2010 Study of the Water Quality of 185 Metropolitan Area Lakes

November 2011

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2010 Study of the Water Quality Of 185 Metropolitan Area Lakes

By

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November 2011

EXECUTIVE SUMMARY

This 2010 report is the latest in a continuing series of reports summarizing results of the annual lake monitoring program of the Metropolitan Council (METC) in the Twin Cities seven-county metropolitan area (TCMA). The METC has collected water quality data on area lakes since 1980. This report contains data from a total of 202 lake sites on 185 lakes monitored in 2010. This year's monitoring program included 5 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.

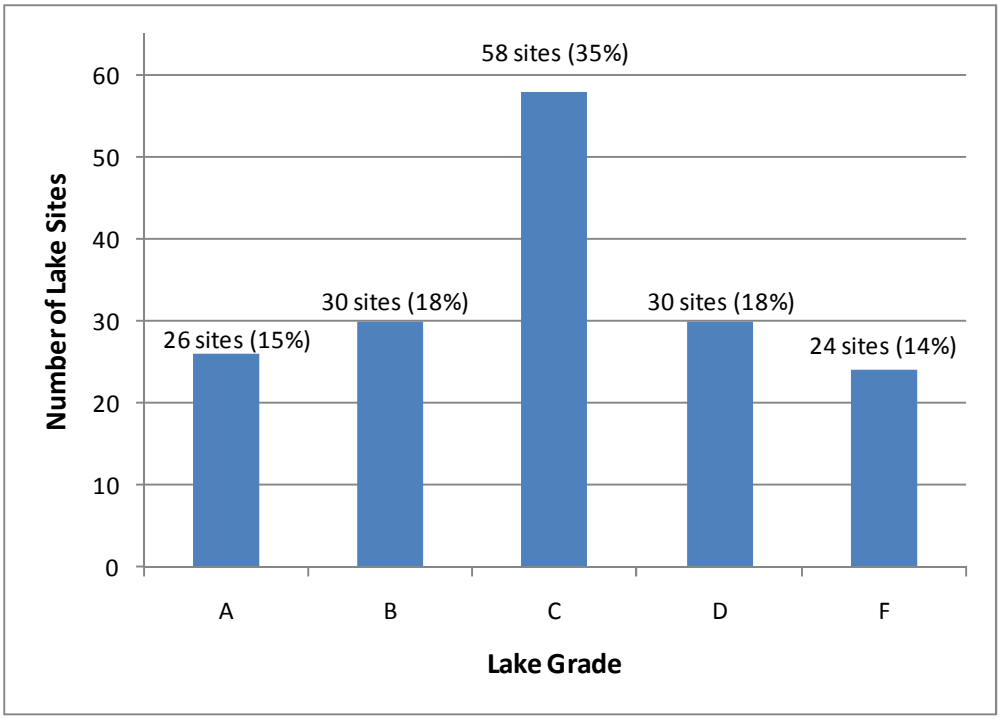
The objectives of this program are:

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 2010 marked the eighteenth 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 2010, there were 28 sponsors who consisted of a mix of municipalities, watershed management organizations (WMOs), watershed districts (WDs), counties, and a basin water resources planning team.

Each lake was given a lake grade which was calculated on the basis of three parameters: total phosphorus, chlorophyll-a, and Secchi depth (water clarity). Not all lake sites received a lake grade because of an insufficient quantity of data during the summer-time period of May through September. The distribution of lake grades for all the lake sites monitored in 2010 is shown in the following figure.

The greatest percentage of the lake sites (35%) 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 were above average (33% A and B lakes) than below average (32% D and F lakes).



Lake Grades for the 2010 Monitoring Season

Since 1980, 363 TCMA lakes have been monitored through the METC's lake monitoring program. Since some of these lakes have multiple monitoring sites, a total of 400 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.

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

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

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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:

18 years of service
Diane and Bob Coderre – Sunset Lake

17 years of service
Washington CD – multiple lakes

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

15 years of service
City of Circle Pines – Golden Lake
John Ritter – Lake Alimagnet
Wargo Nature Center – George Watch

14 years of service
Anoka Co. Parks – multiple lakes

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

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

11 years of service
Dave Hanson – Sweeney Lake

10 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
Sly Family – Downs Lake

9 years of service
Bonnie Juran – Klawitter Lake
Al Kettlekamp – Long Lake
Tom Sletta – Cates Lake

8 years of service
Walt Burris – Lower Prior Lake
Kellogg Family – Cobblecrest Lake
Kitty Francy-Payton – Long Lake
Kris Mann – Twin Lake, upper

7 years service
David Florenzano – Riley Lake
Wayne Hubin – Swede Lake
Sue Morgan & Linda Scott – St. Joe Lake
Shelly Strohmaier – Lotus Lake
Chuck Taylor – Jane Lake
Gordan & Fran Warner – Mitchell Lake

6 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

5 years service
David Bluhm – White Rock Lake
Terry Bouthilet – Lake Elmo
Robert Bruce Cornwall – Twin Lake
Dave Johnson – Hornbean Lake
Scott Knudson – Lake Elmo
Minnesota DOT – Rest Area Pond
Gregg Thompson – Bush Lake
Dan Wallace – Sunset Pond
Joe Williamson – McMahon Lake

4 years service
Sandy & Mike Boyce – Lake O'Dowd
John Burton – Wing Lake
George & Pam Christ – Henry Lake
Dan Freeman – Twin Lake south
Gary Gerding – Karth Lake
Jon and Teresa Hafner – Bone Lake
Jim & Tricia Hafner – Loch Ness
Doug Hennes – Rogers Lake
Don Jack – Bone Lake
Tam & Dick McGehee – Langton Lake
Lynne McMullen – Reitz Lake
Jim Nayes – Horseshoe Lake
George Schneider – Rice Lake
Curt Sparks – Sylvan Lake
Voit Family – Dean Lake
Marty Ziermann – Rutz Lake

3 years service
Andrew Carlson – Clear, Mays, Terrapin Lakes
Dan Carlson – Clear, Mays, Terrapin Lakes
David Dixen – Priebe Lake
Greg Durand – Ardmore Lake
Lori Ende – Cowley Lake
Frank Fourre – Upper Prior Lake
Fred Fox – Little Johanna Lake
Lori Fredlund – Reshanau Lake
Annie Gustafson – Colby Lake
Todd Heruth – Armstrong Lake
Steve Iverson – DeMontreville Lake

3 years service (continued)
Christy McGlocklin – Long Lake
Dawn McKinnon – Priebe Lake
Sicora Family – Crystal Lake
Don Smith – Benton Lake
Jeff Sluiter – Cobblestone Lake
John & Maressia Twele – Minnetoga Lake
Jim VanSomeren – Haften Lake
Warner Nature Center – Clear, Mays, Terrapin Lakes

Metropolitan Council Staff

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INTRODUCTION

This 2010 report continues a series of annual lake reports from 1980 to present. Since 1980, 363 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 400 lake sites have been monitored. This report contains data from 202 lake sites on 185 lakes that were monitored in 2010, including 5 lakes and 8 lake sites that have not been previously monitored by the METC lake monitoring program. The list of lakes in the METC's monitoring database is shown in Appendix A. Refer to Appendix B for morphometry and other lake characteristic data.

METC lake monitoring data are available via:

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

The objectives of the METC lake monitoring program are:

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

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

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

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

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

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

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

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 7 lake sites on 6 TCMA lakes during 2010 (Figure 1). The lake sites generally were located over the deepest spot of the lake basin or sub-basin (Figures 2 and 3). A hand-held Global Positioning System (GPS) receiver was used to determine the coordinates of a lake site, and to aid in relocating lake sites during subsequent monitoring events. Time, water surface and weather conditions, water depth, and water transparency were recorded on a field data sheet. Water transparency was measured using a 20 cm black-and-white Secchi disk. Temperature, dissolved oxygen (DO), pH, specific conductivity, turbidity, and oxidation reduction potential (Redox) were measured at one-meter intervals throughout the water column. These parameters were measured using a YSI 6920 multi-parameter sonde that was connected to a YSI 650 data logger.

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

Water was collected from the lake surface (0-2 m) using a two-meter PVC pipe with a two-liter capacity. 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 standard parameters as shown in 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.

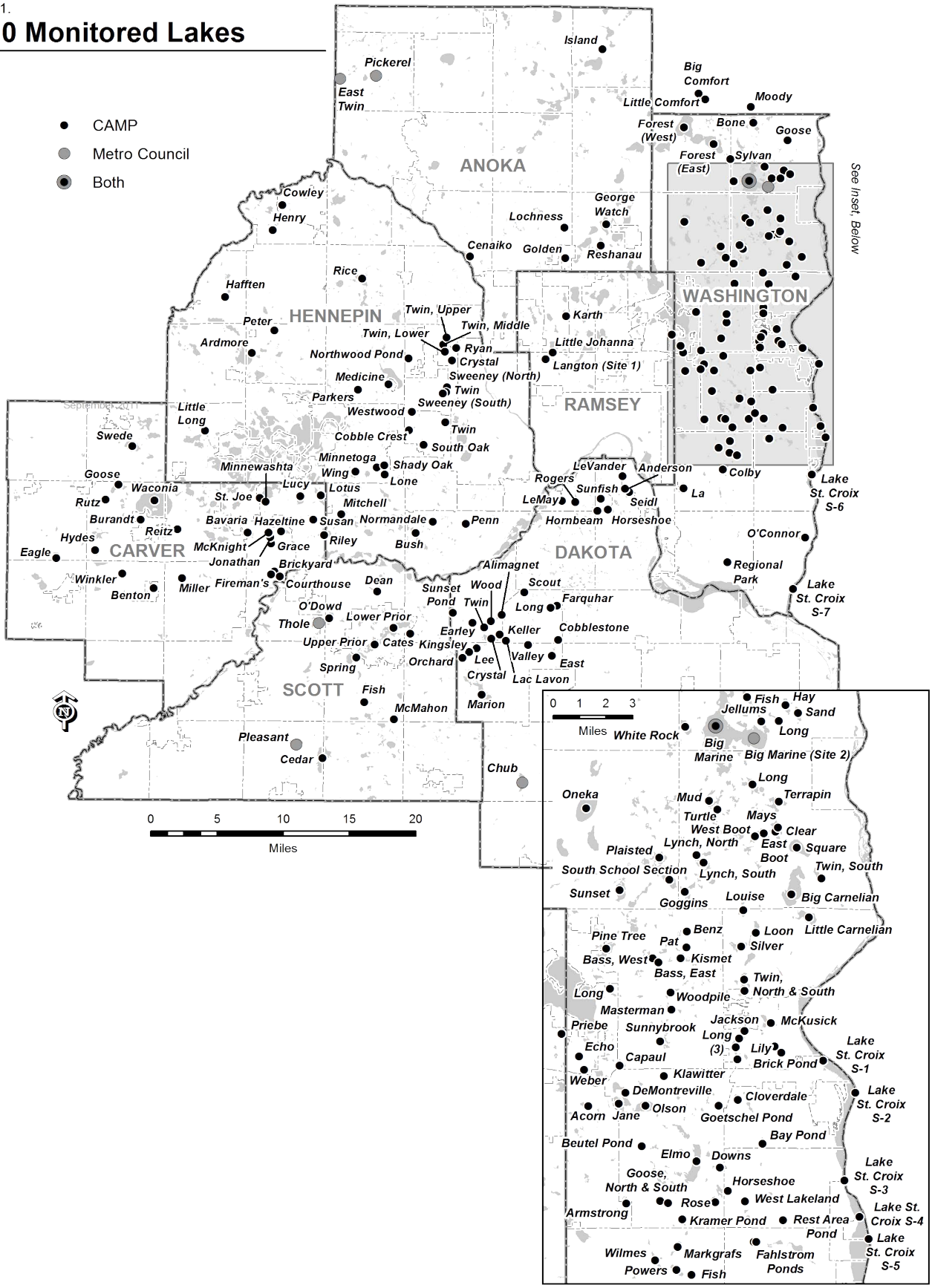
The monochromatic equation gives the following parameters:

- 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.

2010 Monitored Lakes



2010 Metro Council Staff-Monitored Lakes

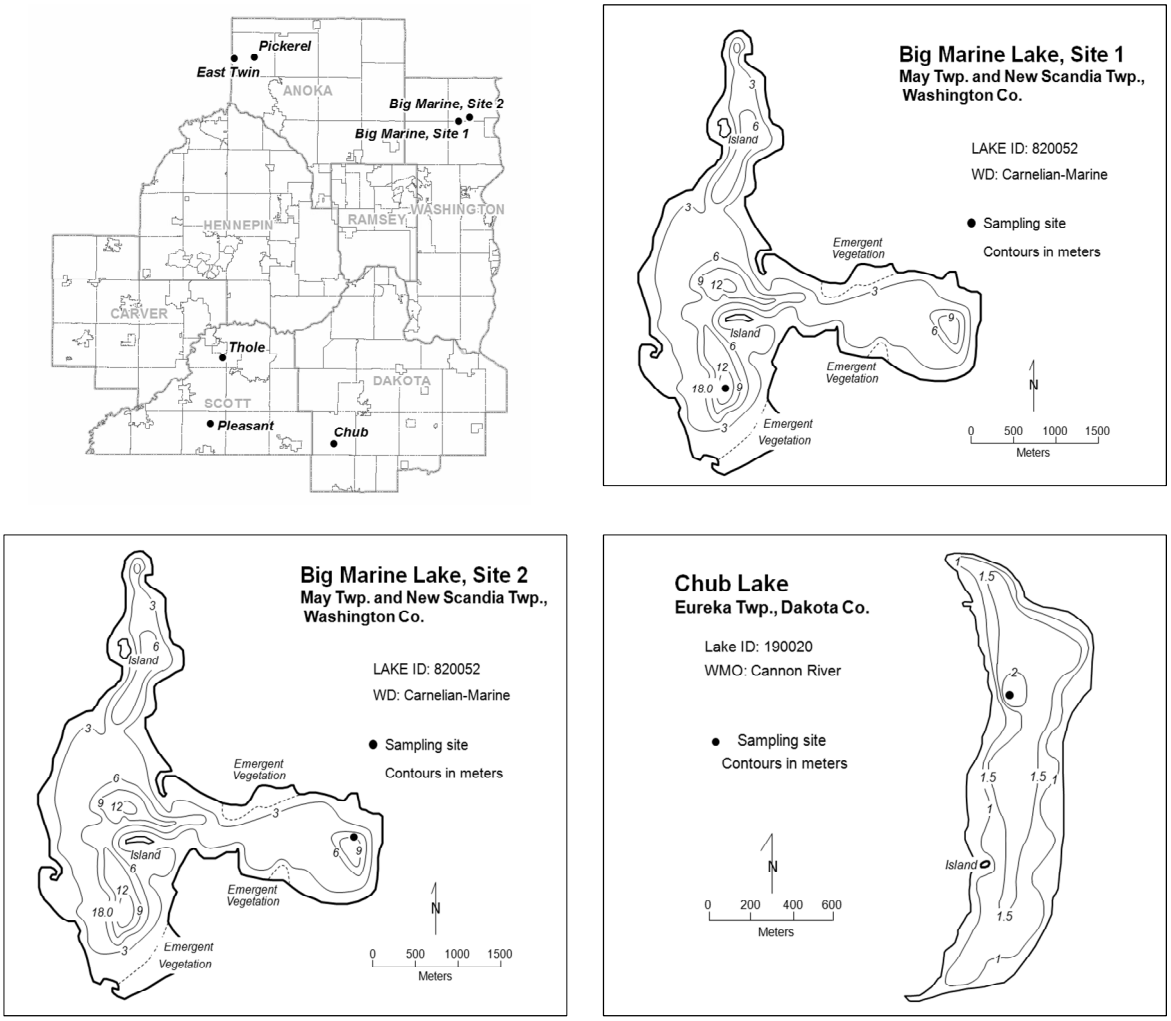


Figure 2. METC Staff Monitored Lakes

2010 Metro Council Staff-Monitored Lakes

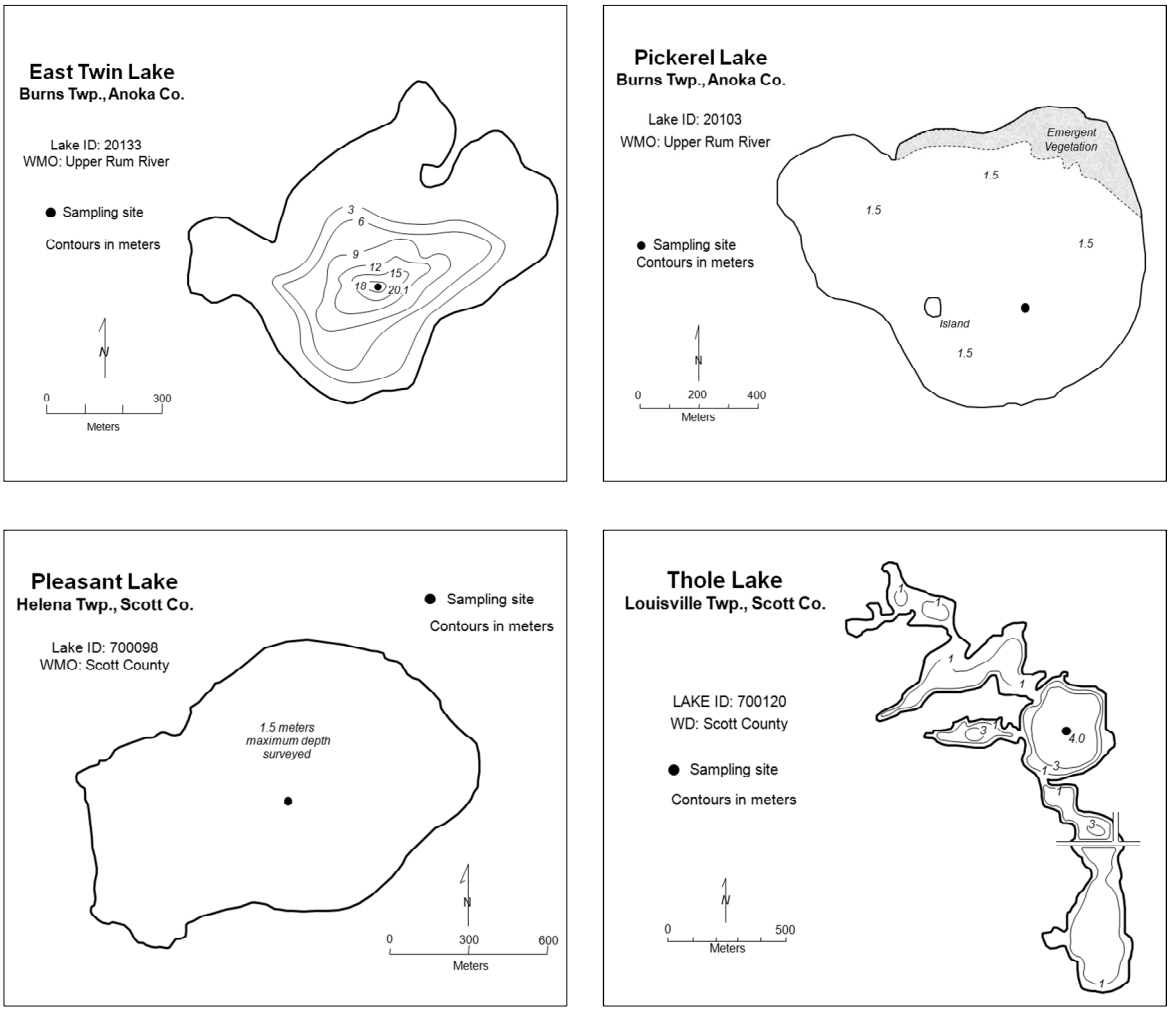


Figure 3. METC Staff Monitored Lakes

Table 1
Summary of Analytical Methods

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

RESULTS

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

Any questions about the 2010 METC lake monitoring data should be directed to Brian Johnson at (651) 602-8743 or brian.johnson@metc.state.mn.us.

TABLE 2

Monitoring Data for METC Staff Monitored Lakes 2010

Lake Name	Date	Site #	Depth m	Secchi Depth m	DO mg/L	Temp. °C	Cl^- mg/L	CLA µg/L	Hardness mg/L as $CaCO_3$	TKN mg/L	TDP mg/L	TP mg/L	SO_4 mg/L
Big Marine Lake	6/14/10	1	0	4.7	9.3	18.88		5.8	92	0.46	0.008	0.076	1.26
Big Marine Lake	6/14/10	1	15		1.4	11.41	13		96	0.64	0.015	0.027	1.58
Big Marine Lake	7/15/10	1	0	3.2	8.0	24.94	14	5.6	82	0.51	0.008	0.018	0.84
Big Marine Lake	7/15/10	1	16		0.1	12.02	13		104	0.83	0.006	0.057	0.79
Big Marine Lake	8/12/10	1	0	2.95	8.7	27.77	12	8.8	96	0.66	0.010	0.011	0.84
Big Marine Lake	8/12/10	1	14		0.1	12.38	13		112	1.10	0.007	0.074	< 0.4
Big Marine Lake	10/12/10	1	0	4.1	11.2	16.89	14		88	0.59		0.017	0.69
Big Marine Lake	10/12/10	1	14		7.9	14.51	13		102	0.63		0.019	0.84
Big Marine Lake	6/14/10	2	0	5.7	8.9	18.93	12	3.4	82	0.46	0.008	0.008	1.24
Big Marine Lake	6/14/10	2	8		9.0	12.79	12		84	0.42	< 0.003	0.011	1.43
Big Marine Lake	7/15/10	2	0	5.2	8.3	25.44	12	3.2	74	0.49	< 0.003	0.008	0.91
Big Marine Lake	7/15/10	2	10		0.3	12.84	12		96	0.51	0.006	0.022	1.01
Big Marine Lake	8/12/10	2	0	5.4	8.3	28.64	11	2.6	80	0.60	~ 0.004	0.006	0.74
Big Marine Lake	8/12/10	2	9		0.3	13.72	12		104	0.50	0.005	0.019	0.9
Big Marine Lake	10/12/10	2	0	6.2	11.5	16.86	13		90	0.61	0.006	0.019	0.75
Big Marine Lake	10/12/10	2	9		9.5	14.59	13		96	0.51	0.006	0.011	0.82
Chub Lake	5/10/10	1	0	0.3	12.6	11.79	15	130	136	3.5	0.009	0.109	2.06
Chub Lake	6/10/10	1	0	0.4	9.6	20.95	15	83	142	4.0	0.021	0.111	0.84
Chub Lake	6/10/10	1	1.5		9.4	20.93	14		176	4.1	0.019	0.098	0.77
Chub Lake	6/29/10	1	0	0.3	6.3	24.31	14	110	132	0.75	0.011	0.031	0.41
Chub Lake	6/29/10	1	1.5		2.9	23.36	14		130	0.75	0.009	0.029	0.43
Chub Lake	7/9/10	1	0	0.9	9.8	27.64	15	30	138	2.2	0.017	0.051	0.49
Chub Lake	7/9/10	1	2		1.2	26.14	14		152	3.0	0.022	0.109	0.51
Chub Lake	7/19/10	1	0	0.2	16.3	26.86	14	200	140	3.6	0.014	0.190	< 0.4

TABLE 2

Monitoring Data for METC Staff Monitored Lakes 2010

Lake Name	Date	Site #	Depth	Secchi Depth	DO	Temp.	Cl^-	CLA	Hardness	TKN	TDP	TP	SO_4
			m	m	mg/L	°C	mg/L	µg/L	mg/L as $CaCO_3$	mg/L	mg/L	mg/L	mg/L
Chub Lake	7/19/10	1	2		4.1	25.62	14		156	3.6	0.014	0.203	< 0.4
Chub Lake	8/6/10	1	0	0.2	5.1	25.81	14	210	112	3.9	0.012	0.315	0.43
Chub Lake	8/6/10	1	1		3.9	25.56	14	210	118	3.9	0.010	0.322	< 0.4
Chub Lake	8/19/10	1	0	0.3	9.8	24.42	12	140	114	3.1	0.228	0.283	< 0.4
Chub Lake	8/19/10	1	2		2.1	23.21	12	260	122	4.6	0.012	0.492	0.49
Chub Lake	9/9/10	1	0	0.46	10.3	17.19		86	134	2.1	0.018	0.119	0.78
Chub Lake	9/9/10	1	2		9.7	17.12			132	2.2	0.018	0.136	0.67
Chub Lake	9/30/10	1	0	0.4	9.7	16.22	11	63	142	1.7	0.009	0.063	0.73
Chub Lake	9/30/10	1	2		8.9	15.82	11		142	2.1	0.008	0.131	0.77
Chub Lake	10/18/10	1	0	0.5	10.3	13.61	10	55	152	1.6	0.010	0.096	1.45
Chub Lake	10/18/10	1	2				11		148	2.0	0.008	0.131	0.7
East Twin Lake	6/30/10	1	0	3.6	9.6	23.84	11	4.2	96	0.77	0.006	0.032	0.48
East Twin Lake	6/30/10	1	18		0.1	4.62	12		114	1.80	0.087	0.192	< 0.4
East Twin Lake	7/13/10	1	0	4	8.2	25.92	10	31	84	0.77	~ 0.003	0.014	0.56
East Twin Lake	7/13/10	1	17		0.1	4.75	12		112	2.0	0.120	0.215	< 0.4
East Twin Lake	7/28/10	1	0	4.3	8.2	26.25	10	4.9	88	0.90	0.011	0.017	< 0.4
East Twin Lake	7/28/10	1	18				13		108	1.9	0.131	0.187	< 0.4
East Twin Lake	8/17/10	1	0	4.65	8.6	23.88	10	5.5	82	0.97	~ 0.004	0.011	0.42
East Twin Lake	8/17/10	1	16				12		104	1.9	0.111	0.160	< 0.4
East Twin Lake	8/31/10	1	0	4.1	9.0	24.64	10	5.2		1.0	0.012	0.019	
East Twin Lake	8/31/10	1	18.1		0.2	5.61							
East Twin Lake	9/28/10	1	0	4.1	9.3	15.68	10	5.9	82	0.87	0.006	0.013	0.52
East Twin Lake	9/28/10	1	16				13		112	2.5	0.181	0.26	< 0.4
Pickerel Lake	6/30/10	1	0	+ 1.2	12	24.27	9	3.5	90	0.99	0.007	0.016	< 0.4

TABLE 2

Monitoring Data for METC Staff Monitored Lakes 2010

Lake Name	Date	Site #	Depth m	Secchi Depth m	DO mg/L	Temp. °C	Cl^- mg/L	CLA µg/L	Hardness mg/L as $CaCO_3$	TKN mg/L	TDP mg/L	TP mg/L	SO_4 mg/L
Pickerel Lake	7/13/10	1	0	+ 1.2	10.9	25.56	9	3.1	88	1.0	0.007	0.015	< 0.4
Pickerel Lake	7/28/10	1	0	+ 1.3	8.1	25.81	8	4.2	96	1.1	0.009	0.022	< 0.4
Pickerel Lake	8/17/10	1	0	+ 1.3	9.6	21.72	8	4.6	100	1.1	0.008	0.025	< 0.4
Pickerel Lake	8/31/10	1	0	+ 1.3	9.0	25.25	8	3.8		1.2	0.007	0.014	
Pickerel Lake	9/28/10	1	0	+ 1.5	12.7	15.13	9	5	104	1.0	0.008	0.012	< 0.4
Pleasant Lake	7/7/10	1	0	0.5	15.8	27.00	35	83	176	2.7	0.019	0.087	2.95
Pleasant Lake	7/21/10	1	0	0.35	12.7	26.63	36	130	172	2.5	0.015	0.102	3.4
Pleasant Lake	8/5/10	1	0	0.4	9.4	26.23	36	79	154	2.9	0.012	0.183	1.75
Pleasant Lake	8/18/10	1	0	0.38	7.5	22.49	35	100	152	1.8	0.13	0.174	1.44
Pleasant Lake	9/30/10	1	0	0.43	14.5	17.81	33	56	152	2.4	0.012	0.100	1.37
Thole Lake	6/8/10	1	0	1.3	11.2	21.31	43	85	144	1.8	0.024	0.066	1.84
Thole Lake	6/8/10	1	3.3				43		128	1.5	~ 0.036	0.142	2.23
Thole Lake	6/24/10	1	0	0.85	11.7	24.31	43	99	118	2.8	0.027	0.100	< 0.4
Thole Lake	6/24/10	1	3		3.1	22.45	44		114	1.6		0.089	1.19
Thole Lake	7/7/10	1	0	0.55	17.1	27.92	42	180	120	2.7	0.044	0.135	1.35
Thole Lake	7/7/10	1	3				42		116	1.7	0.052	0.099	1.38
Thole Lake	7/21/10	1	0	0.55	14.6	26.83	43	68	114	2.7	0.033	0.145	1.61
Thole Lake	7/21/10	1	2.5		3.3	25.46	43		132	1.8	0.053	0.092	1.7
Thole Lake	8/5/10	1	0	0.7	9.9	26.89	43	66	124	2.1	0.022	0.103	< 0.4
Thole Lake	8/5/10	1	3				43		122	1.9	0.060	0.154	< 0.4
Thole Lake	8/18/10	1	0	0.6	8.4	23.94	40	87	108	2.3	0.017	0.116	0.75
Thole Lake	8/18/10	1	3		7.9	23.91	41		102	2.2	0.015	0.130	0.79
Thole Lake	9/30/10	1	0	0.6	12.2	17.02	42	70	118	2.1	0.019	0.103	1.01
Thole Lake	9/30/10	1	3		9.9	15.98	42		118	2.1	0.013	0.073	1.27

TABLE 2

Monitoring Data for METC Staff Monitored Lakes 2010

Lake Name	Date	Site #	Depth m	Secchi Depth m	DO mg/L	Temp. ^{o}C	Cl^- mg/L	CLA µg/L	Hardness mg/L as $CaCO_3$	TKN mg/L	TDP mg/L	TP mg/L	SO_4 mg/L

Notes:

DO = Dissolved Oxygen

Temp. = Water Temperature

Cl^- = Chloride

CLA = Chlorophyll-a, trichromatic

TKN = Total Kjeldahl Nitrogen

TDP = Total Dissolved Phosphorus

TP = Total Phosphorus

SO_4 = Sulfate

CITIZEN-ASSISTED MONITORING PROGRAM (CAMP)

CAMP OVERVIEW

The year 2010 marked the eighteenth year of the CAMP since the program began in 1993. The CAMP monitored 196 lake-sites on 180 lakes in 2010, including 5 lakes and 8 lake-sites that have not been previously monitored by the METC (Figure 1). The CAMP is jointly funded by the METC and local sponsors such as WDs, WMOs, counties, and cities.

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

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

CAMP volunteers collect surface water samples that are analyzed for total phosphorus (TP), total Kjeldahl nitrogen (TKN), and chlorophyll-a (CLA). In addition, they measure surface water temperature and water transparency, and record user perceptions. Some lakes are monitored for dissolved oxygen. Most lakes are visited biweekly from April through October (fourteen sampling dates) and are sampled at the lake's deepest open-water location. In 2010, 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 2010 CAMP would not have been possible without the greatly appreciated work performed by volunteer monitors, and the support of the organizations that enrolled lakes in the program. The enrolling organizations, which included 13 cities, 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 2010 CAMP volunteers is shown in Appendix C. The METC and the local sponsors thank them for their sustained efforts, including their quality work.

CAMP METHODS

Recruiting Volunteers

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

Training Volunteers

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

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

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

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

Monitoring Methods

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

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

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

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

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

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

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

- **Chlorophyll**. Chlorophyll samples from the volunteer's jug were filtered in the field *(out of direct sunlight)* using a field filtration apparatus (called a filter holder) and a hand pump. Water from the sampling jug was measured using a graduated cylinder, and then poured into the reservoir of the filter holder. The reservoir holds approximately 250 ml. By squeezing the handle of the pump, the sample water was forced through a 1 micrometer (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 4. CAMP Field Data Sheet

Laboratory Analytical Methods

The chemical analyses of CAMP water samples were performed at the MCES-EQA laboratory, according to the methods shown in Table 1. Chlorophyll samples collected by the CAMP volunteers were not preserved with magnesium carbonate ($MgCO_3$), which is a change in the method provided in Table 1. Samples that were analyzed for TDP were filtered through a 0.45 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 2010 CAMP QC data are provided in Appendix D. The results of the 2010 QC monitoring indicate good agreement between data from samples and measurements collected by METC staff versus those collected by the volunteer. Figures 5, 6, and 7 show the QC data for TP, CLA, and Secchi depth. 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 0.94, which indicates that most of the variability between the volunteer- and METC staff- collected data can be explained by a linear relationship. The linear regression line for CLA has an R^2 of 0.80 and indicates a deviation from a 1:1 slope. However, one point is causing the skewing of the slope of the trend line from 1:1. This point consists of the highest CLA concentrations (110 and 61 ug/l from Cedar Lake). If this point is removed from the trend analysis, the R^2 value increases to 0.93 and the slope approaches near 1:1. The 0.87 R^2 value for the Secchi depth QC data indicates that the linear relationship is robust. Considering that METC staff typically collect QC samples on a different day and time than the volunteer (although during the same week), it should be expected that there will be variation between the METC staff- and volunteer-collected data.

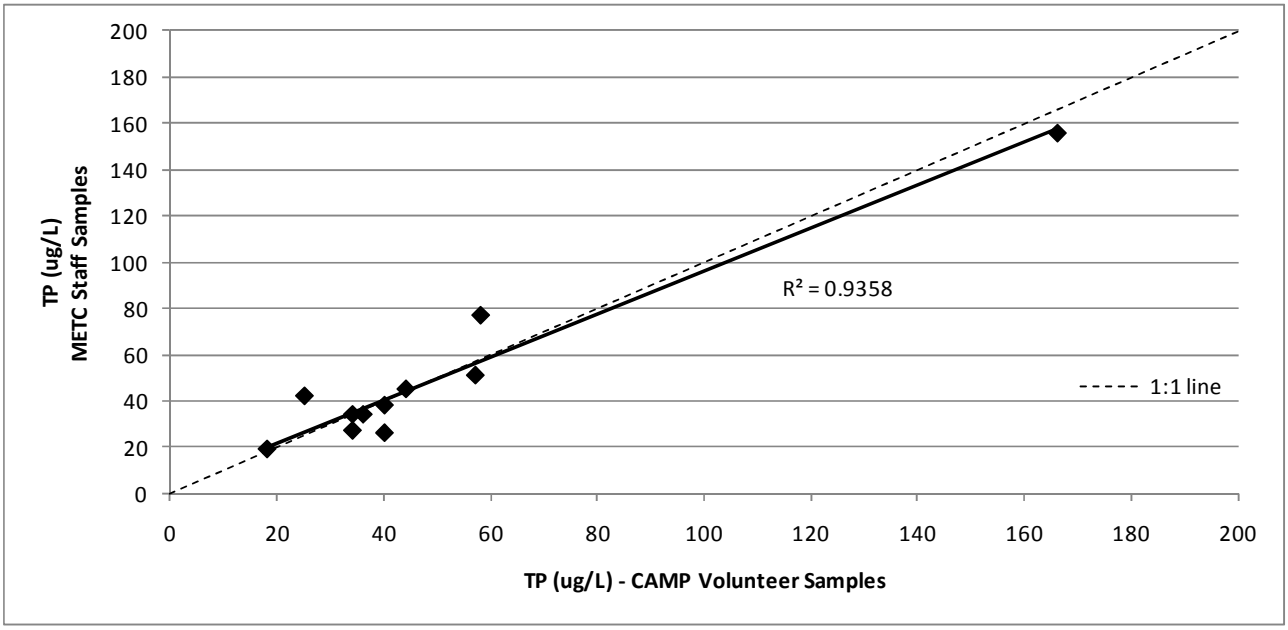


Figure 5. Total Phosphorus Quality Control Data 2010

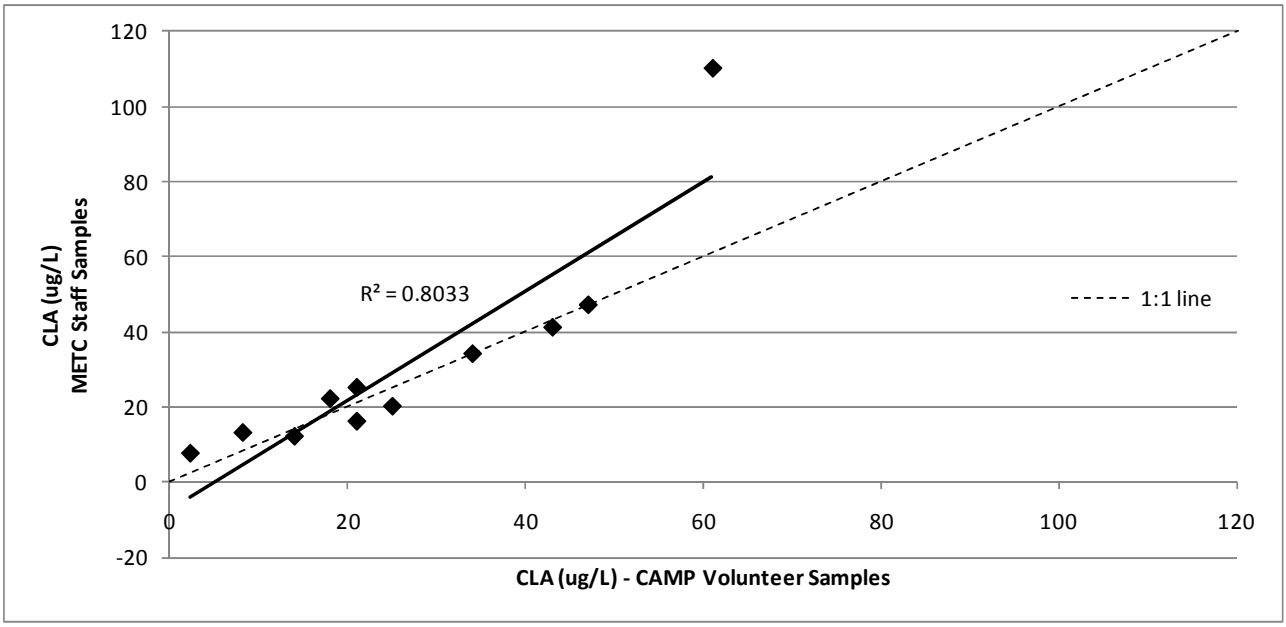


Figure 6. Chlorophyll-a Quality Control Data 2010

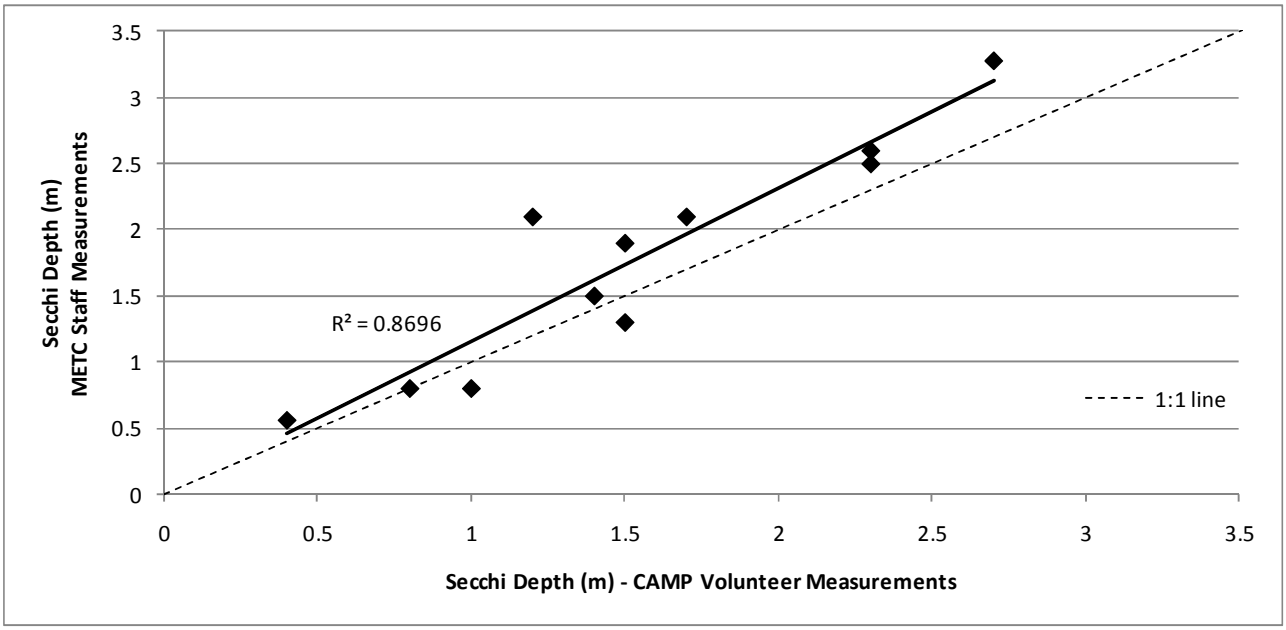


Figure 7. Secchi Depth Quality Control Data 2010

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).

2010 LAKE GRADES

Each lake monitoring site was given a lake grade if there were sufficient data to calculate the grade. At least 5 monitoring events are required to calculate a lake grade, and these 5 events must occur during the May-September (summer) period. Some lakes were not monitored sufficiently, so they did not receive a lake grade. The distribution of lake grades for lake sites monitored in 2010 is shown in Figure 8.

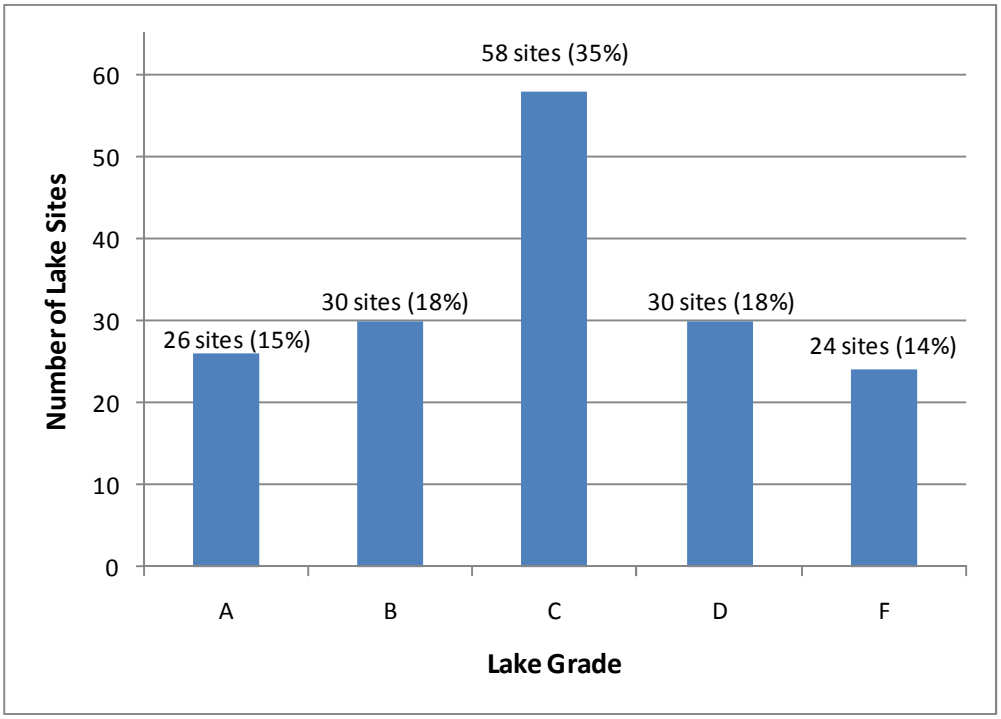


Figure 8. Distribution of 2010 Lake Grades

The greatest percentage of the lake sites (35%) 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 were above average (33% A and B lakes) than below average (32% D and F lakes).

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 six of the seven TCMA counties. Common characteristics of the above-average lakes were deeper maximum and mean depths, development of a thermocline, and small contributing watersheds relative to the lake's surface area.

The MPCA has released its draft 2010 Minnesota Impaired Waters Inventory. The draft 2010 inventory indicates that 77 of the 185 lakes monitored in 2010 by the METC are listed as impaired. Sixty nine lakes are listed as impaired for not meeting recreational use, and 11 lakes are listed as impaired for not meeting aquatic consumption use. Some lakes have multiple impairments. The impairments for aquatic recreational use were caused by excess phosphorus and enhanced eutrophication, as measured by the presence of too much algae (chlorophyll-a) and reduced water clarity (Secchi depth). The aquatic consumption impairments were driven by contaminants in fish tissue, such as mercury, polychlorinated biphenyls (PCB), and/or perfluorooctane sulfonate (PFOS). To learn more about the impaired lakes listings and potential next steps, refer to MPCA's webpage: http://www.pca.state.mn.us/water/tmdl/index.html.

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

MONITORING RESULTS FOR CAMP LAKES 2010

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 2010 water quality data, shown in tables and figures, and the water quality grades from 1980 through 2010.

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

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

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

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

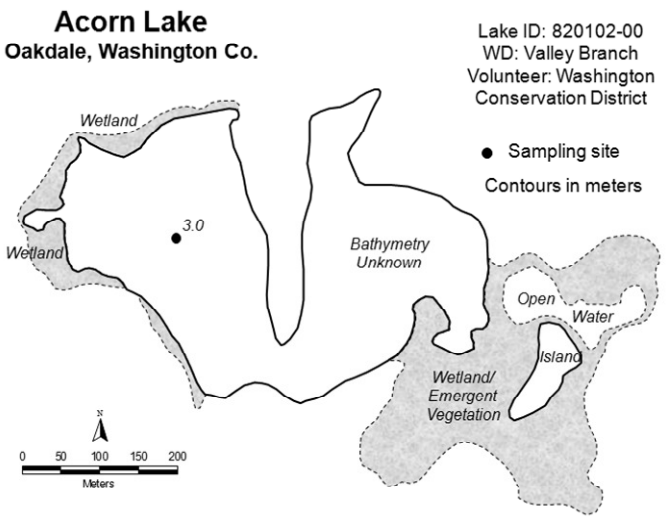
2010 summer (May-September) data summary

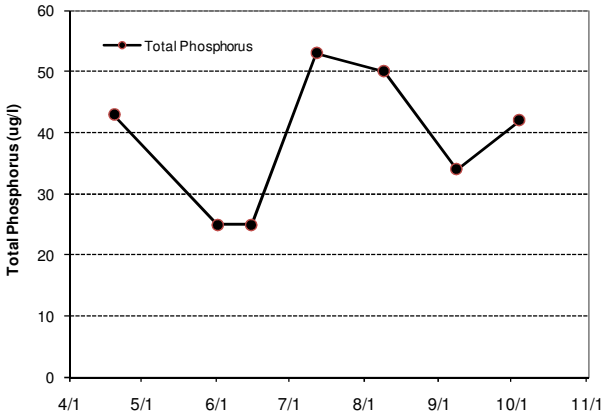
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	37.4	25.0	53.0	C
CLA (µg/l)	14.2	3.4	24.0	B
Secchi (m)	0.8	0.6	1.1	D
TKN (mg/l)	1.22	1.10	1.40	
			Lake Grade	C

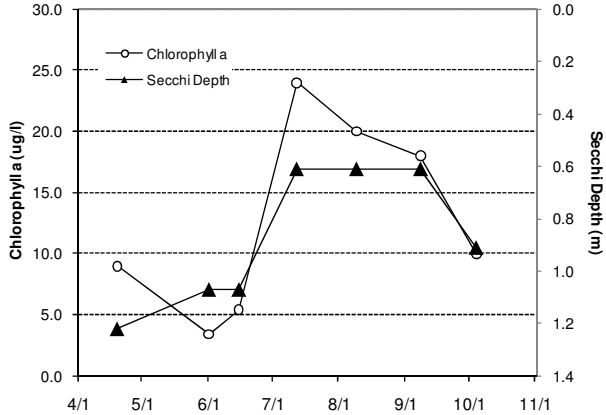
Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet.

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.

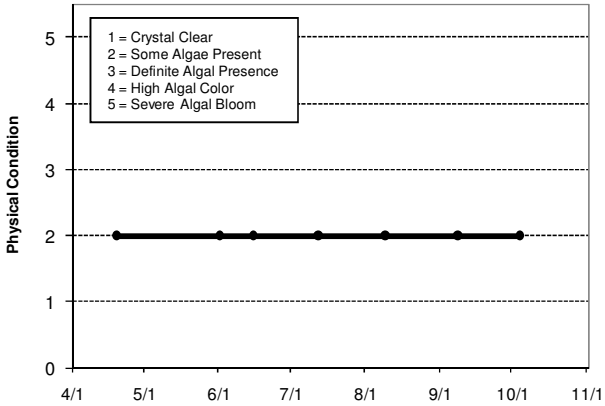






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	17.0	14.9	8.1	0.5	9.0	43		1.2	2	3
6/1	23.6	19.8	8.5	0.2	3.4	25		1.1	2	4
6/15	18.2	18.1	5.9	5.1	5.4	25		1.1	2	4
7/12	23.3	19.9	5.1	0.1	24.0	53		0.6	2	4
8/9	25.8	22.4	6.4	0.2	20.0	50		0.6	2	4
9/8	20.4	15.9	8.1	2.5	18.0	34		0.6	2	4
10/4	12.6	12.4	5.0	0.4	10.0	42		0.9	2	4



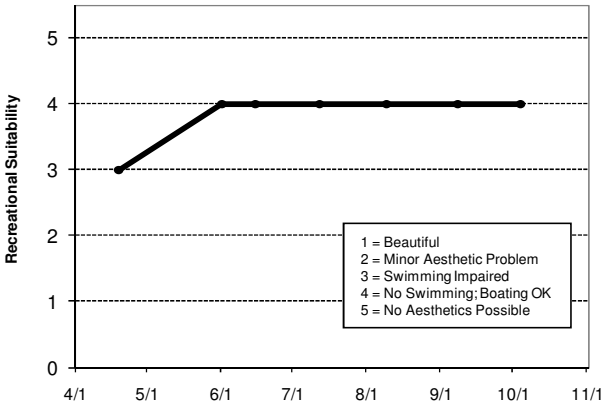
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	67.5	31.0	128.0	C
CLA (µg/l)	33.4	3.2	81.0	C
Secchi (m)	1.0	0.5	2.0	D
TKN (mg/l)	1.28	0.71	2.20	
			Lake Grade	C

The 2010 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 first C since 1998. The mean secchi depth for 2010 moved to grade D, which is an improvement compared to the last 10 years of F grades. 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 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.

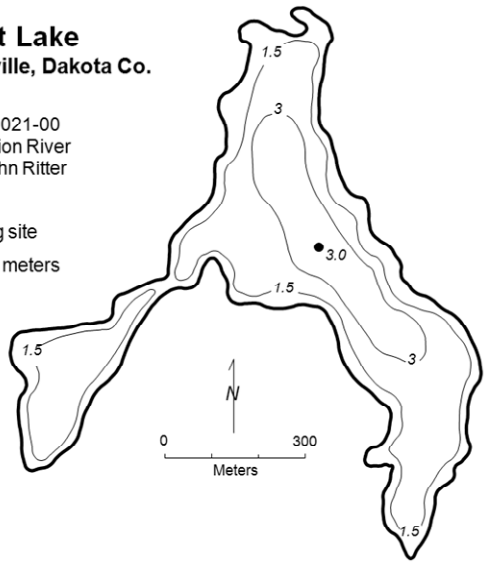
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

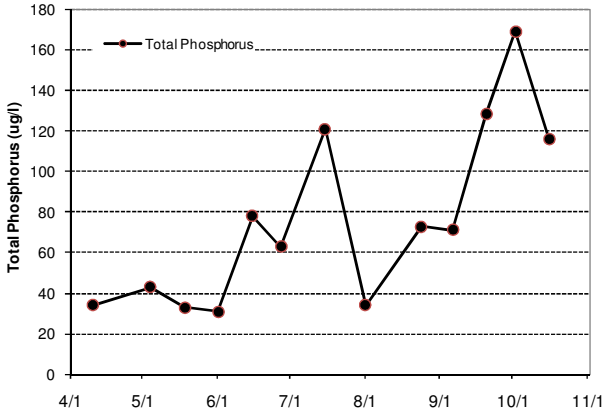
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

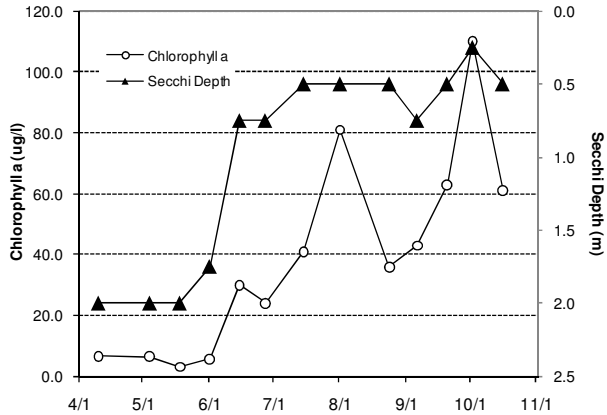
Alimagnet Lake
Apple Valley/Burnsville, Dakota Co.

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

● Sampling site
Contours in meters

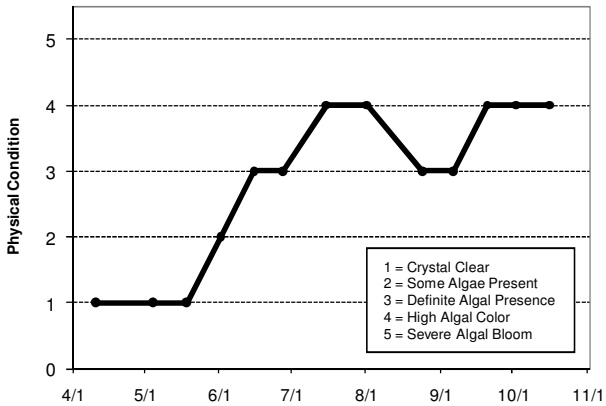






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/10	12.0				6.7	34		2.0	1	1
5/4	15.0				6.5	43		2.0	1	1
5/18	19.2				3.2	33		2.0	1	1
6/1	24.0				5.8	31		1.8	2	2
6/15	20.9				30.0	78		0.8	3	2
6/27	26.0				24.0	63		0.8	3	3
7/15	27.0				41.0	121		0.5	4	3
8/1	27.0				81.0	34		0.5	4	3
8/24	25.0				36.0	73		0.5	3	3
9/6	21.2				43.0	71		0.8	3	3
9/20	16.0				63.0	128		0.5	4	3
10/2	14.0				110.0	169		0.3	4	3
10/16	13.0				61.0	116		0.5	4	3



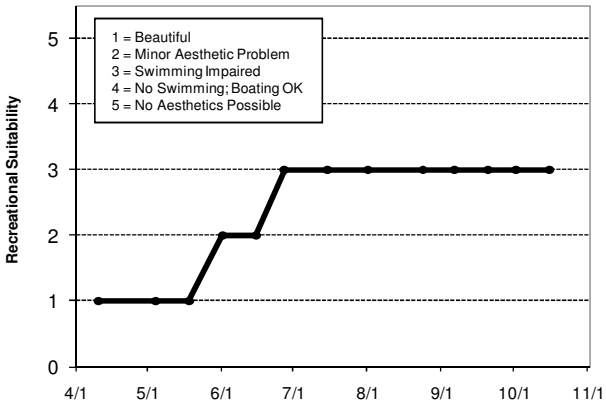
Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	61.3	41.0	91.0	C
CLA (µg/l)	16.3	6.1	28.0	B
Secchi (m)	1.0	0.6	1.8	D
TKN (mg/l)	0.73	0.59	0.97	
			Lake Grade	C

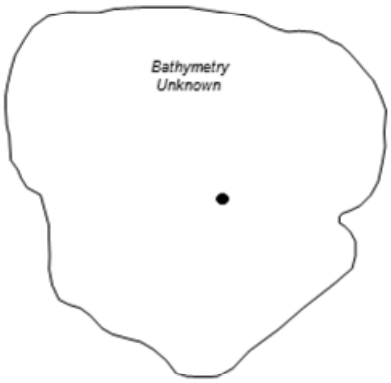
The different grades received for CLA and Secchi depth (B and D respectively) suggests that something other than algal abundance affected water clarity in 2010. It is recommended that monitoring be continued to build a water quality database for this pond.

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.

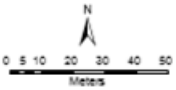
Anderson Pond
South St. Paul, Dakota Co.

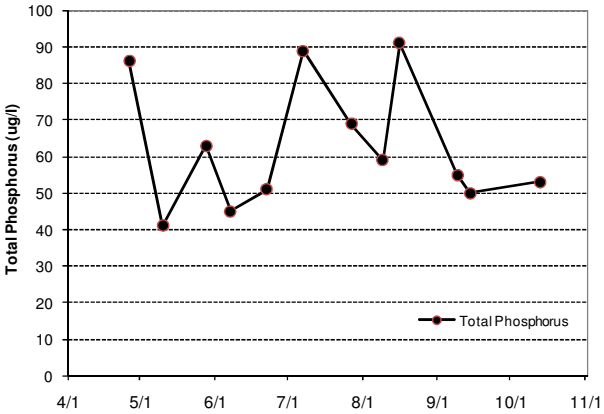
LAKE ID: 190094-00
WMO: Lower Miss. R.
Volunteer: City of South St. Paul

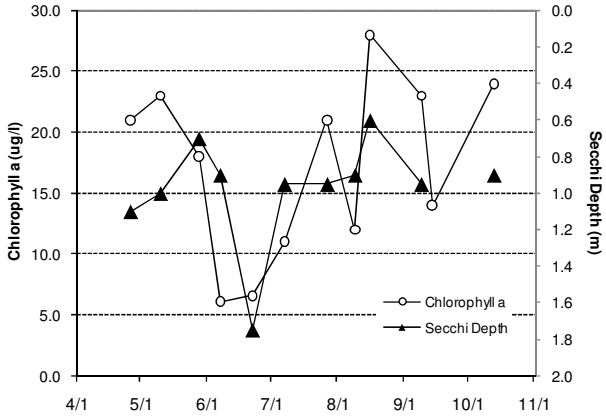


● Sampling site

Contours in meters

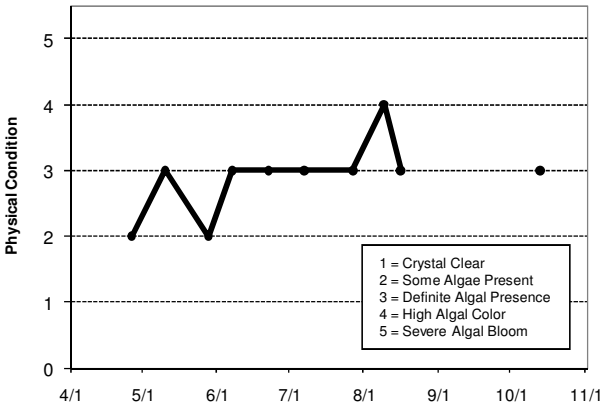






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/26	14.4				21.0	86		1.1	2	4
5/10	14.4				23.0	41		1.0	3	4
5/28	23.7				18.0	63		0.7	2	4
6/7	22.2				6.1	45		0.9	3	4
6/22	29.3				6.6	51		1.8	3	4
7/7	27.4				11.0	89		1.0	3	4
7/27	26.2				21.0	69		1.0	3	4
8/9	27.9				12.0	59		0.9	4	4
8/16	23.1				28.0	91		0.6	3	4
9/9	18.2				23.0	55		1.0		4
9/14	20.8				14.0	50				4
10/13	18.0				24.0	53		0.9	3	4



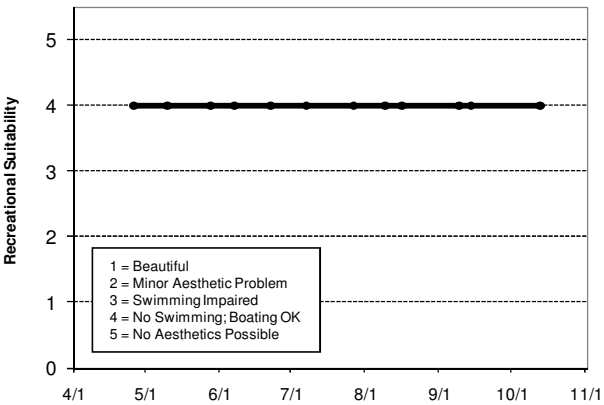
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	171.8	106.0	235.0	F
CLA (µg/l)	91.0	30.0	130.0	F
Secchi (m)	0.5	0.3	0.6	F
TKN (mg/l)	3.27	2.30	4.30	
			Lake Grade	F

The water quality lake grade was an F for 2010. The TP and chlorophyll summer-time means translate to grades of F. These are similar grades that the lake has received since 2007.

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

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

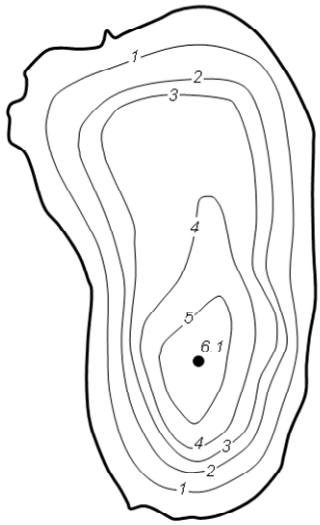
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

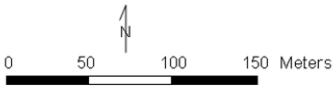
Ardmore Lake
Medina, Hennepin Co.

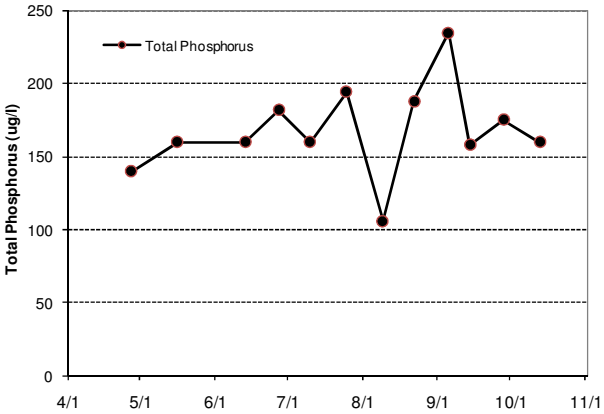
Lake ID: 270153
WMO: Pioneer-Sarah Creek
Volunteer: Greg Durand

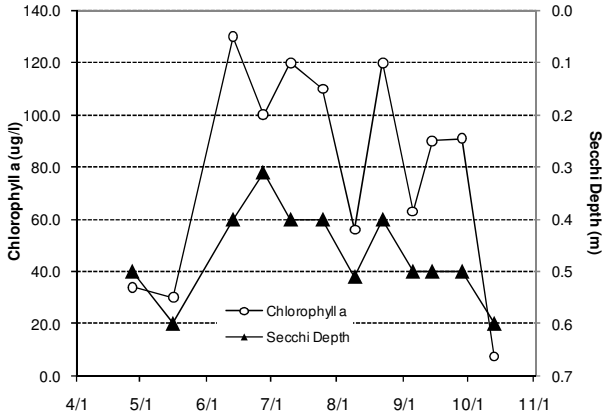
● Sampling site

Contours in meters



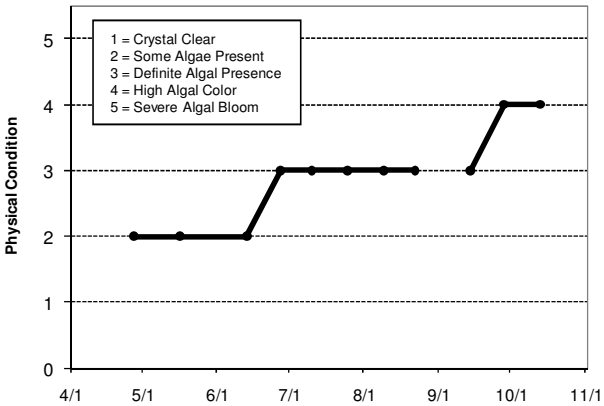






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/27	16.7				34.0	140		0.5	2	2
5/16	19.1				30.0	160		0.6	2	2
6/13	19.3				130.0	160		0.4	2	3
6/27	27.7				100.0	182		0.3	3	3
7/10	27.8				120.0	160		0.4	3	3
7/25	27.2				110.0	194		0.4	3	3
8/9	33.7				56.0	106		0.5	3	3
8/22	26.5				120.0	188		0.4	3	3
9/5	19.2				63.0	235		0.5		
9/14	20.2				90.0	158		0.5	3	3
9/28	16.8				91.0	175		0.5	4	3
10/13	16.7				7.4	160		0.6	4	3



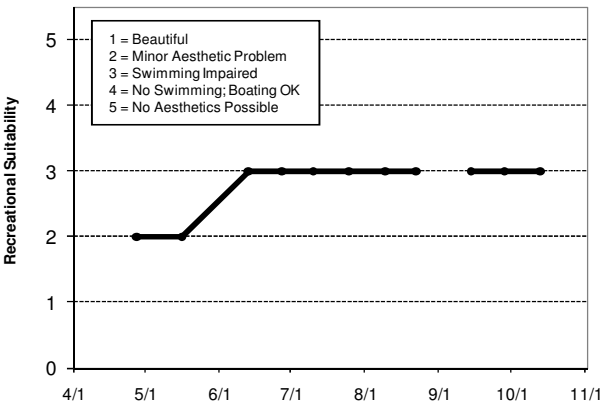
Lake Water Quality Grades Based on Summertime Averages

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	55.2	30.0	104.0	C
CLA (µg/l)	7.1	2.3	14.0	A
Secchi (m)	1.0	0.1	1.2	D
TKN (mg/l)	0.78	0.55	0.84	
			Lake Grade	C

The 2010 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. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2011).

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.

