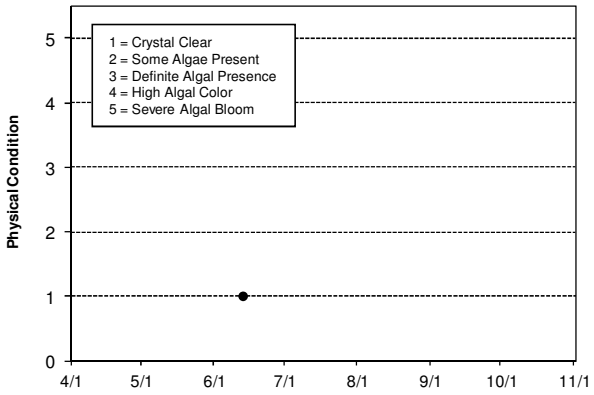






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/13/2011	20.6				2.1	29		4.2	1	1
7/2/2011	27.3				15	71		4.2		1

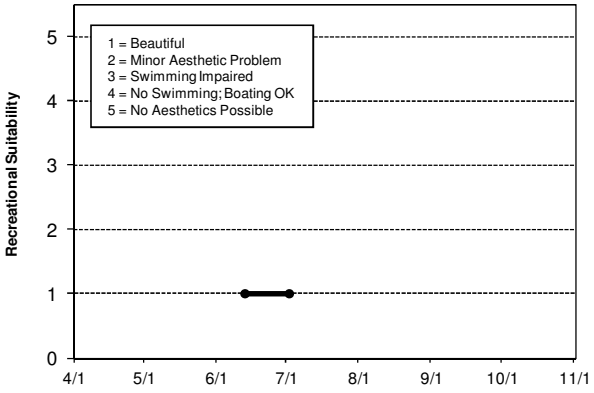


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus						C		
Chlorophyll a						B		
Secchi Depth						A		
Lake Grade						**B**	**NA**	**NA**



Source: Metropolitan Council and STORET data

Pike Lake (27-0111-02) *Shingle Creek Watershed Mangement Commission*

Pike Lake is located in the Cities of Maple Grove and Plymouth (Hennepin County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a maximum depth of 6.7 m (22 feet). Most of the lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	47.0	37.0	60.0	C
CLA (µg/l)	15.7	6.5	29.0	B
Secchi (m)	1.5	1.0	2.1	C
TKN (mg/l)	0.91	0.73	1.30	
			Lake Grade	C

The lake received a lake grade of C, which is consistent with its historical water quality database. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

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

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/.

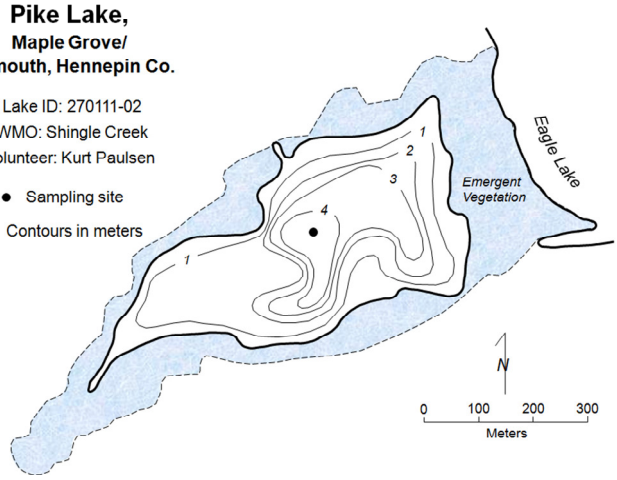
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

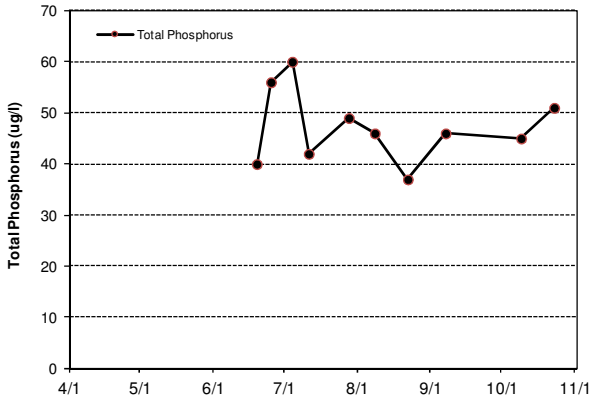
Pike Lake,
Maple Grove/
Plymouth, Hennepin Co.

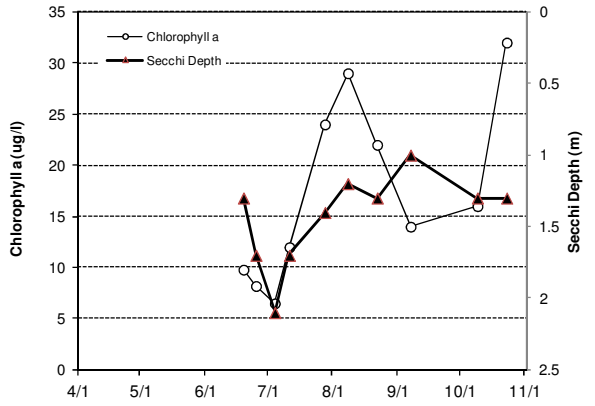
Lake ID: 270111-02
WMO: Shingle Creek
Volunteer: Kurt Paulsen

● Sampling site

Contours in meters

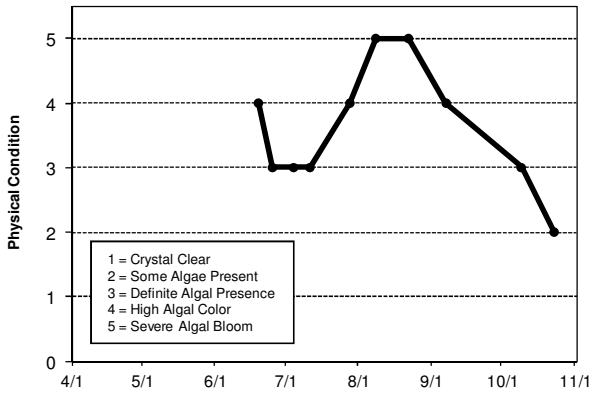






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/19/2011	21.3				9.8	40		1.3	4	4
6/25/2011	21				8.2	56		1.7	3	4
7/4/2011	28				6.5	60		2.1	3	4
7/11/2011	28.9				12	42		1.7	3	4
7/28/2011	29.1				24	49		1.4	4	4
8/8/2011	28.6				29	46		1.2	5	4
8/22/2011	25.6				22	37		1.3	5	4
9/7/2011	24.5				14	46		1	4	4
10/9/2011	18.5				16	45		1.3	3	4
10/23/2011	10.4				32	51		1.3	2	4

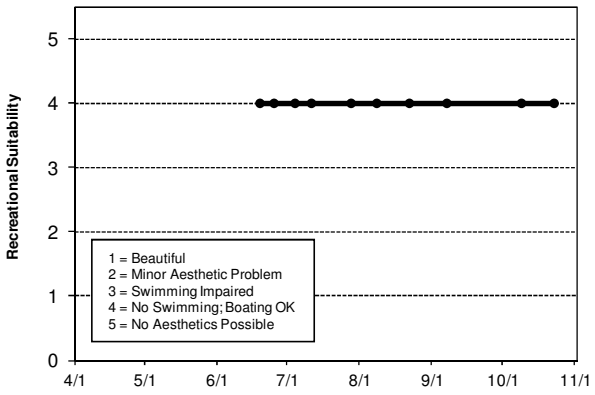


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus				C		D		C
Chlorophyll a				B		C		B
Secchi Depth				D		D		C
Lake Grade				**C**		**D**		**C**



Source: Metropolitan Council and STORET data

Pine Tree Lake (82-0122) *Rice Creek Watershed District*

Pine Tree Lake, located on the eastern edge of the City of Dellwood (Washington County), covers an area of 174 acres. It has a maximum depth of 7.9 m (26 feet), and a mean depth of 3.0 m (10 feet).

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

2011 summer (May-September) data summary

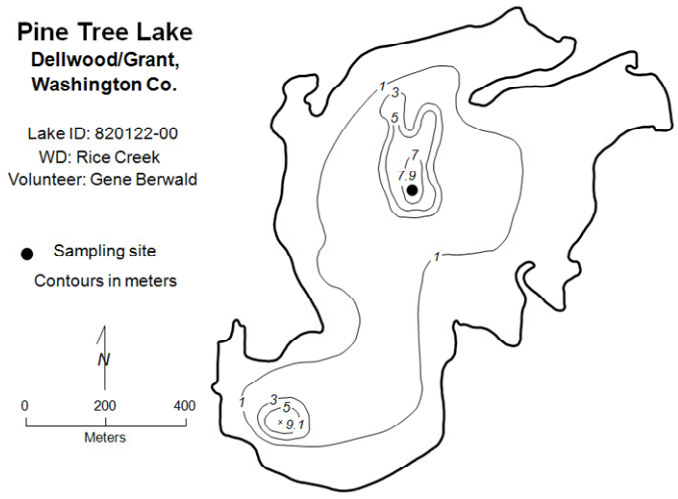
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	24.8	14.0	36.0	B
CLA (µg/l)	4.6	3.1	7.4	A
Secchi (m)	2.7	2.0	3.1	B
TKN (mg/l)	0.86	0.73	1.10	
			Lake Grade	B

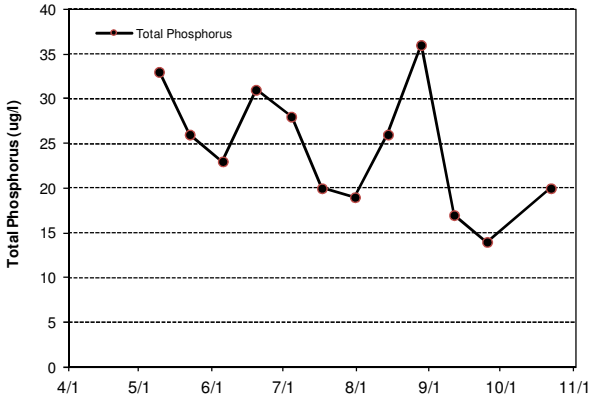
The lake received a lake grade of B, which similar to lake grades received in the mid 2000's, but lower than the A's received in the past two years. Continued monitoring is suggested to determine the trend direction, if any, of the varying water quality of this lake.

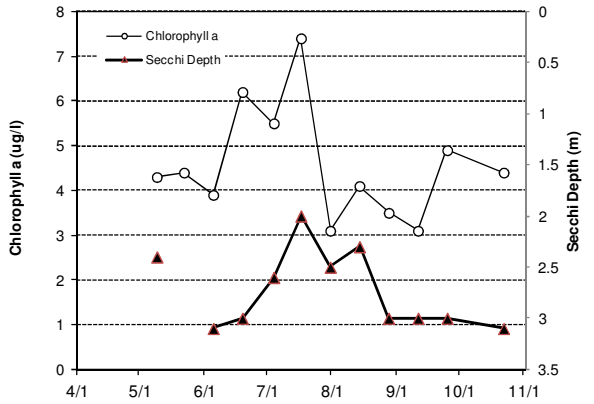
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

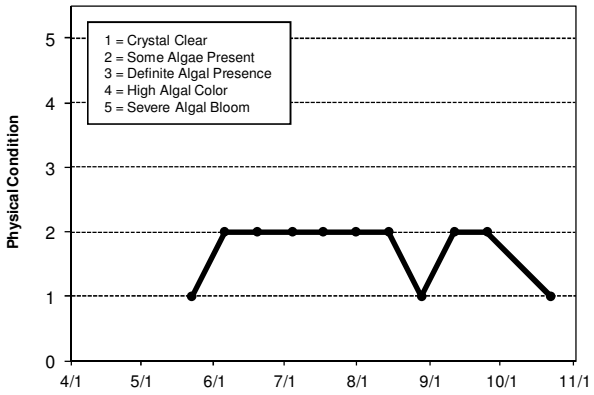
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

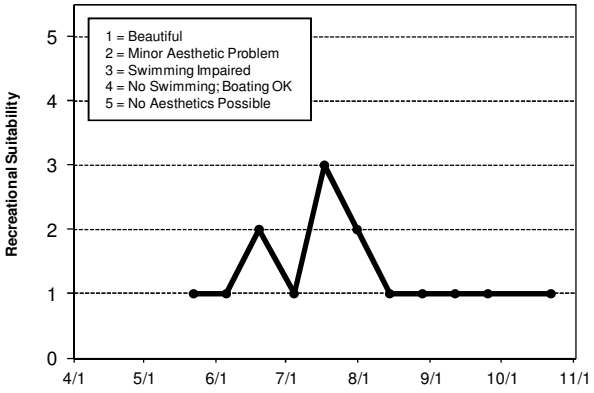
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/9/2011	14.3				4.3	33		2.4		
5/22/2011	18.2				4.4	26			1	1
6/5/2011	24.6				3.9	23		3.1	2	1
6/19/2011	23.2				6.2	31		3	2	2
7/4/2011	27.8				5.5	28		2.6	2	1
7/17/2011	28.2				7.4	20		2	2	3
7/31/2011	31.1				3.1	19		2.5	2	2
8/14/2011	25.8				4.1	26		2.3	2	1
8/28/2011	24.9				3.5	36		3	1	1
9/11/2011	25				3.1	17		3	2	1
9/25/2011	17.2				4.9	14		3	2	1
10/22/2011	10.1				4.4	20		3.1	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						
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
Chlorophyll a		A	A	C	B	A	B	B	A	A	B	C
Secchi Depth		C	B	C	C	B	C	C	A	B	C	C
Lake Grade		**B**	**B**	**C**	**C**	**B**	**B**	**B**	**B**	**B**	**C**	**C**

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	B	B	C	B	B	A	A	B
Chlorophyll a	A	B	A	A	B	A	A	A
Secchi Depth	B	B	B	B	B	A	A	B
Lake Grade	**B**	**B**	**B**	**B**	**B**	**A**	**A**	**B**

Source: Metropolitan Council and STORET data

Plaisted Lake (82-0148) *Washington Conservation District*

Plaisted Lake is located in the City of Hugo (Washington County). Little morphological data is available for the lake.

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

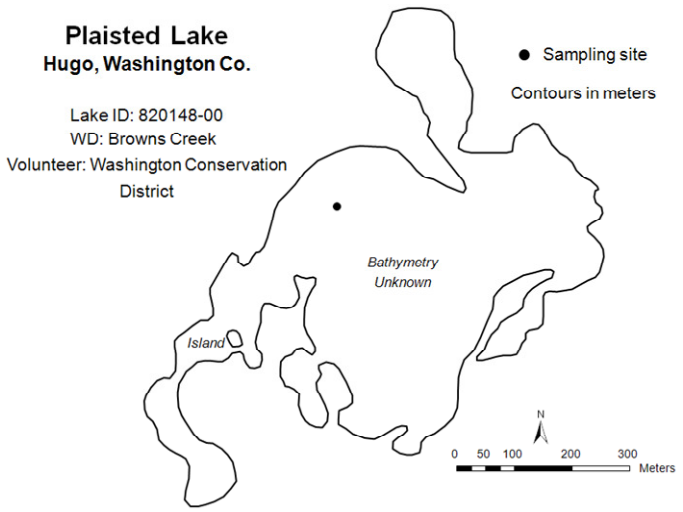
2011 summer (May-September) data summary

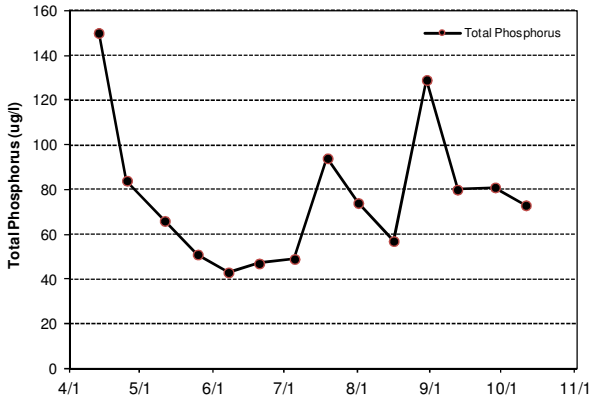
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	70.1	43.0	129.0	D
CLA (µg/l)	32.3	3.5	87.0	C
Secchi (m)	1.7	0.9	3.1	C
TKN (mg/l)	1.64	1.20	2.30	
			Lake Grade	C

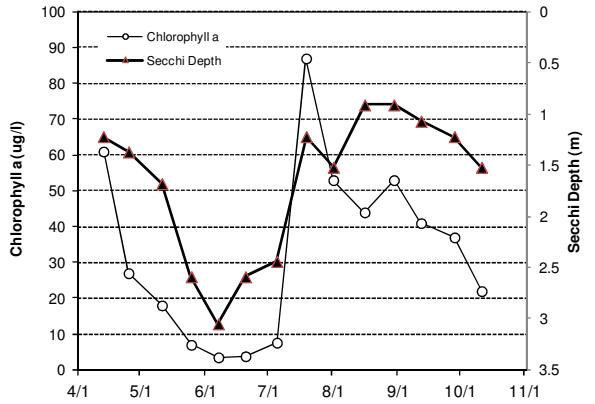
The lake received a lake grade of C, which is consistent with its limited water quality database. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

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

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

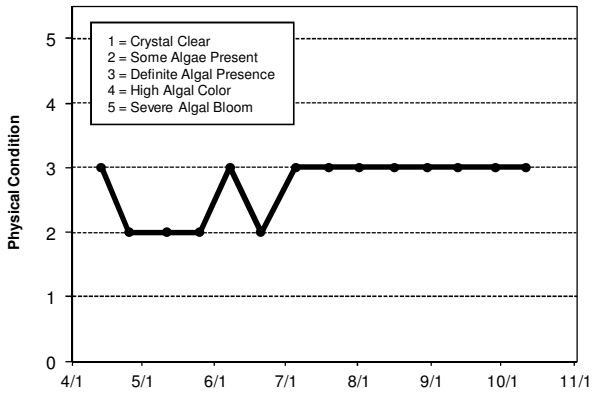






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/13/2011	9.7	6.8	11.6	0.1	61	150		1.22	3	2
4/25/2011	9.6	7.7	13	0.1	27	84		1.37	2	2
5/11/2011	16.5	14.4	10	0.1	18	66		1.68	2	3
5/25/2011	18.3	17.3	7.8	0	7	51		2.59	2	2
6/7/2011	25.9	20.4	8.4	1	3.5	43		3.05	3	2
6/20/2011	22	20.6	8.8	0.1	3.8	47		2.59	2	2
7/5/2011	27.6	22.9	8.3	0	7.6	49		2.44	3	3
7/19/2011	30.3	23.3	10	0.1	87	94		1.22	3	4
8/1/2011	28.7	23.2	7.7	0.1	53	74		1.52	3	4
8/16/2011	26.3	23.4	12.1	0.1	44	57		0.91	3	4
8/30/2011					53	129		0.91	3	4
9/12/2011	23.5	20.8	10.1	0.1	41	80		1.07	3	4
9/28/2011	15.4	15.4	8.6	0.1	37	81		1.22	3	4
10/11/2011	18.9	16.7	8.7	0.1	22	73		1.52	3	3



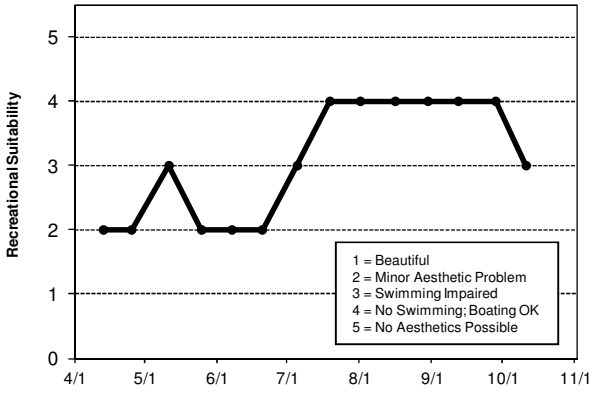
Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus					D	D	D	D
Chlorophyll a					C	C	C	C
Secchi Depth					C	C	C	C
Lake Grade					**C**	**C**	**C**	**C**

Source: Metropolitan Council and STORET data



Powers Lake (82-0092) *City of Woodbury*

Powers Lake is located within the City of Woodbury (Washington County). It has a surface area of approximately 57 acres and a maximum depth of 12.5 m (41.0 feet). The lake has no surface outlet. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

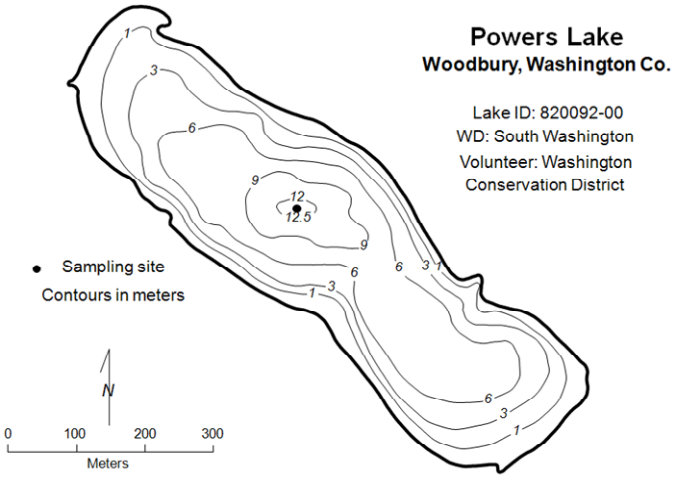
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	51.1	25.0	187.0	C
CLA (µg/l)	22.0	5.3	41.0	C
Secchi (m)	2.4	0.9	4.6	B
TKN (mg/l)	1.15	0.78	1.65	
			Lake Grade	C

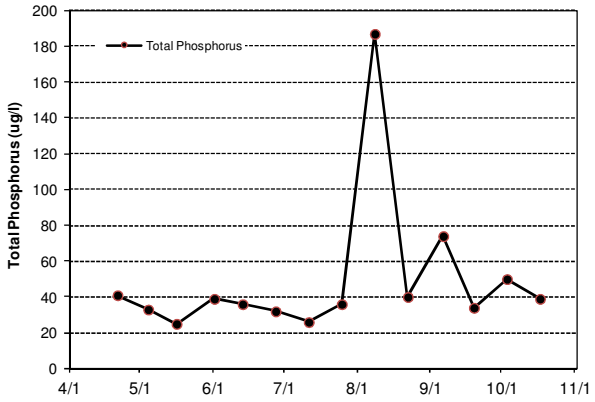
The lake received a lake grade of C. The lake seems to vary in range of A to C grades, although an A lake grade has not been observed since 1999.

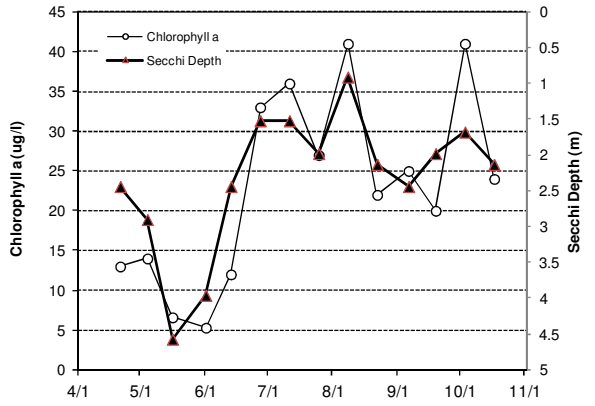
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

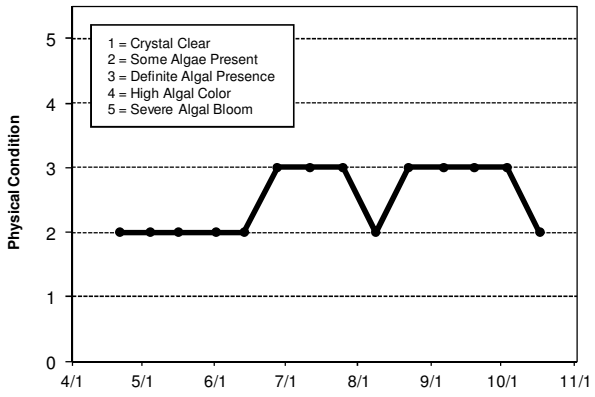
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

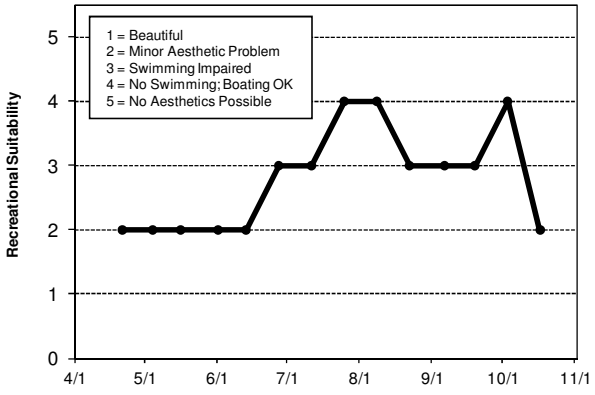
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	5.9	0	10.1	0	13	41	89	2.44	2	2
5/4/2011	8.3	6.8	12.5	0.3	14	33	34	2.9	2	2
5/16/2011	13	7.2	11.3	0.1	6.6	25	63	4.57	2	2
6/1/2011	17.9	7.5	8.6	0.2	5.3	39	49	3.96	2	2
6/13/2011	20.4	7.4	9.5	0.1	12	36	192	2.44	2	2
6/27/2011	21.6	7.6	12.2	0	33	32	278	1.52	3	3
7/11/2011	28	7.9	10.5	0	36	26	227	1.52	3	3
7/25/2011	27.6	8.2	8.5	0	27	36	153	1.98	3	4
8/8/2011	27	0	9.4	0	41	187		0.91	2	4
8/22/2011	24.7	8.3	7.4	0	22	40	180	2.13	3	3
9/6/2011	21.6	8.5	6.3	0.1	25	74	472	2.44	3	3
9/19/2011	17.7	8.5	7	0	20	34	517	1.98	3	3
10/3/2011	15.5	8.6	9	0	41	50	464	1.68	3	4
10/17/2011	13.7	8.8	7.8	0	24	39	585	2.13	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	2009	2010	2011
Total Phosphorus	C	C	C	C	B	B	C	C
Chlorophyll a	C	C	C	B	B	C	C	C
Secchi Depth	C	C	C	C	B	B	C	B
Lake Grade	**C**	**C**	**C**	**C**	**B**	**B**	**C**	**C**

Source: Metropolitan Council and STORET data

Priebe Lake (62-0036) *Rice Creek Watershed District*

Priebe Lake is located in the City of White Bear Lake (Ramsey County). The maximum depth of the lake is 1.5 m (5.0 ft). Other morphological data is unavailable for the lake. The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	123.9	23.0	196.0	D
CLA (µg/l)	70.7	14.0	180.0	D
Secchi (m)	0.5	0.2	0.9	F
TKN (mg/l)	2.08	0.35	3.40	
			Lake Grade	D

The lake received a lake grade of D, which is consistent with its limited database. The Secchi grade of F for 2011 is the same as the secchi grades received for previous monitoring seasons dating back to 1989. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

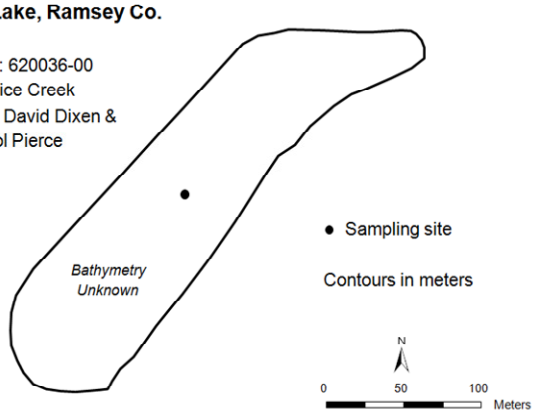
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

Priebe Lake

White Bear Lake, Ramsey Co.

Lake ID: 620036-00
WD: Rice Creek
Volunteers: David Dixen &
Carol Pierce



2011 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 (1-5)	RS (1-5)
5/5/2011	14.7				14	80		0.9	2	3
6/1/2011	23.6				22	77		0.8	2	4
6/13/2011	23				33	23		0.4	4	4
6/27/2011	24				41	110		0.5	4	4
8/6/2011	30				180	189		0.25	5	4
8/22/2011	27.2				130	196		0.25	4	4
9/19/2011	21.1				75	192		0.2	4	4

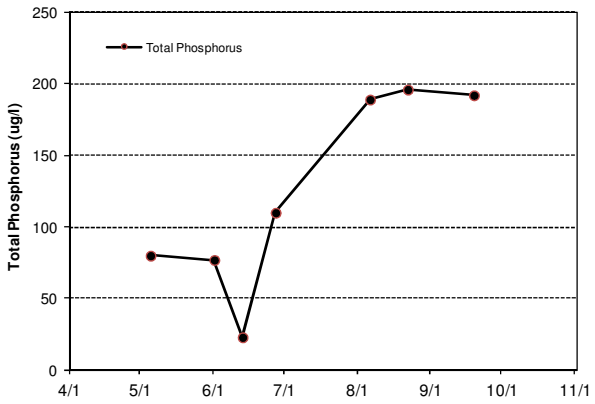
Lake Water Quality Grades Based on Summertime Averages

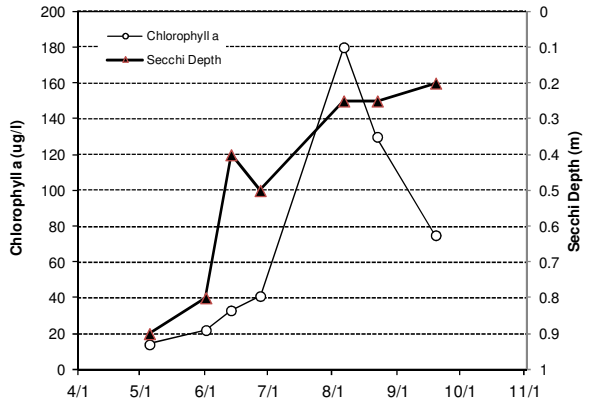
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth										F	F	F
Lake Grade												

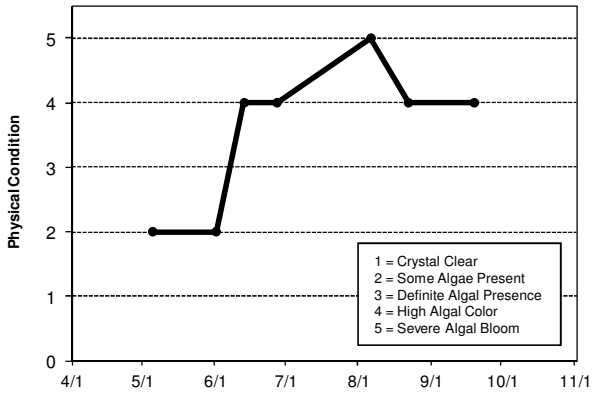
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth						F	F	F				
Lake Grade												

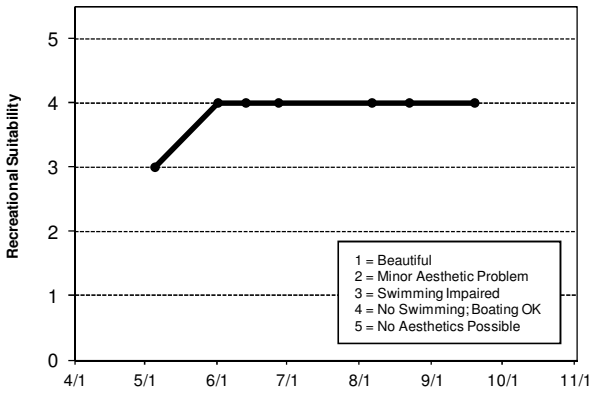
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus					D	D	D	D
Chlorophyll a					F	D		D
Secchi Depth					F	F	F	F
Lake Grade					**F**	**D**		**D**

Source: Metropolitan Council and STORET data









Prior Lake [lower basin, site 1] (70-0026) *Prior Lake - Spring Lake Watershed District*

Prior Lake (lower basin) is located in the City of Prior Lake (Scott County). The lower basin is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lower basin has a surface area of 957 acres. The maximum and mean depths of the basin are 18.3 and 4.1 m (60 and 13 feet), respectively. The lower basin has one inlet, which is the outlet from the upper basin of Prior Lake. The lower basin has one outlet. The outlet structure, located at the southwestern portion of the basin, was installed to regulate surface water elevations.

The MN DNR has designated the lower basin as being infested with Eurasian water milfoil (*Myriophyllum spicatum*) and Zebra mussels (*Dreissena spp.*).

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

2011 summer (May-September) data summary

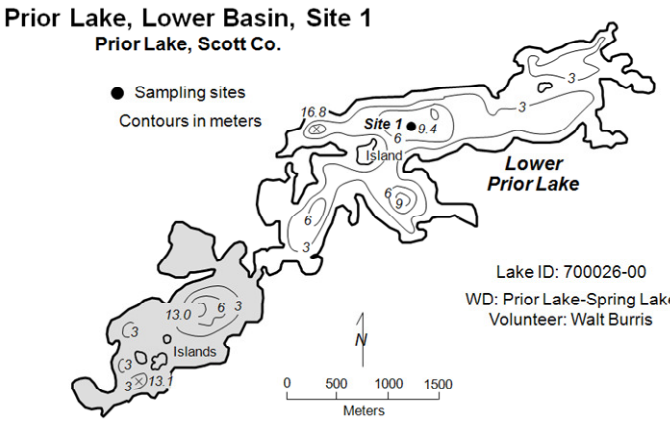
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	19.0	11.0	54.0	A
CLA (µg/l)	4.2	1.0	6.7	A
Secchi (m)	4.3	2.9	7.0	A
TKN (mg/l)	0.89	0.82	1.10	
			Lake Grade	A

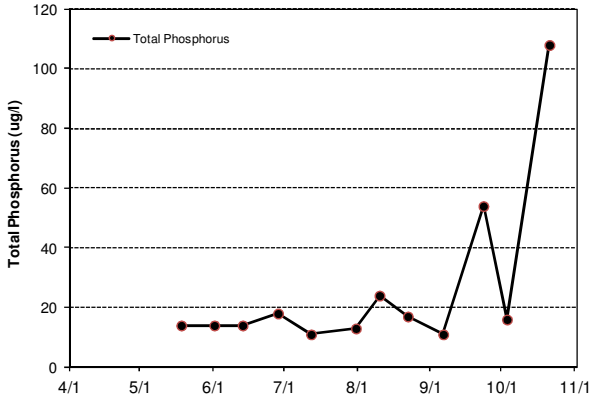
The lower basin received a lake grade of A. The historical lake grades appear to vary from A's to C's, although there has not been a C lake grade observed since 2002. Continued monitoring is suggested to determine the trend direction, if any, of the varying water quality of this lake.

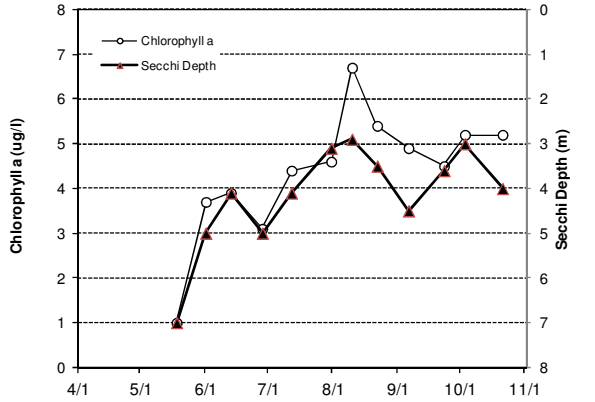
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

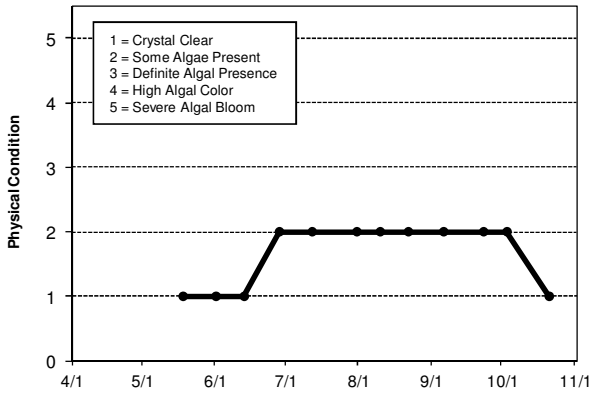






2011 Data

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 (1-5)	RS (1-5)
5/18/2011	14.2				1	14		7	1	1
6/1/2011	17.3				3.7	14		5	1	1
6/13/2011	20.5				3.9	14		4.1	1	1
6/28/2011	22.5				3.1	18		5	2	1
7/12/2011	26.9				4.4	11		4.1	2	1
7/31/2011	29.1				4.6	13		3.1	2	1
8/10/2011	26				6.7	24		2.9	2	1
8/22/2011	25.2				5.4	17		3.5	2	2
9/6/2011	22.7				4.9	11		4.5	2	1
9/23/2011	17.4				4.5	54		3.6	2	1
10/3/2011	17				5.2	16		3	2	1
10/21/2011	11.9				5.2	108		4	1	1



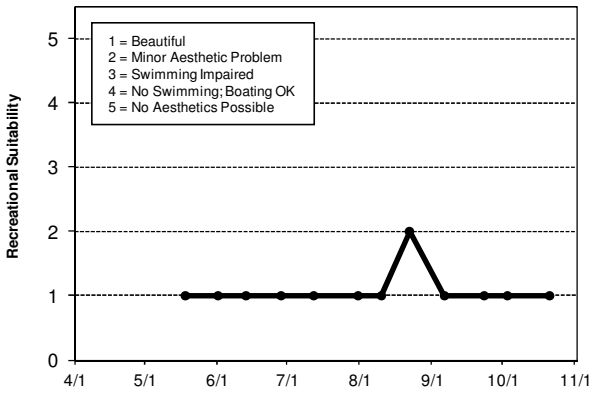
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total Phosphorus	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 SITE1	2009 Site 1	2010 Site 1	2011 Site 1
Total Phosphorus	B	C	C	B	A	C	A	A	B	B	A
Chlorophyll a	B	C	A	B	A	B	B	B	A	A	A
Secchi Depth	B	C	A	B	A	B	B	B	A	B	A
Lake Grade	**B**	**C**	**B**	**B**	**A**	**B**	**B**	**B**	**A**	**B**	**A**

Source: Metropolitan Council and STORET data



Prior Lake [upper basin, site-1] (70-0072) *Prior Lake - Spring Lake Watershed District*

Prior Lake (upper basin) is located in the City of Prior Lake (Scott County). The upper basin is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The upper basin has a surface area of 386 acres. The maximum and mean depths of the upper basin of Prior Lake are 15.2 and 3.1 m (50 and 10 feet), respectively. The upper basin of Prior Lake has two natural inlets, inflow from Spring Lake and the inlet from Rice and Crystal Lake drainage.

The MN DNR has designated the upper basin as being infested with Eurasian water milfoil (*Myriophyllum spicatum*) and Zebra mussels (*Dreissena spp.*).

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

2011 summer (May-September) data summary

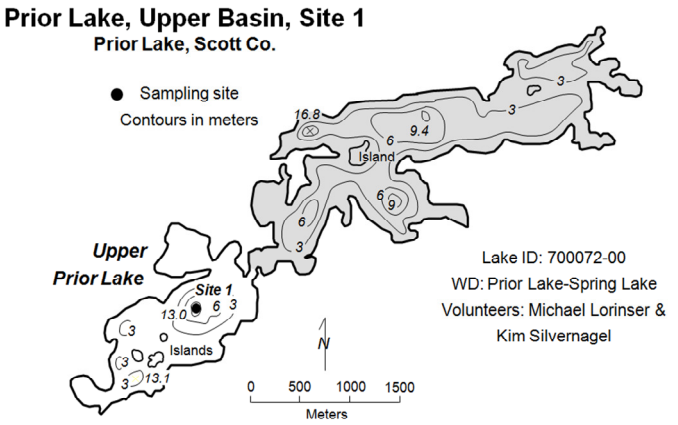
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	31.3	11.0	52.0	B
CLA (µg/l)	23.8	4.2	40.0	C
Secchi (m)	1.3	0.7	2.3	C
TKN (mg/l)	1.16	0.51	1.40	
			Lake Grade	C

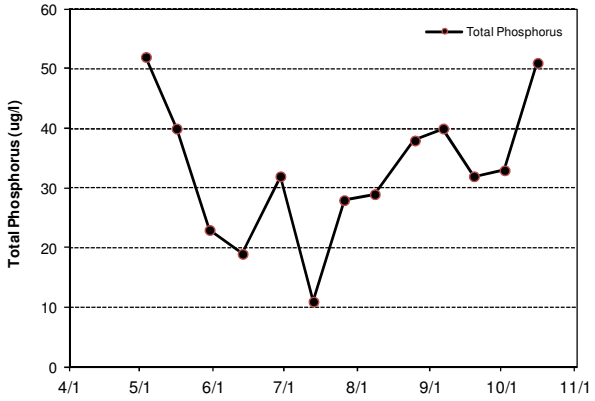
The upper basin received a lake grade of C. Historical data for the upper basin indicate that the water quality of the basin has varied between lake grades of C and D. Continued monitoring is suggested to determine the trend direction, if any, of the varying water quality of this lake.

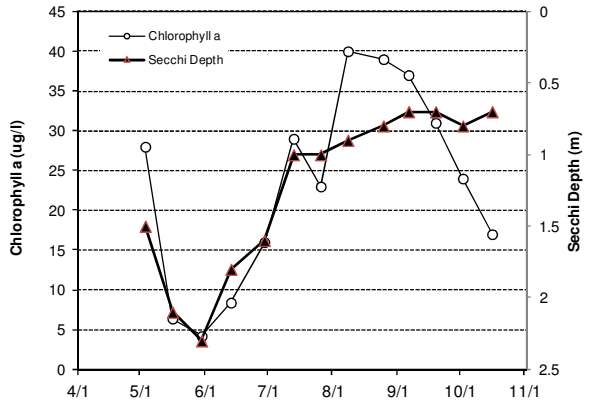
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

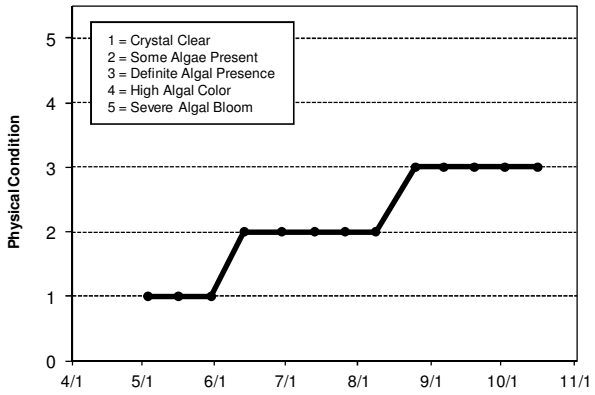






2011 Data

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 (1-5)	RS (1-5)
5/3/2011	7.6				28	52		1.5	1	1
5/16/2011	13.5				6.4	40		2.1	1	1
5/30/2011	16.6				4.2	23		2.3	1	1
6/13/2011	20.9				8.4	19		1.8	2	2
6/29/2011	22.2				16	32		1.6	2	2
7/13/2011	26.2				29	11		1	2	2
7/26/2011	28				23	28		1	2	2
8/8/2011	27.3				40	29		0.9	2	2
8/25/2011	25				39	38		0.8	3	2
9/6/2011	23.2				37	40		0.7	3	2
9/19/2011	19.1				31	32		0.7	3	2
10/2/2011	17.6				24	33		0.8	3	2
10/16/2011	16.1				17	51		0.7	3	4



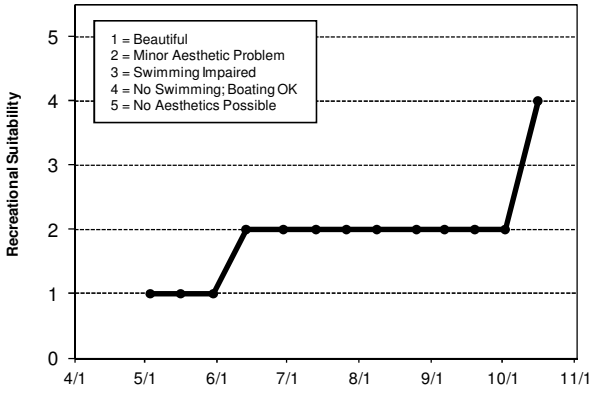
Lake Water Quality Grades Based on Summertime Averages

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	2009 Site 1	2010 Site 1	2011 Site 1
Total Phosphorus	D	D	C	D	C	D	C	C	C	C	B
Chlorophyll a	D	D	D	D	C	D	D	D	C	D	C
Secchi Depth	D	D	C	D	C	C	D	C	B	C	C
Lake Grade	**D**	**D**	**C**	**D**	**C**	**D**	**D**	**C**	**C**	**C**	**C**

Source: Metropolitan Council and STORET data



Red Rock Lake (27-0076) *City of Eden Prairie*

Red Rock Lake is located within the City of Eden Prairie (Hennepin County). The maximum depth of the lake is 4.9 m. Most of the area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

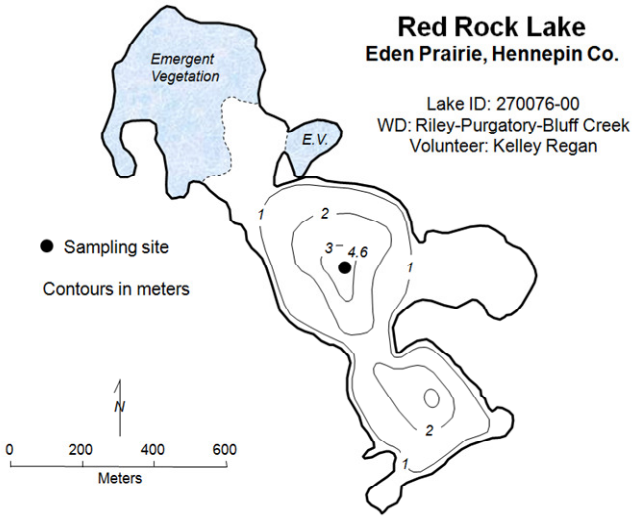
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	21.0	18.0	24.0	
CLA (µg/l)	1.8	1.4	2.2	
Secchi (m)	3.0	2.7	3.3	
TKN (mg/l)	0.74	0.72	0.76	
			Lake Grade	

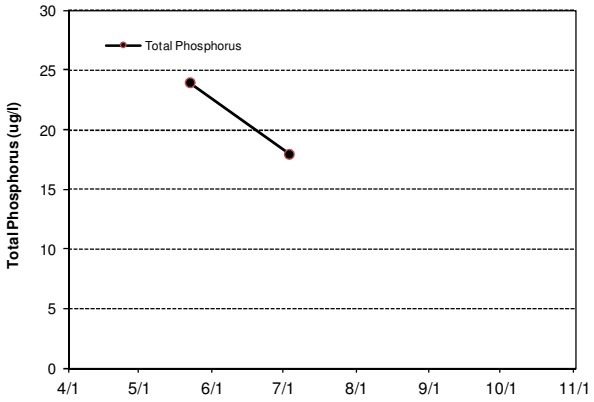
The lake did not receive a lake grade because only 2 monitoring events occurred in 2011. At least 5 monitoring events are needed during the summer time period to calculate a lake grade. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

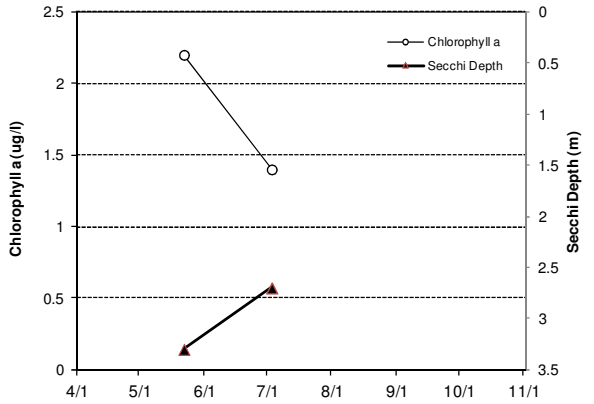
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

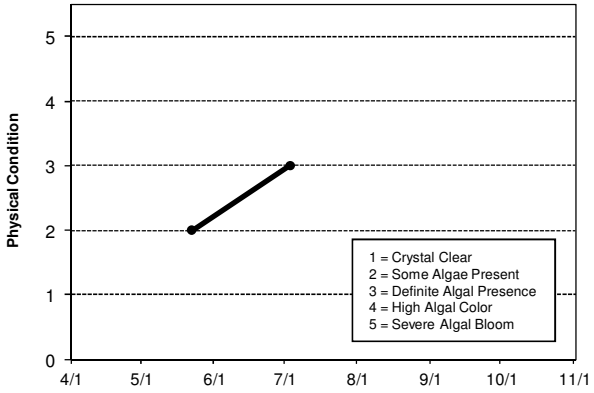






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/22/2011	17.4				2.2	24		3.3	2	2
7/3/2011	28				1.4	18		2.7	3	3

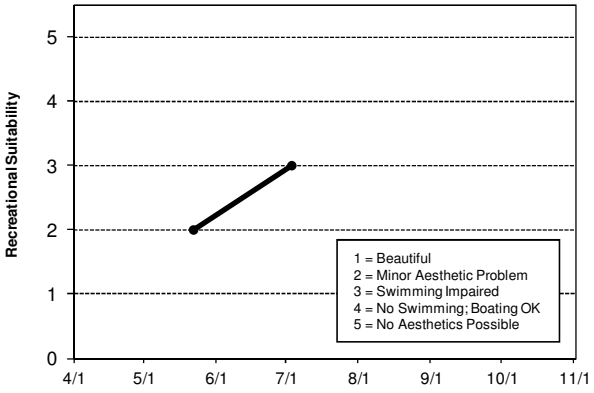


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	D		D					
Chlorophyll a	D		D					
Secchi Depth	C		D					
Lake Grade	**D**		**D**					**NA**



Source: Metropolitan Council and STORET data

Regional Park Lake (82-0087) *South Washington Watershed District*

Regional Park Lake is a 16-acre lake located within the City of Cottage Grove (Washington County). The maximum depth of the lake is 5.8 m. Most of the area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	58.8	40.0	79.0	C
CLA (µg/l)	33.0	5.2	99.0	C
Secchi (m)	2.6	1.5	4.1	B
TKN (mg/l)	0.92	0.55	1.30	
			Lake Grade	C

The lake received a lake grade of C. This year marks continued improvement in water clarity in comparison to the clarity during late 1990s and early 2000s. Additional years of monitoring are suggested for determining if this trend continues.