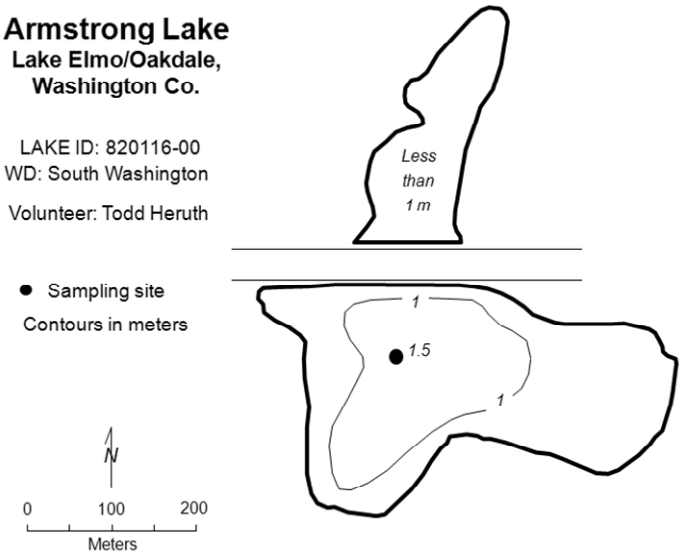
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

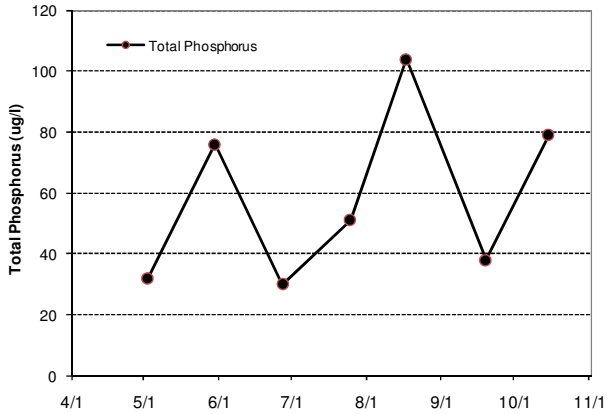
Armstrong Lake

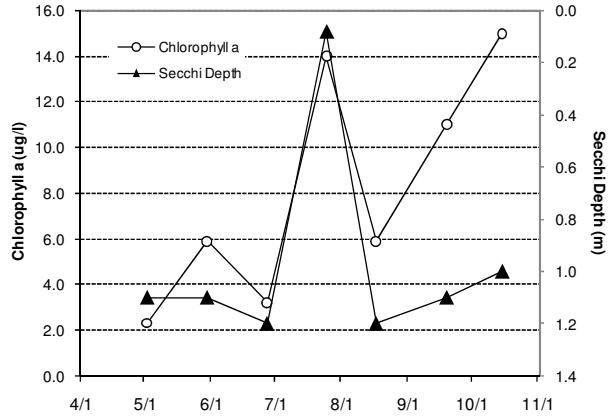
Lake Elmo/Oakdale, Washington Co.

LAKE ID: 820116-00
WD: South Washington

Volunteer: Todd Heruth

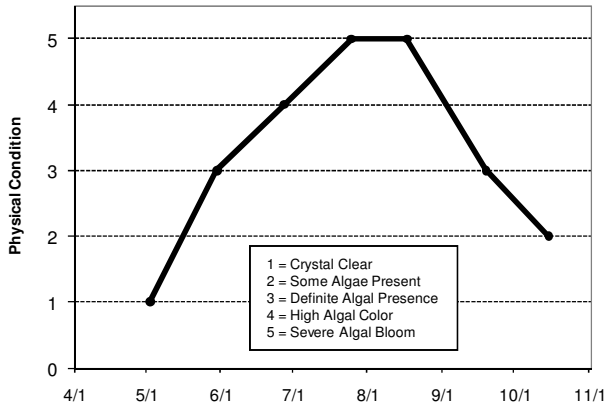






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/2	12.6				2.3	32		1.1	1	
5/30	27.0				5.9	76		1.1	3	
6/27	27.0				3.2	30		1.2	4	
7/25	27.4				14.0	51		0.1	5	
8/17	23.3				5.9	104		1.2	5	
9/19	13.4				11.0	38		1.1	3	
10/15	14.6				15.0	79		1.0	2	



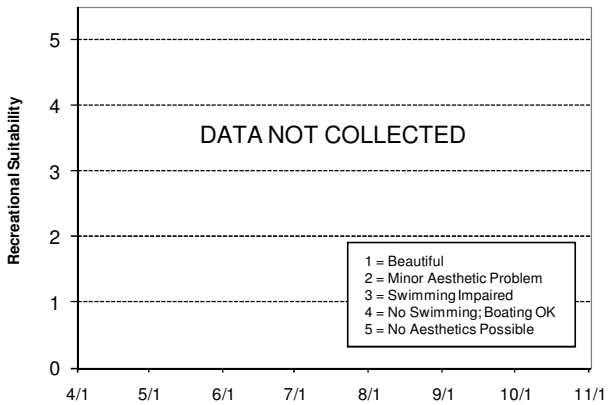
Lake Water Quality Grades Based on Summertime Averages

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	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
Total Phosphorus	C	C	D	D	C	C	C
Chlorophyll a	A	A	B	C	A	B	A
Secchi Depth	D	D	D	D	D	D	D
Lake Grade	**C**	**C**	**C**	**D**	**C**	**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 is little known morphological data available for the lake.

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

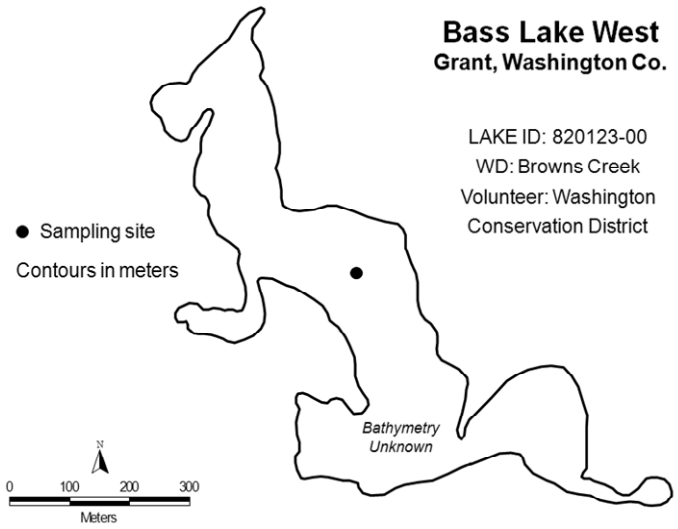
2010 summer (May-September) data summary

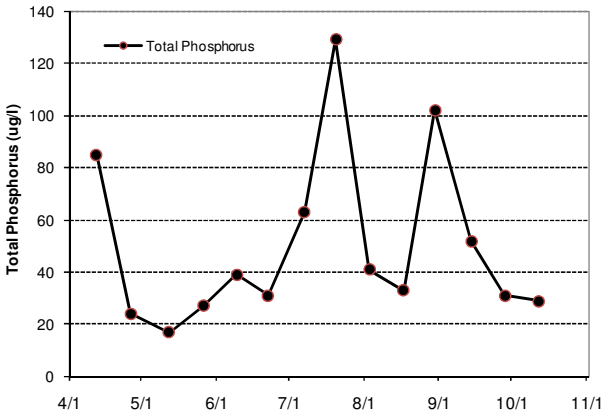
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	51.4	17.0	129.0	C
CLA (µg/l)	17.4	3.2	84.0	B
Secchi (m)	1.9	1.2	2.3	C
TKN (mg/l)	1.31	0.63	3.10	
			Lake Grade	C

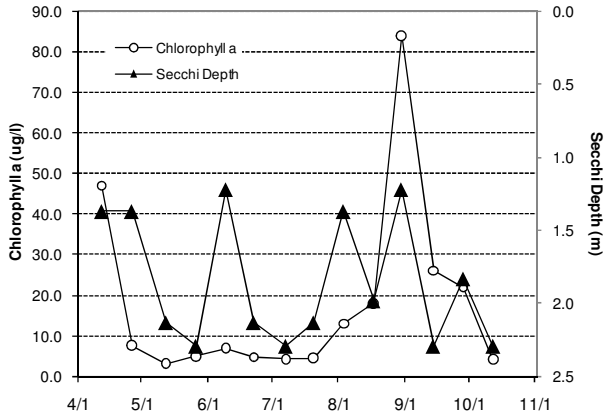
The lake received a lake grade of C for 2010 which is similar to the grade received in 2009. Given that there are 5 years of water quality data available, additional monitoring is necessary to determine water quality trends. However, on the basis of the limited data thus far, it seems that there might be a decreasing trend in water quality, as indicated by the lowering of grades since 2006 for TP, CLA, and Secchi depth.

Throughout the monitoring period, the volunteer's opinions of the lake'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.

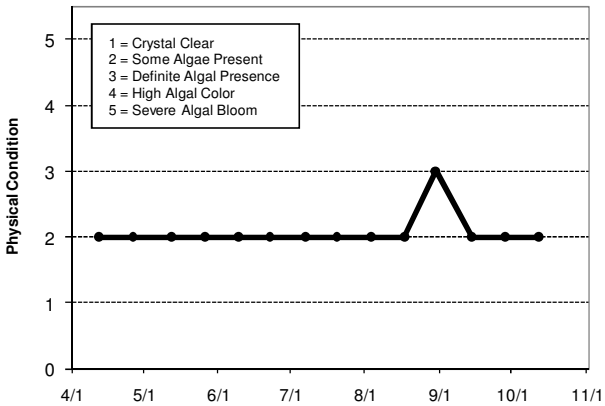






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	13.4	12.8	12.6	4.6	47.0	85		1.4	2	2
4/26	14.1	14.0	9.2	7.5	7.6	24		1.4	2	3
5/12	10.9	10.6	10.6	9.3	3.2	17		2.1	2	2
5/26	26.3	16.1	9.2	16.3	5.0	27		2.3	2	3
6/9	20.0	18.9	3.7	0.1	6.9	39		1.2	2	4
6/22	23.2	19.9	8.6	0.1	4.8	31		2.1	2	3
7/7	26.7	22.2	6.6	0.2	4.3	63		2.3	2	3
7/20	24.8	23.3	3.7	0.1	4.5	129		2.1	2	3
8/3	26.1	24.1	5.2	0.1	13.0	41		1.4	2	4
8/17	22.9	22.9	5.1	0.7	18.0	33		2.0	2	3
8/30	25.0	24.2	7.4	5.6	84.0	102		1.2	3	4
9/14	20.1	18.8	8.3	0.4	26.0	52		2.3	2	2
9/28	15.8	15.3	9.8	0.1	22.0	31		1.8	2	2
10/12	17.3	16.2	10.2	0.9	4.2	29		2.3	2	2



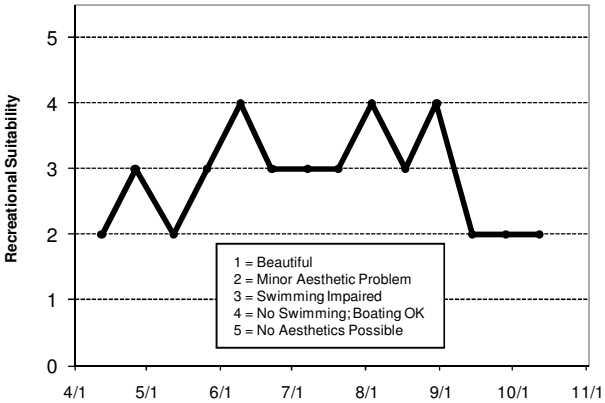
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	55.5	25.0	98.0	C
CLA (µg/l)	8.1	3.3	18.0	A
Secchi (m)	2.5	1.8	3.7	B
TKN (mg/l)	1.15	0.79	1.70	
			Lake Grade	B

The lake received a lake grade of B for 2010, which is similar to last year's grade. The lake continues to received a CLA grade of A. 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.

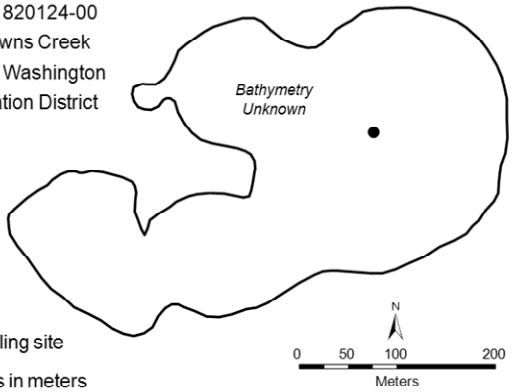
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at http://www.dnr.state.mn.us/lakefind/.

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

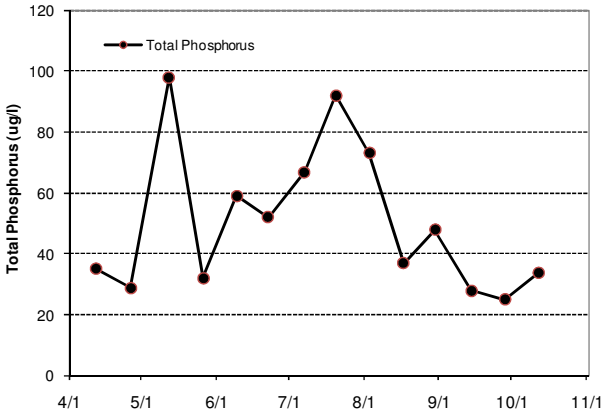
Grant, Washington Co.

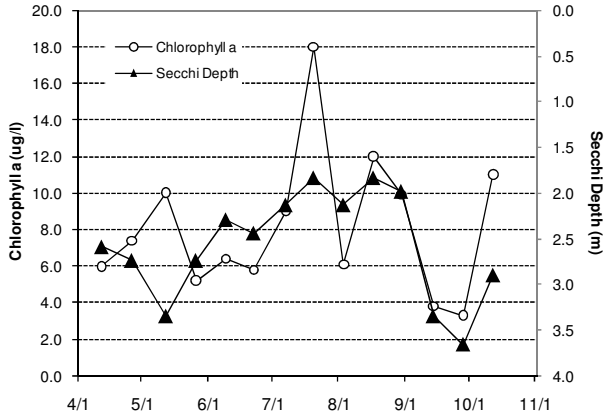
LAKE ID: 820124-00
WD: Browns Creek
Volunteer: Washington Conservation District



● Sampling site

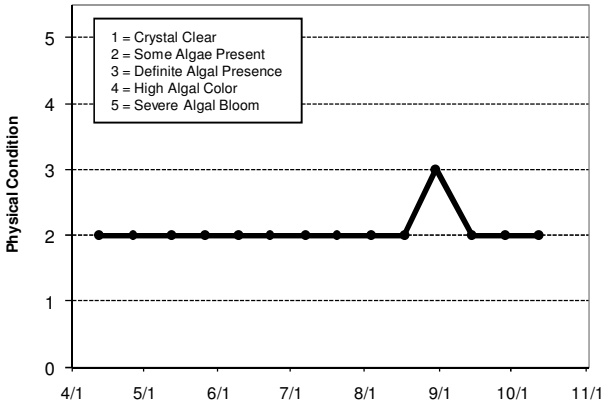
Contours in meters





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	14.0	9.9	11.1	0.1	6.0	35		2.6	2	2
4/26	14.3	13.1	8.9	0.1	7.4	29		2.7	2	2
5/12	11.1	10.9	9.7	9.1	10.0	98		3.4	2	2
5/26	26.4	14.4	8.2	1.9	5.2	32		2.7	2	4
6/9	20.6	16.9	6.0	0.1	6.4	59		2.3	2	3
6/22	24.1	16.9	8.8	0.1	5.8	52		2.4	2	3
7/7	27.8	17.4	7.1	0.1	9.0	67		2.1	2	3
7/20	25.5	16.4	5.7	0.1	18.0	92		1.8	2	3
8/3	26.7	17.3	6.2	0.1	6.1	73		2.1	2	3
8/17	23.1	19.2	5.7	0.2	12.0	37		1.8	2	3
8/30	25.6	19.6	8.9	0.1	9.9	48		2.0	3	3
9/14	20.4	18.8	9.7	0.1	3.8	28		3.4	2	2
9/28	15.7	15.2	10.0	0.1	3.3	25		3.7	2	2
10/12	17.7	15.7	11.3	0.1	11.0	34		2.9	2	2



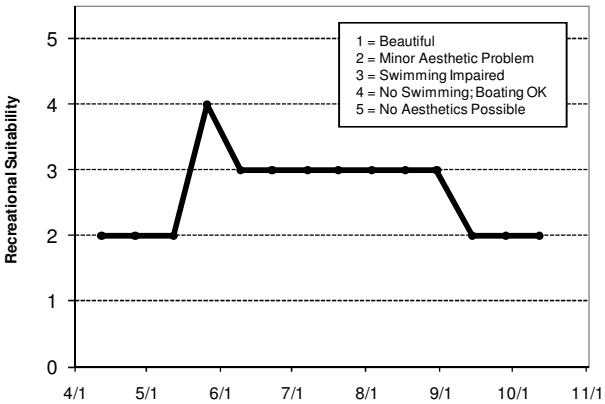
Lake Water Quality Grades Based on Summertime Averages

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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	31.1	23.0	46.0	B
CLA (µg/l)	15.5	3.4	24.0	B
Secchi (m)	1.5	1.0	4.0	C
TKN (mg/l)	1.29	1.00	1.60	
			Lake Grade	B

The lake received a water quality lake grade of C for 2010 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).

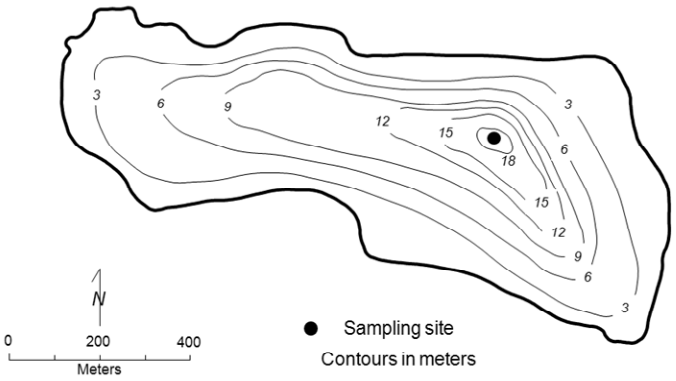
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

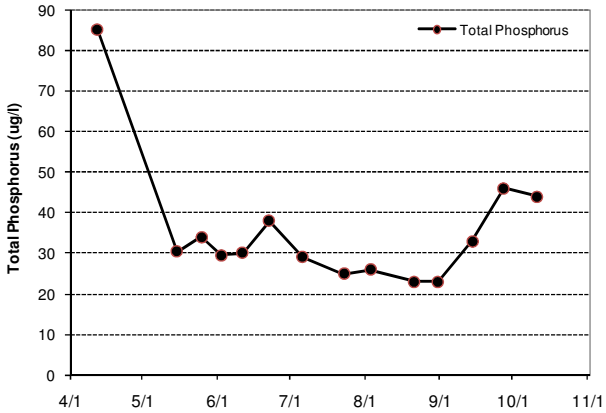
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

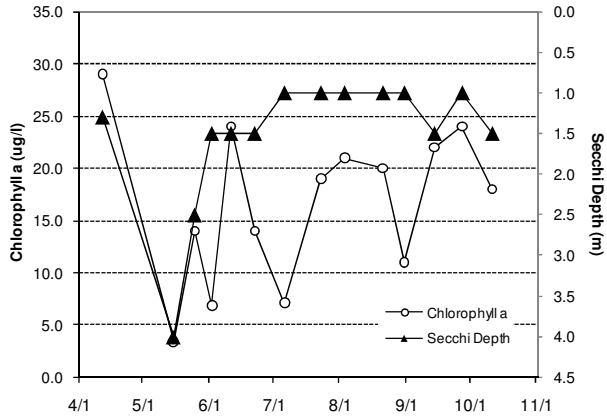
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lake Bavaria
Chaska/Laketown Twp., Carver Co.

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

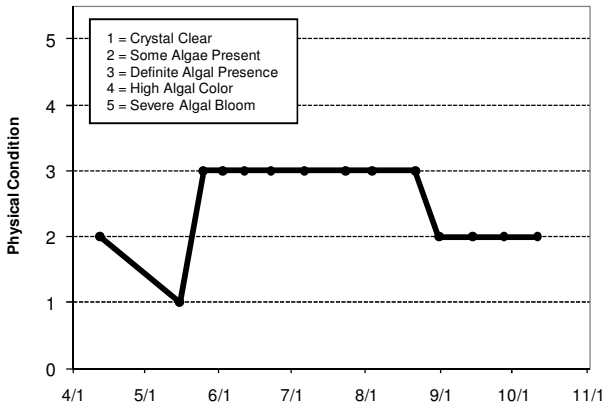






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	10.7	5.4	16.8	6.3	29.0	85		1.3	2	3
5/15	12.0				3.4	31		4.0	1	1
5/25	20.0				14.0	34		2.5	3	3
6/2	20.0				6.9	30		1.5	3	3
6/11	18.0				24.0	30		1.5	3	3
6/22	24.0				14.0	38		1.5	3	3
7/6	25.0				7.1	29		1.0	3	3
7/23	24.0				19.0	25		1.0	3	3
8/3	25.0				21.0	26		1.0	3	3
8/21	23.0				20.0	23		1.0	3	3
8/31	25.0				11.0	23		1.0	2	3
9/14	15.0				22.0	33		1.5	2	3
9/27	14.0				24.0	46		1.0	2	3
10/11	15.0				18.0	44		1.5	2	3



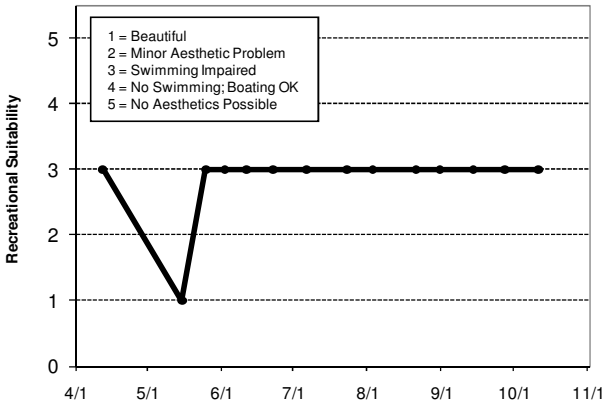
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	313.4	157.0	494.0	F
CLA (µg/l)	96.0	19.0	210.0	F
Secchi (m)	0.4	0.2	0.8	F
TKN (mg/l)	2.92	1.70	4.60	
			Lake Grade	F

The lake received a lake grade of F for 2010 and in the previous four years. Since there are only 5 years of data, there are insufficient data to determine water quality trends. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

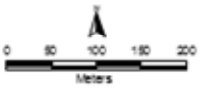
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

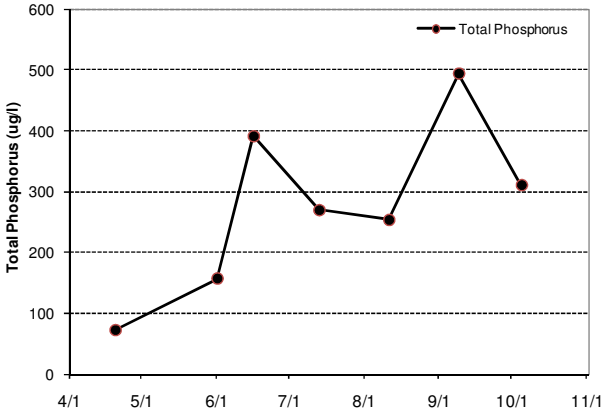
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

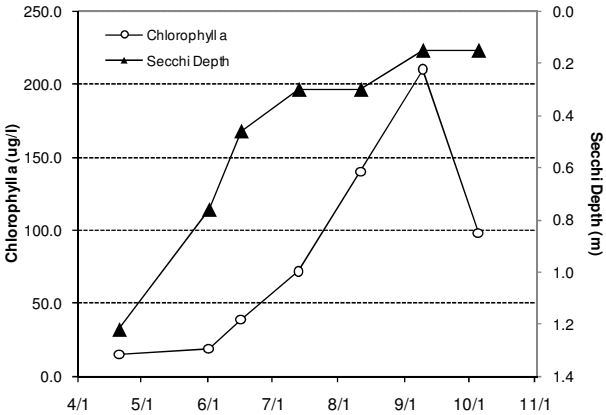
Bay Pond (Bay Lake)
Baytown Twp., Washington Co.

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

● Sampling site
Contours in meters

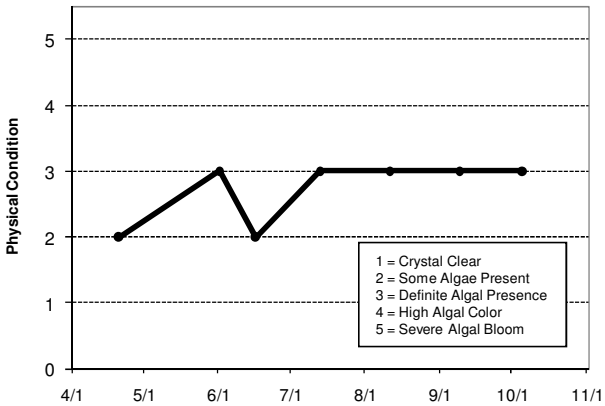






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20	16.3	14.6	10.6	0.1	15.0	74		1.2	2	3
6/1	24.7	21.7	8.5	0.1	19.0	157		0.8	3	4
6/16	20.8	19.0	9.9	0.3	39.0	392		0.5	2	2
7/13	24.0	22.5	7.8	1.8	72.0	270		0.3	3	4
8/11	25.9	24.8	5.3	0.3	140.0	254		0.3	3	4
9/9	16.9	16.5	10.9	0.3	210.0	494		0.2	3	4
10/5	15.2	13.2	12.1	0.2	98.0	310		0.2	3	4



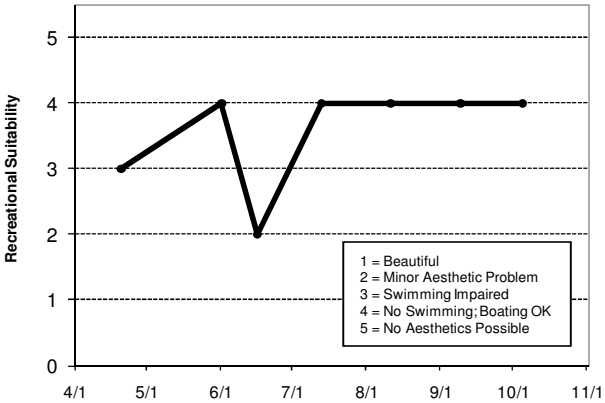
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	141.5	88.0	182.0	D
CLA (µg/l)	76.7	31.0	130.0	D
Secchi (m)	0.3	0.2	0.7	F
TKN (mg/l)	3.39	2.65	4.20	
			Lake Grade	D

The lake received a lake grade of D for 2010, which is better than grades of previous years. The higher grade appears to be driven by decreases in the summer-time averages of TP and CLA. Continued monitoring is recommended to determine potential changes in trends of this lake. 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.

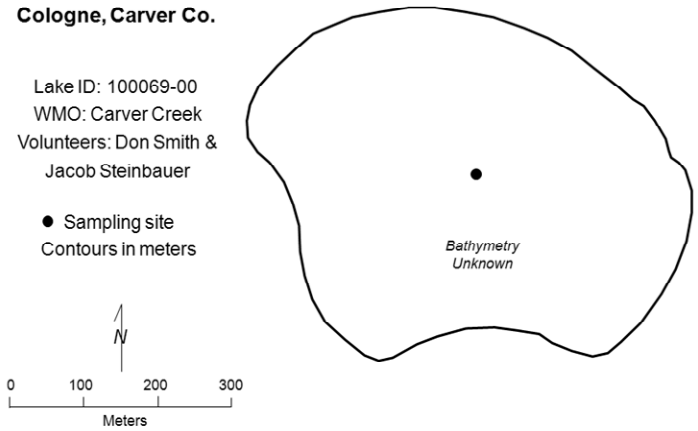
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

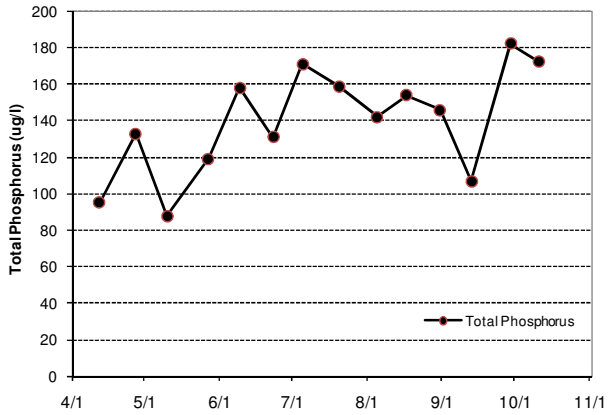
Lake Benton

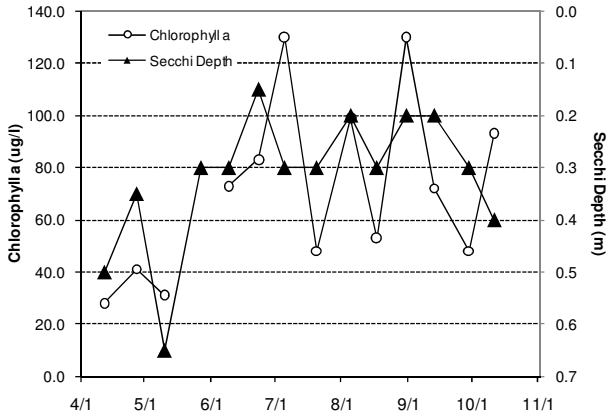
Cologne, Carver Co.

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

● Sampling site
Contours in meters

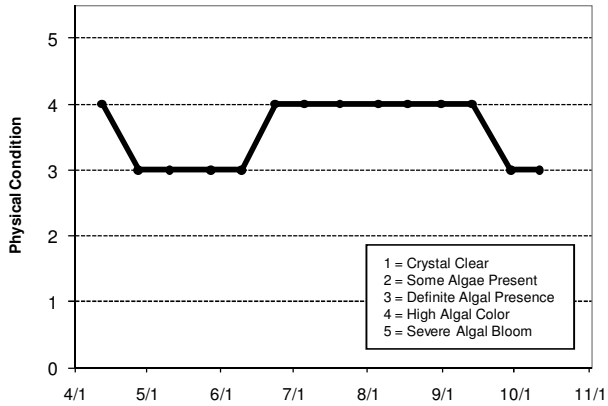






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	16.0				28.0	95		0.5	4	4
4/27	16.0				41.0	133		0.4	3	4
5/10	11.0				31.0	88		0.7	3	4
5/27	24.0					119		0.3	3	4
6/9	25.0				73.0	158		0.3	3	4
6/23	30.0				83.0	131		0.2	4	4
7/5	31.0				130.0	171		0.3	4	4
7/20	31.0				48.0	159		0.3	4	4
8/5	31.0				99.0	142		0.2	4	4
8/17	30.0				53.0	154		0.3	4	4
8/31	30.0				130.0	146		0.2	4	4
9/13	22.0				72.0	107		0.2	4	4
9/29	20.0				48.0	182		0.3	3	4
10/11	25.0				93.0	172		0.4	3	4



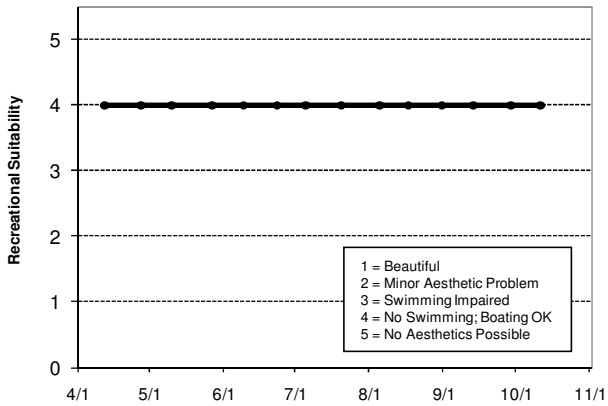
Lake Water Quality Grades Based on Summertime Averages

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	101.5	48.0	150.0	D
CLA (µg/l)	50.3	10.0	120.0	D
Secchi (m)	0.9	0.5	1.5	D
TKN (mg/l)	2.03	1.20	3.10	
			Lake Grade	D

The lake received a lake grade of D in 2010 which was decrease from the C grade received in 2008. Furthermore, the average CLA concentration appears to have increased, and the Secchi depth decreased since 2008 as well. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

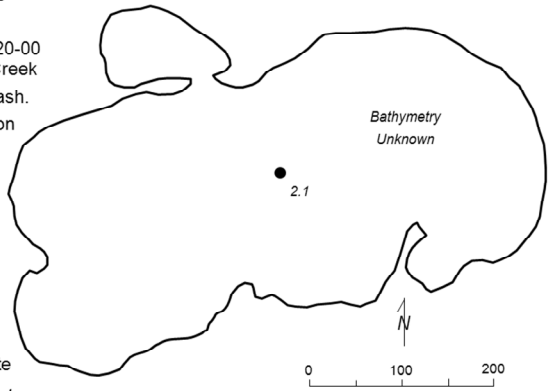
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

Benz Lake

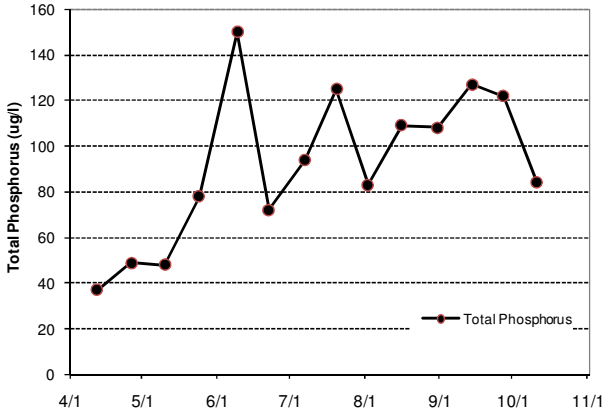
Grant, Washington Co.

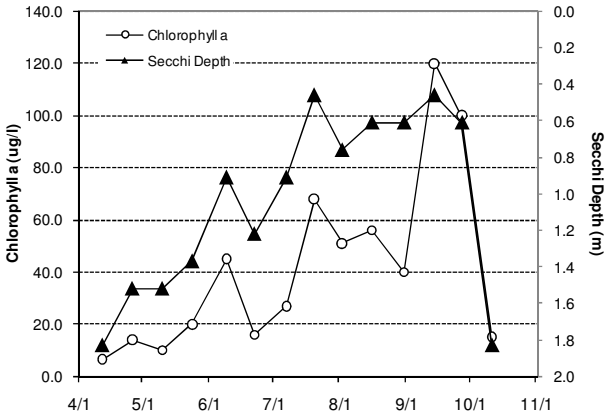
Lake ID: 820120-00
WD: Browns Creek
Volunteer: Wash. Conservation District



● Sampling site
Contours in meters

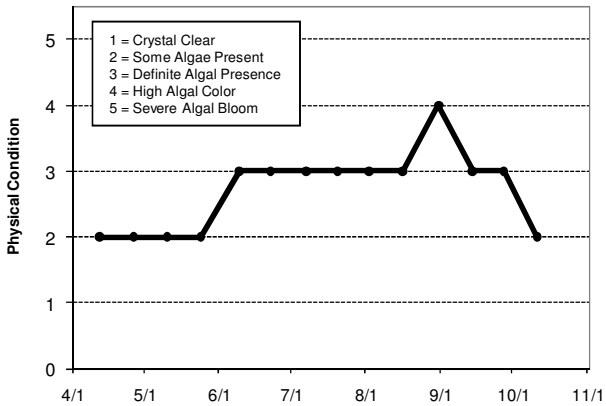
0 100 200
Meters





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	14.7	13.9	10.9	3.7	6.5	37		1.8	2	3
4/26	14.5	14.3	8.5	0.1	14.0	49		1.5	2	3
5/10	13.2	13.2	10.6	10.4	10.0	48		1.5	2	2
5/24	26.0	22.0	8.6	8.0	20.0	78		1.4	2	3
6/9	20.8	20.6	7.0	0.1	45.0	150		0.9	3	4
6/22	24.3	22.2	11.7	0.5	16.0	72		1.2	3	4
7/7	30.1	25.0	12.3	0.4	27.0	94		0.9	3	4
7/20	25.5	24.1	9.5	0.3	68.0	125		0.5	3	4
8/2	27.3	24.6	9.4	0.2	51.0	83		0.8	3	4
8/16	24.5	23.5	10.4	0.2	56.0	109		0.6	3	4
8/31	27.8	23.7	11.3	0.1	40.0	108		0.6	4	4
9/14	18.6	18.0	13.5	0.2	120.0	127		0.5	3	4
9/27	16.3	14.7	10.4	10.4	100.0	122		0.6	3	4
10/11	18.4	15.3	12.8	0.2	15.0	84		1.8	2	3



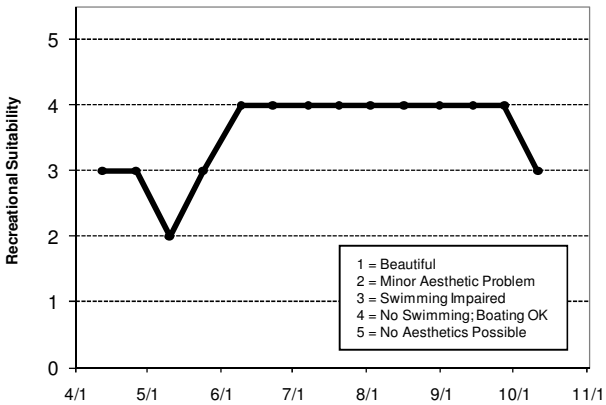
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

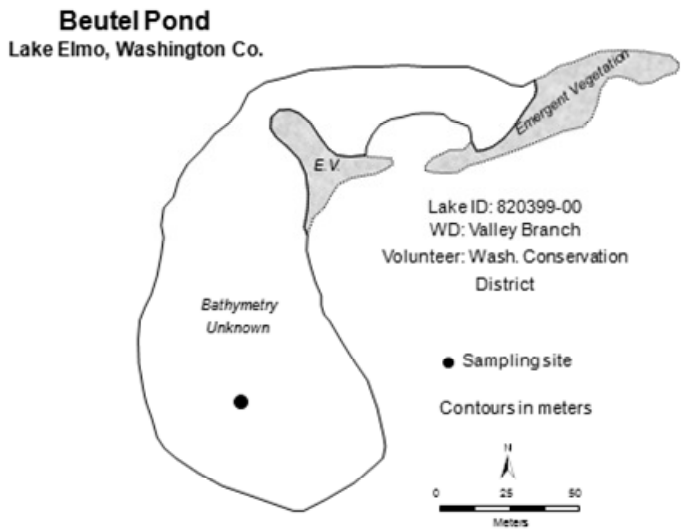
2010 summer (May-September) data summary

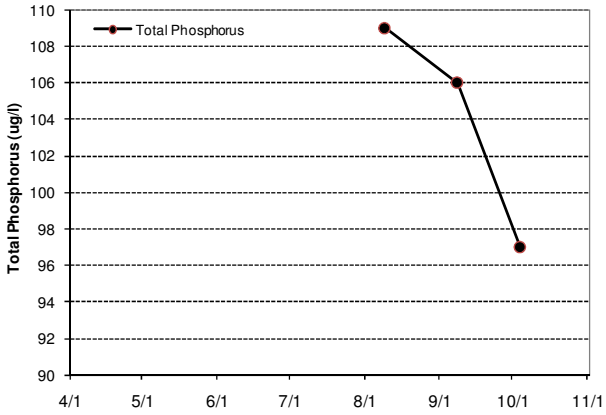
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	107.5	106.0	109.0	
CLA (µg/l)	34.2	4.4	64.0	
Secchi (m)	0.9	0.9	0.9	
TKN (mg/l)	1.30	1.30	1.30	
			Lake Grade	NA

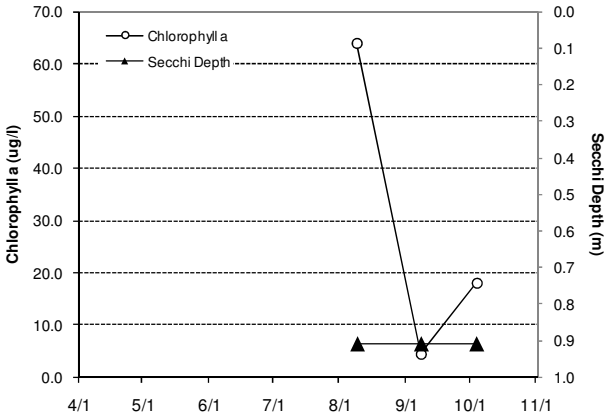
There were insuffcient data to calculate grades (at least 5 data points for the summer-time period are required). To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

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

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

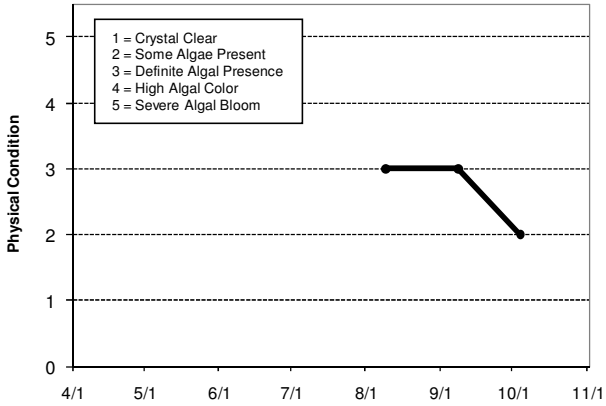






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
8/9	23.6	20.6	2.7	0.2	64.0	109		0.9	3	4
9/8	17.1	16.4	2.0	0.1	4.4	106		0.9	3	4
10/4	12.2	11.7	4.9	1.6	18.0	97		0.9	2	4



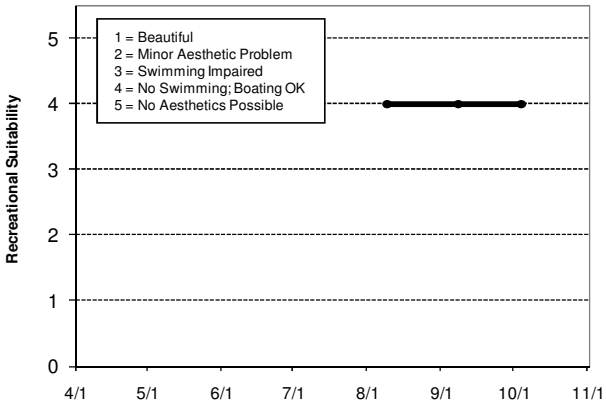
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	14.0	10.0	18.0	A
CLA (µg/l)	3.0	1.3	6.5	A
Secchi (m)	4.1	2.1	6.1	A
TKN (mg/l)	0.42	0.39	0.45	
			Lake Grade	A

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

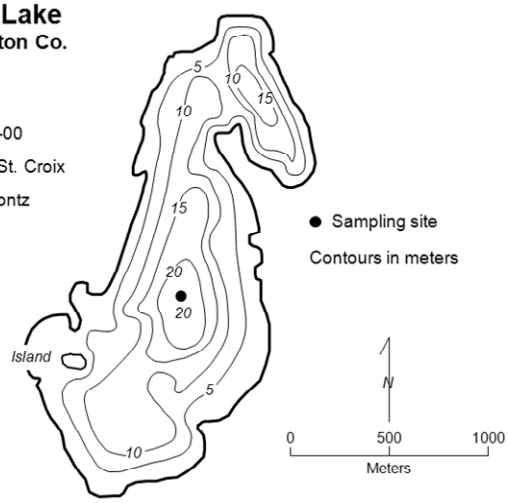
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

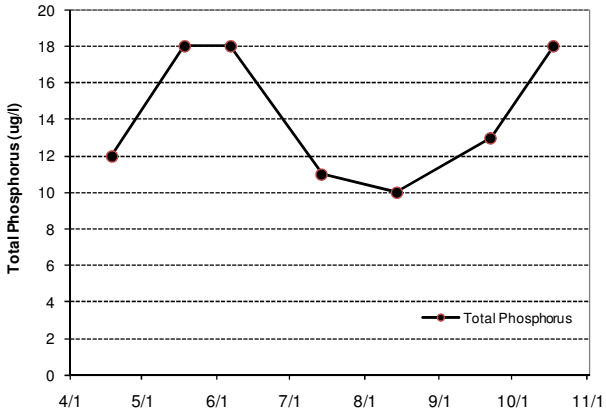
Big Carnelian Lake
May Twp., Washington Co.

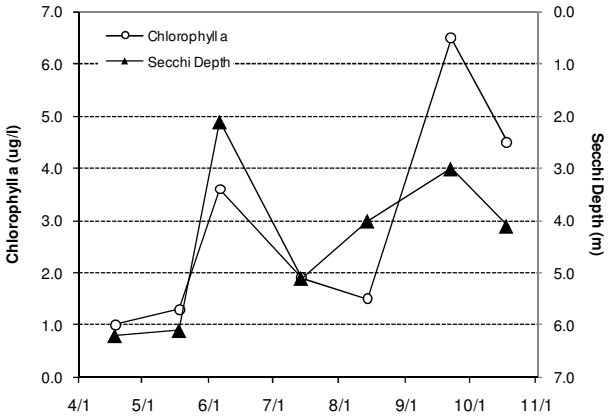
LAKE ID: 820049-00

WD: Carnelian-Marine-St. Croix

Volunteer: Tom Koontz

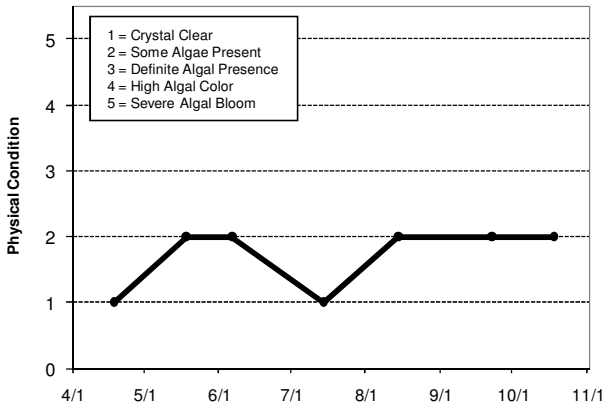






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	12.7				1.0	12		6.2	1	1
5/18	18.6				1.3	18		6.1	2	1
6/6	23.0				3.6	18		2.1	2	1
7/14	31.3				1.9	11		5.1	1	1
8/14	30.1				1.5	10		4.0	2	2
9/22	18.6				6.5	13		3.0	2	1
10/18	17.1				4.5	18		4.1	2	1

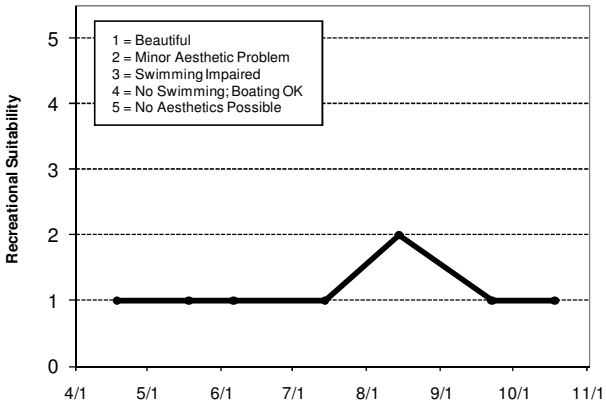


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

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

Big Comfort Lake is located northeast of the City of Forest Lake in Chisago County. The lake has a maximum depth of 14.3 m (47 feet). 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.

2010 summer (May-September) data summary

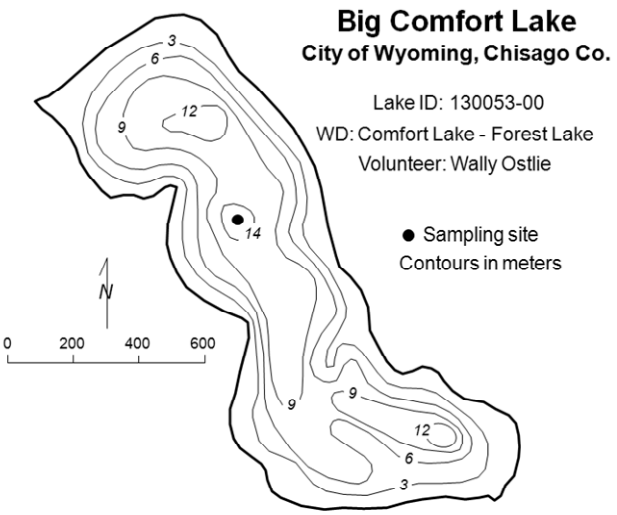
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	28.0	20.0	36.0	B
CLA (µg/l)	19.0	4.7	34.0	B
Secchi (m)	1.7	1.0	2.5	C
TKN (mg/l)	1.11	0.85	1.50	
			Lake Grade	B

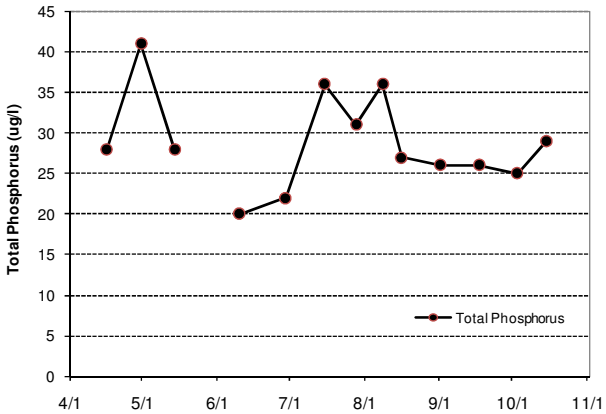
The lake received a lake grade of B for 2010, which is similar to grades received in some previous years. The lake typically receives a Secchi grade of C. Additional monitoring is recommended to determine the direction of potential trends in the water quality of the lake.

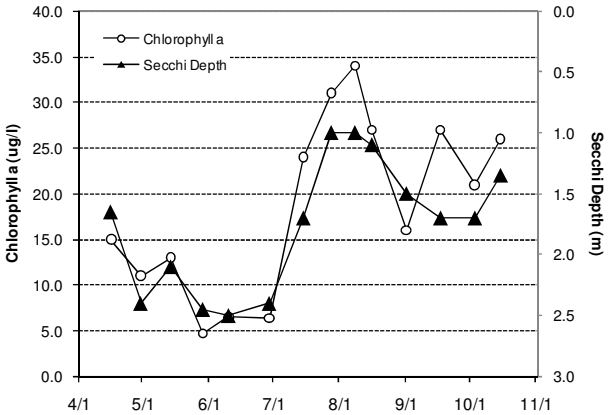
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

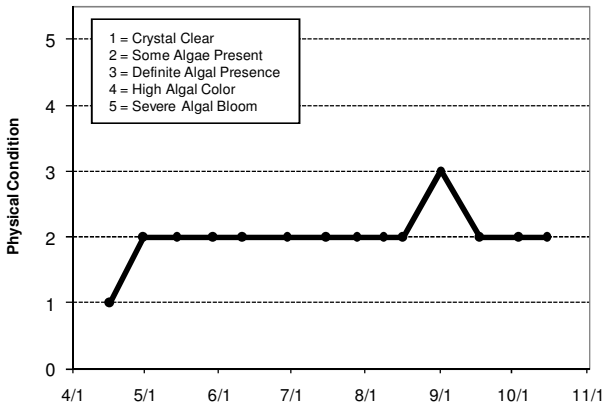






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/16	11.3				15.0	28		1.7	1	2
4/30	13.7				11.0	41		2.4	2	3
5/14	12.1				13.0	28		2.1	2	2
5/29	24.7				4.7			2.5	2	2
6/10	19.9				6.5	20		2.5	2	2
6/29	23.2				6.4	22		2.4	2	2
7/15	25.4				24.0	36		1.7	2	1
7/28	26.8				31.0	31		1.0	2	3
8/8	27.6				34.0	36		1.0	2	3
8/16	24.8				27.0	27		1.1	2	3
9/1	24.7				16.0	26		1.5	3	2
9/17	17.5				27.0	26		1.7	2	3
10/3	15.9				21.0	25		1.7	2	2
10/15	14.5				26.0	29		1.4	2	2



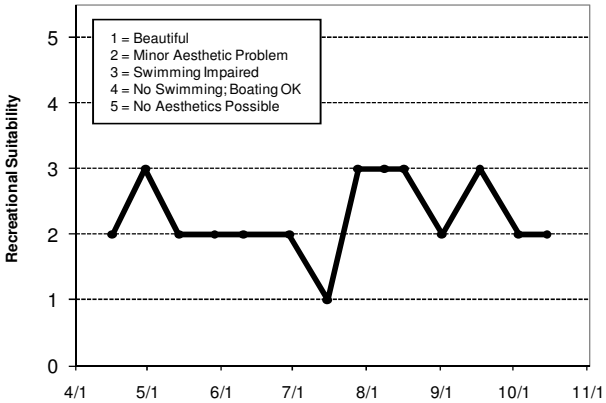
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Big Marine Lake (82-0052) *Carnelian - Marine Watershed District*

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

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

2010 summer (May-September) data summary

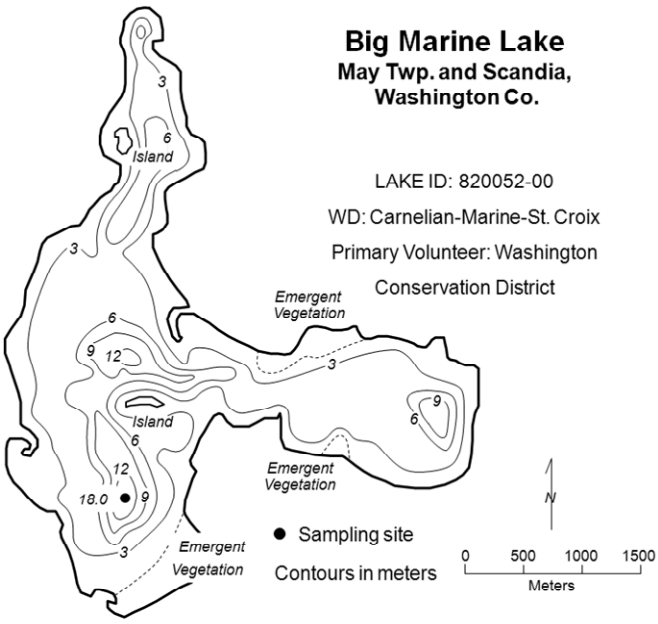
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
Secchi (m)	4.3	2.7	6.1	A

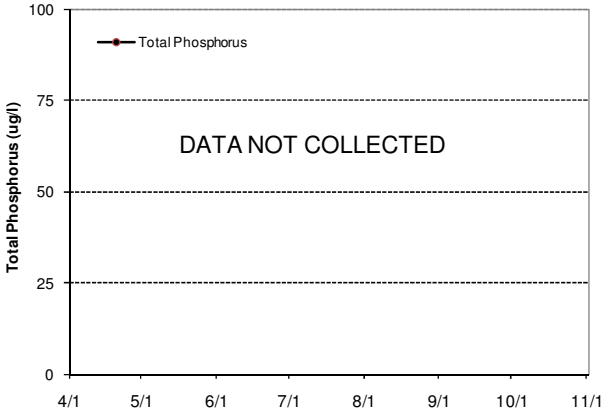
The lake received a Secchi grade of A which is consistent with the historical data. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2011).

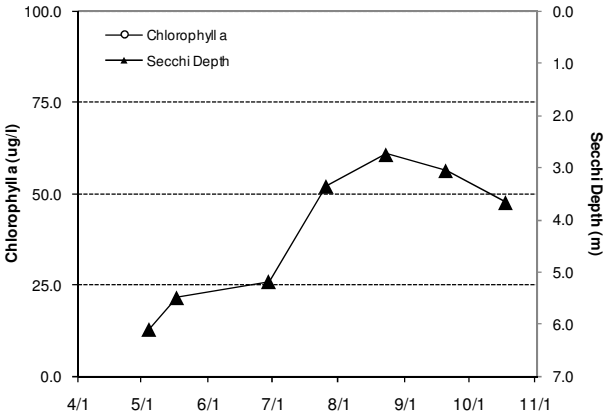
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

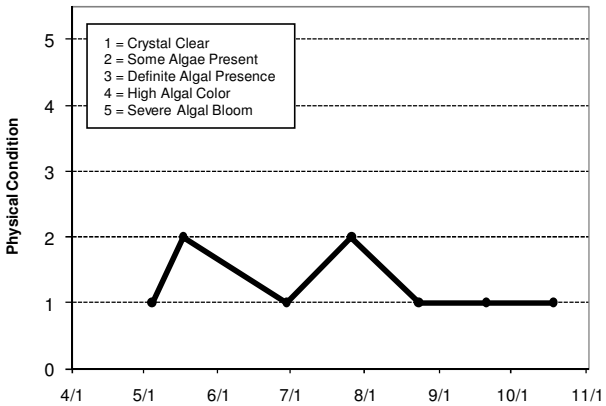






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/4	13.3	13.0	10.3	0.1				6.1	1	1
5/17	18.1	11.4	11.2	0.0				5.5	2	2
6/29	22.9	12.1	8.3	0.0				5.2	1	1
7/26	25.7	12.5	8.7	0.0				3.4	2	1
8/23	24.3	13.0	8.5	0.0				2.7	1	1
9/20	16.7	16.5	8.5	0.1				3.1	1	1
10/18	14.0	13.9	9.4	0.1				3.7	1	1



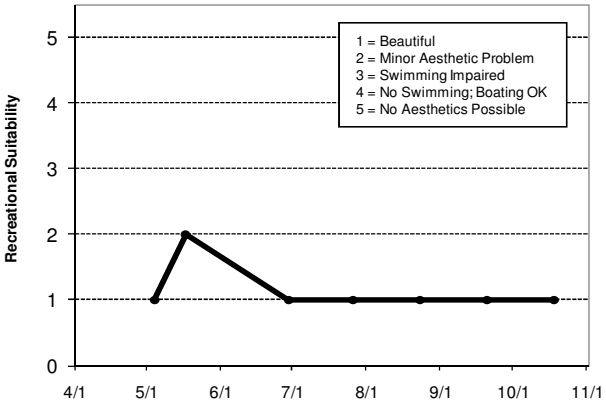
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Bone Lake is located in 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.

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	32.4	17.0	77.0	C
CLA (µg/l)	12.0	4.5	26.0	B
Secchi (m)	1.7	1.0	2.1	C
TKN (mg/l)	1.00	0.88	1.30	
			Lake Grade	C

The lake received a lake grade of C for 2010 which is consistent with the historical database. The lake appears to be represented best by a lake grade of C. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 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/.

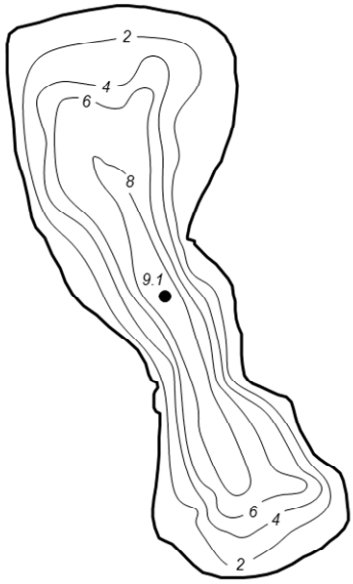
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

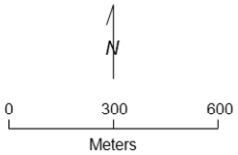
Bone Lake

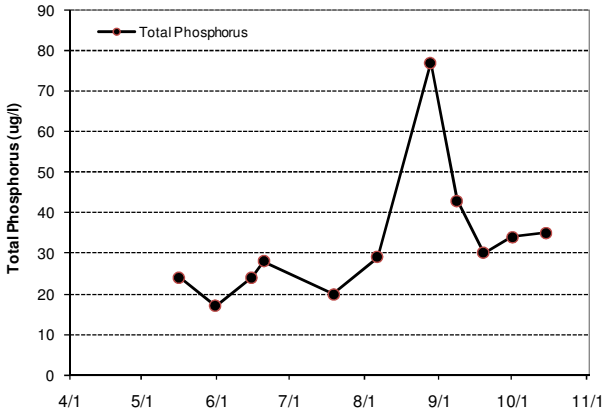
Scandia, Washington Co.

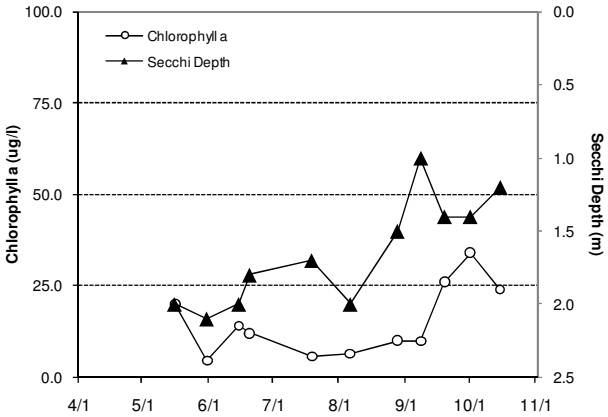
Lake ID: 820054-00
WD: Comfort Lake - Forest Lake
Volunteers: Jon Hafner,
Teresa Hafner & Don Jack

● Sampling site
Contours in meters



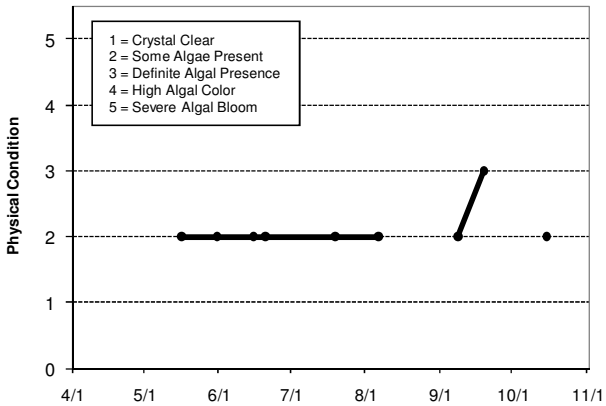






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/16	17.0				20.0	24		2.0	2	2
5/31	25.0				4.5	17		2.1	2	3
6/15	21.0				14.0	24		2.0	2	2
6/20	24.0				12.0	28		1.8	2	2
7/19	29.0				5.7	20		1.7	2	2
8/6	28.0				6.4	29		2.0	2	2
8/28	24.4				10.0	77		1.5		
9/8					9.8	43		1.0	2	3
9/19	21.0				26.0	30		1.4	3	3
10/1					34.0	34		1.4		
10/15					24.0	35		1.2	2	2



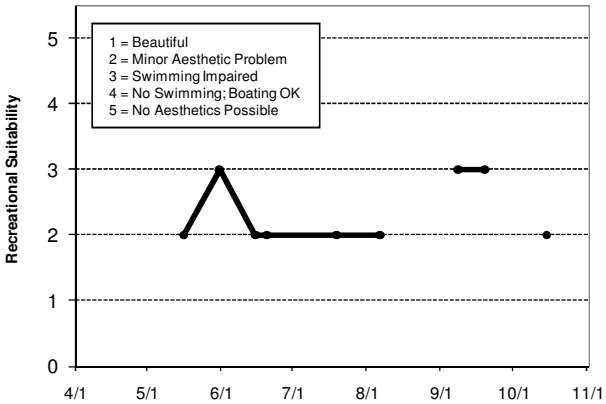
Lake Water Quality Grades Based on Summertime Averages

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



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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	60.3	36.0	91.0	C
CLA (µg/l)	6.8	2.7	15.0	A
Secchi (m)	0.6	0.5	0.9	F
TKN (mg/l)	0.73	0.58	1.00	
			Lake Grade	C

The lake received a lake grade of C for year 2009. Usually the letter grades for each parameter are within a letter grade of each other. A comparison of the CLA grade of A to the F grade for Secchi Depth and the C grade for TP, indicate that suspended sediment may be a possible cause of the low water clarity during 2010. 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 2008 and 2009.

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

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

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

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

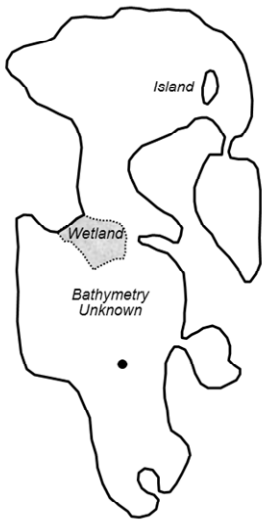
Brick Pond

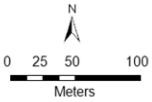
Stillwater, Washington Co.

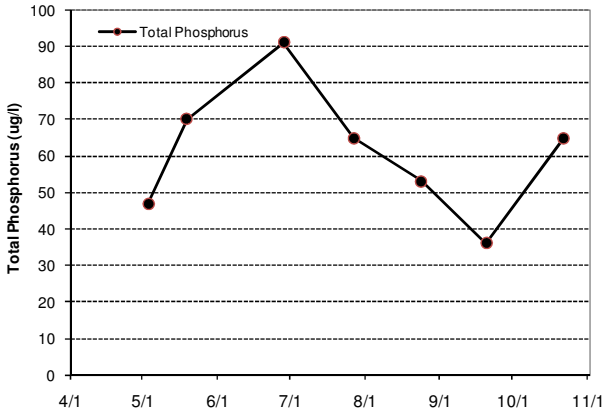
Lake ID: 820308-00
WMO: Middle St. Croix
Volunteer: Washington Conservation District

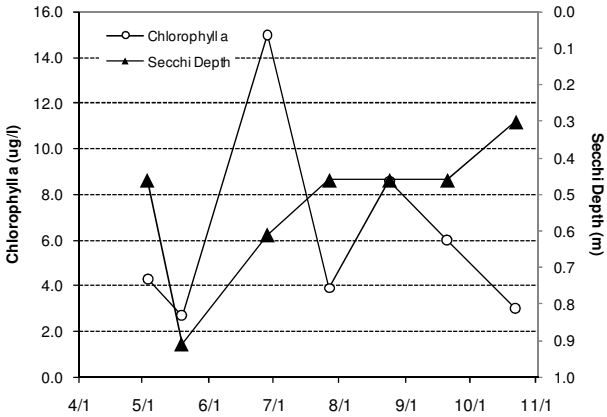
● Sampling site

Contours in meters



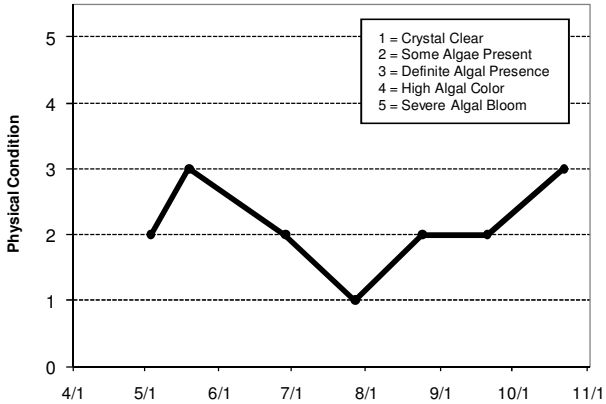






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/3	15.1		3.4		4.3	47		0.5	2	4
5/19	19.3	19.2	11.2	7.0	2.7	70		0.9	3	4
6/28	23.5	23.7	9.3	0.1	15.0	91		0.6	2	4
7/27	30.0		13.7		3.9	65		0.5	1	5
8/24	25.6		10.8		8.6	53		0.5	2	4
9/20	15.4		14.8		6.0	36		0.5	2	4
10/22	7.0		14.3		3.0	65		0.3	3	4



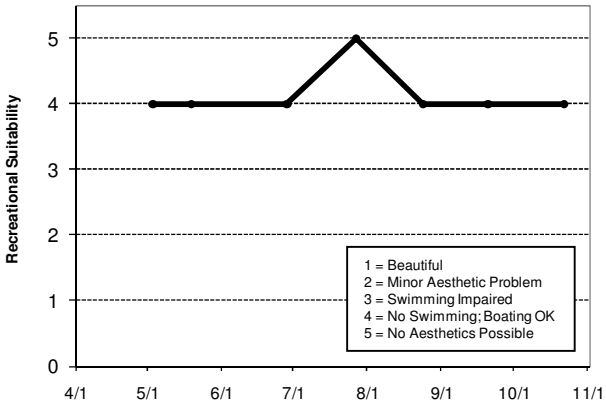
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	14.0	8.0	22.0	A
CLA (µg/l)	3.1	1.4	5.2	A
Secchi (m)	4.1	3.0	5.1	A
TKN (mg/l)	0.55	0.27	0.74	
			Lake Grade	A

The lake received a lake grade of A for 2010. The lake's water quality is well represented by a lake grade of A 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/.

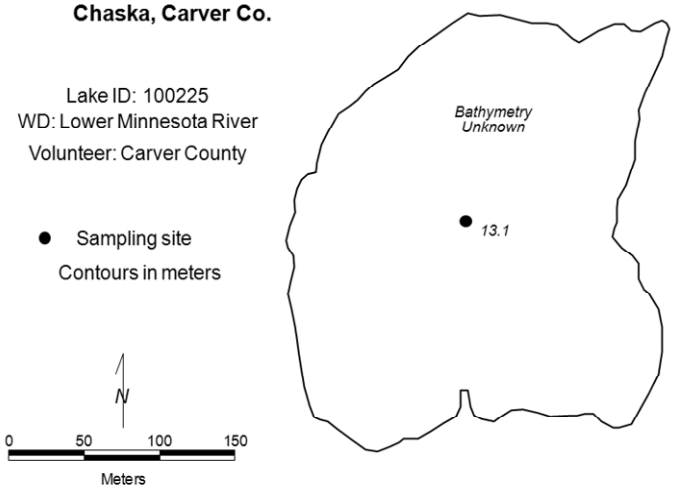
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

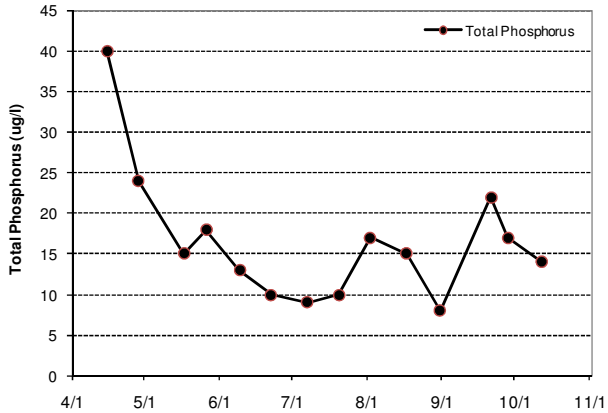
Brickyard Clayhole Lake

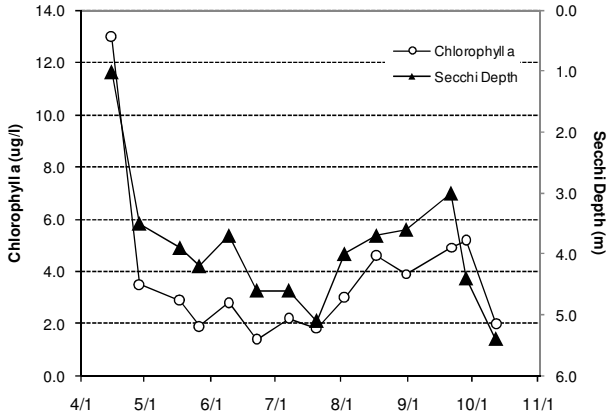
Chaska, Carver Co.

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

● Sampling site
Contours in meters

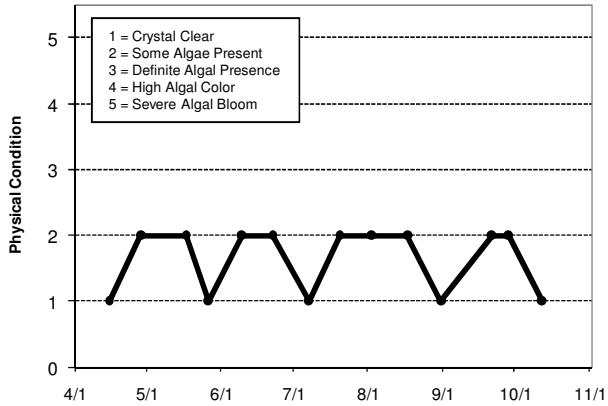






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/15	15.5	4.4	11.7	0.2	13.0	40		1.0	1	2
4/28	14.2	4.2	17.6	0.5	3.5	24		3.5	2	2
5/17	19.5	4.6	12.5	0.2	2.9	15		3.9	2	2
5/26	23.0	4.5	10.1	0.2	1.9	18		4.2	1	1
6/9	22.1	4.6	10.2	0.1	2.8	13		3.7	2	2
6/22	23.8	4.7	9.5	0.1	1.4	10		4.6	2	1
7/7	26.4	4.8	11.3	0.3	2.2	9		4.6	1	1
7/20	26.3	4.9	10.2	0.2	1.8	10		5.1	2	1
8/2	27.6	5.0	8.6	0.1	3.0	17		4.0	2	1
8/17	26.1	5.3	10.7	0.0	4.6	15		3.7	2	2
8/31	26.4	5.5	9.8	0.0	3.9	8		3.6	1	1
9/21	18.4	5.6	9.4	0.0	4.9	22		3.0	2	2
9/28	17.9	6.1	9.2	0.0	5.2	17		4.4	2	2
10/12	18.1	7.2	10.6	0.0	2.0	14		5.4	1	1



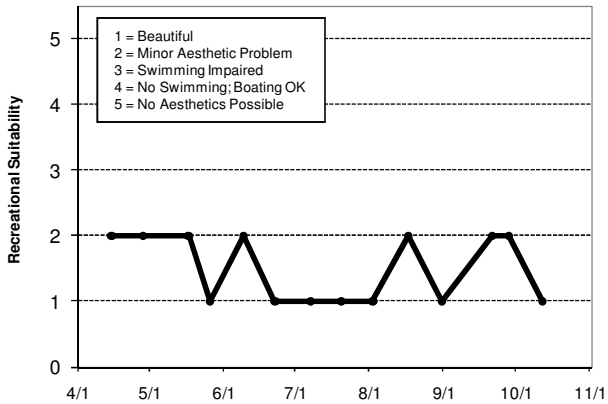
Lake Water Quality Grades Based on Summertime Averages

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	35.2	18.0	79.0	C
CLA (µg/l)	26.8	4.3	45.0	C
Secchi (m)	1.6	0.9	3.1	C
TKN (mg/l)	1.24	0.67	1.80	
			Lake Grade	C

The lake received a lake grade of C in 2010, 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.

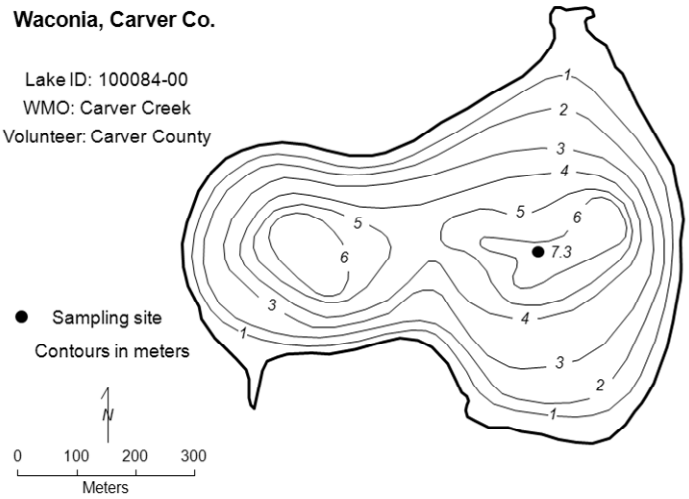
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

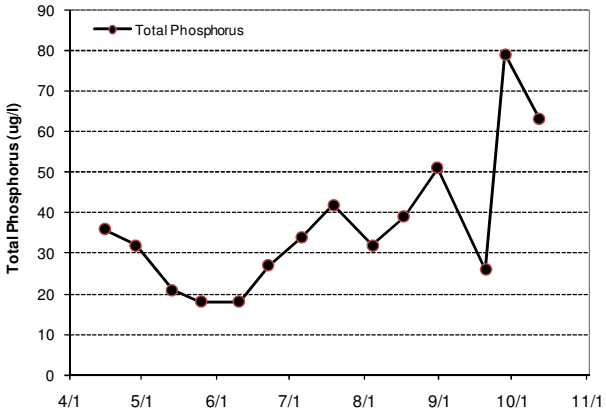
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

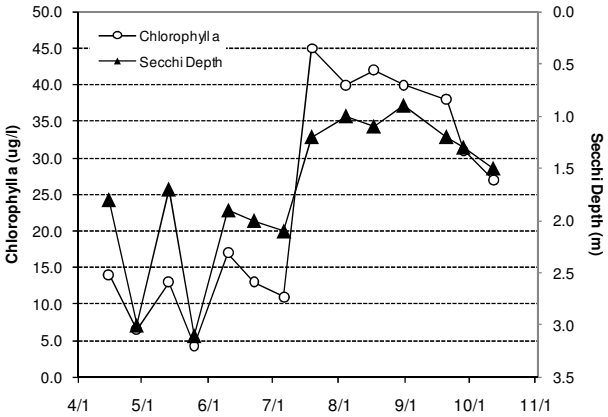
Burandt Lake

Waconia, Carver Co.

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

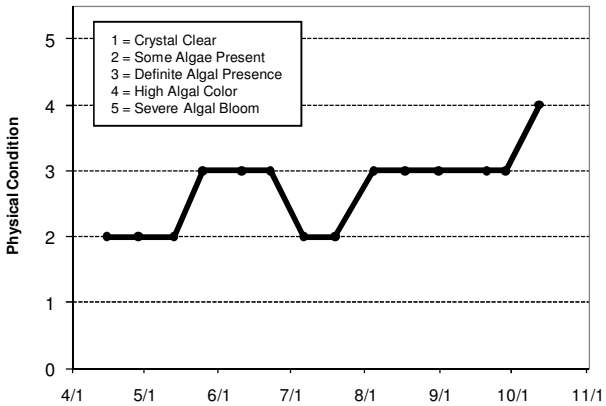






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/15	12.9	12.9	11.1	11.0	14.0	36		1.8	2	2
4/28	14.5	13.0	17.7	13.1	6.5	32		3.0	2	2
5/13	11.1	11.1	11.7	11.2	13.0	21		1.7	2	2
5/25	23.5	11.7	10.2	3.0	4.3	18		3.1	3	3
6/10	20.2	13.3	8.8	0.5	17.0	18		1.9	3	3
6/22	25.5	12.7	10.4	0.1	13.0	27		2.0	3	3
7/6	27.9	14.5	11.7	0.4	11.0	34		2.1	2	2
7/19	26.2	16.5	11.7	0.2	45.0	42		1.2	2	2
8/4	27.6	16.0	10.4	0.1	40.0	32		1.0	3	3
8/17	24.7	16.6	9.3	0.3	42.0	39		1.1	3	3
8/31	24.5	18.7	9.4	0.0	40.0	51		0.9	3	2
9/20	16.3	16.1	10.3	10.1	38.0	26		1.2	3	3
9/28	16.0	15.6	11.5	8.9	31.0	79		1.3	3	2
10/12	17.0	14.5	14.1	1.0	27.0	63		1.5	4	3



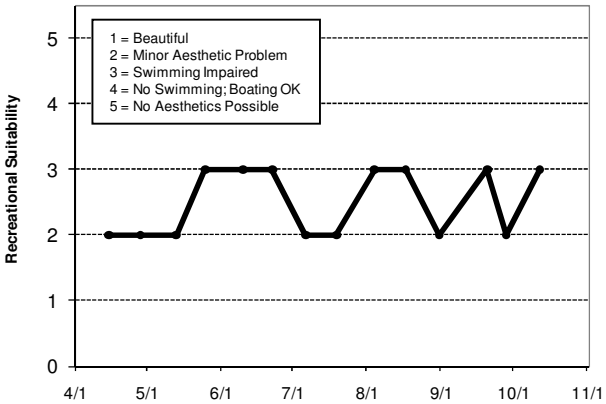
Lake Water Quality Grades Based on Summertime Averages

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	15.9	10.0	21.0	A
CLA (µg/l)	4.1	1.7	15.0	A
Secchi (m)	2.7	1.8	3.4	B
TKN (mg/l)	0.70	0.39	1.10	
			Lake Grade	A

For 2010, 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/.

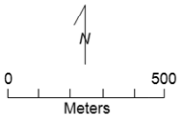
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

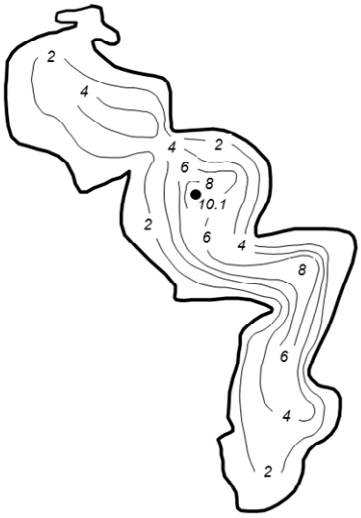
Bush Lake

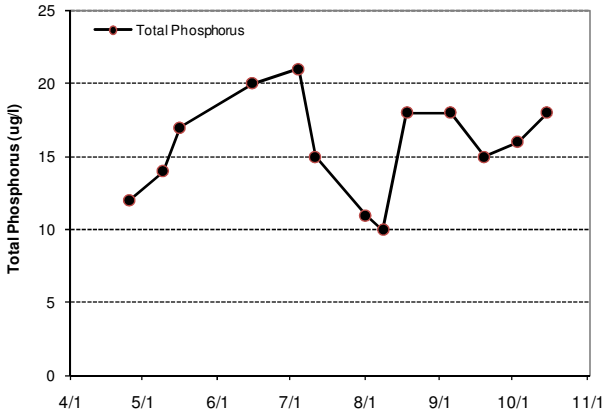
Bloomington, Hennepin Co.

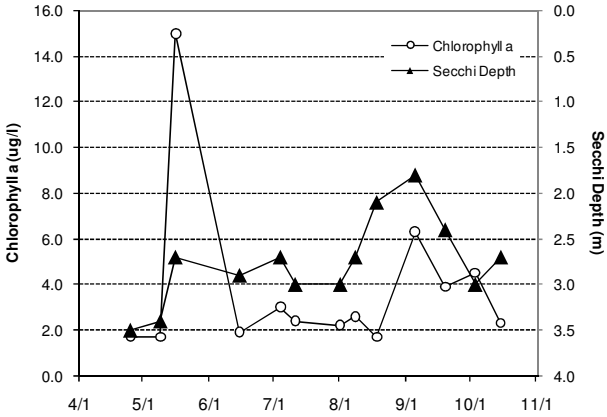
Lake ID: 270047-00
WD: Nine Mile Creek
Volunteer: Gregg Thompson

● Sampling site
Contours in meters



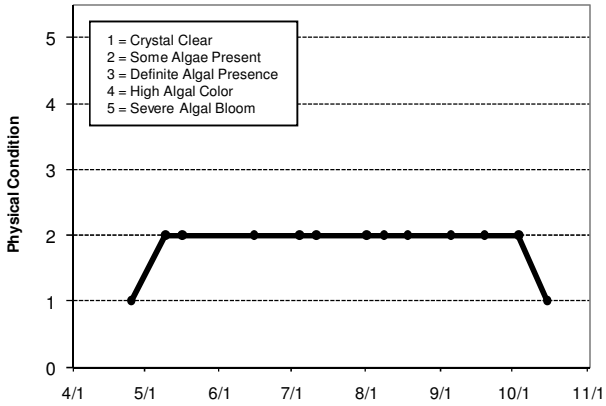






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/25	15.8				1.7	12		3.5	1	1
5/9	15.0				1.7	14		3.4	2	1
5/16	17.9				15.0	17		2.7	2	2
6/15	22.1				1.9	20		2.9	2	2
7/4	26.9				3.0	21		2.7	2	2
7/11	28.0				2.4	15		3.0	2	2
8/1	28.4				2.2	11		3.0	2	2
8/8	33.0				2.6	10		2.7	2	2
8/18	25.6				1.7	18		2.1	2	2
9/5	21.8				6.3	18		1.8	2	3
9/19	18.2				3.9	15		2.4	2	2
10/3	17.3				4.5	16		3.0	2	2
10/15	17.1				2.3	18		2.7	1	1



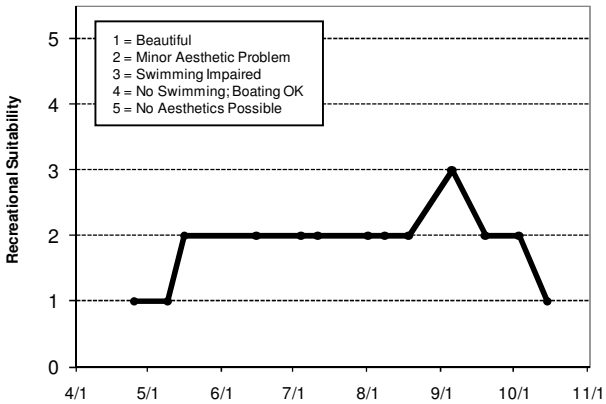
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



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

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

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

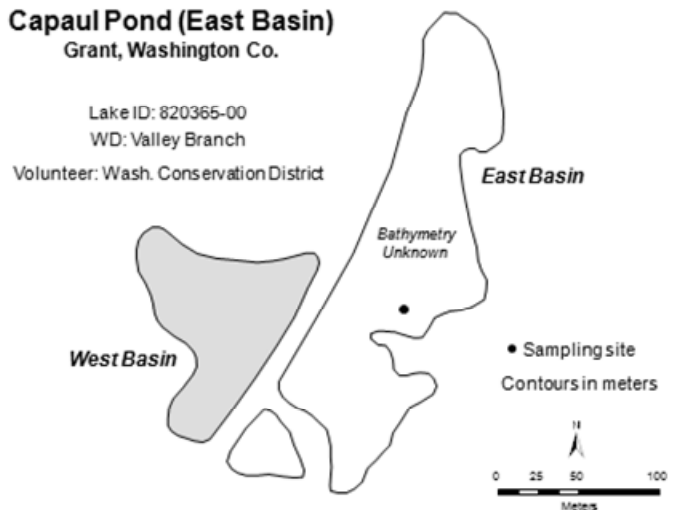
2010 summer (May-September) data summary

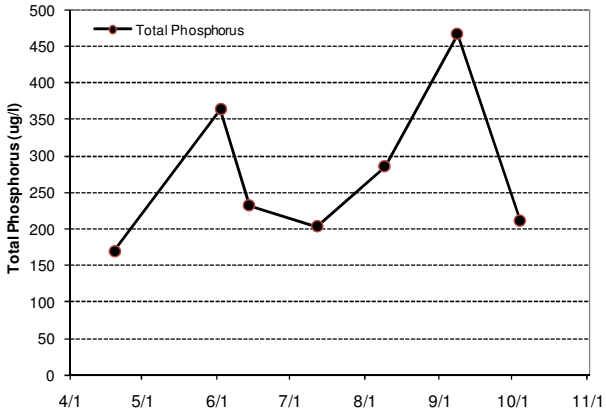
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	310.2	203.0	467.0	F
CLA (µg/l)	192.4	62.0	370.0	F
Secchi (m)	0.4	0.1	0.6	F
TKN (mg/l)	3.34	1.70	5.90	
			Lake Grade	F

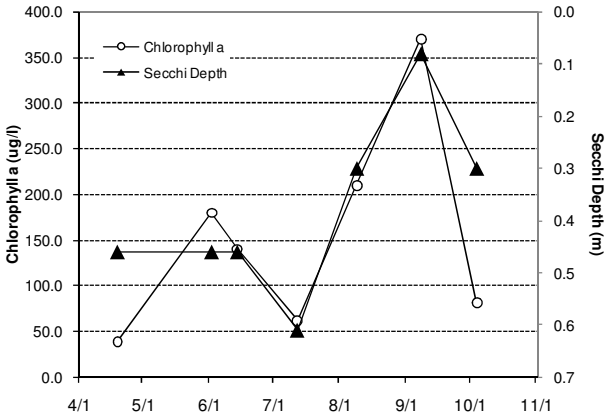
The lake received an F for 2010, worse than the D received in 2008. Additional years of monitoring are suggested to build an historical water quality database for this lake.

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

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

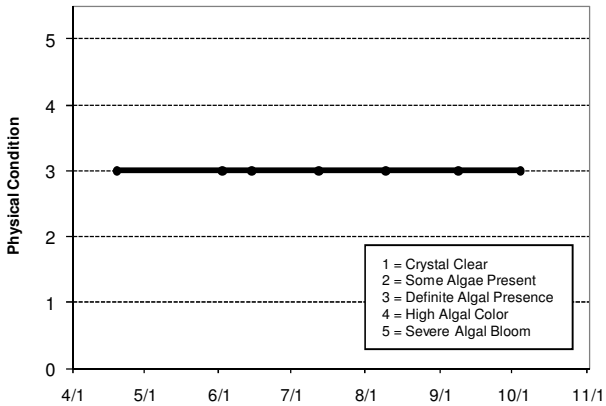






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	16.3	15.2	10.6	0.1	39.0	170		0.5	3	4
6/2	22.1	21.7	10.7	0.1	180.0	364		0.5	3	4
6/14	18.2	18.1	9.4	0.1	140.0	232		0.5	3	3
7/12	24.3	23.9	5.2	0.1	62.0	203		0.6	3	4
8/9	26.2	24.1	6.4	0.1	210.0	285		0.3	3	4
9/8	15.9	15.4	11.6	0.1	370.0	467		0.1	3	4
10/4	12.1	12.4	10.9	0.1	81.0	211		0.3	3	4



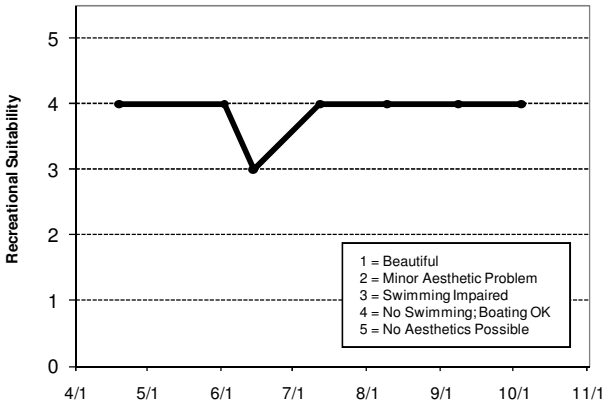
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	17.2	9.0	31.0	A
CLA (µg/l)	3.6	1.7	4.9	A
Secchi (m)	2.3	1.7	2.7	B
TKN (mg/l)	0.71	0.59	0.83	
			Lake Grade	A

The lake received a lake grade of A for 2010, which is the first A the lake has received while being part of the CAMP. The Secchi grade this year was a B, which is an improvement of the C Secchi grades that the lake typically has received. 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.

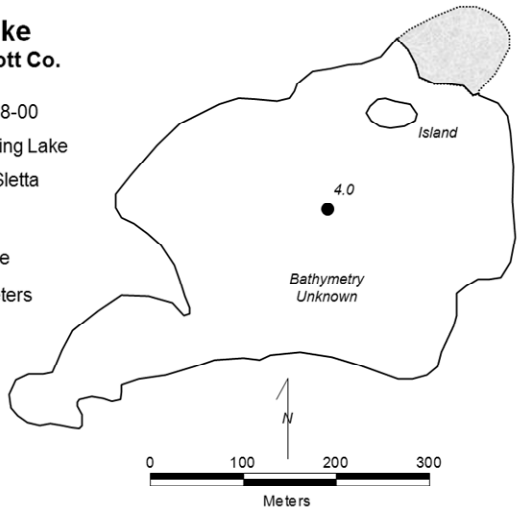
LAKE ID: 700018-00

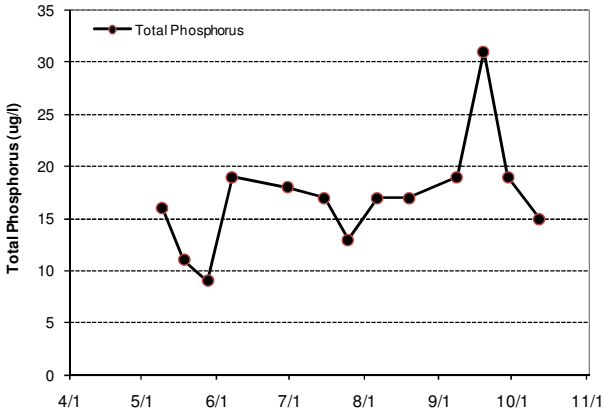
WD: Prior Lake-Spring Lake

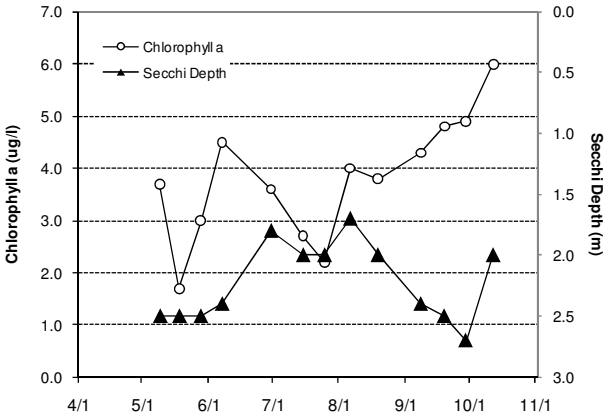
Volunteer: Tom Sletta

● Sampling site

Contours in meters

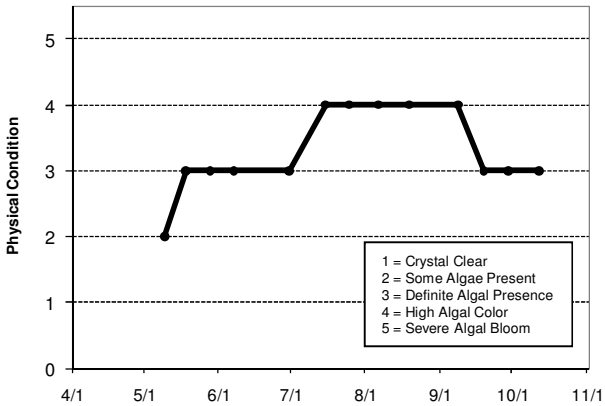






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/9	13.5				3.7	16		2.5	2	4
5/18	19.0				1.7	11		2.5	3	4
5/28	24.0				3.0	9		2.5	3	
6/7	23.2				4.5	19		2.4	3	4
6/30	24.9				3.6	18		1.8	3	
7/15	26.3				2.7	17		2.0	4	4
7/25					2.2	13		2.0	4	4
8/6	26.7				4.0	17		1.7	4	4
8/19	24.9				3.8	17		2.0	4	4
9/8	20.9				4.3	19		2.4	4	4
9/19	18.2				4.8	31		2.5	3	4
9/29	18.3				4.9	19		2.7	3	4
10/12	18.1				6.0	15		2.0	3	4



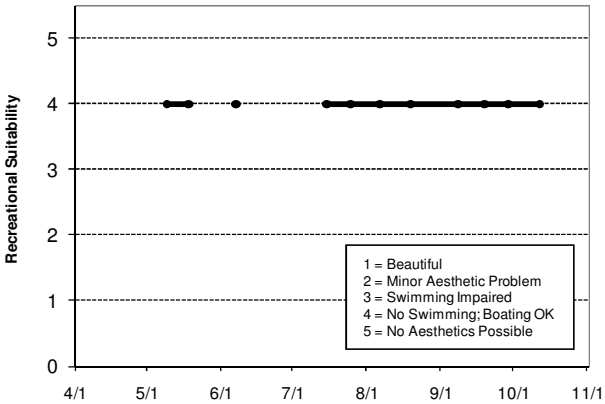
Lake Water Quality Grades Based on Summertime Averages

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

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	160.3	53.0	280.0	F
CLA (µg/l)	52.9	5.3	110.0	D
Secchi (m)	0.8	0.4	1.5	D
TKN (mg/l)	2.00	1.30	3.10	
			Lake Grade	D

The lake received a lake grade of D for 2010, 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

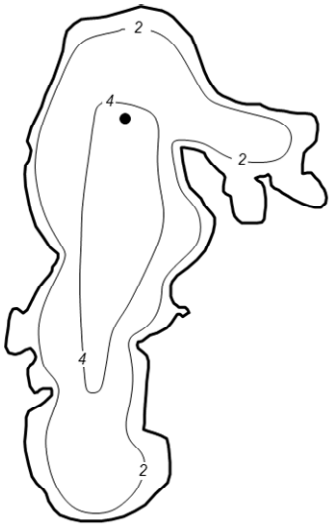
Volunteers: Steve Fjelstad & Kurth Schroeder

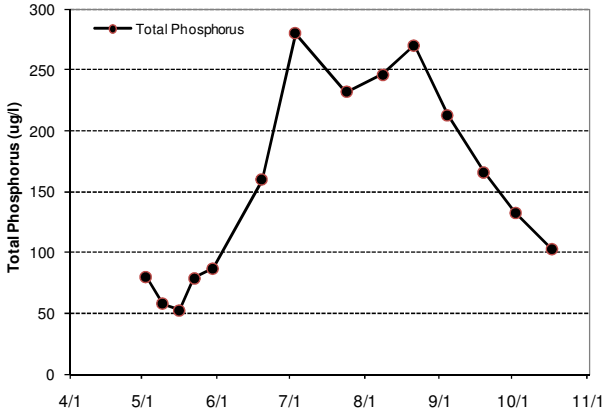
● Sampling site

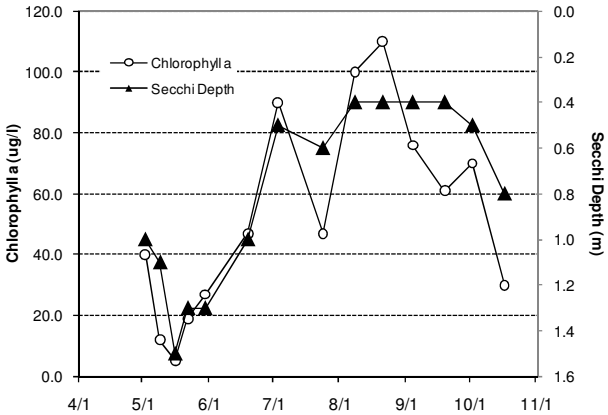
Contours in meters

N

0 500 1000
Meters

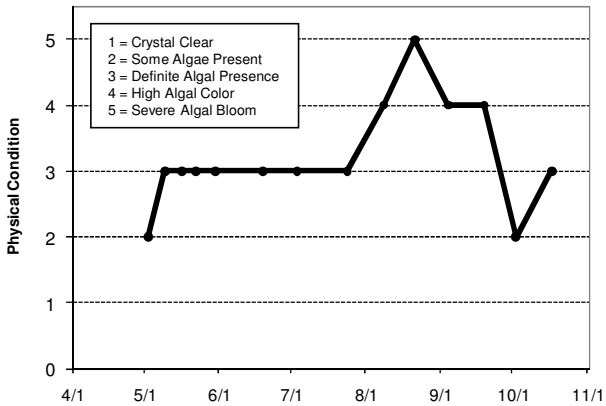






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/2	14.5				40.0	80		1.0	2	2
5/9	13.9				12.0	58		1.1	3	2
5/16	15.2				5.3	53		1.5	3	2
5/22	15.6				19.0	79		1.3	3	2
5/30	23.9				27.0	87		1.3	3	2
6/19	22.0				47.0	160		1.0	3	3
7/3	23.4				90.0	280		0.5	3	3
7/24	25.8				47.0	232		0.6	3	2
8/8	27.4				100.0	246		0.4	4	3
8/21	23.2				110.0	270		0.4	5	3
9/4	20.4				76.0	213		0.4	4	3
9/19	16.1				61.0	166		0.4	4	3
10/2	16.0				70.0	133		0.5	2	2
10/17	13.8				30.0	103		0.8	3	2



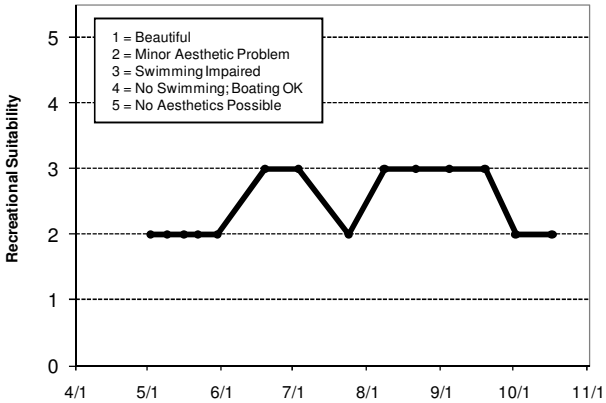
Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	15.6	11.0	25.0	A
CLA (µg/l)	2.9	1.7	4.5	A
Secchi (m)	1.6	1.3	2.8	C
TKN (mg/l)	0.51	0.26	0.82	
			Lake Grade	B

The lake received a water quality lake grade of B for 2010. The lake has received A grades for TP and CLA since 1997. The water clarity shows variation however. The annual mean summer-time water clarity grade has varied in the range of A to C.

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

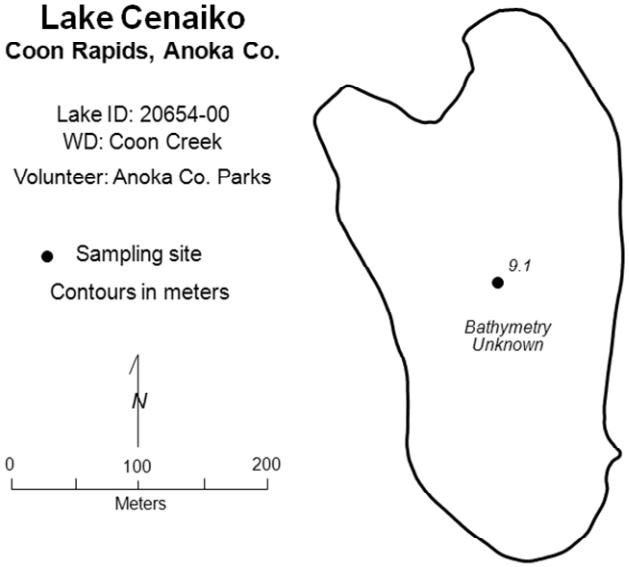
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

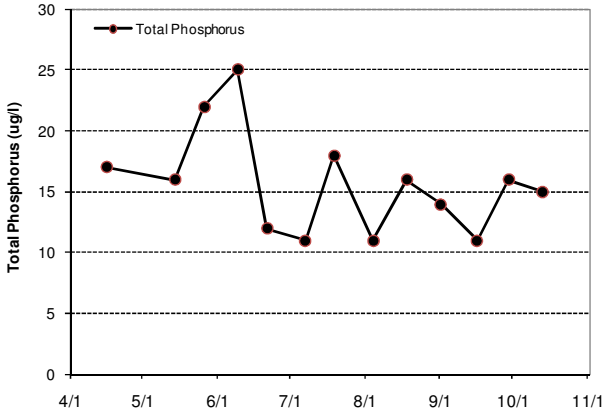
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

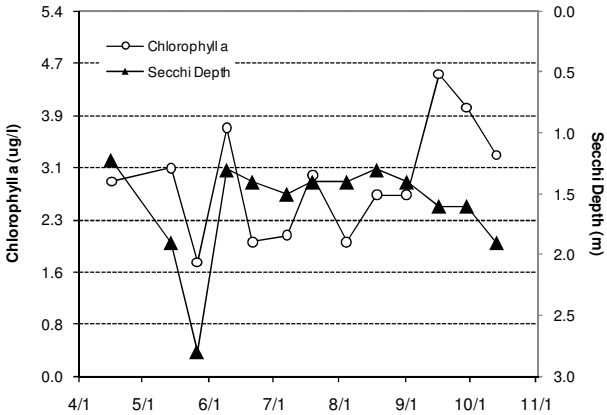
Lake Cenaiko
Coon Rapids, Anoka Co.

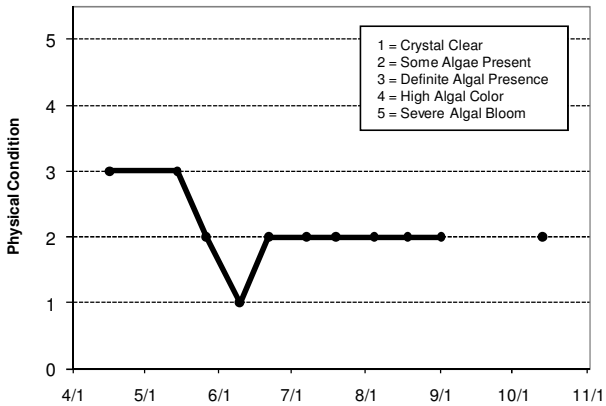
Lake ID: 20654-00
WD: Coon Creek
Volunteer: Anoka Co. Parks

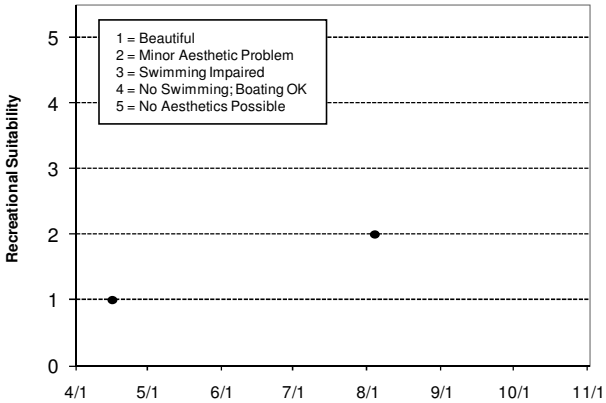
● Sampling site
Contours in meters











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/16	13.9				2.9	17		1.2	3	1
5/14	12.0				3.1	16		1.9	3	
5/26	24.2				1.7	22		2.8	2	
6/9	20.9				3.7	25		1.3	1	
6/21	24.4				2.0	12		1.4	2	
7/7	27.8				2.1	11		1.5	2	
7/19	25.8				3.0	18		1.4	2	
8/4	27.2				2.0	11		1.4	2	2
8/18	23.5				2.7	16		1.3	2	
9/1	26.0				2.7	14		1.4	2	
9/16	17.5				4.5	11		1.6		
9/29	17.3				4.0	16		1.6		
10/13	16.7				3.3	15		1.9	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						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
Total Phosphorus	A	A	A	A	A	A	A
Chlorophyll a	A	A	A	A	A	A	A
Secchi Depth	B	B	A	B	C	C	C
Lake Grade	**A**	**A**	**A**	**A**	**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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	13.3	8.0	20.0	A
CLA (µg/l)	2.5	1.2	4.3	A
Secchi (m)	6.0	4.4	7.5	A
TKN (mg/l)	0.67	0.45	0.87	
			Lake Grade	A

The lake received a lake grade of A for 2010. To better understand the lake's water quality and determine potential trends, additional years of data collection are needed.

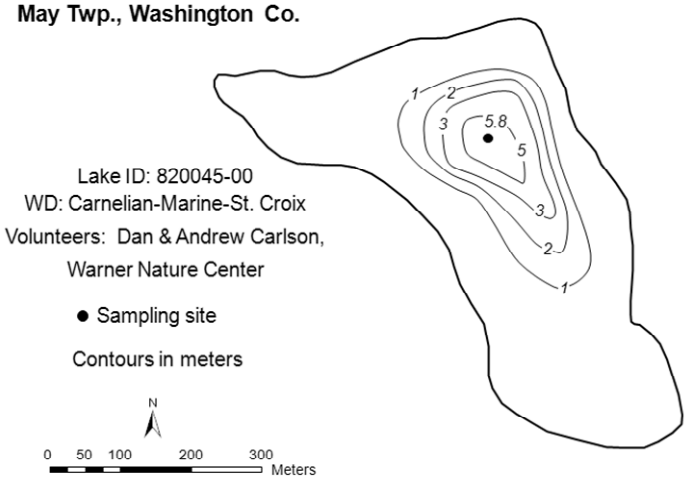
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

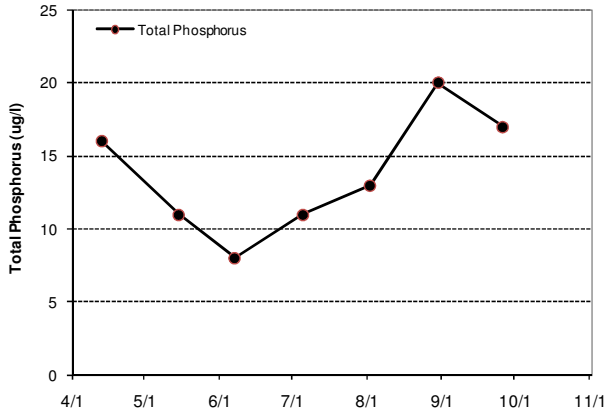
May Twp., Washington Co.

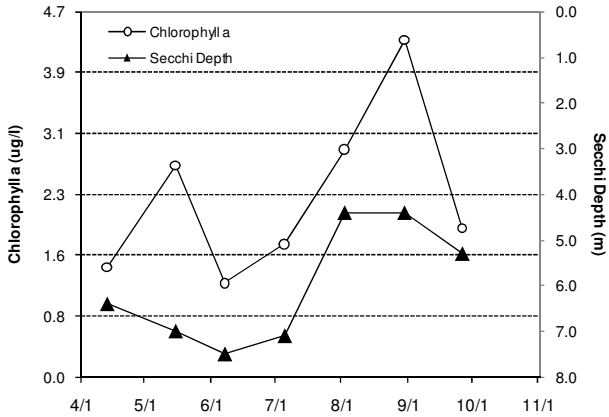


Lake ID: 820045-00
WD: Carnelian-Marine-St. Croix
Volunteers: Dan & Andrew Carlson, Warner Nature Center

● Sampling site

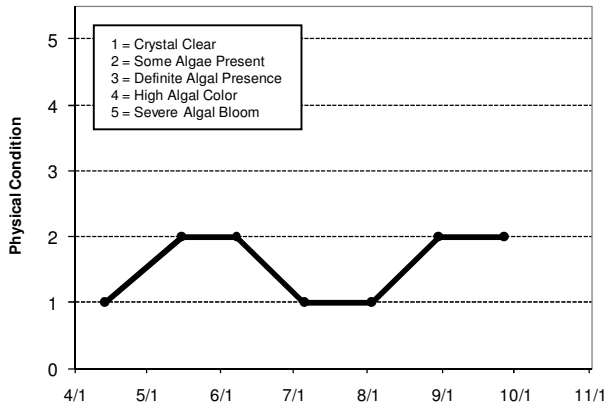
Contours in meters





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	14.0				1.4	16		6.4	1	1
5/15	13.4				2.7	11		7.0	2	1
6/7	24.8				1.2	8		7.5	2	1
7/5	27.5				1.7	11		7.1	1	2
8/2	28.2				2.9	13		4.4	1	1
8/30	28.7				4.3	20		4.4	2	2
9/26	15.9				1.9	17		5.3	2	2



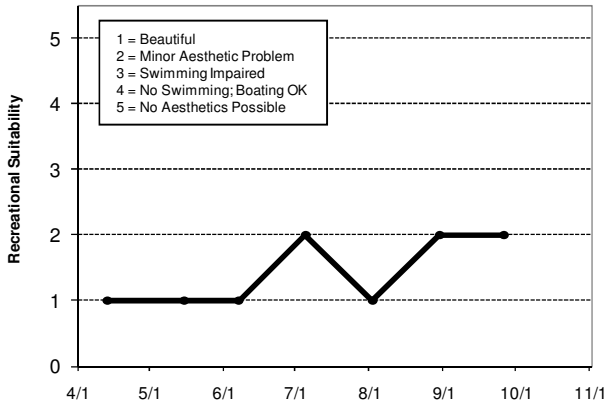
Lake Water Quality Grades Based on Summertime Averages

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												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	36.3	21.0	61.0	C
CLA (µg/l)	10.6	2.2	32.0	B
Secchi (m)	2.6	1.8	3.6	B
TKN (mg/l)	0.90	0.80	1.20	
			Lake Grade	B

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

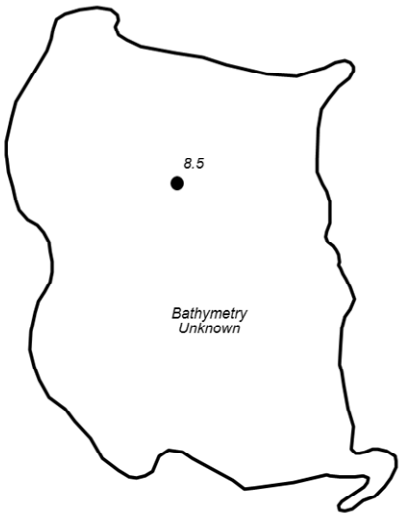
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

Cloverdale Lake

Lake Elmo, Washington Co.



● Sampling site

Contours in meters

Lake ID: 820009-00

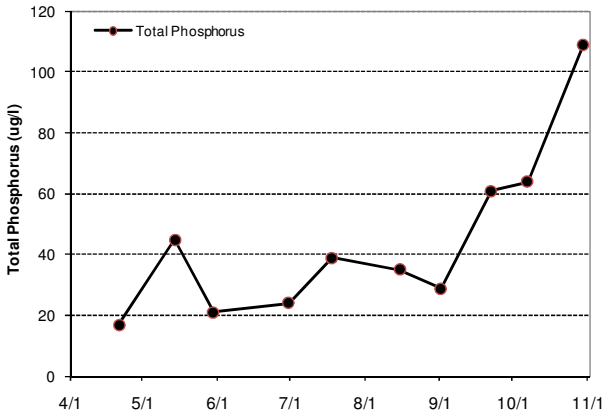
WD: Valley Branch

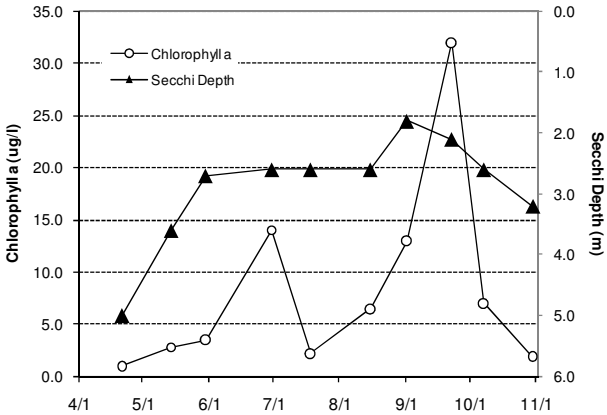
Volunteer: Dr. Kevin Bjork

N

0 100 200

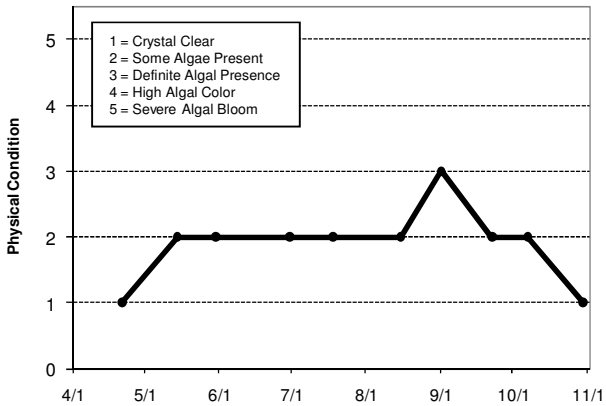
Meters





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/21	16.2				1.0	17		5.0	1	1
5/14	14.9				2.8	45		3.6	2	1
5/30	24.6				3.5	21		2.7	2	2
6/30	23.9				14.0	24		2.6	2	2
7/18	27.6				2.2	39		2.6	2	2
8/15	26.3				6.5	35		2.6	2	1
9/1	25.9				13.0	29		1.8	3	3
9/22	17.8				32.0	61		2.1	2	2
10/7	16.4				7.0	64		2.6	2	2
10/30	9.7				1.9	109		3.2	1	1



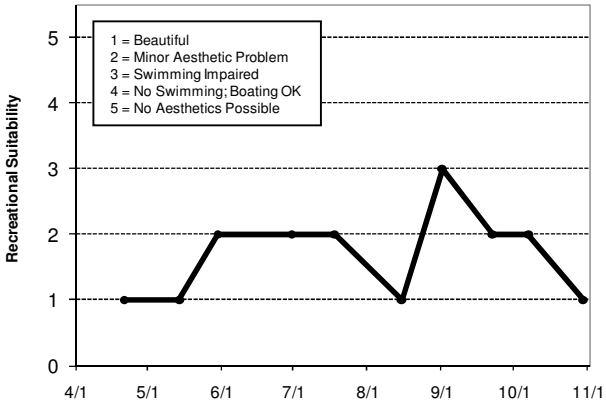
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	130.9	97.0	155.0	D
CLA (µg/l)	118.6	48.0	190.0	F
Secchi (m)	0.3	0.2	0.4	F
TKN (mg/l)	2.19	1.70	2.90	
			Lake Grade	F

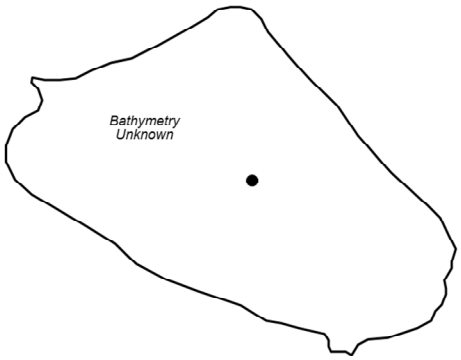
The lake's 2010 lake grade of F is consistent with the lake grades received since 2004. For the past 7 years, the lake appears to be represented well by a lake grade of F.

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

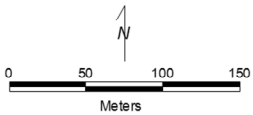
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

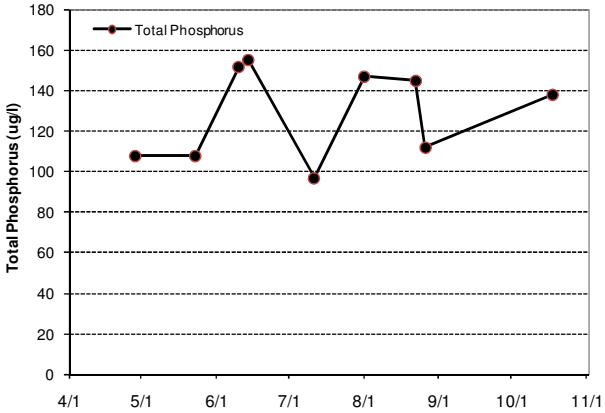
Cobblecrest Lake
St. Louis Park, Hennepin Co.

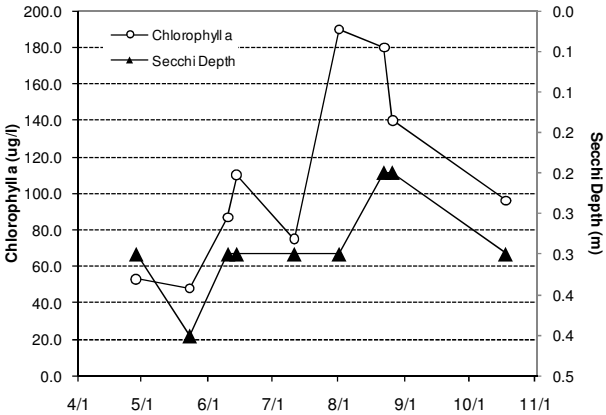
Lake ID: 270053-00
WD: Minnehaha Creek
Volunteer: Jim Kellogg



● Sampling site
Contours in meters

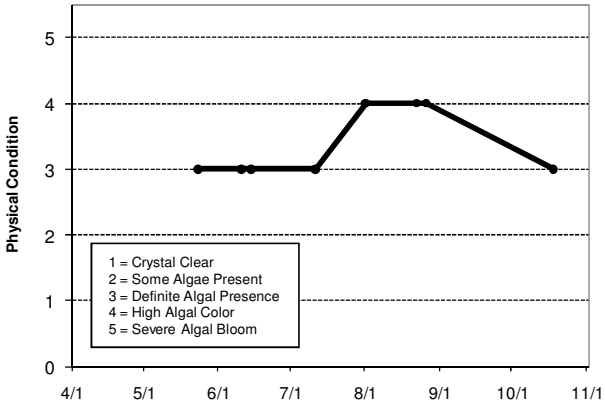






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/28	17.0				53.0	108		0.3		4
5/23	20.6				48.0	108		0.4	3	4
6/10	20.2				87.0	152		0.3	3	4
6/14	19.2				110.0	155		0.3	3	4
7/11	27.7				75.0	97		0.3	3	4
8/1	24.9				190.0	147		0.3	4	4
8/22	27.2				180.0	145		0.2	4	4
8/26	24.5				140.0	112		0.2	4	4
10/18	14.9				96.0	138		0.3	3	4



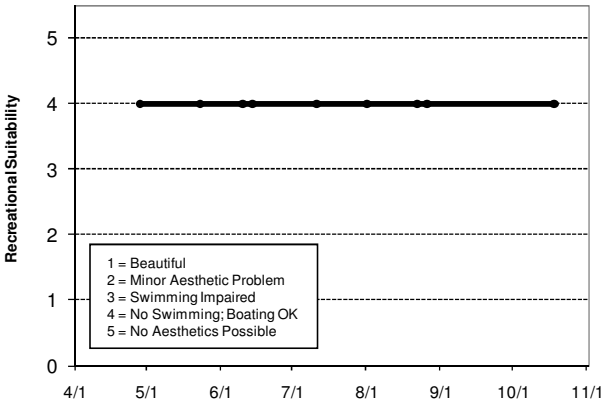
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	36.6	18.0	53.0	C
CLA (µg/l)	20.1	4.2	59.0	C
Secchi (m)	1.1	0.8	1.5	D
TKN (mg/l)	0.90	0.61	1.20	
			Lake Grade	C

The lake received a lake grade of C for 201- which is similar to the lake grades received for the previous 4 years. To better understand the lake's water quality and determine potential trends, additional years of data collection are needed.

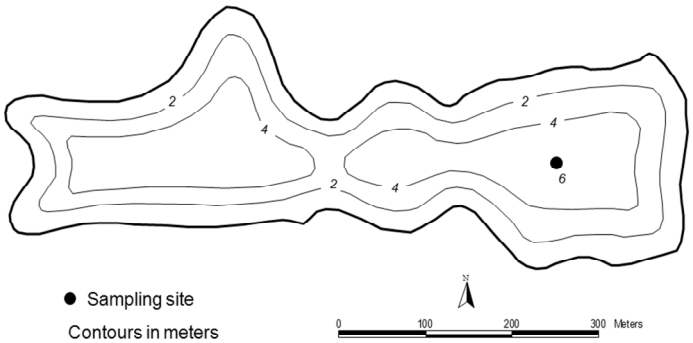
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

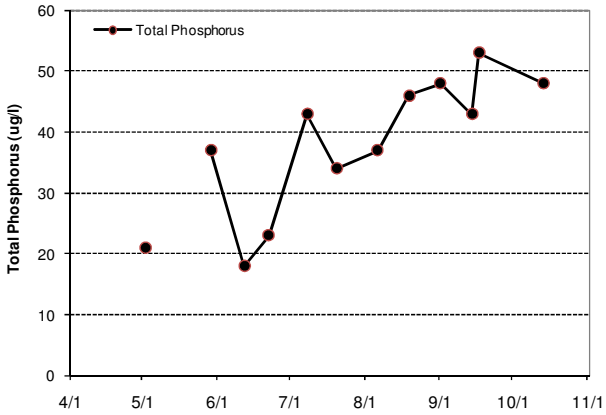
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

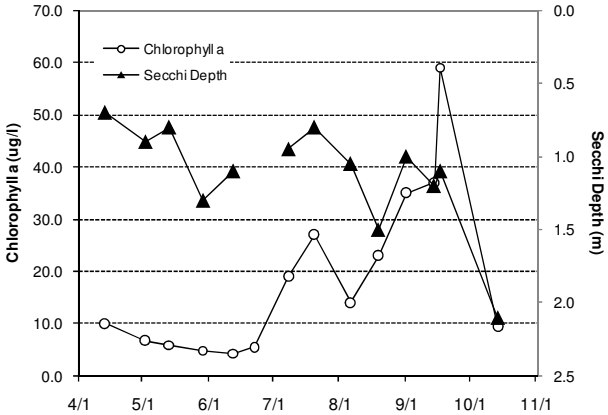
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Cobblestone Lake
Apple Valley, Dakota Co.

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

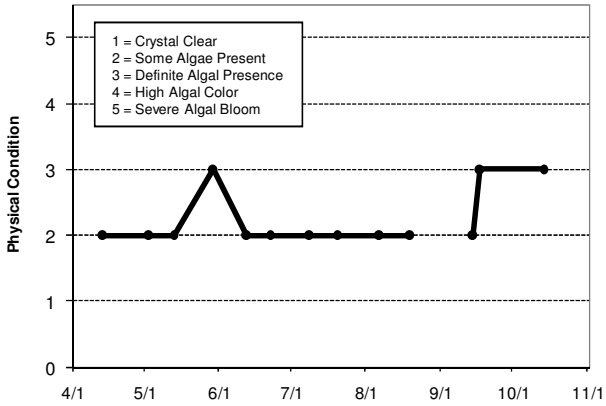






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	13.8				10.0			0.7	2	2
5/2	14.1				6.7	21		0.9	2	2
5/13	9.7				5.8			0.8	2	2
5/29	22.6				4.8	37		1.3	3	3
6/12	18.8				4.2	18		1.1	2	2
6/22	26.0				5.5	23			2	2
7/8	26.9				19.0	43		1.0	2	2
7/20	26.8				27.0	34		0.8	2	2
8/6	26.4				14.0	37		1.1	2	2
8/19	18.8				23.0	46		1.5	2	2
9/1	18.8				35.0	48		1.0		
9/14	19.5				37.0	43		1.2	2	2
9/17	19.0				59.0	53		1.1	3	4
10/14					9.5	48		2.1	3	3



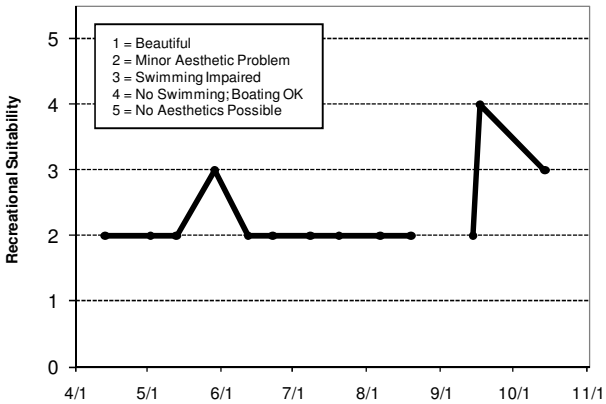
Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	84.1	34.0	129.0	D
CLA (µg/l)	39.2	12.0	67.0	C
Secchi (m)	1.0	0.4	1.8	D
TKN (mg/l)	1.54	1.20	1.90	
			Lake Grade	D

The lake received a water quality lake grade of D for 2010, which is consistent with the historical database. The lake's water quality seems well represented by an overall water quality grade of D or F, depending on the year.

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

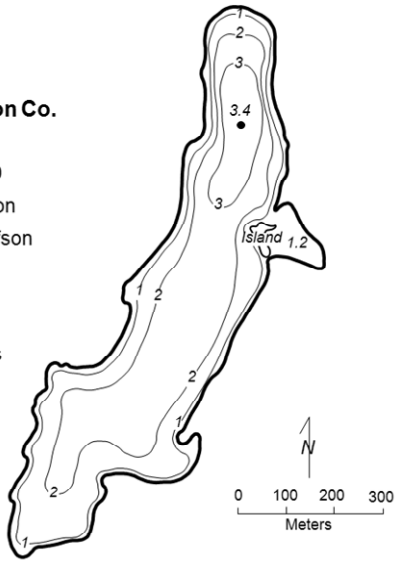
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

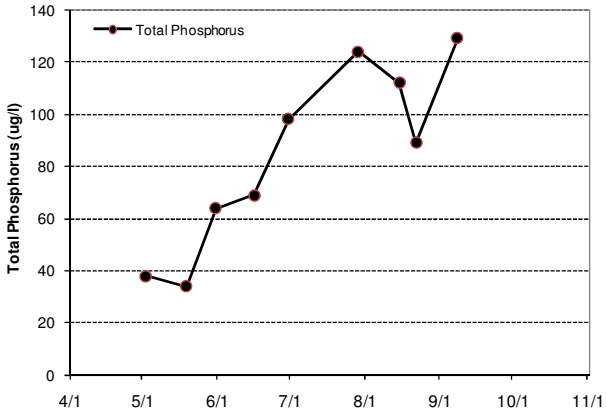
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

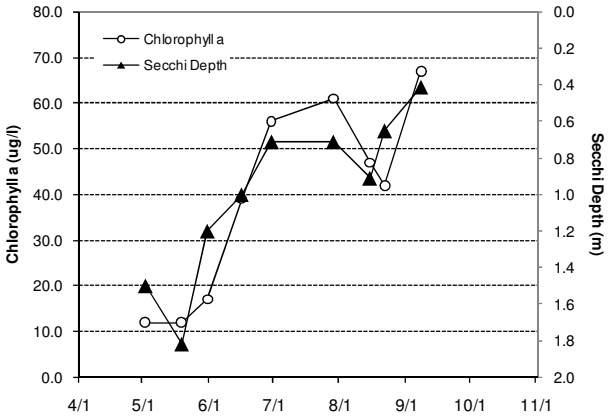
Colby Lake
Woodbury, Washington Co.

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

• Sampling site
Contours in meters

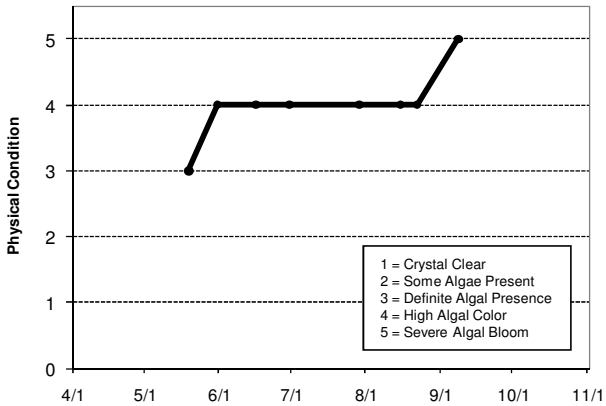






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/2	19.5				12.0	38		1.5		4
5/19	19.7				12.0	34		1.8	3	4
5/31	19.8				17.0	64		1.2	4	4
6/16	21.0				39.0	69		1.0	4	4
6/30	26.0				56.0	98		0.7	4	4
7/29	29.6				61.0	124		0.7	4	4
8/15	26.3				47.0	112		0.9	4	4
8/22	28.2				42.0	89		0.7	4	4
9/8					67.0	129		0.4	5	4



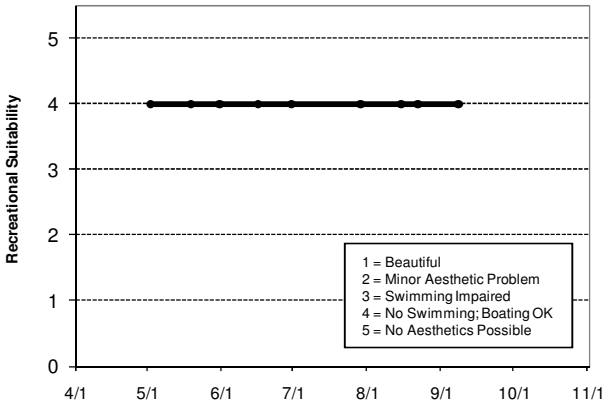
Lake Water Quality Grades Based on Summertime Averages

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	31.4	8.0	124.0	B
CLA (µg/l)	7.0	1.7	43.0	A
Secchi (m)	3.6	1.1	5.2	A
TKN (mg/l)	0.79	0.43	1.50	
			Lake Grade	A

The lake received a lake grade of A for 2010, which is consistent with the historical water quality database. The lake's water quality seems well represented by a lake grade of A.