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

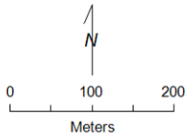
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

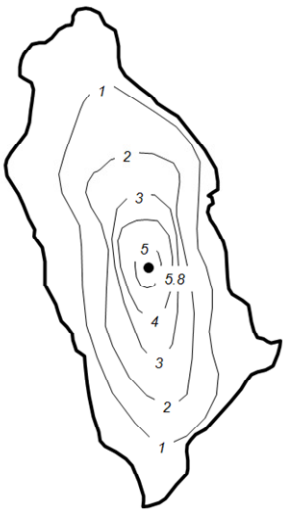
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Regional Park Lake
Cottage Grove, Washington Co.

Lake ID: 820087-00
WD: South Washington
Volunteer: Washington
Conservation District

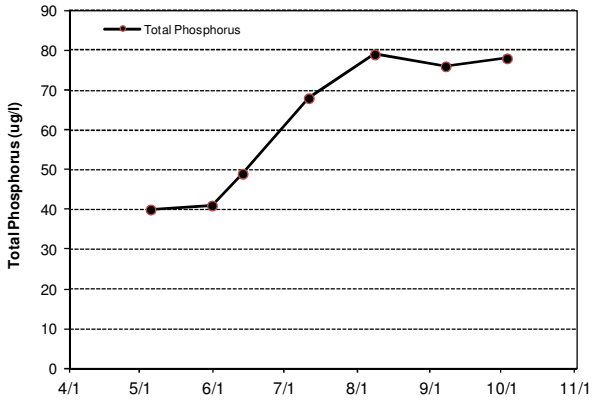
● Sampling site
Contours in meters

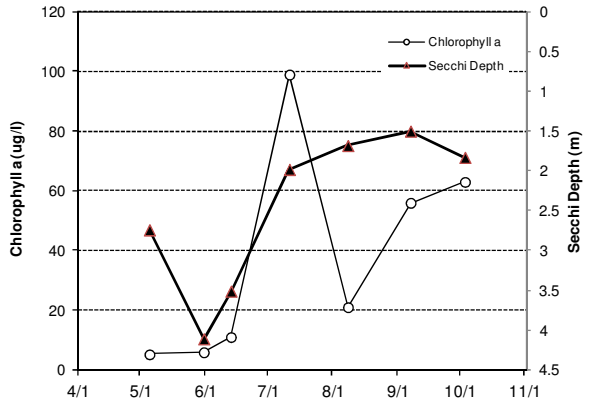


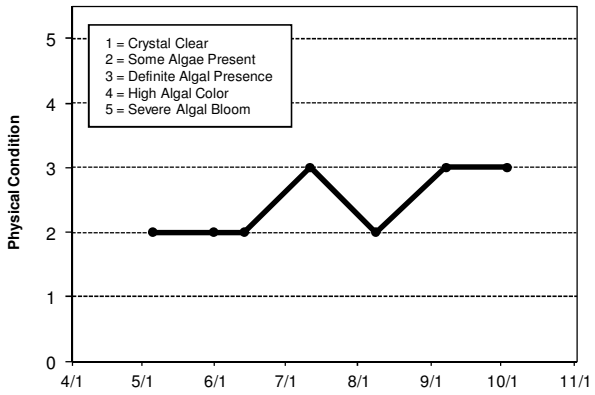


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/5/2011	10.7	8.1	11.4	0.1	5.2	40		2.74	2	3
5/31/2011	18.9	11.1	8.4	0.1	5.9	41		4.11	2	2
6/13/2011	20.1	12.4	7.9	0.1	11	49		3.51	2	3
7/11/2011	27.4	15.5	12.2	0.1	99	68		1.98	3	3
8/8/2011	26.2	15.6	9.2	0	21	79		1.68	2	3
9/7/2011	19.9	16.2	7.9	0.1	56	76		1.5	3	4
10/3/2011	14.5	13.8	10.5	0.1	63	78		1.83	3	4





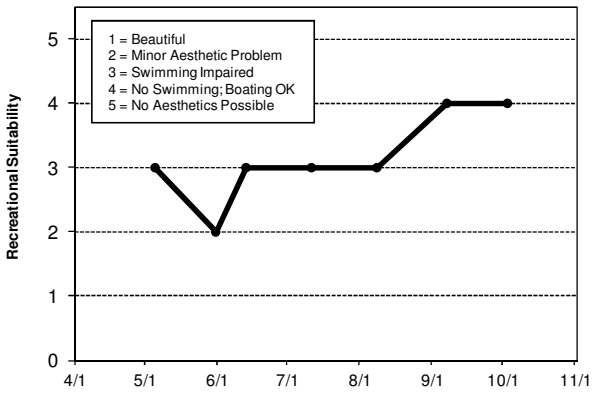


Lake Water Quality Grades Based on Summertime Averages

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	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	2009	2010	2011
Total Phosphorus	C	C	D	C	D	C	C	C
Chlorophyll a	C	C	C	B	C	B	C	C
Secchi Depth	D	C	C	C	C	B	C	B
Lake Grade	**C**	**C**	**C**	**C**	**C**	**B**	**C**	**C**



Source: Metropolitan Council and STORET data

Reitz Lake (10-0052) *Carver County Environmental Services*

Reitz Lake is located in Laketown Township (Carver County). The lake has a surface area of 79 acreas and a watershed area of 3,711 acres, which gives a large watershed-to-lake area ratio of 47:1. The larger the ratio the greater the potential stress put on the lake from surface runoff. The DNR has designated the lake as being infested with Eurasion Water Milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

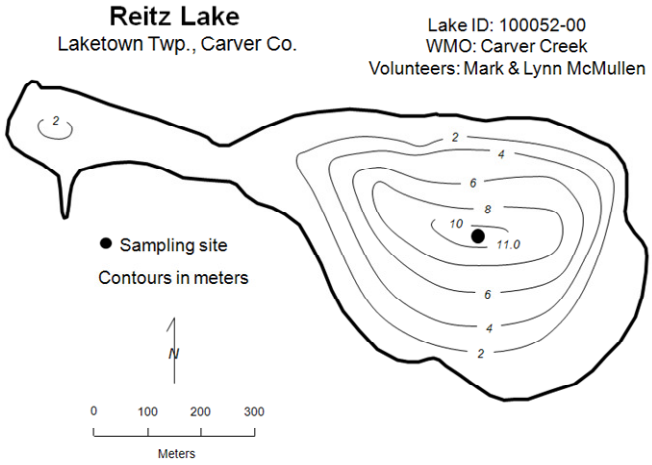
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	70.5	30.0	113.0	D
CLA (µg/l)	38.5	7.4	72.0	C
Secchi (m)	1.3	0.6	2.3	C
TKN (mg/l)	1.71	1.30	2.50	
			Lake Grade	C

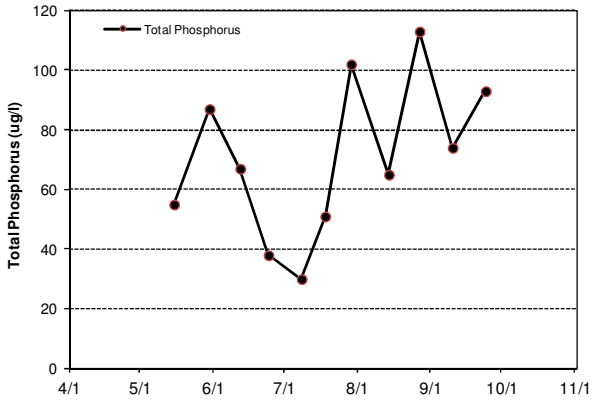
The lake received a lake grade of C, which is consistent with lake grades received in the past decade. Recent Secchi depth and CLA data suggest that the water quality in recent years has improved in comparison to that in the mid 1980's and early 1990's. However, TP remains in the C and D range.

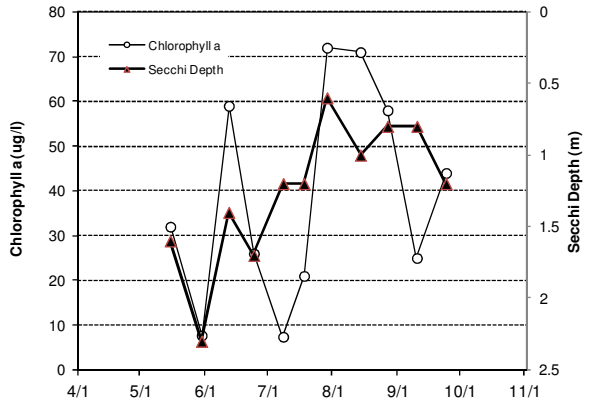
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

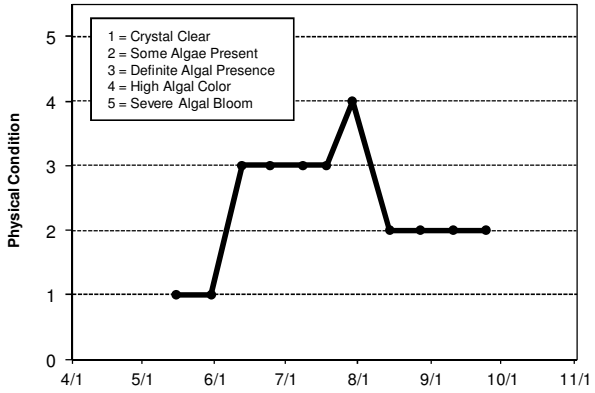






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/15/2011	13				32	55		1.6	1	1
5/30/2011	22				7.7	87		2.3	1	1
6/12/2011	22				59	67		1.4	3	2
6/24/2011	21				26	38		1.7	3	2
7/8/2011	26				7.4	30		1.2	3	3
7/18/2011	26				21	51		1.2	3	3
7/29/2011	29				72	102		0.6	4	3
8/14/2011	24				71	65		1	2	2
8/27/2011	20				58	113		0.8	2	1
9/10/2011	22				25	74		0.8	2	2
9/24/2011	19				44	93		1.2	2	1

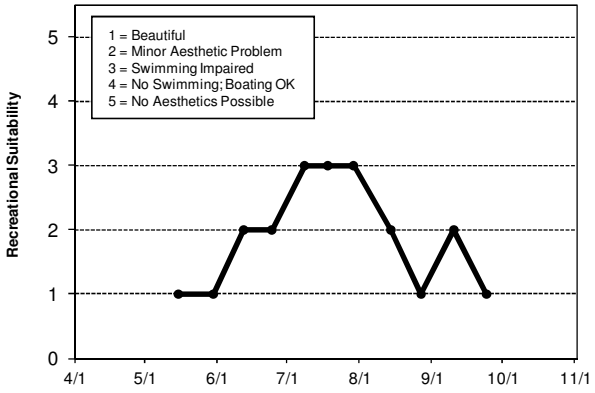


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus						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	2009	2010	2011
Total Phosphorus	D	D	D	C	C	C	C	D
Chlorophyll a	C	C	C	A	B	B	B	C
Secchi Depth	C	C	C	C	C	C	B	C
Lake Grade	**C**	**C**	**C**	**B**	**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 entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	92.7	37.0	149.0	D
CLA (µg/l)	50.7	14.0	110.0	D
Secchi (m)	0.6	0.4	1.0	F
TKN (mg/l)	1.98	1.30	2.70	
			Lake Grade	D

The lake received a lake grade of D, which is consistent with its historical water quality database. Continued monitoring is recommended to continue to build the water quality database for this lake.

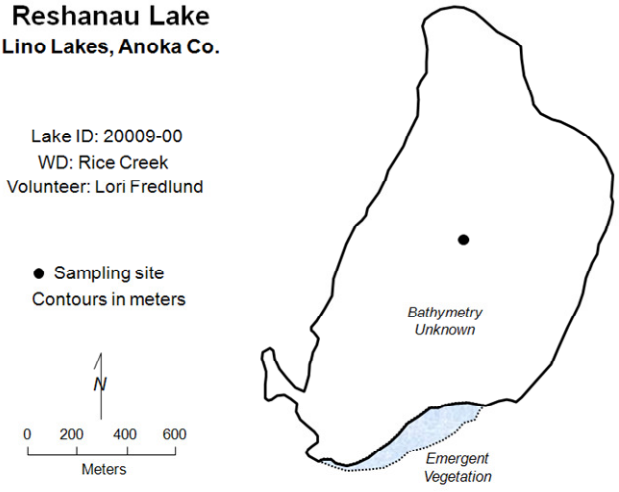
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

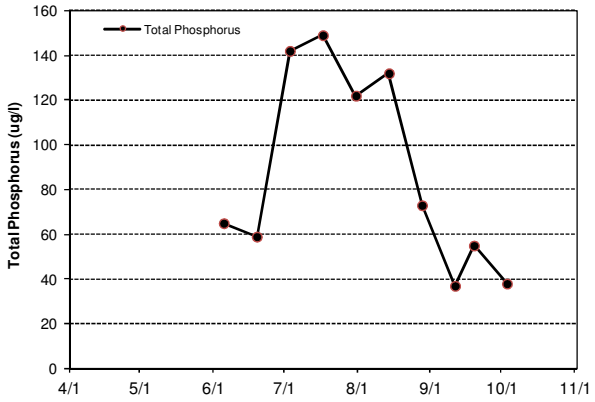
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

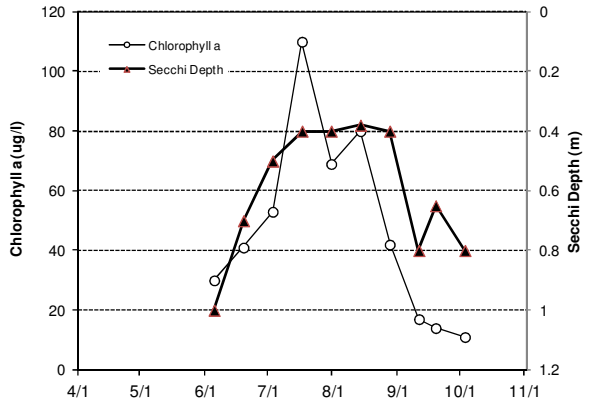
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Reshanau Lake
Lino Lakes, Anoka Co.

Lake ID: 20009-00
WD: Rice Creek
Volunteer: Lori Fredlund

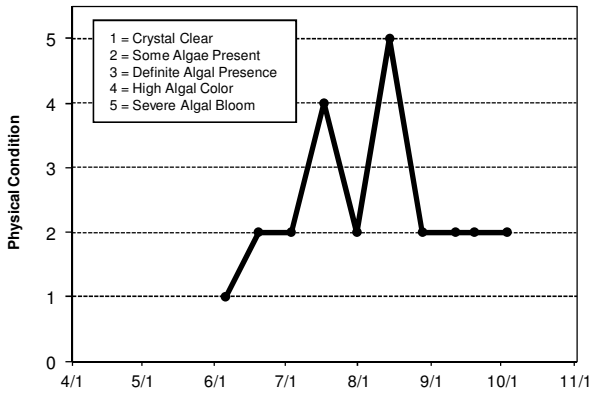






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/5/2011	21.5				30	65		1	1	1
6/19/2011	23.3				41	59		0.7	2	2
7/3/2011	27.2				53	142		0.5	2	3
7/17/2011	28.3				110	149		0.4	4	4
7/31/2011	27.3				69	122		0.4	2	2
8/14/2011	25				80	132		0.38	5	4
8/28/2011	25.2				42	73		0.4	2	3
9/11/2011	26.6				17	37		0.8	2	2
9/19/2011	19.3				14	55		0.65	2	2
10/3/2011	20.4				11	38		0.8	2	2

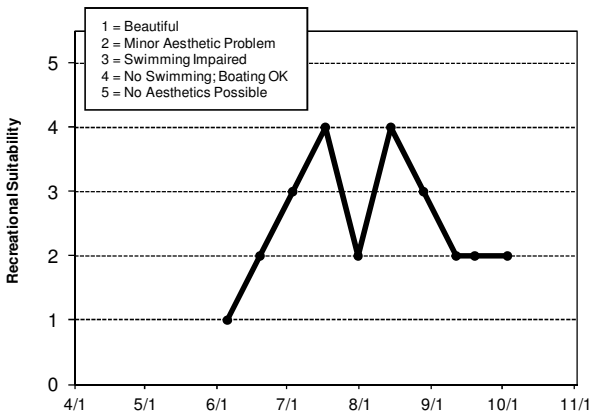


Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus			D	D	D	D	D	D
Chlorophyll a			C	C	D	C	C	D
Secchi Depth			F	F	F	F	D	F
Lake Grade			**D**	**D**	**D**	**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 are few morphological information for the pond. The pond's surface area and watershed area (17,781 acres) translates to a large 157:1 watershed-to-pond area ratio. Generally the larger the ratio, the greater the potential stress on the pond from surface runoff.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	85.1	65.0	105.0	D
CLA (µg/l)	18.0	9.0	42.0	B
Secchi (m)	1.1	0.8	1.8	D
TKN (mg/l)	1.08	0.89	1.30	
			Lake Grade	C

The pond received a lake grade of C, which is the best lake grade the pond has received in its water quality database. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

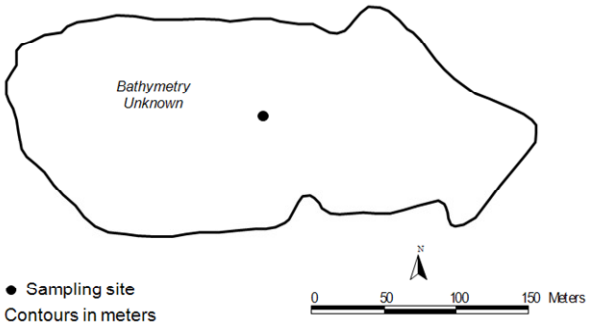
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page (although limited in data).

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

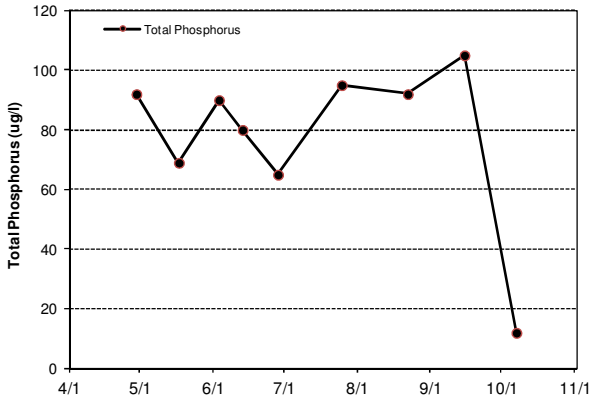
Rest Area Pond

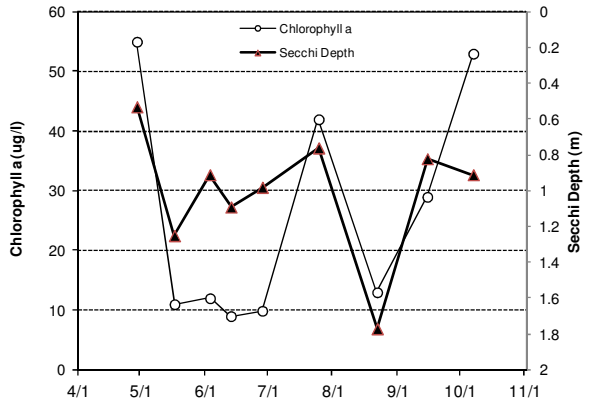
West Lakeland Twp., Washington Co.

Lake ID: 820514-00
WD: Valley Branch
Volunteers: MnDOT Staff



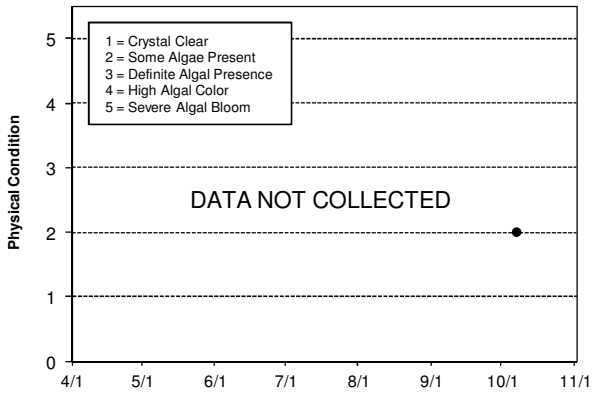
● Sampling site
Contours in meters





2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/29/2011	9.8				55	92		0.53		
5/17/2011	15.6				11	69		1.25		
6/3/2011	20.4				12	90		0.91		
6/13/2011	20.6				9	80		1.09		
6/28/2011	23.6				9.9	65		0.98		
7/25/2011	27.9				42	95		0.76		
8/22/2011	26.1				13	92		1.77		
9/15/2011	22.2				29	105		0.82		
10/7/2011	16.7				53	12		0.91	2	

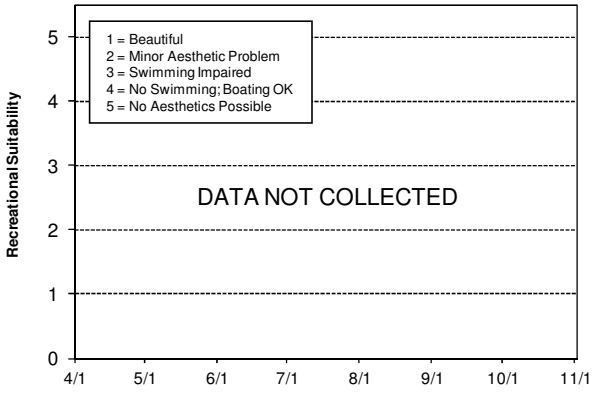


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			D	F	F	F	F	D
Chlorophyll a			D	C	F	F	C	B
Secchi Depth			D	F	F	F	F	D
Lake Grade			**D**	**D**	**F**	**F**	**D**	**C**



Source: Metropolitan Council and STORET data

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

Rice Lake lies within the City of Maple Grove. The lake has a surface area of 252 acres. The maximum depth is 3.4 m (11 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and Secchi transparency (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.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	152.7	52.0	311.0	F
CLA (µg/l)	35.7	5.9	110.0	C
Secchi (m)	1.1	0.4	1.8	D
TKN (mg/l)	1.45	0.90	2.40	
			Lake Grade	D

The lake received a lake grade of D for 2011. The CLA grade was a C for 2011, which is an improvement over the D's and F's received for the past 4 years. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

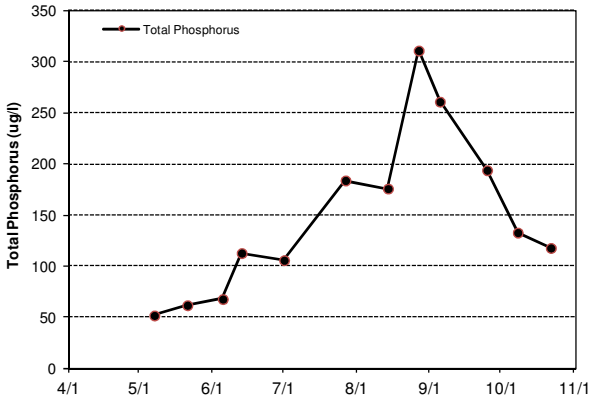
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

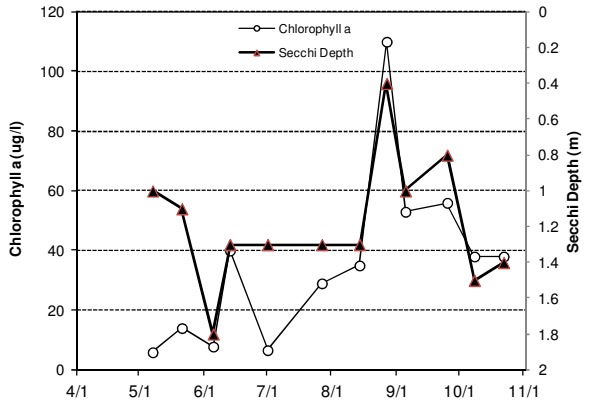
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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.

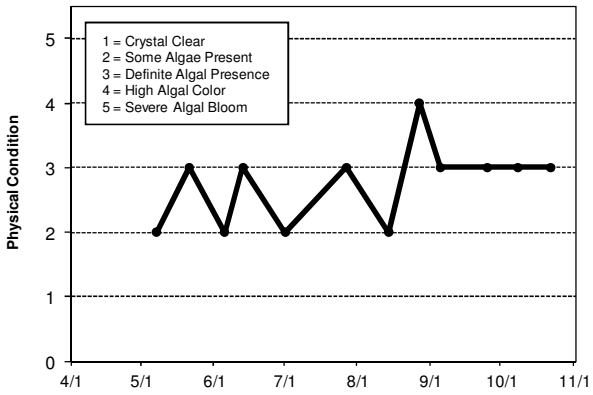
Lake ID: 270116-01
WMO: Elm Creek
Volunteer: George Schneider





2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/7/2011	15.6				5.9	52		1	2	2
5/21/2011	18.5				14	62		1.1	3	3
6/5/2011	24.5				7.8	68		1.8	2	2
6/13/2011	21				40	113		1.3	3	3
7/1/2011	30.2				6.6	106		1.3	2	2
7/27/2011	28.5				29	184		1.3	3	3
8/14/2011	26.7				35	176		1.3	2	2
8/27/2011	25.1				110	311		0.4	4	4
9/5/2011	21				53	261		1	3	3
9/25/2011	15.6				56	194		0.8	3	3
10/8/2011	19.4				38	133		1.5	3	3
10/22/2011	11.7				38	118		1.4	3	3

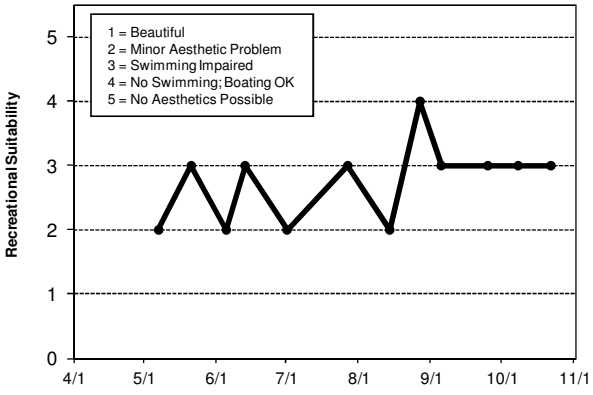


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus				F	F	F	F	F
Chlorophyll a				F	D	F	D	C
Secchi Depth	C	D	D	F	C	D	D	D
Lake Grade				**F**	**D**	**F**	**D**	**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 (METC 2007). The maximum and mean depths are 15.0 m and 6.6 m, respectively. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*). The lake is listed as impaired by the MPCA for mercury content in fish.

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

2011 summer (May-September) data summary

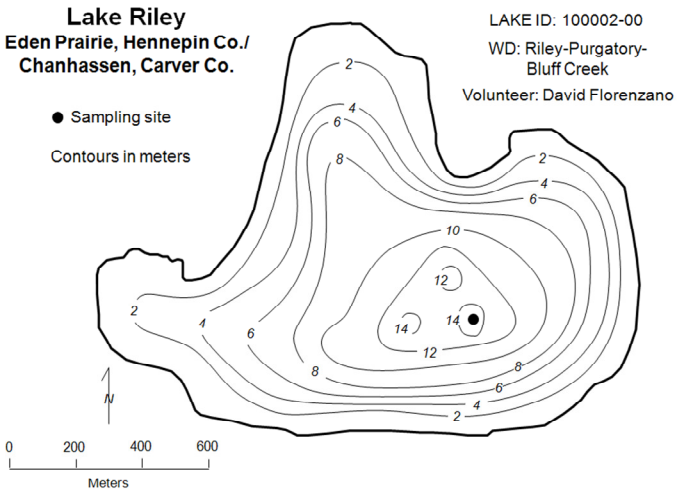
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	33.0	27.0	41.0	C
CLA (µg/l)	23.1	1.3	68.0	C
Secchi (m)	3.0	0.8	8.2	B
TKN (mg/l)	1.23	0.96	1.70	
			Lake Grade	C

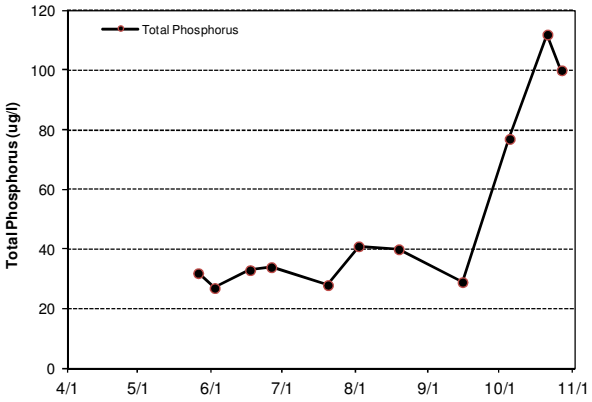
The lake received a lake grade of C for 2011, which is consistent with most years of monitoring dating back to 1980. The lake appears to be characterized as a C lake grade.

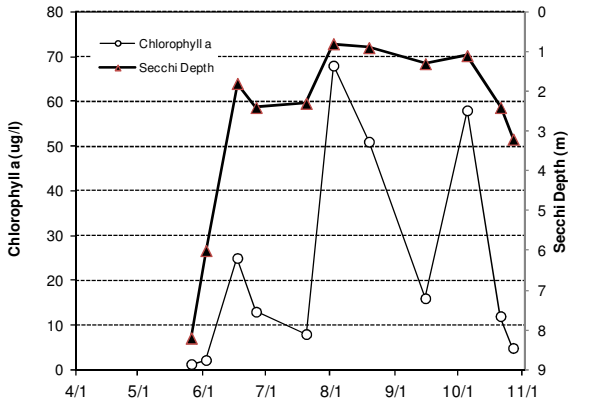
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

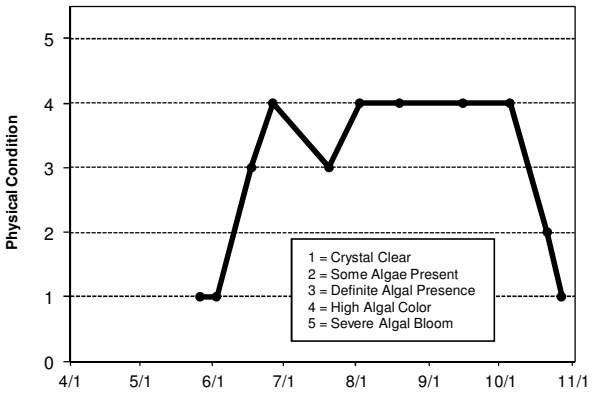
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

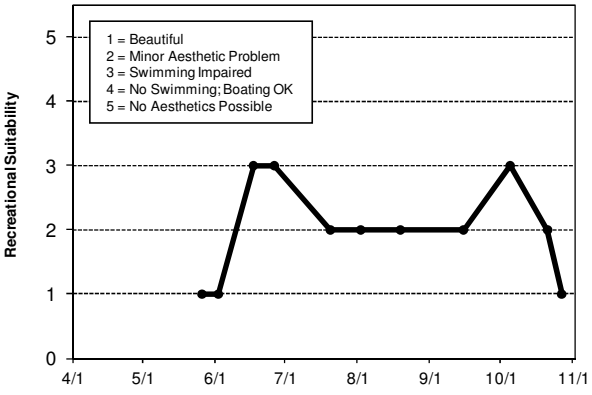
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/26/2011	17.1				1.3	32		8.2	1	1
6/2/2011	18.3				2.2	27		6	1	1
6/17/2011	20.8				25	33		1.8	3	3
6/26/2011	21.1				13	34		2.4	4	3
7/20/2011	29.6				8	28		2.3	3	2
8/2/2011	28.1				68	41		0.8	4	2
8/19/2011	25.6				51	40		0.9	4	2
9/15/2011	21.2				16	29		1.3	4	2
10/5/2011	17.6				58	77		1.1	4	3
10/21/2011	12.4				12	112		2.4	2	2
10/27/2011	11.2				4.9	100		3.2	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	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	2009	2010	2011
Total Phosphorus	C	C	C	B	C	C	C	C
Chlorophyll a	C	C	B	B	B	B	C	C
Secchi Depth	B	C	B	C	C	C	C	B
Lake Grade	**C**	**C**	**B**	**B**	**C**	**C**	**C**	**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 a maximum depth of 2.4 m (7.9 ft). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	46.4	29.0	76.0	C
CLA (µg/l)	5.8	3.2	10.0	A
Secchi (m)	1.5	1.2	1.8	C
TKN (mg/l)	1.30	0.83	2.00	
			Lake Grade	B

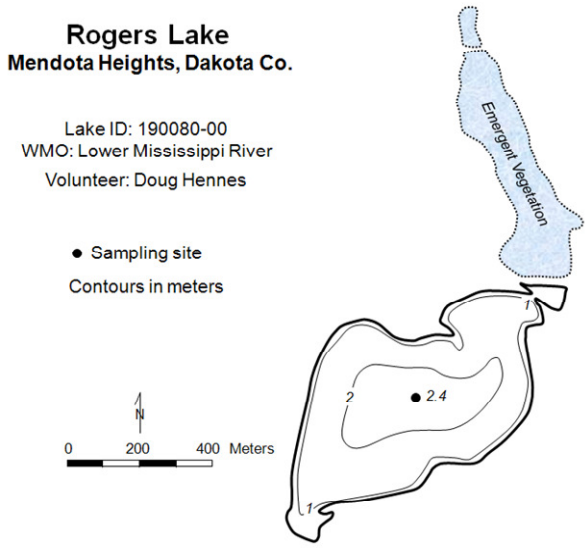
The lake received a lake grade of B for 2011. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

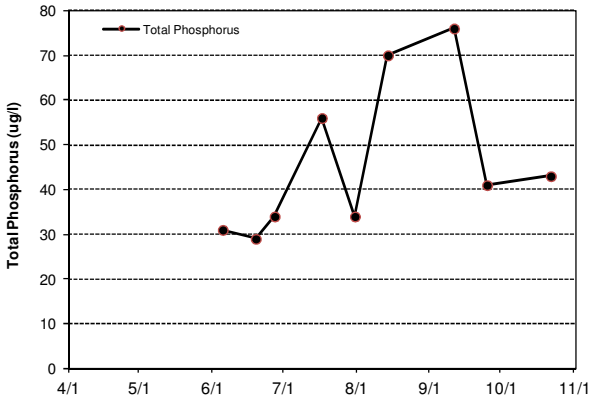
The water clarity grade of C does not correlate well with the chlorophyll-a grade of A. A possible explanation may be that the water clarity may be affected by higher levels of total suspended solids from surface runoff from the surrounding urbanized watershed. It is possible for higher suspend solids loadings to decrease water clarity which would decrease light penetration thereby inhibiting algal growth.

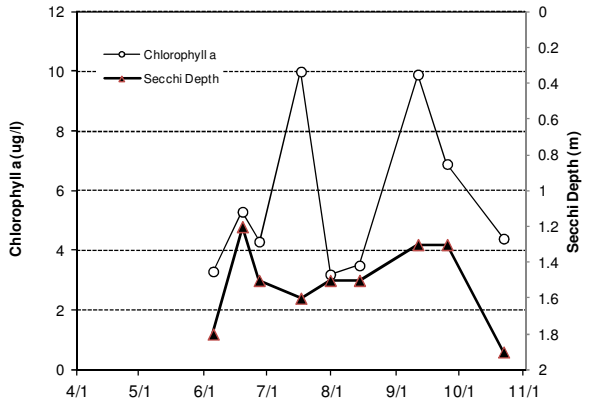
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

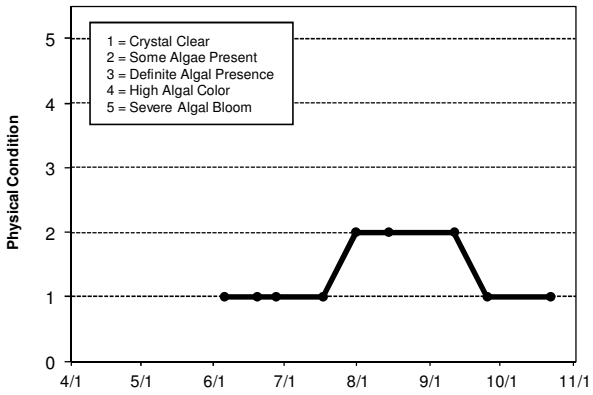






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/5/2011	25.2				3.3	31		1.8	1	1
6/19/2011	21.2				5.3	29		1.2	1	1
6/27/2011	22.3				4.3	34		1.5	1	1
7/17/2011	28.4				10	56		1.6	1	1
7/31/2011	29.2				3.2	34		1.5	2	2
8/14/2011	26.1				3.5	70		1.5	2	2
9/11/2011	25				9.9	76		1.3	2	3
9/25/2011	18.6				6.9	41		1.3	1	1
10/22/2011	9.6				4.4	43		1.9	1	1



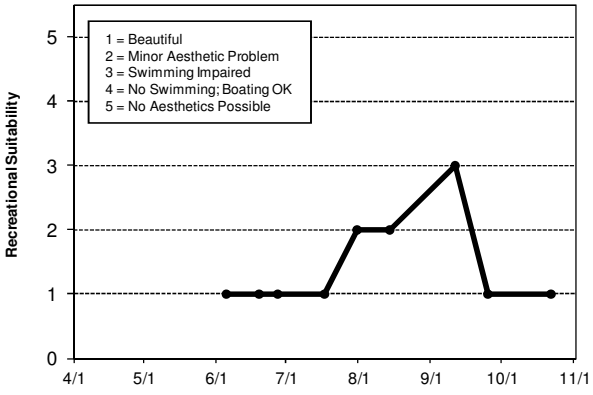
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus				C	B	C	C	C
Chlorophyll a				A	A	A	A	A
Secchi Depth				D	C	C	C	C
Lake Grade				**C**	**B**	**B**	**B**	**B**

Source: Metropolitan Council and STORET data



Rutz Lake (10-0080) *Carver County Environmental Services*

Rutz Lake is a 61-acre lake located within Waconia Township (Carver County). The maximum depth of the lake is 4.0 m (roughly 13 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	125.0	90.0	206.0	D
CLA (µg/l)	52.0	27.0	120.0	D
Secchi (m)	0.6	0.4	0.7	F
TKN (mg/l)	2.23	1.70	3.70	
			Lake Grade	D

The lake received a lake grade of D for 2011. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

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

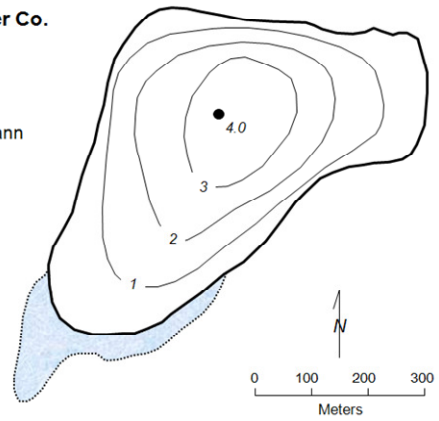
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

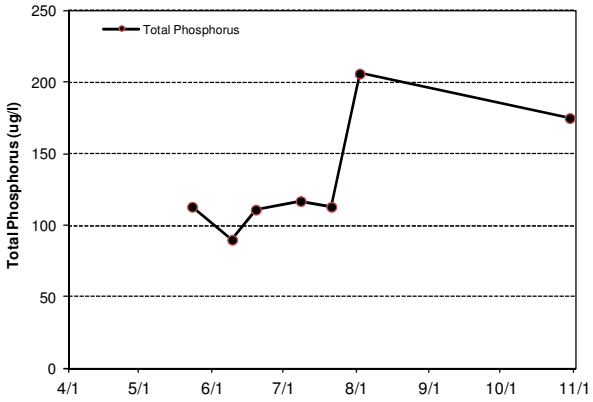
Rutz Lake

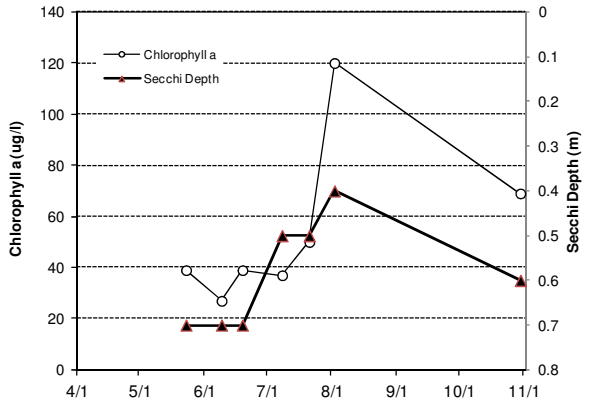
Waconia Twp., Carver Co.

Lake ID: 100080-00
WMO: Carver Creek
Volunteer: Marty Ziermann

● Sampling site
Contours in meters

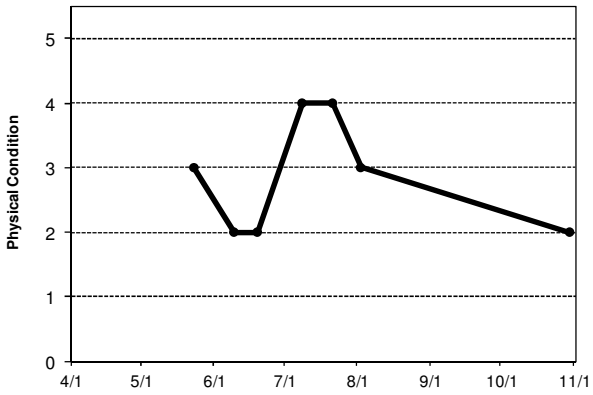






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/23/2011	19				39	113		0.7	3	3
6/9/2011	22.1				27	90		0.7	2	3
6/19/2011	22.7				39	111		0.7	2	3
7/8/2011	33.6				37	117		0.5	4	3
7/21/2011	31.5				50	113		0.5	4	4
8/2/2011	28.4				120	206		0.4	3	4
10/30/2011	8.1				69	175		0.6	2	

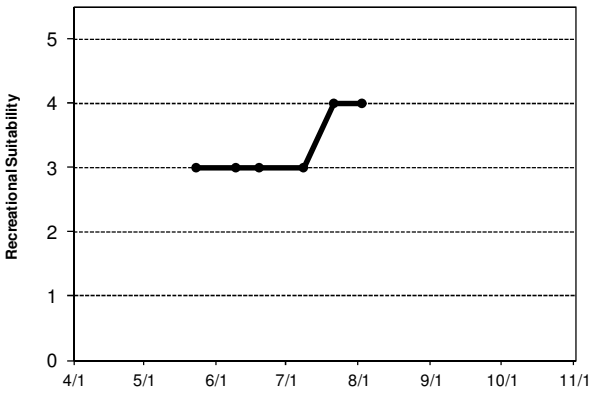


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			F	F	F	F		D
Chlorophyll a			D	F	D	D		D
Secchi Depth			D	D	F	F		F
Lake Grade			**D**	**F**	**F**	**F**	**NA**	**D**



Source: Metropolitan Council and STORET data

Sand Lake (82-0067) *Marine on St. Croix Watershed Management Organization*

Sand Lake is located within City of Scandia (Washington County). The lake has a surface area of 46 acres.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	57.6	35.0	108.0	C
CLA (µg/l)	17.0	14.0	19.0	
Secchi (m)	1.9	1.5	3.1	C
TKN (mg/l)	1.40	1.10	1.80	
			Lake Grade	

The lake did not receive a lake grade in 2011 because there were insufficient data for calculating a CLA grade. All three parameter grades are needed to calculate the lake grade. The CLA data point for September 19, 2011 was a suspiciously high outlier, and therefore was excluded from the analysis. The C grades for TP and Secchi depth are consistent with the lake's historical water quality database.

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

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

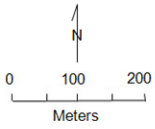
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

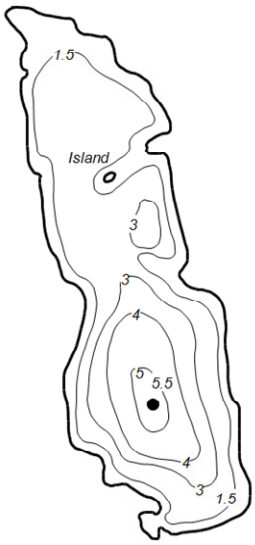
Sand Lake
Scandia, Washington Co.

Lake ID: 820067-00
WD: Carnelian-Marine-St. Croix
Volunteer: Washington Conservation District

● Sampling site

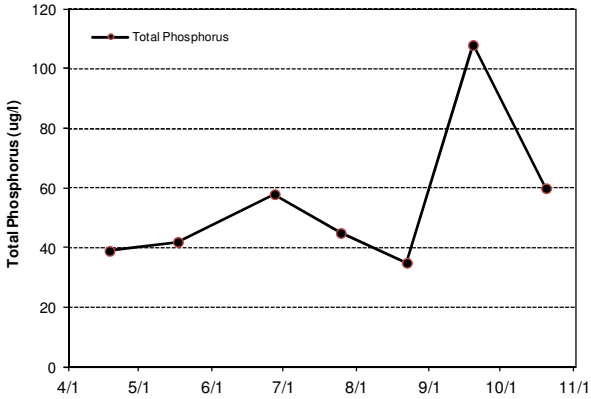
Contours in meters

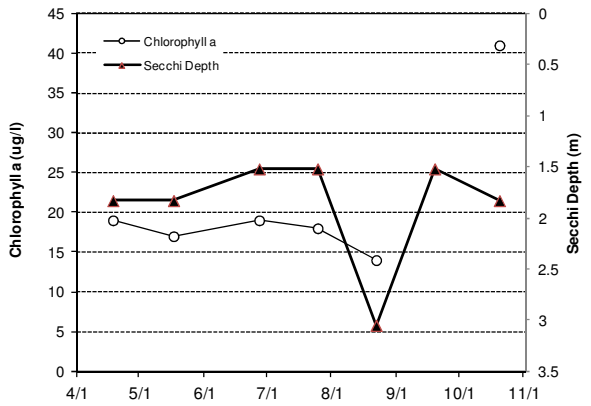


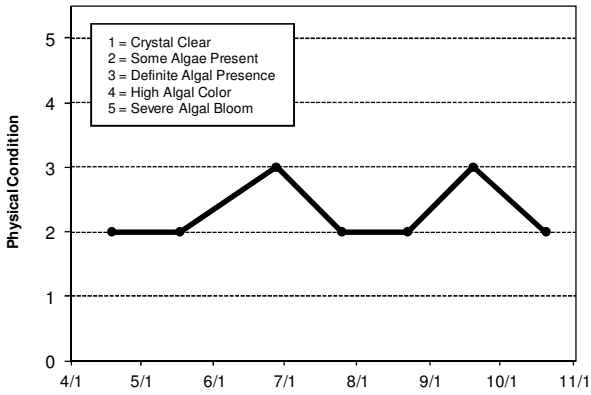


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/18/2011	8.2	7.2	11.1	0.1	19	39		1.83	2	2
5/17/2011	15.6	9.4	11.1	0.1	17	42		1.83	2	2
6/27/2011	22.3	11.4	11.9	0.1	19	58		1.52	3	3
7/25/2011	29.1	12.9	8.3	0.1	18	45		1.52	2	3
8/22/2011	26	14.1	6.6	0.1	14	35		3.05	2	2
9/19/2011	19.9	15.7	8.4	0.1		108		1.52	3	3
10/20/2011	10.9	11.1	8.4	0.1	41	60		1.83	2	2





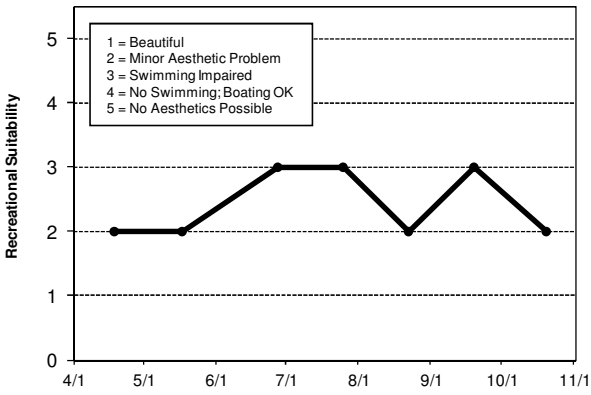


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	B	C	C	B	C	C	C	C
Chlorophyll a	B	C	B	B	C	B	B	
Secchi Depth	C	C	C	B	C	A	C	C
Lake Grade	**B**	**C**	**C**	**B**	**C**	**B**	**C**	**NA**



Source: Metropolitan Council and STORET data

Schmidt Lake (27-0102) *Shingle Creek Watershed Management Commission*

Schmidt Lake is located within the City of Plymouth (Hennepin County). It has a maximum depth of 7.6 m. Most of the surface area is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. The lake has been designated as infested with Eurasian Water Milfoil (*Myriophyllum spicatum*). In an attempt to reduce the lake's algal population and improve the lake's water quality, an experimental bacterial treatment took place on Schmidt Lake in 2004 and 2005.

On each sampling day the lake was monitored for total 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.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	23.0	3.0	51.0	B
CLA (µg/l)	4.4	1.6	14.0	A
Secchi (m)	3.3	2.0	5.0	A
TKN (mg/l)	0.55	0.20	0.88	
			Lake Grade	A

The lake received an A lake grade for 2011, which is the best lake grade received according to its historical CAMP database. Continued monitoring is suggested to help determine if this improvement is an improving trend in water quality.

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

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

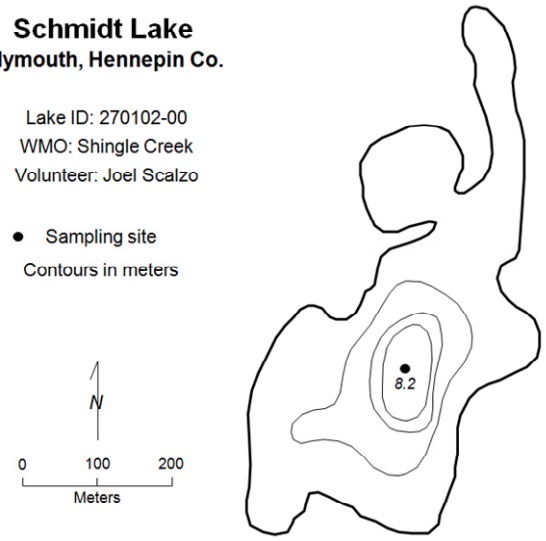
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

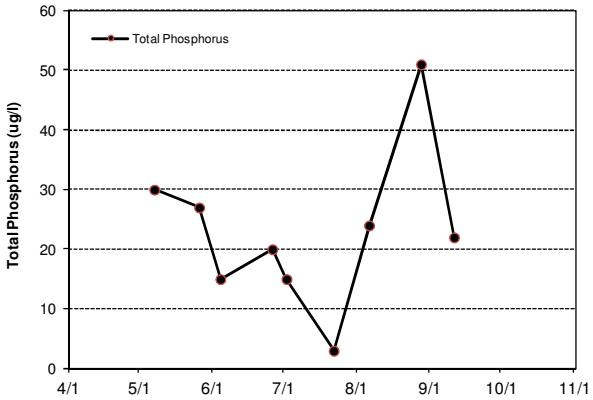
Schmidt Lake
Plymouth, Hennepin Co.

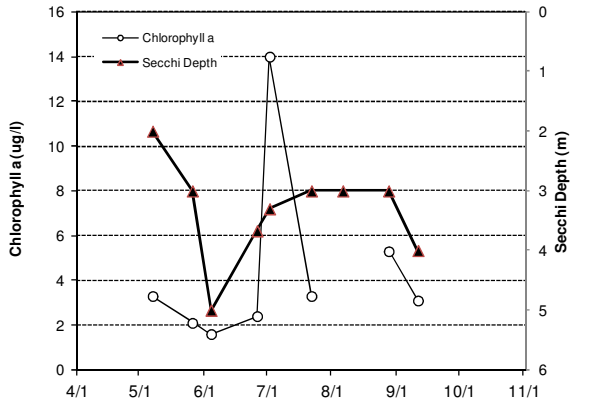
Lake ID: 270102-00
WMO: Shingle Creek
Volunteer: Joel Scalzo

- Sampling site

Contours in meters

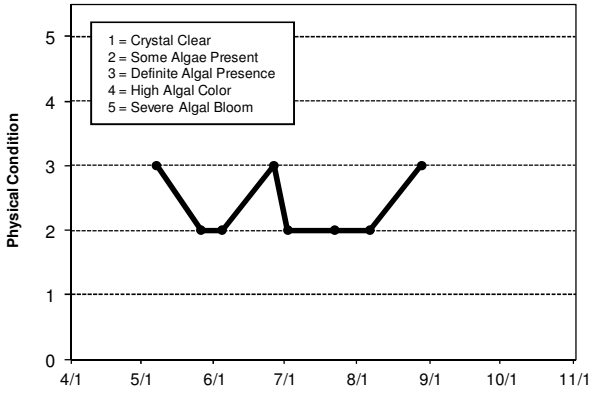






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/7/2011	16.2				3.3	30		2	3	3
5/26/2011	18.2				2.1	27		3	2	2
6/4/2011	23				1.6	15		5	2	2
6/26/2011	20.7				2.4	20		3.67	3	3
7/2/2011	28.4				14	15		3.3	2	
7/22/2011	29				3.3	3		3	2	2
8/6/2011	27.9					24		3	2	2
8/28/2011	24.8				5.3	51		3	3	3
9/11/2011	23.9				3.1	22		4		

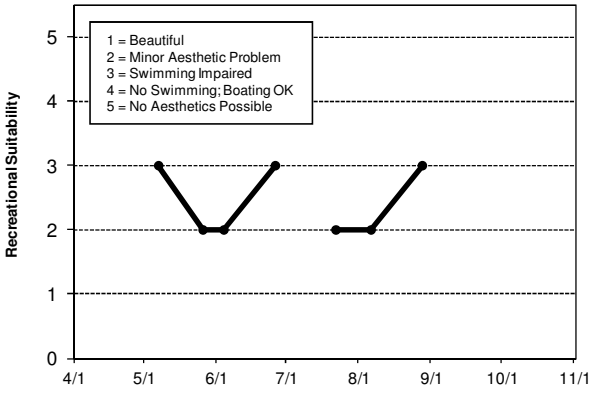


Lake Water Quality Grades Based on Summertime Averages

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	D		
Lake Grade				**C**			**C**		**C**	**C**		

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	C						B
Chlorophyll a	B	B						A
Secchi Depth	C	C						A
Lake Grade	**C**	**C**						**A**



Source: Metropolitan Council and STORET data

Scout Lake (19-0198) *City of Apple Valley*

Scout Lake is a small lake located in Apple Valley. Little information is available on the morphology of the lake. The maximum depth of the lake is 2.9 m (9.5 feet). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

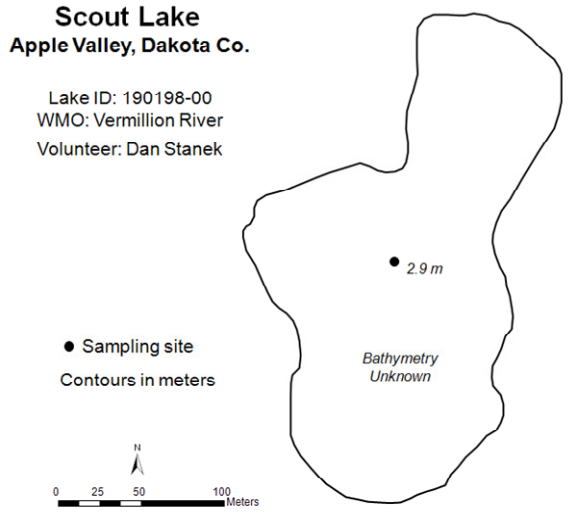
2011 summer (May-September) data summary

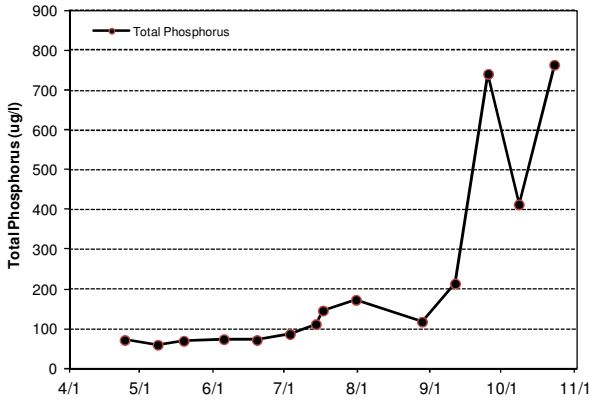
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	169.7	60.0	741.0	F
CLA (µg/l)	84.3	16.0	160.0	F
Secchi (m)	0.7	0.4	1.2	F
TKN (mg/l)	2.56	1.40	7.00	
			Lake Grade	F

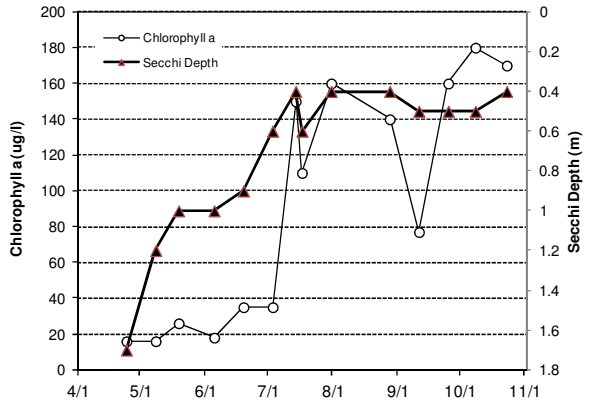
The lake received a lake grade of F for 2011, which is the worst grade yet received within its limited historical water quality database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

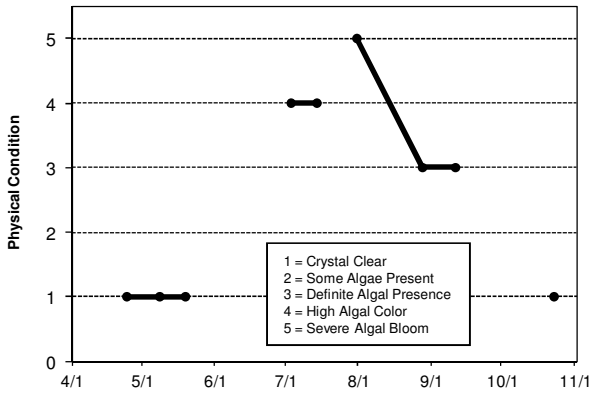






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	8.3				16	72		1.7	1	1
5/8/2011	15.6				16	60		1.2	1	1
5/19/2011	20				26	70		1	1	1
6/5/2011	27				18	74		1		
6/19/2011	24.8				35	72		0.9		
7/3/2011	31.3				35	87		0.6	4	
7/14/2011	26.7				150	112		0.4	4	
7/17/2011	31				110	146		0.6		
7/31/2011	32.3				160	173		0.4	5	
8/28/2011	23.6				140	118		0.4	3	
9/11/2011	25.7				77	214		0.5	3	
9/25/2011	17				160	741		0.5		
10/8/2011	19.6				180	413		0.5		
10/23/2011	11				170	764		0.4	1	



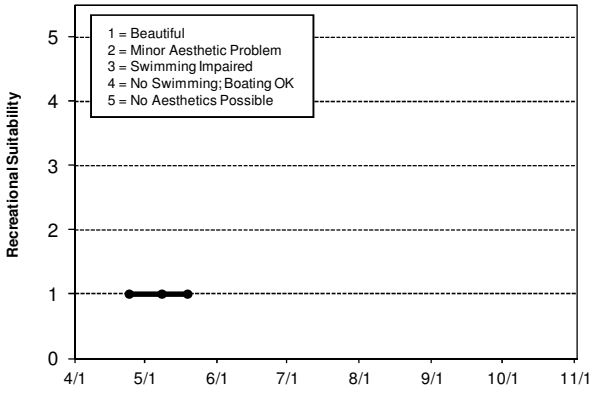
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus				D	C	D	D	F
Chlorophyll a				C	C	C	D	F
Secchi Depth				F	C	D	D	F
Lake Grade				**D**	**C**	**D**	**D**	**F**

Source: Metropolitan Council and STORET data



Seidl's Lake (19-0095) Cities of *Inver Grove Heights and South St. Paul*

Seidl's Lake is a 14-acre lake located in the City of Inver Grove Heights (Dakota County) which receives inflow from five inlets. The maximum depth of the lake is approximately 5.0 m (17 feet). There are little known morphological data available.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	81.3	34.0	124.0	D
CLA (µg/l)	55.3	16.0	100.0	D
Secchi (m)	0.8	0.4	1.2	D
TKN (mg/l)	1.26	0.31	1.80	
			Lake Grade	D

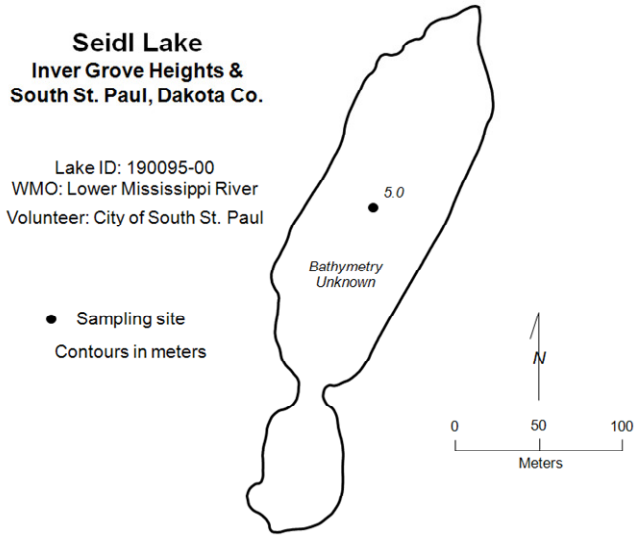
The lake received a D lake grade in 2011, which is consistent with its historical database over the past decade.

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

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

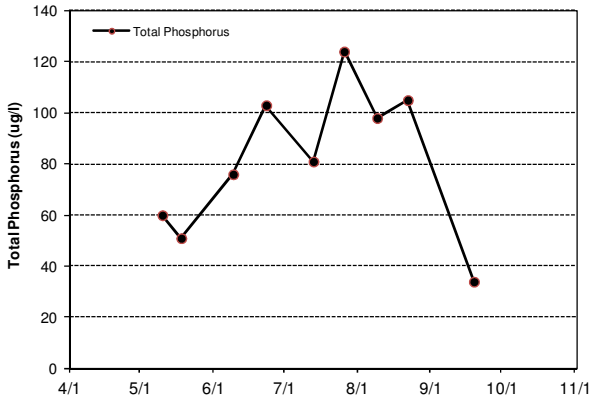
Seidl Lake
Inver Grove Heights & South St. Paul, Dakota Co.

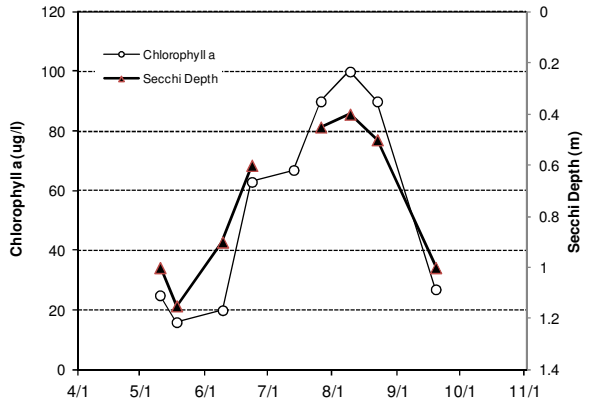
Lake ID: 190095-00
WMO: Lower Mississippi River
Volunteer: City of South St. Paul

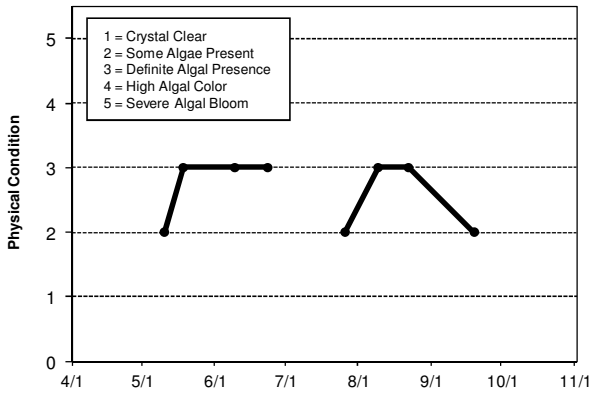


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/10/2011	14.9				25	60		1	2	4
5/18/2011	15.7				16	51		1.15	3	4
6/9/2011	22.1				20	76		0.9	3	4
6/23/2011	20				63	103		0.6	3	4
7/13/2011					67	81				
7/26/2011	25.9				90	124		0.45	2	4
8/9/2011	24.6				100	98		0.4	3	4
8/22/2011	23.2				90	105		0.5	3	4
9/19/2011	17.3				27	34		1	2	4





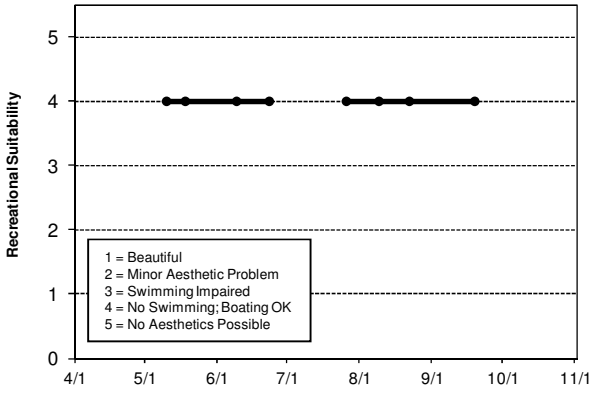


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												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	2009	2010	2011
Total Phosphorus	D	C	D	D			C	D
Chlorophyll a	B	C	C	C			C	D
Secchi Depth	C	D	F	F			D	D
Lake Grade	**C**	**C**	**D**	**D**		**NA**	**C**	**D**



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 are few known morphological data available for the lake.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	58.3	28.0	128.0	C
CLA (µg/l)	14.5	4.3	46.0	B
Secchi (m)	0.8	0.4	1.1	D
TKN (mg/l)	1.03	0.62	1.70	
			Lake Grade	C

The lake received a lake grade of C for 2011, which is consistent with water quality received since 2009. Lake grades of D's and F's were received in the period 2002 – 2008. This year's CLA grade of B continues the improvement in this parameter starting last year. Continued monitoring is suggested to determine if these data indicate a potential improving trend in water quality.

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

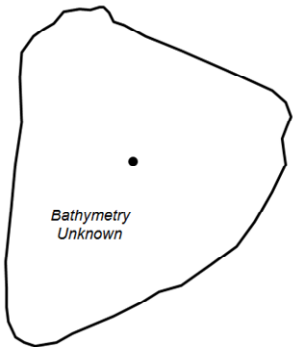
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

South Oak Lake

St. Louis Park, Hennepin Co.

Lake ID: 270661-00
WD: Minnehaha Creek
Volunteer: John Graff

● Sampling site
Contours in meters



2011 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 (1-5)	RS (1-5)
4/21/2011	9				5.1	33			2	4
5/3/2011	8.4				13	42		0.9		4
5/17/2011	19.9				9.7	40		0.85	2	4
6/1/2011	21				46	81		0.4	4	4
6/14/2011	20.9				9.7	65		0.9	3	4
6/29/2011	28.3				6.2	90		0.4	4	5
7/13/2011	26.5				22	51		0.7	3	4
7/29/2011	27				18	44		1.1	3	4
8/11/2011	25.5				8	28		0.9	3	5
8/23/2011	25.8				11	128		0.8	3	4
9/5/2011	26.5				4.3	28		0.8	5	5
9/21/2011	15.4				12	44		1	4	4
10/5/2011	17.9				17	73		1.1	3	4
10/21/2011	11.3				28	50		1.6	2	4

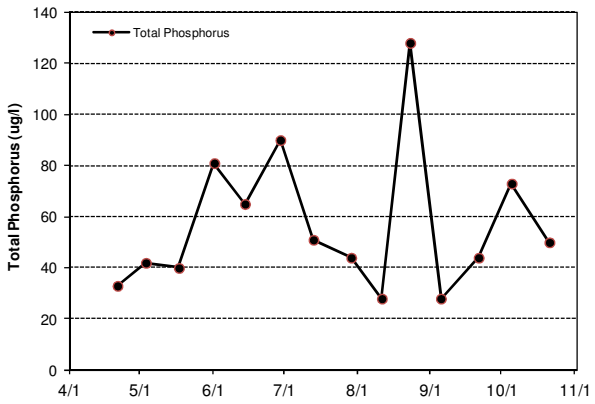
Lake Water Quality Grades Based on Summertime Averages

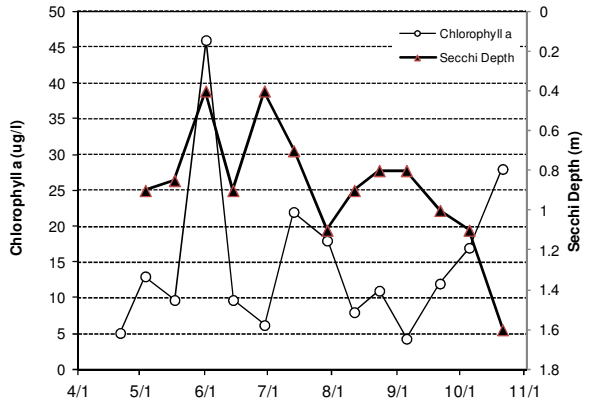
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

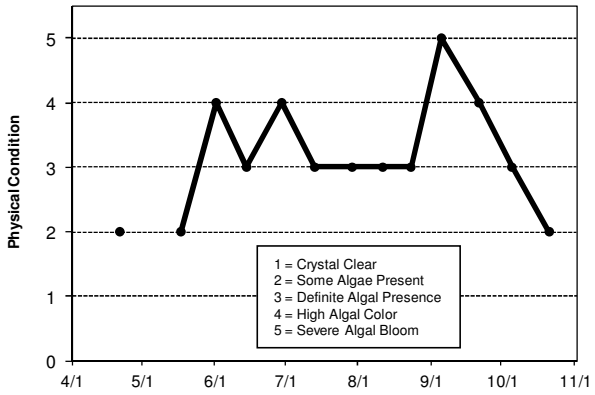
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus											D	D
Chlorophyll a											D	C
Secchi Depth											D	F
Lake Grade											**D**	**D**

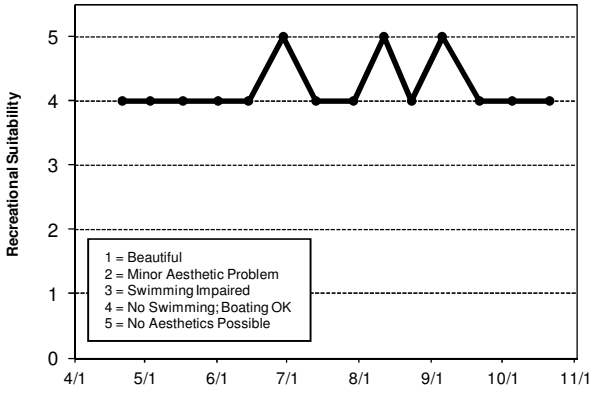
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			D	F	F	C	C	C
Chlorophyll a			C	F	F	C	B	B
Secchi Depth			D	F	F	C*		D
Lake Grade			**D**	**F**	**F**	**C**		**C**

Source: Metropolitan Council and STORET data









South School Section Lake (82-0151) *Browns Creek Watershed District*

South School Section Lake is located in southeastern Hugo Township in Washington County. The 125-acre lake has a maximum depth of 8.0 m (26 feet).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	59.9	23.0	120.0	C
CLA (µg/l)	28.0	3.7	64.0	C
Secchi (m)	2.0	0.9	3.5	C
TKN (mg/l)	1.12	0.72	1.60	
			Lake Grade	C

The lake received a lake grade of C for 2011, which is consistent with its historical water quality database. The lake has typically received C lake grades with the occasional B grade.

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

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

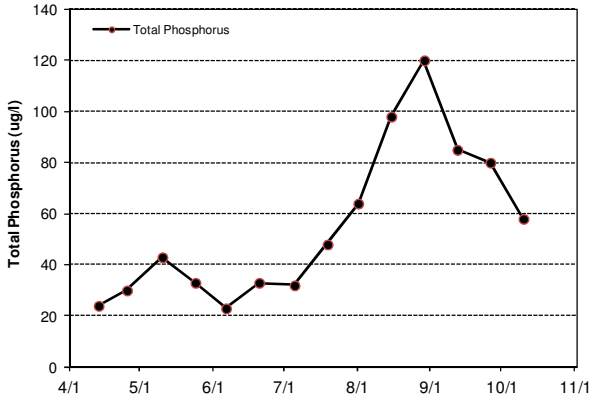
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

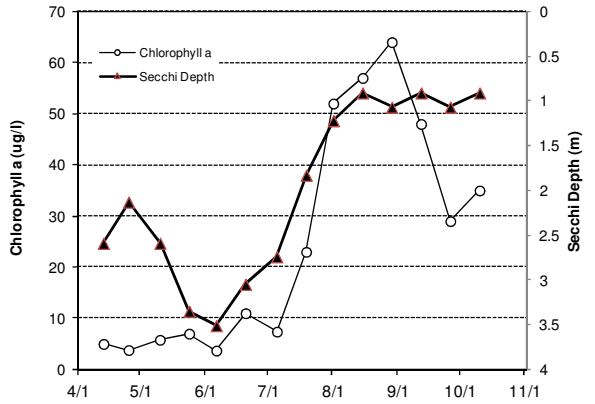
South School Section Lake,
Hugo, Washington Co.

Lake ID: 820151-00
WD: Browns Creek
Volunteer: Washington Conservation District

● Sampling site

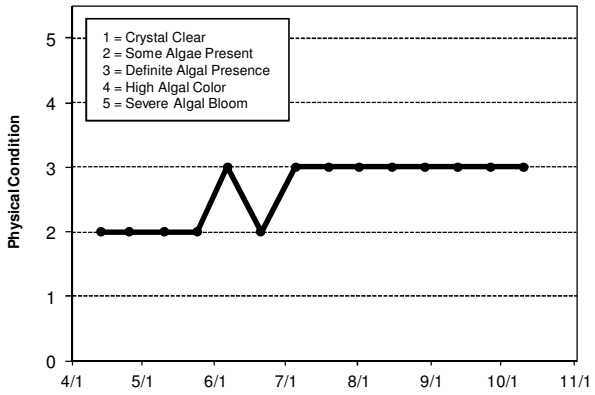
Contours in meters





2011 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 (1-5)	RS (1-5)
4/13/2011	7.4	7.3	7.1	0.3	5	24		2.59	2	2
4/25/2011	8.7	7.2	11.2	1	3.8	30		2.13	2	2
5/10/2011	12.6	12.4	9.8	5.6	5.8	43		2.59	2	3
5/24/2011	17.9	16.8	8.4	0.1	7	33		3.35	2	2
6/6/2011	22.6	19.5	7.5	0.1	3.7	23		3.51	3	3
6/20/2011	21.5	20.2	7.9	0.1	11	33		3.05	2	2
7/5/2011	26.9	22.9	7.7	0.8	7.4	32		2.74	3	2
7/19/2011	29.7	23.9	9.5	0.1	23	48		1.83	3	4
8/1/2011	28.9	24.5	11	0.1	52	64		1.22	3	4
8/15/2011	25.9	23.8	12.7	0	57	98		0.91	3	4
8/29/2011	23.8	23.7	6.6	0.1	64	120		1.07	3	3
9/12/2011	23.6	21.1	11.4	0.1	48	85		0.91	3	3
9/26/2011	15.4	15	11.7	0.2	29	80		1.07	3	3
10/10/2011	17.8	17	8.7	0.1	35	58		0.91	3	5

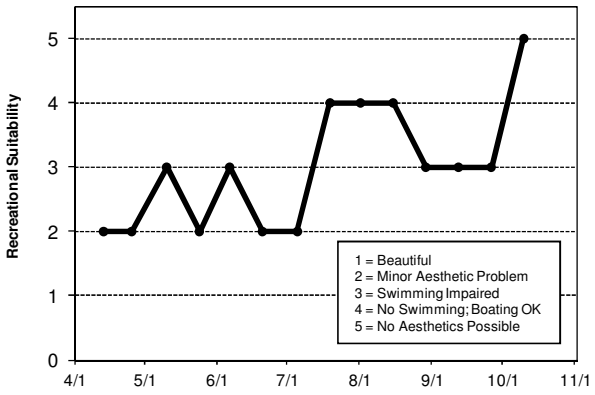


Lake Water Quality Grades Based on Summertime Averages

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				C	C		C					
Chlorophyll a				C	C		C					
Secchi Depth				C	C		C					
Lake Grade				**C**	**C**		**C**					

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		C	C	C	C	C	C	C
Chlorophyll a		C	C	C	B	B	C	C
Secchi Depth		B	C	C	C	B	C	C
Lake Grade		**C**	**C**	**C**	**C**	**B**	**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 entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	69.2	45.0	126.0	D
CLA (µg/l)	22.4	8.8	42.0	C
Secchi (m)	1.9	1.0	2.9	C
TKN (mg/l)	1.46	1.00	1.90	
			Lake Grade	C

The lake received a lake grade of C for 2011, which is a return to similar water quality prior to 2009. Continued monitoring is suggested to determine the trend direction, if any, of the varying water quality of this lake.

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

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

South Twin Lake
Stillwater Twp., Washington Co.

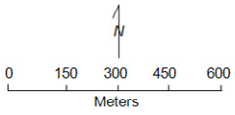
LAKE ID: 820019-00

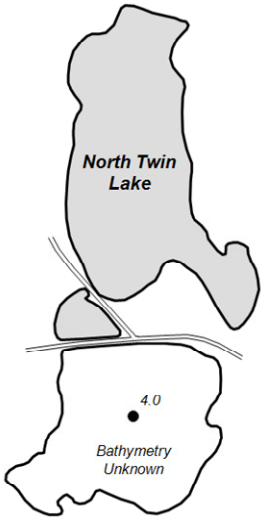
WD: Carnelian-Marine-St. Croix

Volunteer: Washington Conservation District

● Sampling site

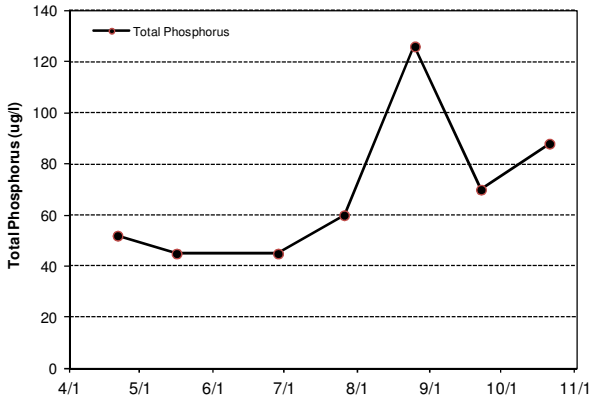
Contours in meters

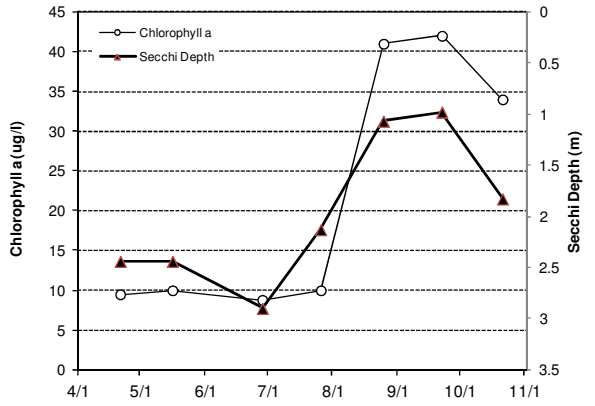


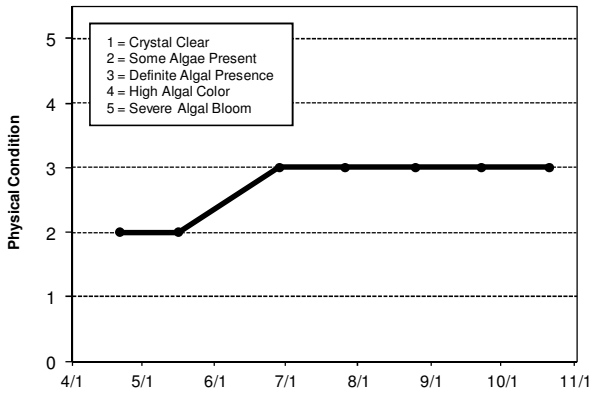


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	8.7	7.5	11.3	0.1	9.5	52		2.44	2	3
5/16/2011	13.7	13	9.4	0.1	10	45		2.44	2	4
6/28/2011	22.1	20.2	8.4	0	8.8	45		2.9	3	3
7/26/2011	27.6	24.8	8.4	0	10	60		2.13	3	4
8/25/2011	24.8	23.5	5.8	0	41	126		1.07	3	4
9/22/2011	15.7	15.9	8.7	0.1	42	70		0.98	3	4
10/21/2011	9.9	9.9	11.1	0.1	34	88		1.83	3	4





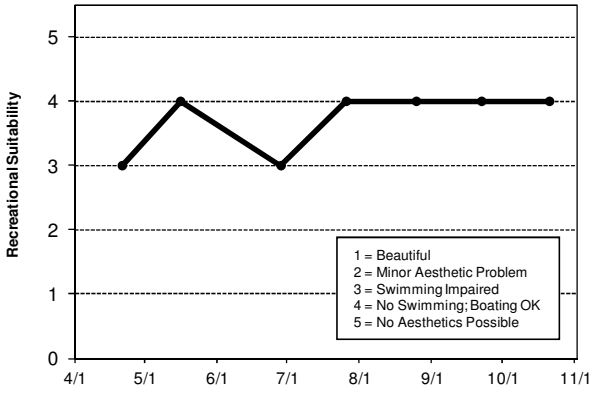


Lake Water Quality Grades Based on Summertime Averages

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	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	2009	2010	2011
Total Phosphorus	C	C	D	D	D	C	C	D
Chlorophyll a	B	C	C	C	C	B	A	C
Secchi Depth	C	C	D	D	D	C	B	C
Lake Grade	**C**	**C**	**D**	**D**	**D**	**C**	**B**	**C**



Source: Metropolitan Council and STORET data

Spring Lake (70-0054) *Prior Lake - Spring Lake Watershed District*

Spring Lake is located in Spring Lake Township (Scott County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a surface area of 630 acres. The maximum and mean depths of the lake are 11.3 and 5.6 m (37 and 18 feet), respectively.

In an attempt to improve the lake's water quality, a ferric chloride ($FeCl_3$) 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 $FeCl_3$ dissassociates into free iron (Fe) where it combines with P to form an insoluble Fe-P complex called floc. The desiltation basin then provides an area where the floc can settle out and be removed. The watershed district continues to monitor the effectiveness of the system.

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	87.5	24.0	208.0	D
CLA (µg/l)	59.8	3.4	120.0	D
Secchi (m)	1.1	0.4	2.8	D
TKN (mg/l)	1.58	0.85	2.10	
			Lake Grade	D

The lake received a lake grade of D in 2011. The lake grades have varied from Cs to Ds since 1980. Continued monitoring is suggested to provide water quality data for supporting the PLSLWD's efforts in managing Spring Lake.

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

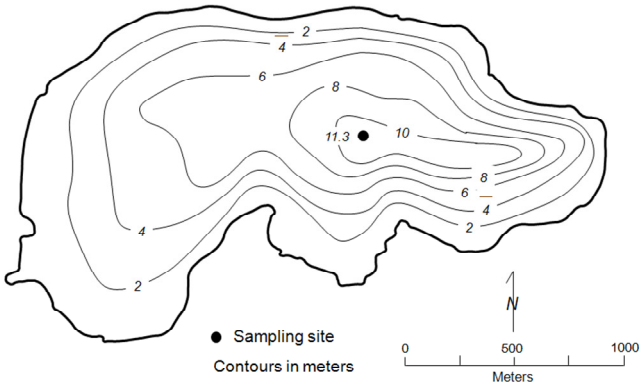
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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

Spring Lake

Prior Lake/Spring Lake Twp., Scott Co.

Lake ID: 700054-00
WD: Prior Lake-Spring Lake
Volunteer: Jim Weninger



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
7/6/2011	27.7				3.4	24		2.8		
7/25/2011					27	63		1	1	1
8/7/2011	29					55		1.2		
8/14/2011	21				33	55		1.1		
8/26/2011	25.5				98	98		0.6	2	1
9/5/2011	23.9				120	117		0.4	2	2
9/19/2011	18.6				59	80		0.7	2	1
9/28/2011	19.6				78	208		0.6	2	1

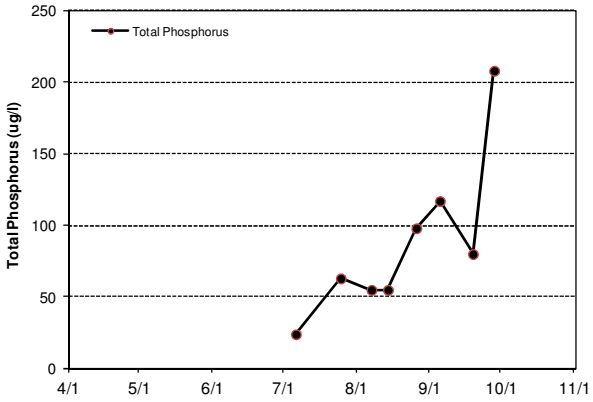
Lake Water Quality Grades Based on Summertime Averages

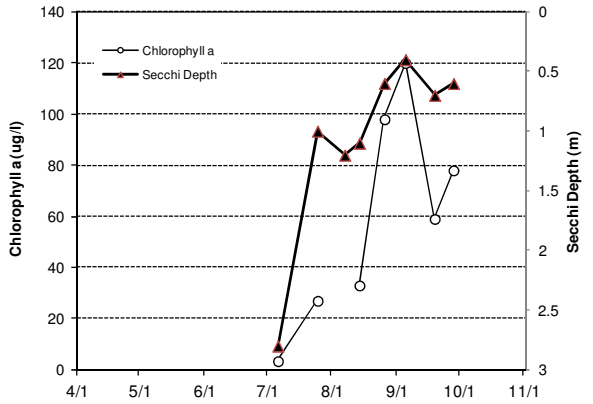
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	F	D	D		D							
Chlorophyll a	C	C	C		D						C	
Secchi Depth	C	B	C	C	C	D	D	D	D	C	B	D
Lake Grade	**D**	**C**	**C**		**D**							

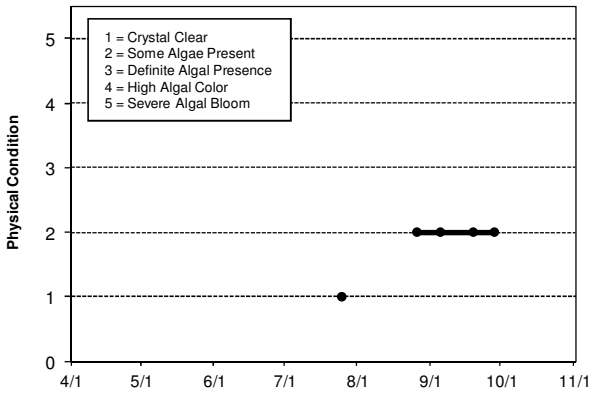
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					D	D			F	D	D	D
Chlorophyll a					C	C			D	D	F	C
Secchi Depth	C	C	C	C	D	D			C	D	F	C
Lake Grade					**D**	**D**			**D**	**D**	**F**	**C**

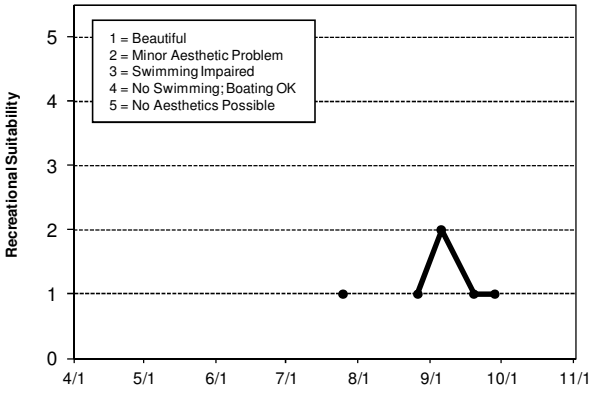
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	D	D	D	C	C	D	D	D
Chlorophyll a	D	C	C		D	C	C	D
Secchi Depth	D	C	C	D	D	D	D	D
Lake Grade	**D**	**C**	**C**	**C**	**D**	**D**	**D**	**D**

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). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value and exceptional water clarity (METC 2007). The lake has a surface area of 193 acres, and a maximum and mean depth of 20.7 and 9.0 m, respectively. The lake has a trout fishery (MDNR 1996).

On each sampling day the lake was monitored for secchi transparency, perceived physical condition, and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	11.0	6.0	18.0	A
CLA (µg/l)	3.8	2.3	6.5	A
Secchi (m)	5.7	4.3	7.6	A
TKN (mg/l)	0.50	0.35	0.67	
			Lake Grade	A

The lake continues to receive A lake grades. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends for this outstanding water resource.

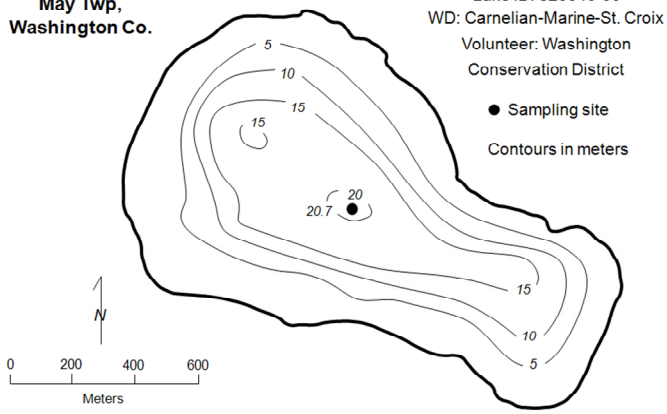
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

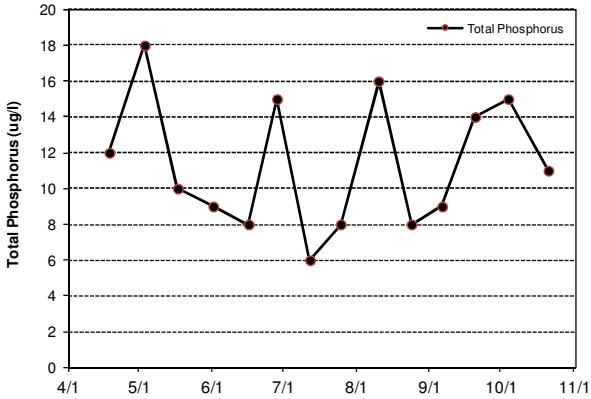
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

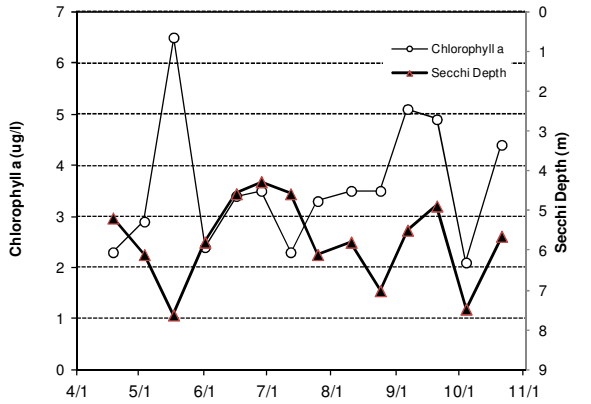
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Square Lake

May Twp, Washington Co.

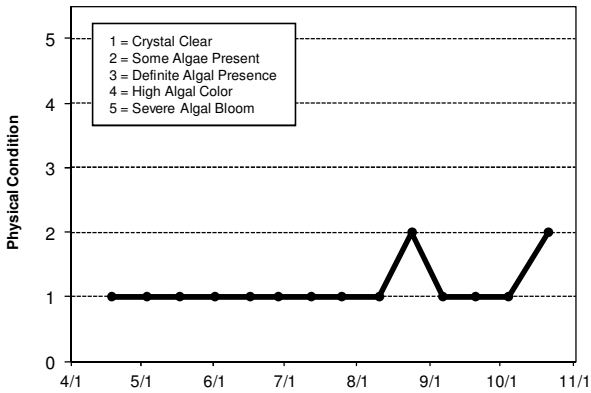






2011 Data

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 (1-5)	RS (1-5)
4/18/2011	4.8	4.5	9.5	0	2.3	12		5.18	1	1
5/3/2011	7.4	6.2	11.3	0.2	2.9	18		6.1	1	1
5/17/2011	12.2	6.4	11.8	0.1	6.5	10		7.62	1	1
6/1/2011	17.6	6.9	9.2	0.1	2.4	9		5.79	1	1
6/16/2011	20.2	6.9	11.3	0.1	3.4	8		4.57	1	1
6/28/2011	21.3	6.9	9.5	0	3.5	15		4.27	1	1
7/12/2011	27.3	7	9.5	0.1	2.3	6		4.57	1	1
7/25/2011	27.3	6.9	7.7	0.1	3.3	8		6.1	1	1
8/10/2011	26.3	7	7.9	0	3.5	16		5.79	1	1
8/24/2011	25.6	7.1	9.3	0.1	3.5	8		7.01	2	2
9/6/2011	23.1	7.1	7.8	0	5.1	9		5.49	1	1
9/20/2011	18.8	7.3	8.8	0	4.9	14		4.88	1	1
10/4/2011	16.2	7.4	9.6	0	2.1	15		7.47	1	1
10/21/2011	12.5	7.3	9.1	0	4.4	11		5.64	2	1

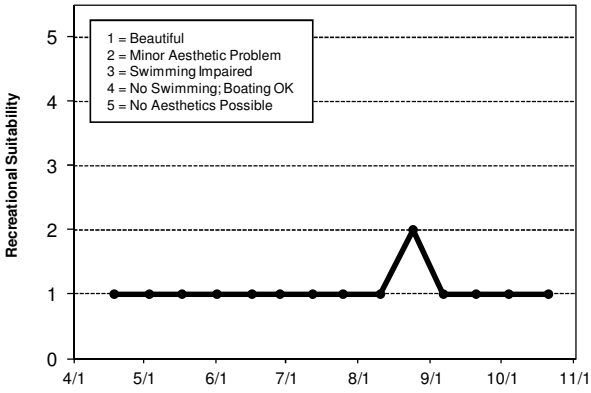


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	B	A	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	
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	2009	2010	2011
Total Phosphorus	A	A	A	A			A	A
Chlorophyll a	A	A	A	A			A	A
Secchi Depth	A	A	A	A	A	A	A	A
Lake Grade	**A**	**A**	**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 7 monitoring sites amongst the four pools in 2011. The results will be discussed for the entire lake, as well as individually for each of the sites.

Lake St. Croix (approximately 8,600 acres) is considered by the MDNR to extend from Stillwater, Minnesota to Prescott, Wisconsin, a distance of approximately 23 miles. Morphometry information of each of the pools is shown in the table below.

Lake St. Croix Morphometry

Pool Name	*Length (miles)*	*Area (ac)*	*Volume (ac-ft)*	*Mean depth range (dry vs. wet years) (meters)*
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 Eurasion water milfoil (*Myriophyllum spicatum*) and Zebra mussels (*Dreissena spp.*).

The year 2011 was the seventh year in which any of the Lake St. Croix sites have been formally involved in the CAMP. Prior to 2005, a citizen-monitoring program conducted by the St. Croix Basin Team produced water quality data for the following sites during the 1999 – 2002 period: Bayport Pool- Site 2; Troy Beach Pool-Site 3; Troy Beach Pool-Site 5; and Black Bass Pool-Site 6. Kinnickinnic Pool-Site 7 was monitored during the 2000-2001. All data are available in STORET.

On each sampling day, each lake site was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the site's perceived physical condition and recreational suitability. The monitoring data are summarized in tables and figures on the following pages for each lake site. The following table shows the summer data summarized with respect to the whole lake.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	57	34	86	C
CLA (µg/l)	13	3	30	B
Secchi (m)	1.4	0.6	2.2	C
TKN (mg/l)	0.92	0.47	1.70	
			Lake Grade	C

The whole lake received a lake grade of C for 2011, which is consistent with the lake's historical database.