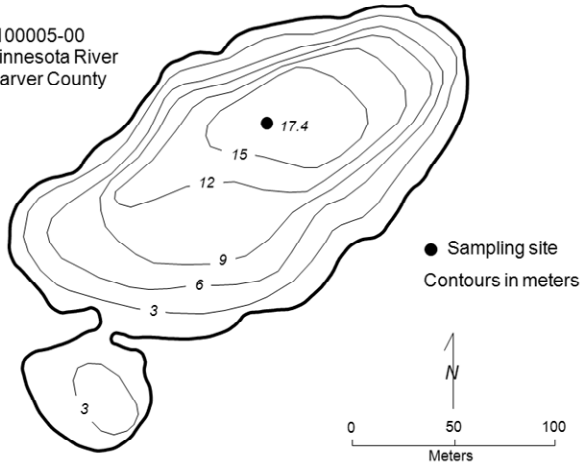
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

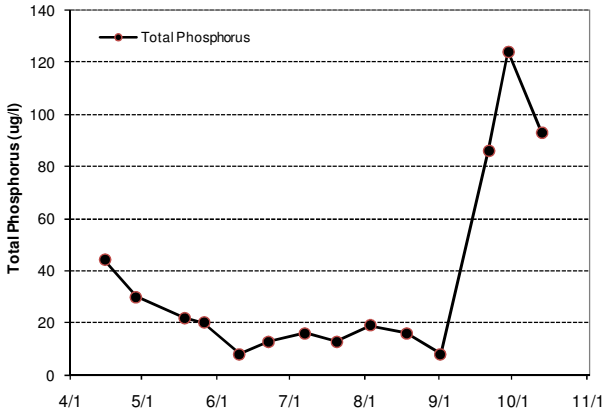
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

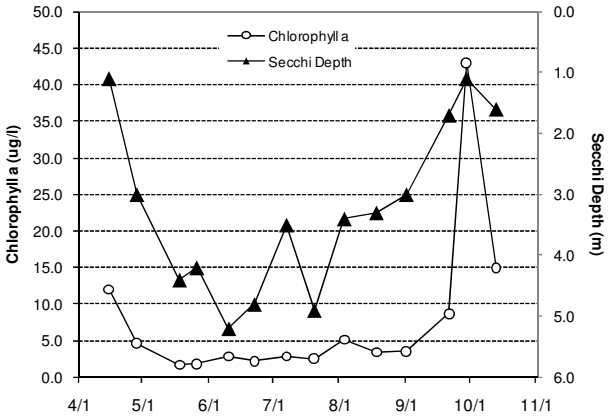
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Courthouse Lake
Chaska, Carver Co.

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

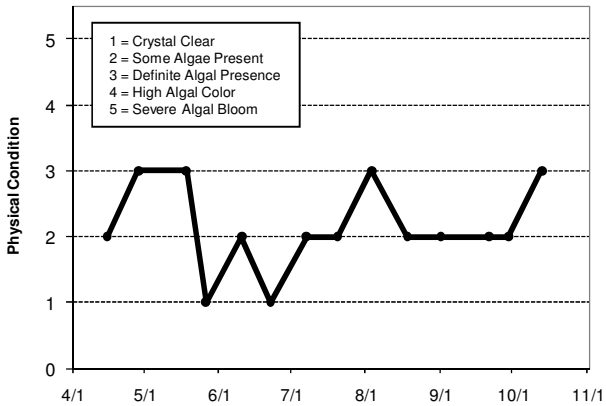






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/15	15.8	3.9	14.2	0.2	12.0	44		1.1	2	3
4/28	15.2	3.9	16.7	0.3	4.6	30		3.0	3	2
5/18	18.0	4.0	12.6	0.2	1.7	22		4.4	3	3
5/26	23.9	4.0	9.2	0.1	1.8	20		4.2	1	2
6/10	21.4	4.0	9.3	0.1	2.8	8		5.2	2	2
6/22	24.0	4.0	9.4	0.4	2.2	13		4.8	1	1
7/7	27.1	4.1	11.4	0.3	2.8	16		3.5	2	1
7/20	26.8	4.1	10.2	0.2	2.5	13		4.9	2	1
8/3	27.7	4.2	8.6	0.2	5.1	19		3.4	3	2
8/18	25.7	4.2	9.6	0.1	3.4	16		3.3	2	1
9/1	25.8	4.3	9.3	0.3	3.5	8		3.0	2	1
9/21	15.3	11.3	5.3	1.3	8.7	86		1.7	2	3
9/29	16.2	12.8	11.2	0.0	43.0	124		1.1	2	2
10/13	14.8	14.8	3.3	3.6	15.0	93		1.6	3	3



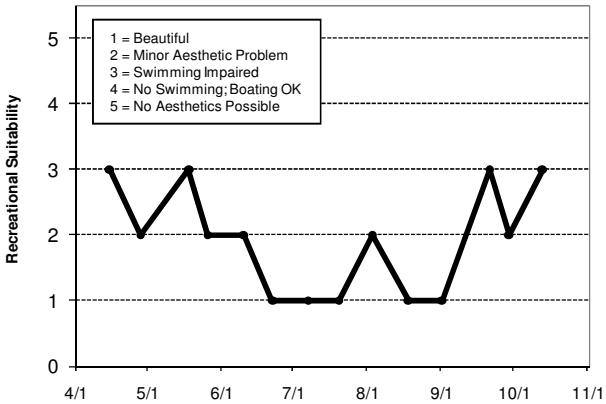
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	145.3	107.0	177.0	D
CLA (µg/l)	5.0	1.9	7.5	A
Secchi (m)	0.7	0.7	0.8	D
TKN (mg/l)	0.92	0.75	1.10	
			Lake Grade	C

The lake received a lake grade of C for 2010, which is better than the other years with sufficient data. Of particular note for the 2010 monitoring season is that the lake experienced a relatively low CLA summer-time mean concentration compared to the summer-time means of TP concentration and secchi depth (which yielded a CLA grade of A versus the D grades for TP and water clarity). The relatively lower CLA concentrations indicate that possibly something other than algal abundance was causing the diminished water clarity. Suspended particulates may be a possible cause of the relatively lower water clarity and higher TP concentrations. Likely causes may be either that lake sediment was resuspended in the water column because of frequent mixing events, or the lake received significant quantities of suspended solids from the watershed via runoff events, or both. In either case, the increase turbidity would decrease available light via reduced water clarity, and thereby suppress algal growth.

CLA was not decoupled from the TP and Secchi in years 2006 and 2007. Additional annual monitoring is suggested to determine water quality trends and if CLA continues to be decoupled from the other two trophic parameters.

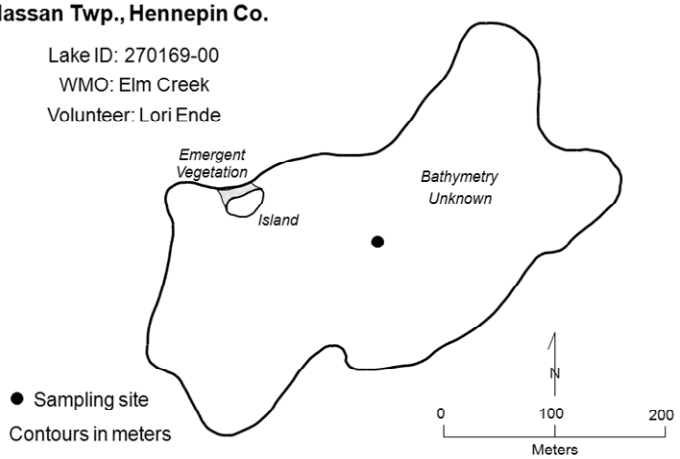
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

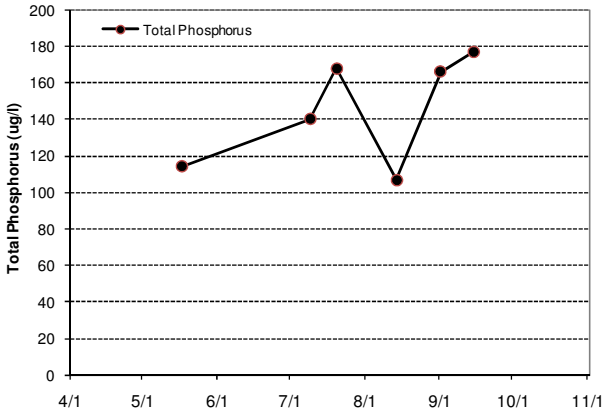
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

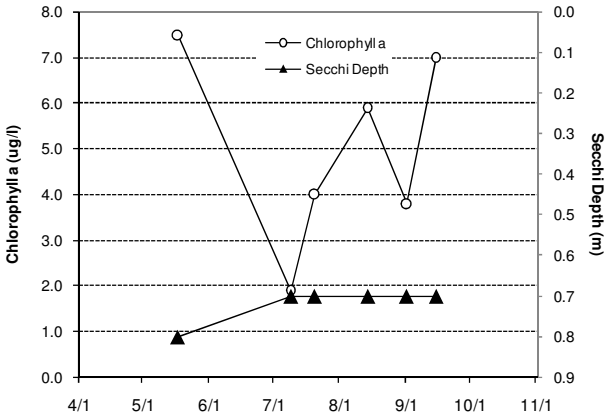
Cowley Lake

Hassan Twp., Hennepin Co.

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

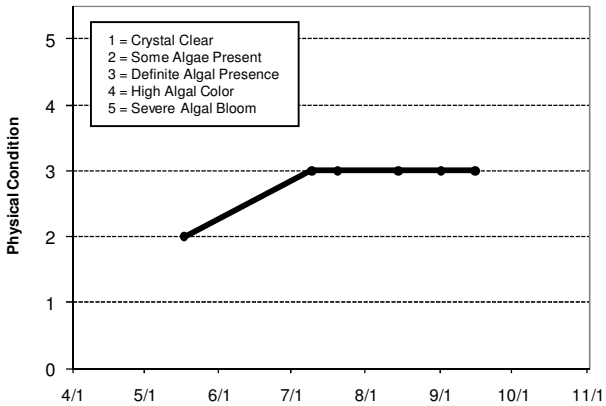






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/17	20.0				7.5	114		0.8	2	4
7/9	23.0				1.9	140		0.7	3	4
7/20	24.2				4.0	168		0.7	3	4
8/14	24.3				5.9	107		0.7	3	4
9/1	22.0				3.8	166		0.7	3	4
9/15	22.0				7.0	177		0.7	3	4



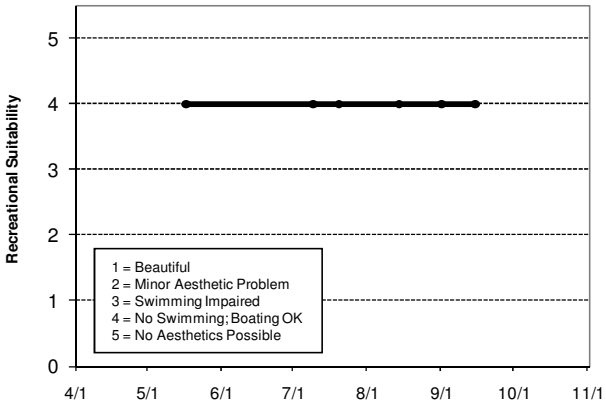
Lake Water Quality Grades Based on Summertime Averages

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

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

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.

2010 summer (May-September) data summary

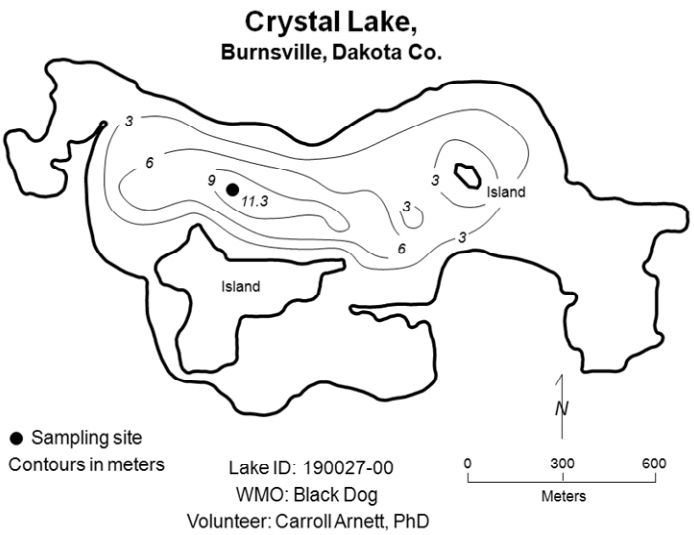
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	30.7	14.0	57.0	B
CLA (µg/l)	23.0	3.4	59.0	C
Secchi (m)	1.8	0.7	4.1	C
TKN (mg/l)	1.06	0.66	1.80	
			Lake Grade	C

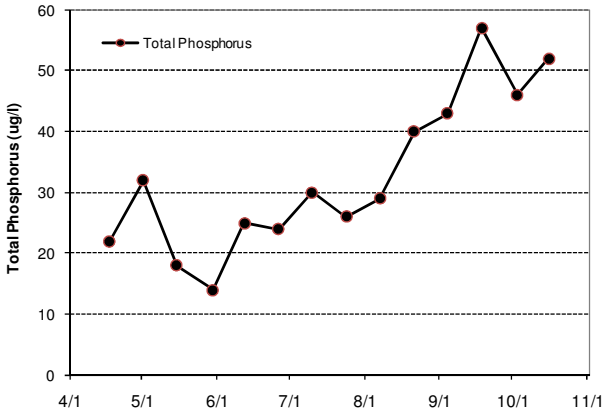
The lake received a lake grade of C for 2010. The lake typically receives a C lake grade according to its historical water quality database.

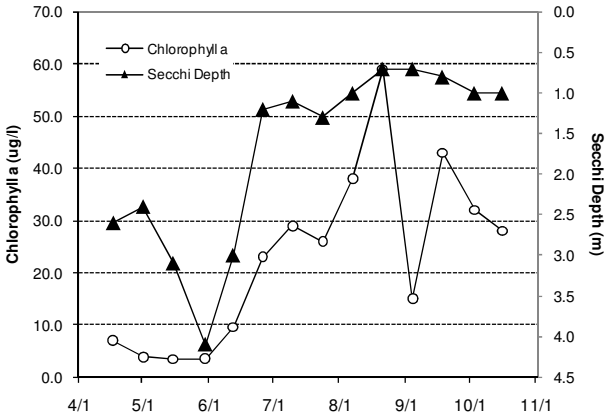
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

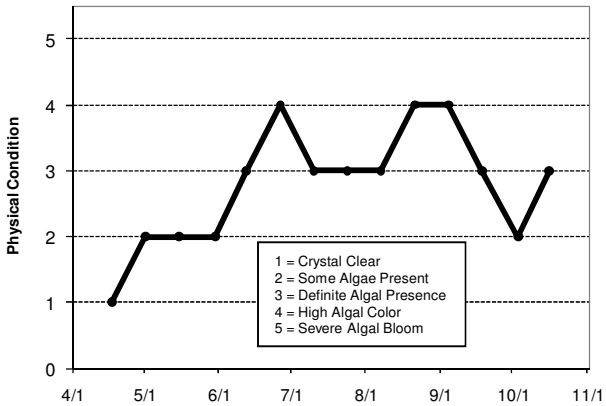






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/17	14.0				7.0	22		2.6	1	1
5/1	15.1				3.9	32		2.4	2	2
5/15	14.1				3.4	18		3.1	2	1
5/30	24.0				3.5	14		4.1	2	1
6/12	20.2				9.6	25		3.0	3	2
6/26	26.3				23.0	24		1.2	4	2
7/10	26.9				29.0	30		1.1	3	2
7/24	26.6				26.0	26		1.3	3	2
8/7	26.8				38.0	29		1.0	3	2
8/21	26.1				59.0	40		0.7	4	3
9/4	21.1				15.0	43		0.7	4	3
9/18	17.3				43.0	57		0.8	3	2
10/3					32.0	46		1.0	2	2
10/16	15.7				28.0	52		1.0	3	2



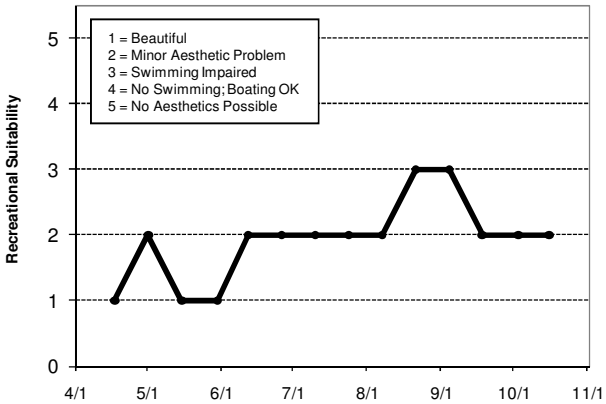
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



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

Crystal Lake is a 76-acre lake located in the City of Robbinsdale (Hennepin County). The lake has a maximum and mean depth of 10.4 meters and 3.7 meters, respectively. The lake's fishing pier and earthen public access are located on the southeastern end 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.

2010 summer (May-September) data summary

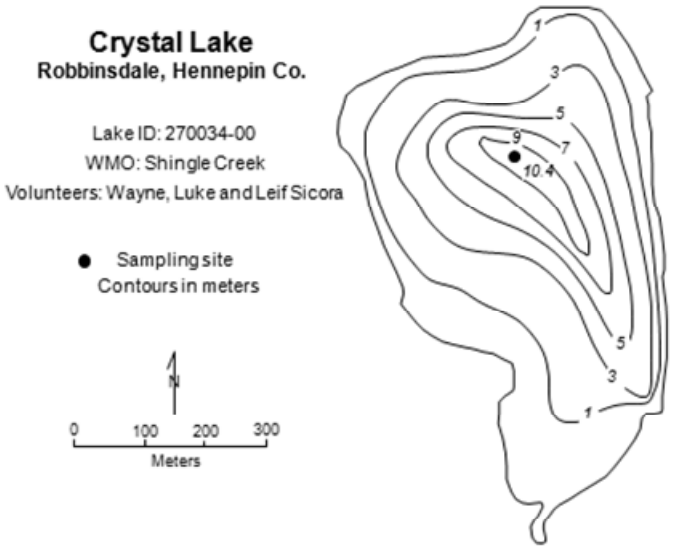
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	90.1	71.0	110.0	D
CLA (µg/l)	57.3	9.9	100.0	D
Secchi (m)	0.6	0.4	0.8	F
TKN (mg/l)	2.29	1.50	3.70	
			Lake Grade	D

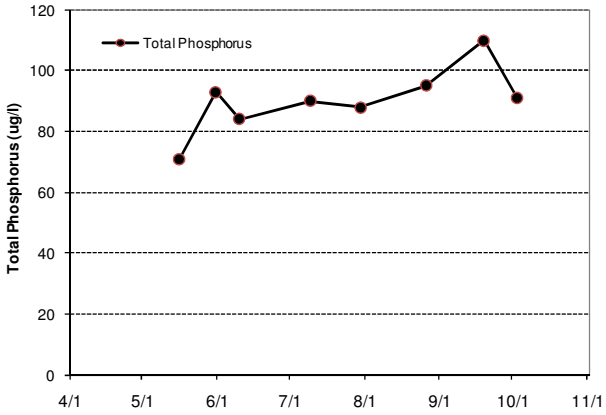
The lake received a lake grade of D for 2010. The lake has typically received a D grade according to its water quality database. The lake has typically received D Secchi grades. Additionally monitoring is suggested to determine potential water quality trends.

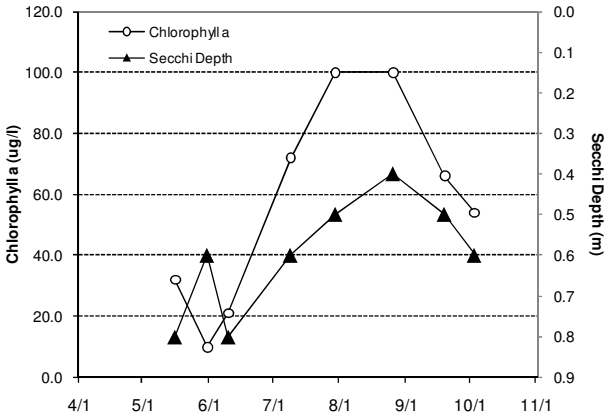
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

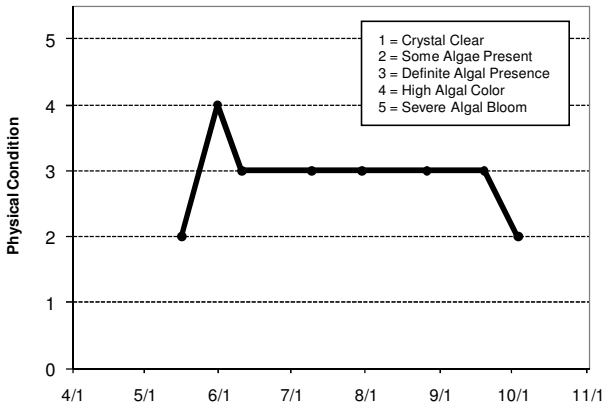






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/16	18.7				32.0	71		0.8	2	4
5/31	26.9				9.9	93		0.6	4	4
6/10	20.8				21.0	84		0.8	3	4
7/9	28.9				72.0	90		0.6	3	3
7/30	26.5				100.0	88		0.5	3	4
8/26	25.3				100.0	95		0.4	3	3
9/19	18.2				66.0	110		0.5	3	3
10/3	16.6				54.0	91		0.6	2	4



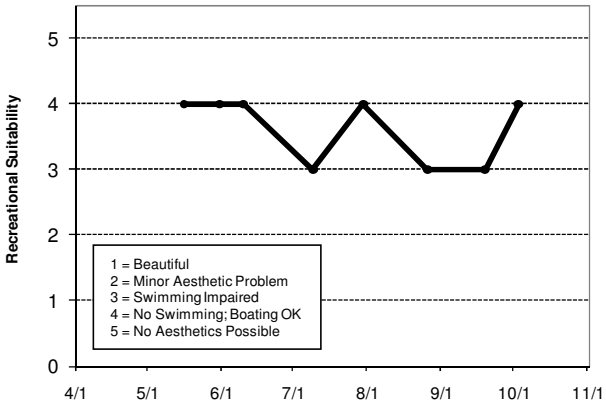
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

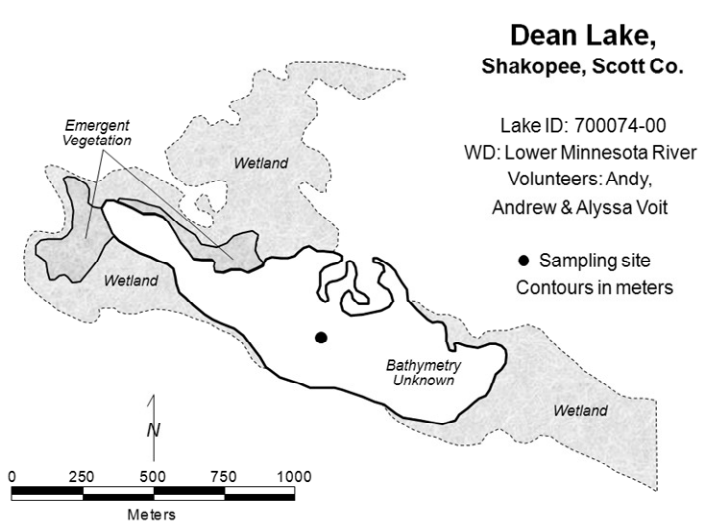
2010 summer (May-September) data summary

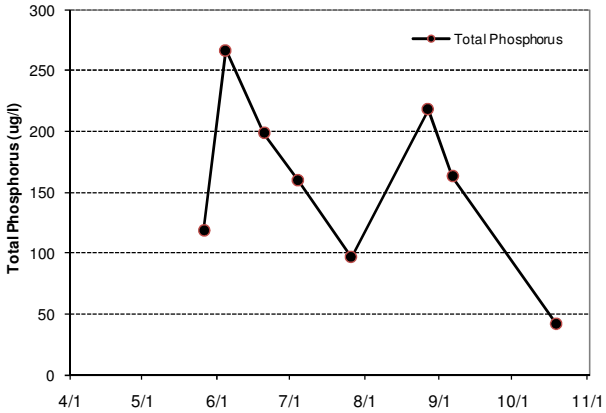
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	174.7	97.0	267.0	F
CLA (µg/l)	27.1	6.2	81.0	C
Secchi (m)	0.7	0.6	0.7	
TKN (mg/l)	1.50	1.10	2.10	
			Lake Grade	

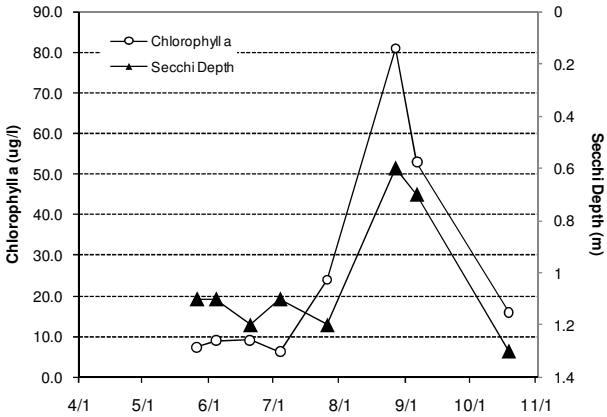
A new, deeper sampling point was monitored this year. The new point was established to avoid low water conditions, which hindered the monitoring at the former site. The lake did not receive a lake grade this year because the Secchi grade could not be determined. Even with the deeper site, the Secchi disk was visible on the bottom of the lake for much of the monitoring season. Secchi depths ranged from 0.6 m to more than 1.3 m.

Throughout the monitoring period, the volunteer's opinions of the lake'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.



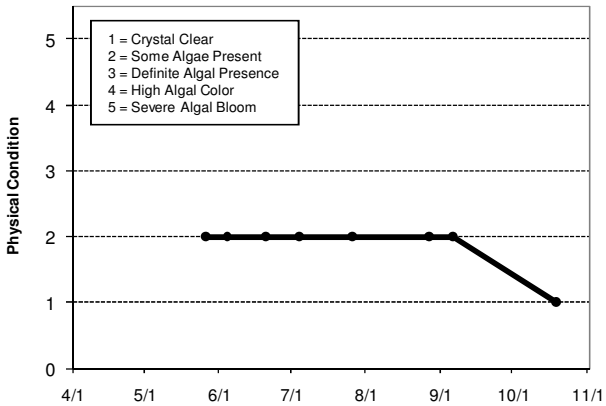




2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/26	26.9				7.4	119		1.1+	2	1
6/4	24.6				9.0	267		1.1+	2	1
6/20	26.6				9.1	199		1.2+	2	1
7/4	27.5				6.2	160		1.1+	2	2
7/26	29.3				24.0	97		1.2+	2	2
8/27	24.2				81.0	218		0.6	2	2
9/6	19.1				53.0	163		0.7	2	1
10/19	12.4				16.0	42		1.3+	1	1

+ Secchi Disk visible on lake bottom



Lake Water Quality Grades Based on Summertime Averages

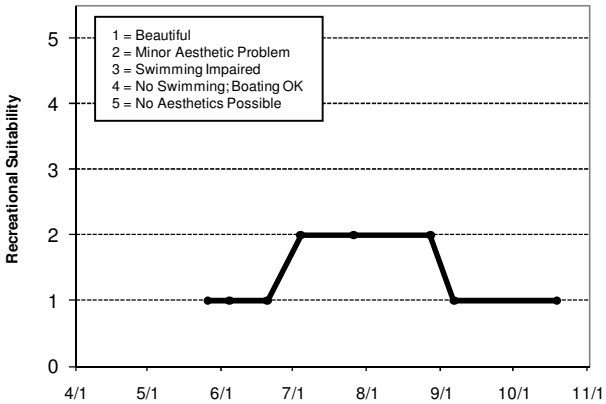
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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

Year	2004	2005	2006	2007	2008	2009	2010
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**

* Secchi Disk visible on lake bottom

Source: Metropolitan Council and STORET data



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

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

2010 summer (May-September) data summary

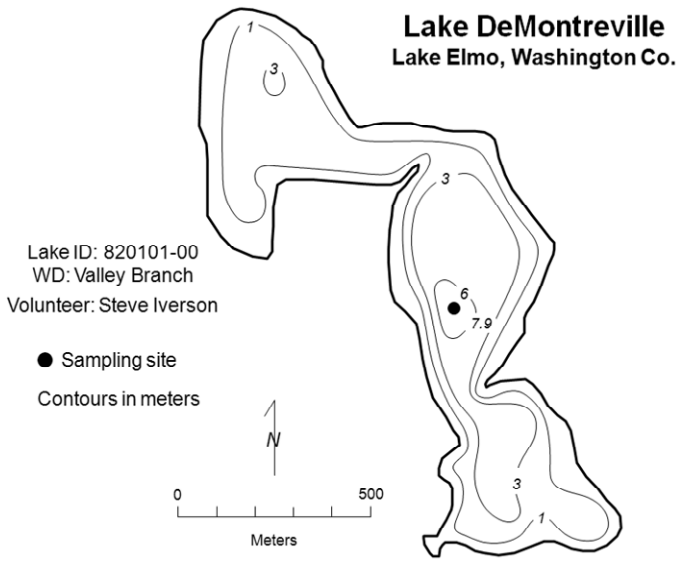
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	37.5	22.0	54.0	C
CLA (µg/l)	15.4	2.1	34.0	B
Secchi (m)	3.1	1.1	6.5	A
TKN (mg/l)	0.87	0.42	1.30	
			Lake Grade	B

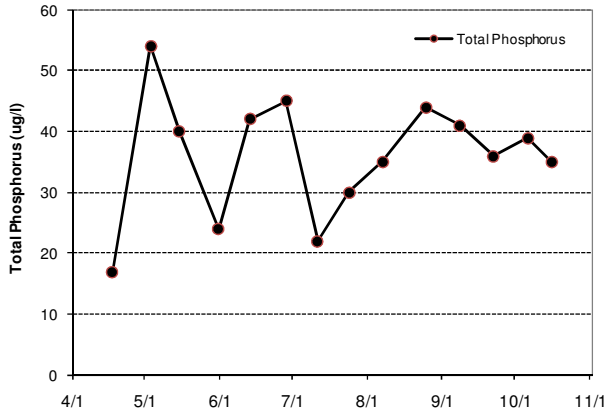
The lake received a lake grade of B for 2010. Historically, the lake grades for the years 1980 through 2010 show that the quality of the lake has improved over the past 30 years (see lake information sheet on the following page). The lake has been fluctuating between an A and B grades since the early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

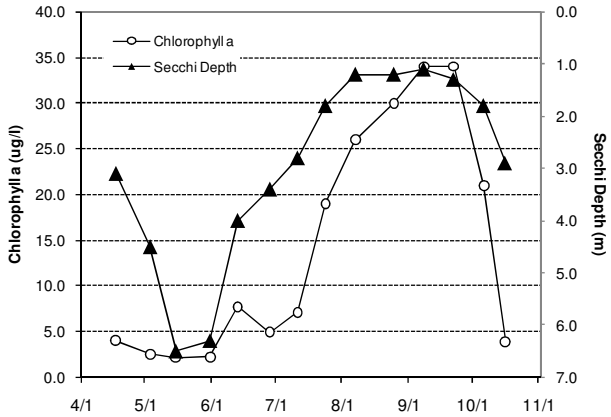
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

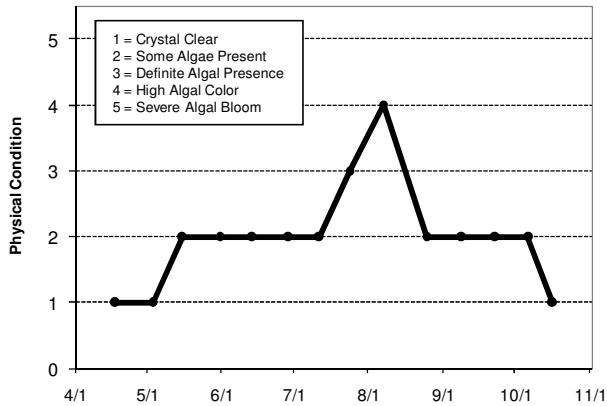






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/17	14.0				4.0	17		3.1	1	1
5/3	14.8				2.5	54		4.5	1	1
5/15	16.0				2.1	40		6.5	2	1
5/31	24.7				2.2	24		6.3	2	1
6/13	20.2				7.7	42		4.0	2	1
6/28	24.6				4.9	45		3.4	2	1
7/11	27.6				7.1	22		2.8	2	1
7/24	27.0				19.0	30		1.8	3	1
8/7	28.0				26.0	35		1.2	4	1
8/25	26.0				30.0	44		1.2	2	1
9/8	20.5				34.0	41		1.1	2	1
9/22	17.7				34.0	36		1.3	2	1
10/6	15.8				21.0	39		1.8	2	1
10/16	15.4				3.9	35		2.9	1	1

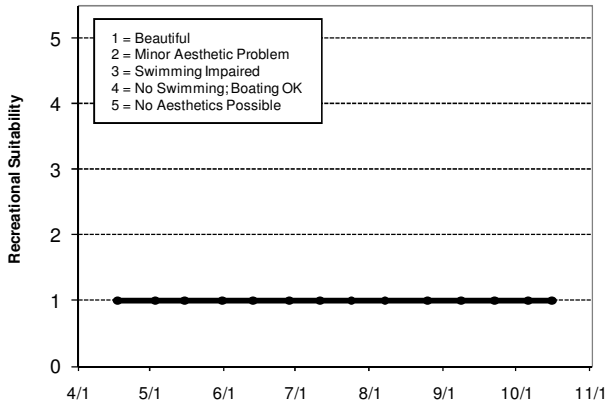


Lake Water Quality Grades Based on Summertime Averages

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



Source: Metropolitan Council and STORET data

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

Downs Lake is located in Lake Elmo (Washington County). The lake has mean and maximum depths of 1.5 m (5 feet) and 2.1 m (7 feet), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	259.0	259.0	259.0	
CLA (µg/l)	210.0	210.0	210.0	
Secchi (m)	0.3	0.3	0.3	
TKN (mg/l)	3.40	3.40	3.40	
			Lake Grade	

There were fewer than 5 monitoring events (just one) during the summer period, so there were insufficient data to calculate letter grades.

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

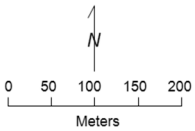
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

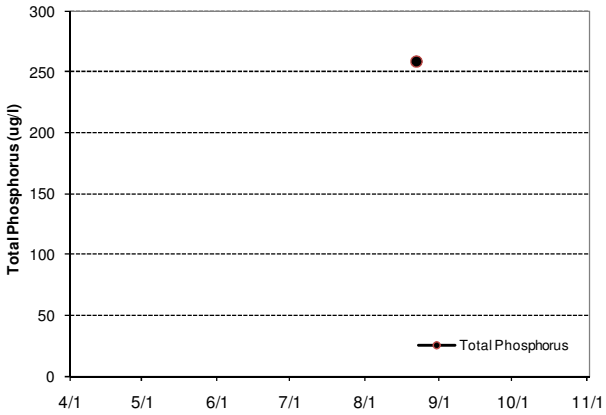
Downs Lake

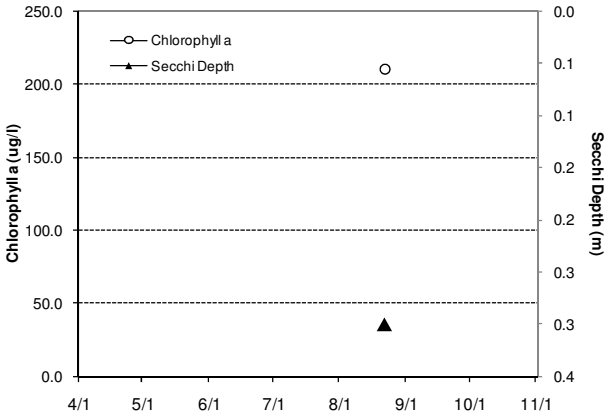
Lake Elmo, Washington Co.

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

● Sampling site
Contours in meters

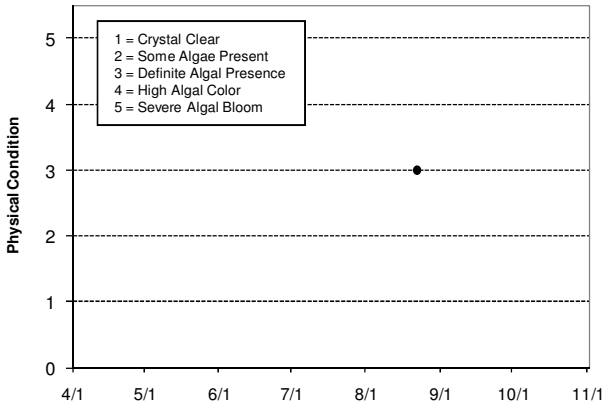






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
8/22	29.6				210.0	259		0.3	3	4

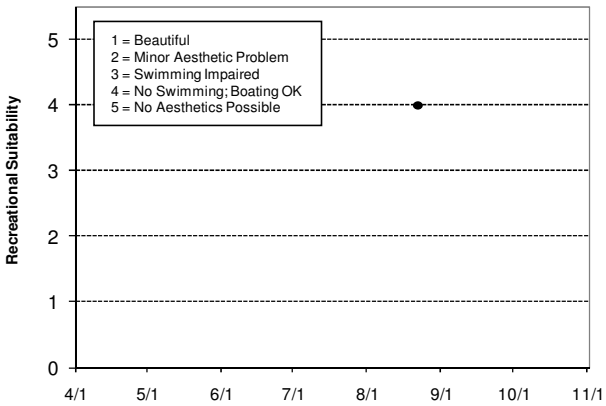


Lake Water Quality Grades Based on Summertime Averages

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

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

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



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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	121.2	49.0	194.0	D
CLA (µg/l)	58.4	18.0	110.0	D
Secchi (m)	0.6	0.3	1.4	F
TKN (mg/l)	2.35	1.80	3.00	
			Lake Grade	D

The lake received a lake grade of D for 2010. The lake appears to fluctuate between a lake grade of D and 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.

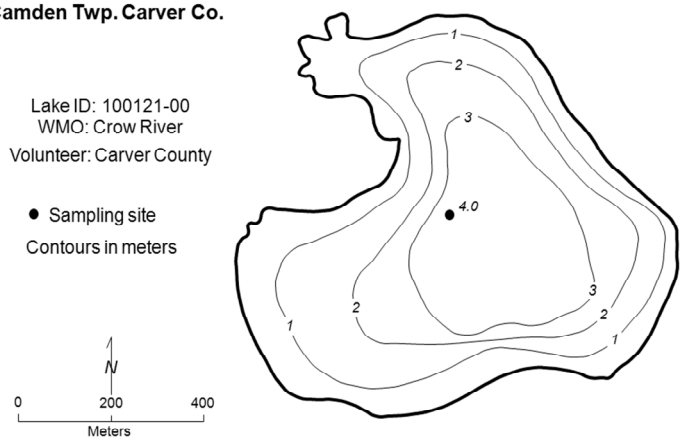
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

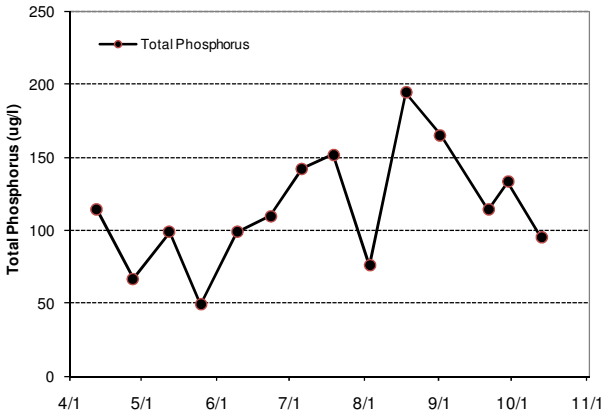
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

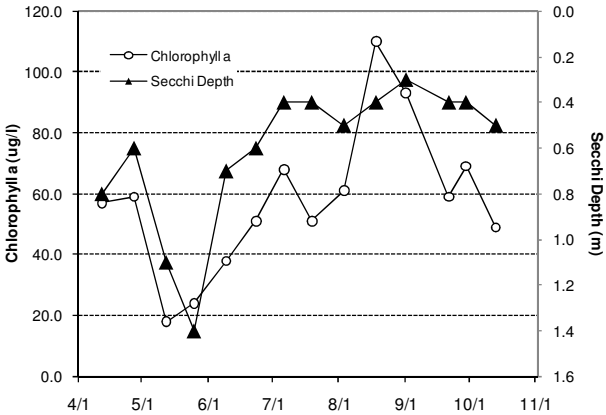
Eagle Lake,
Camden Twp. Carver Co.

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

● Sampling site
Contours in meters

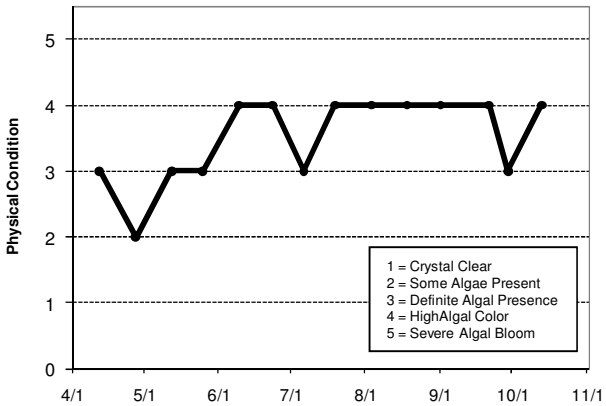






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	11.2	10.9	17.5	17.1	57.0	114		0.8	3	3
4/27	13.2	13.1	16.3	15.7	59.0	67		0.6	2	2
5/12	10.7	10.6	10.0	9.7	18.0	99		1.1	3	2
5/25	21.7	12.9	10.3	0.7	24.0	49		1.4	3	4
6/9	20.4	20.3	8.8	8.3	38.0	99		0.7	4	4
6/23	24.7	21.1	15.0	0.5	51.0	110		0.6	4	4
7/6	26.1	24.2	14.6	0.4	68.0	142		0.4	3	3
7/19	26.2	25.1	8.5	1.0	51.0	152		0.4	4	4
8/3	27.8	25.6	10.8	0.6	61.0	76		0.5	4	4
8/18	23.8	23.3	10.1	6.5	110.0	194		0.4	4	4
9/1	23.9	23.5	9.7	7.1	93.0	165		0.3	4	4
9/21	17.0	16.5	10.2	9.9	59.0	114		0.4	4	4
9/29	15.4	15.3	8.5	8.9	69.0	133		0.4	3	3
10/13	15.6	15.3	11.3	11.4	49.0	95		0.5	4	4

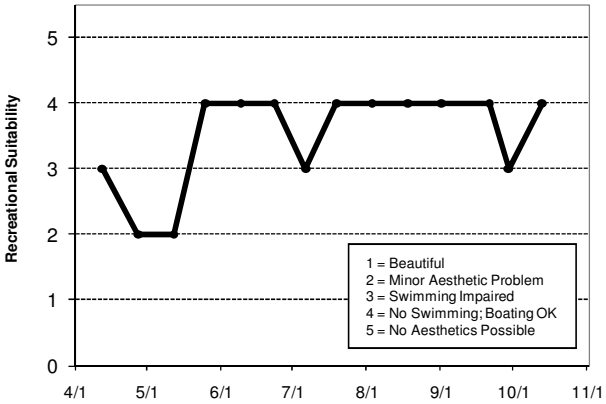


Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	39.5	25.0	63.0	C
CLA (µg/l)	14.8	4.5	29.0	B
Secchi (m)	1.5	1.0	2.2	C
TKN (mg/l)	0.63	0.44	1.00	
			Lake Grade	C

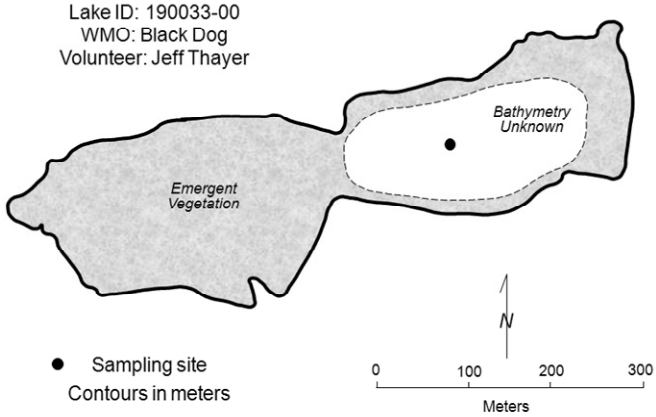
The lake received a lake grade of B for 2010, which is consistent with the lake's water quality database.

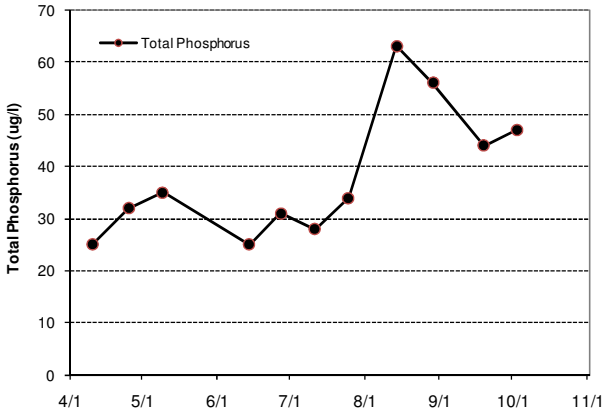
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

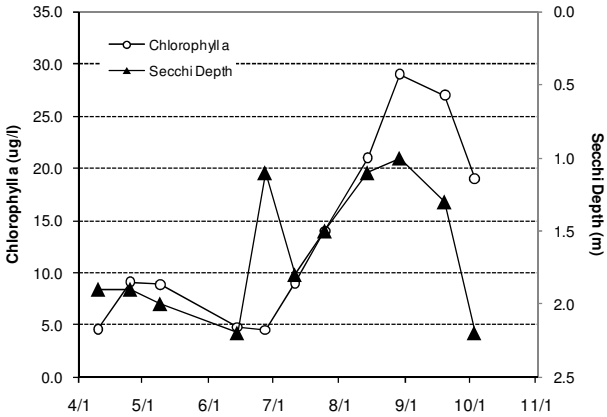
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Earley Lake
Burnsville, Dakota Co.

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

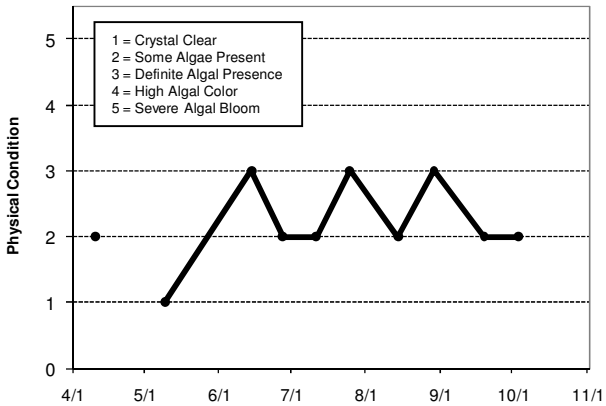






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/10	13.1				4.6	25		1.9	2	2
4/25	15.7				9.1	32		1.9		
5/9	13.2				8.9	35		2.0	1	4
6/14	13.4				4.8	25		2.2	3	4
6/27	25.0				4.5	31		1.1	2	4
7/11	28.0				9.0	28		1.8	2	4
7/25	28.1				14.0	34		1.5	3	4
8/14	26.2				21.0	63		1.1	2	4
8/29	26.8				29.0	56		1.0	3	4
9/19	16.5				27.0	44		1.3	2	4
10/3	17.1				19.0	47		2.2	2	



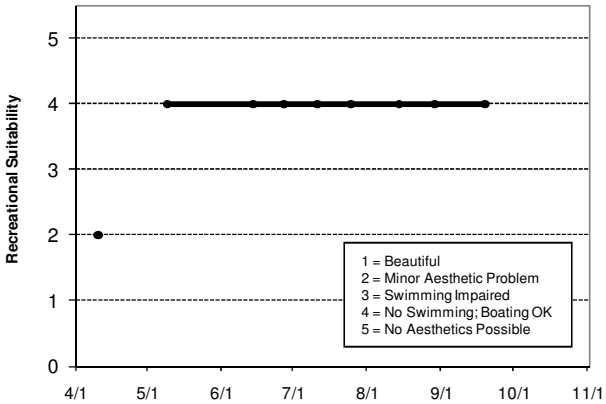
Lake Water Quality Grades Based on Summertime Averages

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

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

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.

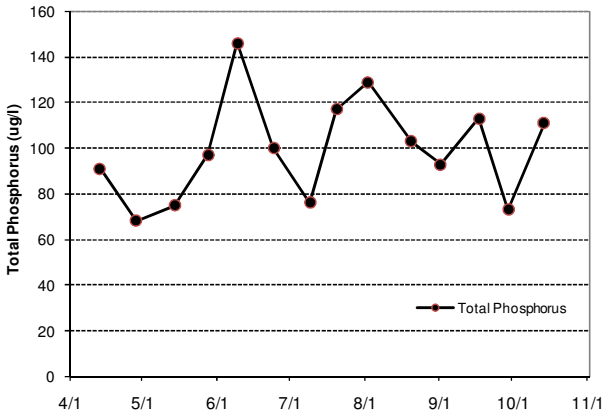
2010 summer (May-September) data summary

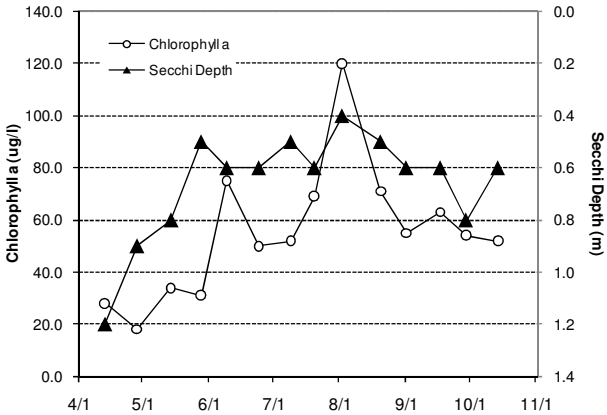
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	102.0	73.0	146.0	D
CLA (µg/l)	61.3	31.0	120.0	D
Secchi (m)	0.6	0.4	0.8	F
TKN (mg/l)	1.40	1.10	1.90	
			Lake Grade	D

The lake received a lake grade of D for 2010. Further monitoring is suggested to 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.

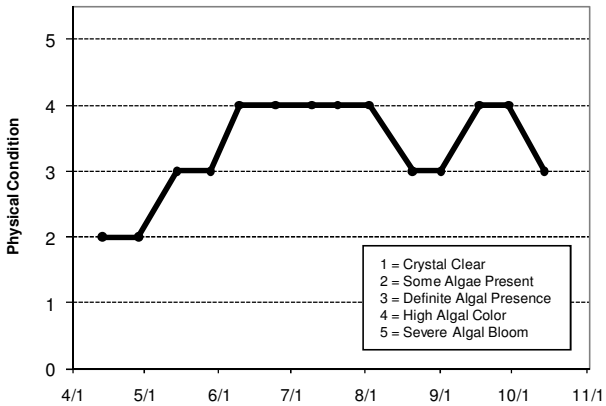
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	12.0				28.0	91		1.2	2	3
4/28	13.0				18.0	68		0.9	2	4
5/14	9.4				34.0	75		0.8	3	2
5/28	22.0				31.0	97		0.5	3	4
6/9	19.0				75.0	146		0.6	4	4
6/24	23.0				50.0	100		0.6	4	4
7/9	26.0				52.0	76		0.5	4	4
7/20	26.0				69.0	117		0.6	4	4
8/2	26.0				120.0	129		0.4	4	4
8/20	23.0				71.0	103		0.5	3	4
9/1	22.0				55.0	93		0.6	3	4
9/17	14.4				63.0	113		0.6	4	4
9/29	14.0				54.0	73		0.8	4	4
10/14	15.5				52.0	111		0.6	3	4



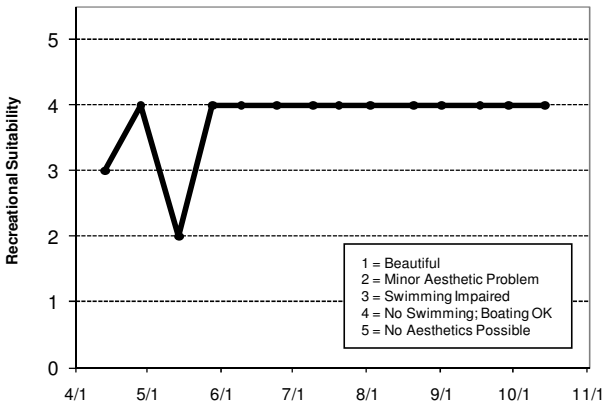
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



East Boot Lake (82-0034) *Carnelian - Marine Watershed District*

East Boot Lake is located in May Township (Washington County). The mean and maximum depths of the 47-acre lake are 8.2 m (27 feet) and 0.9 m (3 feet), respectively.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	29.5	23.0	41.0	B
CLA (µg/l)	5.5	2.3	8.2	A
Secchi (m)	3.7	1.5	5.0	A
TKN (mg/l)	0.91	0.58	1.10	
			Lake Grade	A

The lake received a lake grade of A for 2010, which is similar to the 2009 lake grade. This was the second 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.

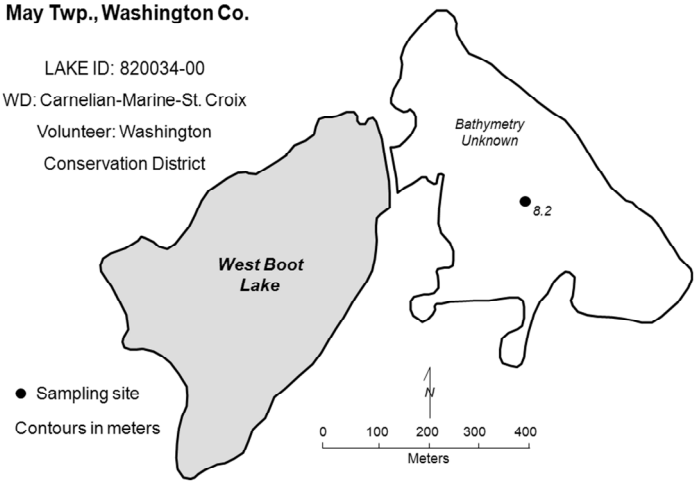
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

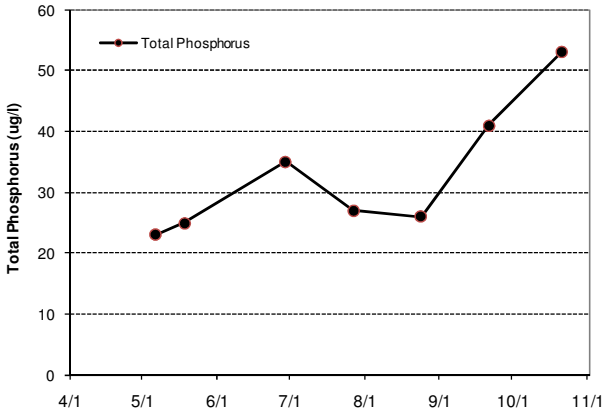
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

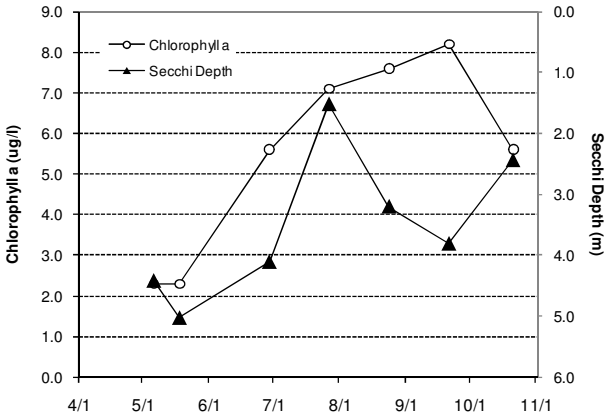
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

East Boot Lake
May Twp., Washington Co.

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

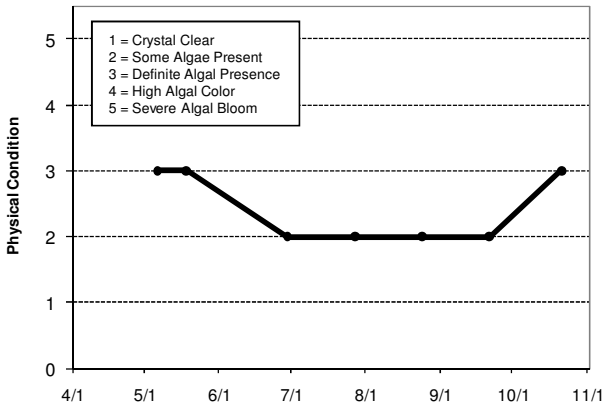






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/6	14.4	6.5	10.6	0.0	2.3	23		4.4	3	4
5/18	18.7	6.8	12.0	0.0	2.3	25		5.0	3	4
6/29	23.7	8.3	8.4	0.0	5.6	35		4.1	2	3
7/27	27.3	8.2	9.7	0.0	7.1	27		1.5	2	3
8/24	25.8	9.3	10.2	0.1	7.6	26		3.2	2	3
9/21	17.0	9.8	8.3	0.1	8.2	41		3.8	2	3
10/21	12.9	12.1	7.9	1.6	5.6	53		2.4	3	3



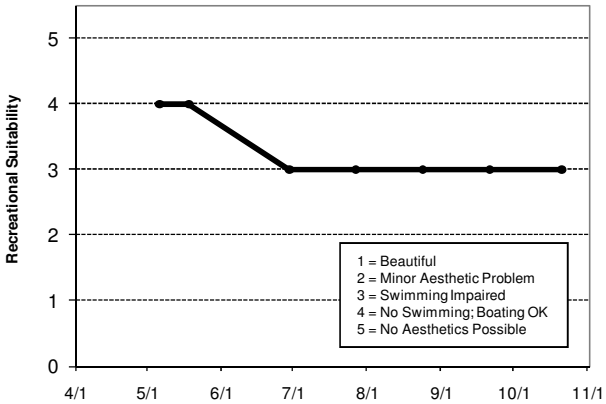
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



Echo Lake (82-0135) *Valley Branch Watershed District*

Echo Lake is a 41-acre lake located within the City of Mahtomedi (Washington County). The mean and maximum depth of the lake is 0.8 m (2.6 feet) and 1.8 m (6 feet), respectively. Because of the shallowness of the lake, its entire area is considered littoral (the shallow [0-15 foot depth] area dominated by aquatic vegetation), and it never maintains a thermocline (a density gradient caused by changing water temperatures throughout the lake's water column) through the 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.

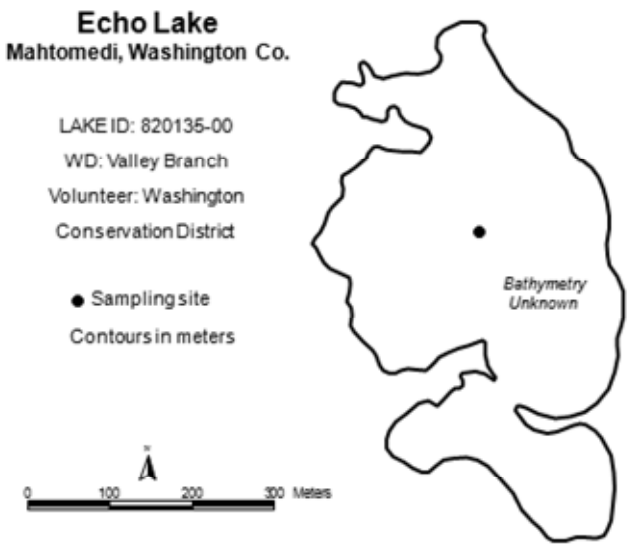
2008 summer (May-September) data summary

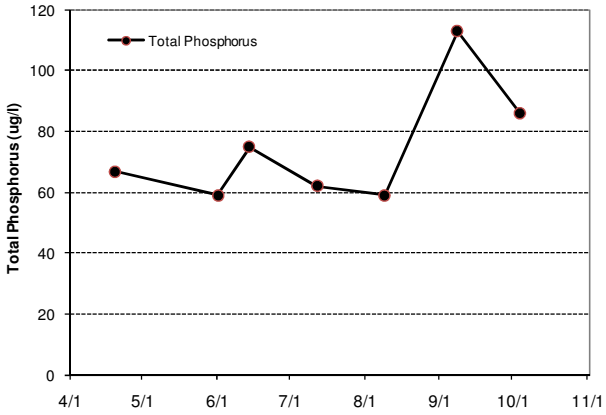
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	73.6	59.0	113.0	D
CLA (µg/l)	41.4	22.0	72.0	C
Secchi (m)	0.7	0.6	1.1	D
TKN (mg/l)	1.42	1.20	1.90	
			Lake Grade	D

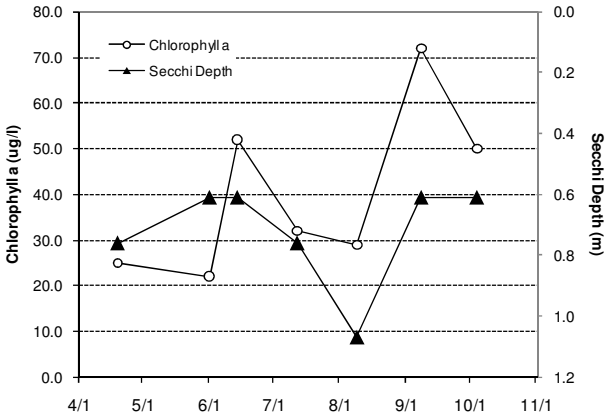
The lake received a lake grade of D for 2010, which is consistent with its limited historical water quality database. Additional monitoring is suggested to build the water quality database of this lake.

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.

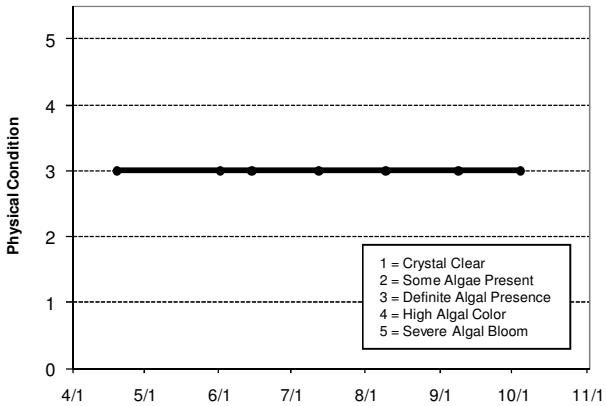






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	15.5	13.8	10.4	0.1	25.0	67		0.8	3	4
6/1	23.6	19.1	9.5	0.1	22.0	59		0.6	3	4
6/14	18.6	18.4	9.0	0.0	52.0	75		0.6	3	3
7/12	24.7	21.8	7.2	0.0	32.0	62		0.8	3	4
8/9	26.2	23.2	5.9	0.0	29.0	59		1.1	3	4
9/8	17.7	17.2	8.9	0.1	72.0	113		0.6	3	4
10/4	13.5	13.7	9.1	0.1	50.0	86		0.6	3	4



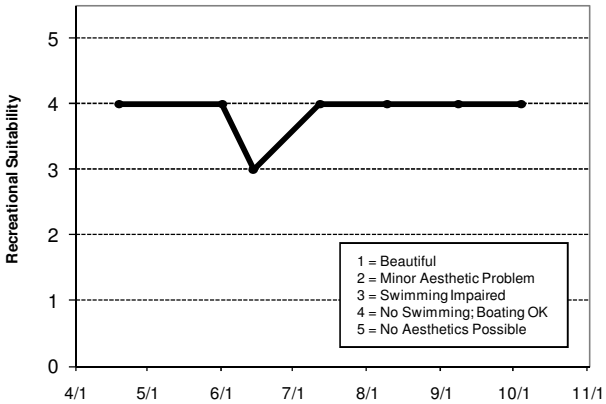
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	16.3	10.0	28.0	A
CLA (µg/l)	2.0	1.3	3.2	A
Secchi (m)	4.3	3.3	5.5	A
TKN (mg/l)	0.56	0.32	1.20	
			Lake Grade	A

The lake received a lake grade of A for 2010, which is similar to the lake grades it has received for the past 20 years, and better than the water quality of the early to mid 1980s. The lake's database indicates that the lake's recent water quality is well represented by a lake grade of A.

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

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

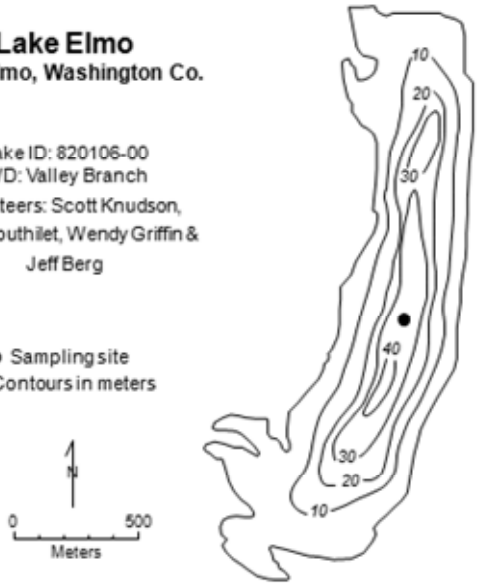
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

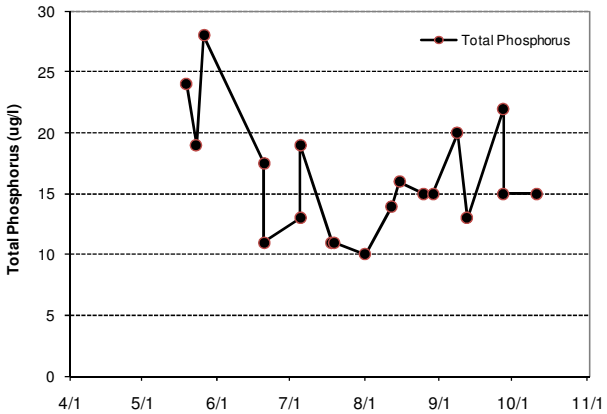
Lake Elmo

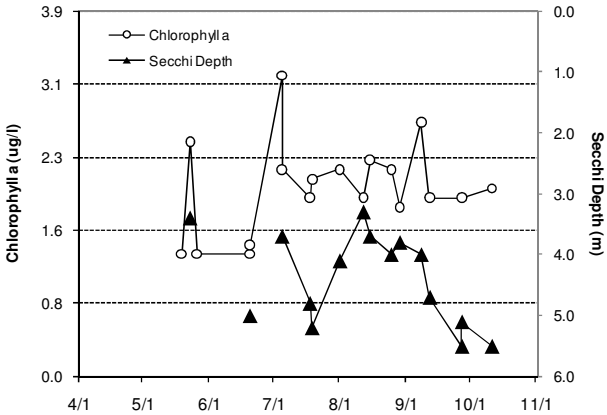
Lake Elmo, Washington Co.