Lake water quality grades based on the whole lakes summer means

Year	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*
Total Phosphorus	D	D	C	C			C	C	C	C	B	C	C
Chlorophyll a	B	C	C	C			B	B	C	B	C	B	B
Secchi Depth	C	C	C	C			C	C	C	C	C	C	C
Overall	**C**	**C**	**C**	**C**			**C**	**C**	**C**	**C**	**C**	**C**	**C**

Source: Metropolitan Council and STORET data

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

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

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St. Croix Lake [Bayport Pool-Site 1] (82-0001) *St. Croix Basin Planning Team*

On each sampling day this 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.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	60.7	46.0	86.0	C
CLA (µg/l)	18.3	7.0	30.0	B
Secchi (m)	1.1	0.6	1.4	D
TKN (mg/l)	0.90	0.73	1.10	
			Lake Grade	C

This lake site received a lake grade of C for 2011. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

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

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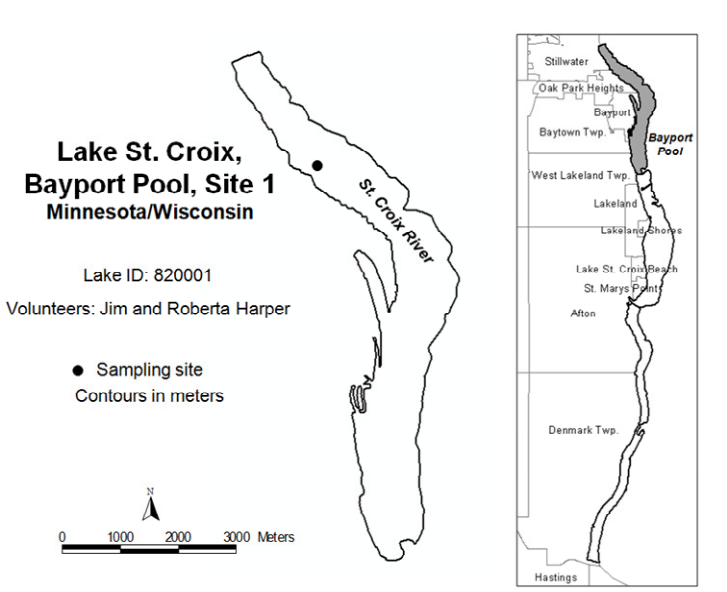
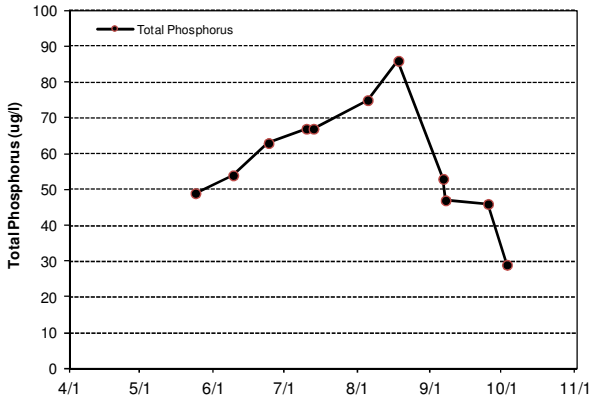
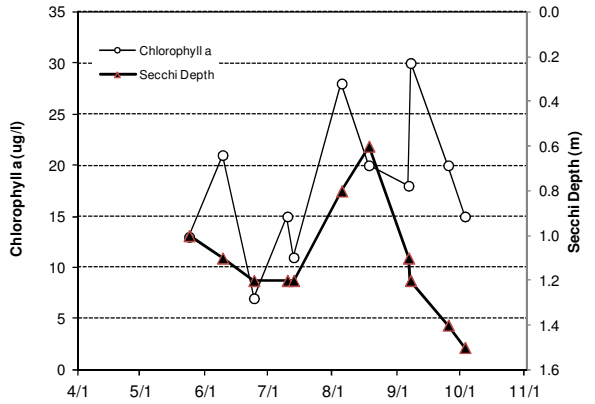
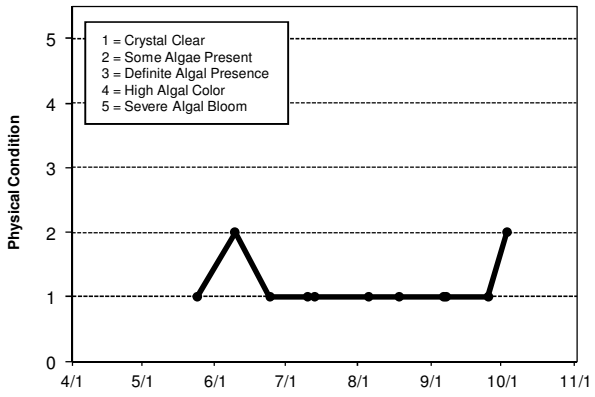
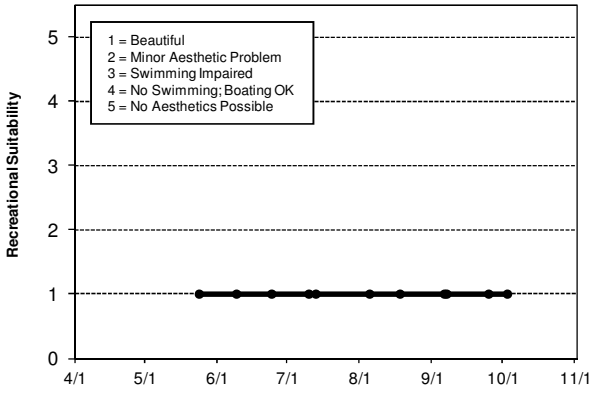










2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/24/2011	18.7				13	49		1.0	1	1
6/9/2011	24.1				21	54		1.1	2	1
6/24/2011	19.8				7.0	63		1.2	1	1
7/10/2011	28.1				15	67		1.2	1	1
7/13/2011	27.1				11	67		1.2	1	1
8/5/2011	28.0				28	75		0.8	1	1
8/18/2011	25.2				20	86		0.6	1	1
9/6/2011	23.3				18	53		1.1	1	1
9/7/2011	25.7				30	47		1.2	1	1
9/25/2011	18.2				20	46		1.4	1	1
10/3/2011	17.0				15	29		1.5	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												
Lake Grade												

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus						C	C	C
Chlorophyll a						C	C	B
Secchi Depth						C	D	D
Lake Grade						**C**	**C**	**C**

Source: Metropolitan Council and STORET data

St. Croix Lake [Bayport Pool-Site 2] (82-0001) *St. Croix Basin Planning Team*

On each sampling day this 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.

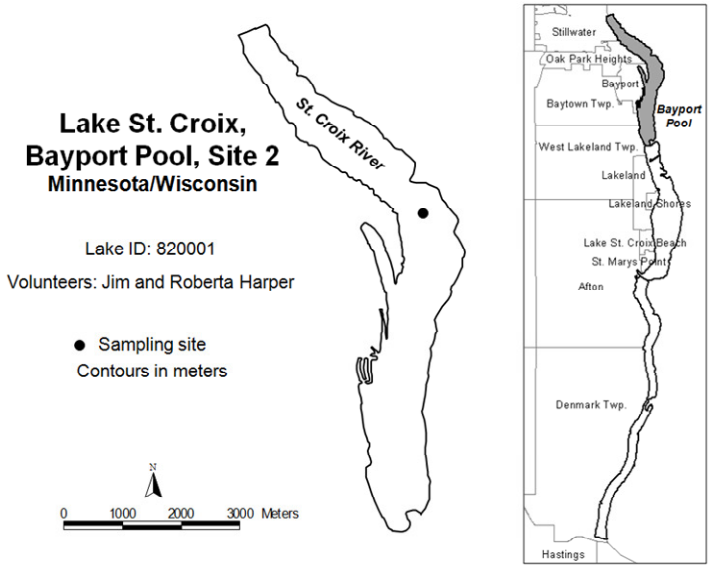
2011 summer (May-September) data summary

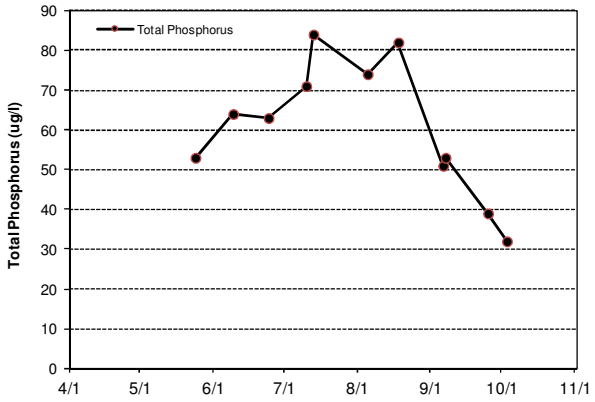
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	63.4	39.0	84.0	C
CLA (µg/l)	13.0	6.8	21.0	B
Secchi (m)	1.2	0.8	1.4	D
TKN (mg/l)	0.87	0.63	1.10	
			Lake Grade	C

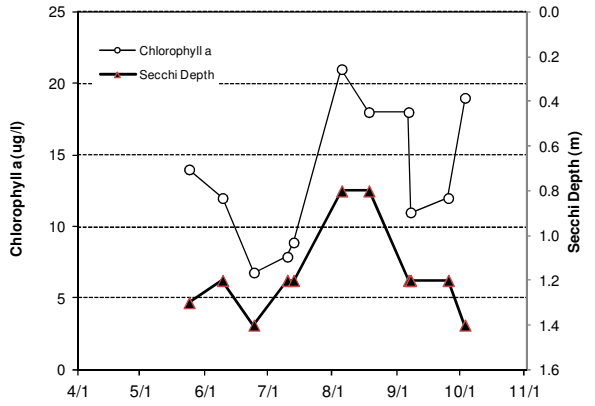
The pool received a lake grade of C for 2011, which is similar to lake grades received in the past. Further monitoring is suggested to continue to build the water quality database for increasing power to detect potential water quality trends.

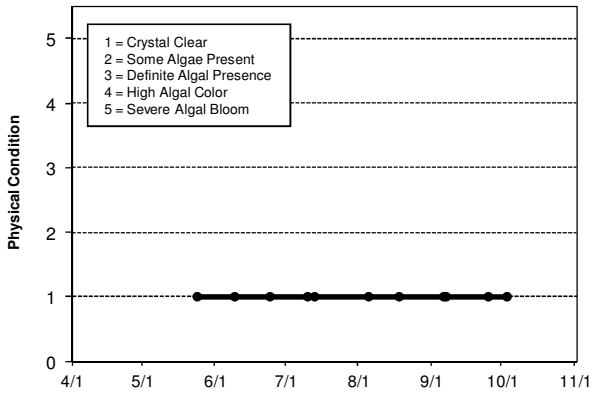
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

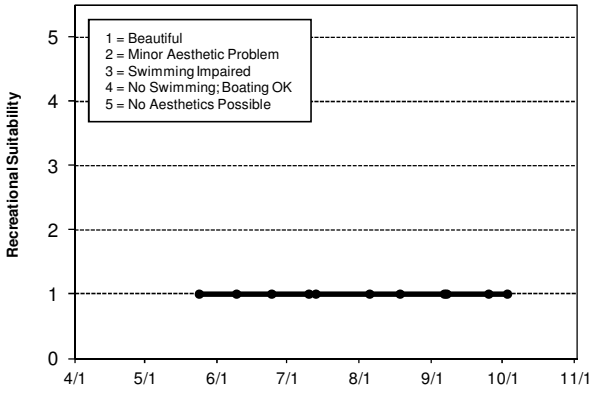
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/24/2011	21.2				14	53		1.3	1	1
6/9/2011	27.0				12	64		1.2	1	1
6/24/2011	21.1				6.8	63		1.4	1	1
7/10/2011	28.7				7.9	71		1.2	1	1
7/13/2011	28.0				8.9	84		1.2	1	1
8/5/2011	29.8				21	74		0.8	1	1
8/18/2011	28.2				18	82		0.8	1	1
9/6/2011	26.4				18	51		1.2	1	1
9/7/2011	25.0				11	53		1.2	1	1
9/25/2011	22.1				12	39		1.2	1	1
10/3/2011	20.7				19	32		1.4	1	1

Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		C	C	C	C	C	C	C
Chlorophyll a		C	C	C	B	C	B	B
Secchi Depth		C	C	C	C	C	D	D
Lake Grade		**C**	**C**	**C**	**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*

On each sampling day this 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.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	59.2	39.0	75.0	C
CLA (µg/l)	13.1	5.8	26.0	B
Secchi (m)	1.3	0.8	1.6	C
TKN (mg/l)	0.96	0.47	1.70	
			Lake Grade	C

The site received a lake grade of C for 2011, which is consistent with its historical database. Further monitoring is suggested to continue to build the water quality database for increasing power to detect potential water quality trends.

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

If you notice any errors in the lake's data or physical information, or are aware of 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

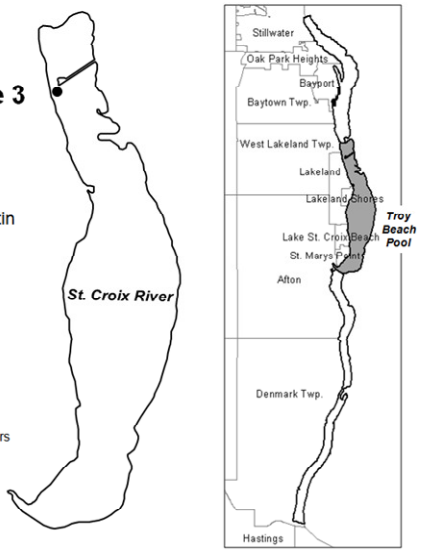
Minnesota/Wisconsin

Lake ID: 820001

Volunteers: Cecilia and Harry Martin

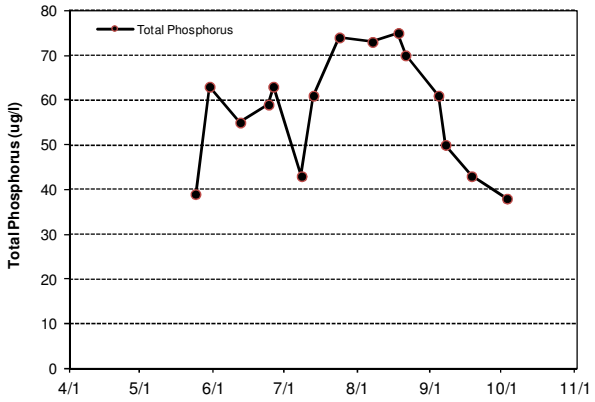
● Sampling site

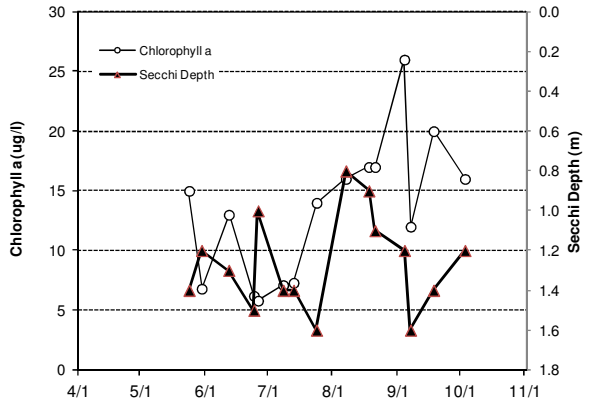
Contours in meters

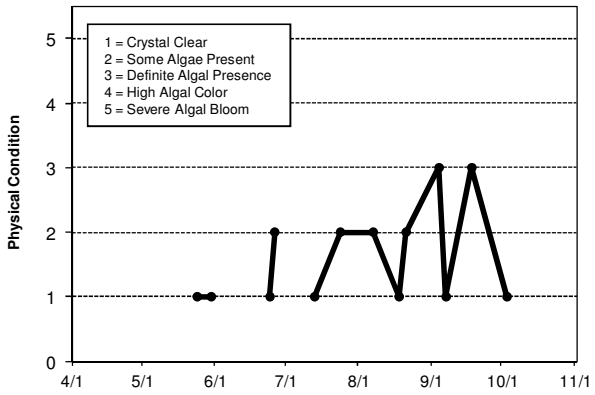


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/24/2011	19.0				15	39		1.4	1	1
5/30/2011	17.8				6.8	63		1.2	1	
6/12/2011	22.0				13	55		1.3		
6/24/2011	21.3				6.2	59		1.5	1	1
6/26/2011	19.2				5.8	63		1.0	2	1
7/8/2011	28.6				7.1	43		1.4		2
7/13/2011	27.1				7.3	61		1.4	1	1
7/24/2011	28.0				14	74		1.6	2	1
8/7/2011	25.8				16	73		0.8	2	2
8/18/2011	25.1				17	75		0.9	1	1
8/21/2011	25.8				17	70		1.1	2	2
9/4/2011	23.4				26	61		1.2	3	3
9/7/2011	23.1				12	50		1.6	1	1
9/18/2011	18.5				20	43		1.4	3	3
10/3/2011	16.1				16	38		1.2	1	1





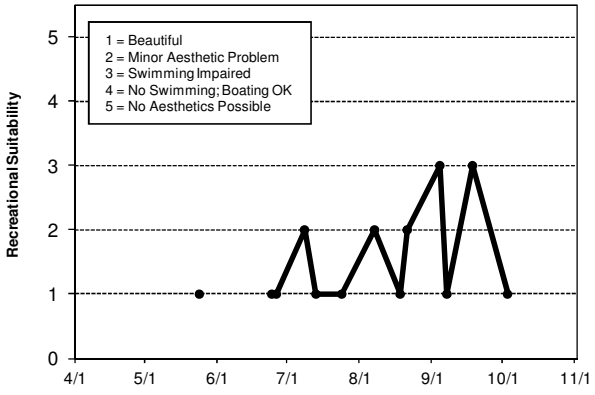


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		C	C	C	C	B	C	C
Chlorophyll a		B	B	C	B	C	B	B
Secchi Depth		C	C	C	C	C	C	C
Lake Grade		**C**	**C**	**C**	**C**	**C**	**C**	**C**



Source: Metropolitan Council and STORET data

St. Croix Lake [Troy Beach Pool-Site 4] (82-0001) *St. Croix Basin Planning Team*

On each sampling day this 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.

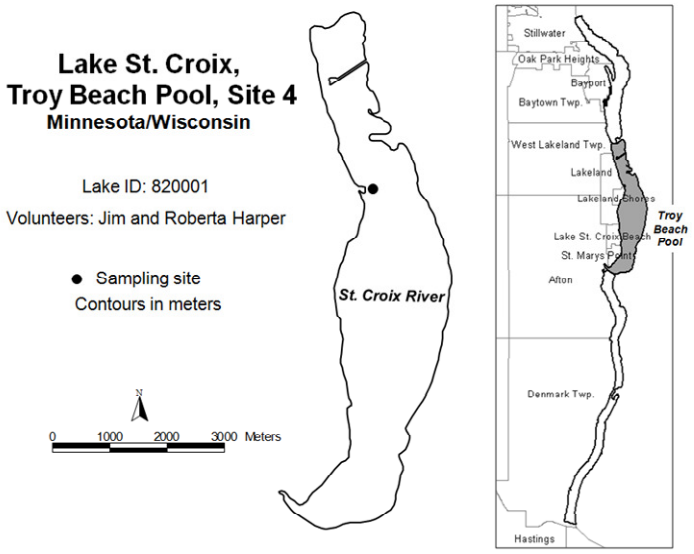
2011 summer (May-September) data summary

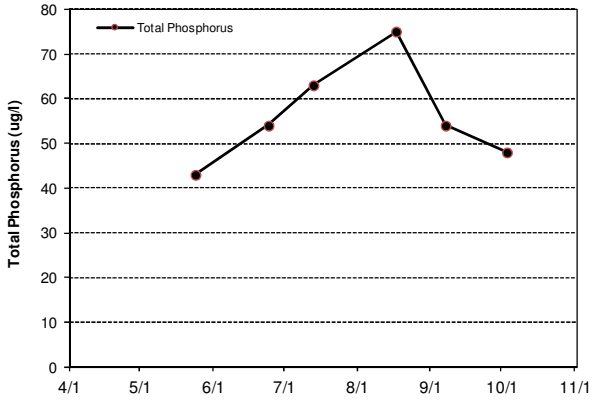
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	57.8	43.0	75.0	C
CLA (µg/l)	14.2	7.8	20.0	B
Secchi (m)	1.4	1.1	1.6	C
TKN (mg/l)	0.87	0.64	1.20	
			Lake Grade	C

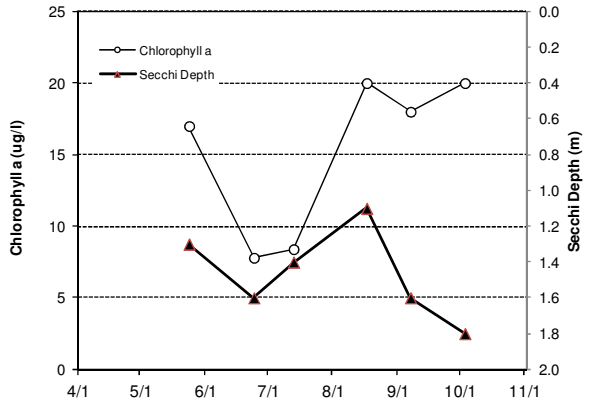
The site received a lake grade of C, which is consistent with its historical water quality database. Further monitoring is suggested to continue to build the water quality database for increasing power to detect potential water quality trends.

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

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

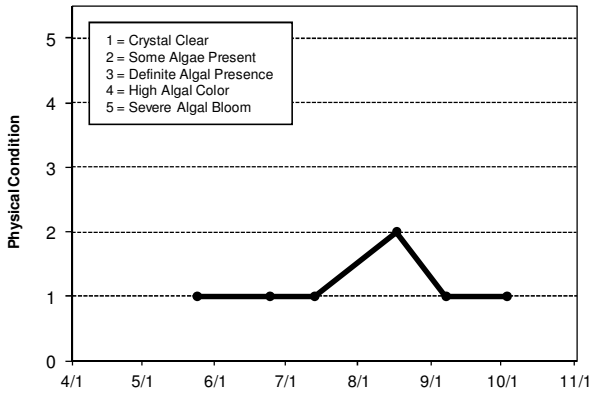






2011 Data

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 (1-5)	RS (1-5)
5/24/2011	19.0				17	43		1.3	1	1
6/24/2011	21.8				7.8	54		1.6	1	1
7/13/2011	26.9				8.4	63		1.4	1	1
8/17/2011	25.5				20	75		1.1	2	1
9/7/2011	25.4				18	54		1.6	1	1
10/3/2011	17.8				20	48		1.8	1	1



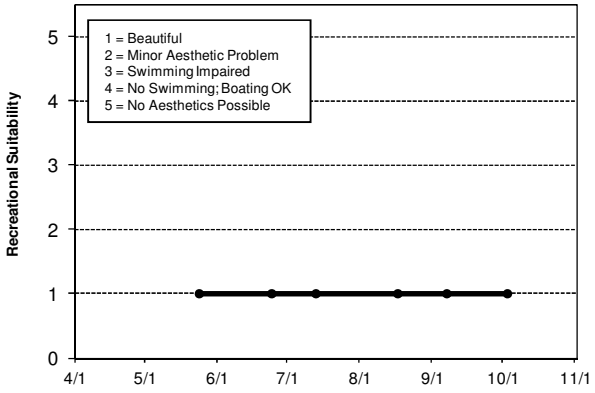
Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		C	C	C	C	B	C	C
Chlorophyll a		B	B	C	B	C	B	B
Secchi Depth		C	C	C	C	C	C	C
Lake Grade		**C**	**C**	**C**	**C**	**C**	**C**	**C**

Source: Metropolitan Council and STORET data



St. Croix Lake [Troy Beach Pool-Site 5] (82-0001) *St. Croix Basin Planning Team*

On each sampling day this 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.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	54.0	37.0	78.0	C
CLA (µg/l)	13.6	4.8	27.0	B
Secchi (m)	1.6	0.8	2.2	C
TKN (mg/l)	0.96	0.68	1.20	
			Lake Grade	C

The site received a lake grade of C, which is consistent with its historical water quality database. Further monitoring is suggested to continue to build the water quality database for increasing power to detect potential water quality trends.

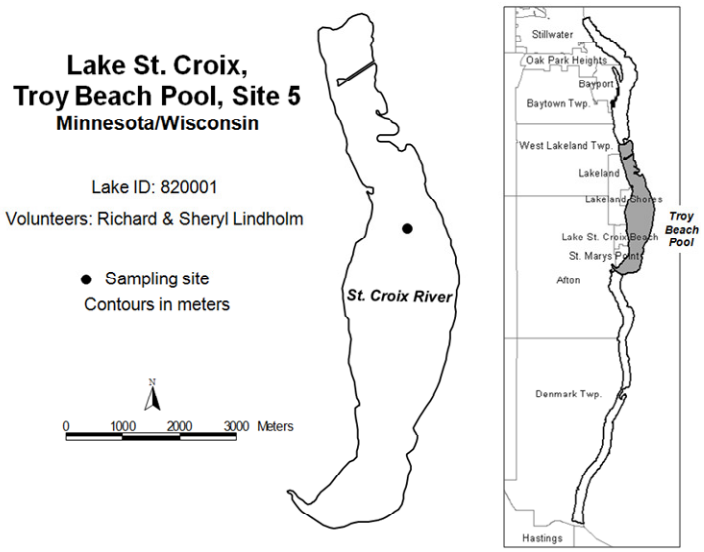
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

If you notice any errors in the lake's data or physical information, or are aware of 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

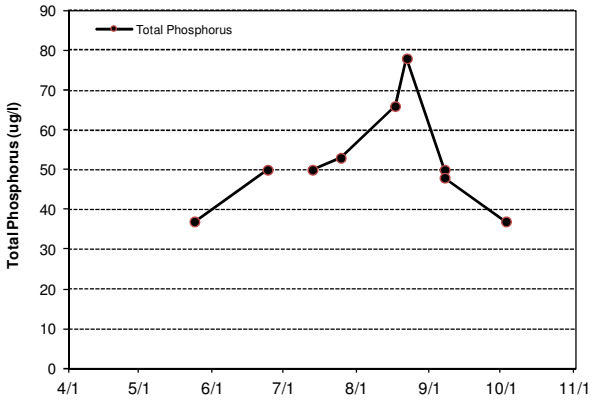
Lake ID: 820001

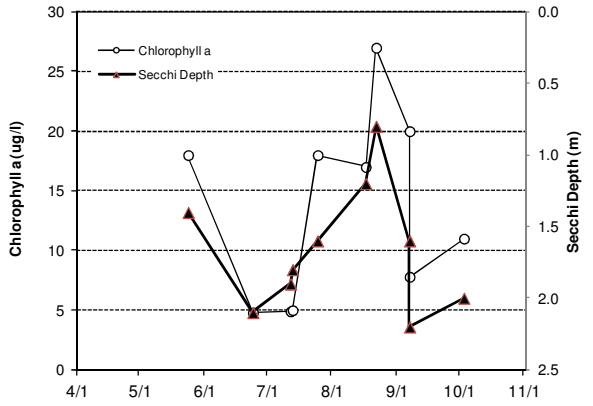
Volunteers: Richard & Sheryl Lindholm

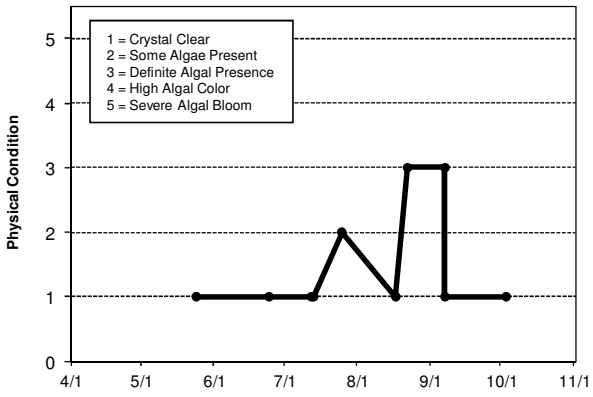


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/24/2011	18.1				18	37		1.4	1	1
6/24/2011	21.9				4.8	50		2.1	1	1
7/12/2011	26.4				4.9			1.9	1	2
7/13/2011	26.9				5.0	50		1.8	1	1
7/25/2011	27.6				18	53		1.6	2	1
8/17/2011	25.9				17	66		1.2	1	1
8/22/2011	25.1				27	78		0.8	3	1
9/7/2011	24.1				20	50		1.6	3	1
9/7/2011	25.5				7.8	48		2.2	1	1
10/3/2011	17.8				11	37		2.0	1	1





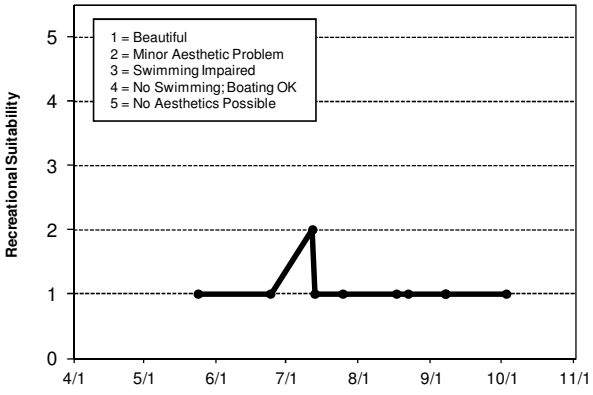


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		C	C	C	C	B	C	C
Chlorophyll a		C	B	C	B	C	B	B
Secchi Depth		C	C	C	C	C	C	C
Lake Grade		**C**	**C**	**C**	**C**	**C**	**C**	**C**



Source: Metropolitan Council and STORET data

St. Croix Lake [Black Bass Pool-Site 6] (82-0001) *St. Croix Basin Planning Team*

On each sampling day this lake site 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.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	48.5	34.0	63.0	C
CLA (µg/l)	12.2	2.7	22.0	B
Secchi (m)	1.5	1.2	2.2	C
TKN (mg/l)	0.91	0.69	1.20	
			Lake Grade	C

The site received a lake grade of C, which is consistent with its historical water quality database. Further monitoring is suggested to continue to build the water quality database for increasing power to detect potential water quality trends.

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

If you notice any errors in the lake's data or physical information, or are aware of 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

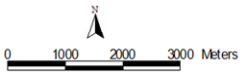
Minnesota/Wisconsin

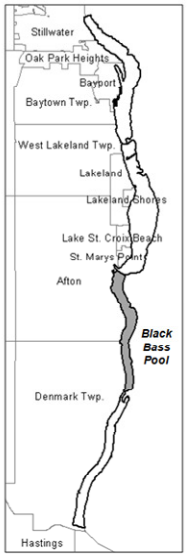
Lake ID: 820001

Volunteer: Rick Meierotto

● Sampling site

Contours in meters





2011 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 (1-5)	RS (1-5)
5/16/2011	14.3				13	39		1.7	2	3
5/24/2011	17.9				21	34		1.5	1	1
5/29/2011	16.9				11	63		1.3	2	3
6/12/2011	20.7				10	44		1.5	2	2
6/24/2011	22.5				4.8	47		2.2	1	1
6/26/2011	21.7				3.0	50		1.6	3	2
7/10/2011	27.6				2.7	42		1.6	3	3
7/13/2011	26.9				17	56		1.8	1	1
7/24/2011	28.1				6.6	46		1.5	3	3
8/7/2011	27.2				20	46		1.4	3	3
8/17/2011	25.2				11	63		1.4	1	1
8/21/2011	25.9				20	52		1.2	3	2
9/5/2011	23.4				15	53		1.4	3	2
9/7/2011	24.6				22	51		1.6	2	2
9/18/2011	19.8				6.5	41		1.5	3	3
10/3/2011	18.8				14	35		2.0	1	1

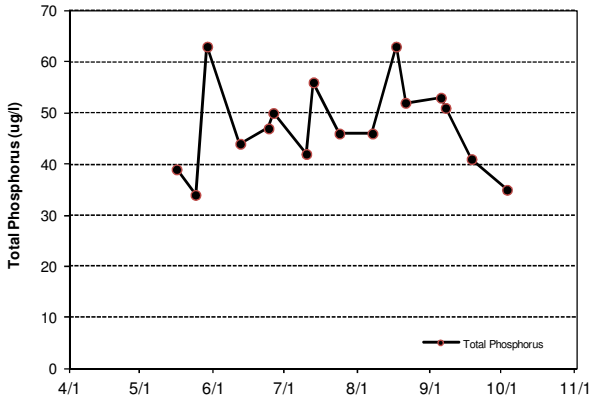
Lake Water Quality Grades Based on Summertime Averages

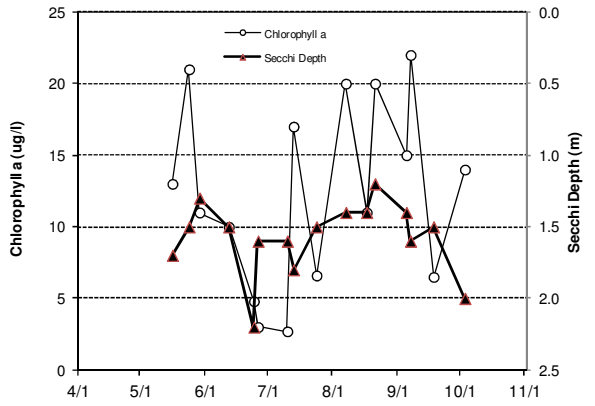
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

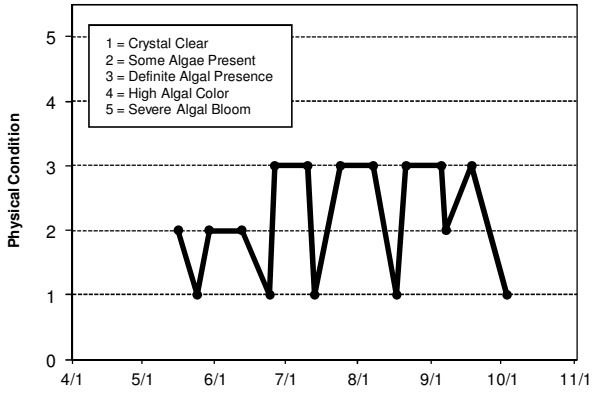
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus								C	C	C	C	
Chlorophyll a								B	C	B	C	
Secchi Depth								C	C	C	C	
Lake Grade								**C**	**C**	**C**	**C**	

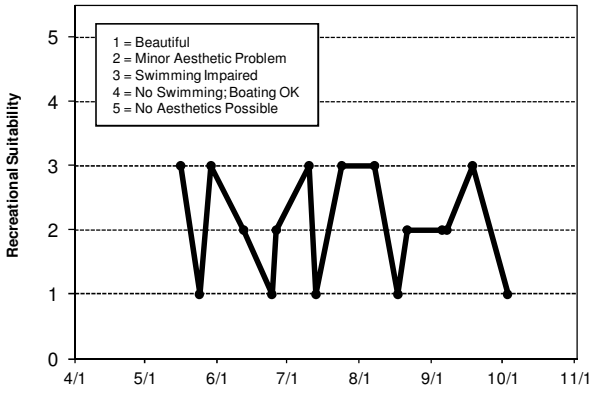
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		C	C	C	C	A	C	C
Chlorophyll a		B	B	C	B	B	B	B
Secchi Depth		C	C	C	C	C	C	C
Lake Grade		**C**	**C**	**C**	**C**	**B**	**C**	**C**

Source: Metropolitan Council and STORET data









St. Croix Lake [Kinnickinnic Pool-Site 7] (82-0001) *St. Croix Basin Planning Team*

On each sampling day this 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.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	55.5	38.0	70.0	
CLA (µg/l)	7.4	4.6	14.0	A
Secchi (m)	1.6	1.4	2.0	C
TKN (mg/l)	0.95	0.74	1.10	
			Lake Grade	

Site 7 did not receive a lake grade for 2011 because there was insufficient quantity of TP data to calculate the TP grade. At least 5 monitoring events are needed during the summer time period to calculate a parameter grade. All three parameter grades are needed to calculate a lake grade. Also, this lake site typically receives a CLA grade of B, but this year it received an A. Additional years of monitoring are suggested for continuing to build the water quality database for this lake site.

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

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

Lake St. Croix, Kinnickinnic Pool, Site 7

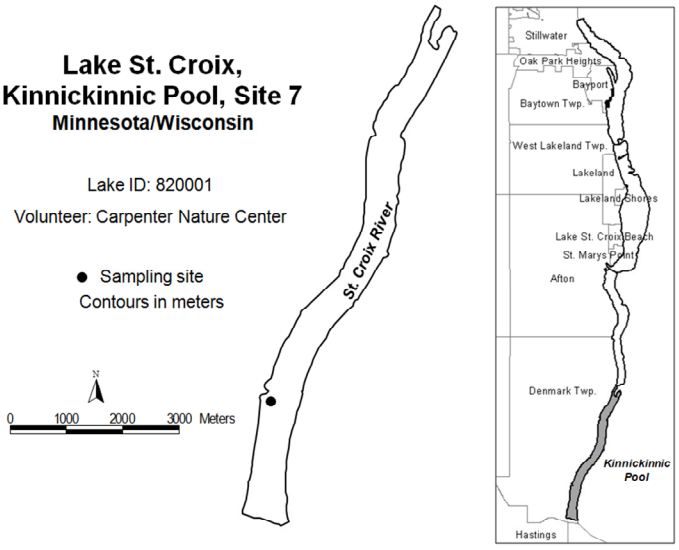
Minnesota/Wisconsin

Lake ID: 820001

Volunteer: Carpenter Nature Center

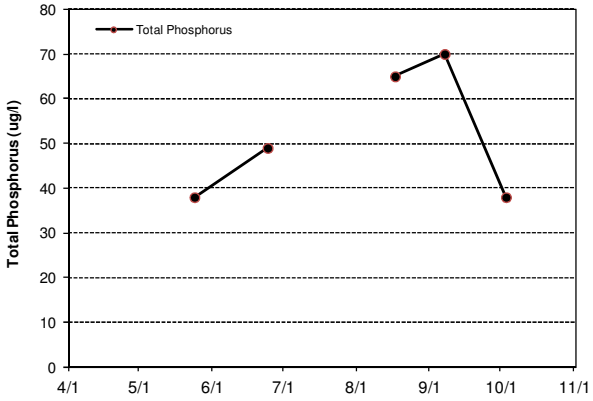
● Sampling site

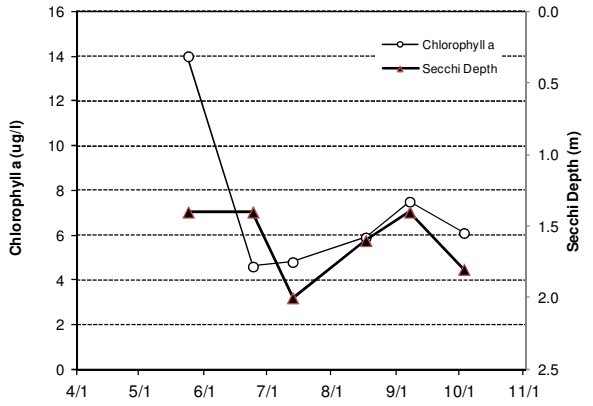
Contours in meters

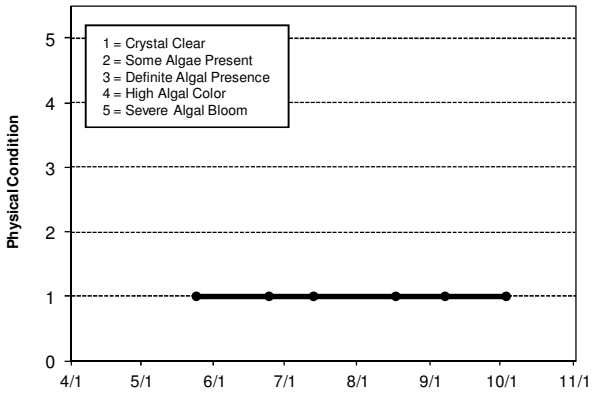


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/24/2011	17.2				14	38		1.4	1	1
6/24/2011	23.3				4.6	49		1.4	1	1
7/13/2011	27.3				4.8			2.0	1	1
8/17/2011	25.7				5.9	65		1.6	1	1
9/7/2011	23.7				7.5	70		1.4	1	1
10/3/2011	18.0				6.1	38		1.8	1	1







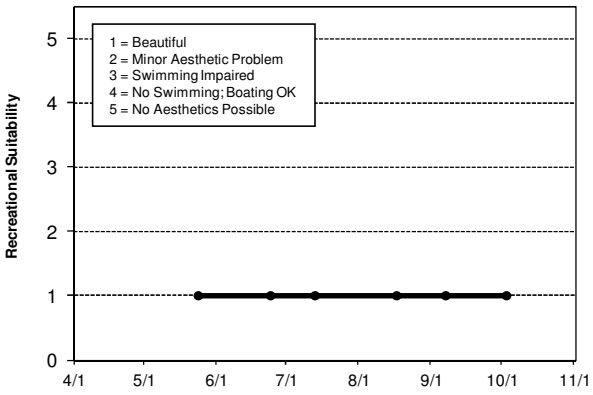
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		B	B	B	C	A	C	
Chlorophyll a		B	B	B	B	B	B	A
Secchi Depth		C	C	C	C	C	C	C
Lake Grade		**B**	**B**	**B**	**C**	**B**	**C**	**NA**

Source: Metropolitan Council and STORET data



St. Joe Lake (10-0011) C*ity of Chanhassen*

St. Joe Lake is a 14-acre lake located within the City of Chanhassen (Carver County). It has a maximum depth of 15.9 m (52 ft).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	19.9	16.0	27.0	A
CLA (µg/l)	6.2	2.2	11.0	A
Secchi (m)	2.6	1.6	3.5	B
TKN (mg/l)	0.79	0.74	0.90	
			Lake Grade	A

The lake received a lake grade of A for 2011, which is consistent with its historical water quality database. The lake has varied in the A to B lake grade range. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

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

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.

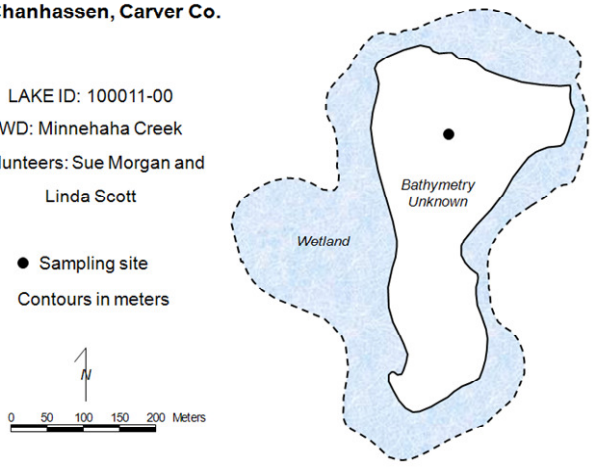
LAKE ID: 100011-00

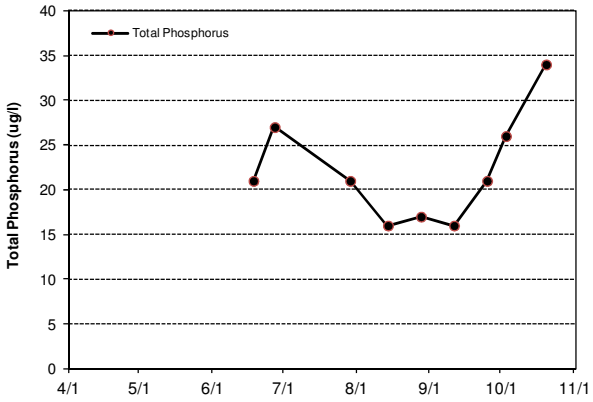
WD: Minnehaha Creek

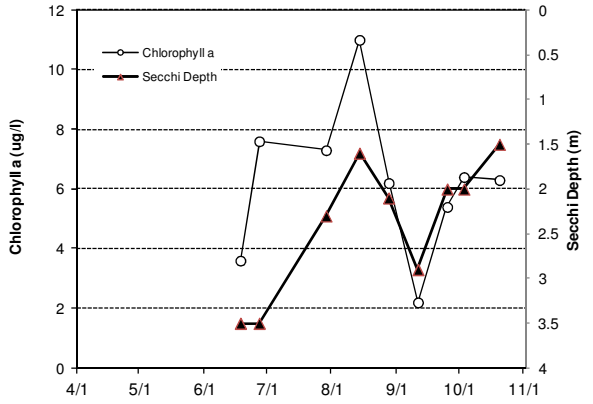
Volunteers: Sue Morgan and Linda Scott

● Sampling site

Contours in meters

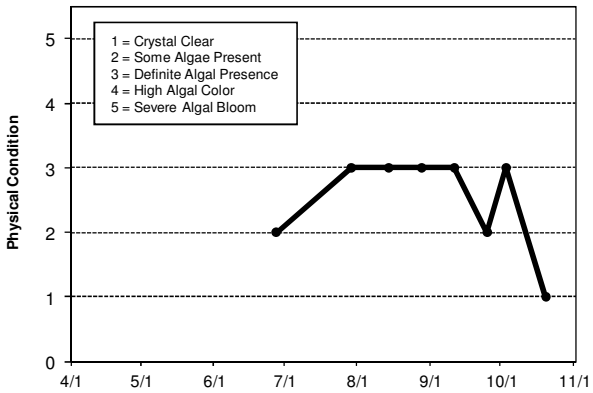






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
6/18/2011	22.3				3.6	21		3.5		
6/27/2011	20.8				7.6	27		3.5	2	1
7/29/2011	27				7.3	21		2.3	3	1
8/14/2011	24.1				11	16		1.6	3	1
8/28/2011	23.6				6.2	17		2.1	3	1
9/11/2011	22.4				2.2	16		2.9	3	1
9/25/2011	15				5.4	21		2	2	1
10/3/2011	15.2				6.4	26		2	3	1
10/20/2011	11				6.3	34		1.5	1	1

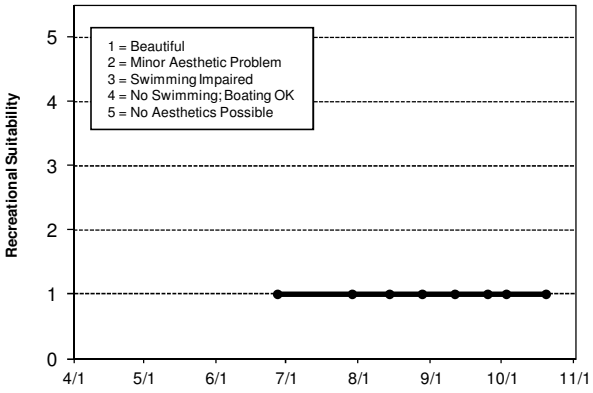


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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	2009	2010	2011
Total Phosphorus	A	A	C	A	A	C	A	A
Chlorophyll a	A	A	A	A	A	A	A	A
Secchi Depth	B	A	B	A	B	A	B	B
Lake Grade	**A**	**A**	**B**	**A**	**A**	**B**	**A**	**A**



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). Little morphological data are available for this lake.

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

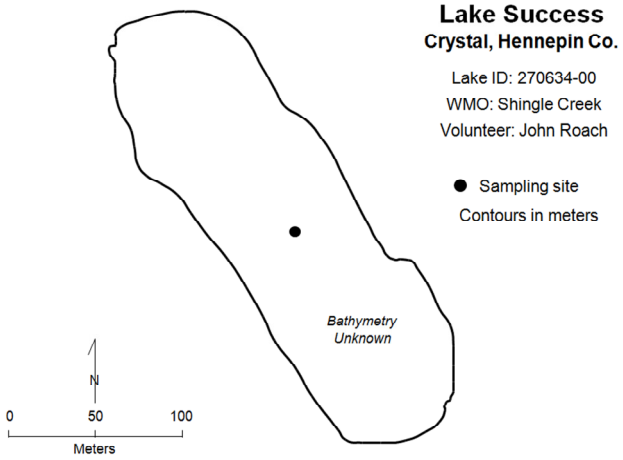
2011 summer (May-September) data summary

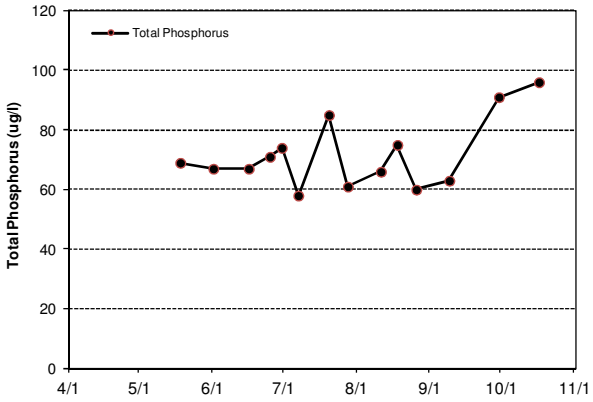
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	69.8	58.0	91.0	D
CLA (µg/l)	55.7	6.0	120.0	D
Secchi (m)	0.4	0.3	0.6	F
TKN (mg/l)	1.55	1.10	2.40	
			Lake Grade	D

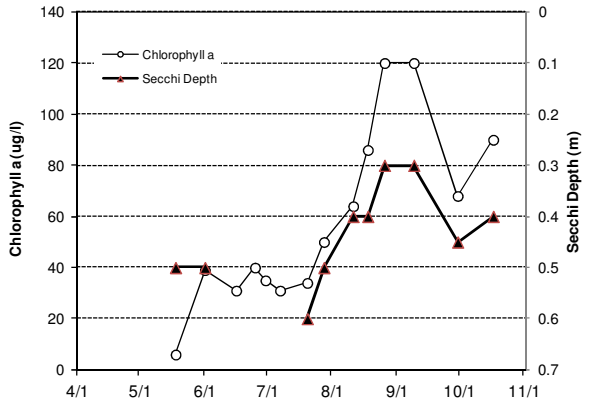
The lake received a lake grade of D for 2011, which suggests that water quality was poorer in 2011 than in previous years. Continued monitoring is suggested to continue to build the historical water quality database for determining potential trends in water quality.

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

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

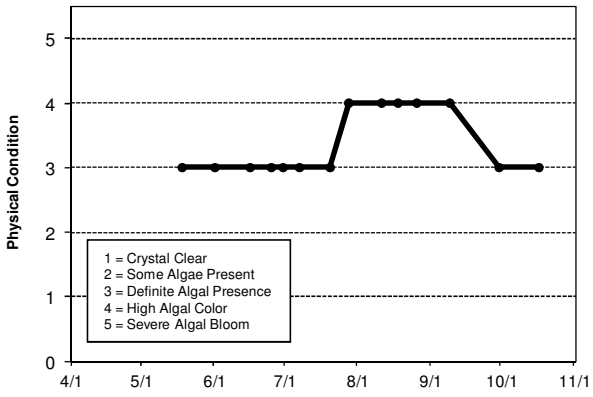






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/18/2011	16.7				6	69		0.5	3	4
6/1/2011	20.9				39	67		0.5	3	4
6/16/2011	24				31	67			3	4
6/25/2011	21.4				40	71			3	4
6/30/2011	27.4				35	74			3	4
7/7/2011	27.5				31	58			3	3
7/20/2011	30.9				34	85		0.6	3	3
7/28/2011	31.1				50	61		0.5	4	4
8/11/2011	26.1				64	66		0.4	4	3
8/18/2011	25.8				86	75		0.4	4	4
8/26/2011	25.9				120	60		0.3	4	4
9/9/2011	24.9				120	63		0.3	4	4
9/30/2011	16				68	91		0.45	3	4
10/17/2011	13.4				90	96		0.4	3	4

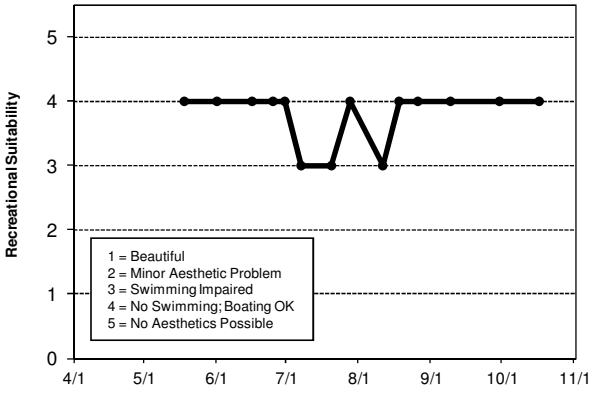


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			D		C			D
Chlorophyll a			B		B			D
Secchi Depth			D		C			F
Lake Grade			**C**		**C**			**D**



Source: Metropolitan Council and STORET data

Sunfish Lake [Sunfish Lake] (19-0050) *City of Sunfish Lake*

Sunfish Lake is located in the City of Sunfish Lake (Dakota County). The lake has a surface area of 49 acres and a maximum depth of 9.8 m (32 ft).

During each sampling event the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), and total kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	30.8	11.0	55.0	B
CLA (µg/l)	11.5	1.3	43.0	B
Secchi (m)	3.3	1.1	5.2	A
TKN (mg/l)	0.73	0.52	1.20	
			Lake Grade	B

The lake received a lake grade of B for 2011. This was the first year in the lake's historical CAMP database that the lake has received an A grade for Secchi depth. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

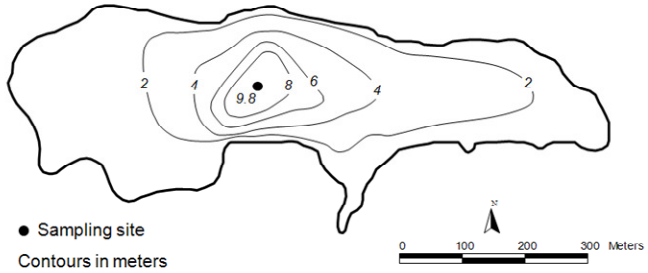
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

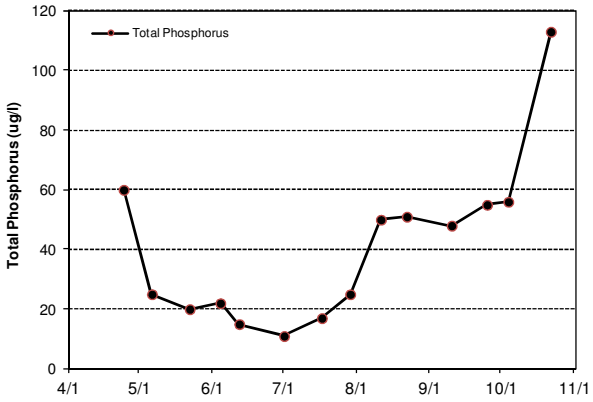
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

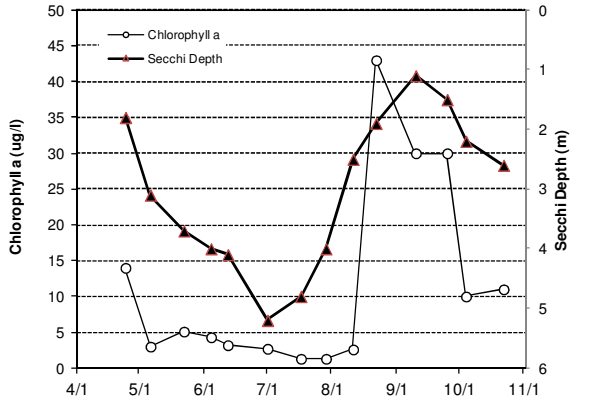
Sunfish Lake

Sunfish Lake, Dakota Co.

Lake ID: 190050-00
WMO: Lower Mississippi River
Volunteer: Jim Stowell

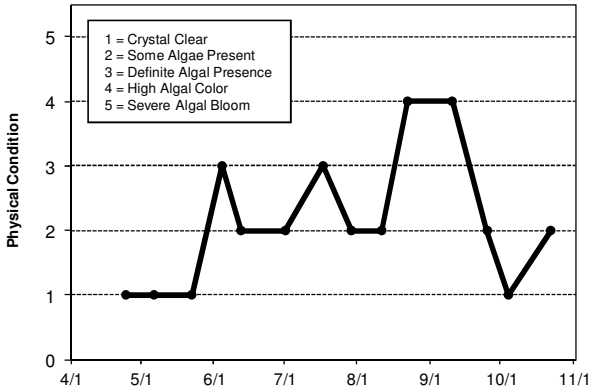






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	8.8				14	60		1.8	1	1
5/6/2011	14.1				3	25		3.1	1	1
5/22/2011	17.3				5.1	20		3.7	1	1
6/4/2011	20.4				4.3	22		4	3	2
6/12/2011	18.6				3.2	15		4.1	2	2
7/1/2011	27.4				2.7	11		5.2	2	2
7/17/2011	32.1				1.3	17		4.8	3	3
7/29/2011	27.8				1.3	25		4	2	2
8/11/2011	24.6				2.6	50		2.5	2	2
8/22/2011	25.8				43	51		1.9	4	3
9/10/2011	24.2				30	48		1.1	4	4
9/25/2011	15.6				30	55		1.5	2	3
10/4/2011	17.5				10	56		2.2	1	1
10/22/2011	11				11	113		2.6	2	2



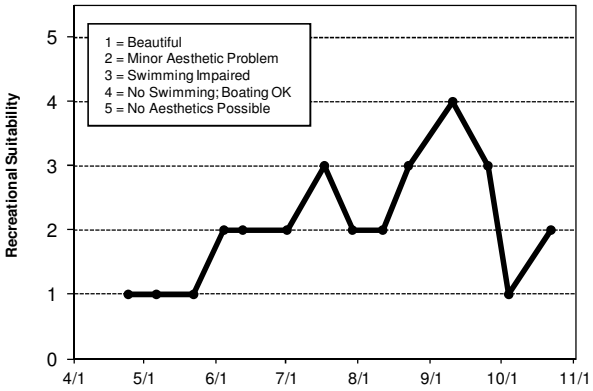
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			C	C	C	B	C	B
Chlorophyll a			C	C	C	B	C	B
Secchi Depth			D	C	C	B	B	A
Lake Grade			**C**	**C**	**C**	**B**	**C**	**B**

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.

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

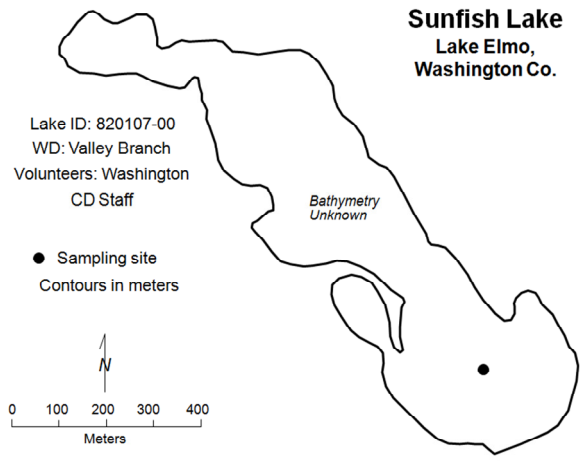
2011 summer (May-September) data summary

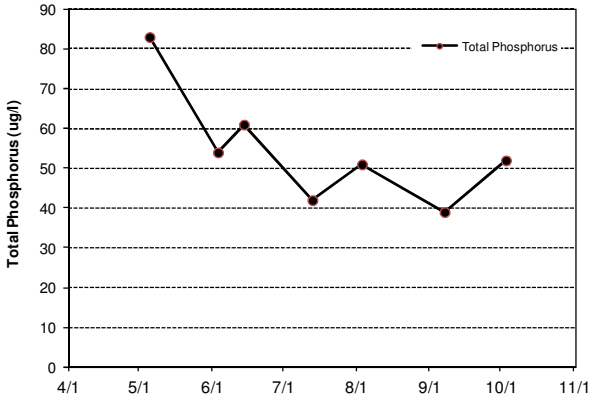
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	55.0	39.0	83.0	C
CLA (µg/l)	26.6	4.8	49.0	C
Secchi (m)	1.3	1.1	1.8	C
TKN (mg/l)	1.77	1.50	2.00	
			Lake Grade	C

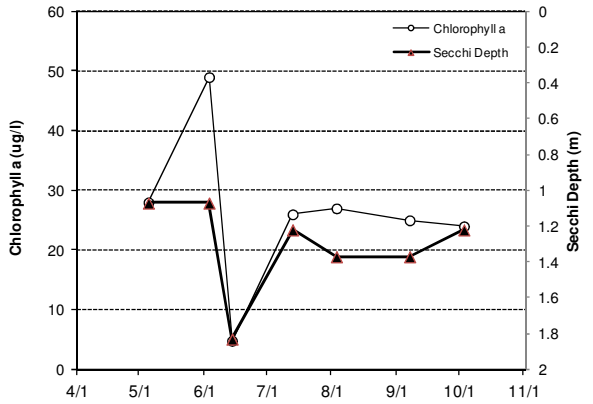
The lake received a lake grade of C for 2011. The lake has received lake grades varying from C's to D's since 2000. Continued monitoring is suggested to continue to build the water quality database for this lake.

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.

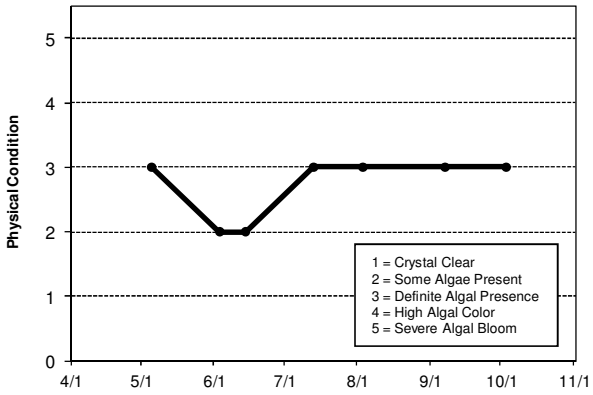






2011 Data

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 (1-5)	RS (1-5)
5/5/2011	10.4	9.8	11.2	0.1	28	83		1.07	3	3
6/3/2011	20.4	19.4	8.7	0.1	49	54		1.07	2	3
6/14/2011	20.9	20	5.8	0.1	4.8	61		1.83	2	2
7/13/2011	27.1	26.1	8	0	26	42		1.22	3	4
8/3/2011	27.3	24.9	6.2	0.2	27	51		1.37	3	3
9/7/2011	21.3	20.5	8.7	0.3	25	39		1.37	3	4
10/3/2011	15.3	14.5	11.3	0.1	24	52		1.22	3	4

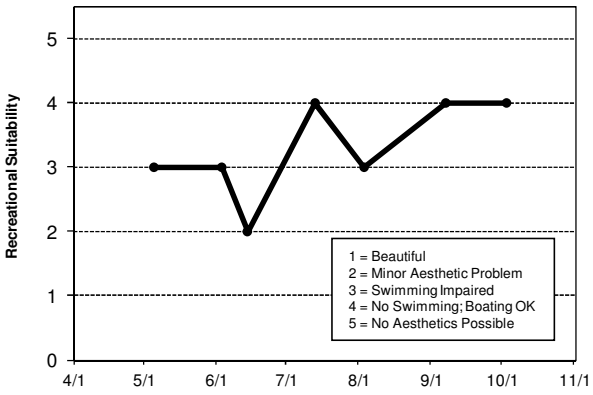


Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus		C	C		D			C
Chlorophyll a		C	C		C			C
Secchi Depth		F	F		F			C
Lake Grade		**D**	**D**		**D**			**C**



Source: Metropolitan Council and STORET data

Sunnybrook Lake (82-0133) *Valley Branch Watershed District*

Sunnybrook Lake is a 16-acre lake located within Grant Township (Washington County). The maximum and mean depths of the lake are 6.1 and 2.0 m (20.0 and 6.5 feet), respectively. The majority of the lake's area is considered littoral zone (the area of aquatic vegetation dominance).

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

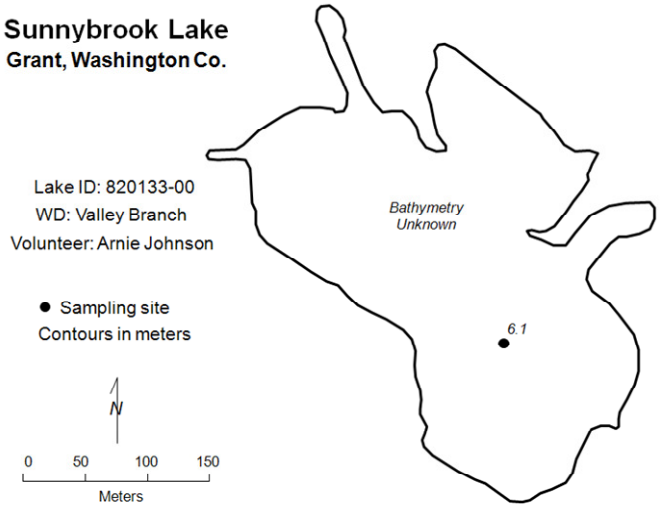
2011 summer (May-September) data summary

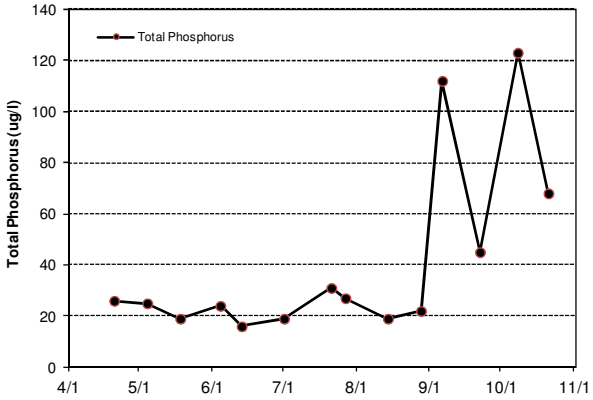
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	32.6	16.0	112.0	C
CLA (µg/l)	7.0	2.3	17.0	A
Secchi (m)	2.2	1.5	3.2	B
TKN (mg/l)	0.80	0.60	1.00	
			Lake Grade	B

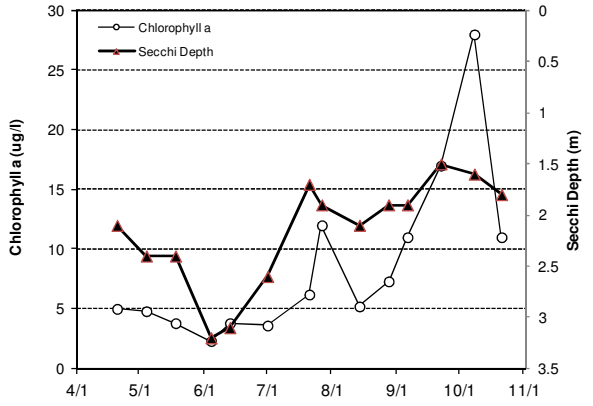
The lake received a lake grade of B for 2011. The total summer time average phosphorus concentration in 2011 increased in comparison to the past 5 years. Continued monitoring is suggested to help determine the trend direction, if any, of the varying water quality of this lake.

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

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

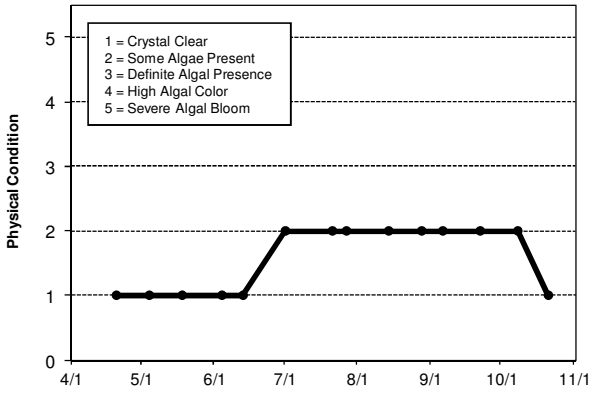






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/20/2011	7.6				5	26		2.1	1	1
5/4/2011	10				4.8	25		2.4	1	1
5/18/2011	16.2				3.8	19		2.4	1	1
6/4/2011	22.9				2.3	24		3.2	1	1
6/13/2011	20.4				3.8	16		3.1	1	1
7/1/2011	28.6				3.6	19		2.6	2	2
7/21/2011	30.7				6.2	31		1.7	2	2
7/27/2011	27.3				12	27		1.9	2	2
8/14/2011	26.1				5.2	19		2.1	2	2
8/28/2011	25.8				7.3	22		1.9	2	2
9/6/2011	21.6				11	112		1.9	2	1
9/22/2011	16				17	45		1.5	2	2
10/8/2011	18.9				28	123		1.6	2	2
10/21/2011	11.4				11	68		1.8	1	1

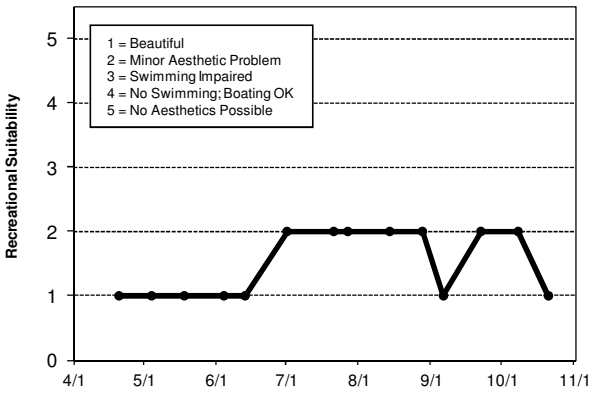


Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	B	C	B	B	A	A	A	C
Chlorophyll a	A	B	A	A	A	A	A	A
Secchi Depth	B	B	B	B	B	B	B	B
Lake Grade	**B**	**B**	**B**	**B**	**A**	**A**	**A**	**B**



Source: Metropolitan Council and STORET data

Sunset Lake (82-0153) *Rice Creek Watershed District*

Sunset Lake is located in the southern portion of the City of Hugo (Washington County). It has a surface area of 124 acres and a maximum depth of 5.2 m (17 ft). Nearly the entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	25.9	17.0	37.0	B
CLA (µg/l)	4.6	2.2	12.0	A
Secchi (m)	2.8	2.4	3.0	B
TKN (mg/l)	0.72	0.52	0.92	
			Lake Grade	B

The lake received a lake grade of B for 2011, which suggests a return to similar water quality last observed in 2000. According to the historical water quality database, the water quality of the lake has improved over the past 25 years, as demonstrated by the shift from mostly C lake grades received in the period 1993-1999 to A lake grades in the period 2001-2010. Furthermore, Secchi depths were measured throughout the mid- to late-1980's as part of the MPCA's volunteer program. Secchi grades in the 1980s were in the C to D range. Continued monitoring is suggested to determine if drop in TP and Secchi depth grades is a simply a one year variation or an early sign of changing water quality of the lake.

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

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

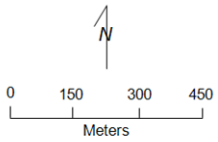
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

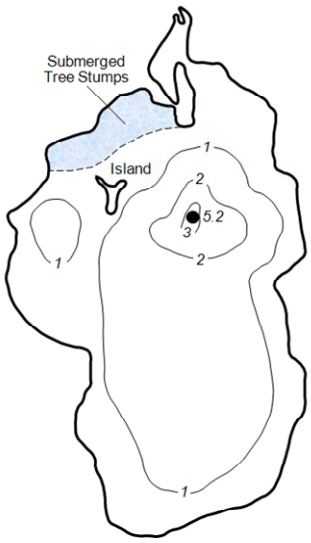
Sunset Lake

Hugo, Washington Co.

Lake ID: 820153-00
WD: Rice Creek
Volunteer:
Dianne Coderre

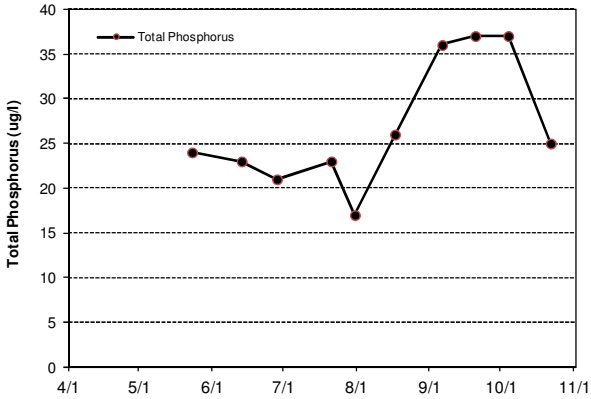
● Sampling site
Contours in meters

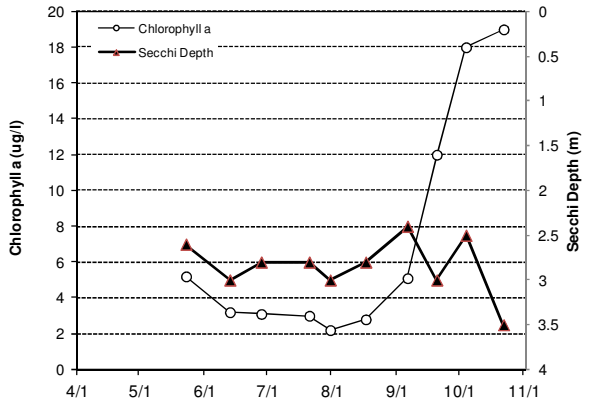


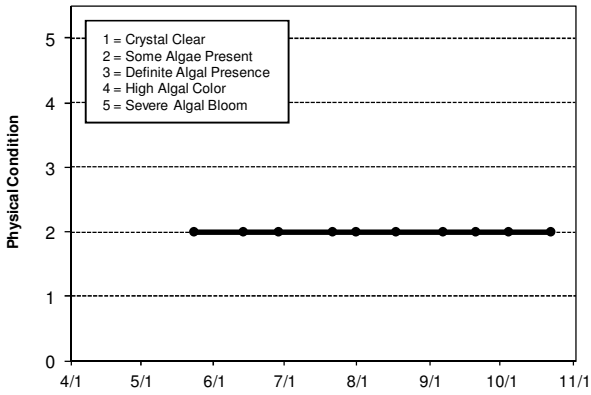


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/23/2011	18.6				5.2	24		2.6	2	1
6/13/2011	22.2				3.2	23		3	2	4
6/28/2011	23.2				3.1	21		2.8	2	2
7/21/2011	30.9				3	23		2.8	2	
7/31/2011	30.8				2.2	17		3	2	
8/17/2011	27				2.8	26		2.8	2	1
9/6/2011	23.4				5.1	36		2.4	2	1
9/20/2011	18.9				12	37		3	2	2
10/4/2011	17.5				18	37		2.5	2	4
10/22/2011	11.7				19	25		3.5	2	3





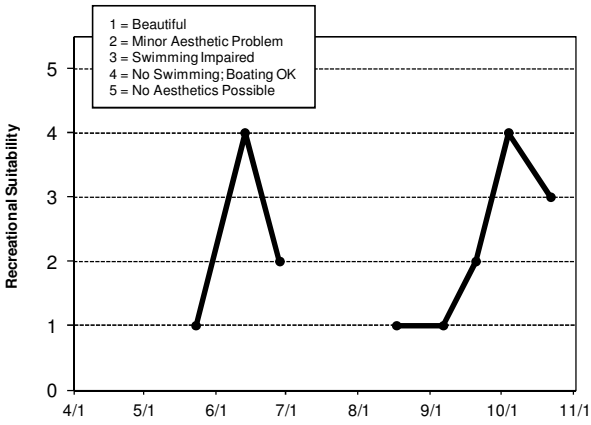


Lake Water Quality Grades Based on Summertime Averages

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

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	A	A	A	A	A	A	A	B
Chlorophyll a	A	A	A	A	A	A	A	A
Secchi Depth	A	A	A	B	A	B		B
Lake Grade	**A**	**A**	**A**	**A**	**A**	**A**		**B**



Source: Metropolitan Council and STORET data

Sunset Pond (19-0451) *Black Dog Watershed Management Commission*

Sunset Pond, a 60-acre man-made lake, is located in the City of Burnsville (Dakota County). It has been involved in CAMP since 1994 (with an omission in 1999). The pond has a normal maximum depth of 3.7 m (12 ft). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The pond collects drainage from a portion of the cities of Burnsville's and Savage's stormwater conveyance systems, including outflow from Crystal and Earley lakes. Because the lake was created to detain stormwater, the pond can experience extreme bounce in its water level during runoff conditions. The pond has been designated by the MN DNR as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	45.2	28.0	61.0	C
CLA (µg/l)	7.6	3.4	25.0	A
Secchi (m)	2.2	1.7	2.5	C
TKN (mg/l)	0.83	0.58	1.30	
			Lake Grade	B

The pond received a lake grade of B for 2011, which is consistent with lake grades received since 2007. The pond experiences variability in its water quality as demonstrated by the variation in the historical lake grades. The lake typically receives a B or C lake grade. The Secchi grade of C does not correlate well with the CLA grade of A. One possible explanation for this incongruency may be that the water clarity may be affected by higher levels of total suspended solids from surface runoff via the surrounding urbanized watershed. In this scenario, higher loadings of suspended solids could cause a decrease in water clarity which would decrease light penetration, thereby inhibiting algal growth. In other words, the algal population may be light-limited rather than nutrient-limited.

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

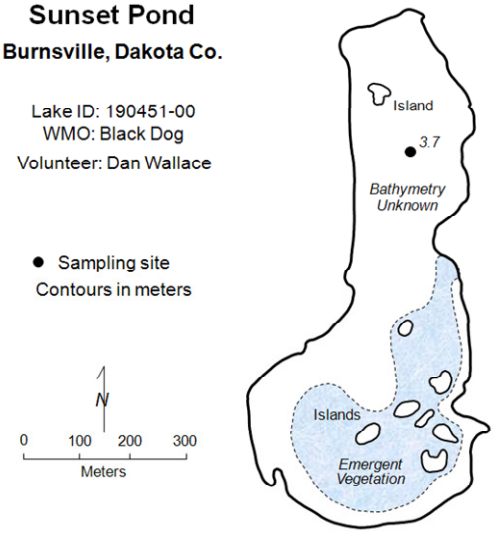
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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

Sunset Pond

Burnsville, Dakota Co.

Lake ID: 190451-00
WMO: Black Dog
Volunteer: Dan Wallace



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/24/2011	7.4				5.4	31		2.5	1	1
5/6/2011	12.9				7.3	28		2.1	2	1
5/24/2011	19.7				13	46		1.7	3	3
6/5/2011	23.7				7.2	36		2.2	2	2
6/19/2011	22.5				4.6	43		2.5	2	2
7/3/2011	27.3				25	61		2.3	2	4
7/17/2011	25.6				3.4	54		2.3	2	3
7/30/2011	28.4				5.6	43		2.4	3	4
8/14/2011	26.1				3.4	28		2.4	3	4
8/29/2011	22.3				3.7	60		2.3	5	5
9/11/2011	22.5				5.9	42		1.8	5	5
9/25/2011	14				4.4	56		2.2	5	5
10/9/2011	19				2.6	30		2.3	3	3
10/22/2011	8.8				4.5	79		2.4	2	2

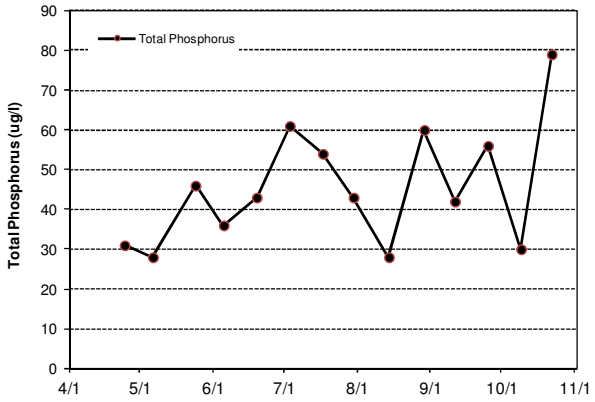
Lake Water Quality Grades Based on Summertime Averages

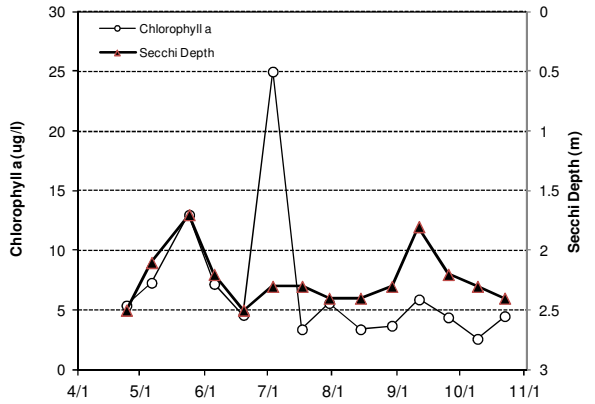
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

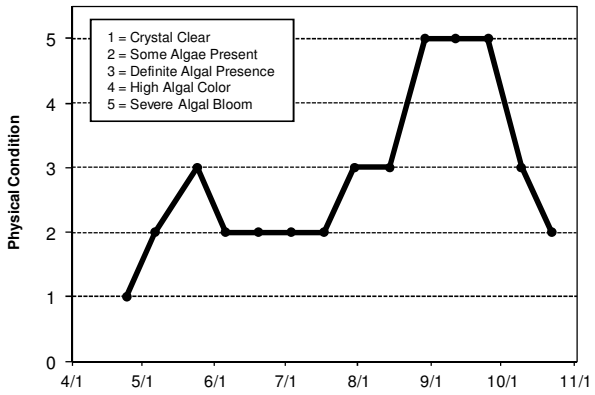
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus			C	C	C	C	C		C	C	C	D
Chlorophyll a			A	B	B	B	A		A	A	A	B
Secchi Depth			C	C	C	C	C		C	B	B	C
Lake Grade			**B**	**C**	**C**	**C**	**B**		**B**	**B**	**B**	**C**

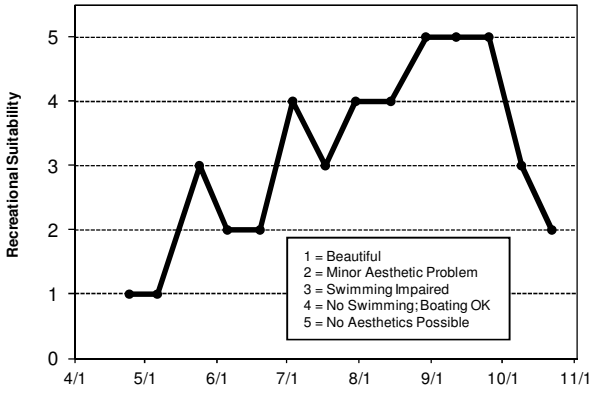
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	D		D	C	C	C	C	C
Chlorophyll a	A		B	A	A	A	A	A
Secchi Depth	B		C	C	C	C	C	C
Lake Grade	**B**		**C**	**B**	**B**	**B**	**B**	**B**

Source: Metropolitan Council and STORET data









Susan Lake (10-0013) *City of Chanhassen*

Susan Lake, located in the City of Chanhassen (Carver County), covers an area of 93 acres and has a maximum depth of 5.2 m (17 feet). Approximately 81 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

Susan Lake is involved in a study on the common carp (*Cyprinus carpio*), which is an invasive, non-native fish species, originally from central Asia. The study is being lead by Dr. Peter Sorensen of the the University of Minnesota. The purpose of the study is to develop an integrated management plan for the Riley chain-of-lakes (including Susan Lake) so as to improve the water quality of the lake chain. The activity and feeding behavior of the common carp can wreak havoc on the water quality and ecology of lakes by causing a litany of problems including reduced water clarity, decreased abundance of rooted aquatic vegetation, increase in algal populations, resuspension of sediment, increased internal loading of phosphorus, and negative changes in native fish populations. The long-term goal of the study is to develop a carp management strategy that can be applied to other lakes beyond the study lakes. For more information on this project, please refer to Dr. Sorensen's website at:
http://fwcb.cfans.umn.edu/sorensen/research/index.html

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	56.2	22.0	110.0	C
CLA (µg/l)	24.7	1.9	56.0	C
Secchi (m)	1.8	0.5	4.2	C
TKN (mg/l)	1.32	0.92	1.90	
			Lake Grade	C

The lake received a lake grade of C for 2011, which is consistent with its limited historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

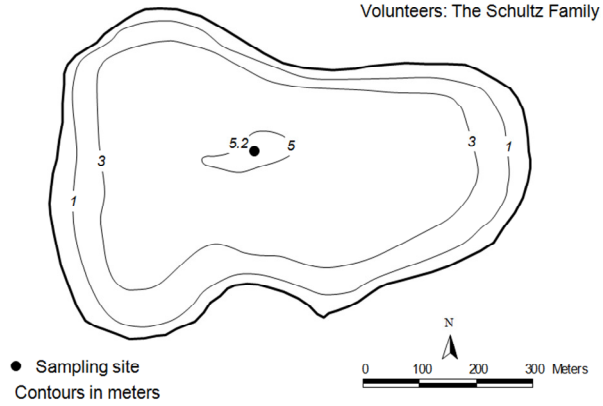
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

If you notice any errors in the lake's data or physical information, or are aware of 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: 100013-00
WD: Riley-Purgatory-Bluff Creek
Volunteers: The Schultz Family



● Sampling site
Contours in meters

2011 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 (1-5)	RS (1-5)
5/6/2011	13.8				2.8	22		4.2	1	1
5/18/2011	16				1.9	23		4.1	1	
6/3/2011	21.7				9.4	29		2.5	2	1
6/17/2011	21.3				6.9	24		2.5	2	1
7/3/2011	27.3				10	40		2	3	1
7/16/2011	25.8				16	54		1.5		
7/31/2011	29.1				47	54		0.9		
8/14/2011	26.3				43	92		0.75	4	1
8/27/2011	25.2				32	63		0.5	3	1
9/10/2011	24.8				47	110		0.5	2	1
9/24/2011	16.2				56	107		0.75	3	2
10/9/2011	19.6				54	92		0.9	2	1
10/22/2011	11.8				47	79		0.9	2	1

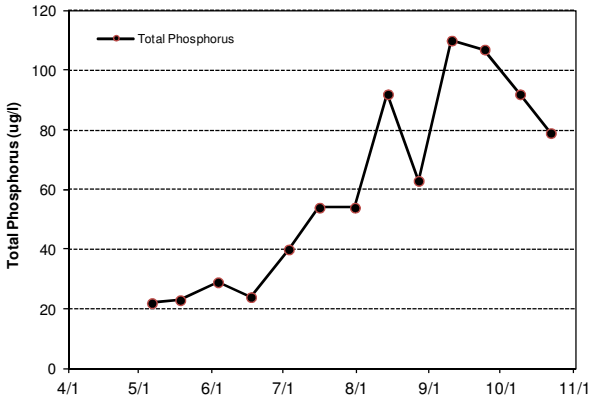
Lake Water Quality Grades Based on Summertime Averages

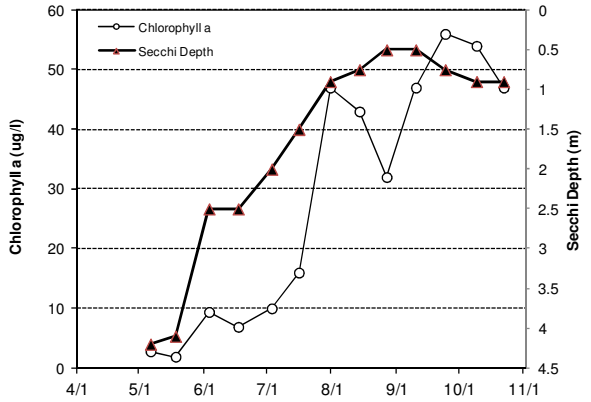
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

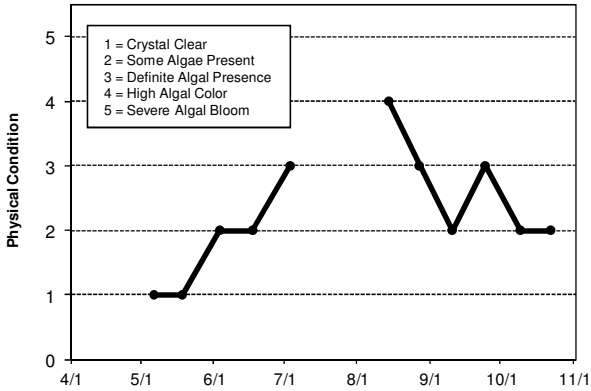
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

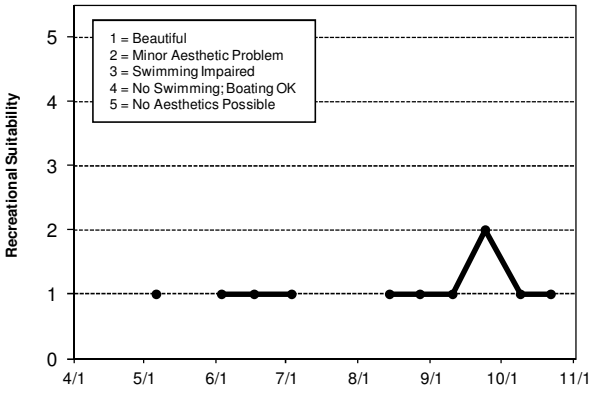
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			D	C	F	D	C	C
Chlorophyll a			C	C	D	C	C	C
Secchi Depth			C	C	D	C	C	C
Lake Grade			**C**	**C**	**D**	**C**	**C**	**C**

Source: Metropolitan Council and STORET data









Swede Lake (10-0095) *Carver County Environmental Services*

Swede Lake is a 376-acre lake located in Watertown Township (Carver County) with a maximum depth of approximately 4.0 m (13.1 feet). Because of the shallowness of the lake, its entire surface area is considered littoral (the shallow [0-15 foot depth] area dominated by aquatic vegetation). The MN DNR has designated the lake as being infested with Eurasion Water Milfoil (*Myriophyllum spicatum*).

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

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	329.0	167.0	444.0	F
CLA (µg/l)	64.5	24.0	110.0	D
Secchi (m)	0.3	0.3	0.4	F
TKN (mg/l)	3.56	2.90	4.40	
			Lake Grade	F

The lake received a lake grade of F. The lake receives typically F lake grades with the occasional D grade. The lake's water quality seems well represented by a lake grade of F with occassional variation.

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

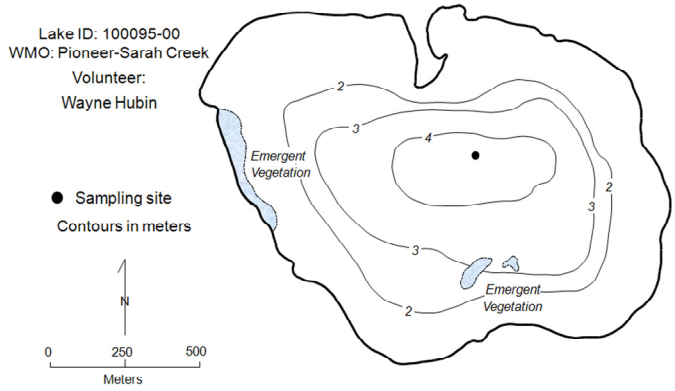
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

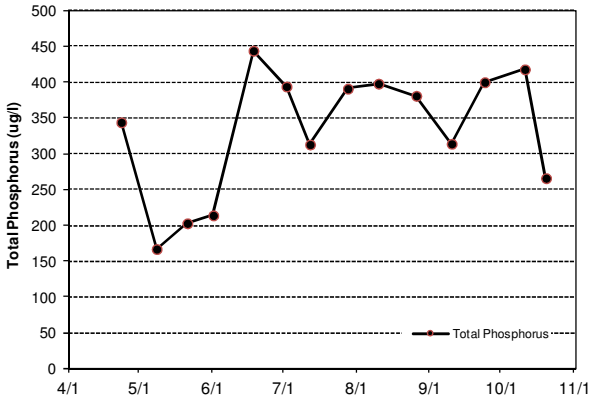
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

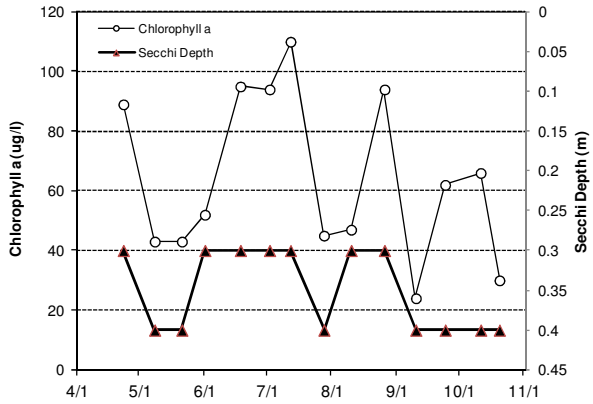
Swede Lake

Watertown Twp., Carver Co.

Lake ID: 100095-00
WMO: Pioneer-Sarah Creek
Volunteer:
Wayne Hubin

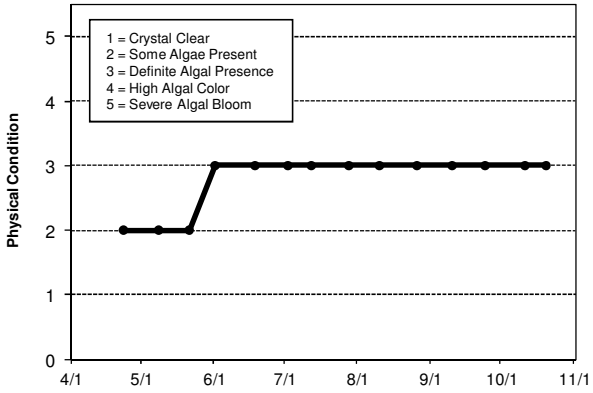






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/23/2011	10				89	344		0.3	2	4
5/8/2011	21				43	167		0.4	2	
5/21/2011	21				43	203		0.4	2	4
6/1/2011	20				52	214		0.3	3	4
6/18/2011	24				95	444		0.3	3	4
7/2/2011	28				94	394		0.3	3	4
7/12/2011	29				110	313		0.3	3	4
7/28/2011	30				45	391		0.4	3	4
8/10/2011	29				47	398		0.3	3	4
8/26/2011	26				94	381		0.3	3	4
9/10/2011	29				24	314		0.4	3	4
9/24/2011	18				62	400		0.4	3	4
10/11/2011	18				66	418		0.4	3	4
10/20/2011	11				30	266		0.4	3	4

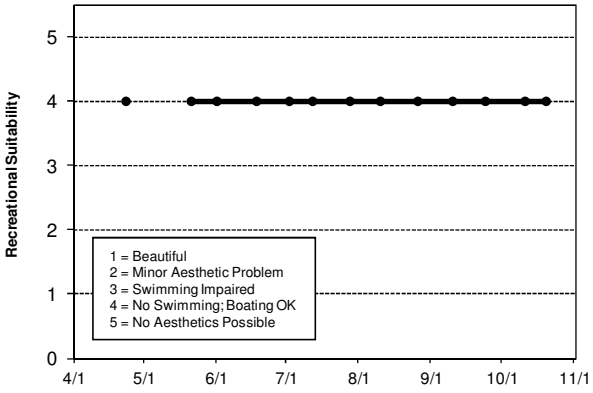


Lake Water Quality Grades Based on Summertime Averages

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					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	2009	2010	2011
Total Phosphorus	F	F	F	F	F	F	F	F
Chlorophyll a	D	D	F	F	F	F	F	D
Secchi Depth	F	D	F	F	F	F	F	F
Lake Grade	**F**	**D**	**F**	**F**	**F**	**F**	**F**	**F**



Source: Metropolitan Council and STORET data

Sweeney Lake [Site 1, south site) (27-0035-01) *Bassett Creek WMC*

Sweeney Lake is located in the City of Golden Valley (Hennepin County). The lake has a surface area of 66 acres and mean and maximum depths of 3.6 m (12 ft) and 8.0 m (26 ft), respectively. The lake's surface area and a watershed area of 2,400 acres give a large watershed-to-lake area ratio of 36:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The Sweeney Lake branch of Bassett Creek flows into the lake on the south end and discharges at the north end over a dam. Sweeny Lake is connected to Twin Lake during periods of high water levels by a channel. The surface elevations of the two lakes are about the same.

The lake has a hypolimnetic aeration system which generally operates year round. The aeration system keeps the lake well mixed, so it does not develop a thermocline when the system is operational. A thermocline is a density gradient caused by changing water temperatures throughout the water column.

The aeration system was turned off during the monitoring seasons of 2007 and 2008 as part of a total maximum daily load (TMDL) study. The TMDL study was initiated in response to the lake being listed as impaired in 2004 by the Minnesota Pollution Control Agency. The impaired listing is due to excessive nutrients.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

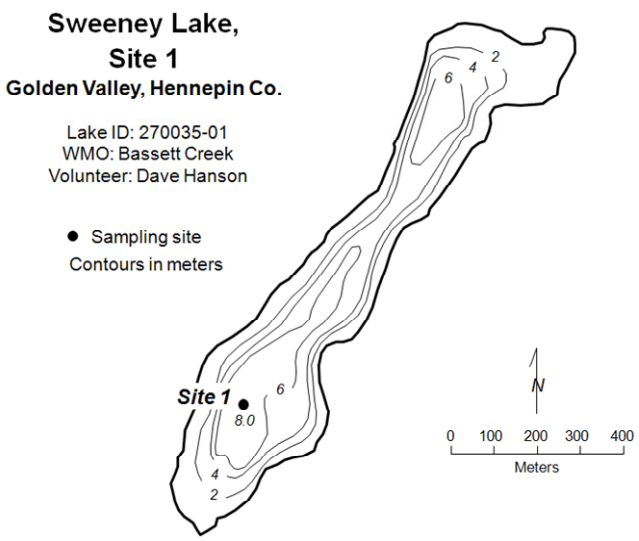
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	41.9	22.0	86.0	C
CLA (µg/l)	17.7	7.5	33.0	B
Secchi (m)	1.2	1.0	1.4	C
TKN (mg/l)	1.08	0.92	1.30	
			Lake Grade	C

The south site received a lake grade of C, which is consistent with its historical database. Over the period of the monitoring database, the water quality of the lake seems represented by a lake grade of C. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

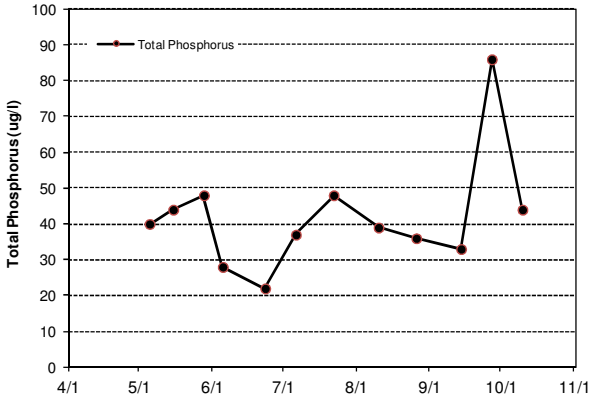
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

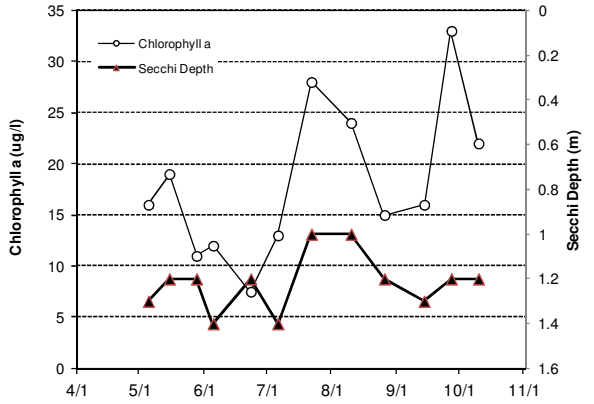
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

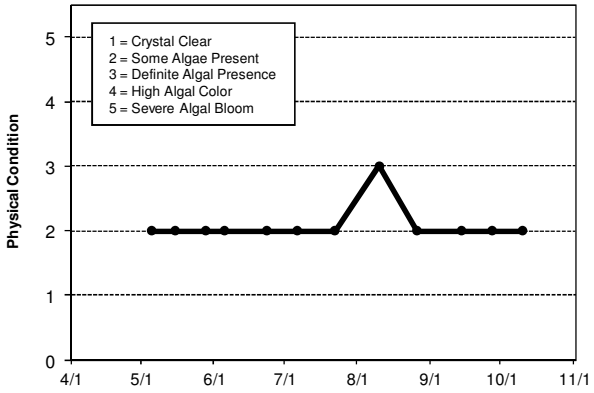


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(ºC)	(ºC)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/5/2011	11.1				16	40		1.3	2	2
5/15/2011	13.4				19	44		1.2	2	1
5/28/2011	16.4				11	48		1.2	2	2
6/5/2011	22.1				12	28		1.4	2	2
6/23/2011	20.9				7.5	22		1.2	2	2
7/6/2011	26.2				13	37		1.4	2	2
7/22/2011	28.5				28	48		1	2	2
8/10/2011	27.3				24	39		1	3	2
8/26/2011	25.7				15	36		1.2	2	2
9/14/2011	22.5				16	33		1.3	2	1
9/27/2011	17.3				33	86		1.2	2	1
10/10/2011	18				22	44		1.2	2	1





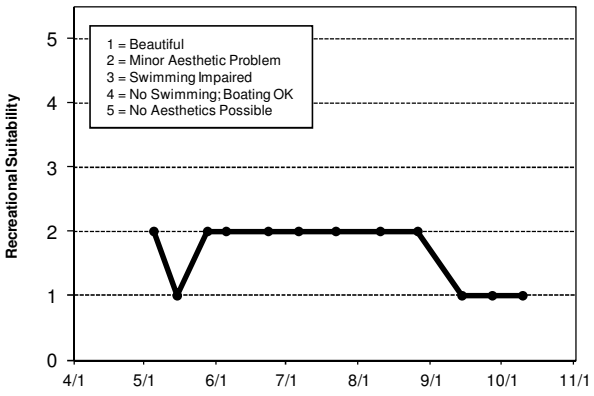


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total Phosphorus													
Chlorophyll a													
Secchi Depth													
Lake Grade													

Year	1993	1994	1995	1996	1997	1998	1999	2000 Site 1	2000 Site 2	2001 Site 1	2001 Site 2	2002 Site 1	2002 Site 2
Total Phosphorus								C	C	C	C	C	NA
Chlorophyll a								C	C	B	C	B	NA
Secchi Depth								D	D	C	C	C	NA
Lake Grade								**C**	**C**	**C**	**C**	**C**	**NA**

Year	2003 Site 1	2004 Site 1	2005 Site 1	2006 Site 1	2007 Site 1	2008 Site 1	2009 Site 1	2010 Site 1	2010 Site 2	2011 Site 1	2011 Site 2
Total Phosphorus	C	C	C	D	C	C	C	C	C	C	
Chlorophyll a	B	B	C	C	B	B	C	B	C	B	B
Secchi Depth	C	C	C	D	D	C	C	C	C	C	D
Lake Grade	**C**	**C**	**C**	**D**	**C**	**C**	**C**	**C**	**C**	**C**	**NA**



Source: Metropolitan Council and STORET data

Sweeney Lake [Site 2, north site] (27-0035-01) *Bassett Creek WMC*

Sweeney Lake is located in the City of Golden Valley (Hennepin County). The lake has a surface area of 66 acres and mean and maximum depths of 3.6 m (12 ft) and 8.0 m (26 ft), respectively. The lake's surface area and a watershed area of 2,400 acres give a large watershed-to-lake area ratio of 36:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The Sweeney Lake branch of Bassett Creek flows into the lake on the south end and discharges at the north end over a dam. Sweeny Lake is connected to Twin Lake during periods of high water levels by a channel. The surface elevations of the two lakes are about the same.