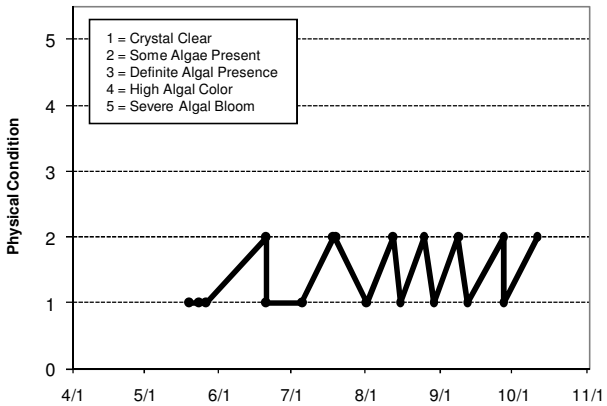
Lake ID: 820106-00
WD: Valley Branch
Volunteers: Scott Knudson, Terry Bouthilet, Wendy Griffin & Jeff Berg

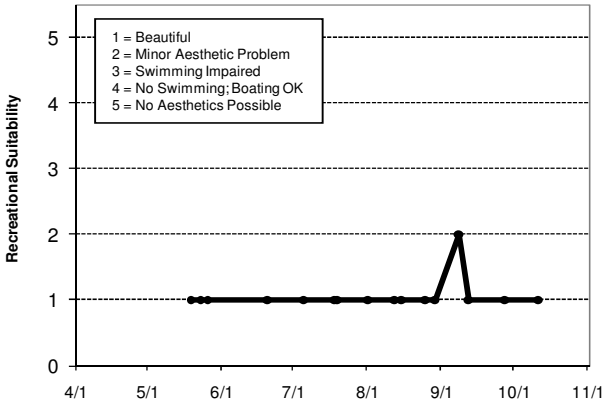
● Sampling site
Contours in meters











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/19	20.4				1.3	24			1	1
5/23	21.3				2.5	19		3.4	1	1
5/26	22.4				1.3	28			1	1
6/20	23.3				1.3	18			2	1
6/20	23.6				1.4	11		5.0	1	1
7/5	24.3				3.2	13			1	1
7/5	25.4				2.2	19		3.7	1	1
7/18	28.7				1.9	11		4.8	2	1
7/19	26.6				2.1	11		5.2	2	1
8/1	27.1				2.2	10		4.1	1	1
8/12	29.5				1.9	14		3.3	2	1
8/15	27.2				2.3	16		3.7	1	1
8/25	25.1				2.2	15		4.0	2	1
8/29	24.8				1.8	15		3.8	1	1
9/8	20.6				2.7	20		4.0	2	2
9/12	20.9				1.9	13		4.7	1	1
9/27	17.3				1.9	22		5.5	2	1
9/27	18.0				1.9	15		5.1	1	1
10/11	18.2				2.0	15		5.5	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	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
Total Phosphorus		A	A	A	A	A	A
Chlorophyll a		A	A	A	A	A	A
Secchi Depth		A	A	A	A	A	A
Lake Grade		**A**	**A**	**A**	**A**	**A**	**A**

Source: Metropolitan Council and STORET data

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

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

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

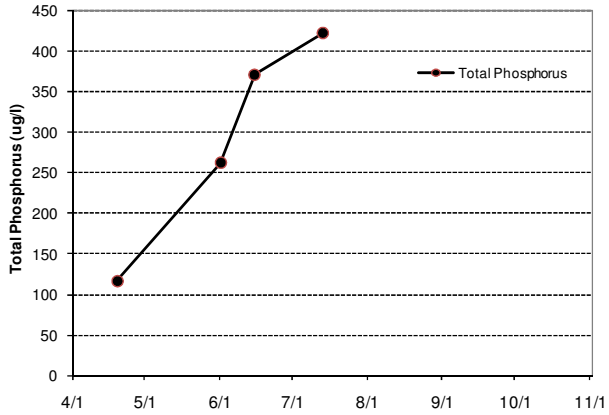
2010 summer (May-September) data summary

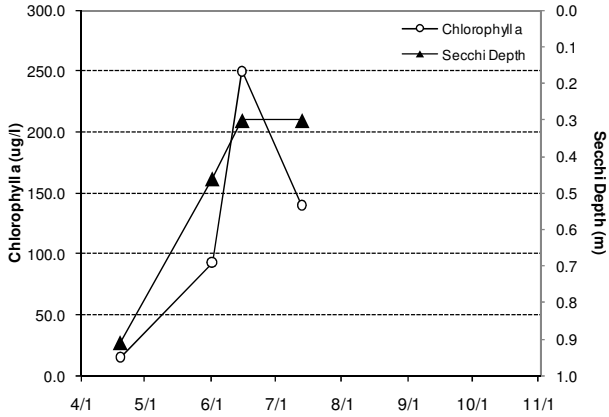
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	351.7	262.0	422.0	
CLA (µg/l)	161.0	93.0	250.0	
Secchi (m)	0.4	0.3	0.5	
TKN (mg/l)	4.13	3.40	4.70	
			Lake Grade	

There were insufficient data to calculate a lake grade for 2010. At least 5 monitoring events are required during the summer-time period to determine water quality grades. Additional monitoring data are needed to build a water quality database for this water body.

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

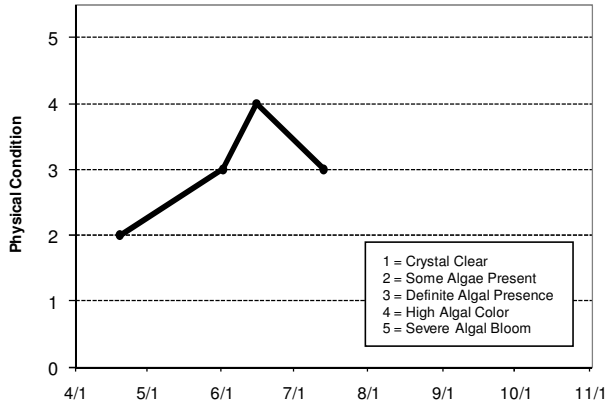
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	18.1	17.1	9.7	1.2	15.0	117		0.9	2	4
6/1	25.6	23.3	15.7	0.1	93.0	262		0.5	3	4
6/15	18.9		7.4		250.0	371		0.3	4	4
7/13	24.9	22.9	6.3	1.2	140.0	422		0.3	3	4



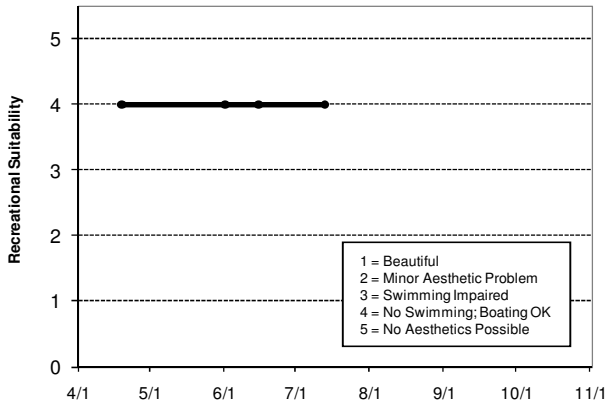
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

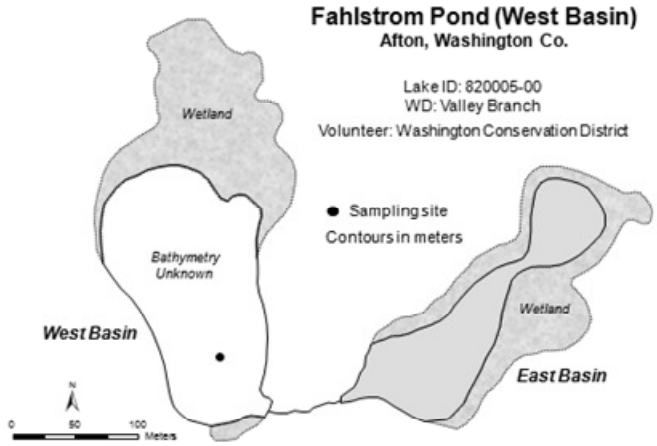
2010 summer (May-September) data summary

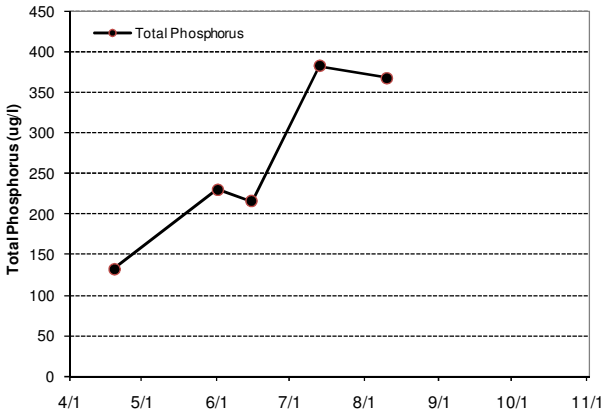
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	299.0	216.0	382.0	
CLA (µg/l)	33.3	15.0	59.0	
Secchi (m)	0.6	0.6	0.8	
TKN (mg/l)	1.20	1.00	1.30	
			Lake Grade	

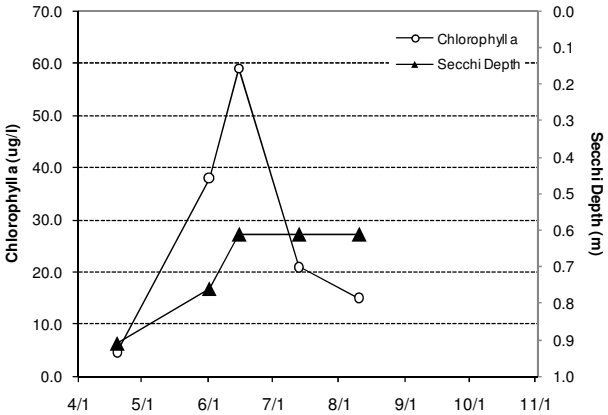
There were insufficient data to calculate a lake grade for 2010. At least 5 monitoring events are required during the summer-time period to determine water quality grades. Additional monitoring data are needed to build a water quality database for this water body.

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

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

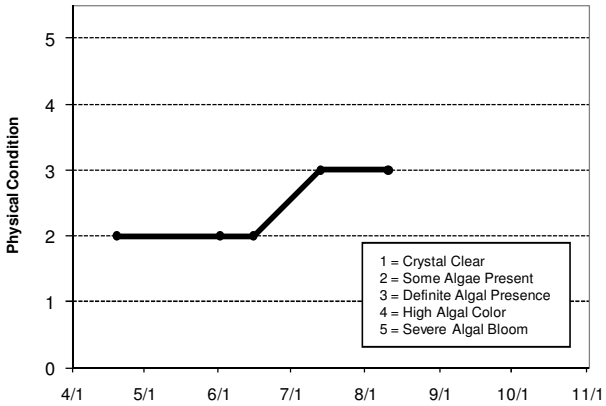






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	16.7	15.9	7.8	7.3	4.7	132		0.9	2	3
6/1	26.1	25.5	10.3	0.2	38.0	230		0.8	2	4
6/15	20.1		11.5		59.0	216		0.6	2	4
7/13	25.0	24.6	4.7	1.0	21.0	382		0.6	3	4
8/10	28.1		1.7		15.0	368		0.6	3	4



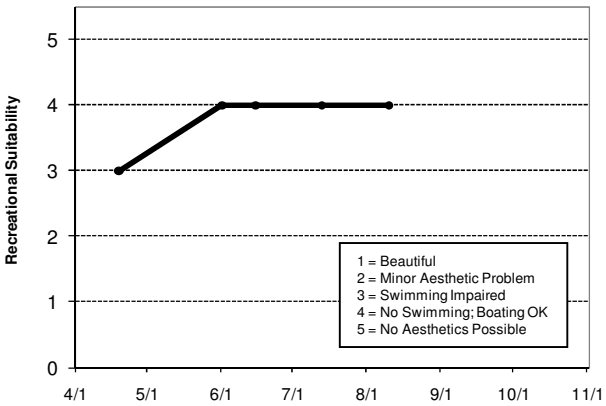
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	104.7	66.0	147.0	D
CLA (µg/l)	76.1	17.0	150.0	D
Secchi (m)	0.6	0.4	0.8	F
TKN (mg/l)	2.55	1.70	4.50	
			Lake Grade	D

The lake received a lake grade of F for 2010, which is consistent with the lake grades received over the past decade.

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

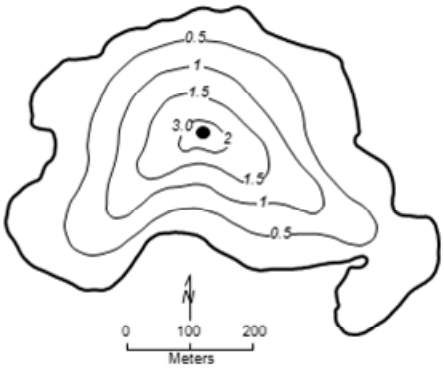
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

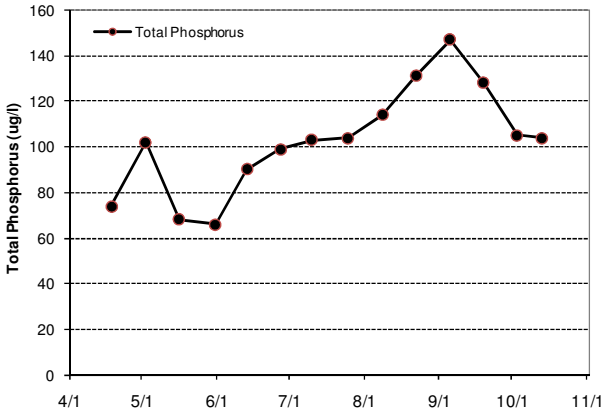
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

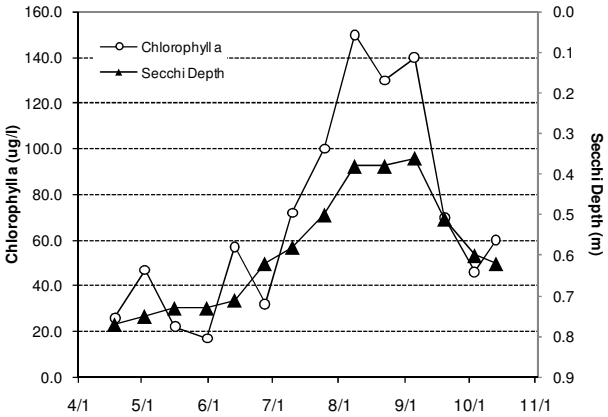
Farquar Lake
Apple Valley, Dakota Co.

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

● Sampling site
Contours in meters

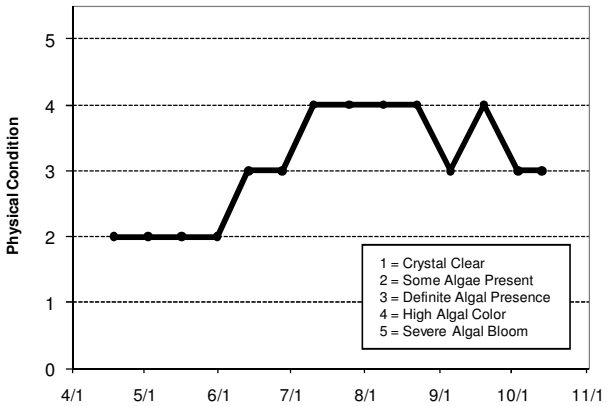






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	19.1				26.0	74		0.8	2	1
5/2	15.4				47.0	102		0.8	2	1
5/16	18.7				22.0	68		0.7	2	1
5/31	26.6				17.0	66		0.7	2	2
6/13	20.5				57.0	90		0.7	3	3
6/27	26.1				32.0	99		0.6	3	3
7/10	28.2				72.0	103		0.6	4	3
7/25	30.9				100.0	104		0.5	4	3
8/8	31.4				150.0	114		0.4	4	3
8/22	28.3				130.0	131		0.4	4	3
9/5	18.2				140.0	147		0.4	3	3
9/19	17.6				70.0	128		0.5	4	3
10/3	16.1				46.0	105		0.6	3	3
10/13	16.3				60.0	104		0.6	3	3

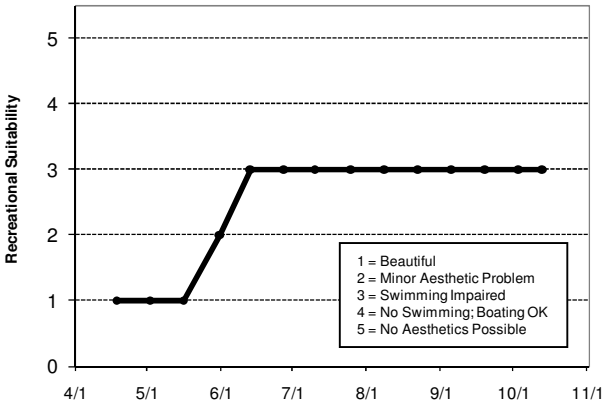


Lake Water Quality Grades Based on Summertime Averages

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

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



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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	29.3	12.0	69.0	B
CLA (µg/l)	7.2	1.0	13.0	A
Secchi (m)	2.8	1.7	4.3	B
TKN (mg/l)	0.54	0.36	0.74	
			Lake Grade	B

The lake received a lake grade of B for 2010, which is lower than the typical A grade. This is the second year in a row that the lake received a B lake grade. Additional monitoring is suggested to determine potential long term 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 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/.

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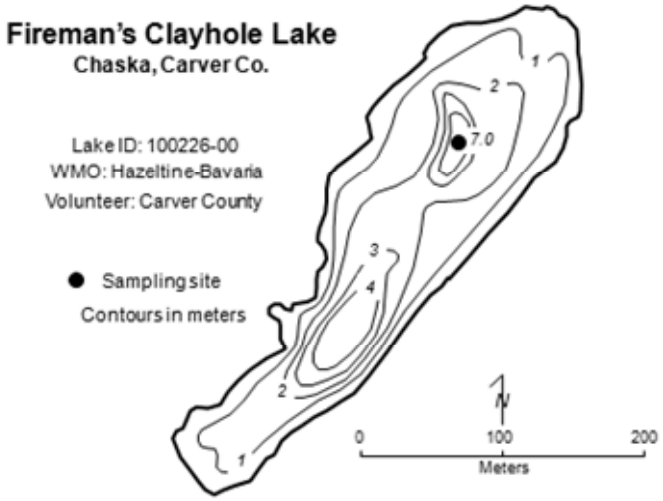
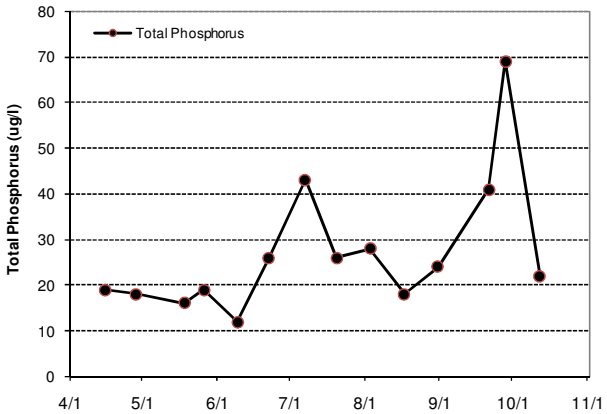
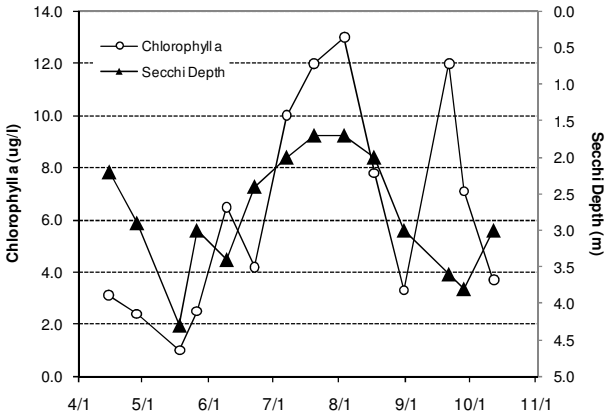
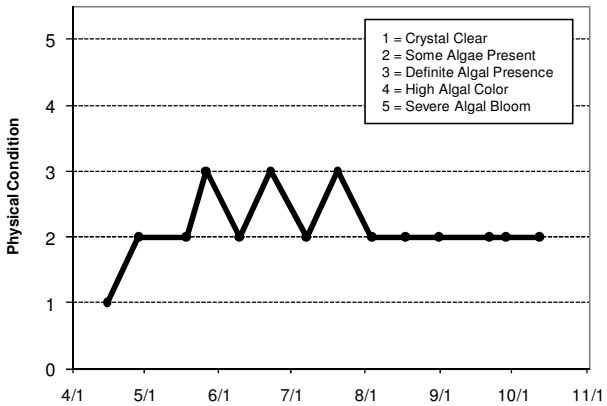






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/15	15.5	10.0	9.8	2.3	3.1	19		2.2	1	2
4/28	14.9	14.0	16.0	11.2	2.4	18		2.9	2	2
5/18	18.5	12.7	12.2	12.5	1.0	16		4.3	2	2
5/26	23.6	13.9	10.2	11.6	2.5	19		3.0	3	2
6/9	22.5	20.7	11.5	12.2	6.5	12		3.4	2	2
6/22	24.7	17.9	6.0	0.2	4.2	26		2.4	3	3
7/7	27.5	18.5	13.5	0.1	10.0	43		2.0	2	3
7/20	26.9	23.4	12.6	0.8	12.0	26		1.7	3	2
8/3	27.6	23.4	12.3	0.3	13.0	28		1.7	2	2
8/17	27.2	25.4	10.4	0.9	7.8	18		2.0	2	2
8/31	27.2	24.6	11.8	3.9	3.3	24		3.0	2	1
9/21	18.5	17.6	8.6	4.4	12.0	41		3.6	2	3
9/28	17.8	16.4	10.3	1.9	7.1	69		3.8	2	2
10/12	17.9	16.2	12.1	11.2	3.7	22		3.0	2	2



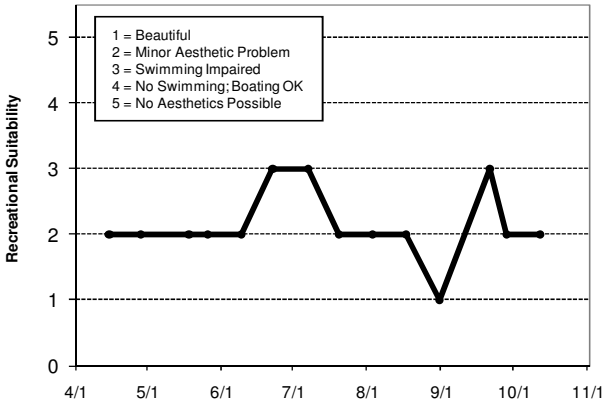
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Fish Lake [Scott County] (70-0069) *Prior Lake - Spring Lake Watershed District*

Fish Lake is located in Spring Lake Township (Scott County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a surface area of 171 acres. The lake has a mean and a maximum depth of 4.4 m (14 feet) and 8.5 m (28 feet). The MPCA has listed the lake as impaired for mercury content in fish.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	44.0	21.0	75.0	C
CLA (µg/l)	14.1	4.2	30.0	B
Secchi (m)	1.5	1.0	2.8	C
TKN (mg/l)	1.35	0.97	1.70	
			Lake Grade	C

The lake received a lake grade of C for 2010. The lake appears to be represented by a lake grade of C given the historical water quality database.

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

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

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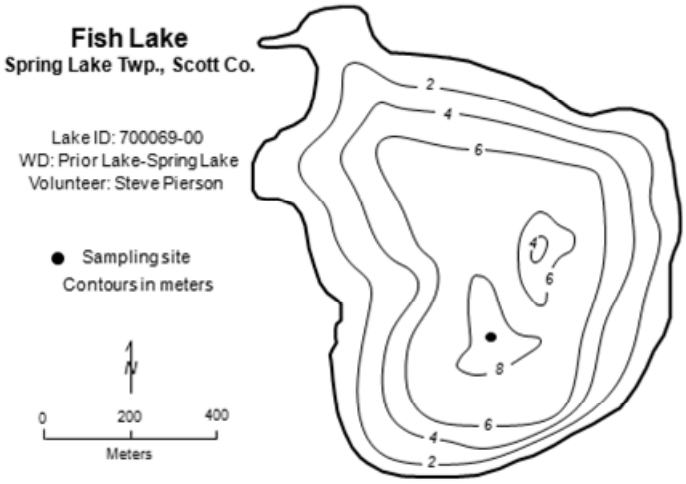
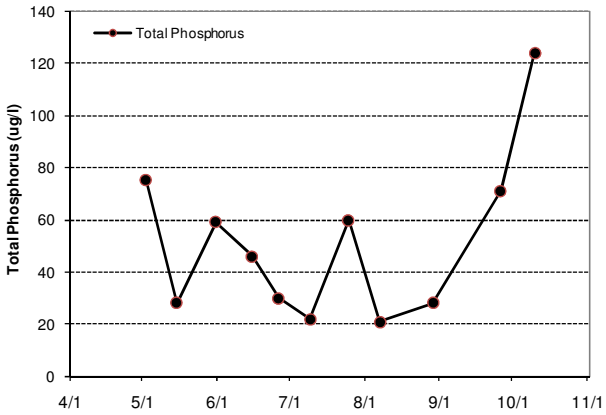
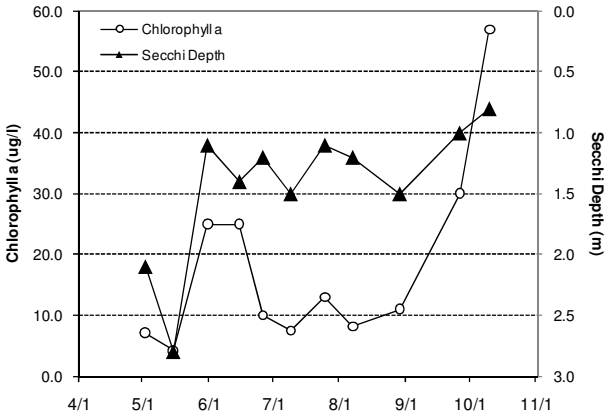
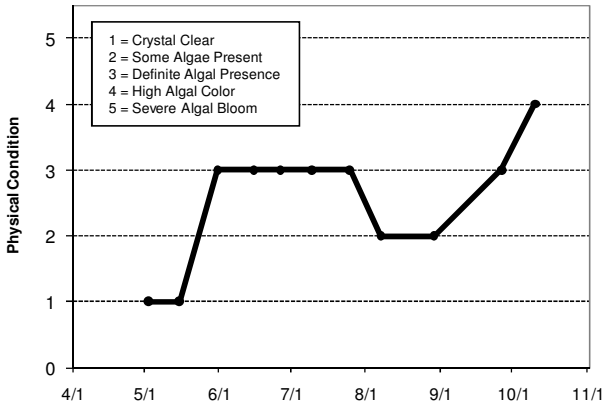






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/2	14.7				7.1	75		2.1	1	1
5/15	15.1				4.2	28		2.8	1	1
5/31	24.8				25.0	59		1.1	3	2
6/15	20.8				25.0	46		1.4	3	2
6/26	26.2				10.0	30		1.2	3	2
7/9	27.9				7.5	22		1.5	3	2
7/25	28.0				13.0	60		1.1	3	2
8/7	27.2				8.2	21		1.2	2	2
8/29	24.5				11.0	28		1.5	2	2
9/26	18.3				30.0	71		1.0	3	2
10/10	19.0				57.0	124		0.8	4	3

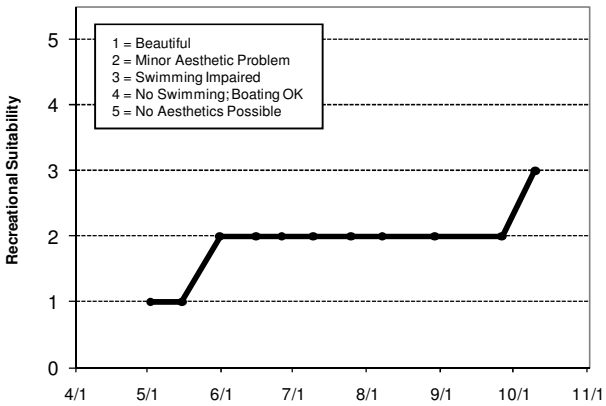


Lake Water Quality Grades Based on Summertime Averages

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	80.0	29.0	150.0	D
CLA (µg/l)	32.5	2.3	95.0	C
Secchi (m)	1.2	0.5	2.1	C
TKN (mg/l)	1.39	0.64	2.40	
			Lake Grade	C

The lake received a lake grade of C for 2010, which continues the improvement in water quality that this lake has been experiencing over the past decade. This was the fourth 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.

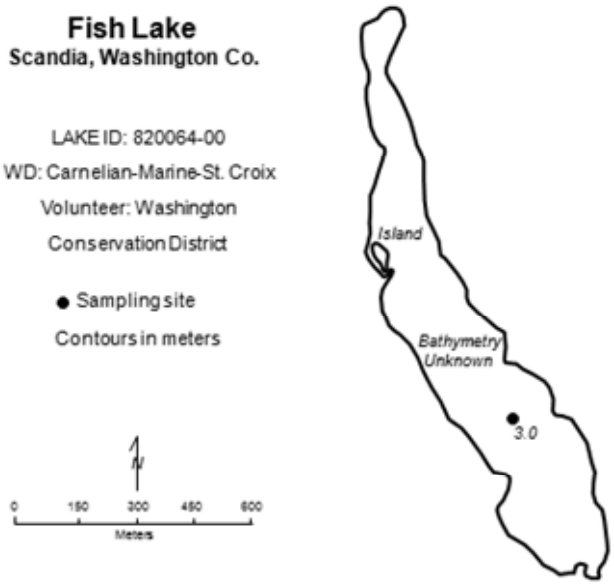
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

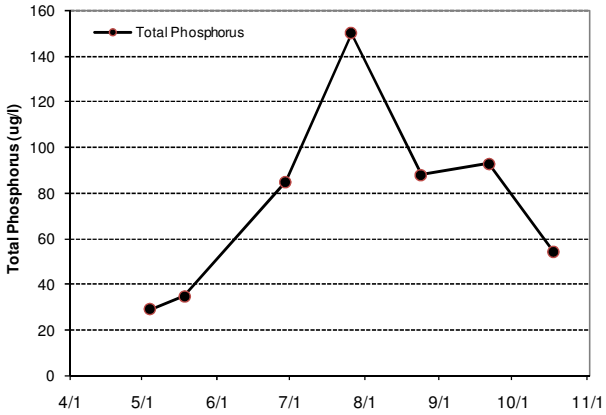
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

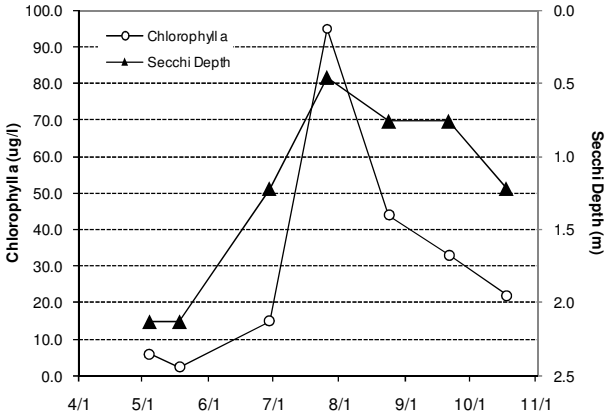
Fish Lake
Scandia, Washington Co.

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

● Sampling site
Contours in meters

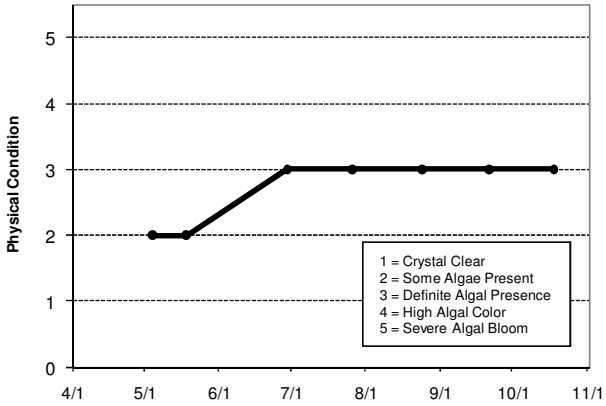






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/4	13.9	13.6	8.8	7.2	5.9	29		2.1	2	3
5/18	18.3	16.8	9.6	6.7	2.3	35		2.1	2	2
6/29	23.5	23.1	8.3	0.5	15.0	85		1.2	3	4
7/26	26.8	24.6	11.5	0.2	95.0	150		0.5	3	3
8/24	25.8	24.3	7.8	0.1	44.0	88		0.8	3	4
9/21	15.8	15.7	9.0	1.2	33.0	93		0.8	3	4
10/18	12.6	12.6	8.5	0.9	22.0	54		1.2	3	4

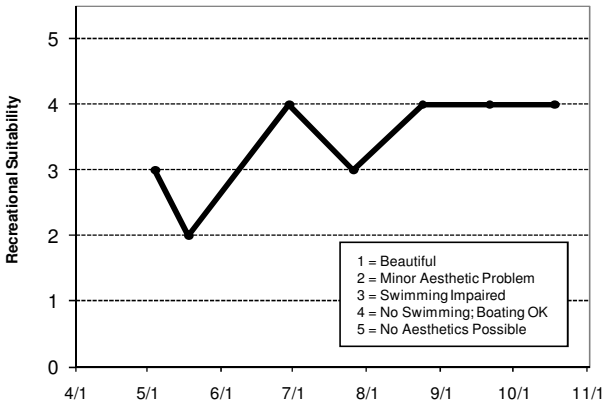


Lake Water Quality Grades Based on Summertime Averages

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

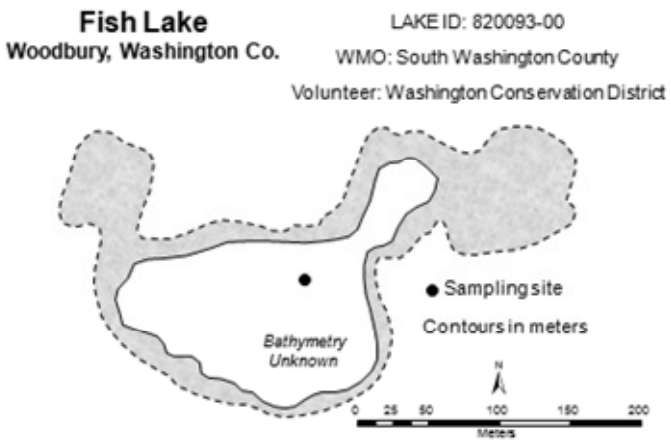
2010 summer (May-September) data summary

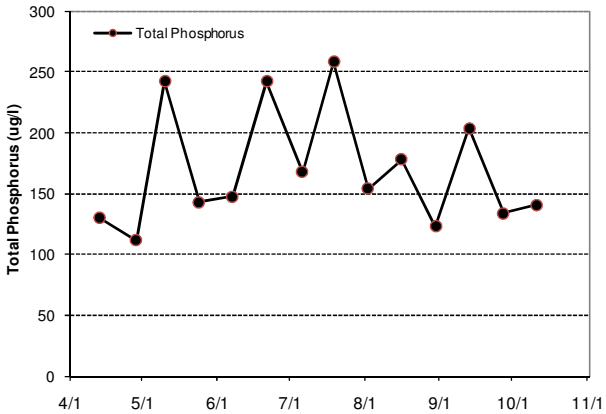
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	181.3	123.0	258.0	F
CLA (µg/l)	174.0	57.0	530.0	F
Secchi (m)	0.7	0.2	0.9	F
TKN (mg/l)	1.94	1.10	4.20	
			Lake Grade	F

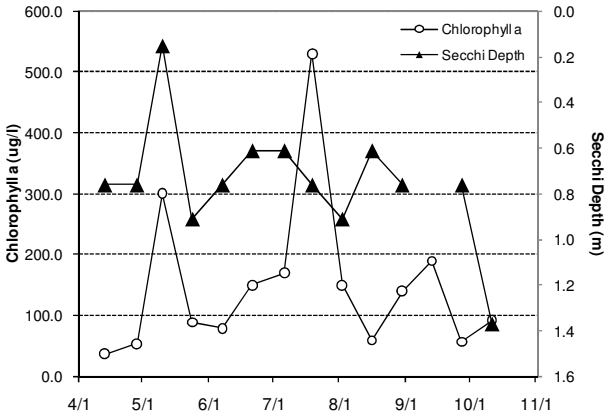
This was the first year the lake was enrolled in the CAMP, and the lake received a lake grade of F. Additional monitoring is suggested to build the water quality database of this lake.

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.

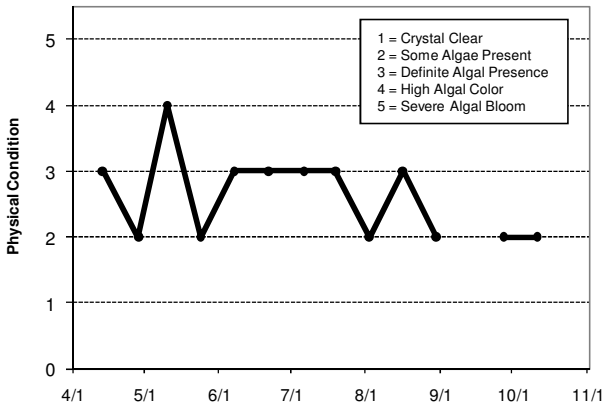






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	13.1	13.1	7.9	0.1	37.0	130		0.8	3	4
4/28	13.8	13.6	9.8	9.6	54.0	112		0.8	2	4
5/10	12.3	10.4	15.4	6.8	300.0	242		0.2	4	4
5/24	22.8	18.1	9.2	0.1	89.0	143		0.9	2	4
6/7	21.0	18.9	8.9	0.1	79.0	148		0.8	3	4
6/21	23.4	18.4	9.5	0.1	150.0	242		0.6	3	4
7/6	24.8	19.4	3.7	0.1	170.0	168		0.6	3	4
7/19	24.7	20.5	8.3	0.1	530.0	258		0.8	3	4
8/2	24.6	20.5	3.3	0.1	150.0	154		0.9	2	3
8/16	22.3	20.5	1.3	0.2	59.0	178		0.6	3	4
8/30	23.2	20.8	6.6	0.1	140.0	123		0.8	2	4
9/13	17.4	16.8	1.6	11.6	190.0	204				
9/27	13.9	13.7	5.2	0.2	57.0	134		0.8	2	4
10/11	16.5	15.1	10.5	0.1	92.0	141		1.4	2	4



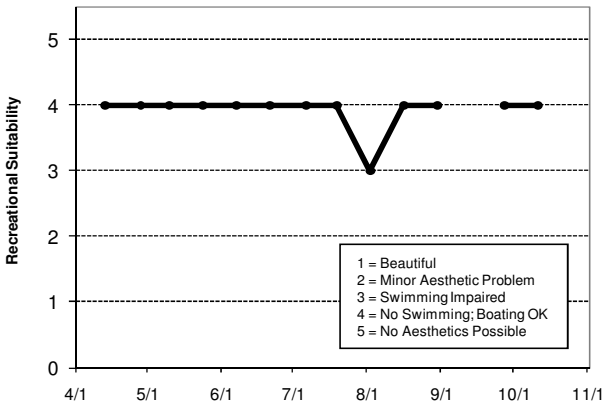
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

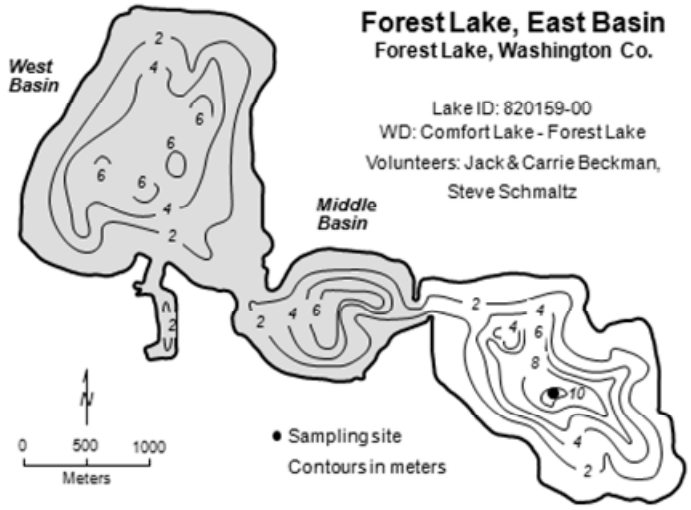
2010 summer (May-September) data summary

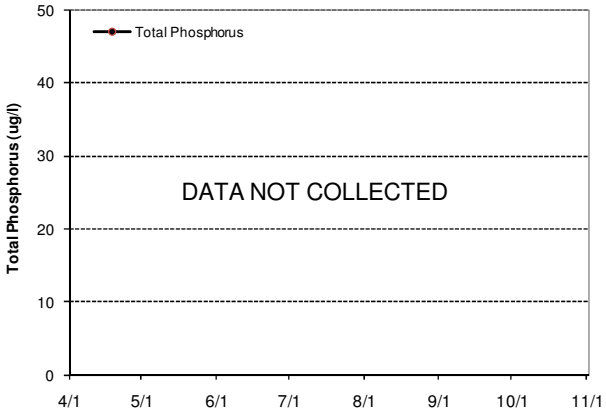
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
Secchi (m)	1.7	1.0	2.7	C

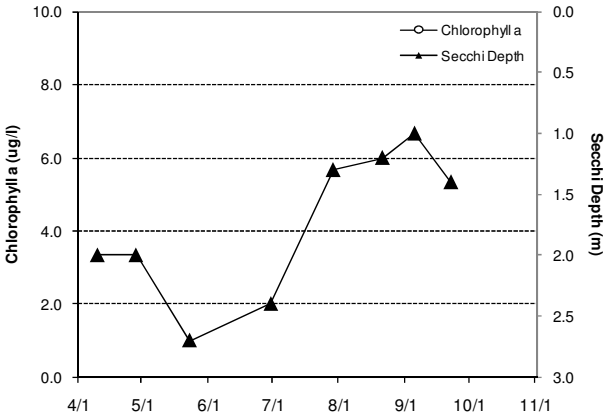
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

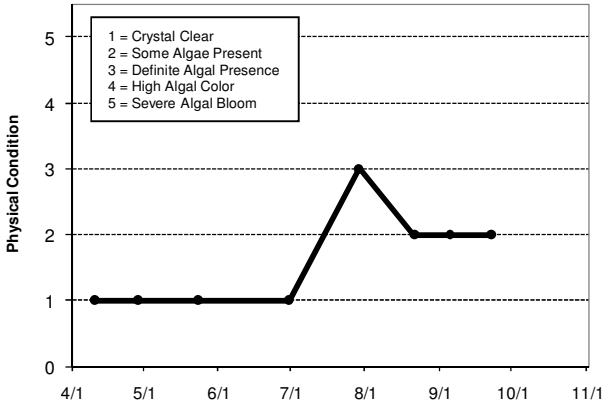






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/10								2.0	1	1
4/28								2.0	1	1
5/23								2.7	1	1
6/30								2.4	1	1
7/29								1.3	3	2
8/21								1.2	2	2
9/5								1.0	2	1
9/22								1.4	2	1



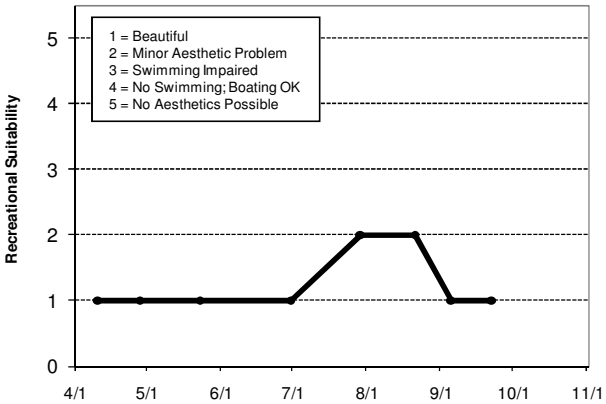
Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

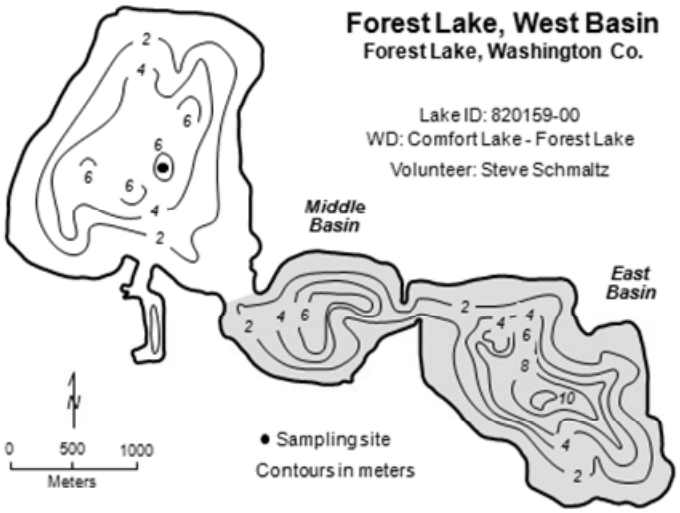
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	30.3	19.0	49.0	B
CLA (µg/l)	19.5	2.7	53.0	B
Secchi (m)	1.8	0.5	3.5	C
TKN (mg/l)	0.94	0.63	1.40	
			Lake Grade	B

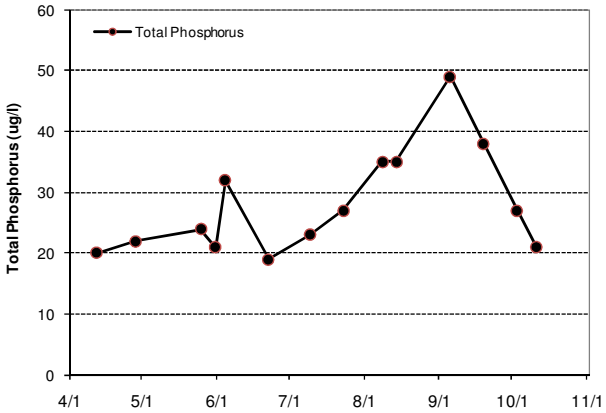
The lake received a lake grade of B for 2010. The water quality of the west basin has fluctuated between lake grades of B and C according to its historical water quality database.

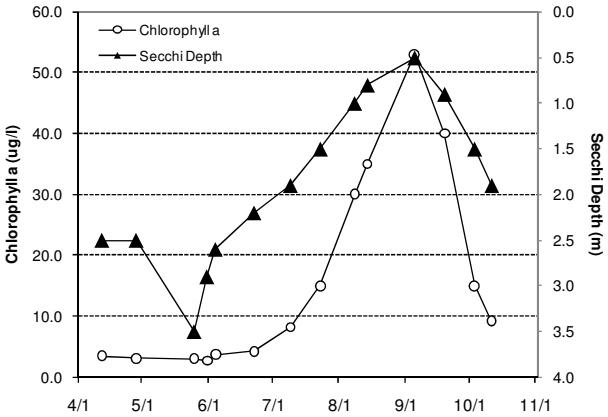
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

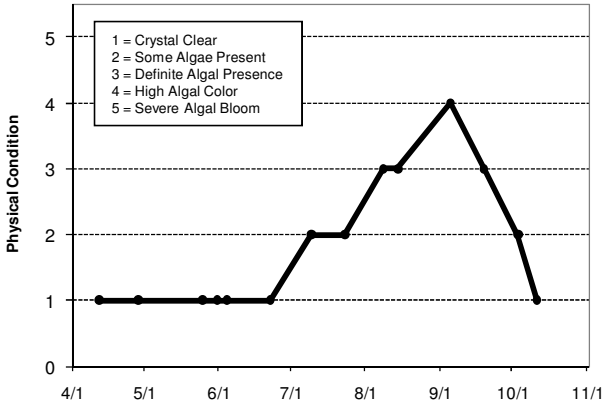
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

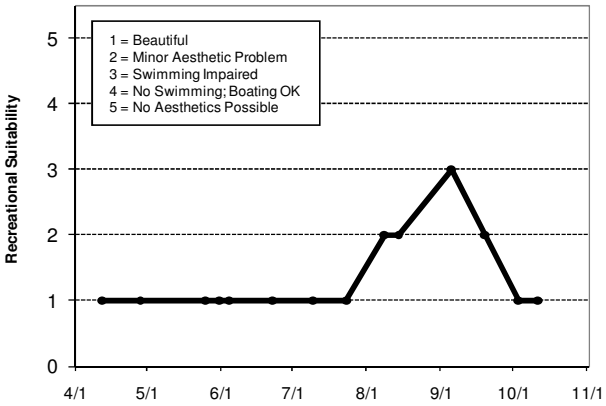
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	11.2				3.5	20		2.5	1	1
4/28	13.9				3.1	22		2.5	1	1
5/25	24.5				3.0	24		3.5	1	1
5/31	23.3				2.7	21		2.9	1	1
6/4	22.7				3.7	32		2.6	1	1
6/22	24.7				4.2	19		2.2	1	1
7/9	26.8				8.2	23		1.9	2	1
7/23	27.0				15.0	27		1.5	2	1
8/8	26.5				30.0	35		1.0	3	2
8/14	27.1				35.0	35		0.8	3	2
9/5	19.9				53.0	49		0.5	4	3
9/19	16.5				40.0	38		0.9	3	2
10/3	14.3				15.0	27		1.5	2	1
10/11	17.4				9.2	21		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		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
Total Phosphorus	B	C	C	C	C	B	B
Chlorophyll a	A	C	B	C	A	A	B
Secchi Depth	B	C	C	C	C	C	C
Lake Grade	**B**	**C**	**C**	**C**	**B**	**B**	**B**

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	136.4	37.0	318.0	D
CLA (µg/l)	45.1	3.4	96.0	C
Secchi (m)	0.5	0.1	0.8	F
TKN (mg/l)	1.91	0.79	3.20	
			Lake Grade	D

The lake received a lake grade of D for 2010, 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.

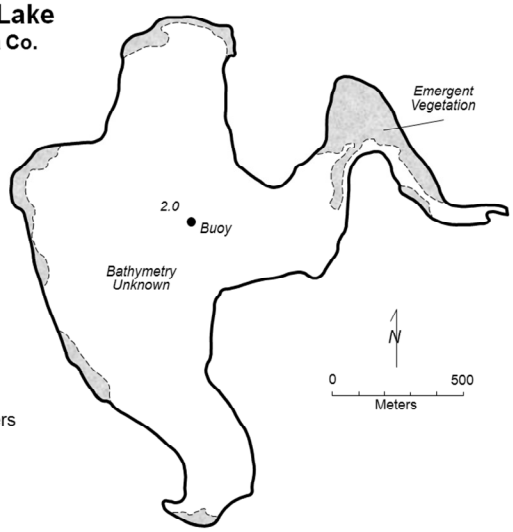
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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.

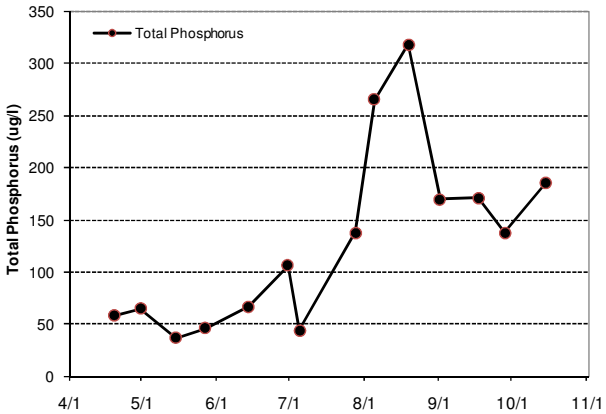
George Watch Lake
Lino Lakes, Anoka Co.

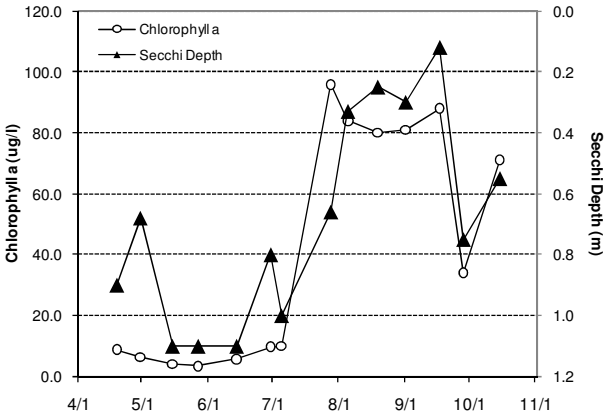
Lake ID: 20005-00
WD: Rice Creek

Volunteer:
Wargo Nature Center



● Sampling site
Contours in meters

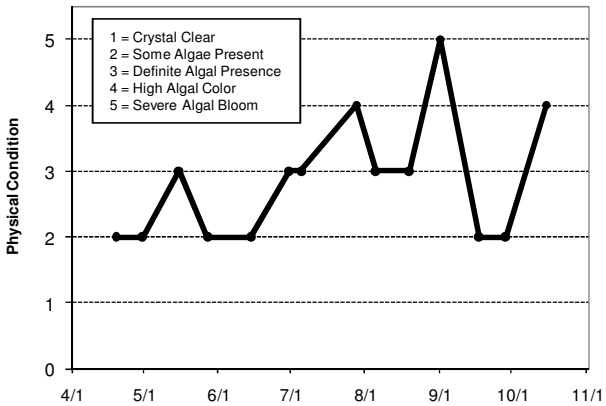




2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	18.2				8.8	58		0.9+	2	4
4/30	14.1				6.3	65		0.7	2	4
5/15	20.4				4.0	37		1.1+	3	4
5/27	23.8				3.4	46		1.1+	2	4
6/14	17.9				5.7	67		1.1+	2	4
6/30	24.7				9.7	106		0.8	3	4
7/5	29.1				10.0	44		1.0+	3	4
7/28	27.4				96.0	138		0.7	4	4
8/5	25.6				84.0	265		0.3	3	4
8/19	22.2				80.0	318		0.3	3	4
9/1	24.2				81.0	170		0.3	5	4
9/17	15.6				88.0	171		0.1	2	4
9/28	16.4				34.0	138		0.8	2	4
10/15	13.4				71.0	186		0.6	4	4

+ Secchi Disk visible on lake bottom

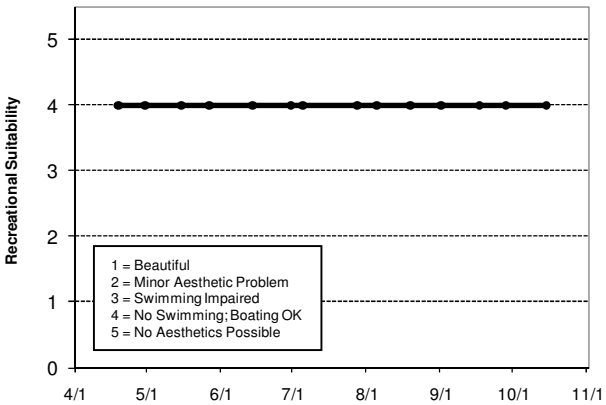


Lake Water Quality Grades Based on Summertime Averages

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



Source: Metropolitan Council and STORET data

Goetschel Pond (82-0313) *Valley Branch Watershed District*

Goetschel Lake is located in Grant Township (Washington County). The lake has a surface area of 22-acres. The lake has a mean and a maximum depth of 1.2 m (4 feet) and 4.2 m (14 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has a 2,812-acre watershed which yields a watershed-to-lake area ratio of 122:1. The larger the ratio the greater the potential stress on the lake from surface runoff.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	59.2	38.0	88.0	C
CLA (µg/l)	7.1	2.4	14.0	A
Secchi (m)	1.2	0.8	1.5	C
TKN (mg/l)	1.02	0.88	1.20	
			Lake Grade	B

The lake received a lake grade of B for 2010, which is consistent with its historical database. Usually the letter grades for each parameter are within a letter grade of each other. A comparison of the CLA grade of A to the C grades for Secchi Depth and TP, indicate that suspended sediment may be a possible cause of the low water clarity during 2010. 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 decreased water clarity would decrease available light, and thereby suppress algal growth.

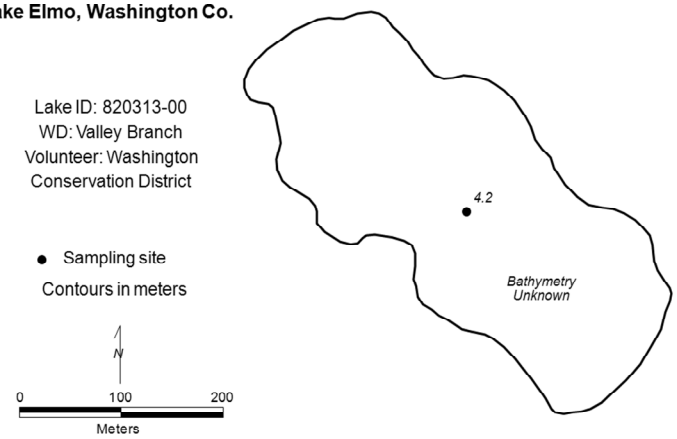
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

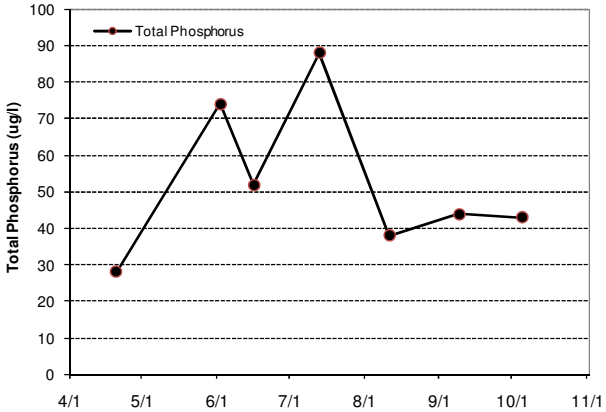
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

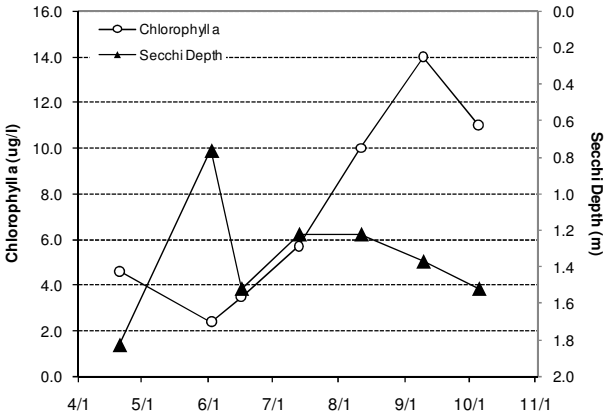
Goetschel Pond
Lake Elmo, Washington Co.

Lake ID: 820313-00
WD: Valley Branch
Volunteer: Washington Conservation District

● Sampling site
Contours in meters

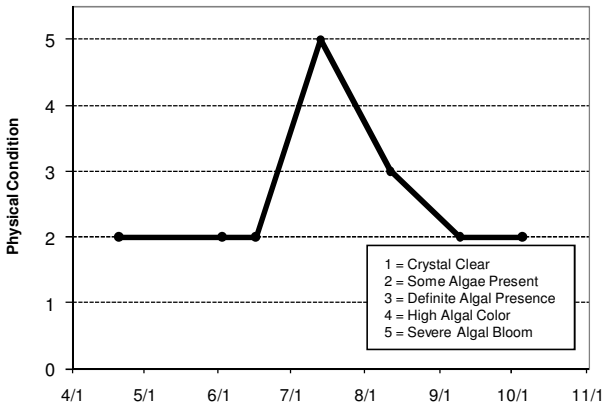






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20	15.9	14.4	10.4	2.5	4.6	28		1.8	2	3
6/2	22.9	21.2	9.2	0.1	2.4	74		0.8	2	4
6/16	21.3	16.5	9.9	0.1	3.5	52		1.5	2	3
7/13	25.4	24.7	1.9	0.3	5.7	88		1.2	5	4
8/11	26.7	22.1	3.5	0.2	10.0	38		1.2	3	4
9/9	18.4	16.2	9.9	0.4	14.0	44		1.4	2	4
10/5	14.6	13.4	8.9	5.3	11.0	43		1.5	2	3

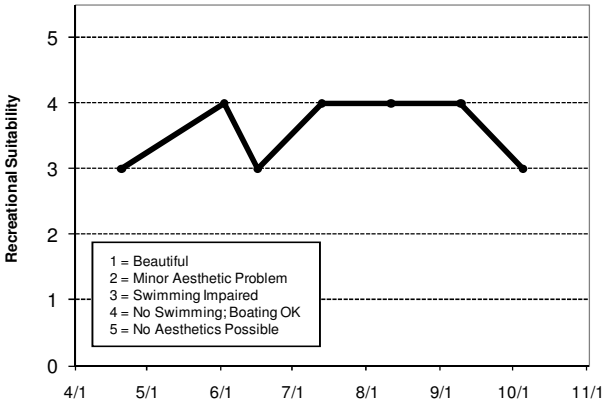


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

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

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

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

2010 summer (May-September) data summary

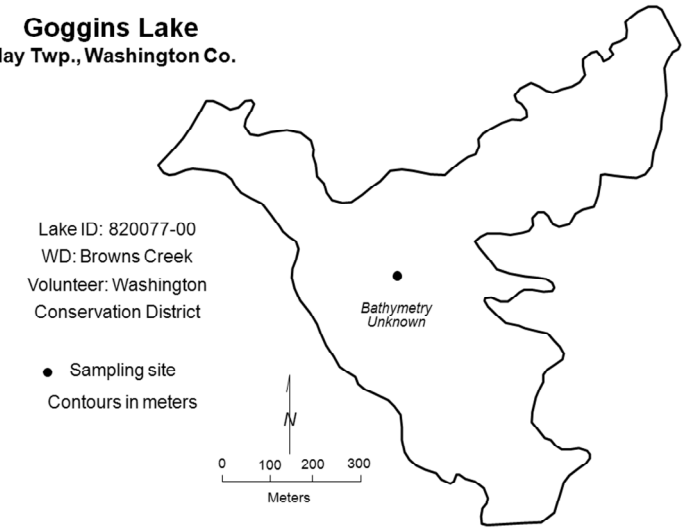
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	138.5	65.0	206.0	D
CLA (µg/l)	72.5	7.5	120.0	D
Secchi (m)	0.7	0.3	1.8	D
TKN (mg/l)	3.44	1.50	5.00	
			Lake Grade	D

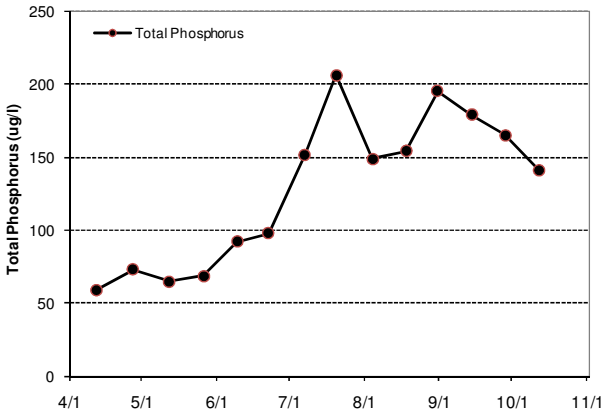
The lake received a lake grade of D for 2010 which is consistent with those received in some previous years. The lake's water quality seems to be represented by a lake grade of C or D, depending on the year. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

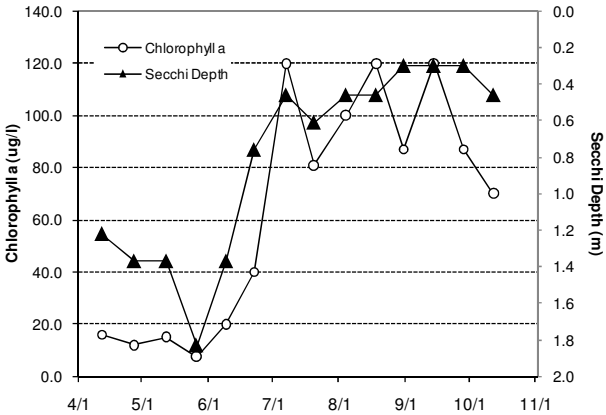
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

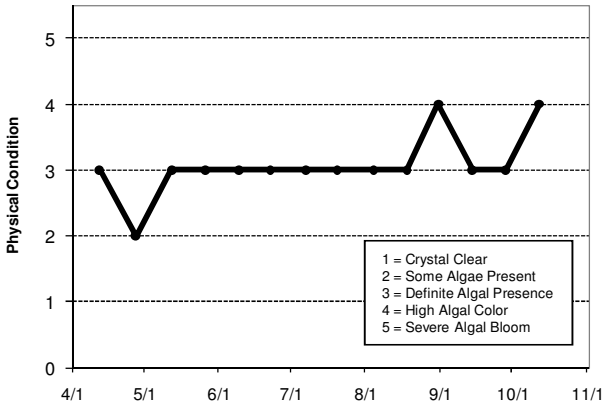






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	13.1	11.5	12.6	0.1	16.0	59		1.2	3	3
4/27	14.1	13.8	9.5	9.6	12.0	73		1.4	2	2
5/12	10.5	10.5	10.6	10.3	15.0	65		1.4	3	4
5/26	24.3	21.1	8.4	8.3	7.5	69		1.8	3	4
6/9	20.8	20.7	6.9	0.1	20.0	92		1.4	3	4
6/22	24.4	20.6	14.6	0.1	40.0	98		0.8	3	4
7/7	27.0	22.4	11.1	0.1	120.0	152		0.5	3	4
7/20	26.9	23.2	9.8	0.1	81.0	206		0.6	3	4
8/4	26.7	23.4	8.9	0.1	100.0	149		0.5	3	4
8/18	23.1	22.7	8.8	0.2	120.0	154		0.5	3	4
8/31	26.2	24.2	10.1	0.0	87.0	195		0.3	4	4
9/14	19.7	18.6	10.6	0.3	120.0	179		0.3	3	4
9/28	15.3	15.3	8.2	0.2	87.0	165		0.3	3	4
10/12	17.6	15.0	12.5	0.1	70.0	141		0.5	4	4

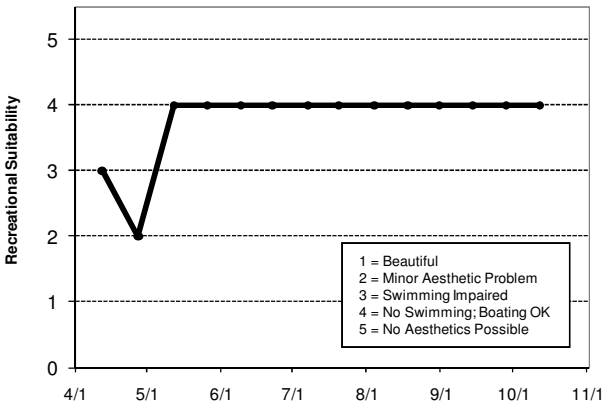


Lake Water Quality Grades Based on Summertime Averages

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

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



Source: Metropolitan Council and STORET data

Golden Lake (2-0045) *Rice Creek Watershed District*

Golden Lake is located in the City of Circle Pines (Anoka County). The mean and maximum depths of the lake are 2.5 m (8 feet) and 7.3 m (24 feet), respectively. The lake has a surface area of 57 acres and a watershed area of 7,680 acres, giving a watershed-to-lake area ratio of 135:1, which is quite large. The greater the ratio, the greater the potential stress on the lake from surface runoff.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	57.7	30.0	113.0	C
CLA (µg/l)	31.1	2.6	72.0	C
Secchi (m)	1.5	0.5	2.7	C
TKN (mg/l)	1.98	1.80	2.40	
			Lake Grade	C

The lake received a lake grade of C for 2010. This lake has a fairly extensive water quality database. The lake's water quality grade has fluctuated between C, D, and F throughout 20+ years of monitoring data.