The lake has a hypolimnetic aeration system which generally operates year round. The aeration system keeps the lake well mixed, so it does not develop a thermocline when the system is operational. A thermocline is a density gradient caused by changing water temperatures throughout the water column.

The aeration system was turned off during the monitoring seasons of 2007 and 2008 as part of a total maximum daily load (TMDL) study. The TMDL study was initiated in response to the lake being listed as impaired in 2004 by the Minnesota Pollution Control Agency. The impaired listing is due to excessive nutrients.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	43.3	25.0	52.0	
CLA (µg/l)	17.5	4.3	30.0	B
Secchi (m)	1.0	0.8	1.5	D
TKN (mg/l)	1.04	0.81	1.30	
			Lake Grade	

The north site did not receive a lake grade for 2011 because there was insufficient quantity of TP data to calculate the TP grade. At least 5 monitoring events are needed during the summer time period to calculate a parameter grade. All three parameter grades are needed to calculate a lake grade.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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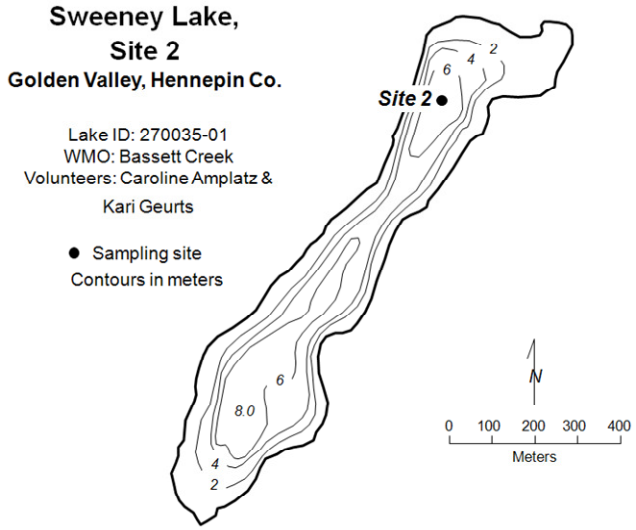
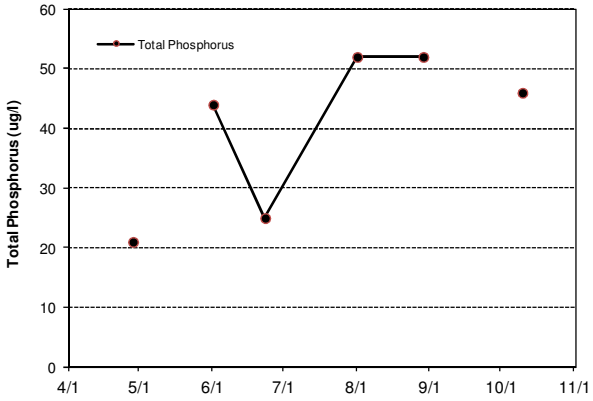
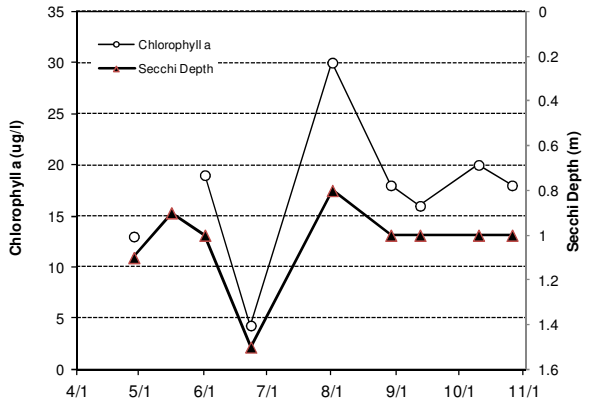
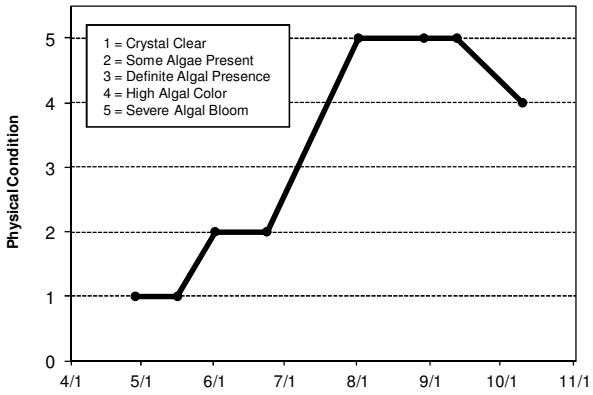






2011 Data

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 (1-5)	RS (1-5)
4/28/2011	8.8				13	21		1.1	1	2
5/16/2011	13.9							0.9	1	1
6/1/2011	21.1				19	44		1	2	2
6/23/2011	20.9				4.3	25		1.5	2	
8/1/2011	28				30	52		0.8	5	5
8/29/2011	27				18	52		1	5	5
9/12/2011	24.7				16			1	5	5
10/10/2011	18.5				20	46		1	4	5
10/26/2011	12.2				18			1		4



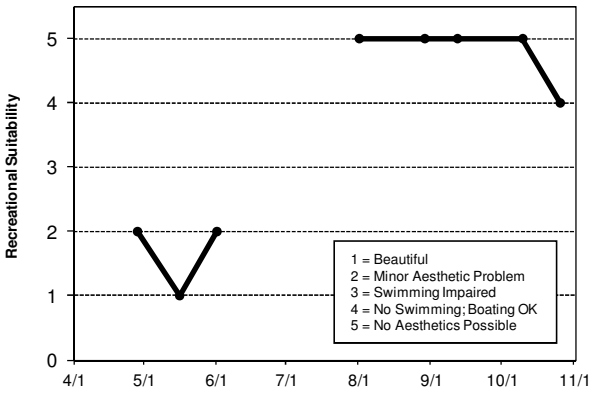
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total Phosphorus													
Chlorophyll a													
Secchi Depth													
Lake Grade													

Year	1993	1994	1995	1996	1997	1998	1999	2000 Site 1	2000 Site 2	2001 Site 1	2001 Site 2	2002 Site 1	2002 Site 2
Total Phosphorus								C	C	C	C	C	NA
Chlorophyll a								C	C	B	C	B	NA
Secchi Depth								D	D	C	C	C	NA
Lake Grade								**C**	**C**	**C**	**C**	**C**	**NA**

Year	2003 Site 1	2004 Site 1	2005 Site 1	2006 Site 1	2007 Site 1	2008 Site 1	2009 Site 1	2010 Site 1	2010 Site 2	2011 Site 1	2011 Site 2
Total Phosphorus	C	C	C	D	C	C	C	C	C	C	
Chlorophyll a	B	B	C	C	B	B	C	B	C	B	B
Secchi Depth	C	C	C	D	D	C	C	C	C	C	D
Lake Grade	**C**	**C**	**C**	**D**	**C**	**C**	**C**	**C**	**C**	**C**	**NA**

Source: Metropolitan Council and STORET data



Sylvan Lake [Half Breed Lake] (82-0080) *Comfort Lake-Forest Lake Watershed District*

Sylvan Lake (also known as Half Breed Lake) is a 75-acre lake located in Forest Lake Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	22.6	11.0	51.0	A
CLA (µg/l)	3.1	1.5	5.9	A
Secchi (m)	4.2	3.0	6.2	A
TKN (mg/l)	0.56	0.44	0.67	
			Lake Grade	A

The lake received a lake grade of A for 2011, which is consistent with its historical water quality database. The historic water quality database indicates that the lake has maintained its high quality over the past 20+ years.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Sylvan Lake
(Halfbreed Lake)
Forest Lake/Scandia, Washington Co.

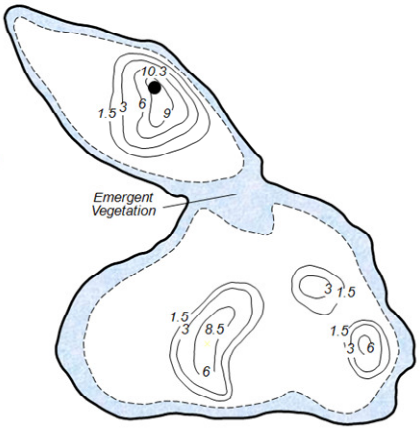
LAKE ID: 820080-00

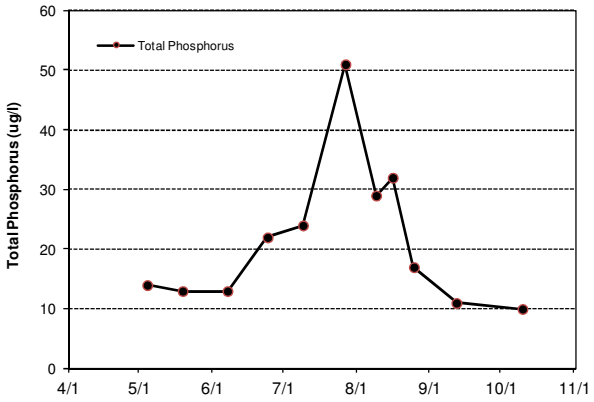
WD: Comfort Lake - Forest Lake

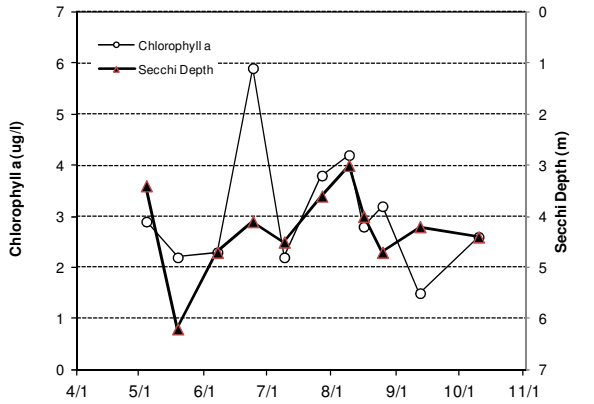
Volunteer: Curt Sparks

● Sampling station

Contours in meters

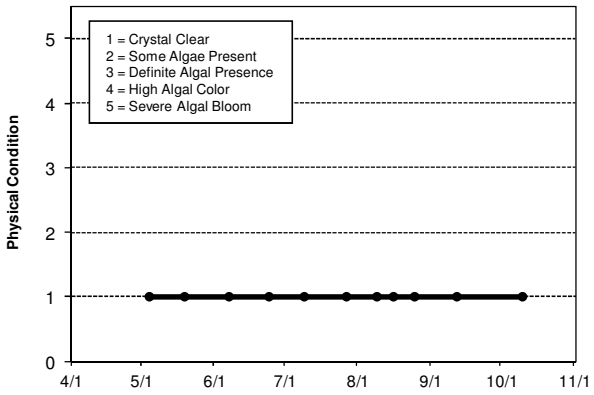






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/4/2011	9.9				2.9	14		3.4	1	1
5/19/2011	16.9				2.2	13		6.2	1	1
6/7/2011	26				2.3	13		4.7	1	1
6/24/2011	20.2				5.9	22		4.1	1	1
7/9/2011	28.1				2.2	24		4.5	1	1
7/27/2011	27.3				3.8	51		3.6	1	1
8/9/2011	26				4.2	29		3	1	1
8/16/2011	25				2.8	32		4	1	1
8/25/2011	26.1				3.2	17		4.7	1	1
9/12/2011	23.5				1.5	11		4.2	1	1
10/10/2011	18				2.6	10		4.4	1	1

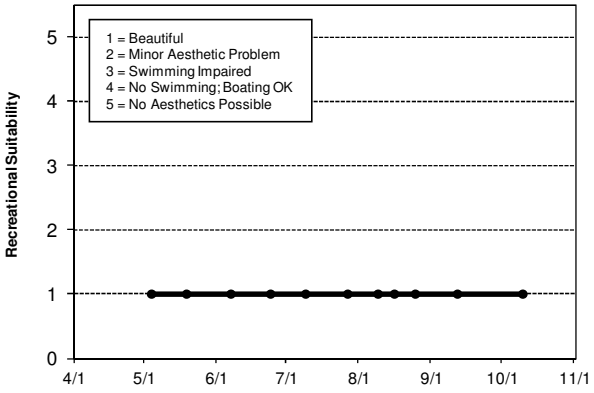


Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus	A	A		A	A	A	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**



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.

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.

2011 summer (May-September) data summary

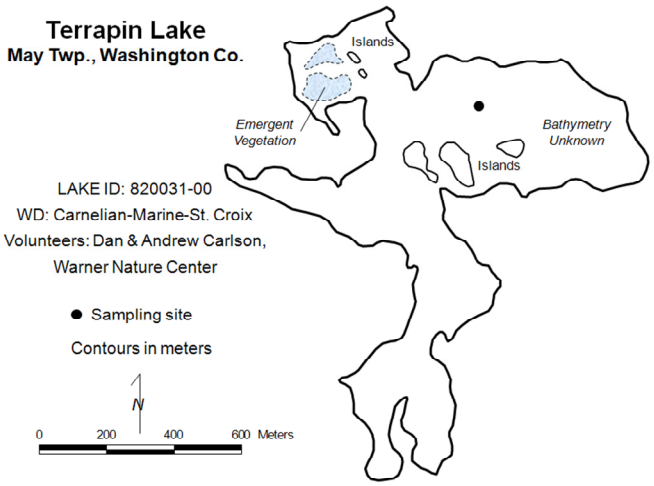
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)				
CLA (µg/l)				
Secchi (m)	+4.0		+4.2	A
TKN (mg/l)				
			Lake Grade	

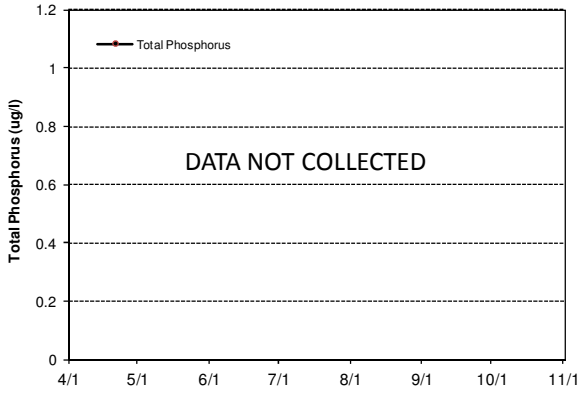
No TP, TKN, and CLA samples were collected in 2011. The Secchi disk was visible while resting on the lake bottom during some monitoring events, so the Secchi depth would have been greater during these monitoring events. Regardless, the Secchi depths were greater than 3.0 m in these cases, which translates into an A Secchi grade. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

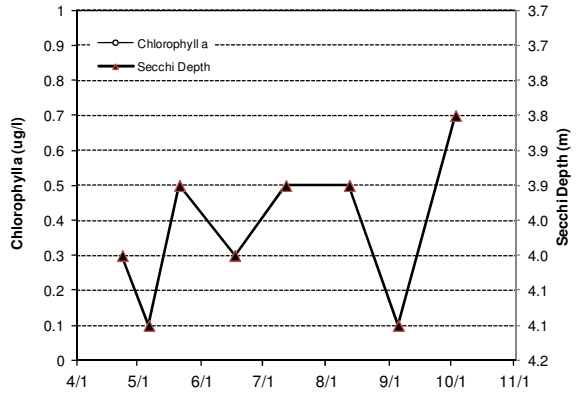
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (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.

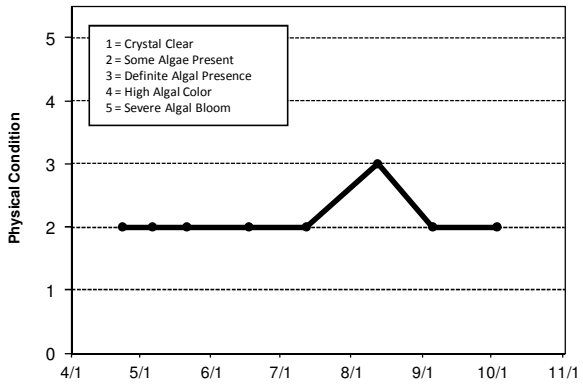






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/23/2011	7.2							>4.0	2	2
5/6/2011	12.6							>4.1	2	2
5/21/2011	17.4							>3.9	2	1
6/17/2011	22.2							>4.0	2	3
7/12/2011	28							>3.9	2	1
8/12/2011	25.7							>3.9	3	2
9/5/2011	23							>4.1	2	3
10/3/2011	14.7							>3.8	2	2



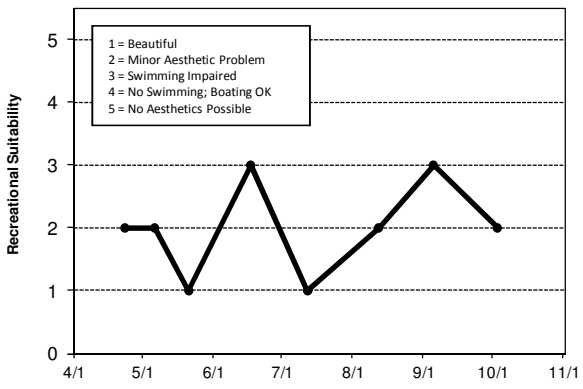
Lake Water Quality Grades Based on Summertime Averages

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	2009	2010	2011
Total Phosphorus	B	A	C	B			A	
Chlorophyll a	A	A	A	A			A	
Secchi Depth	A	A	A	B	A	A		A*
Lake Grade	**A**	**A**	**B**	**B**				**NA**

* Secchi disk visible on lake bottom



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 has being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

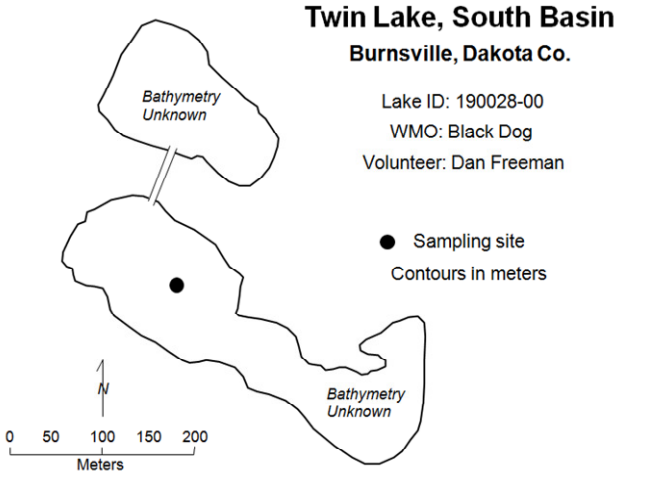
2011 summer (May-September) data summary

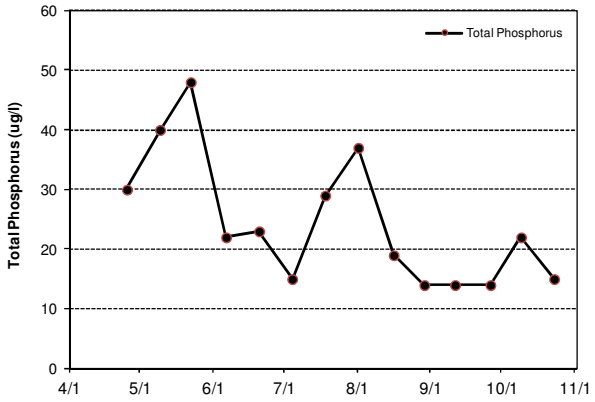
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	25.0	14.0	48.0	B
CLA (µg/l)	6.8	1.0	11.0	A
Secchi (m)	2.4	1.0	2.9	B
TKN (mg/l)	0.86	0.54	1.40	
			Lake Grade	B

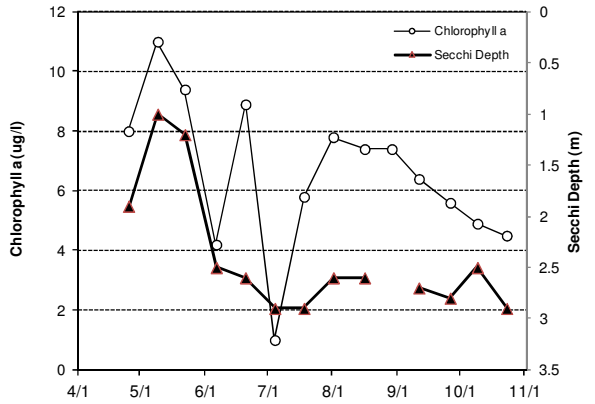
The lake received a lake grade of B for 2011. The lake grades received in the past have varied in the B and C range. Since 1999 CLA grades have varied widely from A's to C's. The water clarity grades have remained a C from 2001 through 2010. The Secchi grade was an B in 2011, which is the first A received for this parameter in the lake's historical water quality database.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

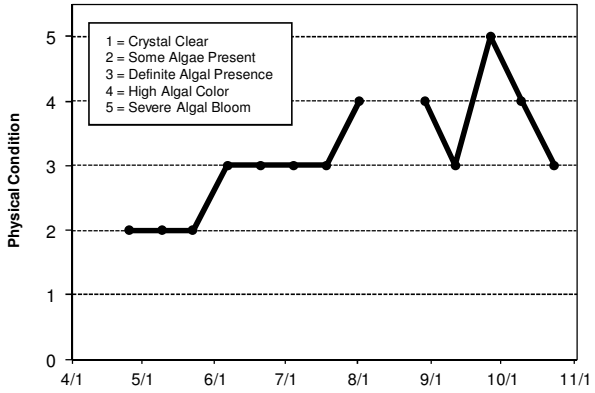






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/25/2011	10.3				8	30		1.9	2	4
5/9/2011	15				11	40		1	2	4
5/22/2011	18.8				9.4	48		1.2	2	4
6/6/2011	27.7				4.2	22		2.5	3	4
6/20/2011	22.4				8.9	23		2.6	3	4
7/4/2011	29.3				1	15		2.9	3	
7/18/2011	31.3				5.8	29		2.9	3	
8/1/2011	28.7				7.8	37		2.6	4	4
8/16/2011	25.8				7.4	19		2.6		
8/29/2011	23				7.4	14			4	4
9/11/2011	25.1				6.4	14		2.7	3	
9/26/2011	16.8				5.6	14		2.8	5	4
10/9/2011	20.4				4.9	22		2.5	4	4
10/23/2011	11.3				4.5	15		2.9	3	

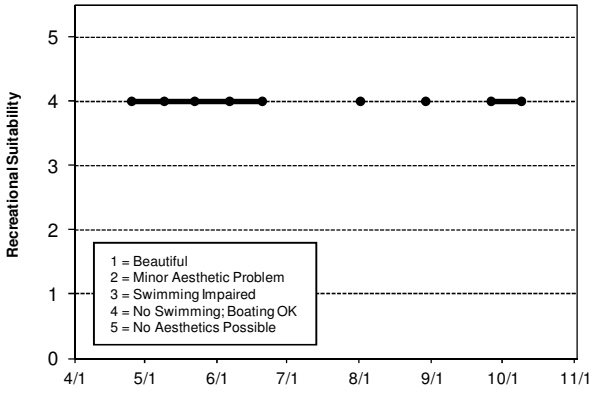


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
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
Chlorophyll a								B		A	A	A
Secchi Depth								D		C	C	C
Lake Grade								**C**		**B**	**B**	**B**

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus		C	D	C	C	C	C	B
Chlorophyll a		A	C	A	B	B	C	A
Secchi Depth		C	C	C	C	C	C	B
Lake Grade		**B**	**C**	**B**	**C**	**C**	**C**	**B**



Source: Metropolitan Council and STORET data

Twin Lake [Golden Valley] (27-0035-02) *Bassett Creek WMC*

Twin Lake is located in the City of Golden Valley (Hennepin County). The surface are of the lake is 19 acres. Approximately 42 percent of the surface is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. The lake has a maximum depth of approximately 17 m (56 ft).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	12.8	9.0	19.0	
CLA (µg/l)	2.8	1.6	3.6	A
Secchi (m)	2.5	0.8	3.2	B
TKN (mg/l)	0.82	0.50	0.99	
			Lake Grade	

The lake did not receive a lake grade for 2011 because there was insufficient quantity of TP data to calculate the TP grade. At least 5 monitoring events are needed during the summer time period to calculate a parameter grade. All three parameter grades are needed to calculate a lake grade.

There were limited historical data available for this lake according the MPCA's Environmental Data Access System: 3 days in 1977, 1 day in 1996, 2 days in 1997. Further monitoring is suggested to build a water quality database for this lake.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

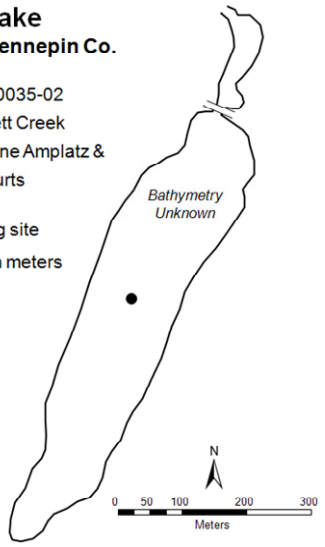
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at http://www.dnr.state.mn.us/lakefind/.

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.

Twin Lake
Golden Valley, Hennepin Co.

LAKE ID: 270035-02
WMO: Bassett Creek
Volunteers: Caroline Amplatz & Kari Geurts

● Sampling site
Contours in meters



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/28/2011	8.3				11	37		1.8	1	3
5/16/2011	15.1							0.8	1	1
6/1/2011	21.7				1.6	19		2.1	1	2
6/23/2011	20.9				3.2	13		3.2	2	
8/1/2011	28				3.6	9		3	1	1
8/29/2011	25.9				2.5	10		3	2	1
9/12/2011	24.7				3.3			2.8	1	1
10/10/2011					3.9	27		3.2	2	2
10/26/2011	11.5				4.3			3.5	1	1

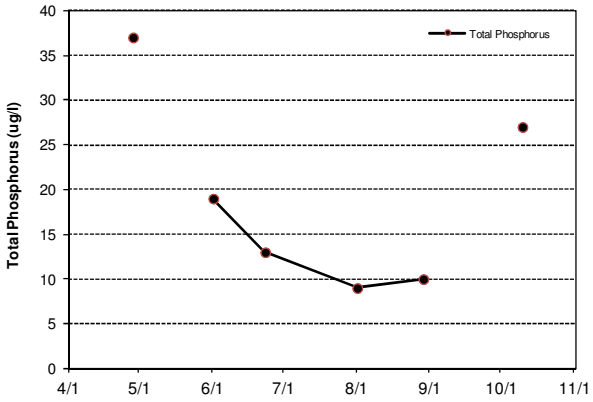
Lake Water Quality Grades Based on Summertime Averages

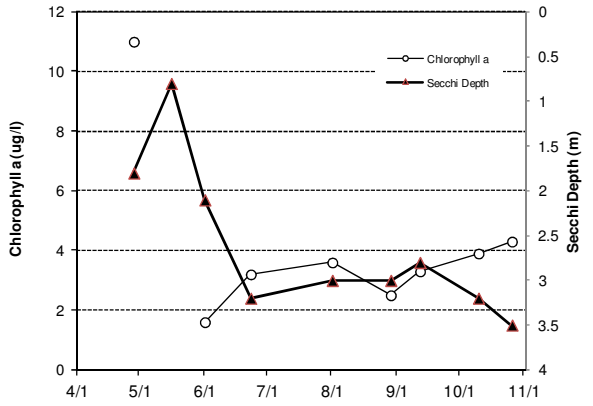
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

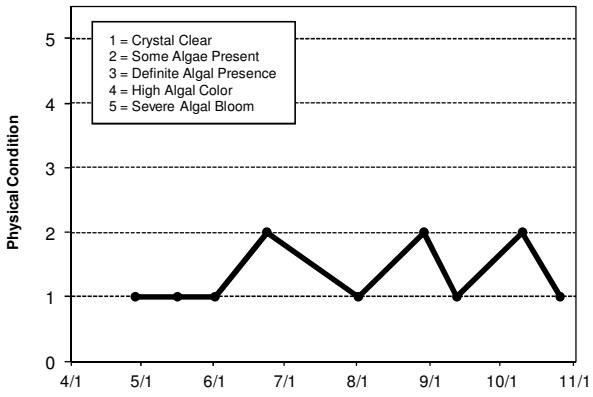
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

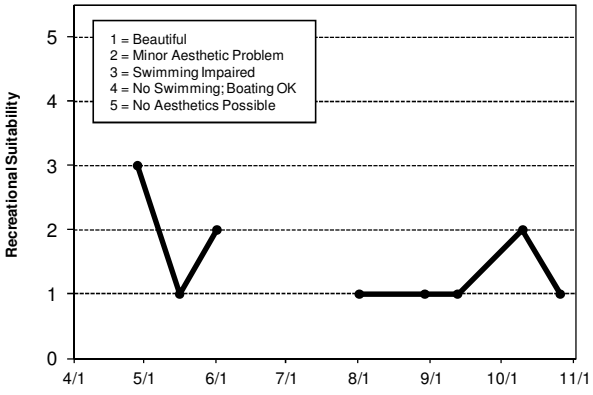
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus							A	
Chlorophyll a							A	A
Secchi Depth							A	B
Lake Grade							**A**	**NA**

Source: Metropolitan Council and STORET data









Twin Lake [St. Louis Park] (27-0656) *City of St. Louis Park*

Twin Lake is a small shallow lake located within the city of St. Louis Park (Hennepin County). Bathymetric information is unknown for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	152.3	85.0	223.0	F
CLA (µg/l)	87.1	18.0	150.0	F
Secchi (m)	0.6	0.4	1.1	F
TKN (mg/l)	1.41	1.00	1.80	
			Lake Grade	F

The lake received a lake grade of F for 2011, which is consistent with its water quality database over the past 5 years. The Secchi grade remains poor with a grade of F. Secchi grades in 2002-2004 were Ds, but since then water clarity grades degressed to Fs. Also, the CLA grades have reduced from a B grade in 2002; to C grades in 2003, 2005, and 2006; to D grades in 2007, 2008, and 2010; and to F grades in 2009 and 2011. These observations seem to indicate that the water quality for Twin Lake has degraded since 2002. Further monitoring is suggested to continue to observe if this trend continues or not.

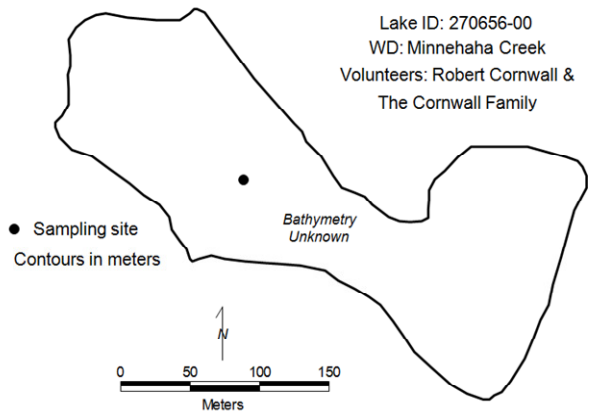
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Twin Lake

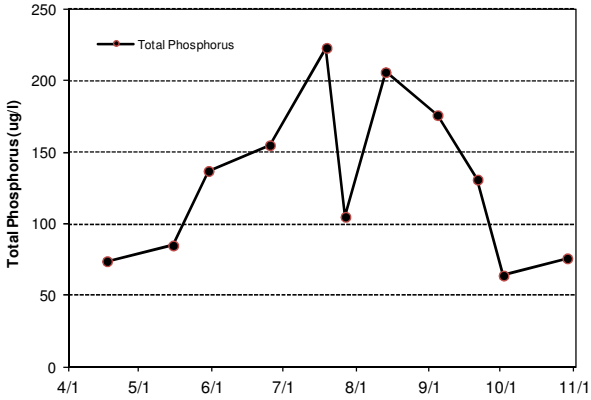
St. Louis Park, Hennepin Co.

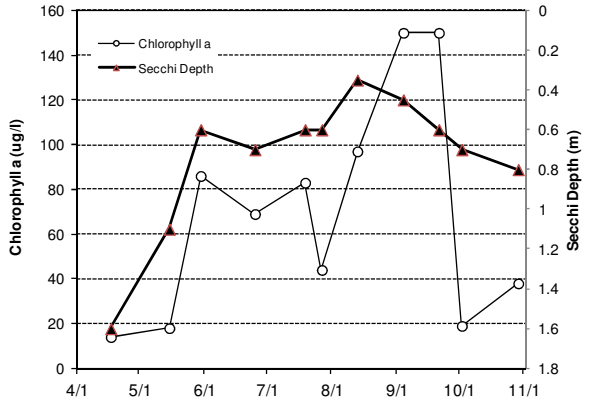
Lake ID: 270656-00
WD: Minnehaha Creek
Volunteers: Robert Cornwall &
The Cornwall Family



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/17/2011	9.5				14	74		1.6	1	4
5/15/2011	14.2				18	85		1.1	1	4
5/30/2011	21.1				86	137		0.6	2	4
6/25/2011	20.3				69	155		0.7	3	4
7/19/2011	30.9				83	223		0.6	4	4
7/27/2011	30.6				44	105		0.6	5	4
8/13/2011	26.7				97	206		0.35	5	4
9/4/2011	21.3				150	176		0.45	4	4
9/21/2011	16				150	131		0.6	5	4
10/2/2011	19.3				19	64		0.7	5	4
10/29/2011	9.3				38	76		0.8	3	4



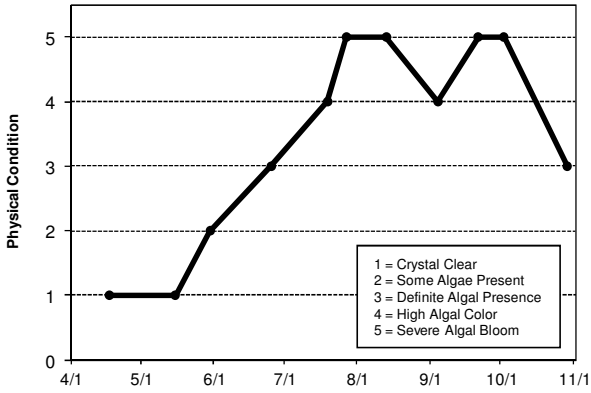


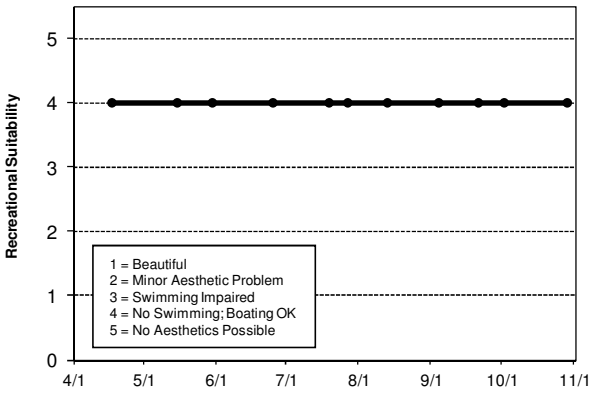
Lake Water Quality Grades Based on Summertime Averages

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											F	F
Chlorophyll a											B	C
Secchi Depth											D	D
Lake Grade											**D**	**D**

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	F	F	D	F	D	F	D	F
Chlorophyll a	D	C	C	D	D	F	D	F
Secchi Depth	D	F	F	F	F	F	F	F
Lake Grade	**D**	**D**	**D**	**F**	**D**	**F**	**D**	**F**





Source: Metropolitan Council and STORET data

Twin Lake [south basin] (82-0048) *May Township*

Twin Lake is located in May Township (Washington County). The lake is considered an METC Priority Lake for its exceptional water clarity (METC 2007). The south basin has a maximum depth of 10 m (33 ft). Other bathymetric information is unknown for this lake. The lake's inflow receives water from Square Lake.

On each sampling day the lake was monitored for 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.

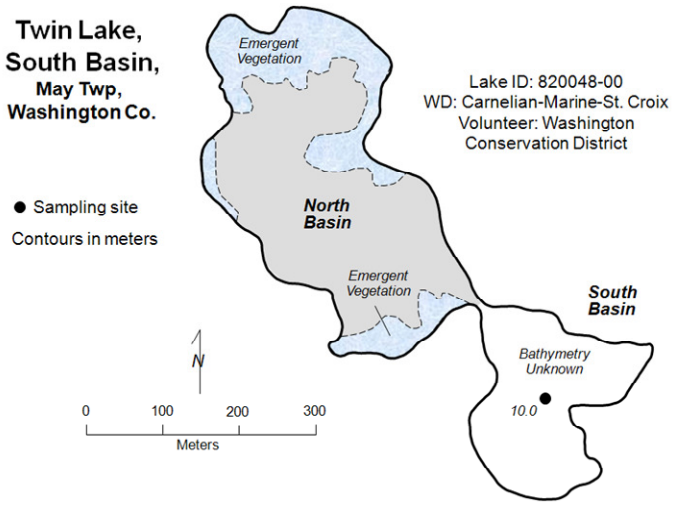
2011 summer (May-September) data summary

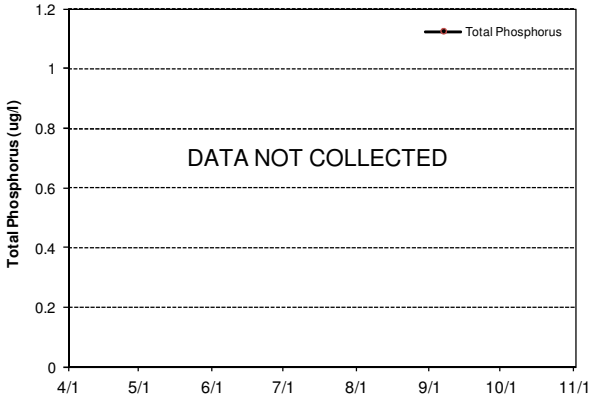
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
Secchi (m)	4.9	3.8	5.3	A

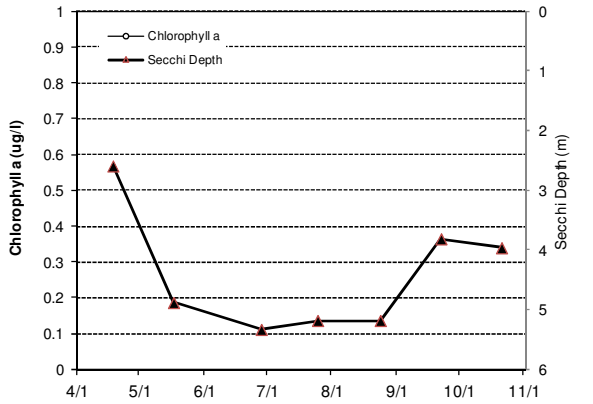
The lake received a Secchi grade of A for 2011, which is consistent with its limited historical database. A lake grade was not determined because TP and CLA were not monitored. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

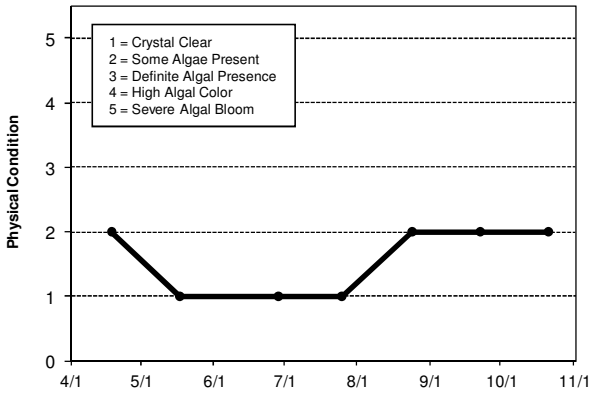






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/18/2011	5.7	5	8.6	0				2.59	2	1
5/17/2011	14.2	5.9	11	0.1				4.88	1	1
6/28/2011	22.2	7.7	8.9	0				5.33	1	1
7/25/2011	27.8	9.1	7.3	0.1				5.18	1	1
8/24/2011	26.2	9.9	8.6	0.1				5.18	2	1
9/22/2011	18.1	10.1	7.4	0				3.81	2	2
10/21/2011	12.6	12.5	8.7	8.5				3.96	2	2



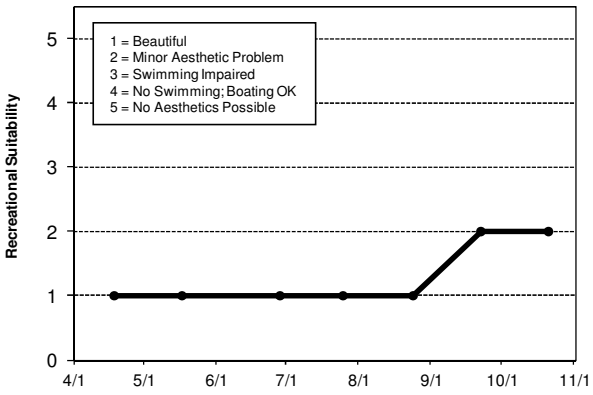
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus						A	A					
Chlorophyll a						A	A					
Secchi Depth						A	A					
Lake Grade						**A**	**A**					

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus					A	A		
Chlorophyll a					A	A		
Secchi Depth					A	A	A	A
Lake Grade					**A**	**A**		**NA**

Source: Metropolitan Council and STORET data



Valley Lake (19-0348) *City of Lakeville*

Valley Lake is located in the City of Lakeville (Dakota County). The surface area of the lake is 8 acres, and it has a maximum depth of 3.2 m (10 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

The lake has been involved in a project in which barley straw or crushed corn was added to the lake in an attempt to inhibit algal populations. CAMP data were used to evaluate the effectiveness of these additions. Refer to McComas and Stuckert (2009b) for details on the project.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	87.6	47.0	168.0	D
CLA (µg/l)	24.9	4.4	48.0	C
Secchi (m)	1.7	0.8	2.4	C
TKN (mg/l)	0.98	0.70	1.20	
			Lake Grade	C

The lake received a lake grade of C for 2011. The lake grades have varied in the range of B to D for the past 17 years.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

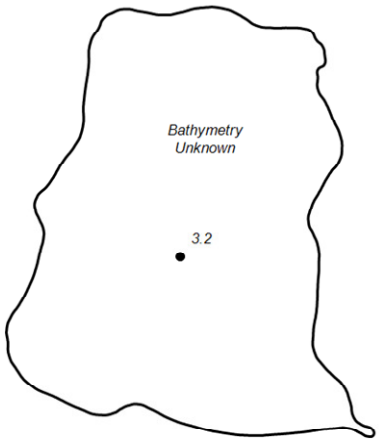
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Valley Lake
Lakeville, Dakota Co.

Lake ID: 190348-00
WMO: Vermillion River
Volunteers: Lakeville City Staff

● Sampling site
Contours in meters



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/3/2011	7.2				4.4	53		2.4	2	1
5/16/2011	12				19	53		2.2	2	2
6/3/2011	20				12	47		2.4	1	1
6/15/2011	21				13	48		2.2	3	2
6/27/2011	22				48	77		1.1	4	3
7/18/2011	27				35	126		1.3	3	3
7/25/2011	28				46	168		0.8	3	3
8/8/2011	26				44	116		1.2	3	3
8/25/2011	27				18	157		1.6	2	3
9/9/2011	22				15	66		1.8	2	2
9/19/2011	18				20	53		2	3	2
10/6/2011	17				14	44		1.9	1	

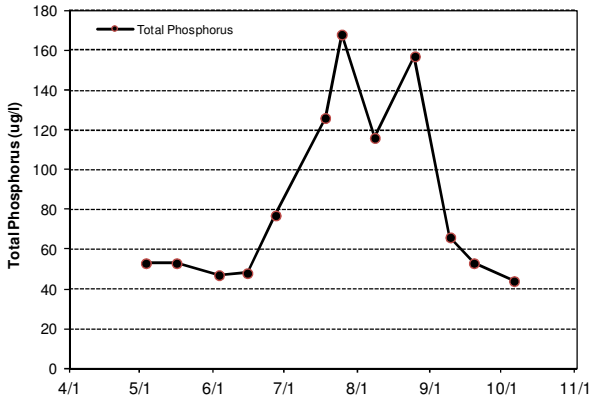
Lake Water Quality Grades Based on Summertime Averages

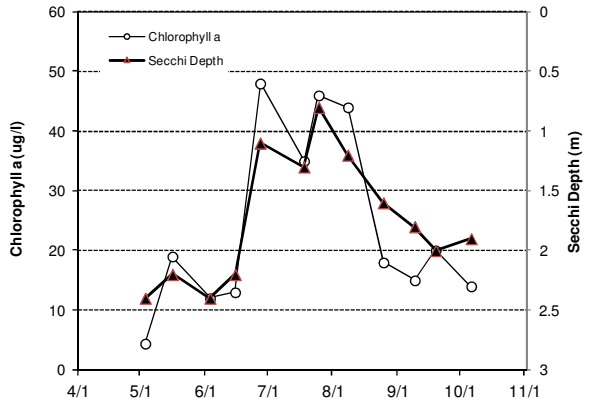
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

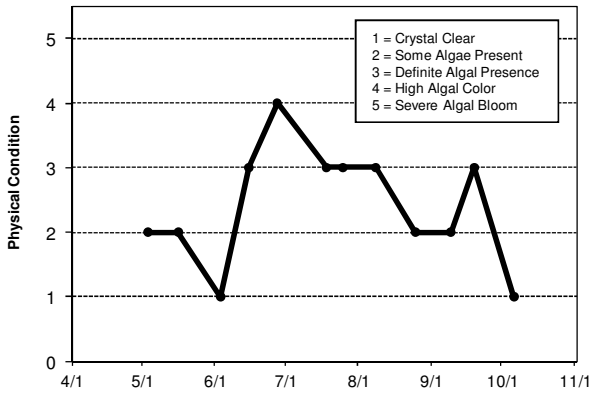
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus				D	D	C			C	C	C	C
Chlorophyll a				C	C	C		C	B	A	A	B
Secchi Depth				D	D	D		D	C	C	B	B
Lake Grade				**D**	**D**	**C**			**C**	**B**	**B**	**B**

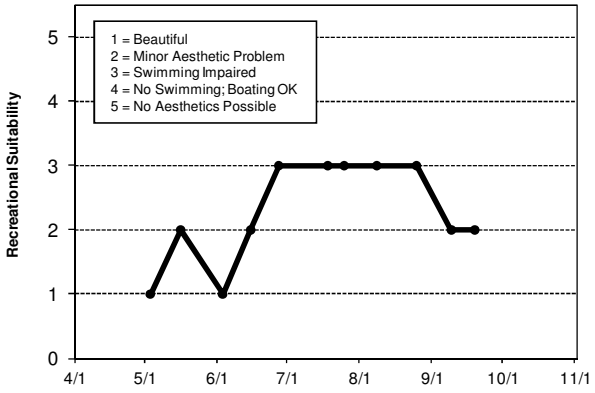
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	C	C	D	D	C	C	D	D
Chlorophyll a	C	C	D	C	C	A	D	C
Secchi Depth	C	C	D	C	C	B	C	C
Lake Grade	**C**	**C**	**D**	**C**	**C**	**B**	**D**	**C**

Source: Metropolitan Council and STORET data









Waconia Lake (10-0059) *Carver County Environmental Services*

ake Waconia is located near the City of Waconia (Carver County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake is one of the largest bodies of water in the region with a surface area of approximately 3,000 acres. It has mean and maximum depths of 4.0 m and 11.3 m (13 ft and 47 ft), respectively. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	44.9	20.0	78.0	C
CLA (µg/l)	26.5	3.1	57.0	C
Secchi (m)	2.3	1.0	4.9	B
TKN (mg/l)	0.98	0.61	1.30	
			Lake Grade	C

The lake received a lake grade of C for 2011, which is consistent with its historical database. The lake grades fluctuate from year to year, but generally the lake receives either a B or C lake grade.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

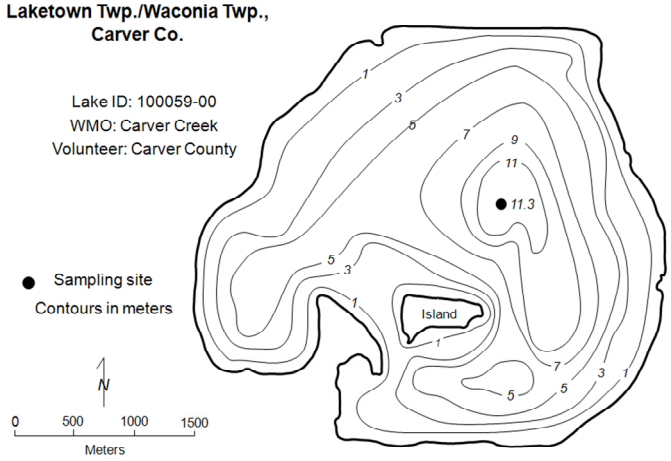
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

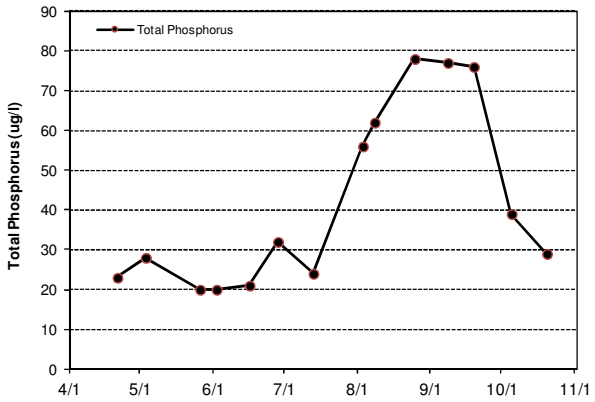
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

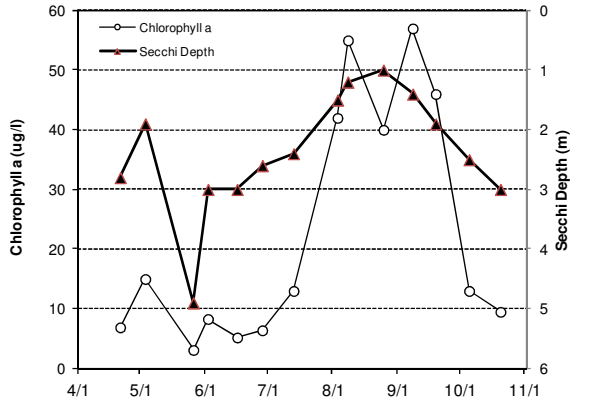
Lake Waconia

Laketown Twp./Waconia Twp., Carver Co.

Lake ID: 100059-00
WMO: Carver Creek
Volunteer: Carver County

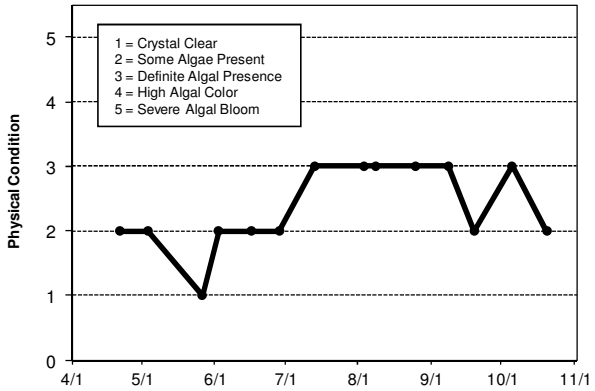






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/21/2011	5.31		16.3		6.9	23		2.8	2	1
5/3/2011	6.9		18.8		15	28		1.9	2	2
5/26/2011	15.51		10.1		3.1	20		4.9	1	1
6/2/2011	16.68		9.4		8.3	20		3	2	2
6/16/2011	19.84		8.5		5.2	21		3	2	2
6/28/2011	21.01		11.6		6.4	32		2.6	2	2
7/13/2011	25.29		9.5		13	24		2.4	3	2
8/3/2011	26.87		7.8		42	56		1.5	3	2
8/8/2011	26.48		9.2		55	62		1.2	3	2
8/25/2011	25.32		8.3		40	78		1	3	2
9/8/2011	21.7		9.1		57	77		1.4	3	3
9/19/2011	19.31		8.6		46	76		1.9	2	2
10/5/2011	15.96		8.9		13	39		2.5	3	2
10/20/2011	11.14		8.3		9.5	29		3	2	2

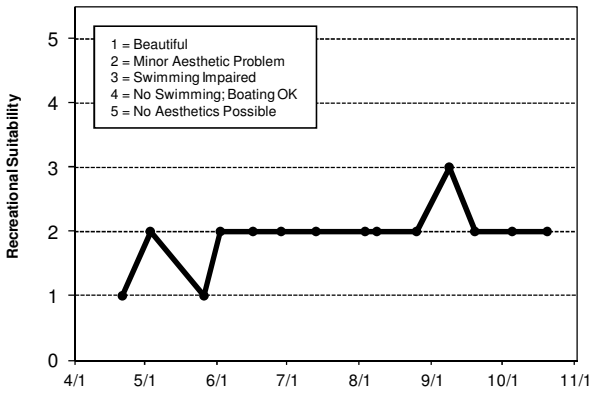


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	C	B				B						
Chlorophyll a	C	B				B					C	
Secchi Depth	C	C	C	C	D	C	C	C	D	C	C	C
Lake Grade	**C**	**B**				**B**						

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus			A	A	B	B	C	C	C	C	B	C
Chlorophyll a			A	B	B	B	B	B	B	B	B	B
Secchi Depth	C	C	A	B	C	C	C	C	C	B	B	C
Lake Grade			**A**	**B**	**B**	**B**	**C**	**C**	**C**	**B**	**B**	**C**

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus	B	B	C	C	C	C	C	C
Chlorophyll a	B	B	C	B	C	A	C	C
Secchi Depth	C	A	B	C	B	A	C	B
Lake Grade	**B**	**B**	**C**	**C**	**C**	**B**	**C**	**C**



Source: Metropolitan Council and STORET data

Westwood Lake (27-0711) *Bassett Creek Watershed Management Organization*

Westwood Lake is located in the City of St. Louis Park (Hennepin County). The lake has a surface are of 41 acres and a maximum depth of 2.0 m (6.6 ft). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	33.9	25.0	48.0	C
CLA (µg/l)	5.2	2.4	13.0	A
Secchi (m)	1.1	0.6	1.7	D
TKN (mg/l)	1.17	0.81	2.50	
			Lake Grade	C

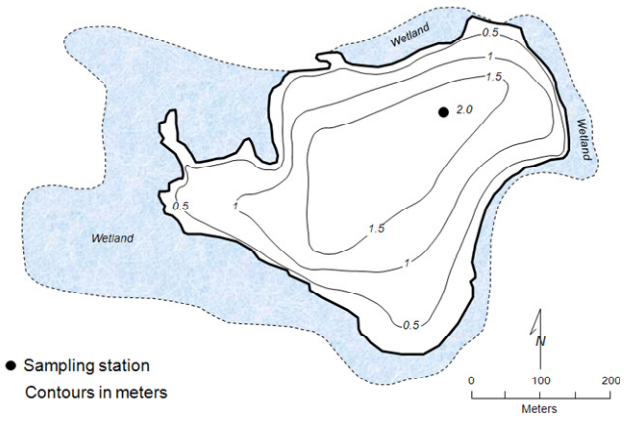
The lake received a lake grade of C in 2011, which is consistent with its historical database. The lake grades have varied mainly in the Cs and Bs.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

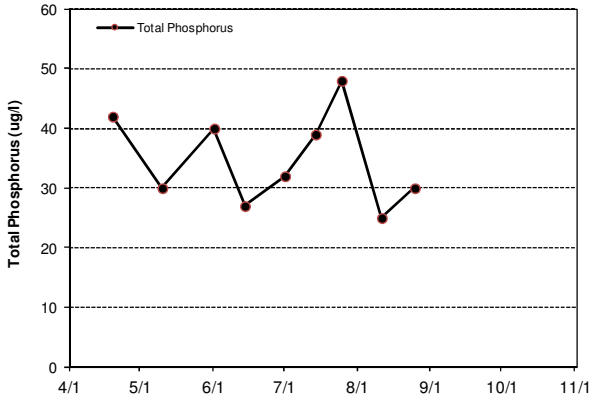
Lake ID: 270711-00
WMO: Bassett Creek
Volunteer: Westwood Nature Center

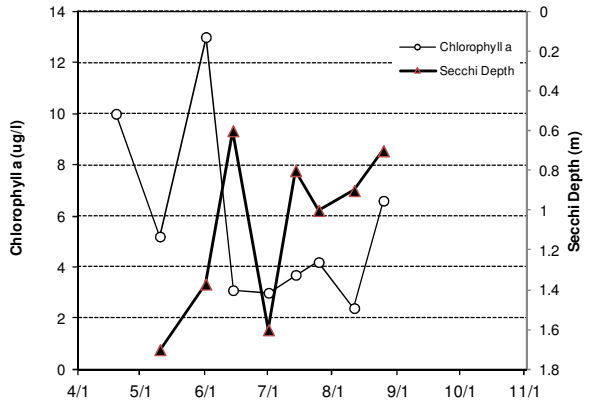
Westwood Lake,
St. Louis Park, Hennepin Co.

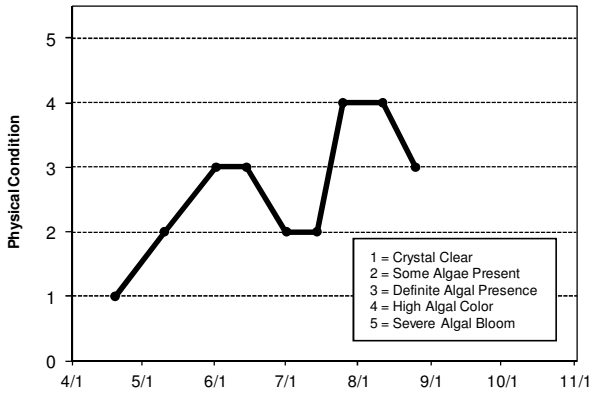


2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/19/2011	7.8				10	42			1	1
5/10/2011	15.4				5.2	30		1.7	2	2
6/1/2011	19.1				13	40		1.37	3	2
6/14/2011	20.5				3.1	27		0.6	3	4
7/1/2011	29.1				3	32		1.6	2	4
7/14/2011	24				3.7	39		0.8	2	4
7/25/2011	27				4.2	48		1	4	4
8/11/2011	26.2				2.4	25		0.9	4	4
8/25/2011	25.5				6.6	30		0.7	3	4





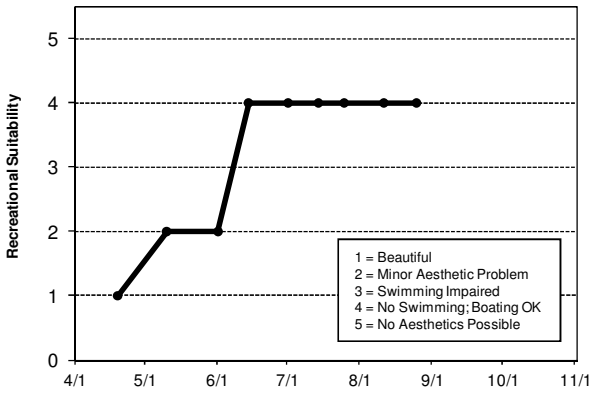


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus			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	2009	2010	2011
Total Phosphorus	C	D	D	C	B	C	A	C
Chlorophyll a	A	C	B	B	A	B	A	A
Secchi Depth	C	C	C	C	D	D	C	D
Lake Grade	**B**	**C**	**C**	**C**	**B**	**C**	**B**	**C**



Source: Metropolitan Council and STORET data

White Rock Lake (82-0072) *Rice Creek Watershed District*

White Rock Lake is a 65-acre lake located in Washington County. There is no other known morphological data for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

Parameter	Mean	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	67.1	39.0	113.0	C
CLA (µg/l)	24.0	3.8	74.0	C
Secchi (m)	1.5	0.8	2.7	C
TKN (mg/l)	1.56	0.46	2.60	
			Lake Grade	C

The lake received a lake grade of C in 2011, which is the second year in a row where a C lake grade was received. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

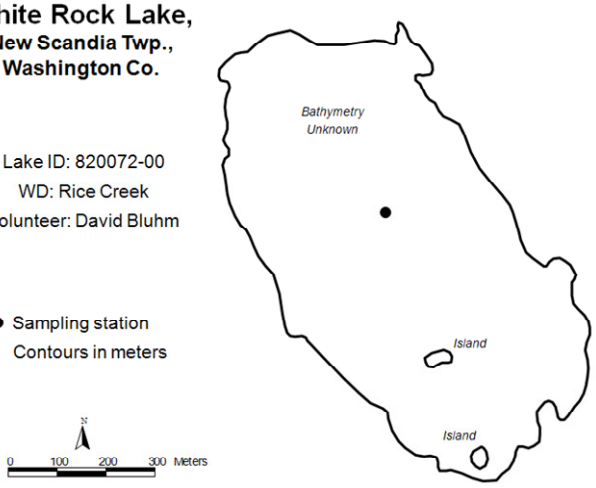
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

White Rock Lake,
New Scandia Twp.,
Washington Co.

Lake ID: 820072-00
WD: Rice Creek
Volunteer: David Bluhm

● Sampling station
Contours in meters



2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(ºC)	(ºC)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/23/2011	6.6				6.1	70		2.3	1	1
5/3/2011	7.6				3.8	48			1	1
5/17/2011	13.8				5.2	39			1	1
5/30/2011	17.5				6.2	72		2.4	1	1
6/18/2011	21.3				6.5	49		2.7	1	1
6/28/2011	20.8				8.6	58		2	1	1
7/12/2011	26.6				16	72		1.4	2	2
8/3/2011	25.9				19	113		1	3	2
8/17/2011	24.4				73	50		0.8	3	3
8/23/2011	24.3				74	54		0.8	3	2
8/30/2011					33	101		1.2	3	3
9/9/2011	23.8				15	72		1.2	3	3
9/20/2011	15.4				28	77		1.2	3	2
10/3/2011	16.4				8.4	65			1	1
10/18/2011	9.6				7	53			1	1

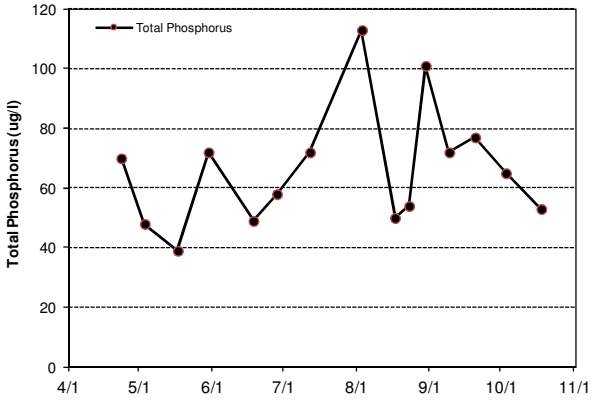
Lake Water Quality Grades Based on Summertime Averages

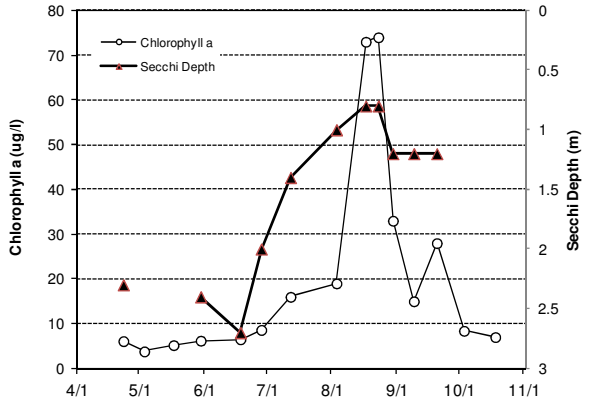
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

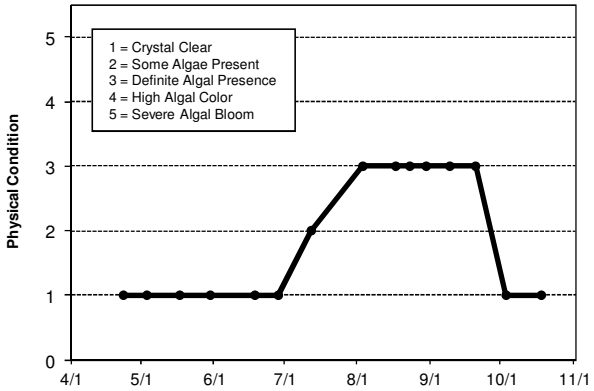
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

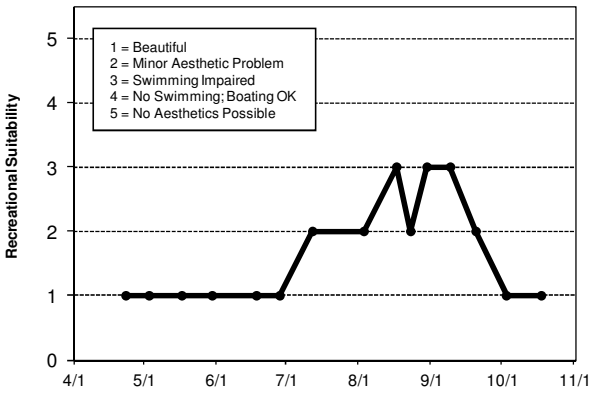
Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			D	D	D	D	C	C
Chlorophyll a			C	C	C	C	C	C
Secchi Depth			F	F	D	D	D	C
Lake Grade			**D**	**D**	**D**	**D**	**C**	**C**

Source: Metropolitan Council and STORET data









Wilmes Lake (82-0090) *City of Woodbury*

Wilmes Lake is located in the City of Woodbury (Washington County). The lake has a surface area of 41 acres and a maximum depth of 5.5 m (18 feet). The lake has a watershed area of 2,247 acres which gives a large watershed-to-lake area ratio of 55:1. The larger the ratio, the greater the potential stress on the lake quality from surface runoff. The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

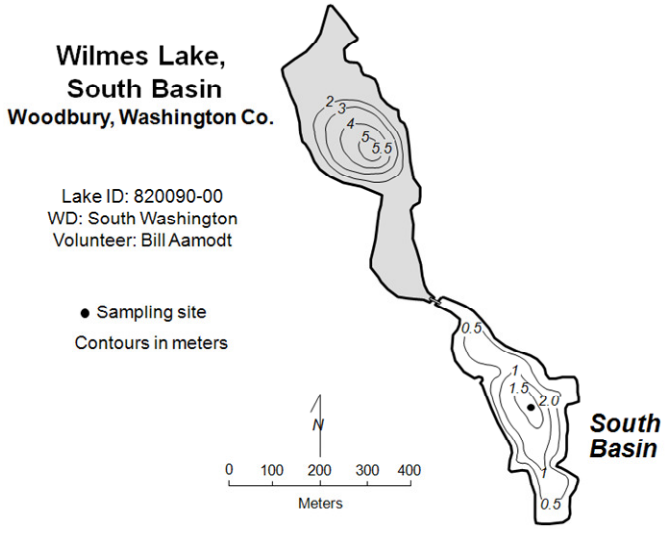
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	63.0	38.0	113.0	C
CLA (µg/l)	15.8	4.0	28.0	B
Secchi (m)	1.7	1.2	2.5	C
TKN (mg/l)	1.04	0.78	1.50	
			Lake Grade	C

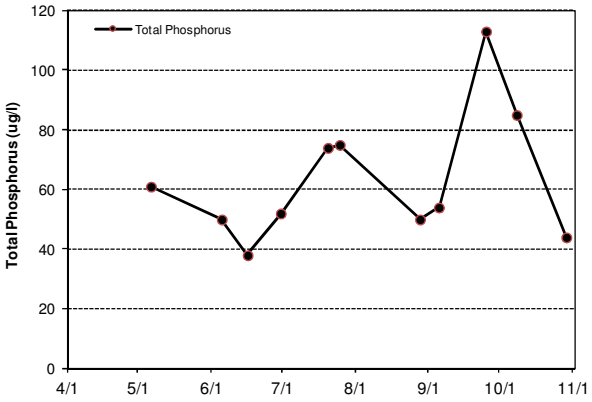
The lake received a lake grade of C for 2011, which is consistent with its historical water quality database. The water quality of the lake varies between a lake grade of C and D, with C's dominating since 2006.

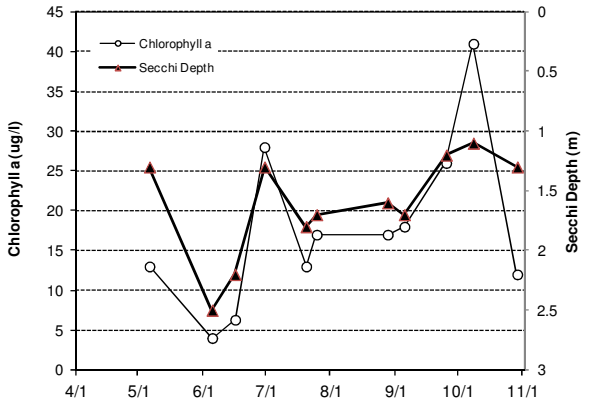
The 1994 and 1995 CAMP monitoring was performed in the northern basin of Wilmes Lake, while the 1996-2009 monitoring was performed in the lake's south basin. Thus, comparisons between the 1994-1995 data and the 1996-2009 data should not be made.

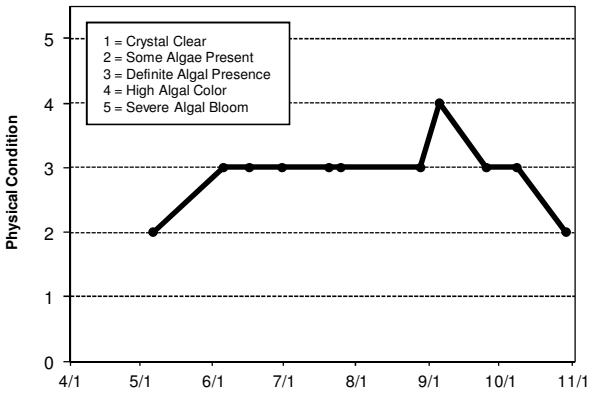
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

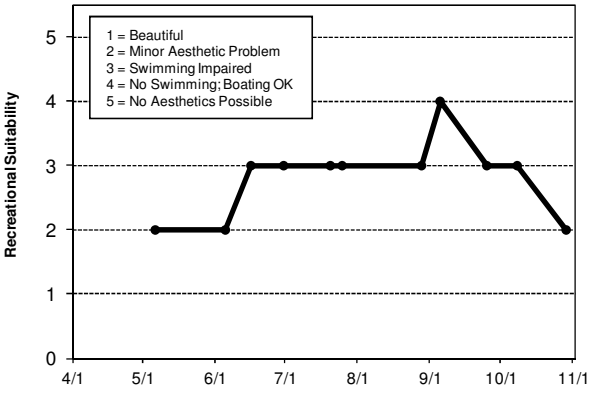
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/6/2011	14.5				13	61		1.3	2	2
6/5/2011	25.2				4	50		2.5	3	2
6/16/2011	21.6				6.3	38		2.2	3	3
6/30/2011	23.8				28	52		1.3	3	3
7/20/2011	29.8				13	74		1.8	3	3
7/25/2011	29.2				17	75		1.7	3	3
8/28/2011	24.6				17	50		1.6	3	3
9/5/2011	22.4				18	54		1.7	4	4
9/25/2011	17.2				26	113		1.2	3	3
10/8/2011	17.3				41	85		1.1	3	3
10/29/2011	9.7				12	44		1.3	2	2

Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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	2009	2010	2011
Total Phosphorus	C	D	D	D	C	C	D	C
Chlorophyll a	C	C	C	C	C	C	C	B
Secchi Depth	C	D	C	C	D	C	C	C
Lake Grade	**C**	**D**	**C**	**C**	**C**	**C**	**C**	**C**

Source: Metropolitan Council and STORET data

Wing Lake (27-0091) *Nine Mile Creek Watershed District*

Wing Lake is located within the City of Minnetonka (Hennepin County). It has a surface area of 11 acres. There are few known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

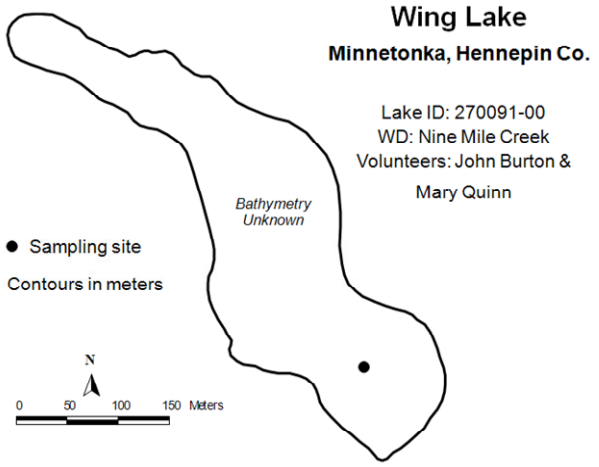
2011 summer (May-September) data summary

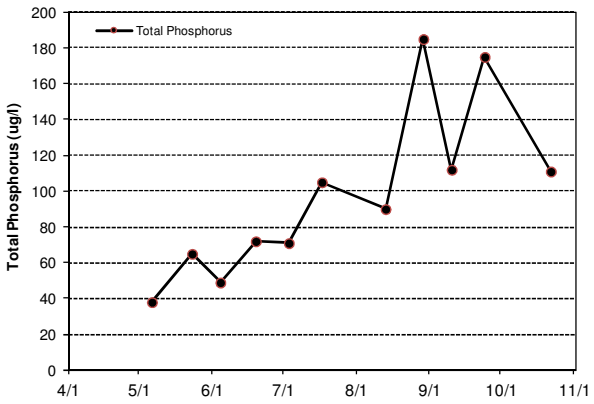
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	96.2	38.0	185.0	D
CLA (µg/l)	42.6	6.1	91.0	C
Secchi (m)	1.0	0.5	1.9	D
TKN (mg/l)	2.45	0.73	13.00	
			Lake Grade	D

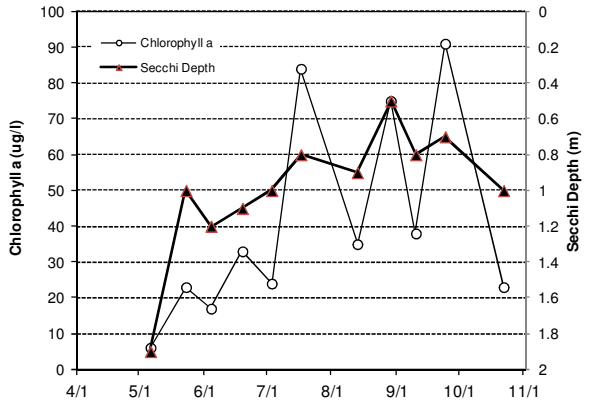
The lake received a lake grade of D for 2011, which is consistent with its limited historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

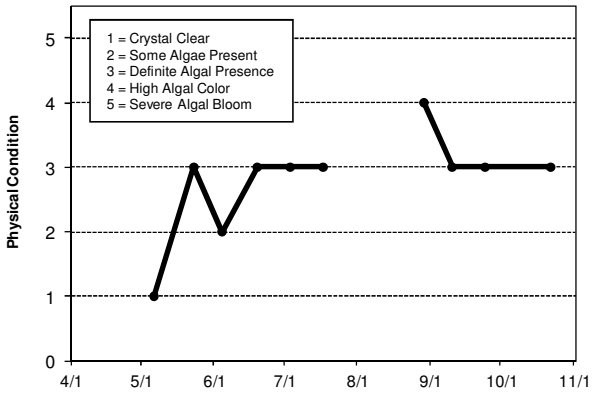






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(ºC)	(ºC)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/6/2011	15.4				6.1	38		1.9	1	1
5/23/2011	20.2				23	65		1	3	4
6/4/2011	23.1				17	49		1.2	2	4
6/19/2011	20				33	72		1.1	3	4
7/3/2011	24.3				24	71		1	3	5
7/17/2011	25.8				84	105		0.8	3	5
8/13/2011	26.7				35	90		0.9		5
8/29/2011	24.6				75	185		0.5	4	5
9/10/2011	21				38	112		0.8	3	5
9/24/2011	13.9				91	175		0.7	3	5
10/22/2011	10				23	111		1	3	4



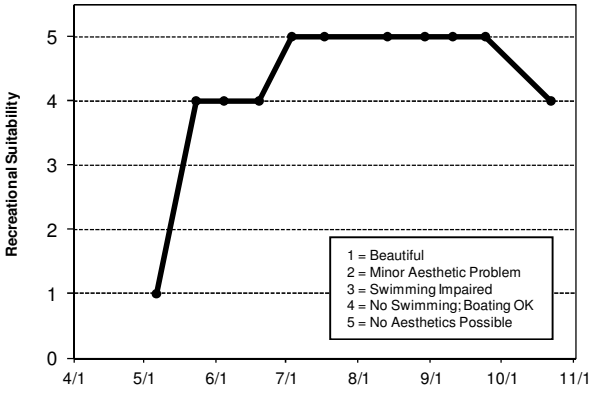
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			D	D	D	D	D	D
Chlorophyll a			C	C	C	C	D	C
Secchi Depth			D	D	D	D	D	D
Lake Grade			**D**	**D**	**D**	**D**	**D**	**D**

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 is the receiving waterbody for the Bongard's wastewater treatment plant.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

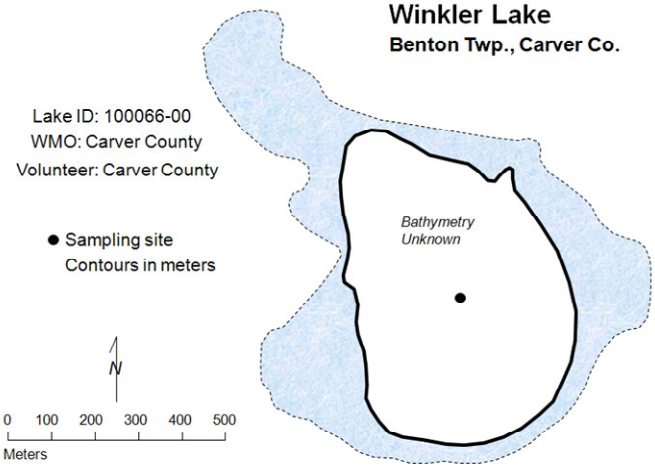
2011 summer (May-September) data summary

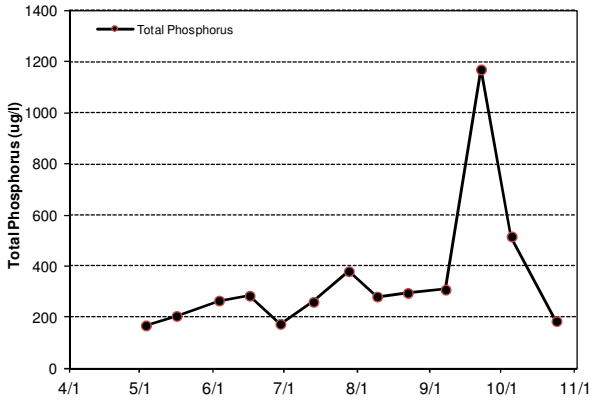
Parameter	Mean	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	345.5	169.0	1170.0	F
CLA (µg/l)	147.3	70.0	330.0	F
Secchi (m)	0.4	0.2	0.6	F
TKN (mg/l)	3.26	2.00	6.90	
			Lake Grade	F

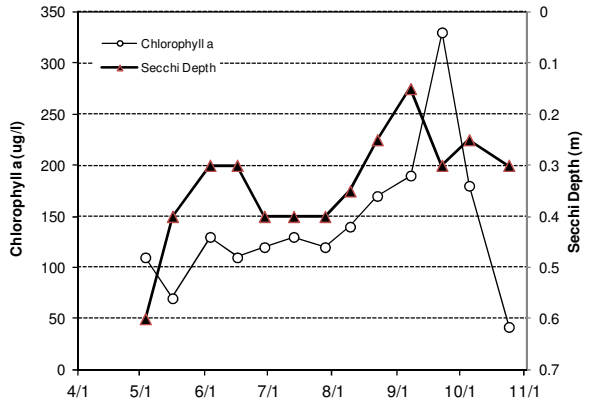
The lake received a lake grade of F for 2011. The lake has fluctuated between lake grades of D and F since 1999. F lake grades were more common.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

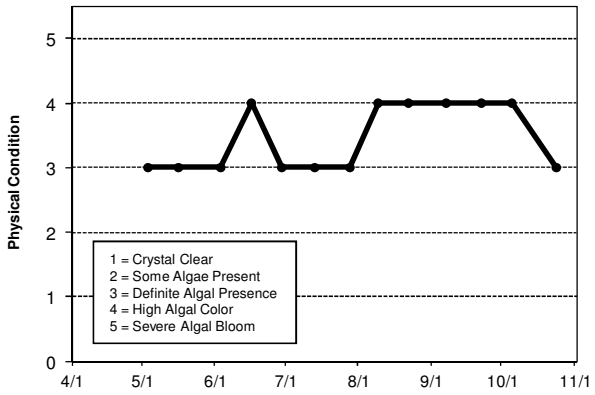






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
5/3/2011	6.66		27		110	169		0.6	3	4
5/16/2011	14.7		16.7		70	206		0.4	3	3
6/3/2011	20.14		7.3		130	266		0.3	3	3
6/16/2011	22.3		18.5		110	285		0.3	4	4
6/29/2011	22.41		22.4		120	175		0.4	3	4
7/13/2011	24.6		15.2		130	261		0.4	3	3
7/28/2011	26.6		5.7		120	381		0.4	3	3
8/9/2011	22.15		7.2		140	282		0.35	4	4
8/22/2011	21.22		7.3		170	296		0.25	4	4
9/7/2011	18.58		9.6		190	309		0.15	4	4
9/22/2011	12.08		2.2		330	1170		0.3	4	4
10/5/2011	19.4		12.6		180	517		0.25	4	4
10/24/2011	7.74		5.9		42	186		0.3	3	4

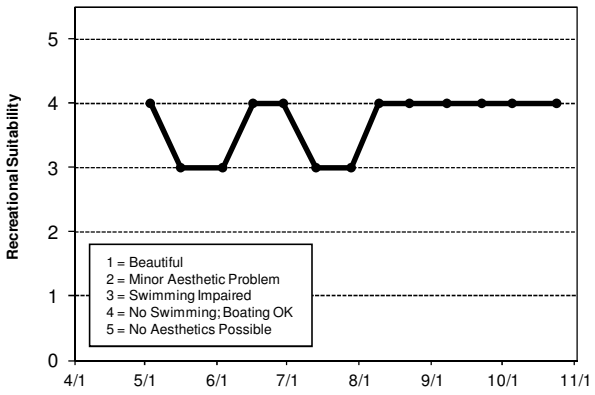


Lake Water Quality Grades Based on Summertime Averages

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				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	2009	2010	2011
Total Phosphorus		F		F	F		F	F
Chlorophyll a		F		C	F		F	F
Secchi Depth		F		F	F		F	F
Lake Grade		**F**		**D**	**F**		**F**	**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. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	47.5	29.0	120.0	C
CLA (µg/l)	9.8	1.9	28.0	A
Secchi (m)	1.2	0.6	2.0	C
TKN (mg/l)	1.06	0.89	1.40	
			Lake Grade	B

The lake received a lake grade of B for 2011, which is the second B lake grade received according to its historical water quality database. The lake typically has received a lake grade of C.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

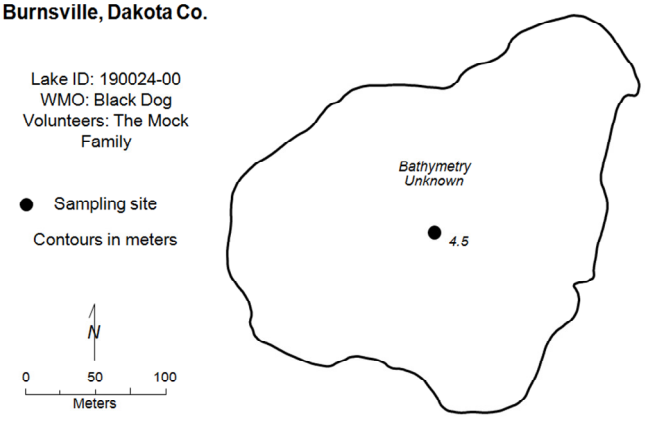
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

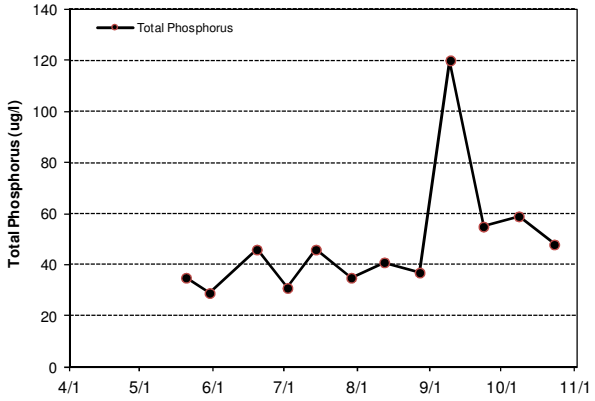
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

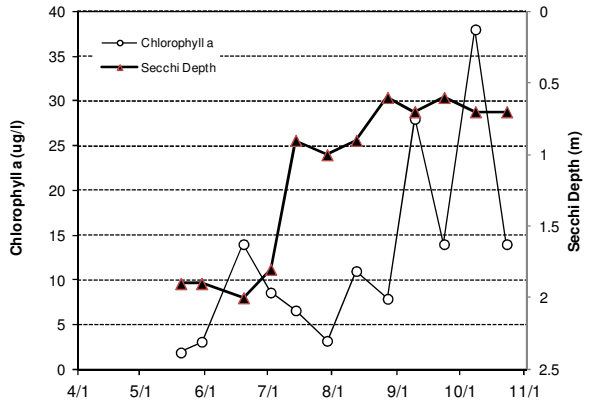
Wood Lake

Burnsville, Dakota Co.

Lake ID: 190024-00
WMO: Black Dog
Volunteers: The Mock Family

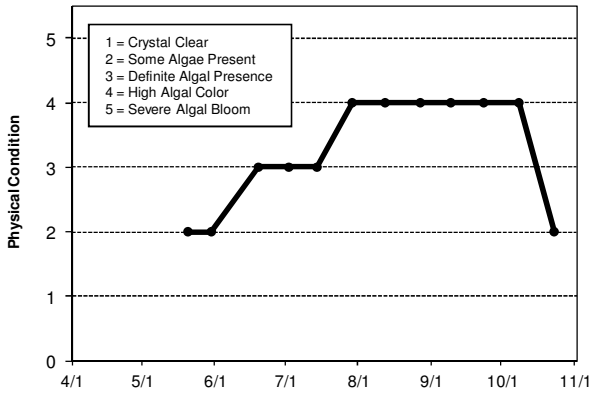






2011 Data

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 (1-5)	RS (1-5)
5/20/2011	19				1.9	35		1.9	2	4
5/30/2011	21.4				3.1	29		1.9	2	4
6/19/2011	23.9				14	46		2	3	4
7/2/2011	29.5				8.6	31		1.8	3	4
7/14/2011	25.5				6.6	46		0.9	3	4
7/29/2011	29.2				3.2	35		1	4	4
8/12/2011	26.5				11	41		0.9	4	4
8/27/2011	26.2				7.9	37		0.6	4	
9/9/2011	26.5				28	120		0.7	4	4
9/23/2011	26				14	55		0.6	4	4
10/8/2011	16.2				38	59		0.7	4	4
10/23/2011	12.1				14	48		0.7	2	4

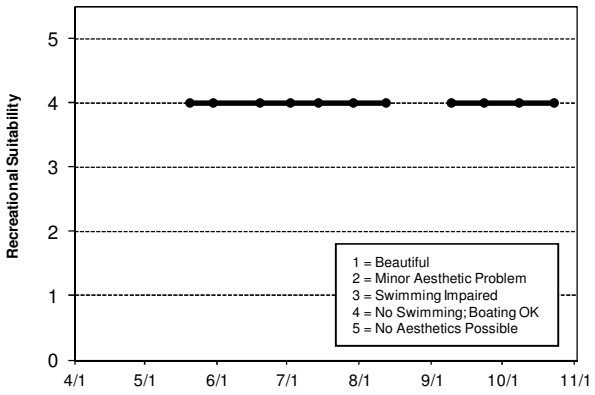


Lake Water Quality Grades Based on Summertime Averages

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	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	2009	2010	2011
Total Phosphorus	C	C	D	C	C	C	C	C
Chlorophyll a	B	C	C	B	B	B	C	A
Secchi Depth	C	C	C	C	C	C	B	C
Lake Grade	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**B**



Source: Metropolitan Council and STORET data

Woodpile Lake (82-0132) *Browns Creek Watershed District*

Woodpile Lake is located in Washington County. It has a surface area of 19 acres. The maximum depth of the lake is 8.2 m (27 ft).

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2011 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	62.2	27.0	109.0	C
CLA (µg/l)	20.1	2.6	94.0	C
Secchi (m)	3.1	0.8	6.4	A
TKN (mg/l)	1.29	0.85	2.00	
			Lake Grade	B

The lake received a lake grade of B for 2011, which is consistent with its limited historical database. One difference for this year compared to other years is the A grade received for Secchi depth. This was the first year the lake has received an A grade for this parameter. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

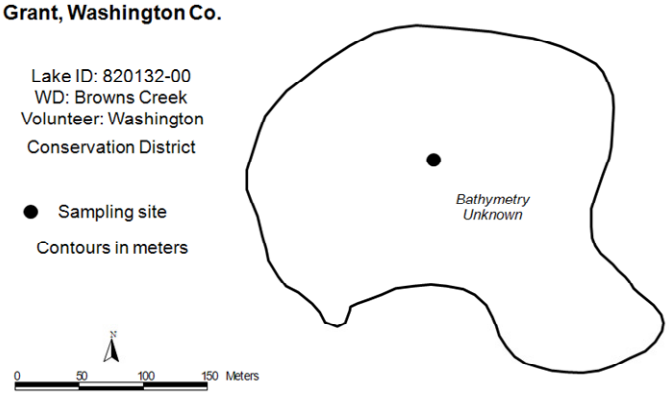
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

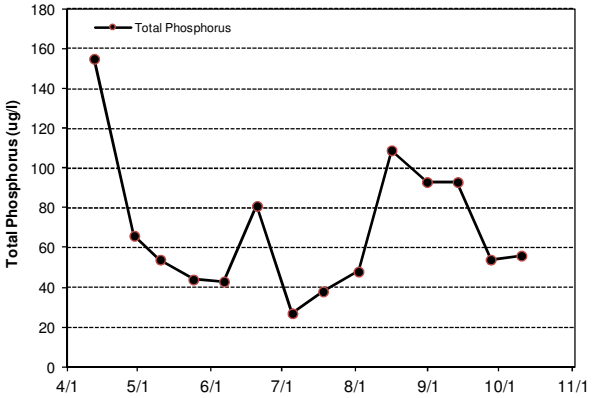
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

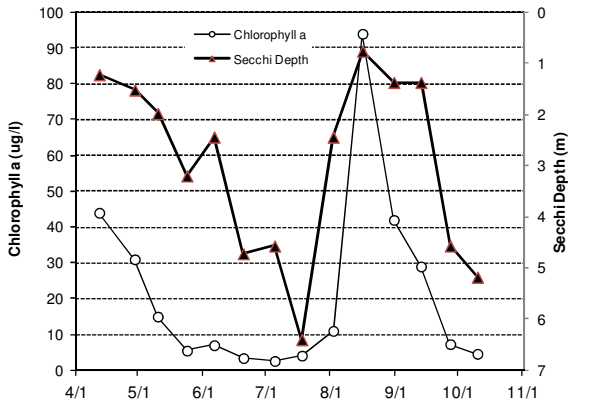
Woodpile Lake

Grant, Washington Co.

Lake ID: 820132-00
WD: Browns Creek
Volunteer: Washington Conservation District

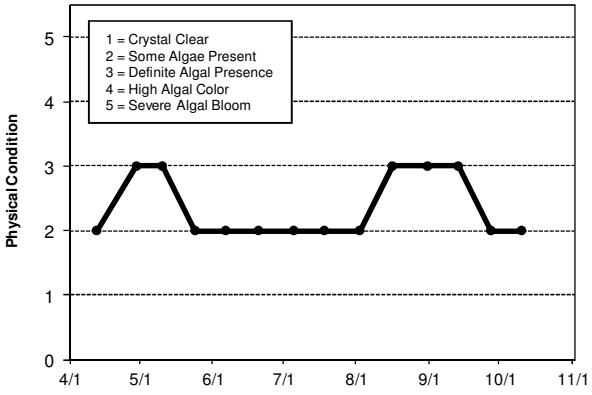






2011 Data

	Surf. Tmp.	Bot. Tmp.	Surf. DO	Bot. DO	CLA	Surf. TP	Bot. TP	Secchi	PC	RS
Date	(°C)	(°C)	(mg/l)	(mg/l)	(µg/l)	(µg/l)	(µg/l)	(m)	(1-5)	(1-5)
4/12/2011	7.3	5.2	12.3	0	44	155		1.22	2	3
4/29/2011	8.4	6.1	13.5	0.1	31	66		1.52	3	4
5/10/2011	14.4	7	10.9	0.1	15	54		1.98	3	3
5/24/2011	19.5	7.3	9.8	0.1	5.5	44		3.2	2	2
6/6/2011	27.4	7.8	8.7	0.1	7	43		2.44	2	3
6/20/2011	22.5	8	8.3	0.1	3.4	81		4.72	2	2
7/5/2011	28.4	13.2	9.3	0	2.6	27		4.57	2	2
7/18/2011	28.1	9.1	8.1	0.1	4.1	38		6.4	2	2
8/2/2011	27.5	9.2	6.2	0.1	11	48		2.44	2	3
8/16/2011	25.3	9	14.2	0	94	109		0.76	3	4
8/31/2011	23.3	9.4	3.3	0	42	93		1.37	3	4
9/13/2011	22.2	9.7	7.4	0	29	93		1.37	3	4
9/27/2011	15.8	9.8	6.1	0.1	7.3	54		4.57	2	2
10/10/2011	18.3	18.3	9.6		4.6	56		5.18	2	2

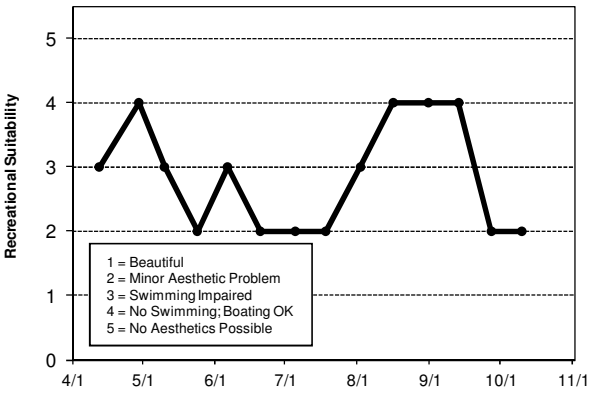


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	2004	2005	2006	2007	2008	2009	2010	2011
Total Phosphorus			D	C	C	C	C	C
Chlorophyll a			B	B	C	B	C	C
Secchi Depth			C	B	C	B	C	A
Lake Grade			**C**	**B**	**C**	**B**	**C**	**B**



Source: Metropolitan Council and STORET data

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APPENDIX A

Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2011

Appendix A

Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2011

(Numbers indicate monitoring events per year. A "v" indicates monitoring performed by volunteers.)

Lake	DNR ID	Location	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11
Acorn Lake	82010200																												v14		v 6	v 6	v 7	
Alimagnet Lake	19002100																	v 12	v10	v10	v10	v10	v10	v8	v9	v12	v10	v10	v8	v10	v 12	v 10	v 13	v 12
Anderson Pond	19009400																																v 12	v 9
Ann Lake	10001200							5				13													13									
Ardmore Lake	27015300																													v4	v 11	v 14	v 12	
Armstrong Lake	82011602	south basin																			v15	v10	v13	v14	v15	v14	v14	v14	v7	v7	v 7	v 14	v 7	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						
Baldwin Lake	2001300																																	v 2
Barker Lake	82007600																						v5	v5	v7	v7	v7	v7	v7	v7	v 7	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		v 12		v 14
Bass Lake	82003500	May Township																					v14	v5	v7	v7	v7	v7	v7	v7	v 7	v 7		
Bass Lake	82012300	west [Grant Twnshp]																											v7	v8	v 7	v 7	v 14	v 14
Bass Lake	82012400	east [Grant Twnshp]																											v7	v7	v 7	v 7	v 14	v 14
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	v 14	v 15	v 15
Bay Pond	82001100																												v14	v14	v 11	v 7	v 7	
Benton Lake	10006900																					v13	v14	v14		v15		v14		v13	v 14	v 14	v 14	v 14
Benz Lake	82012000																				v8							v14	v14	v14	v 14	v 14	v 14	v 15
Berliner Lake	10010300																					v1												
Beutel Pond	82039900																														v 7	v 5	v 3	
Big Carnelian Lake	82004900						5					13					13			13			v14	v7	v14	v14	v14	v14	v7	v7	v 6	v 7	v 7	
Big Comfort Lake	13005300																			v3			v14	v14	v14	v14	v14	v13	v14	v14	v 14	v 13	v 14	v 13
Big Marine Lake	82005200		4	5			5					13					13			13			v14	v7	v14	v14	v14	v14	v7	v7	v 7	v 7	4 & v 7	12
Big Marine Lake	82005200																																4	11
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	v14	13	v10	v 15	v 12	v 11	v 15
Brand Lake	10011000																					v1												
Braunworth Lake	10010700																					v1												
Brick Pond	82030800																														v 7	v 6	v 7	v 7

Appendix A

Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2011

(Numbers indicate monitoring events per year. A "v" indicates monitoring performed by volunteers.)