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

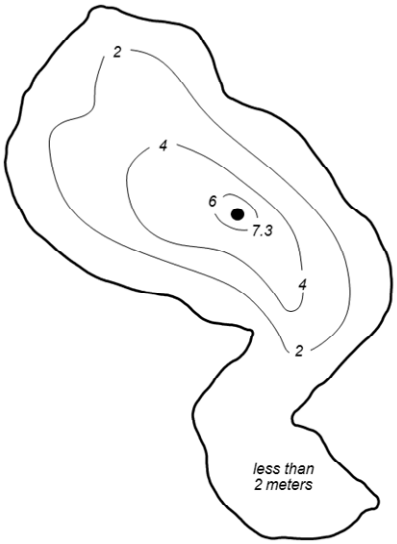
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

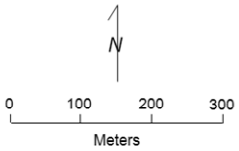
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

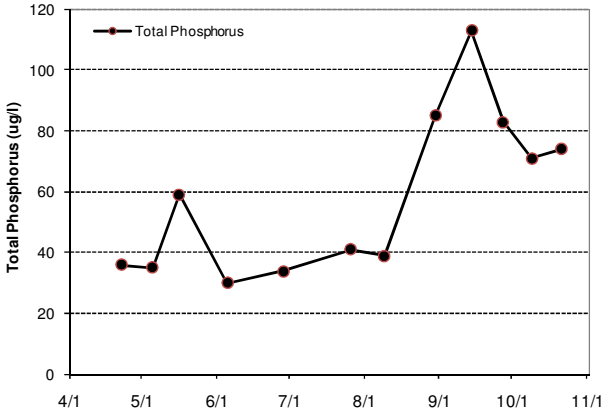
Golden Lake
Circle Pines, Anoka Co.

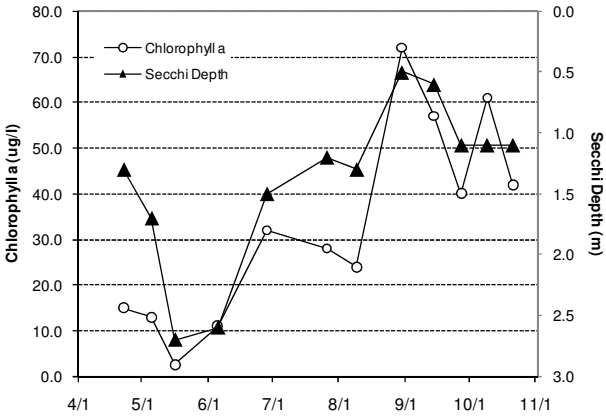
Lake ID: 20045-00
WD: Rice Creek
Volunteer: Dave Phipps

● Sampling site
Contours in meters



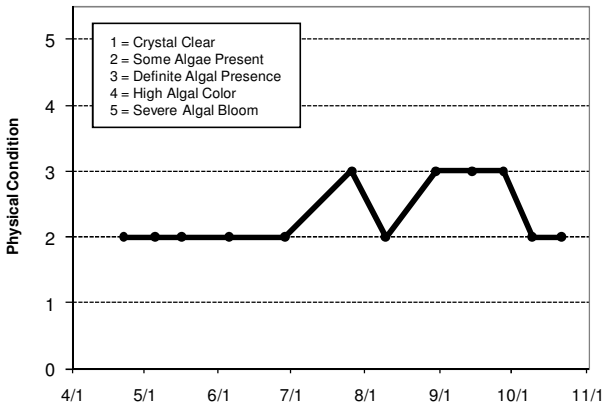






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/22	18.4				15.0	36		1.3	2	1
5/5	14.3				13.0	35		1.7	2	1
5/16	20.6				2.6	59		2.7	2	2
6/5	23.3				11.0	30		2.6	2	1
6/28	23.8				32.0	34		1.5	2	2
7/26	26.9				28.0	41		1.2	3	2
8/9	28.3				24.0	39		1.3	2	2
8/30	26.8				72.0	85		0.5	3	2
9/14	20.2				57.0	113		0.6	3	2
9/27	16.3				40.0	83		1.1	3	2
10/9	15.0				61.0	71		1.1	2	2
10/21	12.2				42.0	74		1.1	2	2

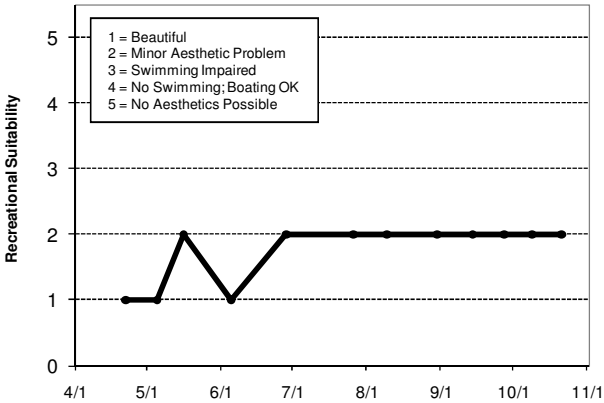


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

Goose Lake (10-0089) *Carver County Environmental Services*

Goose Lake is located in Waconia Township (Carver County). It has a surface area of 407-acres. The maximum depth of the lake is 3.0 m; therefore the entire lake area is considered littoral zone which is the 0-15 feet depth area of the lake dominated by aquatic vegetation. 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.

2010 summer (May-September) data summary

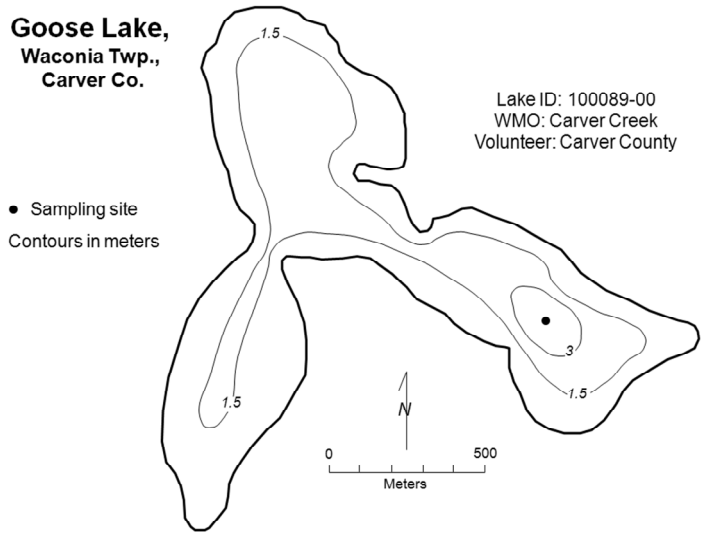
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	103.9	78.0	145.0	D
CLA (µg/l)	109.0	67.0	160.0	F
Secchi (m)	0.4	0.3	0.6	F
TKN (mg/l)	3.19	2.70	3.80	
			Lake Grade	F

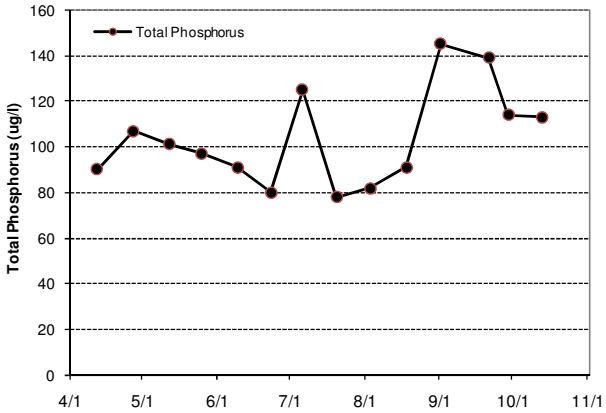
The lake received a lake grade of F for 2010 which is consistent with its historical database. The lake has experienced variability in water quality over the long term (i.e. grades ranging from C to F), with F grades being predominant for the past 6 years. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

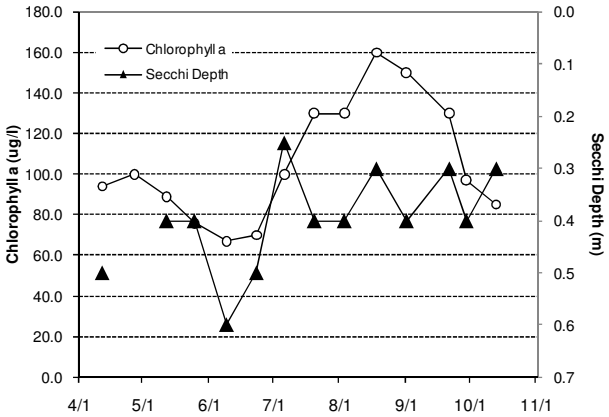
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

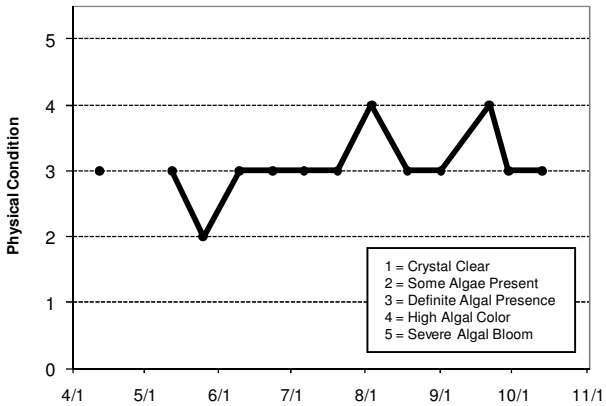






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	12.6	12.3	13.3	14.1	94.0	90		0.5	3	3
4/27	13.7	13.0	17.0	16.2	100.0	107				
5/12	10.3	10.2	11.9	11.4	89.0	101		0.4	3	4
5/25	23.4	19.9	10.3	2.7	76.0	97		0.4	2	4
6/9	20.5	20.5	7.6	7.4	67.0	91		0.6	3	4
6/23	24.9	23.3	9.0	3.8	70.0	80		0.5	3	4
7/6	26.3	25.3	10.7	4.2	100.0	125		0.3	3	3
7/20	25.9	25.3	11.8	9.9	130.0	78		0.4	3	4
8/3	27.7	25.3	13.1	0.3	130.0	82		0.4	4	4
8/18	23.1	23.1	9.7	9.0	160.0	91		0.3	3	4
9/1	24.2	23.8	11.4	8.9	150.0	145		0.4	3	3
9/21	16.9	16.3	10.7	10.4	130.0	139		0.3	4	4
9/29	15.4	15.4	9.8	10.8	97.0	114		0.4	3	3
10/13	16.0	15.5	10.4	9.6	85.0	113		0.3	3	4

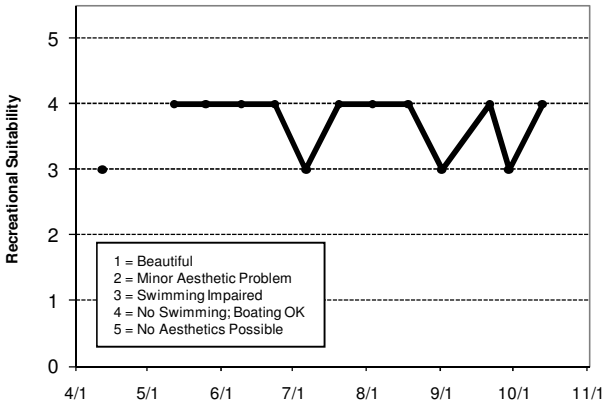


Lake Water Quality Grades Based on Summertime Averages

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	34.5	25.0	46.0	C
CLA (µg/l)	19.6	5.2	58.0	B
Secchi (m)	1.9	0.8	2.7	C
TKN (mg/l)	1.27	1.10	1.60	
			Lake Grade	C

The lake received a lake grade of C for 2010, which is similar to the lake grades received in the past. There is some variation in the parameters' annual means, however. The lake's overall water quality seems to be represented by a lake grade of C given the historical water quality database.

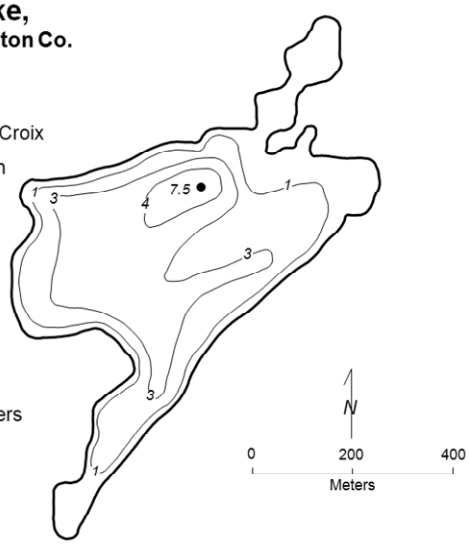
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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/.

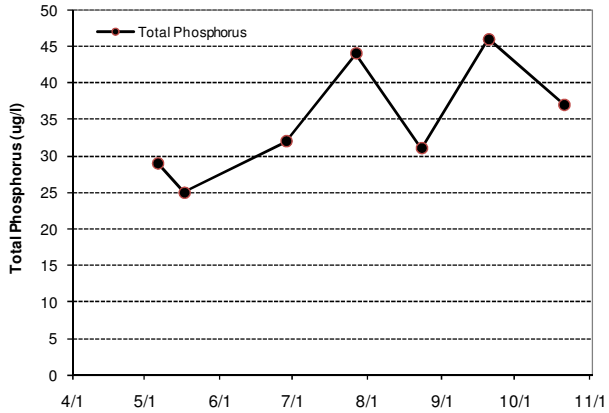
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

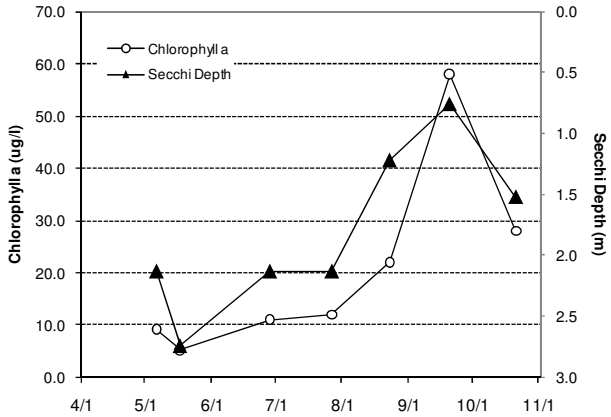
Goose Lake,
Scandia, Washington Co.

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



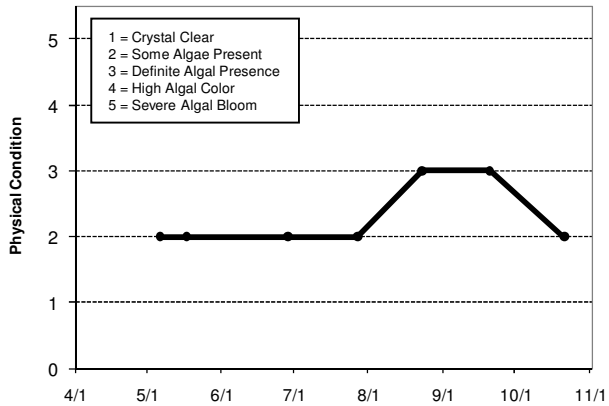
● Sampling site
Contours in meters





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/6	13.3	13.2	9.9	0.5	9.1	29		2.1	2	2
5/17	18.4	12.3	11.2	5.4	5.2	25		2.7	2	3
6/28	24.3	18.2	8.7	0.0	11.0	32		2.1	2	3
7/27	26.6	21.4	9.2	0.1	12.0	44		2.1	2	3
8/23	25.4	22.3	11.1	0.0	22.0	31		1.2	3	4
9/20	16.5	16.6	9.0	0.1	58.0	46		0.8	3	3
10/21	12.4	12.3	9.4	0.1	28.0	37		1.5	2	3



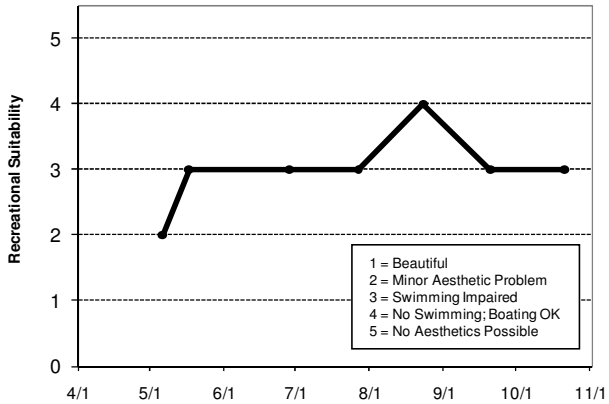
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



Goose Lake [north basin] (82-0113-01) *Valley Branch Watershed District*

Goose Lake is located in the City of Lake Elmo (Washington County). The year 2009 was the second year that Goose Lake was monitored via the CAMP. The lake is split into two basins by county highway 10. The north basin is Site #1 of Goose Lake. The depth of the north basin at the sampling location is 1.8 m (6 ft). There is no other bathymetric information available for the lake. A search via STORET revealed no historical monitoring data prior to 2008.

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

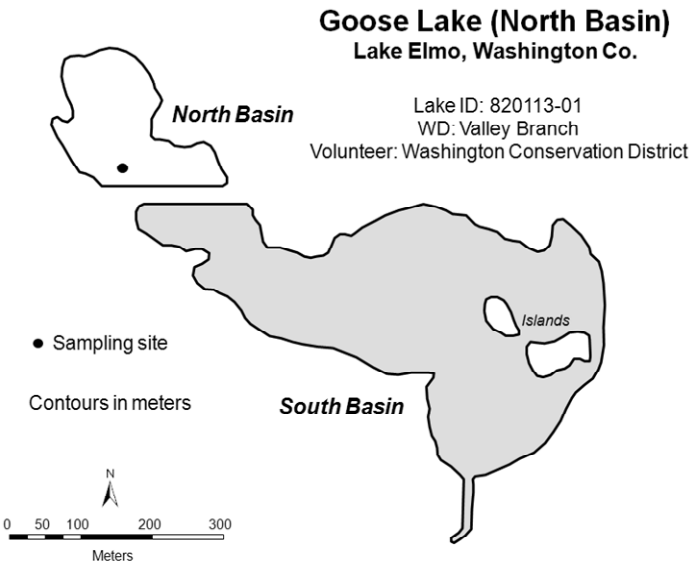
2010 summer (May-September) data summary

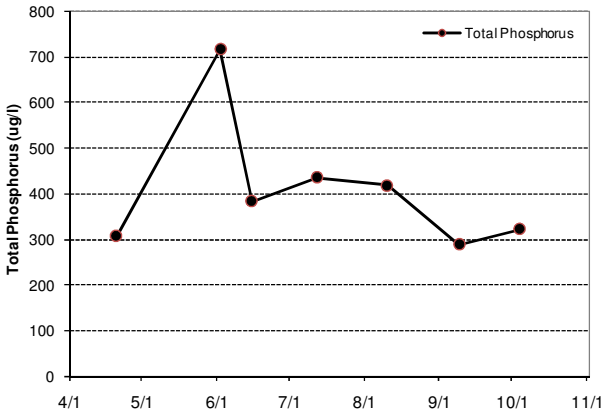
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	448.2	288.0	716.0	F
CLA (µg/l)	212.0	140.0	270.0	F
Secchi (m)	0.2	0.2	0.2	F
TKN (mg/l)	5.06	3.80	7.00	
			Lake Grade	F

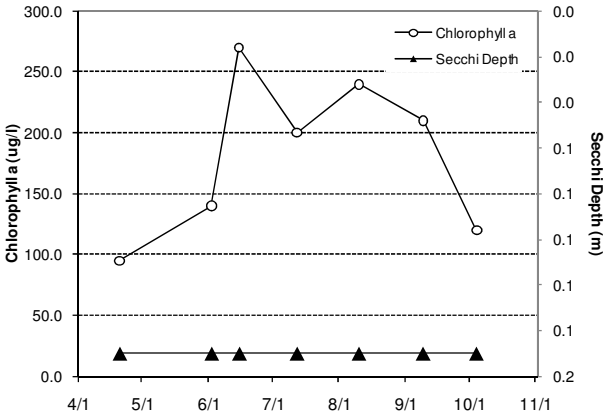
The north basin received a lake grade of F for 2010. Continued monitoring is suggested to build an historical water quality database for this lake site.

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

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

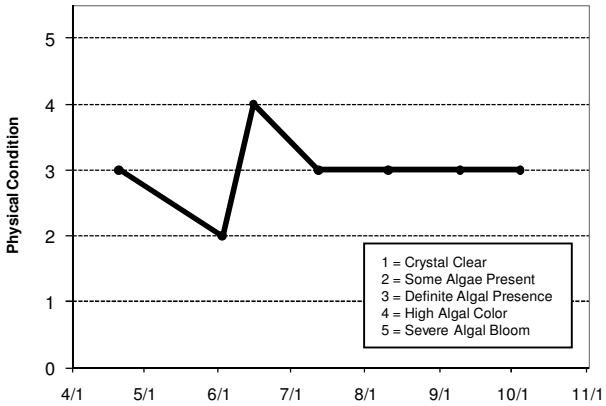






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20	15.9	15.2	15.0	0.1	95.0	307		0.2	3	4
6/2	21.7	21.6	6.3	0.1	140.0	716		0.2	2	4
6/15	19.3	19.0	12.1	0.0	270.0	384		0.2	4	4
7/12	24.8	24.0	5.8	0.1	200.0	435		0.2	3	4
8/10	27.5	25.6	6.6	0.1	240.0	418		0.2	3	4
9/9	17.0	17.1	9.8	0.1	210.0	288		0.2	3	4
10/4	14.8	13.6	12.5	0.1	120.0	322		0.2	3	4



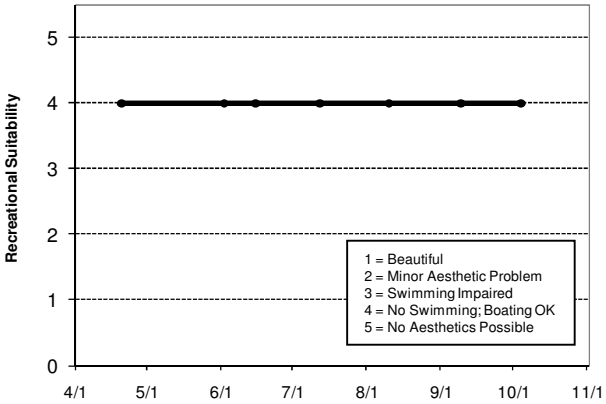
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Goose Lake [south basin] (82-0113-02) *Valley Branch Watershed District*

Goose Lake is located in the City of Lake Elmo (Washington County). The year 2009 was the second year that Goose Lake was monitored via the CAMP. The lake is split into two basins by county highway 10. The south basin is Site #2 of Goose Lake. The depth of the south basin at the sampling location is 2.1 m (7 ft). There is no other bathymetric information available for the lake. A search via STORET revealed no historical monitoring data prior to 2008.

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

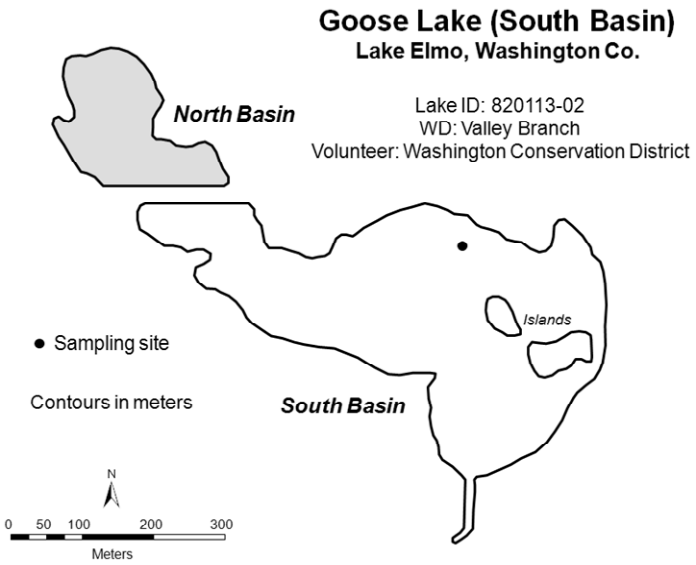
2010 summer (May-September) data summary

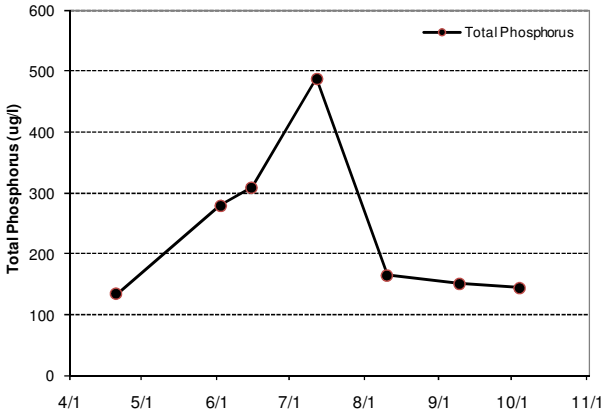
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	278.4	151.0	488.0	F
CLA (µg/l)	192.0	120.0	270.0	F
Secchi (m)	0.2	0.1	0.3	F
TKN (mg/l)	4.78	3.50	5.90	
			Lake Grade	F

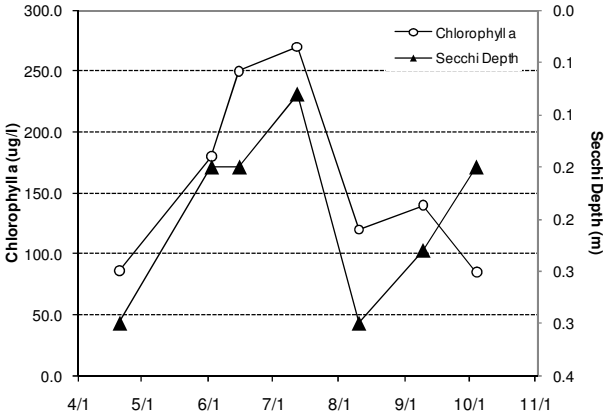
The south basin received a lake grade of F for 2010. Continued monitoring is suggested to build an historical water quality database for this lake site.

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

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

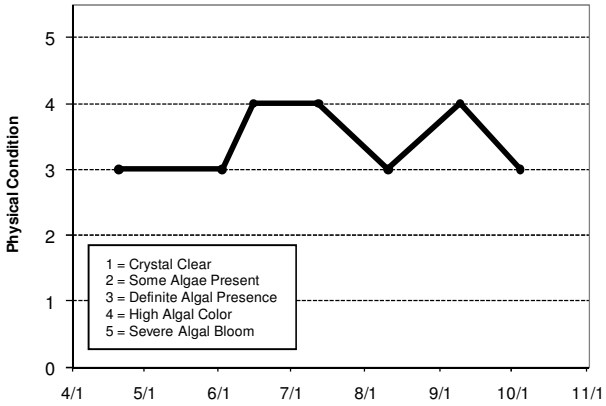






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20	15.2	15.0	14.4	0.1	86.0	134		0.3	3	4
6/2	21.8	21.8	8.5	0.1	180.0	279		0.2	3	4
6/15	19.0	18.8	9.5	0.0	250.0	309		0.2	4	4
7/12	25.7	24.3	13.2	0.1	270.0	488		0.1	4	4
8/10	28.2	25.9	9.7	0.1	120.0	165		0.3	3	4
9/9	16.7	16.6	12.0	0.1	140.0	151		0.2	4	4
10/4	14.6	13.6	12.8	0.1	85.0	145		0.2	3	4



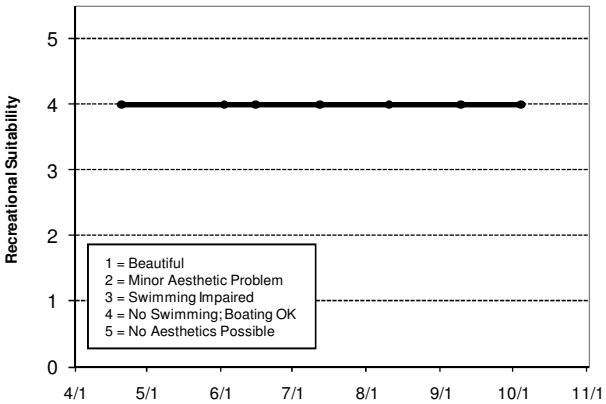
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	108.2	27.0	249.0	D
CLA (µg/l)	52.8	2.3	130.0	D
Secchi (m)	1.4	0.4	3.5	C
TKN (mg/l)	1.80	1.20	3.00	
			Overall Grade	D

The lake received a lake grade of D for 2010 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.

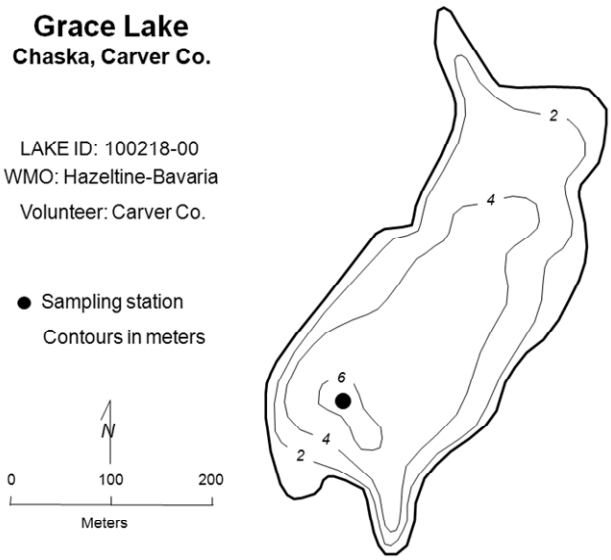
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 297-4916 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

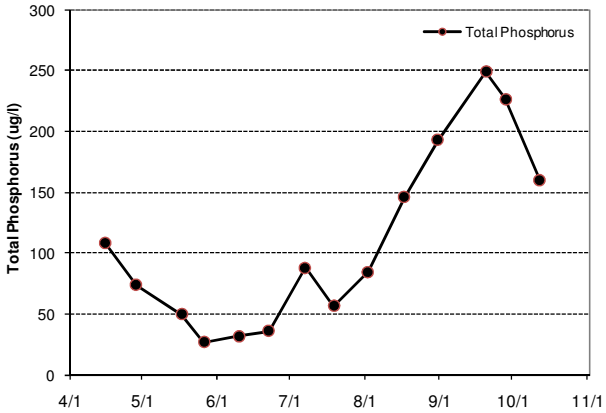
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

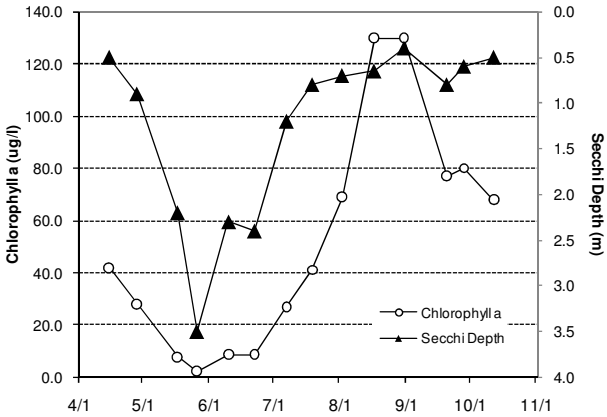
Grace Lake
Chaska, Carver Co.

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

● Sampling station
Contours in meters

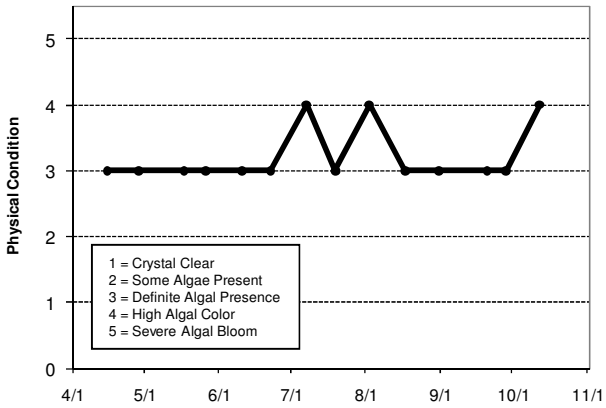






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/15	14.9	6.1	12.4	1.0	42.0	109		0.5	3	3
4/28	14.2	6.7	16.5	0.6	28.0	74		0.9	3	3
5/17	19.5	11.1	13.4	0.8	7.7	50		2.2	3	3
5/26	24.0	11.1	9.8	1.0	2.3	27		3.5	3	2
6/10	21.0	11.9	8.2	0.2	8.6	32		2.3	3	4
6/22	24.5	13.7	10.1	0.3	8.6	36		2.4	3	4
7/7	27.0	14.5	15.6	0.1	27.0	88		1.2	4	4
7/19	26.6	15.4	13.3	0.2	41.0	57		0.8	3	4
8/2	27.5	15.7	13.7	0.1	69.0	85		0.7	4	4
8/17	25.4	18.1	12.4	0.2	130.0	146		0.7	3	3
8/31	26.3	18.0	12.3	0.0	130.0	193		0.4	3	3
9/20	16.9	16.2	8.5	1.3	77.0	249		0.8	3	3
9/28	16.6	15.6	11.5	7.5	80.0	227		0.6	3	3
10/12	18.2	14.6	15.4	0.3	68.0	160		0.5	4	4

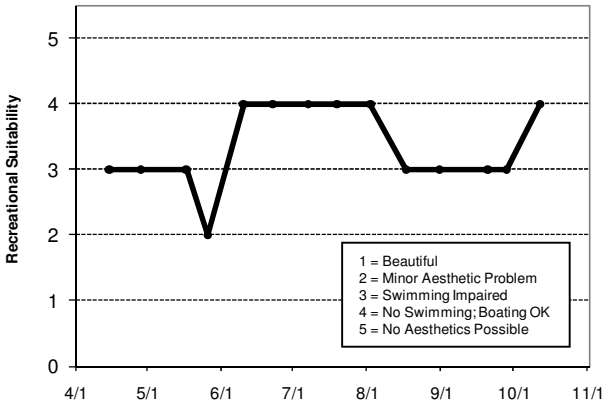


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

Hafften Lake (27-0199) *Pioneer-Sarah Watershed Management Commission*

Hafften Lake, located in Greenfield (Hennepin County), has public access on the eastern side of the lake. The 43-acre lake has a maximum depth of 13.4 m (44 feet). Approximately 60 percent of the lake's surface area is considered littoral zone which is the 0-15 feet depth area of the lake dominated by aquatic vegetation.

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

2006 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	44.4	30.0	67.0	C
CLA (µg/l)	24.4	2.9	42.0	C
Secchi (m)	1.1	0.6	2.1	D
TKN (mg/l)	1.95	1.60	2.40	
			Overall Grade	C

The lake received a lake grade of C for 2010 which is consistent with its historical database. Further monitoring is suggested for this lake to further develop 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.

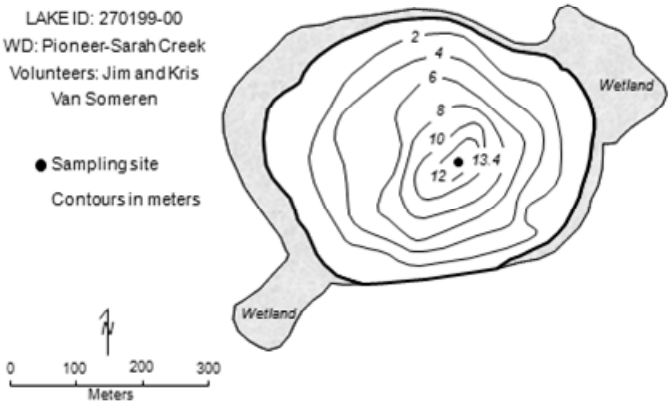
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 297-4916 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

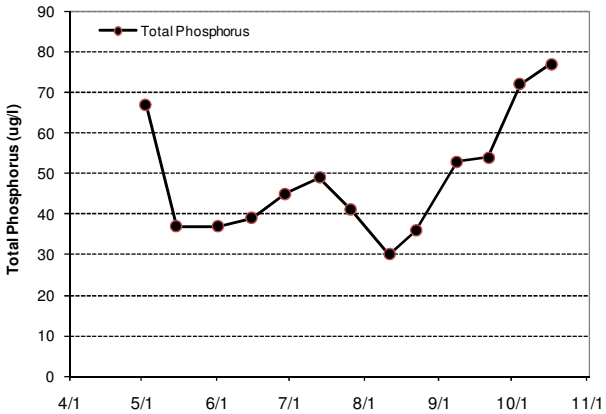
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

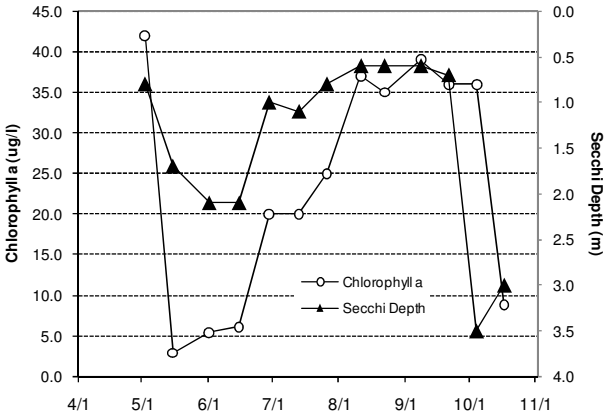
Hafften Lake,
Greenfield, Hennepin Co.

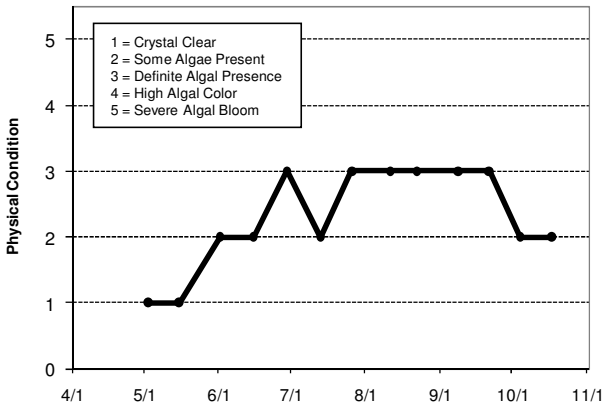
LAKE ID: 270199-00
WD: Pioneer-Sarah Creek
Volunteers: Jim and Kris Van Someren

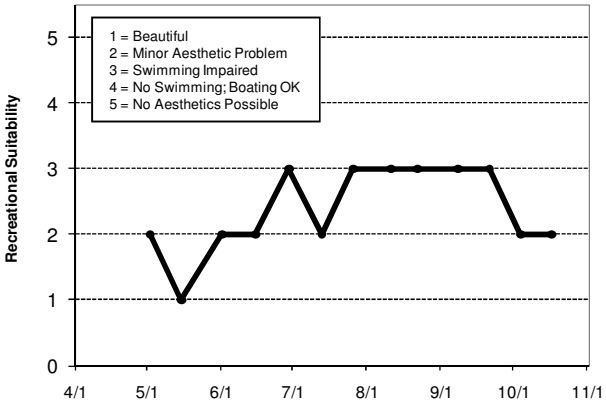
● Sampling site
Contours in meters











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/2	13.8				42.0	67		0.8	1	2
5/15	18.8				2.9	37		1.7	1	1
6/1	24.4				5.4	37		2.1	2	2
6/15	21.1				6.1	39		2.1	2	2
6/29	26.2				20.0	45		1.0	3	3
7/13	27.6				20.0	49		1.1	2	2
7/26	29.3				25.0	41		0.8	3	3
8/11	30.5				37.0	30		0.6	3	3
8/22	27.2				35.0	36		0.6	3	3
9/8	21.6				39.0	53		0.6	3	3
9/21	19.0				36.0	54		0.7	3	3
10/4	16.2				36.0	72		3.5	2	2
10/17	15.3				8.8	77		3.0	2	2

Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	37.7	21.0	57.0	C
CLA (µg/l)	14.7	2.2	36.0	B
Secchi (m)	1.7	1.4	1.8	C
TKN (mg/l)	0.97	0.81	1.20	
			Lake Grade	C

The lake received a lake grade of C for 2010, 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,

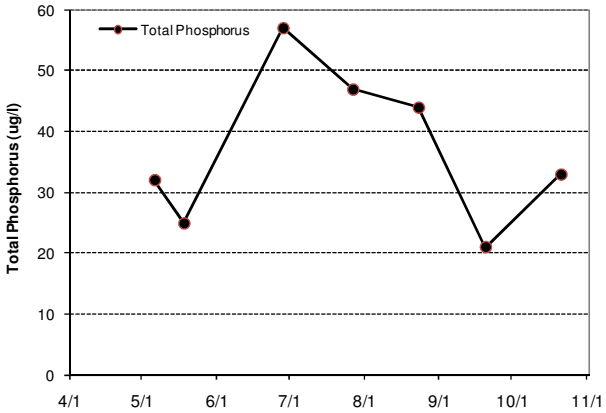
Washington Co.

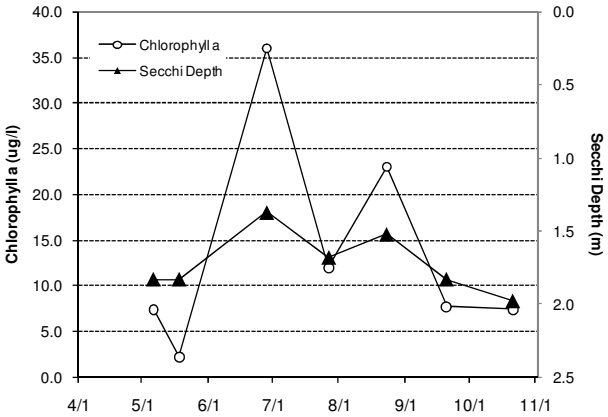
LAKE ID: 820065-00
WD: Carnelian-Marine-St. Croix
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters

N

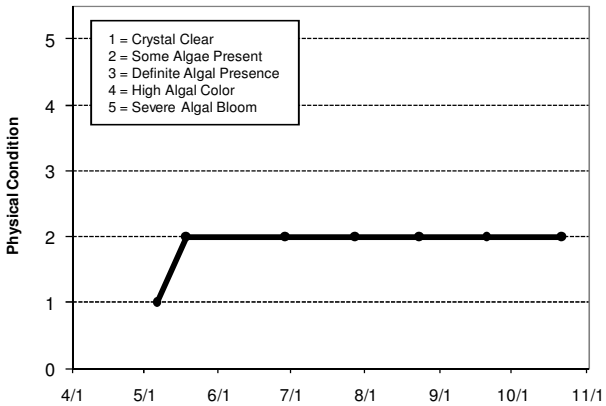
0 200 400
Meters





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/6	12.8	12.8	9.4	9.5	7.4	32		1.8	1	2
5/18	19.3	18.1	9.2	10.1	2.2	25		1.8	2	2
6/28	23.3	22.3	6.9	0.0	36.0	57		1.4	2	3
7/27	25.6	24.1	6.8	0.1	12.0	47		1.7	2	3
8/23	24.8	22.3	7.3	0.1	23.0	44		1.5	2	3
9/20	15.0	15.3	7.3	0.7	7.7	21		1.8	2	2
10/21	10.2	10.8	9.3	0.1	7.4	33		2.0	2	3

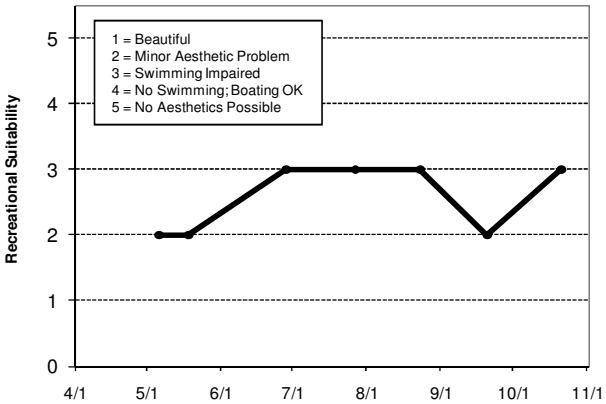


Lake Water Quality Grades Based on Summertime Averages

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

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

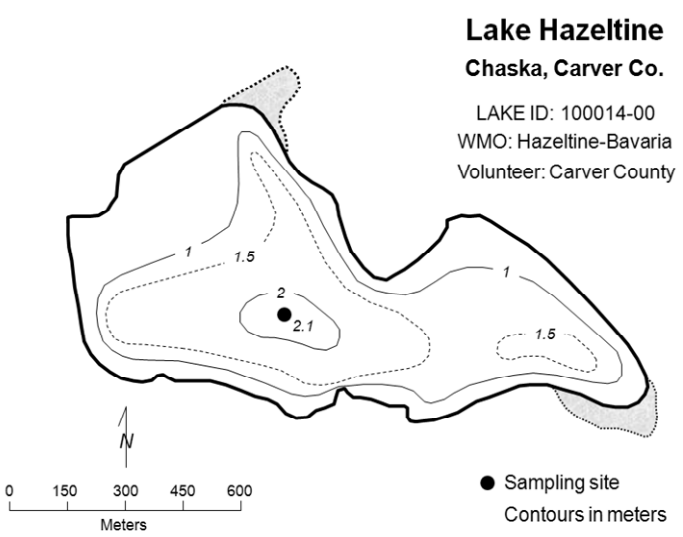
2010 summer (May-September) data summary

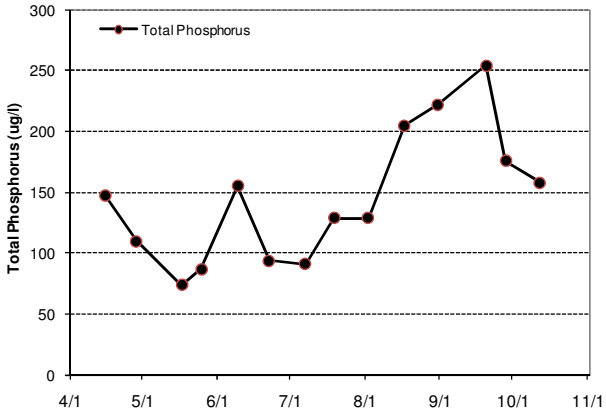
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	146.9	74.0	254.0	D
CLA (µg/l)	189.2	4.9	480.0	F
Secchi (m)	0.4	0.2	0.7	F
TKN (mg/l)	3.75	1.80	6.80	
			Lake Grade	F

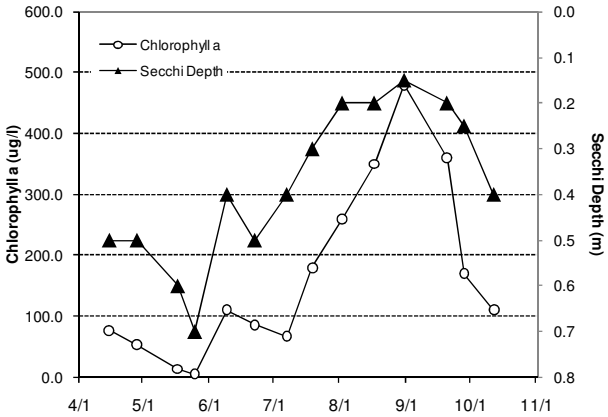
The lake received a lake grade of F for 2010, which is consistent with its limited historical database. Continued monitoring is suggested to continue to build the water quality database for this lake.

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.

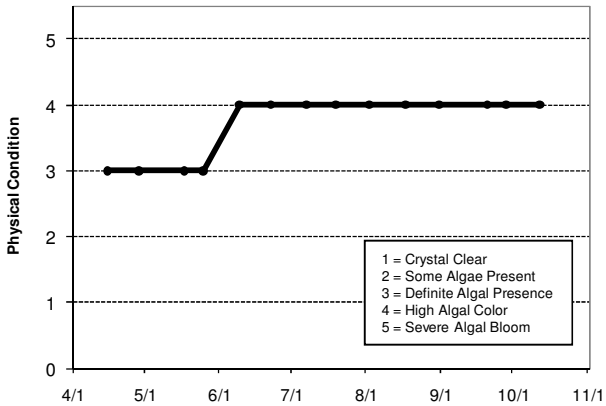






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/15	15.3	15.3	9.7	9.6	77.0	148		0.5	3	4
4/28	14.4	14.2	19.8	19.5	53.0	110		0.5	3	4
5/17	19.5	16.0	13.0	11.3	13.0	74		0.6	3	4
5/25	26.9	22.8	4.5	0.3	4.9	87		0.7	3	4
6/9	20.6	20.6	10.6	10.5	110.0	155		0.4	4	4
6/22	25.3	23.8	15.1	12.0	86.0	94		0.5	4	4
7/7	27.7	27.3	15.4	13.2	67.0	91		0.4	4	4
7/19	25.7	25.3	16.8	9.9	180.0	129		0.3	4	4
8/2	27.1	26.0	16.4	11.1	260.0	129		0.2	4	4
8/17	23.4	22.0	15.2	7.7	350.0	205		0.2	4	4
8/31	26.1	24.5	14.3	6.1	480.0	222		0.2	4	5
9/20	15.4	15.3	10.5	10.4	360.0	254		0.2	4	4
9/28	15.9	15.6	12.2	11.9	170.0	176		0.3	4	4
10/12	18.1	18.0	10.7	10.4	110.0	158		0.4	4	4

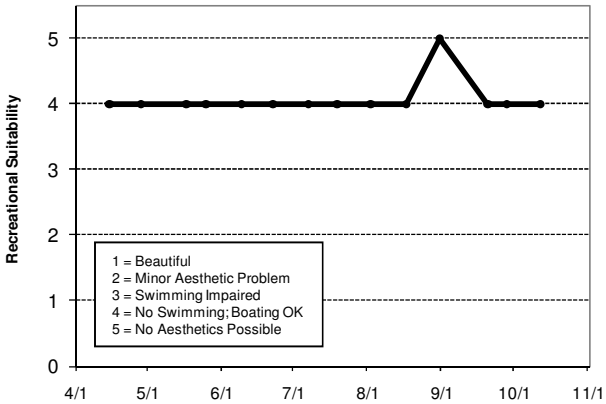


Lake Water Quality Grades Based on Summertime Averages

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

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



Source: Metropolitan Council and STORET data

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.

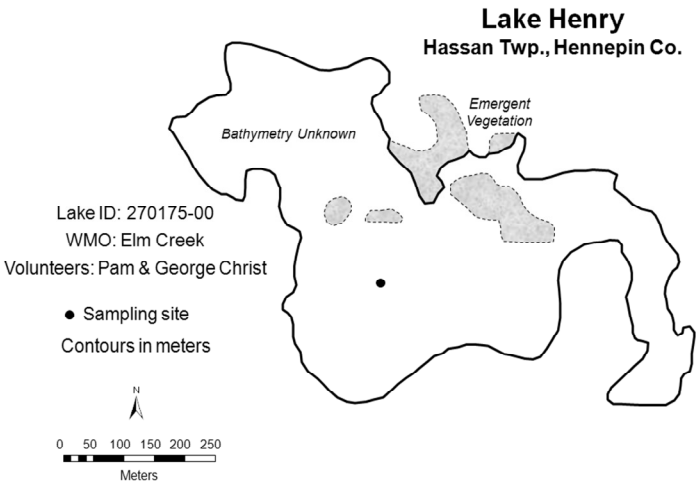
2010 summer (May-September) data summary

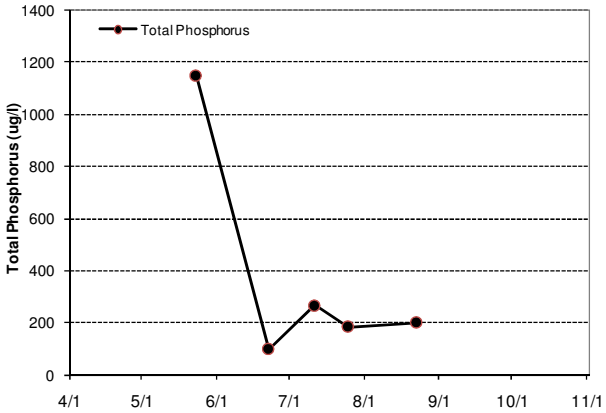
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	380.8	100.0	1150.0	F
CLA (µg/l)	58.4	1.0	140.0	D
Secchi (m)	0.7	0.4	1.0	F
TKN (mg/l)	3.48	1.50	7.90	
			Lake Grade	F

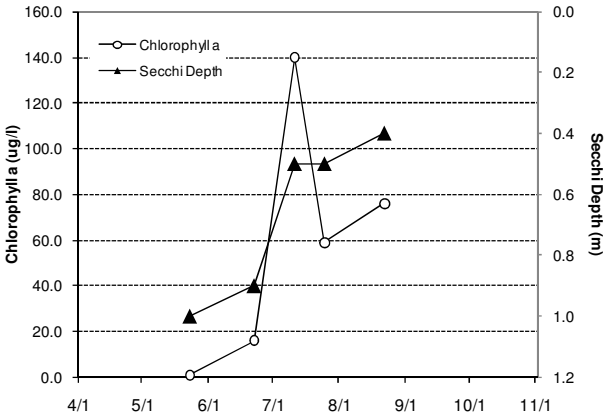
The lake received a lake grade of F for 2010 which is the second year in a row that the lake received an F grade. Prior to 2009, the lake typically received a D grade. Continued monitoring is recommended to determine if the lake is experiencing a degradation of water quality.

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.

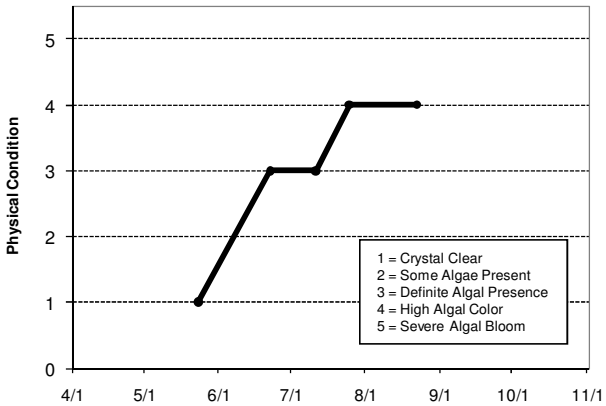






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/23					1.0	1150		1.0	1	4
6/22	27.9				16.0	100		0.9	3	5
7/11					140.0	268		0.5	3	5
7/25	28.4				59.0	186		0.5	4	5
8/22	28.1				76.0	200		0.4	4	5



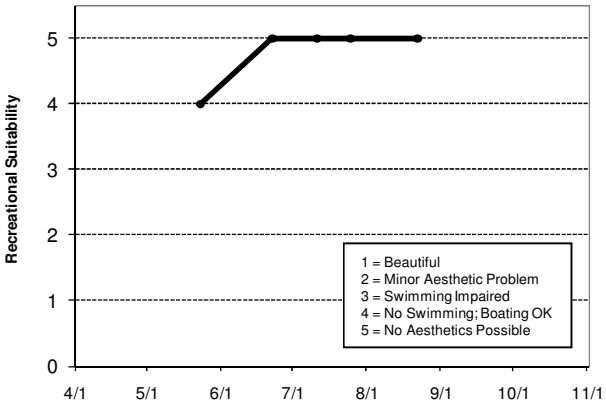
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Hornbean Lake (19-0047) *City of Sunfish Lake*

Hornbean Lake is located within the City of Sunfish Lake (Dakota County), and has an area of approximately 22-acres. There is very little morphological information available for the lake.

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

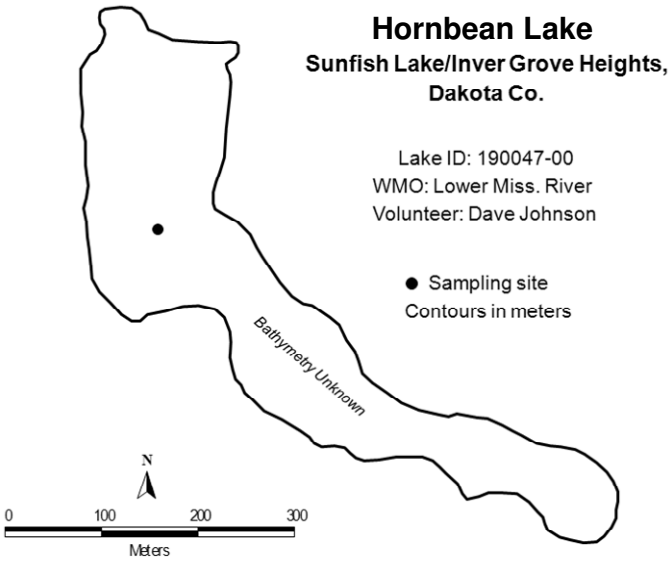
2010 summer (May-September) data summary

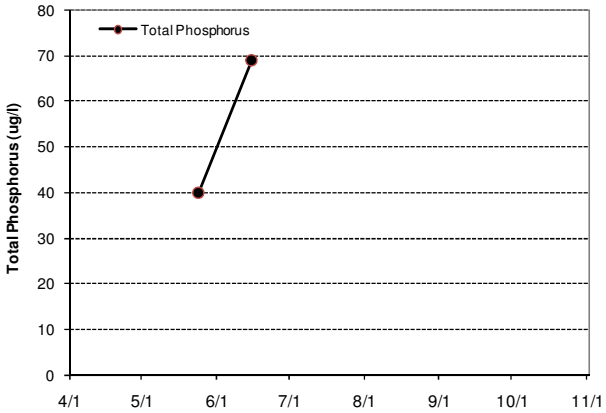
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	54.5	40.0	69.0	
CLA (µg/l)	16.0	6.9	25.0	
Secchi (m)	1.2	0.8	1.6	
TKN (mg/l)	1.35	1.30	1.40	
			Lake Grade	

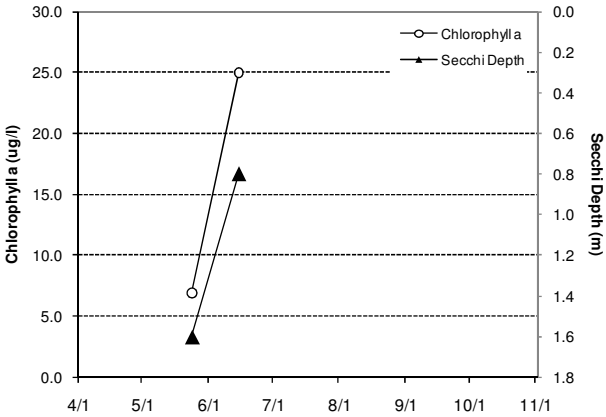
There was an insufficient quantity of data to calculate grades for the lake in 2009. Only two monitoring events occurred in 2010. At least 5 monitoring events during the summer-time period (May – September) are needed. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

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

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

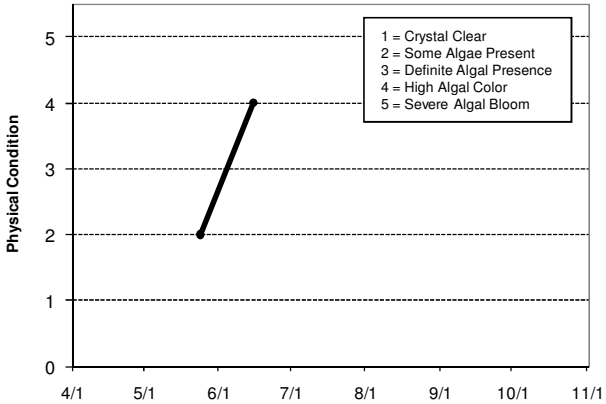






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/24	23.9				6.9	40		1.6	2	3
6/15	24.0				25.0	69		0.8	4	4



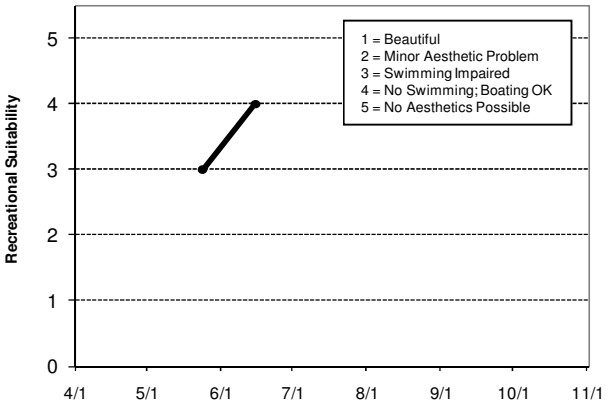
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	52.5	18.0	144.0	C
CLA (µg/l)	3.0	1.4	5.3	A
Secchi (m)		+ 2.0	+ 2.3	B (estimated)
TKN (mg/l)	0.63	0.48	1.20	
			Lake Grade	B (estimated)

The lake's 2009 lake water quality grade was a B, which was similar to last year's lake grade. However, the water clarity was better than the Secchi depth data would suggest since most of the measurements were made with the Secchi disk visible on the lake bottom. Therefore the Secchi depth mean and grade given above underestimate the actual water clarity. However the Secchi grade was estimated to be a B grade. Additional monitoring is recommended to continue to build the water quality database for this lake.

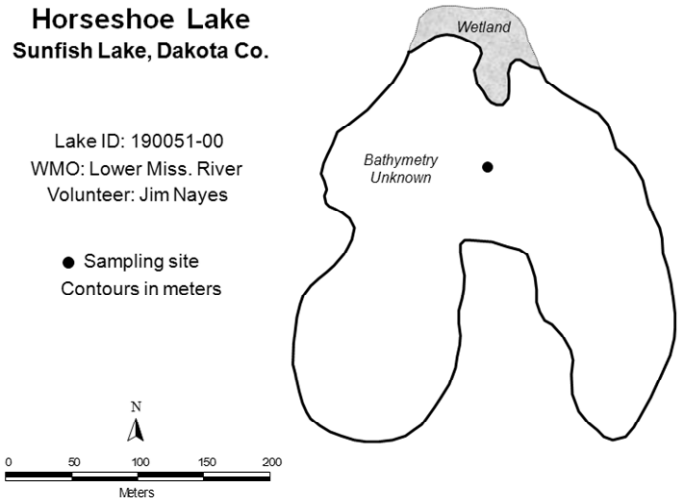
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

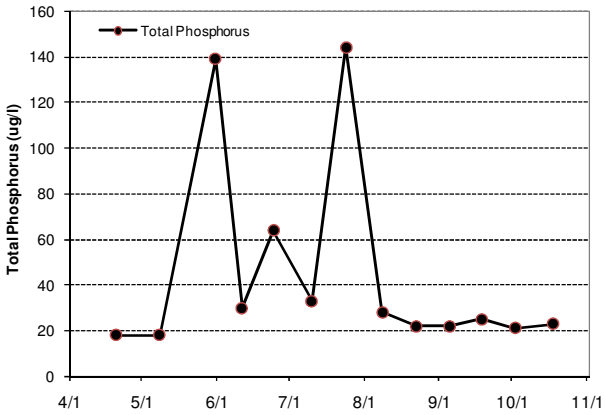
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

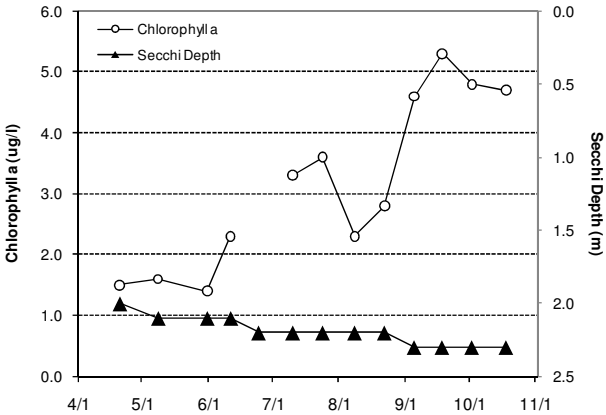
Horseshoe Lake
Sunfish Lake, Dakota Co.

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

● Sampling site
Contours in meters



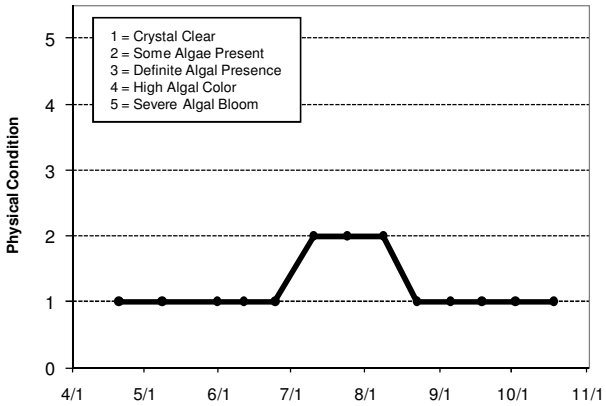




2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20	19.6				1.5	18		2.0+	1	1
5/8	13.1				1.6	18		2.1+	1	1
5/31	26.5				1.4	139		2.1+	1	1
6/11	21.3				2.3	30		2.1+	1	1
6/24	27.9					64		2.2+	1	1
7/10	29.1				3.3	33		2.2+	2	1
7/24	28.1				3.6	144		2.2+	2	1
8/8	30.9				2.3	28		2.2+	2	1
8/22	28.1				2.8	22		2.2+	1	1
9/5	20.8				4.6	22		2.3+	1	2
9/18	16.9				5.3	25		2.3+	1	1
10/2	15.5				4.8	21		2.3+	1	1
10/18	14.0				4.7	23		2.3+	1	1

\+ Secchi Disk visible on lake bottom



Lake Water Quality Grades Based on Summertime Averages

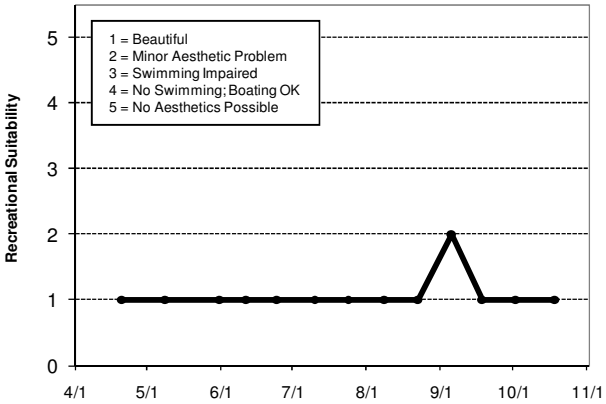
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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

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

* 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.

2010 summer (May-September) data summary

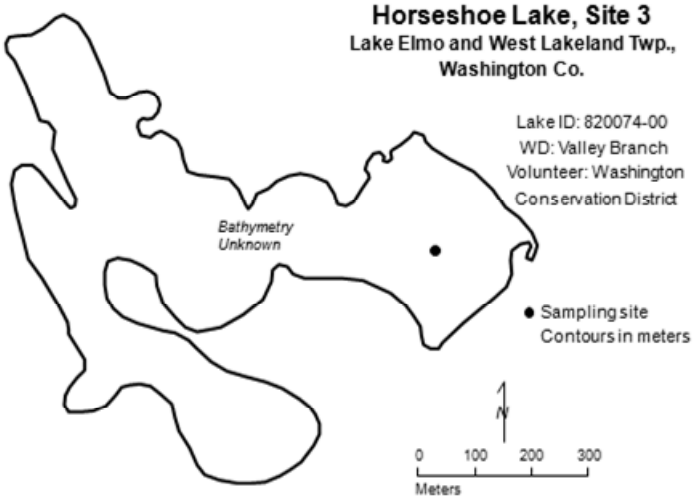
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	58.8	47.0	93.0	C
CLA (µg/l)	35.0	10.0	98.0	C
Secchi (m)	0.9	0.3	1.4	D
TKN (mg/l)	1.48	1.10	2.40	
			Lake Grade	C

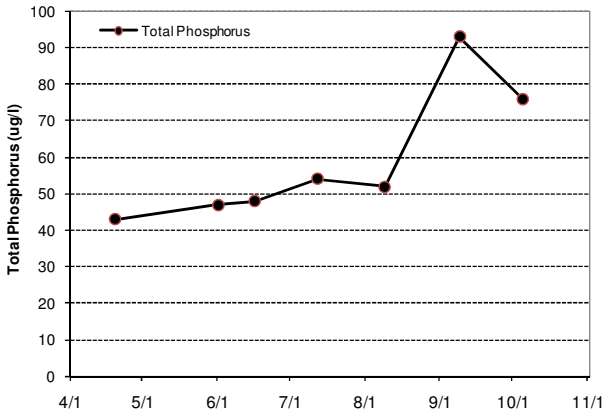
The lake site received a lake grade of C for 2010. Continued monitoring is suggested to continue to build the water quality database for this lake site.

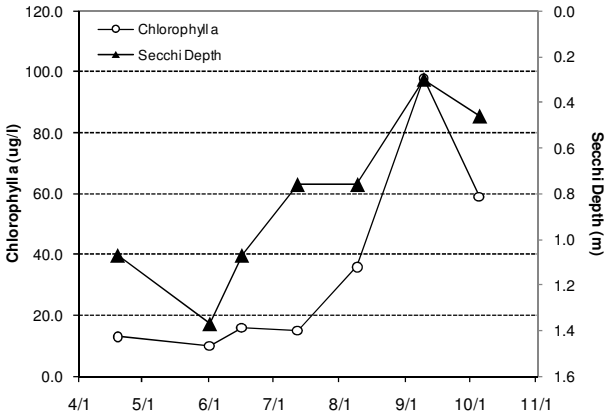
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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) 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.

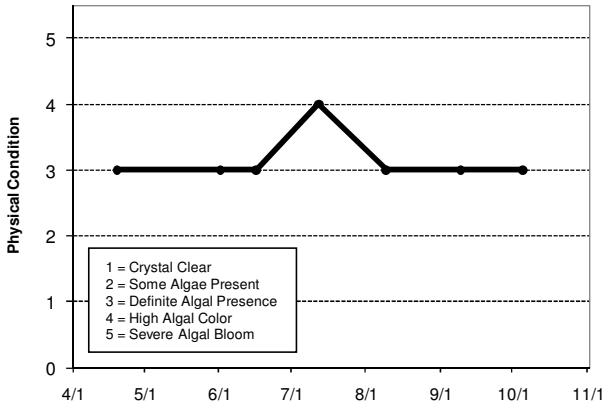






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	17.5	14.7	10.9	0.1	13.0	43		1.1	3	4
6/1	26.3	24.1	10.2	0.1	10.0	47		1.4	3	4
6/16	20.9	19.8	9.7	0.1	16.0	48		1.1	3	3
7/12	28.3	26.0	8.9	0.0	15.0	54		0.8	4	4
8/9	30.7	26.2	11.9	0.1	36.0	52		0.8	3	4
9/9	17.8	17.4	12.4	0.1	98.0	93		0.3	3	4
10/5	14.3	13.9	12.3	0.1	59.0	76		0.5	3	4



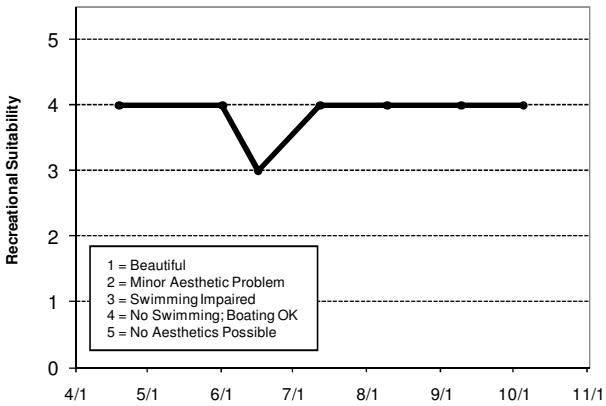
Lake Water Quality Grades Based on Summertime Averages

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

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

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

2010 summer (May-September) data summary

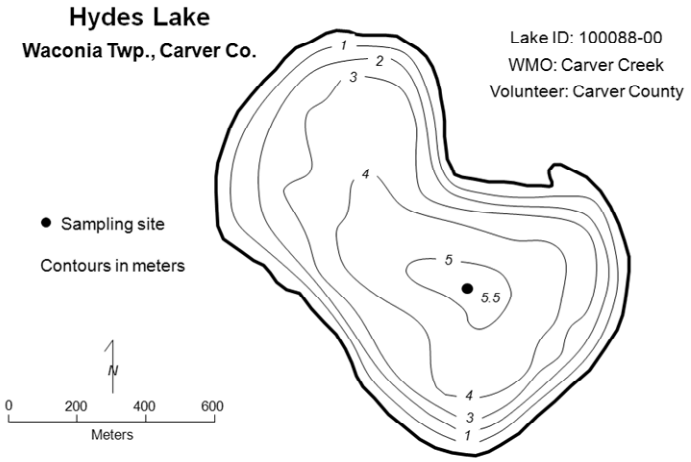
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	110.1	44.0	155.0	D
CLA (µg/l)	30.6	3.1	73.0	C
Secchi (m)	1.4	0.7	2.9	C
TKN (mg/l)	1.74	1.10	2.20	
			Lake Grade	C

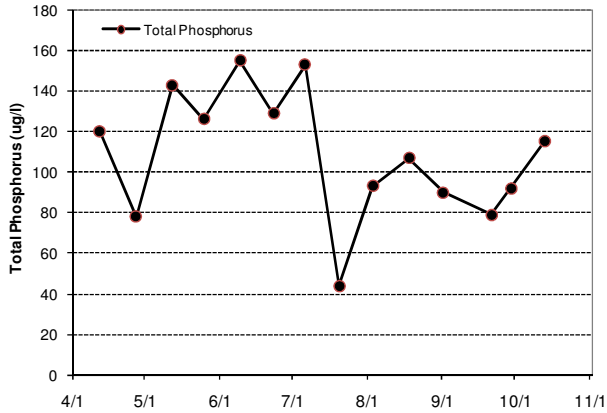
The lake received a lake grade of C for 2010, which is consistent with its historical database (the lake received similar grades in 2001 and 2003). The lake seems to fluctuate between C and F grades.

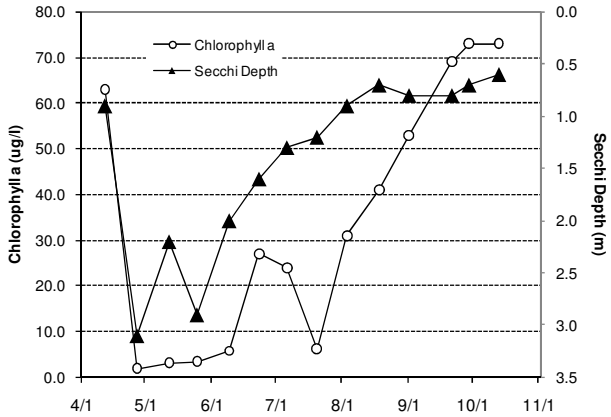
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

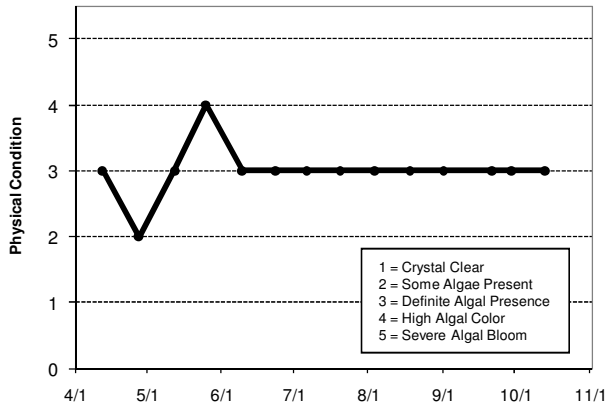






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	10.8	10.7	22.0	25.4	63.0	120		0.9	3	3
4/27	13.6	13.3	11.3	11.0	1.9	78		3.1	2	2
5/12	11.3	11.2	9.6	9.0	3.1	143		2.2	3	2
5/25	22.1	15.4	8.9	6.0	3.4	126		2.9	4	4
6/9	20.7	20.5	7.7	7.4	5.7	155		2.0	3	3
6/23	24.4	22.7	10.7	7.5	27.0	129		1.6	3	4
7/6	26.1	24.7	11.5	6.2	24.0	153		1.3	3	3
7/20	26.4	24.9	10.7	1.0	6.2	44		1.2	3	4
8/3	27.2	25.7	9.0	0.5	31.0	93		0.9	3	3
8/18	23.9	23.9	8.3	8.0	41.0	107		0.7	3	3
9/1	24.1	24.0	10.5	7.8	53.0	90		0.8	3	3
9/21	17.0	16.6	10.4	7.9	69.0	79		0.8	3	3
9/29	15.9	15.6	9.9	8.9	73.0	92		0.7	3	3
10/13	15.7	15.3	9.1	6.3	73.0	115		0.6	3	3



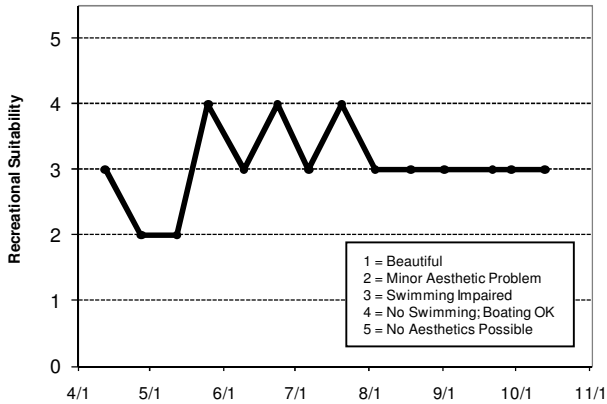
Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	35.5	20.0	121.0	C
CLA (µg/l)	11.0	4.7	18.0	B
Secchi (m)	1.7	1.2	2.5	C
TKN (mg/l)	1.07	0.76	1.90	
			Lake Grade	C

The lake received a lake grade of C for 2010, which is consistent with its historical database. The annual lake grades have varied among B's and C's. Continued monitoring is suggested to continue to build the water quality database for determining trends in its water quality.

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

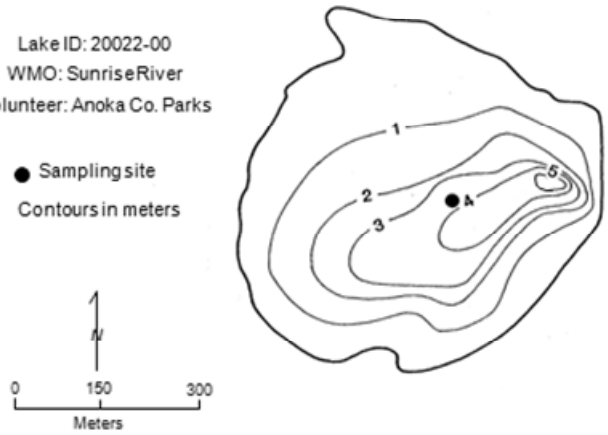
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

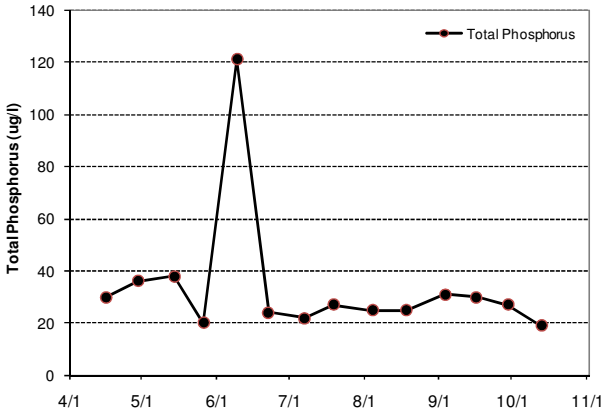
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

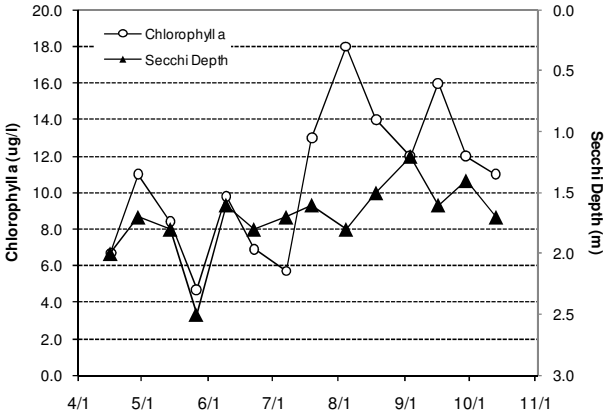
Island Lake
Linwood Twp., Anoka Co.

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

● Sampling site
Contours in meters

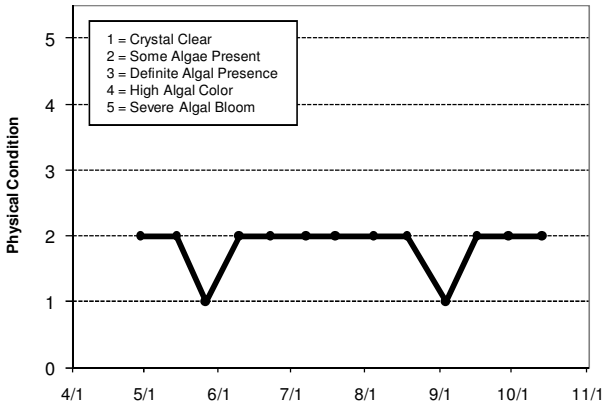






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/16	14.4				6.7	30		2.0		
4/29	41.3				11.0	36		1.7	2	
5/14	12.1				8.4	38		1.8	2	
5/26	25.0				4.7	20		2.5	1	
6/9	20.3				9.8	121		1.6	2	
6/22	23.6				6.9	24		1.8	2	
7/7	26.5				5.7	22		1.7	2	
7/19	25.6				13.0	27		1.6	2	1
8/4	28.9				18.0	25		1.8	2	2
8/18	22.3				14.0	25		1.5	2	
9/3	19.6				12.0	31		1.2	1	1
9/16	15.6				16.0	30		1.6	2	
9/29	15.1				12.0	27		1.4	2	
10/13	16.4				11.0	19		1.7	2	

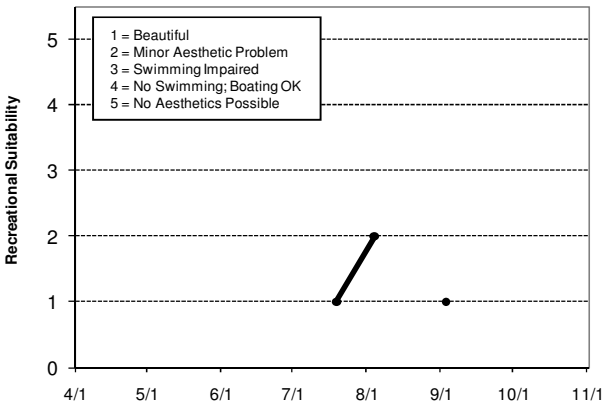


Lake Water Quality Grades Based on Summertime Averages

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



Source: Metropolitan Council and STORET data

Jackson WMA Wetland (82-0305) *Washington Conservation District*

The Jackson 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	49.0	28.0	87.0	C
CLA (µg/l)	14.1	5.3	33.0	B
Secchi (m)	2.0	1.4	2.4	C
TKN (mg/l)	1.22	0.82	2.30	
			Lake Grade	C

The lake received a lake grade of C for 2010. 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.

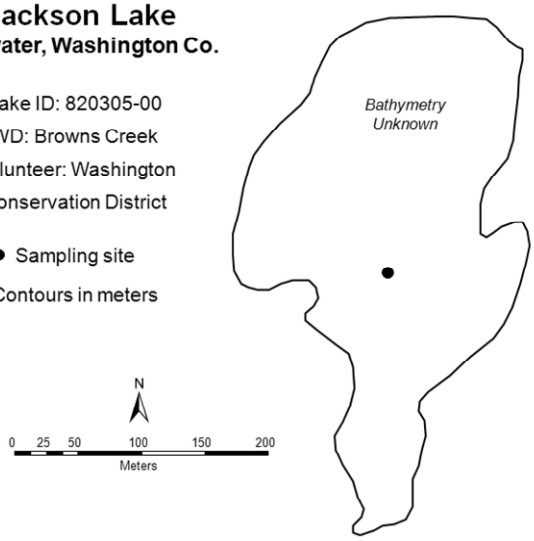
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

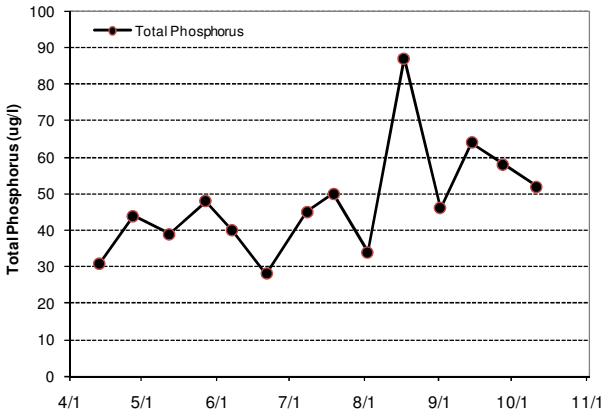
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

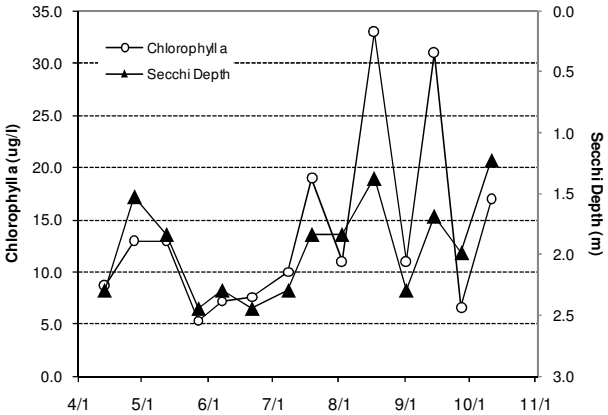
Jackson Lake
Stillwater, Washington Co.

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

● Sampling site
Contours in meters

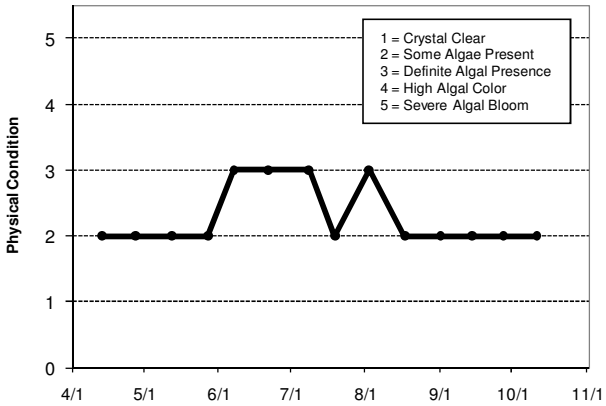






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	14.3	13.7	10.1	1.9	8.7	31		2.3	2	3
4/27	16.1	9.7	9.5	15.4	13.0	44		1.5	2	2
5/12	11.9	11.7	9.1	8.7	13.0	39		1.8	2	3
5/27	24.0	19.4	9.2	5.8	5.3	48		2.4	2	3
6/7	24.2	20.4	9.0	0.0	7.2	40		2.3	3	4
6/21	23.9	19.4	10.3	0.3	7.6	28		2.4	3	4
7/8	26.1	21.3	5.0	0.1	10.0	45		2.3	3	4
7/19	26.2	22.2	6.6	0.0	19.0	50		1.8	2	4
8/2	26.1	22.8	4.7	0.0	11.0	34		1.8	3	4
8/17	24.5	22.6	3.6	0.0	33.0	87		1.4	2	3
9/1	24.9	23.6	6.2	0.2	11.0	46		2.3	2	2
9/14	19.8	19.0	8.7	7.8	31.0	64		1.7	2	3
9/27	16.0	15.7	6.4	4.6	6.6	58		2.0	2	3
10/11	19.0	15.3	10.6	0.5	17.0	52		1.2	2	3



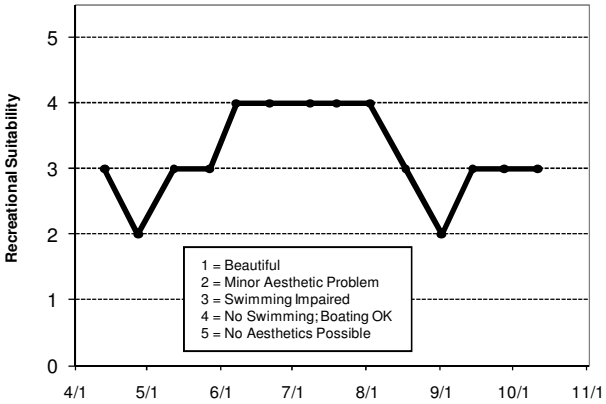
Lake Water Quality Grades Based on Summertime Averages

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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	14.9	8.0	24.0	A
CLA (µg/l)	3.3	1.3	6.5	A
Secchi (m)	4.5	3.2	6.5	A
TKN (mg/l)	0.72	0.34	1.70	
			Lake Grade	A

The lake received a lake grade of A for 2010, which is consistent with lake grades received since the year 2000.

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

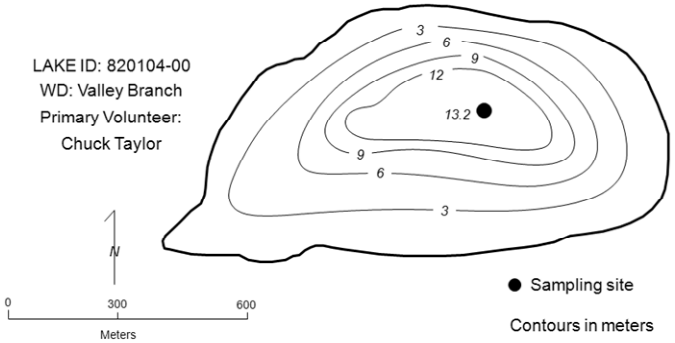
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

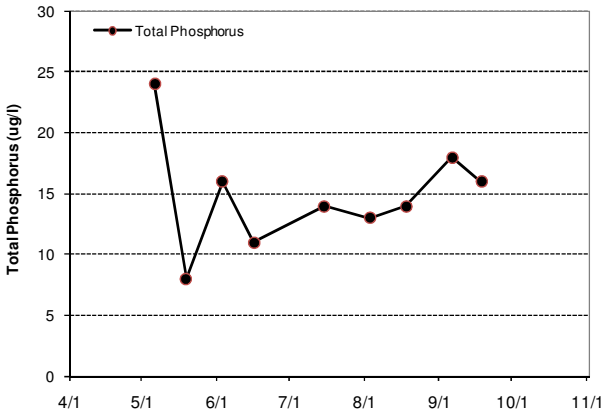
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

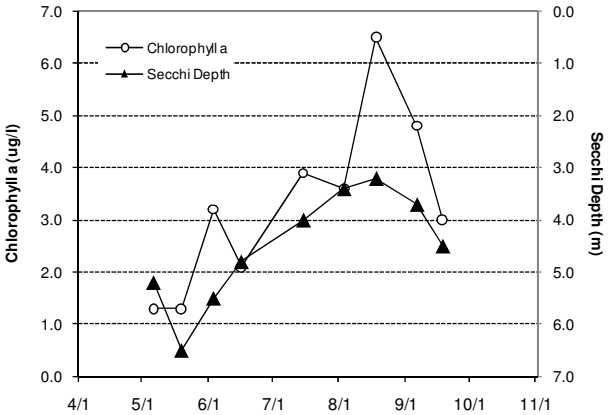
Lake Jane

Lake Elmo, Washington Co.

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

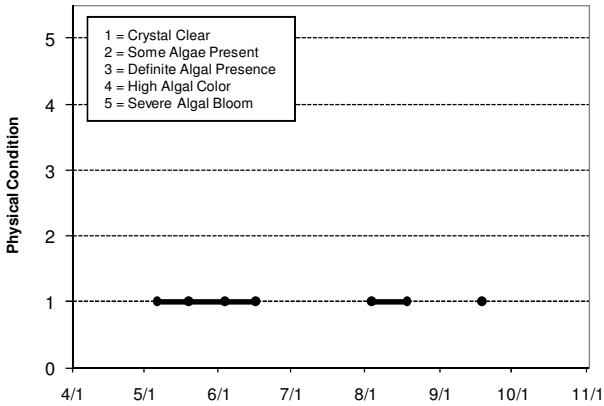






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/6	13.4				1.3	24		5.2	1	1
5/19	19.1				1.3	8		6.5	1	
6/3	23.6				3.2	16		5.5	1	
6/16	22.9				2.1	11		4.8	1	
7/15	25.8				3.9	14		4.0		
8/3	27.7				3.6	13		3.4	1	1
8/18	24.8				6.5	14		3.2	1	1
9/6	20.4				4.8	18		3.7		
9/18	17.7				3.0	16		4.5	1	



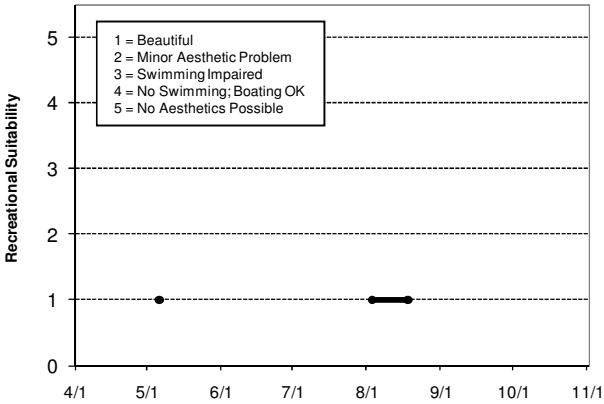
Lake Water Quality Grades Based on Summertime Averages

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
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



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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	60.2	25.0	88.0	C
CLA (µg/l)	29.2	2.8	64.0	C
Secchi (m)	2.0	1.1	3.8	C
TKN (mg/l)	1.22	0.71	1.70	
			Lake Grade	C

The lake received a lake grade of C for 2010, which lower than the B grade received last year, but better than the D and F grades received before 2007. Further monitoring is suggested to determine if the recent improvements are indication of an improving trend over the D lake grades received between 1996 and 2006.

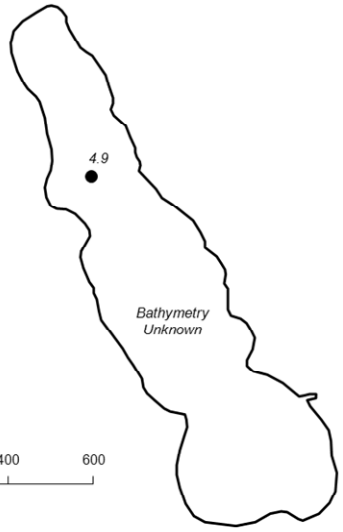
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

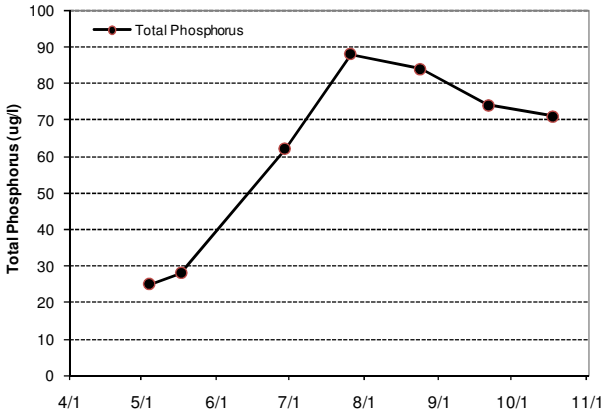
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

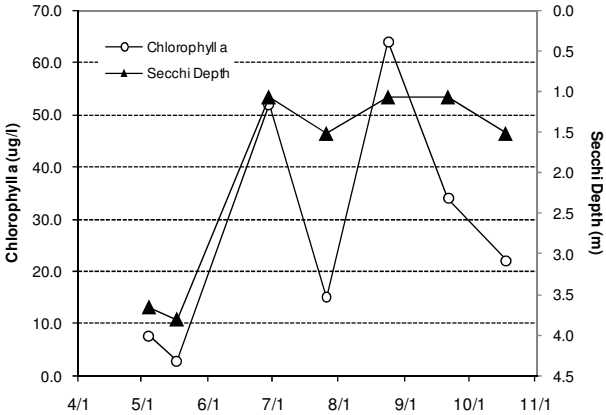
Jellum's Lake, Site 1
Scandia, Washington Co.

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

● Sampling site
Contours in meters

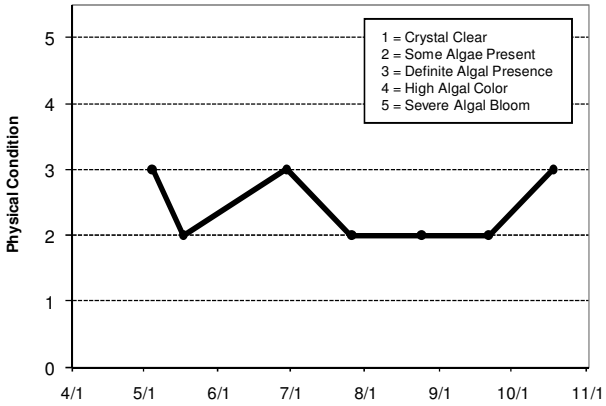






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/4	14.1	14.1	9.6	0.1	7.6	25		3.7	3	3
5/17	20.7	13.3	9.7	0.9	2.8	28		3.8	2	2
6/29	23.5	20.3	9.8	0.2	52.0	62		1.1	3	4
7/26	26.7	21.8	8.8	0.1	15.0	88		1.5	2	3
8/24	25.8	22.9	10.7	0.1	64.0	84		1.1	2	3
9/21	16.0	16.0	7.9	0.2	34.0	74		1.1	2	3
10/18	13.3	13.3	6.7	0.1	22.0	71		1.5	3	3



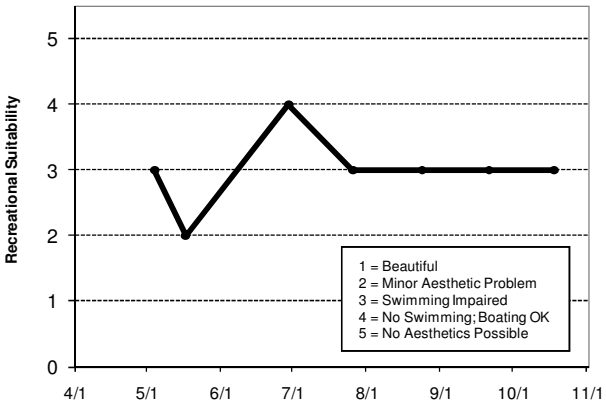
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



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

Jonathan Lake is a small lake located in Carver County. There is 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	143.6	68.0	215.0	D
CLA (µg/l)	96.6	11.0	330.0	F
Secchi (m)	0.5	0.3	0.9	F
TKN (mg/l)	1.92	1.40	2.90	
			Overall Grade	F

The lake received a lake grade of F for 2010, 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.

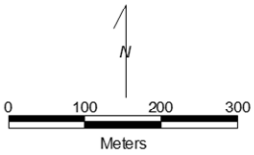
LAKE ID: 100217-00

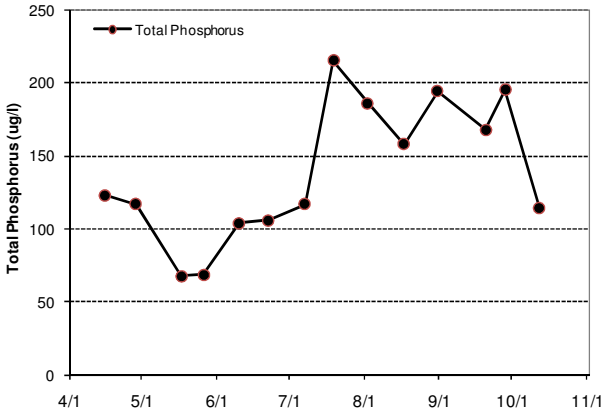
WMO: Hazeltine-Bavaria

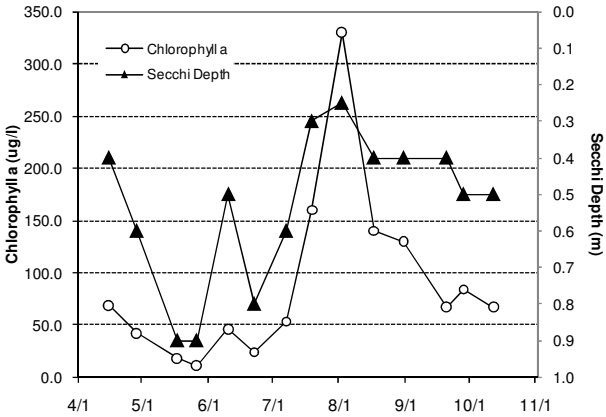
Volunteer: Carver Co.

● Sampling site

Contours in meters

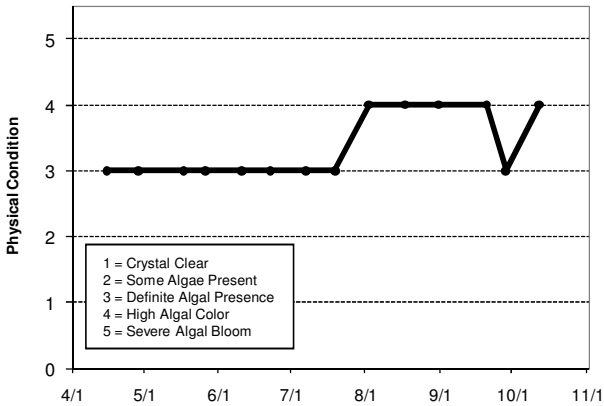






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/15	15.6	15.1	10.7	9.9	69.0	123		0.4	3	3
4/28	14.3	13.7	18.6	16.2	42.0	117		0.6	3	4
5/17	20.3	14.6	14.9	18.2	18.0	68		0.9	3	4
5/26	24.6	20.6	8.2	2.9	11.0	69		0.9	3	3
6/10	20.5	20.5	6.5	6.3	46.0	104		0.5	3	4
6/22	25.3	22.9	8.2	0.4	24.0	106		0.8	3	4
7/7	26.9	26.5	11.5	8.8	53.0	117		0.6	3	3
7/19	26.3	25.5	14.2	0.7	160.0	215		0.3	3	4
8/2	27.6	25.3	13.7	1.0	330.0	186		0.3	4	4
8/17	25.0	23.1	15.9	7.4	140.0	158		0.4	4	4
8/31	27.2	25.0	13.5	5.9	130.0	194		0.4	4	4
9/20	15.9	15.9	10.3	10.3	67.0	168		0.4	4	4
9/28	16.8	16.0	13.8	11.5	84.0	195		0.5	3	3
10/12	17.6	17.2	13.0	11.4	67.0	114		0.5	4	4



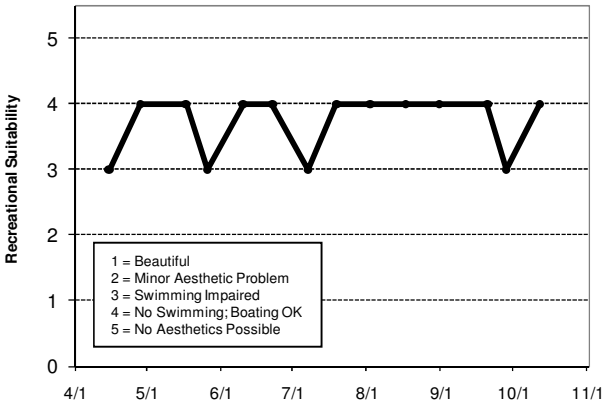
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Karth Lake (62-0072) *Rice Creek Watershed District*

Karth Lake is located in the City of Arden Hills. There is little physical information available for this lake. A search in STORET showed that the lake was monitored for a variety of parameters on three different dates. Monitoring occurred on one day in July in each of the following years: 1988, 1990, and 1991.

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

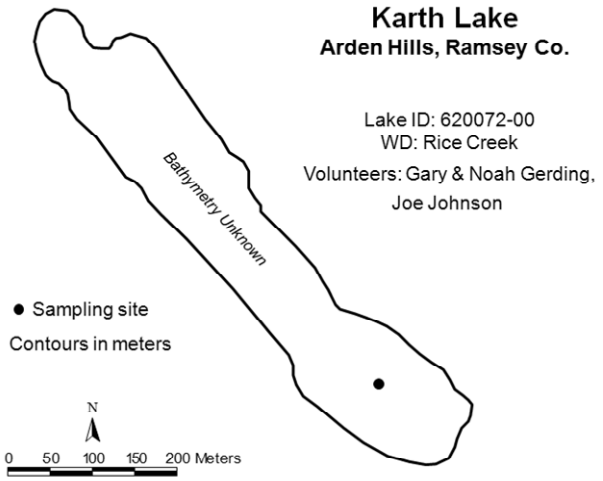
2010 summer (May-September) data summary

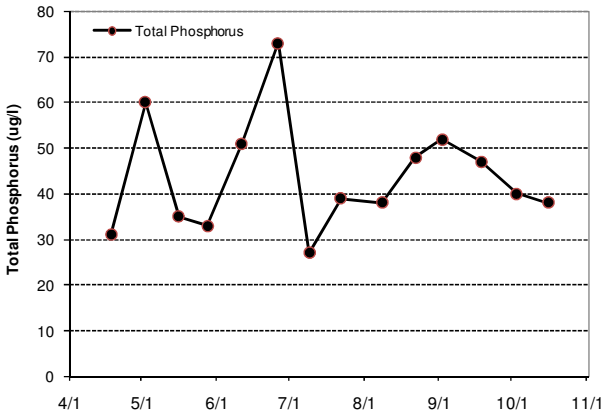
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	45.7	27.0	73.0	C
CLA (µg/l)	27.1	4.1	65.0	C
Secchi (m)	1.7	0.7	3.1	C
TKN (mg/l)	1.31	0.99	1.80	
			Lake Grade	C

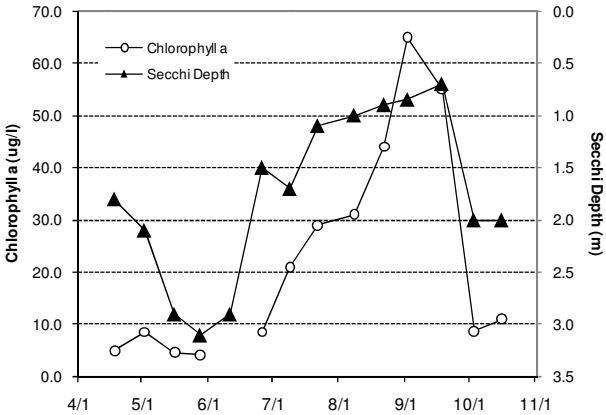
The lake received a lake grade of C for 2010, which is consistent with its limited water quality database. Further monitoring is suggested to more fully develop its water quality database.

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.

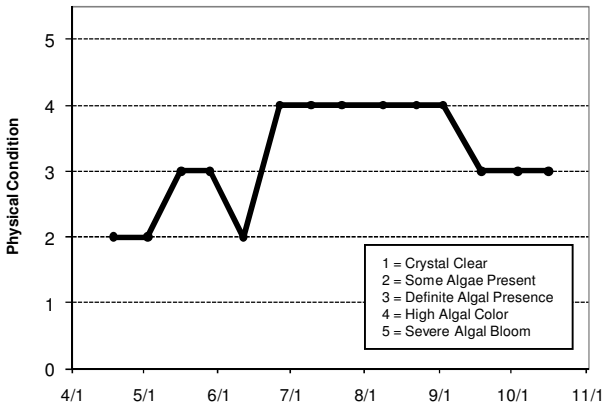






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	18.2				4.9	31		1.8	2	1
5/2	16.6				8.5	60		2.1	2	1
5/16	17.2				4.6	35		2.9	3	2
5/28	25.6				4.1	33		3.1	3	3
6/11	21.7					51		2.9	2	2
6/26	28.0				8.5	73		1.5	4	4
7/9	28.9				21.0	27		1.7	4	4
7/22	27.0				29.0	39		1.1	4	4
8/8	30.7				31.0	38		1.0	4	3
8/22	27.5				44.0	48		0.9	4	3
9/2	24.9				65.0	52		0.9	4	3
9/18	18.0				55.0	47		0.7	3	3
10/3	16.4				8.7	40		2.0	3	2
10/16	15.6				11.0	38		2.0	3	2



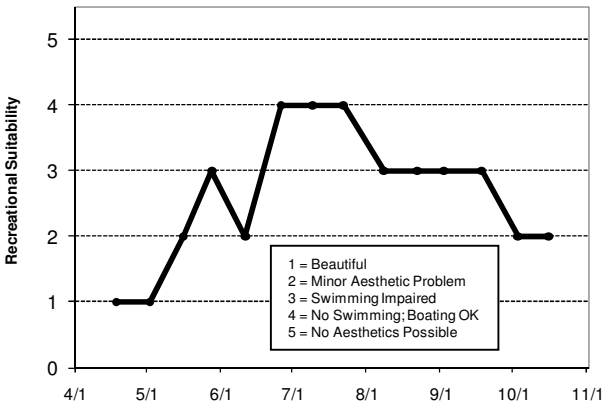
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



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

Keller Lake is located in the cities of Apple Valley and Burnsville (Dakota County). The surface area of the lake is 55 acres. It has a maximum depth of 3.0 m (10 feet) 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	72.8	43.0	108.0	D
CLA (µg/l)	60.6	17.0	160.0	D
Secchi (m)	0.7	0.3	1.1	F
TKN (mg/l)	1.44	0.93	2.70	
			Lake Grade	D

The lake received a lake grade of D for 2010. The water quality of 2010 continues the shift to poorer water quality starting 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/.

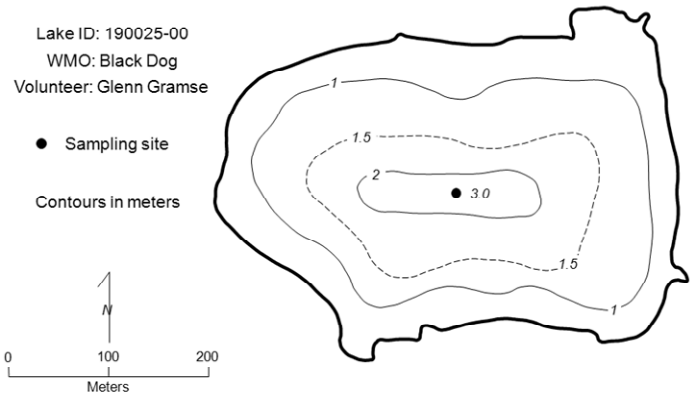
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

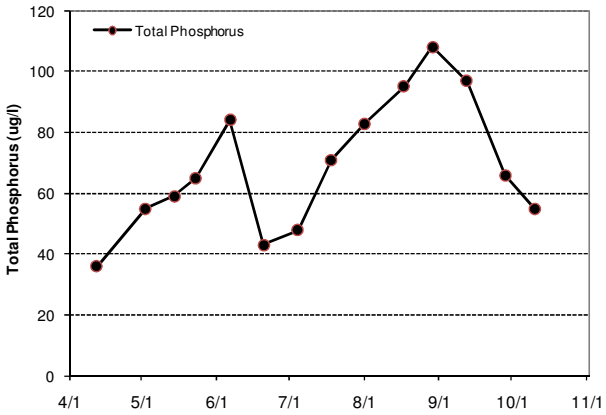
Keller Lake
Burnsville, Dakota Co.

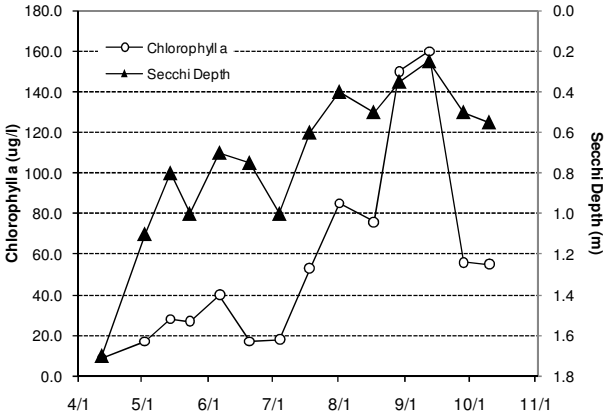
Lake ID: 190025-00
WMO: Black Dog
Volunteer: Glenn Gramse

● Sampling site

Contours in meters

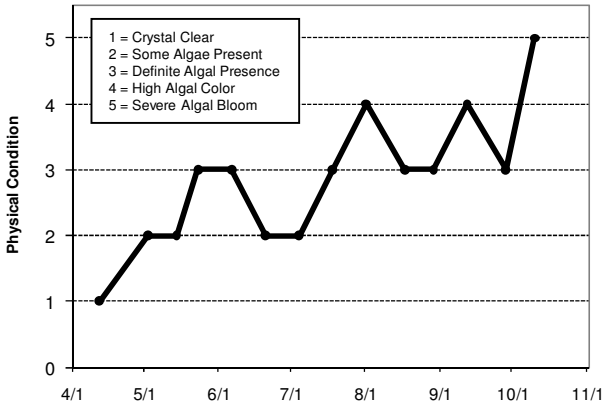






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	16.4				8.9	36		1.7	1	1
5/2	16.2				17.0	55		1.1	2	2
5/14	14.2				28.0	59		0.8	2	2
5/23	23.9				27.0	65		1.0	3	4
6/6	23.9				40.0	84		0.7	3	4
6/20	27.3				17.0	43		0.8	2	4
7/4	27.5				18.0	48		1.0	2	4
7/18	27.7				53.0	71		0.6	3	4
8/1	28.7				85.0	83		0.4	4	4
8/17	25.5				76.0	95		0.5	3	4
8/29	24.9				150.0	108		0.4	3	4
9/12	18.0				160.0	97		0.3	4	4
9/28	16.6				56.0	66		0.5	3	4
10/10	19.4				55.0	55		0.6	5	5

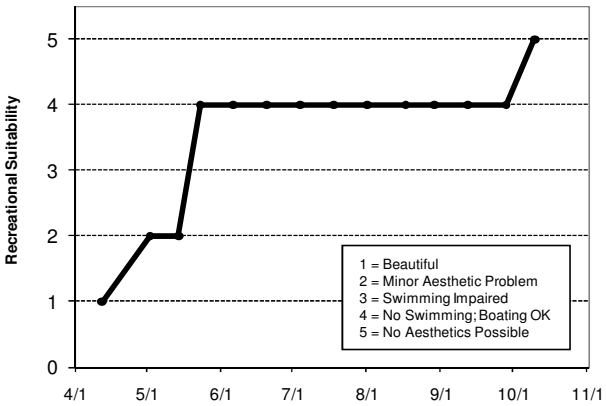


Lake Water Quality Grades Based on Summertime Averages

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

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

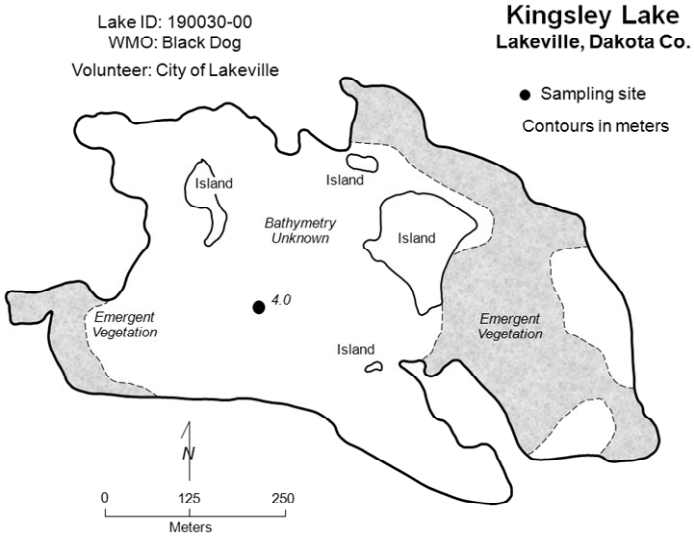
2010 summer (May-September) data summary

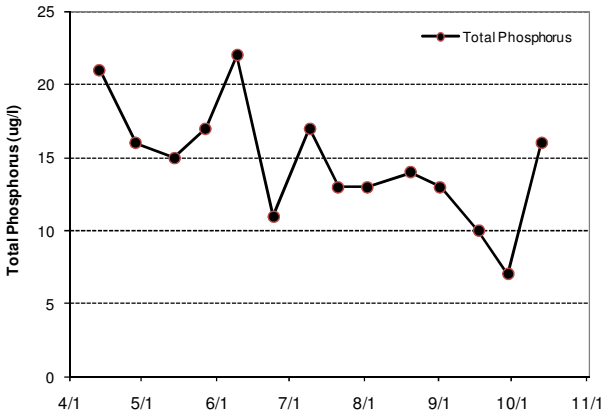
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	13.8	7.0	22.0	A
CLA (µg/l)	2.5	1.8	3.8	A
Secchi (m)		+ 2.5	+ 2.5	A (estimated)
TKN (mg/l)	0.52	0.45	0.58	
			Lake Grade	A (estimated)

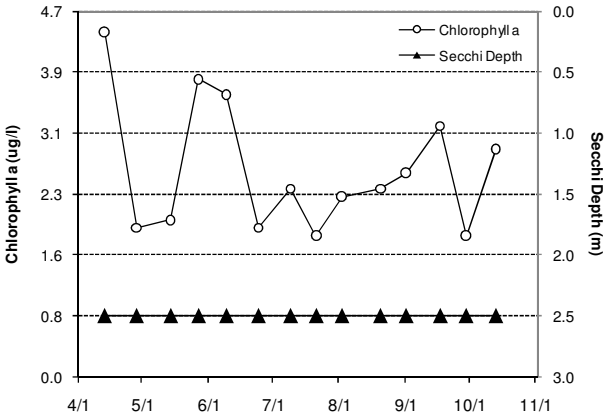
Similar to past years, the Secchi transparency in 2010 would have been greater except that during most monitoring events either the lake's excessive submergent macrophyte growth obscured the secchi disk, or the secchi was visible while resting on the lake bottom. According to the volunteer's judgement, the Secchi depths in these instances would have likely been in excess of 3 meters. Also, the other two water quality parameter received A grades. Therefore, giving a Secchi depth grade of A may be justified.

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

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



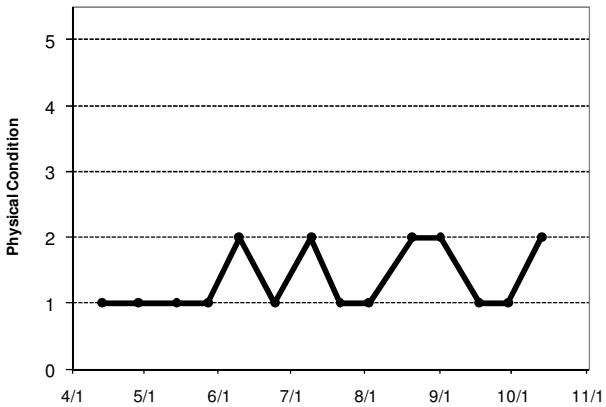




2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	11.0				4.4	21		2.5+	1	1
4/28	13.0				1.9	16		2.5+	1	1
5/14	8.9				2.0	15		2.5+	1	1
5/27	23.0				3.8	17		2.5+	1	1
6/9	19.0				3.6	22		2.5+	2	1
6/24	22.0				1.9	11		2.5+	1	1
7/9	25.0				2.4	17		2.5+	2	1
7/21	27.0				1.8	13		2.5+	1	1
8/2	25.0				2.3	13		2.5+	1	1
8/20	23.0				2.4	14		2.5+	2	1
9/1	22.0				2.6	13		2.5+	2	
9/17	14.0				3.2	10		2.5+	1	1
9/29	13.0				1.8	7		2.5+	1	1
10/13	15.5				2.9	16		2.5+	2	1

+ Secchi Disk visible on lake bottom



Lake Water Quality Grades Based on Summertime Averages

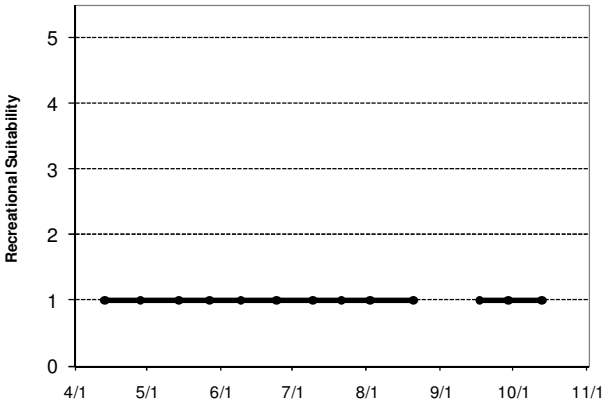
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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

2010 summer (May-September) data summary

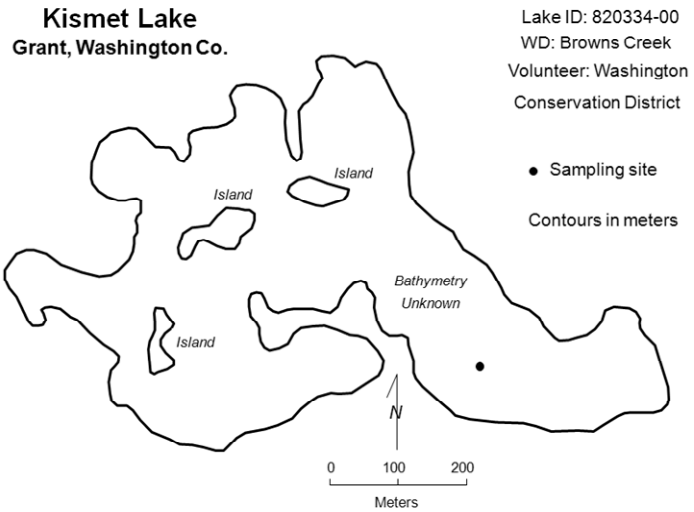
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	44.2	27.0	69.0	C
CLA (µg/l)	21.0	2.4	69.0	C
Secchi (m)	1.4	0.9	1.8	C
TKN (mg/l)	0.93	0.74	1.20	
			Lake Grade	C

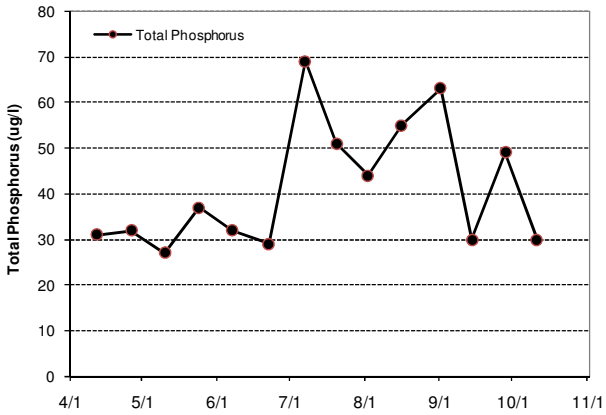
The lake received a lake grade of C for 2010, which is consistent with its historical water quality database.

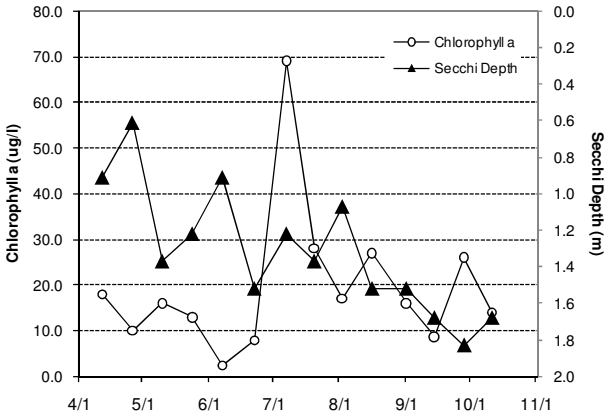
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

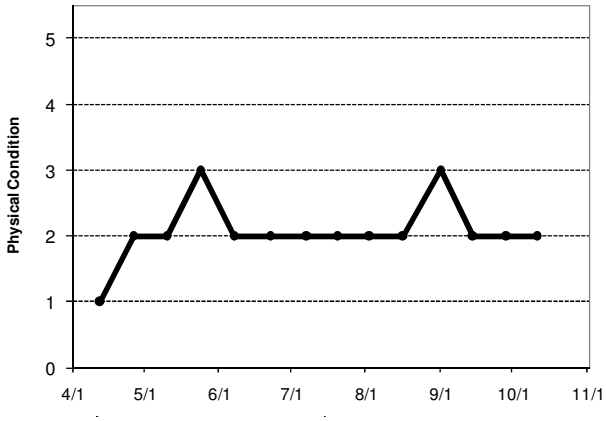






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	16.0	10.7	12.3	0.7	18.0	31		0.9	1	2
4/26	14.0	13.2	9.2	0.1	10.0	32		0.6	2	3
5/10	14.1	11.2	13.9	7.7	16.0	27		1.4	2	2
5/24	27.3	18.7	12.2	3.2	13.0	37		1.2	3	4
6/7	24.4	17.9	10.3	1.0	2.4	32		0.9	2	3
6/22	24.0	19.8	6.9	1.5	7.9	29		1.5	2	3
7/7	27.0	23.3	8.0	0.9	69.0	69		1.2	2	3
7/20	24.5	21.7	3.9	0.1	28.0	51		1.4	2	3
8/2	27.0	23.6	6.7	0.7	17.0	44		1.1	2	3
8/16	24.2	23.3	4.0	0.2	27.0	55		1.5	2	3
9/1	25.3	23.6	5.7	4.6	16.0	63		1.5	3	3
9/14	18.4	17.6	6.6	1.4	8.7	30		1.7	2	2
9/28	15.0	14.6	7.1	4.4	26.0	49		1.8	2	2
10/11	17.8	15.9	10.3	7.6	14.0	30		1.7	2	2



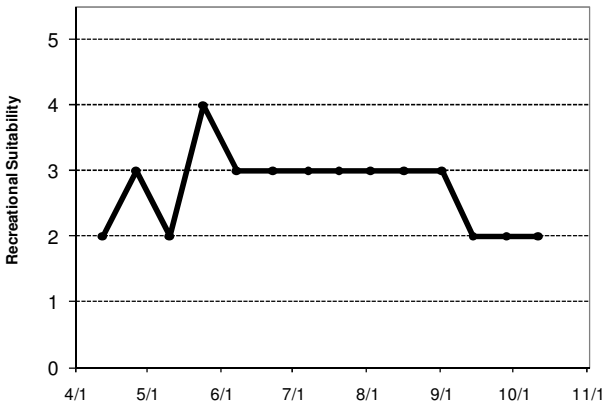
Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	151.0	123.0	223.0	D
CLA (µg/l)	63.8	29.0	100.0	D
Secchi (m)	0.4	0.3	0.5	F
TKN (mg/l)	2.69	1.90	3.60	
			Lake Grade	D

The lake received a lake grade of D for 2010, which is similar to previous years' lake grades. Based on the limited water quality database for the lake, it appears to be represented by a lake grade of D. Additional years of monitoring are suggested for continuing to build the water quality database to determine potential water quality trends.

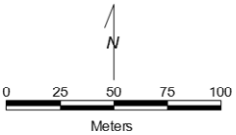
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

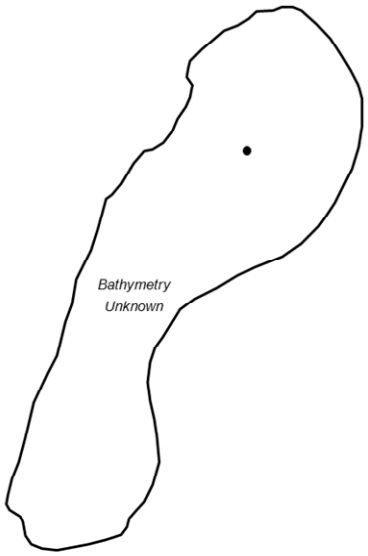
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

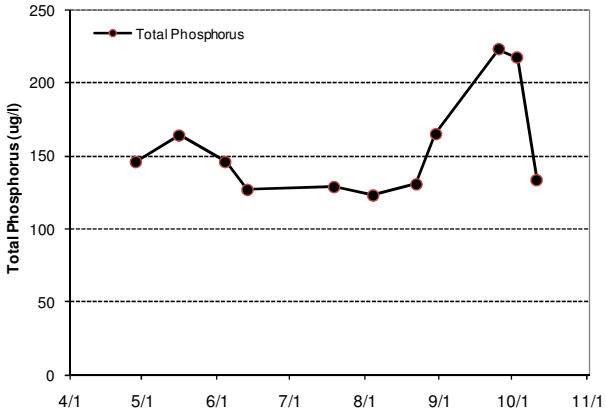
Klawitter Pond
Lake Elmo, Washington Co.