Lake	DNR ID	Location	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11
Brickyard Clayhole Lake	10022500																								v14	v13	v14	v14	v14	v13	v 14	v 15	v 14	v 14
Bryant Lake	27006700		2	5	16		5					13	13	12																				
Burandt Lake	10008400																					v7	v13	v9			v18	v22				v 4	v 14	v 14
Bush Lake	27004700						5									13	13					13		13			13		v13	v15	v 13	v 13	v 13	v 12
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	v 3	v 7	
Capaul Pond	82036500	west basin																													v 7	v 1		
Carol Lake	82001700																						v5	v5	v7	v7	v7	v7	v7	v7	v 7	v 6		
Carver Lake	82016600										20					v15	v15	v16	v9															
Cates Lake	70001800																								v14	v13	v15	v13	v14	v13	v 12	v 13	v 13	v 12
Cedar Island Lake	27011900																	v13						v13		v11			v9			v 11		
Cedar Lake	27003900	Minneapolis					5																											
Cedar Lake	70009100	Scott Co.	4	5			5						13			14					13			13				13	v14	v14	v 14	v 14	v 14	v 14
Cenaiko Lake	2065400																			v12	v11	v13	v11	v13	v12	v12	v14	v14	v14	v12	v 13	v 13	v 13	v 13
Centerville Lake	2000600		4	5		5																	13	13/v4	v1	13	13				2		
Charley Lake	62006200							5																										
Christmas Lake	27013700		4	5				5												13	13	13			13	13						1	4
Chub Lake	19002000		2													v14	v14	v11														10	10
Clear Lake	82004500	May Township																													v 14	v 14	v 7	v 8
Clear Lake	82009900	north lobe [Lake Elmo]																														v 4		
Clear Lake	82009900	south lobe [Lake Elmo]																														v 6		
Clear Lake	82016300	Forest Lake	4				5						13			v11	v12	v12	v11	v10	v11	v10	v9	v12	v12	v12	v6		13			3		
Cleary Lake	70002200						5																											
Cloverdale Lake	82000900																							v10	v10	v11	v13	v12	v11	v10	v 9	v 11	v 10	v 9
Cobblecrest Lake	27005300																								v4		v14	v16	v13	v13	v 13	v 10	v 9	v 6
Cobblestone Lake	19045600																											v14	v14	v12	v 14	v 13	v 14	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	v 3	v 9	v 14
Coon Lake	2004200		4				5										13			13												2		
Cornelia Lake	27002800																									v7		v11	v14	v14	v 13	v 14		
Courthouse Lake	10000500	Chaska																	v2	v14	v13	v13	v14	v14	v14	v14	v14	v14	v13	v13	v 14	v 14	v 14	v 14
Cowley Lake	27016900																		v12										v10	v1		v 4	v 6	
Crane Lake	27073400															v9																		
Crooked Lake	2008400					5						13				v15	v15	v14	v14	v12	v14	v14												
Crystal Lake	19002700	Burnsville	2			5						13					13	13	13	13	13	v12	v10	v14	v15	v15	v15	v16	v14	v14	v 14	v 14	1 & v 14	4 & v 14
Crystal Lake	27003400	Robbinsdale							17	19	19						v15			v11				v8				v7			v 7		v 8	

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Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2011

(Numbers indicate monitoring events per year. A "v" indicates monitoring performed by volunteers.)

Lake	DNR ID	Location	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11
Crystal Lake	70006100	Spring Lake																		v12		v11												
Cynthia Lake	70005200		2																															
Dan Patch Lake	70001600																			v15														
Dean Lake	70007400																								v7	v7	v6	v7	v8	v9	v 10	v 12	v 8	v 3
Deeg Lake	19011700																							v12										
Deep Lake	62001800							5																										
Demontreville Lake	82010100		4				5							12		v15		14					13			13	v14	v7	v7	v11	v 20	v 12	v 14	v 20
Diamond Lake	27012500	Dayton	2														v13										13							
Downs Lake	82011000																					v14		v9	v9	v6	v7	v9	v7	v5	v 2	v 9	v 1	
Dutch Lake	27018100						5																											
Eagle Lake	10012100	Young America	4	5				5											12		v15	v14	v14	v12	v14	v14	13	v14	v14	v13	v 13	v 14	v 14	v 14
Eagle Lake	27011101	Maple Grove	4			5			17	18				11		v15			v14	v14	v14		v6		v4			v6				v 6		
Eagle Point Lake	82010900				2											v14													v5	v2	v 2	v 2		v 7
Earley Lake	19003300																v10	v11	v9	v10	v10	v9	v8	v6	v10	v9	v6	v7	v9	v12	v 9	v 10	v 11	v 8
East Boot Lake	82003400																						v14	v14	v14	v14	v14	v14	v7	v7	v 7	v 7	v 7	v 7
East Lake	19034900																											v13	v6	v14	v 13		v 14	v 11
East Twin Lake	2013300		2	5		5						13						13			13											3	6	
Echo Lake	82013500																												v10	v8	v 4		v 7	
Edina Lake	27002900																										v10	v10						
Edith Lake	82000400																											v6	v12	v12	v 15	v 17		v 15
Egg Lake	82014700																							v3										
Elmo Lake	82010600		4	5	16		5				19			12			v11											v9	v8	v8	v 18	v 9	v 19	v 9
Fahlstrom Pond	82000500	east basin																													v 3	v 8	v 4	
Fahlstrom Pond	82000500	west basin																													v 5	v 5	v 5	
Farquhar Lake	19002300		4														v15	v16	v14	v15		v15	v13	v11	v13	v14	v14	v15	v13	v13	v 13	v 14	v 14	v 14
Fireman's Clayhole Lake	10022600																							v12	v14	v14	v14	v14	v13	v13	v 14	v 14	v 14	v 14
Fish Lake	19005700	Eagan										13																						
Fish Lake	27011800	Maple Grove	4	5	16			5					13																					
Fish Lake	70006900	Scott Co.	4				5						13					13		v2	v13	v8	v12	v9	v14	v13	v11	v13	v11	v13	v 11	v 12	v 11	v 10
Fish Lake	82006400	Washington Co.																					v5	v14	v7	v7	v7	v7	v7	v7	v 7	v 8	v 7	v 7
Fish Lake	82009300	Woodbury																															v 14	v 14
Fish Lake	82013700	Grant Township																							v5	v5	v4							v 13
Forest Lake	82015900	west basin					5						13			v7			v12	v14	v15	v14	v14	v14	v14	v14	v14	v14	13	v14	v 14	v 14	v 14	v 13
Forest Lake	82015900	middle basin					5						13			v7			v12						13			13	13			v 11		v 12
Forest Lake	82015900	east basin	4				5						13			v7			v12						13			13	13			v 8	v 8	v 7
French Lake	27012700																							v11	v10	v7	v7							
Friedrich's Pond	82010800																												v13	v14	v 11	v 1		
Gables Lake	82008200																				v8	v5												

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Gaystock Lake	10003100																					v2	v14	v14				v14	v14					
George Lake	2009100		4	5	16		5					13					13				13											v 14		
George Watch Lake	2000500																		v14	v12	v11	v11	v6	v7	v8	v9	v10	v12	v7	v8	v 12	v 14	v 14	v 14
German Lake	82005600																								v7	v7	v7	v7	v7	v7	v 7	v 7		
Gervais Lake	62000700							5																										
Glen Lake	27009300																												v13	v7	v 4			
Goetschel Lake	82031300																								v11	v9	v4	v15	v9	v5	v 7	v 7	v 7	
Goggins Lake	82007700																					v13	v14	v14	v14	v14	v14	v14	v14	v14	v 14	v 14	v 14	v 14
Golden Lake	2004500		2											12		14			v13	v11	v15	v13	v13	v12	v11	v11	v10	v11	v11	v10	v 9	v 13	v 12	
Goose Lake	10008900	Waconia																v9	v7	v15	v15	v14	v11	v14	v14	v14	v14	v14	v14	v13	v 14	v 14	v 14	v 14
Goose Lake	19036000	Lakeville																v13	v13															
Goose Lake	82005900	New Scandia															v15	v15	v13	v13	v15						v7	v7	v7	v7	v 14	v 7	v 7	v 7
Goose Lake	82011300	north basin [Lake Elmo]																													v 7	v 7	v 7	
Goose Lake	82011300	south basin [Lake Elmo]																													v 7	v 7	v 7	
Grace Lake	10021800																								v11	v14	v14		v14		v 14	v 14	v 14	v 14
Grass Lake	27068100																			v12														
Hafften Lake	27019900																						13	13			13	v15	v13				v 13	
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	v 7	v 7	v 7
Hazeltine Lake	10001400																					v1	v14	v14				v14	v14			v 14	v 14	v 14
Heims Lake	13005600																															v 10		
Henry Lake	27017500																	v10										v11	v11	v6	v 7	v 7	v 5	v 10
Herber Pond	82001501																										v14	v14	v7	v7				
Hidden Lake	27069300																																	v 9
Highland Lake	2007900																					v13	v11	v13	v12	v12	v14	v14	v14	v12				
Holland Lake	19006500					10	16	15			20					13						13											1	4
Hornbeam Lake	19004700																												v11	v8	v 7	v 5	v 2	
Horseshoe Lake	19003200	Dakota Co.																v11	v10												v 1			
Horseshoe Lake	19005100	Sunfish Lake																											v11	v11	v 8	v 14	v 13	v 10
Horseshoe Lake	82007400	Site 1 (center)																				v1												
Horseshoe Lake	82007400	Site 2 (north basin)																														v 8		
Horseshoe Lake	82007400	Site 3 (south basin)																														v 7	v 7	v 7
Hydes Lake	10008800							5						12		13			12			v11	v4	v9	v14	v15	v14	v14	v14	v13	v 13	v 14	v 14	v 14
Independence Lake	27017600		4	5		5							13			v14	v15																	

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Isabelle Lake	19000400																v14																	
Island Lake	2002200	Linwood				7																				v12	v14	v14	v14	v13	v 13	v 14	v 14	v 14
Jackson WMA	82030500																																v 14	v 14
Jane Lake	82010400						5		17	18				12			v12						13				v15	v13	v10	v12	v 16	v 11	v 9	v 9
Jellums Lake	82005202	Site 1																					v14	v14	v12	v14	v14	v14	v7	v7	v 7	v 7	v 7	v 7
Jellums Lake	82005202	Site 2																							v11	v11								
Johanna Lake	62007800			5				5				13																						
Jonathan Lake	10021700																								v13				v14		v 14	v 14	v 14	v 14
Josephine Lake	62005700							5				13																						
Jubert Lake	27016500																						v11											
July Lake	82031800																												v7	v7	v 7	v 5		v 14
Karth Lake	62007200																													v11	v 13	v 14	v 14	v 13
Keller Lake	19002500	Burnsville																	13	13	v13	v15	v14	v12	v13	v15	v15	v14	\14	v12	v 8		v 14	v 13
Keller Lake	62001000	Maplewood						5																								v 12		
Kingsley Lake	19003000															5		v11	v10	v9			v14	v14	v15	v14	v15	v16	v14	v14	v 13	v 14	v 14	v 12
Kismet Lake	82033400																				v14	v13	v14	v14	v14	v14	v14	v13	v14	v14	v 14	v 14	v 14	v 14
Klawitter Pond	82036800																								v13	v13	v14	v13	v12	v12	v 13	v 14	v 11	v 12
Kohlman Lake	62000600							5																										
Kramer Pond	82011700																														v 7	v 7	v 7	
La Lake	82009700																v13	v11	v13	v11	v10	v10	v8	v6	v5	v6	v3	v13	v12	v14	v 11	v 12	v 10	v 10
Lac Lavon Lake	19044600																			v11	v10	v10	v9	v2	v7	v12	v12	v12	v12	v13	v 12	v 14	v 13	v 13
Laddie Lake	2007200		4													v13	v14	v12					v13	v13	v14	v10							
Lake Forest	82018700																														v 12	v 11		
Lake Minnetonka	27013302	lower	4	5																														
Lake Minnetonka	27013305	upper	2	5																														
Langdon Lake	27018200						5																											
Langton Lake	62004900	north site																										v14	v7	v13	v 13	v 13	v 13	v 13
Langton Lake	62004900	south site																										v14	v13	v13	v 13			
Langton Lake	62020400	north basin																										v14						
Lee Lake	19002900																v14	v15	v14	v13			v12	v13	v11	v9	v15	v9	v14	v14	v 13	v 14	v 14	v 12
Legion Pond	82046200																											v14	v10		v 7	v 2		
Lemay Lake	19008200																													v11	v 11	v 9	v 11	v 10
LeVander Pond	19008800																																v 11	v 9
Libbs Lake	27008500																										v10							
Lily Lake	82002300																	v15	v14	v14	v15	v13	v14	v14	v14	v7	v7	v7	v7	v7	v 14	v 12	v 9	
Linwood Lake	2002600		4	5		7						13					13			13											v 13			
Lippert Lake	10010400																					v1												
Little Carnelian Lake	82001400																						v14	v7	v14	v14	v14	v14	v7	v7	v 7	v 7	v 7	

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Little Comfort Lake	13005400																												v14	v13	v 12	v 12	v 12	v 13
Little Johanna Lake	62005800																							v12	v16	v15	v8	v6	v3		v 14	v 13	v 12	v 10
Little Long Lake	27017901		4				5						13								13			13		13			v11	v2		v 13	v 14	
Lochness Lake	2058500																													v12	v 11	v 13	v 10	v 7
Lone Lake	27009400																															v 15	v 13	v 11
Long Lake	10001600	Carver Co.																				v2		v13		v5								
Long Lake	19002200	Apple Valley																		v16					v11	v13	v12	v15	v14	v13	v 14	v 13	v 14	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	north basin [Stillwater]																v14	v7		v14	v13	v14	v14	v14	v14	v14	v14	v14	v14	v 14	v 14	v 14	v 14
Long Lake	82002100	middle basin [Stillwater]																														v 4	v 4	v 4
Long Lake	82002100	south basin [Stillwater]																														v 4	v 4	v 4
Long Lake	82003000	May Township														v14	v14	v14	v13	v14		v14	v14	v14	v14	v14	v7	v7	v7	v7	v 7	v 7	v 7	v 7
Long Lake	82006800	Scandia																					v5	v14	v7	v7	v7	v7	v7	v7	v 8	v 6	v 7	v 7
Long Lake	82011800	Pine Springs														v14										13	v15	v14	v14	v14	v 14	v 14		v 21
Long Lake	82013000	Mahtomedi																								v11	v9	v12	v10	v10	v 10	v 10	v 9	v 9
Loon Lake	82001502																						v14	v14	v7	v7	v7	v7	v7	v7	v 14	v 7	v 12	v 1
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	v 10	v 11	v 8
Louise Lake	82002500																						v5	v5	v7	v7	v7	v7	v7	v7	v 14	v 7	v 7	v 7
Lucy Lake	10000700							5																								v 13	v 12	v 13
Lynch Lake	82004200	north																												v7	v 14	v 13	v 14	v 14
Lynch Lake	82004200	south																															v 14	v 14
MacDonald Lake	82006200																										v14	v14	v7	v7				
Magda Lake	27006500																					v14	v13			v11			v12			v 9		
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	v 14	v 14	v 13
Markgraf Lake	82008900																v15	v11	v12	v10	v15	v10	v10	v9	v13	v14	v14	v14	v15	v14	v 14	v 13	v 14	v 13
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	v 14	v 14	v 14

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Mays Lake	82003300																														v 14	v 14	v 7	v 8
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	v 7		v 8
McDonough Lake	19007600							5														13												
McKnight Lake	10021600																												v14		v 14	v 14	v 14	v 14
McKusick Lake	82002000																v14	v14	v14	v14	v14	v13	v14	v14	v14	v14	v14	v14	v14	v14	v 15	v 14	v 14	v 14
McMahon Lake	70005000		2				5											13			13			13				13	v14	v10	v 11	v 10	v 11	v 9
Meadow Lake	27005700																		v12			v12			v9			v10			v 14			v 13
Medicine Lake	27010400	main lake		5		10							13	12																				v 10
Medicine Lake	27010400	southwest bay	4			9																											v 13	v 15
Mergens Pond	82048200																						v10			v3	v2	v6			v 6	v 1		
Meuwissen Lake	10007000																					v1									v 11			
Miller Lake	10002900																		v6	v13		v12	v14	v13	v13	v14	v14	v14	v12	v13	v 14	v 14	v 13	v 14
Minnetoga Lake	27008800																													v14	v 12		v 14	v 13
Minnewashta Lake	10000900	main lake					5						13			13				13	13	13			13	13								
Minnewashta Lake	10000900	south bay																															v 13	v 11
Mitchell Lake	27007000																	13				13	13			13	v14	v14	v14	v13	v 13	v 14	v 13	v 13
Moody Lake	13002300																											v14	v14	v14			v 12	v 10
Mooney Lake	27013400															v14	v10																	
Moore Lake	2007502																					v14												
Mud Lake	82002602																						v5	v5	v7	v7	v7	v7	v7	v7			v 14	v 7
Myers Lake	10006800																					v1												
Nokomis Lake	27001900		4				5																											
Normandale Lake	27104500																												v5	v3		v 11	v 13	v 9
North Twin Lake	82001800																						v5	v5	v7	v7	v7	v7	v7	v7	v 7	v 7	v 7	
Northwood Lake	27062700																						v12	v10	v13	v12	v12	v10	v10	v10	v 9	v 11	v 11	v 12
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	v 10	v 9	v 7
O'dowd Lake	70009500						5										13			13			13		13			13	v12	v13	v 14	v 14	v 14	v 14
Olson Lake	82010300													12		v15		14					13			13	v14	v7	v7	v11	v 19	v 13	v 12	v 18
Oneka Lake	82014000																					v13	v11	v11	v9	v6	v5						v 13	v 10
Orchard Lake	19003100		4	5		5						13				13					13	v15	v13	v13		v14	v14	v14	v14	v14	v 12	v 14	v 13	v 13
Otter Lake	2000300		2			5																												
Owasso Lake	62005600		4			5																												
Ox Yoke Lake	27017800																														v 1			
Pamela Lake	27067500																											v10						

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Parkers Lake	27010700		4										13					13				13	v12		v14	v15	v15	v15	v14	v14	v 13	v 14	v 13	
Parley Lake	10004200						5		17	18				12					12			13		13		13			13					
Pat Lake	82012500																												v7	v7	v 8	v 7	v 14	v 14
Patterson Lake	10008600																					v2												
Peltier Lake	2000400					5										v14	v16	v15	v14	v14	v13	v13	v14	v13	v17	v15	v15	v16	v17	v16				
Penn Lake	27000400																															v 14	v 14	v 12
Pepin Lake	40002800																													v13				
Peter Lake	27014702	north bay																														v 13	v 6	v 2
Phalen Lake	62001300		4	5				5																										
Pickerel Lake	2013000		2															13															6	7
Pierson Lake	10005300		2	5		5						13						13						13	13	13			13					
Pike Lake	27011102	Maple Grove																	v14	v15	v13		v13							v4		v 8		v 10
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	v 12	v 8	v 12
Plaisted Lake	82014800																														v 7	v 8	v 14	v 14
Pleasant Lake	62004600	North Oaks						5																										
Pleasant Lake	70009800	New Prague														13																	5	
Pomerleau Lake	27010000																		v9			v10		v6		v3							
Powers Lake	82009200																v12	v13	v13	v12	v9	v10	v8	v5	v7	v14	v14	v14	v14	v14	v14	v 14	v 14	v 14
Priebe Lake	62003600																														v 13	v 10	v 9	v 7
Prior Lake - Lower	70002600	Site 1					5						13						13	v15	v14	v13	v9	v14	v16	v13	v12	v12	v12	v12	v 12	v 14	v 14	v 12
Prior Lake - Lower	70002600	Site 2																			v14	v13	v9	v14	v15									
Prior Lake - Upper	70007200	Site 1	4	5			5						13						13	v15	v14	v13	v9	v14	v12	v13	v10	v9	v9	v5	v 11	v 14	v 14	v 13
Prior Lake - Upper	70007200	Site 2																							v12									
Raven Lake	19036900																	v13	v6	v8														
Rebecca Lake	27019200					10	12	12																										
Red Rock Lake	27007600																					12	13			13	13		13					v 2
Regional Park Lake	82008700																				v12	v14	v12	v13	v14	v15	v15	v14	v7	v7	v 7	v 7	v 7	v 7
Reitz Lake	10005200							5						12		13						v15	v13	v7	v13	v14	v14	15	v14	v14	v 11	v 11	v 12	v 11
Reshanau Lake	2000900		2																			v7	v1	v6					v13	v9	v 7	v 9	v 11	v 10
Rest Area Pond	82051400																												v13	v10	v 13	v 12	v 10	v 9
Rice Lake	10007800	Carver Co.	2																			v1												
Rice Lake	27011600	Maple Grove																												v10	v 10	v 12	v 14	v 12
Riley Lake	10000200		2	5	16			5	17	18			13	12		13				13			13		13	v14	v15	v14	v10	v15	v 12	v 14	v 13	4 & v 11
Rogers Lake	19008000																													v12	v 9	v 11	v 11	v 9
Rose Lake	27009200	Minnetonka																											v14	v13	v 13			

Appendix A

Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2011

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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	09	10	11
Rose Lake	82011200	north basin [Lake Elmo]																													v 7	v 7	v 7	
Rose Lake	82011200	south basin [Lake Elmo]																													v 7	v 7	v 7	
Rutz Lake	10008000																					v1	v14	v14	v14				v14	v7	v 5	v 8	v 5	v 7
Ryan Lake	27005800																		v14		v5		v9		v4	v6					v 13		v 10	
Sanborn Lake	40002700																													v2				
Sand Lake	82006700															v7	v14	v14	v13						v14	v7	v7	v7	v7	v7	v 14	v 7	v 7	v 7
Sarah Lake	27019100		4			5																												
Scheuble Lake	10008500																					v1												
Schmidt Lake	27010200																	v14			v12		v12	v9			v14	v9		v9				v 9
School Lake	13005700																											v14	v7	v7		v 6		
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	v 14	v 14	v 14
Sea Lake	82005300																														v 12	v 7		
Seidl Lake	19009500																	v15	v14	v14	v15	v16	v14	v14	v15	v8	v14	v14	v14	v8	v 4	v 2	v 12	v 9
Shady Oak Lake	27008902	middle bay																														v 12	v 11	
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	v14	v7			
Silver Lake	62000100	North St. Paul																											v12					
Silver Lake	82001600	Washington Co.																					v14	v5	v7	v7	v7	v7	v7	v7	v 7	v 7	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	v 7	v 13	v 14
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	v 14	v 14	v 14
South Twin Lake	82001900																						v5	v5	v7	v7	v7	v7	v7	v7	v 7	v 7	v 7	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	v 10	v 15	v 8
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	v 7	v 14	v 14
St. Croix Lake	82000100	site 1, Bayport Pool																											v2			v 12	v 11	
St. Croix Lake	82000100	site 2, Bayport Pool																										v10	v10	v9	v 9		v 12	v 11
St. Croix Lake	82000100	site 3, Troy Beach Pool																										v11	v9	v9	v 10		v 12	v 15
St. Croix Lake	82000100	site 4, Troy Beach Pool																															v 6	v 6
St. Croix Lake	82000100	site 5, Troy Beach Pool																										v8	v10	v7	v 8		v 15	v 10
St. Croix Lake	82000100	site 6, Black Bass Pool																										v11	v10	v10	v 9		v 16	v 16
St. Croix Lake	82000100	site 7, Kinnickinnic Pool																										v8	v8	v10	v 5		v 13	v 6

Appendix A

Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2011

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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	09	10	11
St. Joe Lake	10001100																										v17	v8	v9	v9	v 9	v 5	v 7	v 9
Staples Lake	82002800																						v14	v5	v7	v7	v7	v7	v7	v7	v 7	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			v 14
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	v 14	1 & v 15	4 & v 14
Sunfish Lake	82010700	Lake Elmo																					v10					v13	v11		v 7			v 7
Sunnybrook Lake	82013300																					v14		v13	v10	v12	v10	v16	v14	v14	v 14	v 14	v 13	v 14
Sunset Lake	82015300						5									v14	v14	v12	v13	v16	v12	v10	v13	v13	v18	v20	v15	v17	v12	v10	v 9	v 7	v 8	v 10
Sunset Pond	19045100																v14	v14	v14	v12	v10		v13	v11	v10	v12	v11		v14	v14	v 14	v 14	v 14	v 14
Susan Lake	10001300																												v7	v11	v 12	v 13	v 14	v 13
Swan Lake	10008200																					v1												
Swede Lake	10009500		2																13					13	v14	v16	v13	v14	v14	v13	v 14	v 14	v 14	v 14
Sweeney Lake	27003501	south basin																					v11	v9	v14	v13	v14	v11	v10	v15	v 12	v 13	v 14	v 12
Sweeney Lake	27003501	north basin																					v11	v9									v 10	v 9
Sylvan Lake	27017100	Hennepin Co.																													v 10			
Sylvan Lake	82008000	Washington Co.														v7			v14		v15	v14	v14	v14	v14	v14	v14	v14		v11	v 9	v 9	v 9	v 11
Tamarack Lake	10001000																							v10	v11	v12	v11	v11	v13	v14	v 11	v 13		
Tanners Lake	82011500		2								20					v14	v13	v12	v14															
Terrapin Lake	82003100																										v7	v7	v7	v7	v 7	v 7	v 7	v 8
Thole Lake	70012001						5										13			13			13		13			13	v14			2	7	9
Thomas Lake	19006700		2																															
Tiger Lake	10010800																					v1												
Turtle Lake	62006100	Ramsey Co.	4	5		5																												
Turtle Lake	82003600	Washington Co.																					v5	v5	v7	v7	v7	v7	v7	v7	v 7	v 7	v 7	
Twin Lake	19002800	Burnsville																				v6		v13	v11	v6	v2	v11	v8	v8	v 14	v 14	v 13	v 14
Twin Lake	27003502	Golden Valley																															v 9	v 9
Twin Lake	27004201	upper [Br. Center]												12		v14			11		v15		v11		v13		v14		v13		v 12		v 12	
Twin Lake	27004202	middle [Crystal]						5						12					13	v11		v13	13			v13		v8			v 13		v 13	
Twin Lake	27004203	lower [Robbinsdale]												12		v14			13		v5		13			v13		v8					v 9	
Twin Lake	27065600	St. Louis Park																							v12	v14	v14	v11	v14	v10	v 10	v 11	v 13	v 11
Twin Lake	82004800	south [May Twnshp]																		v13	v13										v 14	v 7	v 7	v 7
Vadnais Lake	62003801							5																										
Valentine Lake	62007100																							v14	v13	v12	v12	v9	v10	v12	v 13			
Valley Lake	19034800																	v15	v14	v11		v8	v14	v14	v14	v14	v14	v13	v14	v14	v 13	v 14	v 14	v 12
Virginia Lake	10001500																						v11	v12	v14	v12	v15	v13						

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Wabasso Lake	62008200		4	5		5						12																						
Waconia Lake	10005900		4	5				5					13				v16	v13	v15	v17	v15	v14	v14	v14	v15	v14	12	v14	v14	v13	v 13	v 14	v 14	v 14
Wasserman Lake	10004800					5			17	18							13			13	13	13			13	13			13					
Weaver Lake	27011700					5			17	18																								
Weber Lake	82011900																												v12		v 7	v 7	v 7	
West Boot Lake	82004400																						v14	v14	v14	v14	v14	v14	v7	v7	v 7	v 7	v 7	
West Lakeland Basin	100	south basin																													v 3			
West Lakeland Basin	82048800	north basin																					v2								v 7	v 7	v 7	
Westwood Lake	27071100															v13							v15	v14	v10	v9	v7	v7	v8	v8	v 7	v 7	v 10	v 9
Whaletail Lake	27018400	north basin																									13	13				3		
Whaletail Lake	27018400	south basin	4				5														13			13			13	13				3		
White Bear Lake	82016700		4	5			5																											
White Rock Lake	82007200																												v11	v14	v 13	v 15	v 14	v 15
Wilmes Lake	82009000																v14	v15	v14	v15	v15	v14	v13	v13	v10	v12	v12	v10	v12	v11	v 11	v 11	v 11	v 11
Windsor Lake	27008200																										v12	v14						
Wing Lake	27009100																												v14	v14	v 12	v 9	v 14	v 11
Winkler Lake	10006600																					v8	v6	v6		v13		v14		v13	v 13		v 13	v 13
Wolsfeld Lake	27015700		4																															
Wood Lake	19002400																		v10	v14	v15	v15	v14	v13	v14	v14	v14	v14	v13	v13	v 12	v 9	v 13	v 12
Woodpile Lake	82013200																												v7	v7	v 15	v 14	v 14	v 14
Young America Lake	10010500																					v1												
Zumbra Lake	10004100						5						13												13									

APPENDIX B

Lake Characteristics

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 Area (%)	Inlets (#)	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
Acorn 82-102	44	296	6.7	3.0	0.7	101	100	0	N	N		
Alimagnet 19-21	109	1,094	10.0	3.0	1.5	545	100	12	N	C	3.2	
Anderson Pond 19-94	2											
Ardmore 27-0153	10.1			6.1	2.4	78	89			N		
Armstrong 82-116-02	39			1.5	1	128	100		N	N		
Baldwin 2-13	220			1.5			100		N	N		
Barker 82-76	45	823	18.3	9.0	4.4	648			Y	N		
Bass (St. Louis Park) 27-15	95											
Bass (Hennepin) 27-98	194	3,100	16.0	9.4	3.1	1,979	82		Y	N	2.3	
Bass (Washington) 82-35	81			4.3			100		N	N		
Bass, west (Wash) 82-123							100		N	N		
Bass, east (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	2.0			100		N	N		
Benz 82-120	36			2.7			100		N	N		
Beutel Pond 82-399				1.1					N			

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Big Carnelian 82-49	455	1,900	4.2	20.0	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		
Brick Pond 82-308				1.5					N			
Brickyard 10-225	17			13.1			35		Y	N		
Burandt 10-84	96			7.3			70		Y	N		
Bush 27-47	172			8.5			64		Y	Y		
Campbell 10-127	72			2.0			100		N	N		
Carol 82-17	63	375	6.0	1.8	0.9	186	100		N	N		
Cates 70-18	27			4.0			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 82-45	31			8.2			94		Y	N		
Clear 82-99												

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Clear 82-163	400			8.5	3.7	4,800	67		Y	Y	3.9	Walleye
Cloverdale 82-9	45	819	18.2	8.5	3	450	86		Y	N		
Cobblecrest 27-53	10									N		
Cobblestone 19-456	37			6.0								
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	52			2.0						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		
Downs 82-110	35	2,400	68.6	2.1	1.5	175	100		N	N		
Eagle (Carver) 10-121	186	1,050	5.6	4.3	2.5	1,500	100		N	Y		
Eagle (Maple Grove) 27-111-01	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		

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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				1.0			100		N	N		
Edith 82-4	81	1,576	19.5	13.0					Y			
Elmo 82-106	284	1,191	4.2	41.7			22		Y			
Farquar 19-23	63	353	5.6	3.0	1.4	290	100		N	N		
Fireman's 10-226	8			7.0			88		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	3.0	1.5	360	100		N	N		
Fish (Woodbury) 82-93	5.2											
Fish (Grant) 82-137	21			10.4			67		Y			
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	1.0					N	Y		
Friedrich's 82-108	14.5	360	24.8									
Gaystock 10-31	105			5.0			100		N	N		

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George 2-91	488			9.8			80		Y			
George Watch 2-5	528			2.0	1.5	2,587	100		N	Y		
German 82-56	109											
Glen 27-93	98			7.6			91			N		
Goetschel 82-313	22	2,812	127.8	4.2	1.2	88	100		N	N		
Goggins 82-77	11						100		N	N		
Golden 2-45	57	7,680	134.7	7.3	2.5	463	90	1	Y	Y	1.5	
Goose (Scandia) 82-59	83			7.6	2.4	664	55			Y		
Goose (Waconia) 10-89	407	1,100	2.7	3.0	1.5	2,035	100		N	C		Natural Environment
Grace 10-218	22			6.7			79					
Hafften 27-199	43						60		Y	Y		
Half Breed 82-80	75	303	4.0	10.3	1.7	420	67		Y	N		
Hart 2-81	8						100		N	N		
Harvey 27-??				0.7			100		N	N		
Hay 82-65	33									N		
Hazeltine 10-14	236			2.0			100		N	N		
Heims 13-56												

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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 Area (%)	Inlets (#)	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
Henry 10-175	77			1.5			100		N	N		
Herbers Pond (south bay of Loon Lake) 82-15-01				2.0			100		N	N		
Hidden 27-693	9			8.5			56		Y	N		
Highland 2-79	22			1.0			100		N	N		
Hornbean 19-47	22											
Horseshoe 19-51	16											
Horseshoe (Wash) 82-74	53			3.4					N			
Hydes 10-88	215	430	2.0	5.5	3	2,150	88		Y	Y		
Island 2-22	67			6.7			87		Y	N		
Jackson WMA 82-305	14.3											
Jane 82-104	155	1,402	9.0	12.0	3.7	1,860	72		Y	Y		
Jellum's 82-52-02	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	51	1,387	27.2	3.0	1.8	300	100		N	N		
Kingsley 19-30	44	193	4.4	4.0			100		N	N	1.7	

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Kismet 82-333										N		
Klawitter 82-368	4.5	168	37.3				100					
Kramer Pond 82-117												
La 82-97	35			3.5			100		N	N	1.3	
Lac Lavon 19-446	55	306	5.6	9.8			47		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			4.0	1.6	173						
Levander Pond 19-88	2.5											
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			17.0			44		Y	N		
Little Johanna 62-58	35			12.0			67		N	N		
Little Long 27-179	108			23.2			49		Y	Y		
Lochness 2-0584	5.3			4.9								

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Lone 27-94	22			8.2			18		Y	Y		
Long (Apple Valley) 19-22	36			1.5			100		N	N		
Long (Stillwater) 82-21	71			6.7			96		N	N		
Long (May) 82-30	88			3.7			100		N	Y		
Long (Wash) 82-68	35	381	10.9	2.1	1.1	126	100		N	N		
Long (Pine Springs) 82-118	62	2,060	33.2	10.4	3.6	744	55		Y	N		
Long (Mahtomedi) 82-130	48			7.7			92		Y	N		
Loon 82-15-02	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		
Lucy 10-7	87			6.4			99		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			1.0			100		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 Area (%)	Inlets (#)	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
Marion 19-26	560			6.4			81		Y	Y		
Markgrafs 82-89	46	413	9.0	2.4			100		N	N	2.6	Rearing
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	
Medicine 27-104	886			14.9			45		Y	Y		
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		
Minnewashta 10-9	677			21.3			55		Y	Y		
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		

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 Area (%)	Inlets (#)	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
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
Orchard 19-31	250	2,012	8.0	10.0	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	31			2.1			100		N	Y		
Pepin 40-28	326			3.4	1.1	1,150				Y		
Peter 27-147	46			20.7			35		Y	N		
Pike (Maple Grove) 27-111-02	59	919	15.6	6.7	2	395	95		Y	Y	1.5	Centrarchid

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 Area (%)	Inlets (#)	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
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
Pleasant 70-98	300			1.5			100		N	Y		
Powers 82-92	57	1,238	21.7	12.5			57	2	Y	N	1.8	Centrarchid
Priebe 62-36				1.5			100		N	N		
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
Red Rock 27-76	96.9			4.9			94		N	Y		
Region Park 82-87	16	600	37.5	5.8			100		N	N		
Reitz 10-52	79	3,711	47.0	11.0	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	15.0	6.6	6,429	34		Y	Y	2.9	
Rogers 19-80	94			2.4	1.3	393				Y		
Rose 27-92	17											

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 Area (%)	Inlets (#)	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
Ryan 27-58	20	5,510	275.5	10.7	64.8	312	56		Y	N	0.6	
S. School Section 82-151	125			8.0			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				3.0			100		N	N		
Schutz 10-18	105	943	9.0	15.0	6	2,100	27		Y	N		
Scout 19-198				2.9								
Seidl's 19-95	14	415	29.6	5.0			100	5	N	N		Rearing
Shady Oak 27-89	85			10.7			66		Y	Y		
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		

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 Area (%)	Inlets (#)	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
South Twin 82-19	54	63	1.2	4.0	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	
Square 82-46	193	782	4.1	20.7	9	5,694	65	5	Y	Y	2.2	Stocked w/Trout
St. Croix 82-1	8,600	4,918,790	572.0	23.8					Y	Y		
St. Joe 10-11	14			15.9			46		Y	Y		
Staples 82-28	24	127	5.3	4.3	2.1	165	100		N	N		
Success 27-634												
Sunfish 19-50	49			9.8					Y	N		
Sunfish 82-107	50	526	10.5							N		
Sunnybrook 82-133	16	630	39.4	6.1	2	104			Y	N		
Sunset 82-153	124			5.2			100		N	N	2.3	Gamefish
Sunset Pond 19-451	60			3.7			100		N	N	1.9	
Susan 10-13	93			5.2			81			Y		
Swede 10-95	376			4.0			100		N	Y		
Sweeney 27-35-01	66	2,400	36.4	8.0	3.6	790	52		Y	N		Panfish
Tamarack 10-10	24			20.0			41		Y	N		
Terrapin 82-31	86			4.6			100		N	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 Area (%)	Inlets (#)	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
Thole 70-120	105			3.7			100		N	Y		
Turtle 82-36	44	699	15.9	2.4	1.2	172	100		N	N		
Twin (Burnsville) 19-28	11						100					
Twin (Golden Valley) 27-35-02	19			17.0			42		Y	N		
Twin (Lower) (Rob) 27-42	46	5,322	115.7	6.7	2.3	340	83		Y	Y	1.2	Centrarchid
Twin (Middle) (Cry) 27-42	69	4,053	58.7	14.0	4.9	918	57		Y	Y	1.4	Centrarchid
Twin (Upper) (Br.P) 27-42	137	3,657	26.7	2.4	0.9	397	100		Y	N	2.8	Centrarchid
Twin (St. Louis Pk) 27-656										N		
Valentine 62-71	60	2,237	37.3	4.0	1.5	300	100		N			
Valley 19-348	8	117	14.6	3.2			100	1	N	N		
Virginia 10-18	110	772	7.0	10.4	3.3	1,210	88		Y	Y		
Waconia 10-59	3,000	7,880	2.6	11.3	4	38,632	53		Y	Y	6.8	Centrarchid
Weber 82-119	7.5	1	0.2	1.5			100		N	N		
West Boot 82-44	110	209	1.9	11.9	5.9	2,090	56		Y	Y		
West Lakeland 82-488	27	1,139	42.2						N	N		
Westwood 27-711	41			2.0			100		N	N		
White Rock 82-72	65											

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 Area (%)	Inlets (#)	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
Wilmes 82-90	41	2,247	54.8	5.5						Y	1.3	
Windsor 27-82	14									N		
Wing 27-91	11											
Winkler 10-66	129	2,758	21.4									
Wood (Burnsville) 19-24	9	157	17.4	4.5			100	1	N	N		Panfish
Woodpile 82-132	19											

APPENDIX C

2011 CAMP Volunteers and Sponsors

Appendix C
2011 CAMP Volunteers

Sponsor	Lake	DNR ID	Volunteer Name
Anoka County Parks	Cenaiko Lake	2065400	Anoka County staff
Anoka County Parks	Island Lake	2002200	Anoka County staff
Apple Valley, City of	Cobblestone Lake	19045600	Jeff Sluiter
Apple Valley, City of	Farquhar Lake	19002300	Jeff Christianson
Apple Valley, City of	Long Lake	19002200	Christy and Jake McGlocklin, and Al Kettelkamp
Apple Valley, City of	Scout Lake	19019800	Dan Stanek
Basset Creek WMO	Hidden Lake	27069300	Ryan Atwell
Basset Creek WMO	Medicine Lake	27010400	David, Josie & Karl Nelson, and Ted Hoshal
Basset Creek WMO	Medicine Lake	27010400	Ryan Atwell
Basset Creek WMO	Northwood Lake	27062700	Robert White
Basset Creek WMO	Sweeney Lake	27003501	Dave Hanson
Basset Creek WMO	Sweeney Lake	27003501	Caroline Amplatz and Kari Geurts
Basset Creek WMO	Twin Lake	27003502	Caroline Amplatz and Kari Geurts
Basset Creek WMO	Westwood Lake	27071100	Westwood Nature Center
Black Dog WMO	Crystal Lake	19002700	Carroll Arnett, PhD
Black Dog WMO	Keller Lake	19002500	Glenn Gramse
Black Dog WMO	Kingsley Lake	19003000	Lakeville staff
Black Dog WMO	Lac Lavon Lake	19044600	Wally Shaver
Black Dog WMO	Orchard Lake	19003100	Tom Goodwin
Black Dog WMO	Sunset Pond	19045100	Dan Wallace
Burnsville, City of	Alimagnet Lake	19002100	John Ritter
Burnsville, City of	Earley Lake	19003300	Jeff Thayer
Burnsville, City of	Twin Lake	19002800	Dan Freeman
Burnsville, City of	Wood Lake	19002400	The Mock Family
Carver County	Bavaria Lake	10001900	John Ryski
Carver County	Benton Lake	10006900	Jacob Steinbauer and Don Smith
Carver County	Brickyard Clayhole Lake	10022500	Carver County staff
Carver County	Courthouse Lake	10000500	Carver County staff
Carver County	Eagle Lake	10012100	Carver County staff
Carver County	Fireman's Clayhole Lake	10022600	Carver County staff
Carver County	Goose Lake	10008900	Carver County staff
Carver County	Grace Lake	10021800	Carver County staff
Carver County	Hazeltine Lake	10001400	Carver County staff
Carver County	Hydes Lake	10008800	Carver County staff
Carver County	Jonathan Lake	10021700	Carver County staff
Carver County	McKnight Lake	10021600	Carver County staff
Carver County	Miller Lake	10002900	Carver County staff
Carver County	Reitz Lake	10005200	Mark and Lynne McMullen

Appendix C
2011 CAMP Volunteers

Sponsor	Lake	DNR ID	Volunteer Name
Carver County	Rutz Lake	10008000	Martin Ziermann
Carver County	Swede Lake	10009500	Wayne Hubin
Carver County	Waconia Lake	10005900	Carver County staff
Carver County	Winkler Lake	10006600	Carver County staff
Chanhassen, City of	Lotus Lake	10000600	Laurie Susla and Chanhassen staff
Chanhassen, City of	Lucy Lake	10000700	Tim and Sharon McCotter
Chanhassen, City of	Minnewashta Lake	10000900	Steve Aldritt
Chanhassen, City of	Riley Lake	10000200	David Florenzano
Chanhassen, City of	St. Joe Lake	10001100	Sue Morgan and Linda Scott
Chanhassen, City of	Susan Lake	10001300	The Schultz Family
CLFLWD	Big Comfort Lake	13005300	Wally Ostlie
CLFLWD	Bone Lake	82005400	Jon and Teresa Hafner
CLFLWD	Forest Lake East Basin	82015900	Claus Mahler and Dennis Johnson
CLFLWD	Forest Lake Middle Basin	82015900	Dennis Wachholz and Dennis Johnson
CLFLWD	Forest Lake West Basin	82015900	Steve Schmaltz
CLFLWD	Little Comfort Lake	13005400	Steve Schreiber
CLFLWD	Moody Lake	13002300	Douglas Toavs
CLFLWD	Sylvan Lake	82008000	Curt Sparks
Eden Prairie, City of	Mitchell Lake	27007000	Gordon and Fran Warner
Eden Prairie, City of	Red Rock Lake	27007600	Kelley Regan
Elm Creek WMC	Henry Lake	27017500	Peggy Warfield
Elm Creek WMC	Rice Lake	27011601	George Schneider
Lakeville, City of	East Lake	19034900	Lakeville staff
Lakeville, City of	Lee Lake	19002900	Lakeville staff
Lakeville, City of	Marion Lake	19002601	Wally Potter
Lakeville, City of	Valley Lake	19034800	Lakeville staff
Mendota Heights, City of	Lemay Lake	19008200	Mendota Heights staff
Mendota Heights, City of	Rogers Lake	19008000	Doug Hennes
Minnetonka, City of	Lone Lake	27009400	Bobbie Nebel, Ashley Mecum, and Minnetonka staff
Nine Mile Creek WD	Bush Lake	27004700	Paul Erdmann and Liz Boeser
Nine Mile Creek WD	Minnetoga Lake	27008800	John Twele
Nine Mile Creek WD	Normandale Lake	27104500	The Baldvins Family
Nine Mile Creek WD	Penn Lake	27000400	Lisa McIntire and Dave Thorsen
Nine Mile Creek WD	Wing Lake	27009100	John Burton and Mary Quinn
Pioneer-Sarah WMC	Peter Lake	27014702	Mohan and Meena Chettiar

Appendix C
2011 CAMP Volunteers

Sponsor	Lake	DNR ID	Volunteer Name
Prior Lake Spring Lake WD	Cates Lake	70001800	Tom and Peggy Sletta
Prior Lake Spring Lake WD	Fish Lake	70006900	Steve Pierson
Prior Lake Spring Lake WD	Lower Prior Lake	70002600	Walt Burris
Prior Lake Spring Lake WD	Spring Lake	70005400	Jim Weninger
Prior Lake Spring Lake WD	Upper Prior Lake	70007200	Michael Lorinser, Kim Silvernagel
Rice Cr WD	Baldwin Lake	2001300	Ken Jarosh
Rice Cr WD	George Watch Lake	2000500	Wargo Nature Ctr.
Rice Cr WD	Karth Lake	62007200	Gary Gerding, Kathy Johnson, and Jeff Johnson
Rice Cr WD	Langton Lake	62004901	Tam and Dick McGehee
Rice Cr WD	Little Johanna Lake	62005800	Fred Fox
Rice Cr WD	Lochness Lake	2058500	Jim and Tricia Hafner
Rice Cr WD	Long Lake	82013000	Kitty Francy-Payton
Rice Cr WD	Oneka Lake	82014000	Paul Bolstad
Rice Cr WD	Pine Tree Lake	82012200	Gene Berwald
Rice Cr WD	Priebe Lake	62003600	David Dixen and Carol Pierce
Rice Cr WD	Reshanau Lake	2000900	Lori Fredlund
Rice Cr WD	Sunset Lake	82015300	Dianne Coderre
Rice Cr WD	White Rock Lake	82007200	David Bluhm
Saint Louis Park	Cobblecrest Lake	27005300	Jim Kellogg
Saint Louis Park	South Oak Lake	27066100	John Graff
Saint Louis Park	Twin Lake	27065600	Robert Cornwall and The Cornwall Family
Scott County	Cedar Lake	70009100	Jerry Edberg
Scott County	McMahon Lake	70000500	Joe and Diane Williamson
Shakopee	Dean Lake	70007400	Rachel Romansky
Shakopee	O'dowd Lake	70009500	Sandy and Mike Boyce
Shingle Creek WMC	Bass Lake	27009800	Marvin Groth
Shingle Creek WMC	Meadow Lake	27005700	Diane Stauner
Shingle Creek WMC	Pike Lake	27011102	Kurt Paulsen
Shingle Creek WMC	Schmidt Lake	27010200	Joel Scalzo
Shingle Creek WMC	Success Lake	27063400	John Roach
South St. Paul, City of	Anderson Pond	19009400	South St. Paul Staff
South St. Paul, City of	Levander Pond	19008800	South St. Paul Staff
South St. Paul, City of	Seidl Lake	19009500	South St. Paul Staff
St. Croix Basin Planning Team	Lake St. Croix	82000100	Jim and Roberta Harper
St. Croix Basin Planning Team	Lake St. Croix	82000100	Jim and Roberta Harper
St. Croix Basin Planning Team	Lake St. Croix	82000100	Cecilia and Harry Martin

Appendix C
2011 CAMP Volunteers

Sponsor	Lake	DNR ID	Volunteer Name
St. Croix Basin Planning Team	Lake St. Croix	82000100	Jim and Roberta Harper
St. Croix Basin Planning Team	Lake St. Croix	82000100	Richard and Sheryl Lindholm
St. Croix Basin Planning Team	Lake St. Croix	82000100	Rick Meierotto
St. Croix Basin Planning Team	Lake St. Croix	82000100	Carpenter Nature Center
Sunfish Lake, City of	Horseshoe Lake	19005100	Jim Nayes
Sunfish Lake, City of	Sunfish Lake	19005000	James Stowell

APPENDIX D

2011 CAMP Quality Control Data

Appendix D
CAMP Quality Control Data 2011

Lake Name	DNR ID#	Date		TP ug/L		CLA ug/L		Secchi m	
		MCES	CAMP	MCES	CAMP	MCES	CAMP	MCES	CAMP
Demontreville Lake	82010100	8/12/11	8/14/11	38	18	21	13	1.8	1.7
Demontreville Lake	82010100	8/12/11	8/10/11			21	26	1.8	2.0
Fish Lake	70006900	9/9/11	9/10/11	21	16	18	15	1.9	1.4
Lotus Lake	10000600	9/23/11	9/19/11	53	70	56	51	0.9	0.8
Lotus Lake	10000600	9/23/11	9/28/11	53	49	56	53	0.9	0.9
Marion Lake	19002601	9/9/11	9/9/11	37	47	50	43	0.9	1.0
McMahon Lake	70005000	9/9/11	9/8/11	65	59	79	28	0.8	0.8
Olson Lake	82010300	8/12/11	8/10/11	23	26	10	9.0	2.7	2.7
Orchard Lake	19003100	9/9/11	9/7/11	9.0	19	6.2	9.4	3.9	2.3
Susan Lake	10001300	9/23/11	9/24/11			78	56	0.7	0.8

1. The TP result for Susan Lake collected by MCES staff was suspected as too low for this highly productive lake. The TP results were excluded from this analysis.
2. The TP result for Demontreville Lake (8/10/11), collected by the CAMP volunteer, was a high, far-out outlier, and considered suspect due to its extreme value. The TP result was exluded from this analysis.