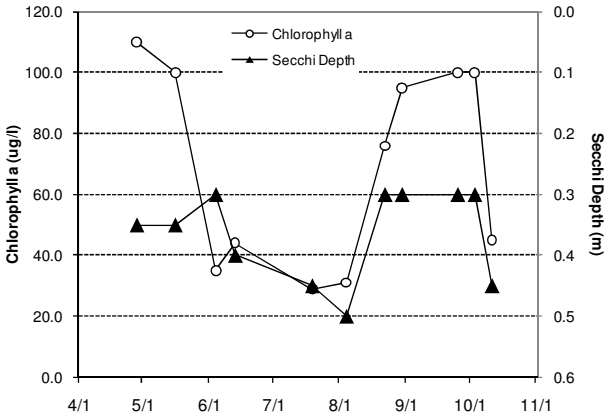
Lake ID: 820368-00
WD: Valley Branch
Volunteers: Bonnie Juran & Pat Barrett

● Sampling site
Contours in meters



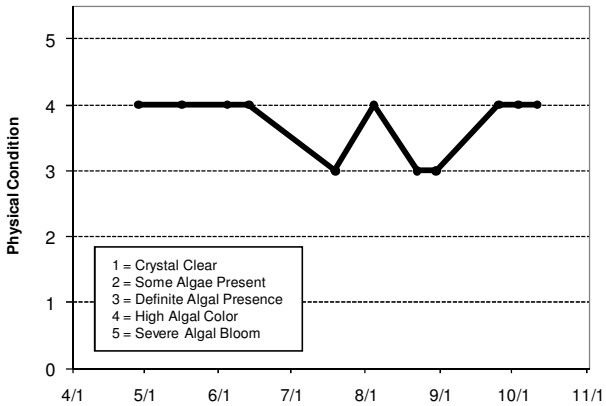






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/28	18.1				110.0	146		0.4	4	3
5/16	20.8				100.0	164		0.4	4	4
6/4	27.0				35.0	146		0.3	4	4
6/13	19.7				44.0	127		0.4	4	4
7/19	26.8				29.0	129		0.5	3	4
8/4	29.3				31.0	123		0.5	4	4
8/22	28.2				76.0	131		0.3	3	4
8/30	27.9				95.0	165		0.3	3	4
9/25	16.1				100.0	223		0.3	4	4
10/3	14.3				100.0	217		0.3	4	4
10/11	18.6				45.0	133		0.5	4	4



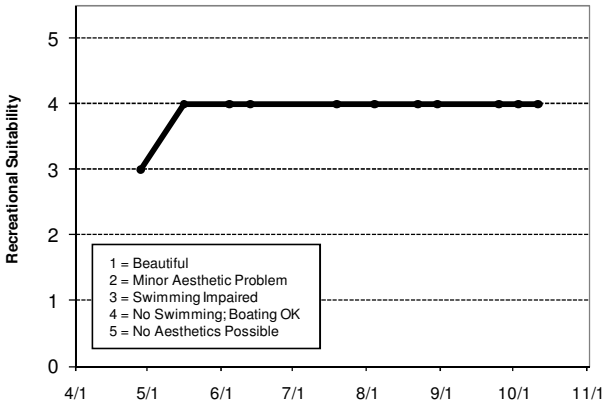
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Kramer Pond (82-0117) *Valley Branch Watershed District*

Kramer Pond is located within the City of Lake Elmo (Washington County). Little morphological information is available for the lake. The maximum depth at the sampling point is 1.8 m (6.0 feet). Because of the shallowness of the lake, the entire surface area is considered littoral zone, which is the 0-15 feet depth zone dominated by aquatic vegetation. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

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

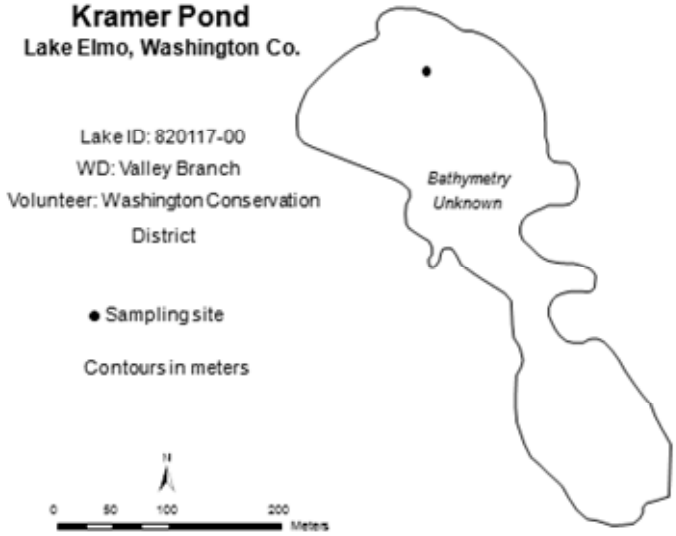
2010 summer (May-September) data summary

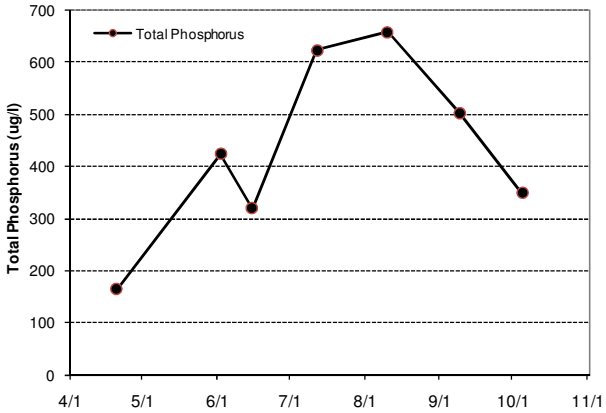
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	504.8	319.0	657.0	F
CLA (µg/l)	194.5	7.7	360.0	F
Secchi (m)	0.4	0.2	0.8	F
TKN (mg/l)	6.36	4.60	7.40	
			Lake Grade	F

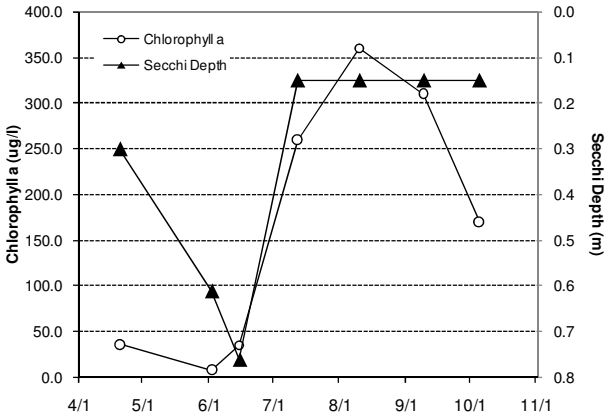
The lake received a lake grade of F for 2010, which is consistent with its limited water quality database. Additional years of monitoring are suggested for continuing to build the water quality database.

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.

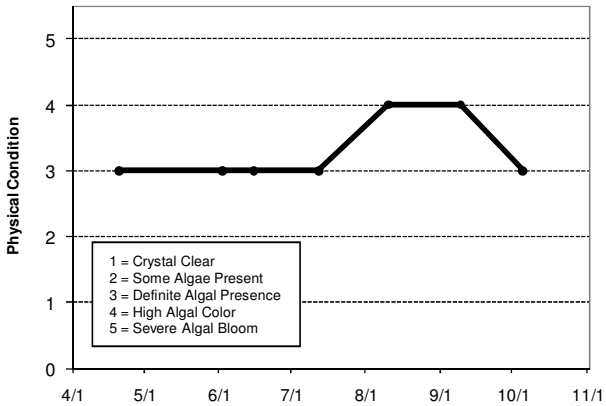






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20	15.6	15.0	14.5	0.1	36.0	165		0.3	3	4
6/2	21.4	21.5	2.8	0.1	7.7	423		0.6	3	4
6/15	18.8	18.7	7.0	0.0	35.0	319		0.8	3	4
7/12	25.7	24.2	13.6	0.2	260.0	622		0.2	3	4
8/10	27.5	24.6	6.0	0.0	360.0	657		0.2	4	4
9/9	16.3	16.0	13.7	0.1	310.0	503		0.2	4	4
10/5	12.6	12.9	10.0	0.2	170.0	349		0.2	3	4



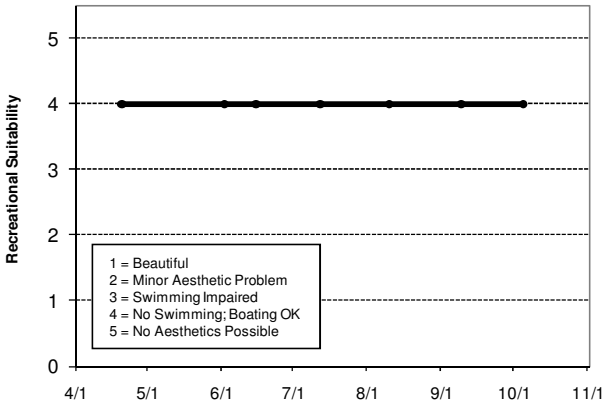
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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.

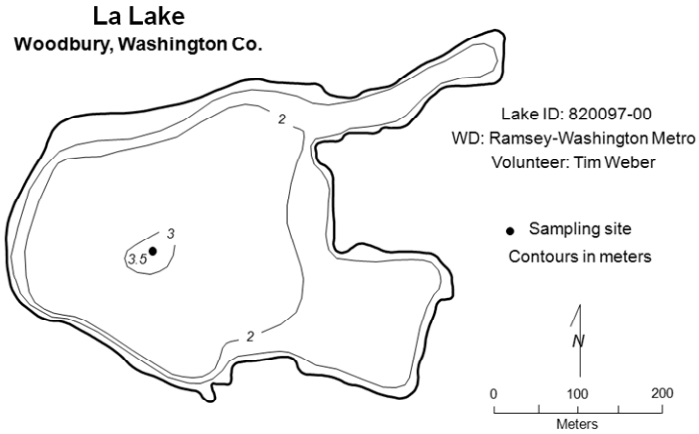
2010 summer (May-September) data summary

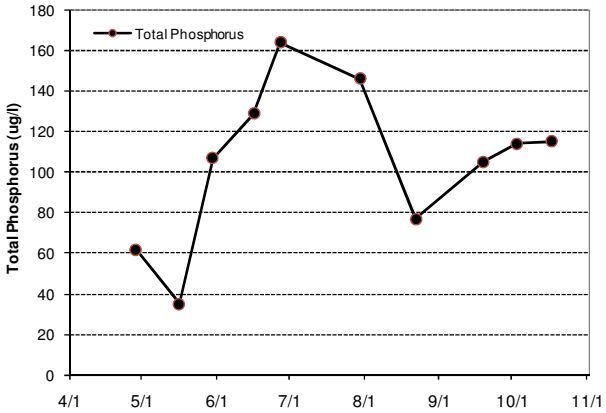
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	109.0	35.0	164.0	D
CLA (µg/l)	46.0	1.6	140.0	C
Secchi (m)	1.6 (estimated)	0.5	+ 2.5	C (estimated)
TKN (mg/l)	1.36	0.87	2.40	
			Lake Grade	C (estimated)

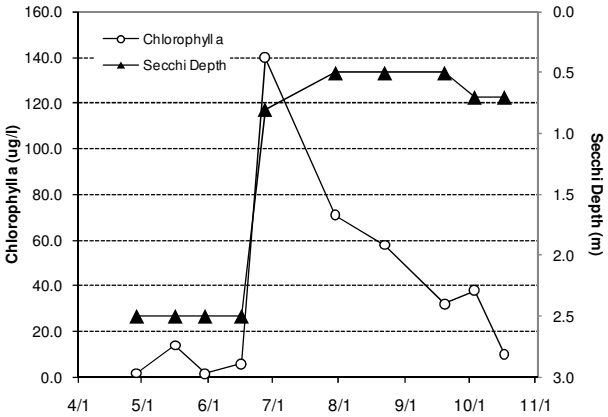
The lake received an estimated lake grade of C for 2010, which is consistent with its historical database. Water quality for the lake has experienced intra-annual variability as indicated by its water quality database. The lake's water quality seems to be represented by lake grades of C or B. Note that the Secchi depth measurements made in April, May, and June 2010 would have been greater except that during these monitoring events the Secchi disk was visible while resting on the lake bottom. The Secchi grade was calculated by assuming that the May and June measurements were equal to 3.0 meters.

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

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



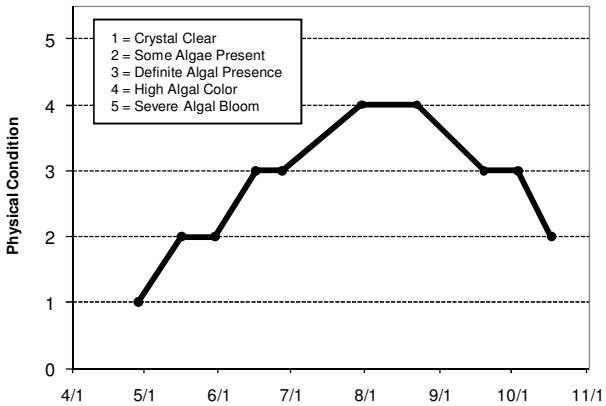




2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/28	15.9				1.8	62		2.5+	1	1
5/16	20.0				14.0	35		2.5+	2	2
5/30	27.2				1.6	107		2.5+	2	2
6/16	26.4				5.7	129		2.5+	3	2
6/27	28.5				140.0	164		0.8	3	4
7/30	28.3				71.0	146		0.5	4	4
8/22	28.7				58.0	77		0.5	4	4
9/19	17.4				32.0	105		0.5	3	4
10/3	19.5				38.0	114		0.7	3	4
10/17	14.0				10.0	115		0.7	2	4

+ Secchi Disk visible on lake bottom



Lake Water Quality Grades Based on Summertime Averages

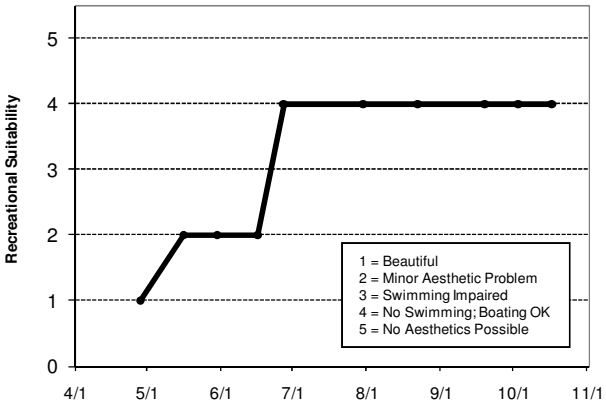
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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

* Secchi Disk visible on lake bottom

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	14.6	9.0	23.0	A
CLA (µg/l)	3.8	1.5	7.6	A
Secchi (m)	3.7	2.5	4.3	A
TKN (mg/l)	0.58	0.50	0.82	
			Lake Grade	A

The lake received a lake grade of A for 2010. The lake appears to be well represented by a lake grade of A on the basis of its historical database.

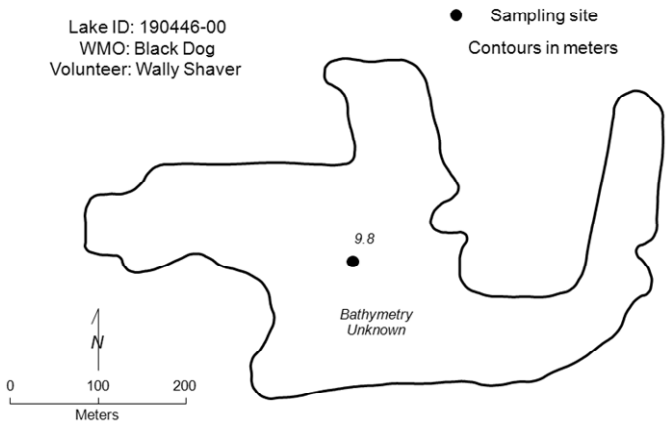
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

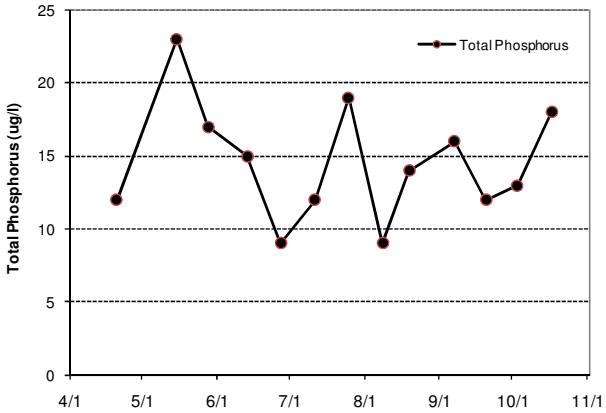
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

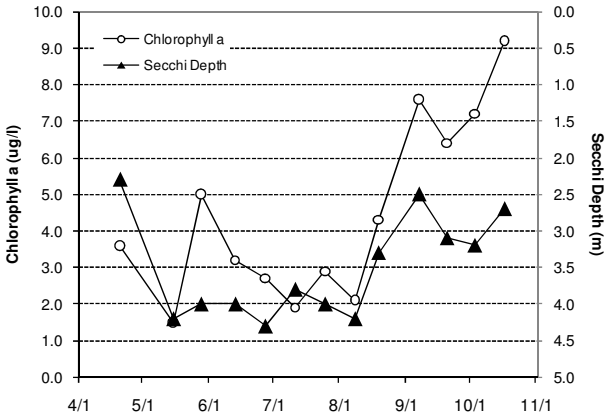
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lac Lavon

Apple Valley/Burnsville, Dakota Co.

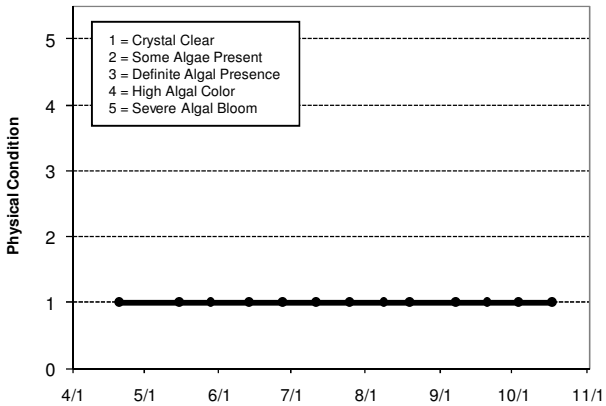






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20	17.2				3.6	12		2.3	1	1
5/15	13.2				1.5	23		4.2	1	1
5/28	23.6				5.0	17		4.0	1	1
6/13	20.0				3.2	15		4.0	1	1
6/27	24.6				2.7	9		4.3	1	1
7/11	27.1				1.9	12		3.8	1	1
7/25	26.6				2.9	19		4.0	1	1
8/8	29.6				2.1	9		4.2	1	1
8/19	24.7				4.3	14		3.3	1	1
9/7	20.1				7.6	16		2.5	1	1
9/20	17.8				6.4	12		3.1	1	1
10/3	16.5				7.2	13		3.2	1	1
10/17	15.0				9.2	18		2.7	1	1



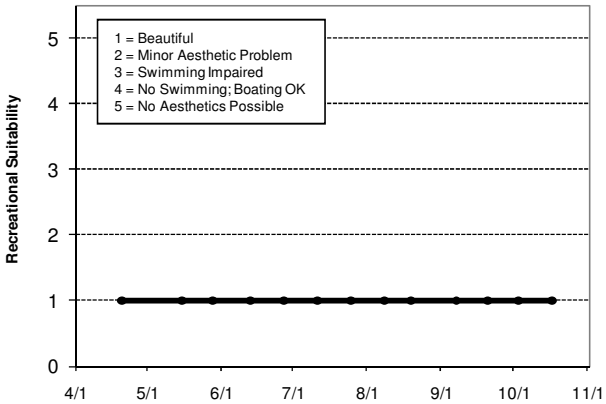
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Langton Lake [north basin, site-1] (62-0049-01) *Rice Creek Watershed District*

Langton Lake is divided into two basins. This report discusses the monitoring results for Site 1. The entire 30-acre lake is located within the City of Roseville (Ramsey County). The maximum depth of the lake is 1.5 m (4.9 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	41.5	22.0	64.0	C
CLA (µg/l)	20.3	3.7	43.0	C
Secchi (m)	1.1	0.9	1.4	D
TKN (mg/l)	0.96	0.79	1.50	
			Lake Grade	C

The basin received a lake grade of C for 2010, which is similar to past years of lake grades. 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.

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.

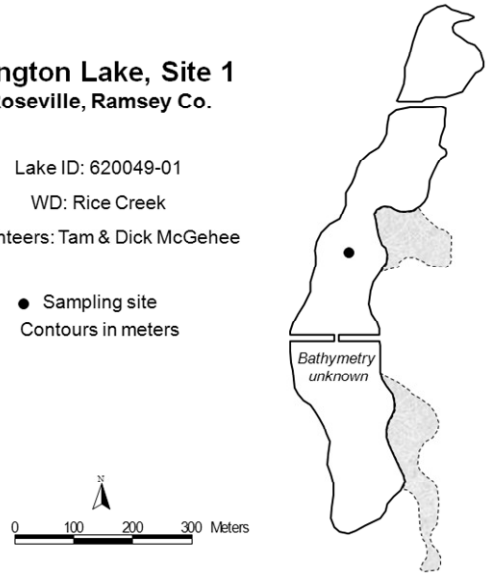
Lake ID: 620049-01

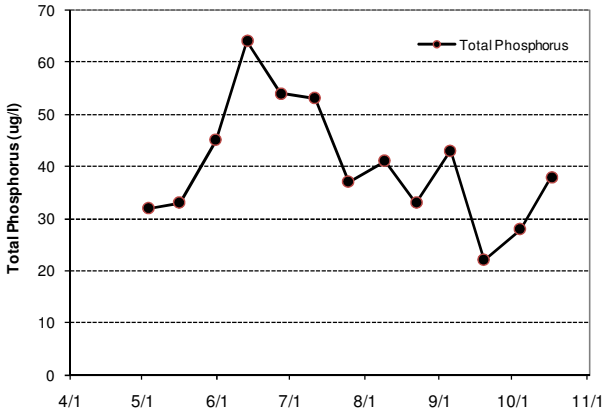
WD: Rice Creek

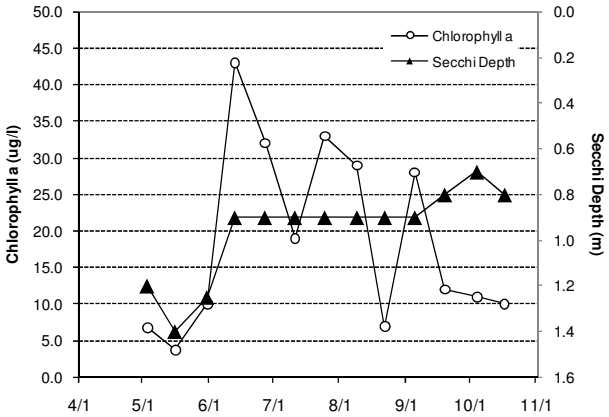
Volunteers: Tam & Dick McGehee

● Sampling site

Contours in meters



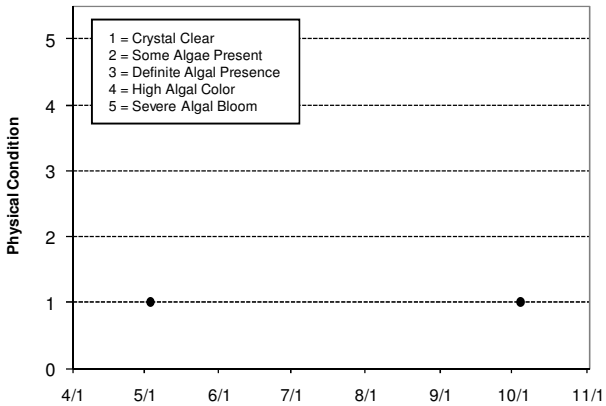




2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/3	15.3				6.8	32		1.2	1	
5/16	20.8				3.7	33		1.4		
5/31	24.5				10.0	45		1.3		
6/13	18.9				43.0	64		0.9		
6/27	25.6				32.0	54		0.9		
7/11	26.9				19.0	53		0.9		
7/25	25.1				33.0	37		0.9+		
8/9	26.1				29.0	41		0.9+		
8/22	28.1				6.9	33		0.9+		
9/5	20.0				28.0	43		0.9+		
9/19	17.3				12.0	22		0.8+		
10/4	12.5				11.0	28		0.7	1	
10/17	13.8				10.0	38		0.8+		

+ Secchi Disk visible on lake bottom



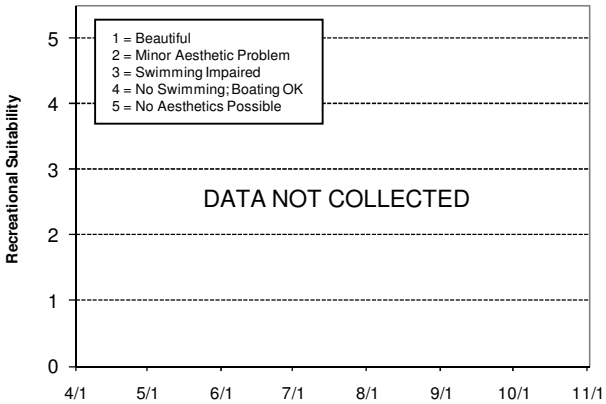
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Lee Lake (19-0029) *City of Lakeville*

Lee Lake is located in Lakeville (Dakota County). The lake has a surface area of 25 acres with a maximum depth of 5.2 m (17 ft). The lake is landlocked with no natural outlet. 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	27.0	18.0	36.0	B
CLA (µg/l)	9.3	2.6	21.0	A
Secchi (m)	3.1	1.7	4.4	A
TKN (mg/l)	0.62	0.41	0.88	
			Lake Grade	A

The lake received a lake grade of A for 2010 which is a repeat of improved water quality similarly observed in 2009. Continued monitoring is recommended to determine if the past 2 years are an indication of an established 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.

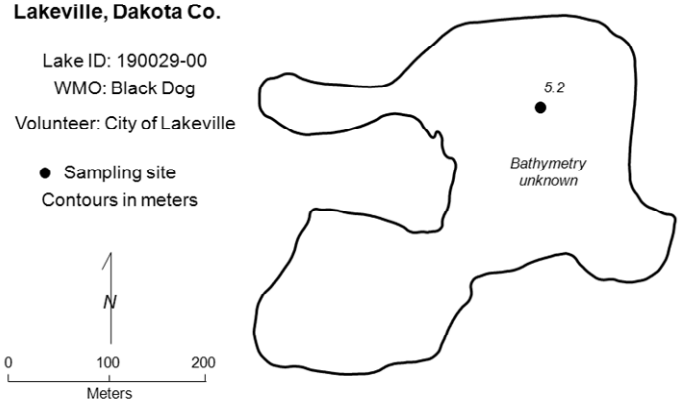
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

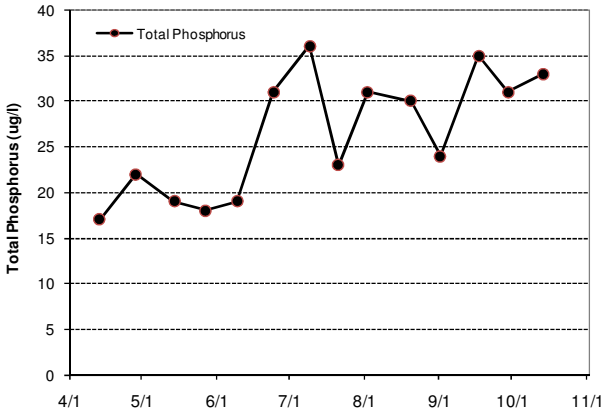
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

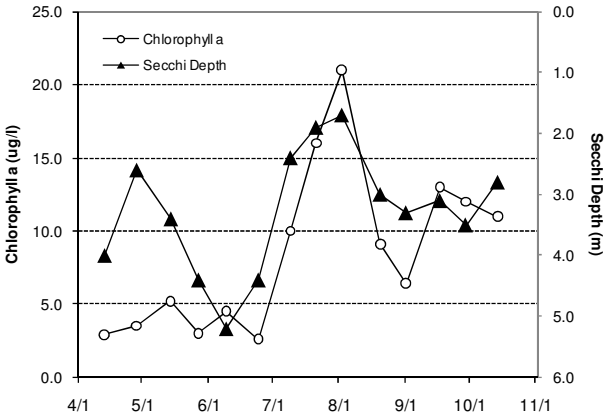
Lee Lake
Lakeville, Dakota Co.

Lake ID: 190029-00
WMO: Black Dog
Volunteer: City of Lakeville

● Sampling site
Contours in meters



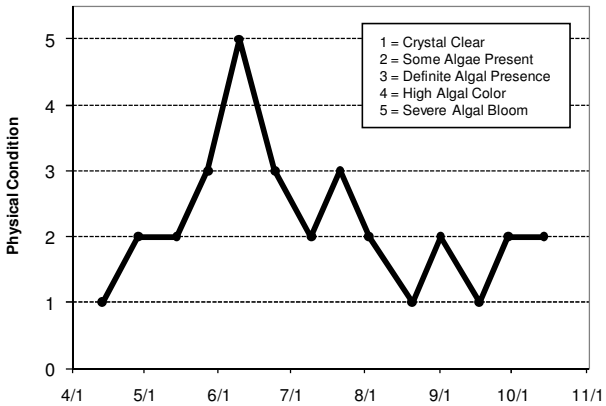




2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	11.0				2.9	17		4.0+	1	1
4/28	14.0				3.5	22		2.6	2	2
5/14	10.0				5.2	19		3.4	2	2
5/27	22.0				3.0	18		4.4	3	
6/9	19.0				4.5	19		5.2+	5	3
6/24	23.0				2.6	31		4.4	3	2
7/9	26.0				10.0	36		2.4	2	2
7/21	28.0				16.0	23		1.9	3	3
8/2	26.0				21.0	31		1.7	2	2
8/20	24.0				9.1	30		3.0	1	1
9/1	23.0				6.4	24		3.3	2	2
9/17	15.5				13.0	35		3.1	1	1
9/29	13.3				12.0	31		3.5	2	1
10/14	15.5				11.0	33		2.8	2	1

+ Secchi Disk visible on lake bottom



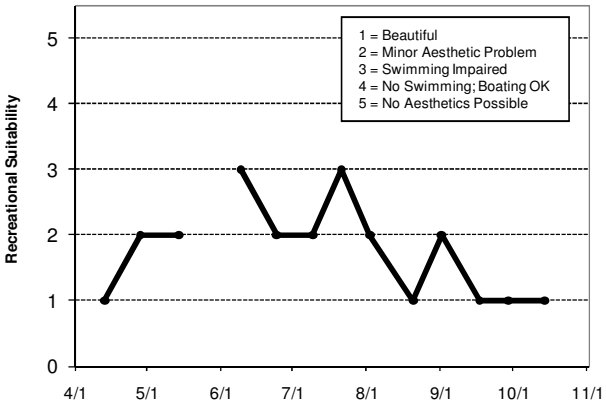
Lake Water Quality Grades Based on Summertime Averages

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

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	28.8	18.0	42.0	B
CLA (µg/l)	6.7	2.9	18.0	A
Secchi (m)	1.9	1.4	2.1	C
TKN (mg/l)	0.94	0.56	1.70	
			Lake Grade	B

The lake received a lake grade of B for 2010 which is consistent with its limited database. Additional years of monitoring are suggested for continuing to build the water quality database.

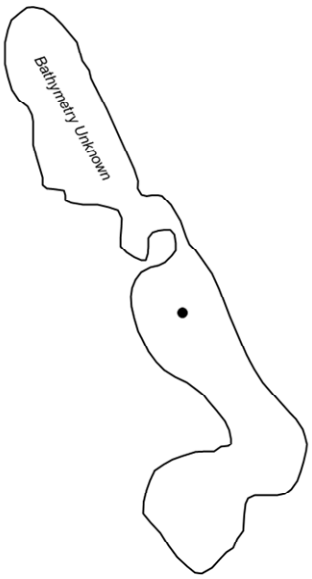
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

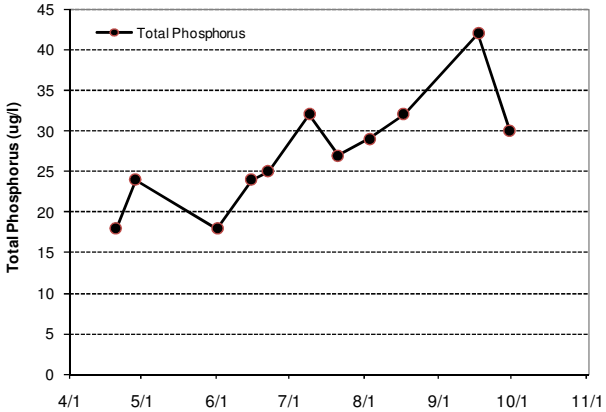
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

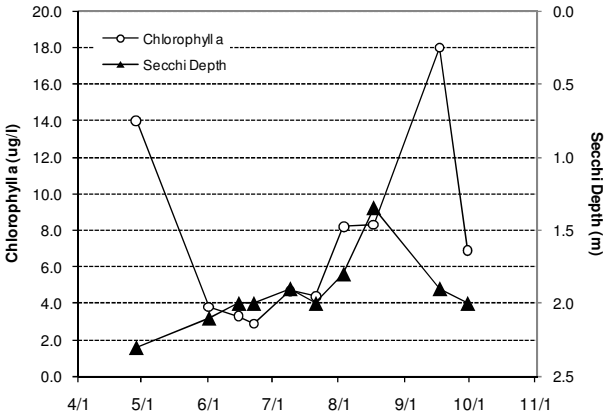
LeMay Lake
Mendota Heights, Dakota Co.

Lake ID: 190082-00
WMO: Gun Club Lake
Volunteers: Mendota Heights City Staff

● Sampling site
Contours in meters

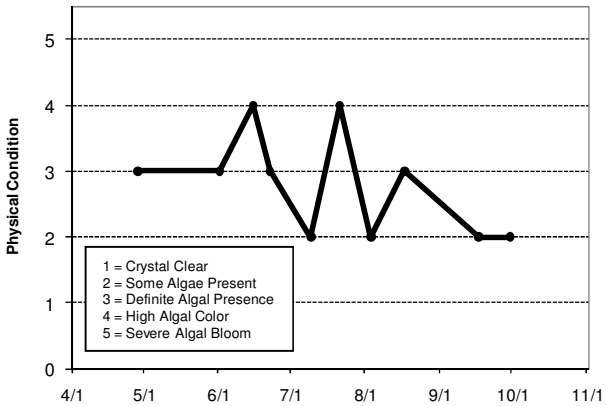






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20						18				
4/28	16.5				14.0	24		2.3	3	4
6/1	26.2				3.8	18		2.1	3	4
6/15	20.8				3.3	24		2.0	4	5
6/22	26.2				2.9	25		2.0	3	4
7/9	27.1				4.7	32		1.9	2	4
7/21	25.0				4.4	27		2.0	4	5
8/3	27.9				8.2	29		1.8	2	4
8/17	24.0				8.3	32		1.4	3	5
9/17	17.7				18.0	42		1.9	2	4
9/30	18.7				6.9	30		2.0	2	4



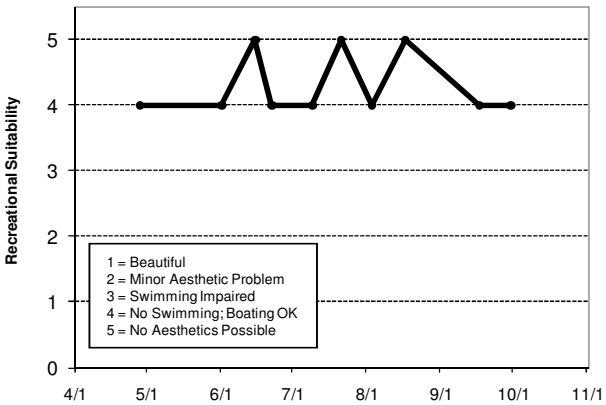
Lake Water Quality Grades Based on Summertime Averages

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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	214.0	73.0	594.0	F
CLA (µg/l)	63.3	2.8	270.0	D
Secchi (m)	0.4	0.2	0.5	F
TKN (mg/l)	1.64	0.92	4.40	
			Lake Grade	F

The pond received a lake grade of F for 2010. This was the first year the pond was involved in the CAMP. Continued monitoring is suggested to continue to build the historical database.

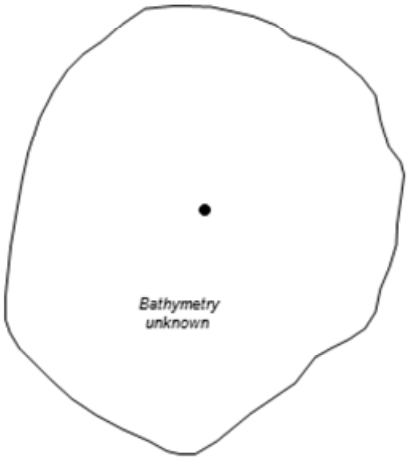
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

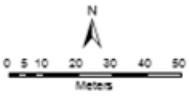
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

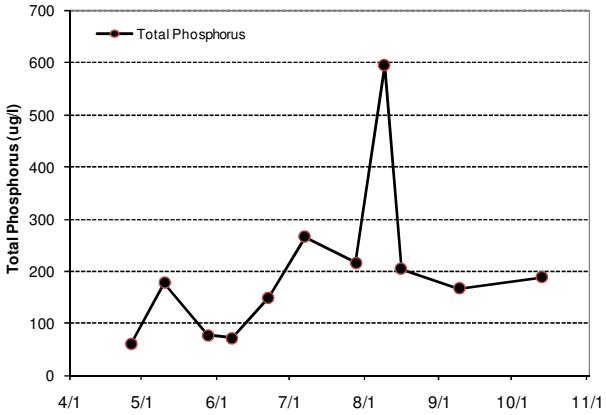
LeVander Pond
South St. Paul, Dakota Co.

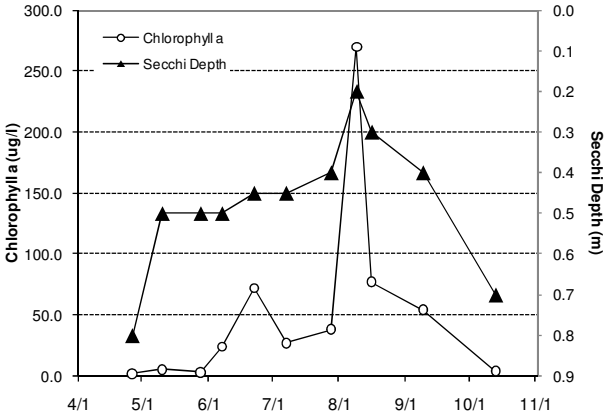
LAKE ID: 190088-00
WMO: Lower Miss. R.
Volunteer: City of South St. Paul

● Sampling site
Contours in meters



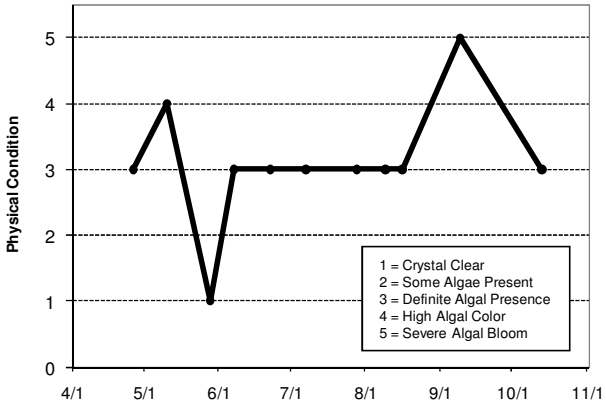






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/26	15.1				1.8	60		0.8	3	4
5/10	14.3				5.0	178		0.5	4	4
5/28	22.9				2.8	78		0.5	1	4
6/7	20.3				24.0	73		0.5	3	4
6/22	22.6				72.0	150		0.5	3	4
7/7	25.6				27.0	266		0.5	3	4
7/28	23.5				38.0	216		0.4	3	4
8/9	26.3				270.0	594		0.2	3	4
8/16	21.3				77.0	204		0.3	3	4
9/9	16.8				54.0	167		0.4	5	5
10/13	15.8				3.5	188		0.7	3	4



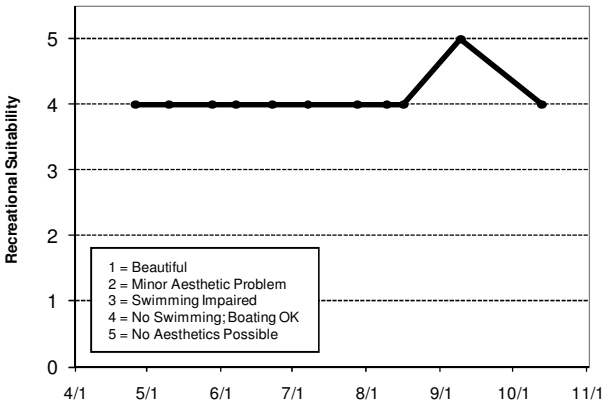
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Lily Lake (82-0023) *City of Stillwater*

Lily Lake is located in the City of Stillwater in Washington County. The lake has a surface area of 52 acres, and a maximum depth of 17.4 m (57 feet). It has public access located on the lake's northern shore, and a fishing pier on its southern shore.

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

2010 summer (May-September) data summary

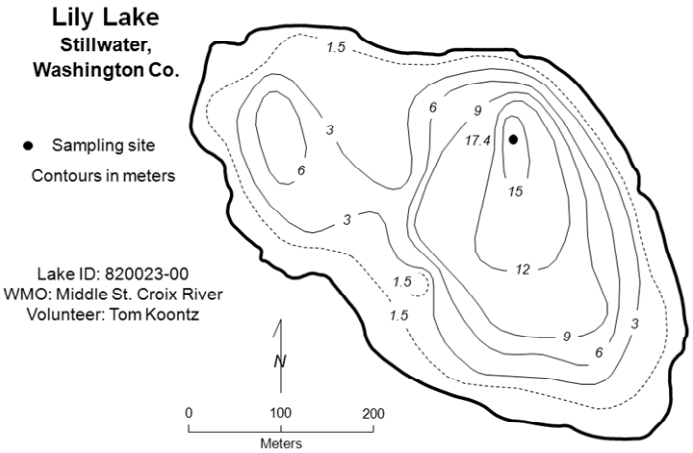
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	27.1	17.0	35.0	B
CLA (µg/l)	18.2	1.4	68.0	B
Secchi (m)	2.2	0.5	3.6	C
TKN (mg/l)	0.80	0.35	1.30	
			Lake Grade	B

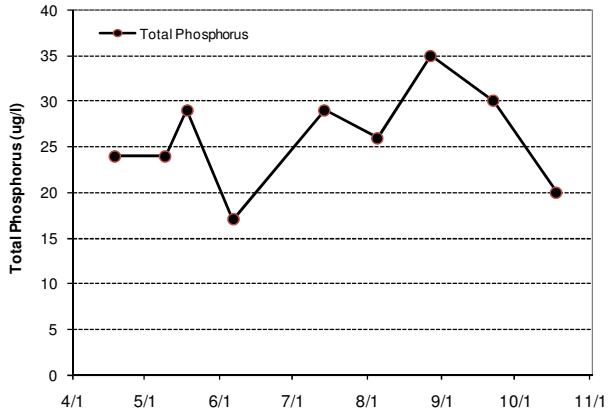
The lake received a lake grade of B for 2010, which is the lake also received in 1995, 2001, and 2009. On the basis of the historical water quality database, the lake appears represented by a lake grade of C. However, there appears to be more variation in the historical CLA and Secchi depth grades. Continued monitoring is recommended determine any trends if present.

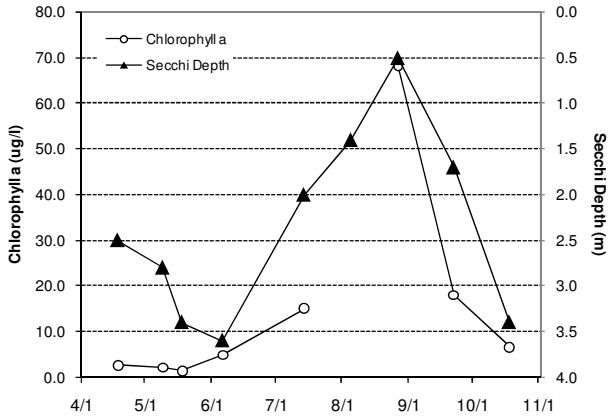
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

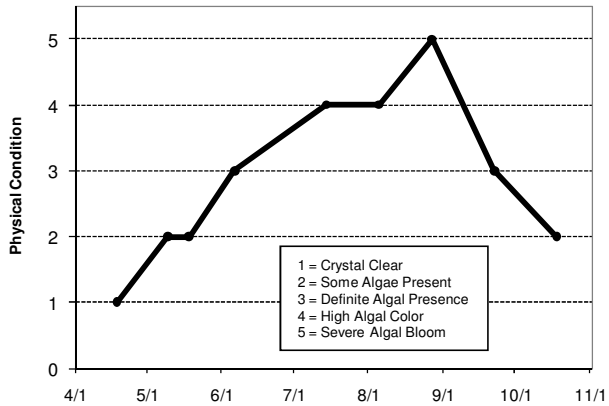






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	16.2				2.6	24		2.5	1	1
5/9	15.8				2.1	24		2.8	2	2
5/18	20.9				1.4	29		3.4	2	2
6/6	22.4				4.8	17		3.6	3	3
7/14	27.6				15.0	29		2.0	4	3
8/5	35.4					26		1.4	4	3
8/27	24.0				68.0	35		0.5	5	5
9/22	18.3				18.0	30		1.7	3	3
10/18	14.1				6.6	20		3.4	2	2



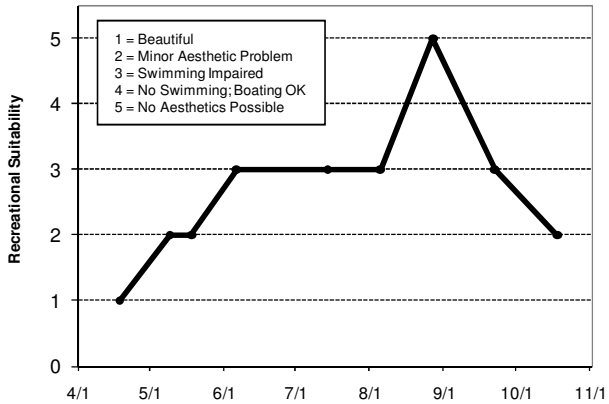
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Little Carnelian Lake (82-0014) *Carnelian - Marine Watershed District*

Little Carnelian Lake is located in Stillwater Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007). The lake has a surface area of 162 acres.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
Secchi (m)	6.4	4.7	7.6	A

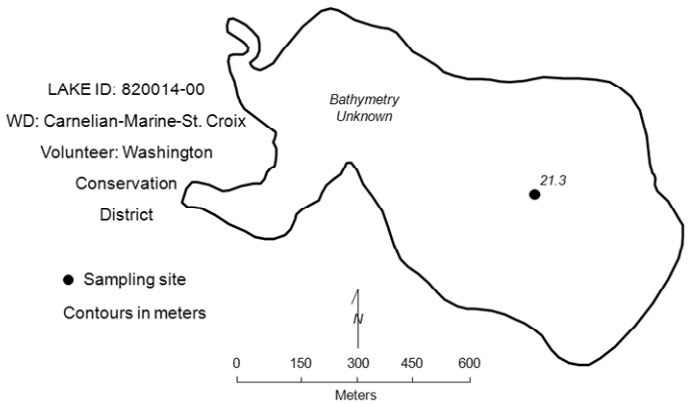
Similar to all past years of CAMP monitoring, the lake received a water clarity grade of A. TP and CLA were not monitored in 2010 so a lake grade cannot be determined. The historical water quality database indicates that the lake's water quality is well represented by a lake grade of A.

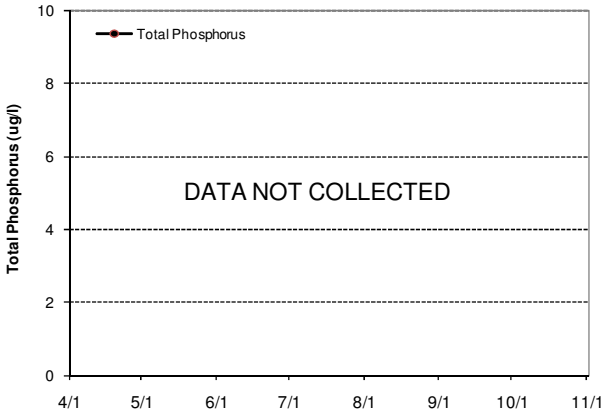
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

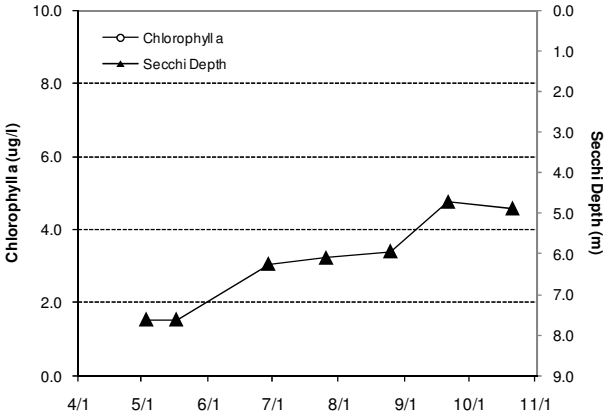
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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

Little Carnelian Lake
Stillwater Twp., Washington Co.

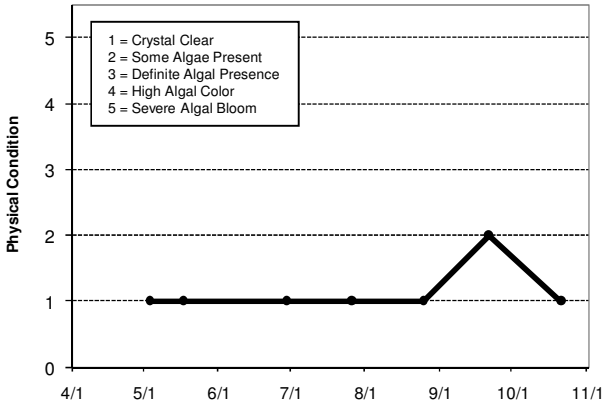






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/3	13.8	5.1	10.8	0.0				7.6	1	1
5/17	16.4	5.5	10.8	0.0				7.6	1	2
6/29	23.9	6.4	8.8	0.0				6.3	1	1
7/26	27.1	6.4	9.0	0.1				6.1	1	1
8/25	24.9	6.7	9.0	0.0				5.9	1	1
9/21	18.5	6.9	8.7	0.0				4.7	2	2
10/21	14.2	7.2	8.9	0.0				4.9	1	1

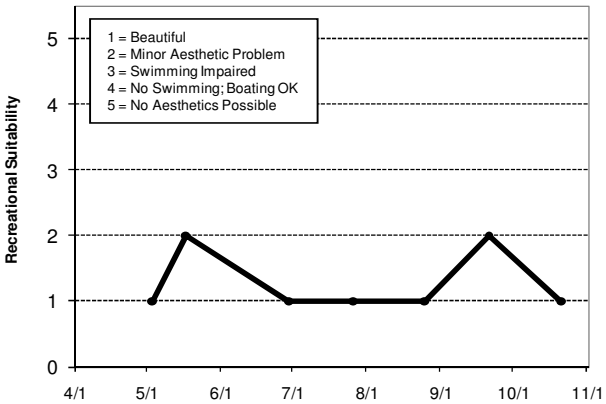


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

Little Comfort Lake (13-0054) *Comfort Lake - Forest Lake Watershed District*

Little Comfort Lake is located near the City of Wyoming (Chisago County). The lake has a maximum depth of 17.0 m (56 feet).

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

2010 summer (May-September) data summary

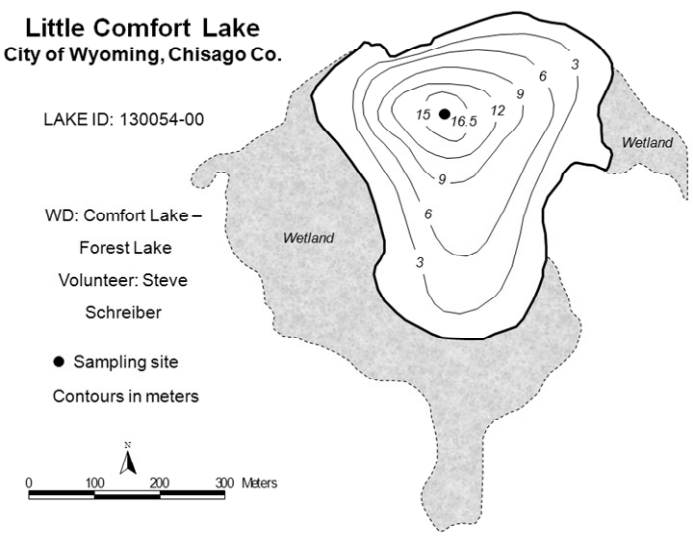
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	26.4	15.0	42.0	B
CLA (µg/l)	11.8	2.7	26.0	B
Secchi (m)	1.8	1.0	2.4	C
TKN (mg/l)	0.90	0.58	1.20	
			Lake Grade	B

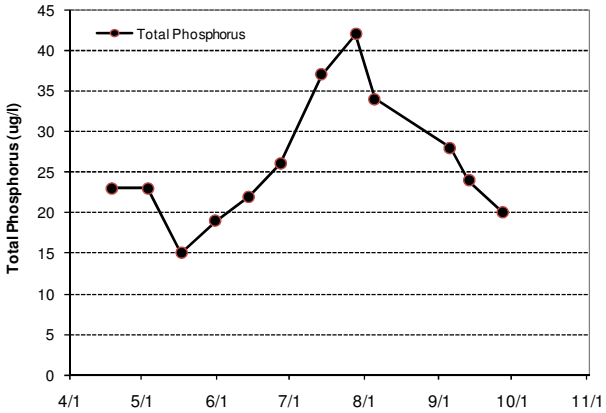
The lake received a lake grade of B for 2010 which is consistent with its varying historical water quality database. Additional annual monitoring is recommended to continue to build the water quality database for this lake.

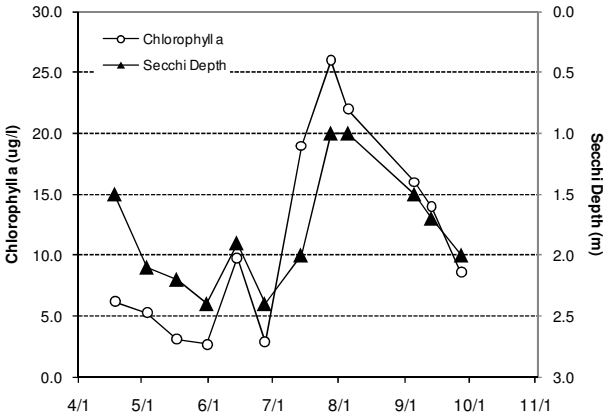
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

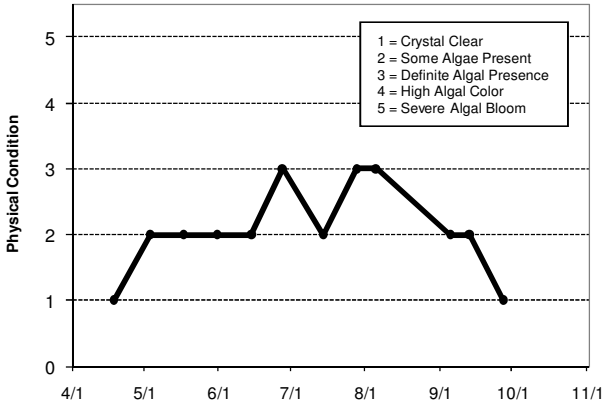
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

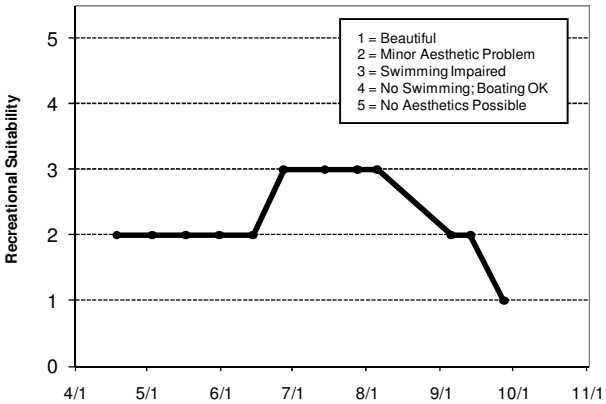
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	13.0				6.2	23		1.5	1	2
5/3	14.5				5.3	23		2.1	2	2
5/17	20.2				3.1	15		2.2	2	2
5/31	23.3				2.7	19		2.4	2	2
6/14	20.5				9.8	22		1.9	2	2
6/27	24.3				2.9	26		2.4	3	3
7/14	25.7				19.0	37		2.0	2	3
7/28	25.4				26.0	42		1.0	3	3
8/5	26.6				22.0	34		1.0	3	3
9/5	21.2				16.0	28		1.5	2	2
9/13	20.3				14.0	24		1.7	2	2
9/27	18.1				8.6	20		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									
Chlorophyll a			C									
Secchi Depth			C									
Lake Grade			**C**									

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

Source: Metropolitan Council and STORET data

Little Johanna Lake (62-0058) *Rice Creek Watershed District*

Little Johanna Lake is located on the boundary between the Cities of Arden Hills and Roseville (Ramsey County). The lake has a surface area of 18 acres and a maximum depth of 12.0 m (39 feet).

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	64.7	38.0	88.0	C
CLA (µg/l)	31.2	6.2	78.0	C
Secchi (m)	0.8	0.4	1.3	D
TKN (mg/l)	1.10	0.75	1.80	
			Lake Grade	C

The lake received a lake grade of C for 2010, which is consistent with its historical water quality database. The lake appears well represented by a lake grade of C. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

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

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

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

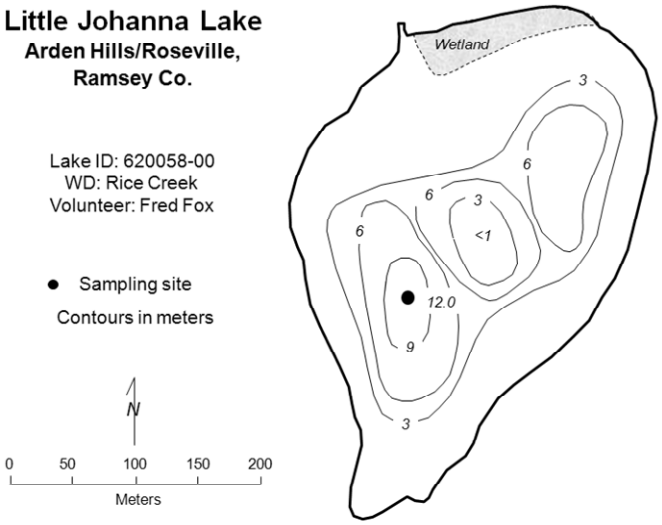
Little Johanna Lake

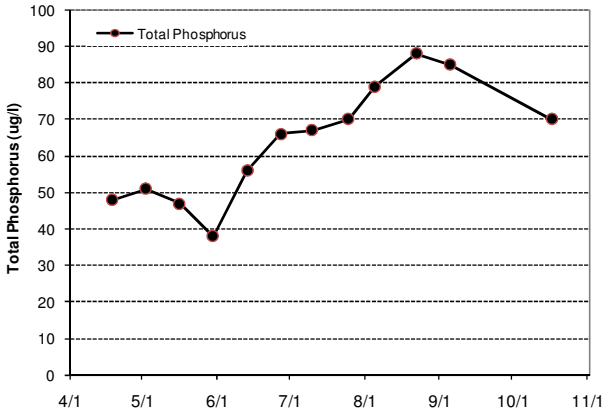
Arden Hills/Roseville, Ramsey Co.

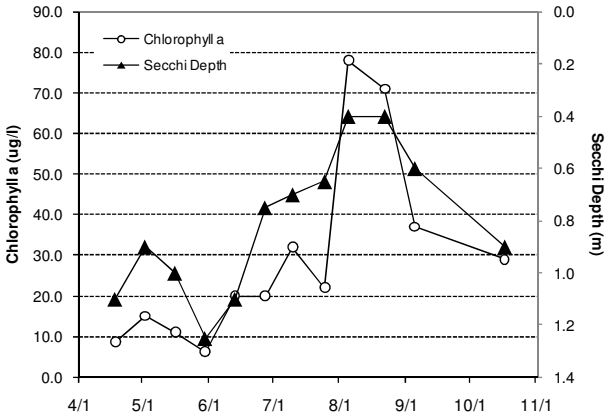
Lake ID: 620058-00
WD: Rice Creek
Volunteer: Fred Fox

● Sampling site

Contours in meters

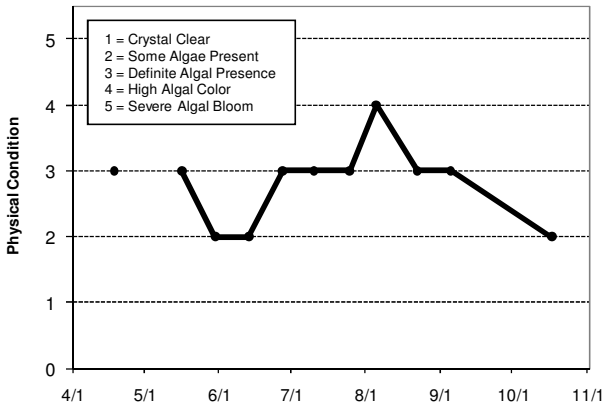






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	17.6				8.6	48		1.1	3	2
5/2	15.4				15.0	51		0.9		
5/16	20.3				11.0	47		1.0	3	2
5/30	25.4				6.2	38		1.3	2	2
6/13	18.6				20.0	56		1.1	2	2
6/27	26.8				20.0	66		0.8	3	2
7/10	26.9				32.0	67		0.7	3	3
7/25	29.7				22.0	70		0.7	3	3
8/5	26.7				78.0	79		0.4	4	3
8/22	28.3				71.0	88		0.4	3	3
9/5	21.2				37.0	85		0.6	3	4
10/17	14.5				29.0	70		0.9	2	2



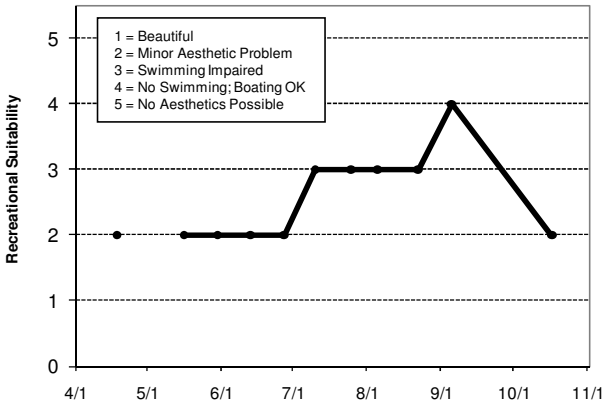
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Little Long Lake (27-0179-01) *Pioneer Sarah Creek Watershed Management Commission*

Little Long Lake is located in the City of Minnetrista (Hennepin County). It has a surface area of 108 acres. It has a maximum depth of 23.2 m (76 ft). The lake is a METC Priority Lake because of its outstanding water clarity (METC 2007). The MN DNR has designated the lake as being infested with 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.

2010 summer (May-September) data summary

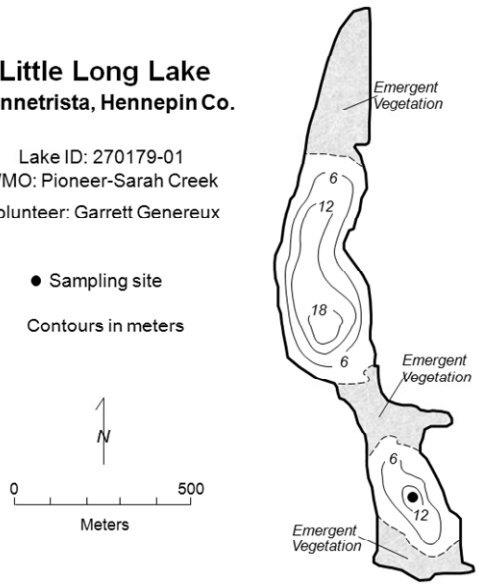
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	12.3	6.0	20.0	A
CLA (µg/l)	3.8	2.0	5.6	A
Secchi (m)	4.1	2.7	6.0	A
TKN (mg/l)	0.57	0.45	0.89	
			Lake Grade	A

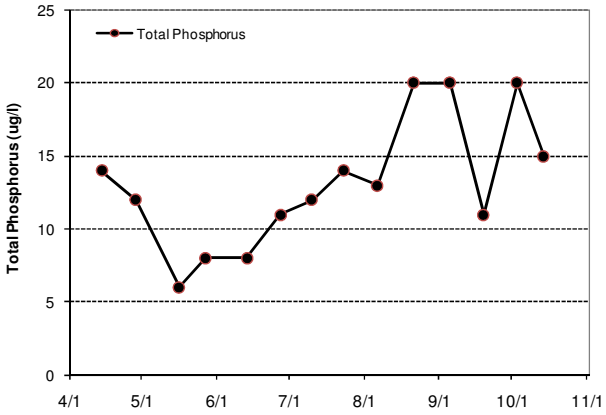
The lake received a lake grade of A for 2010, which is consistent with its historical water quality database. Additional years of monitoring are suggested for continuing to monitor this outstanding resource.

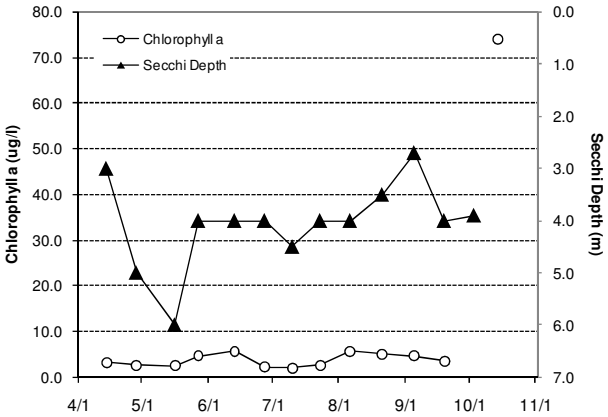
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake in 2005. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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

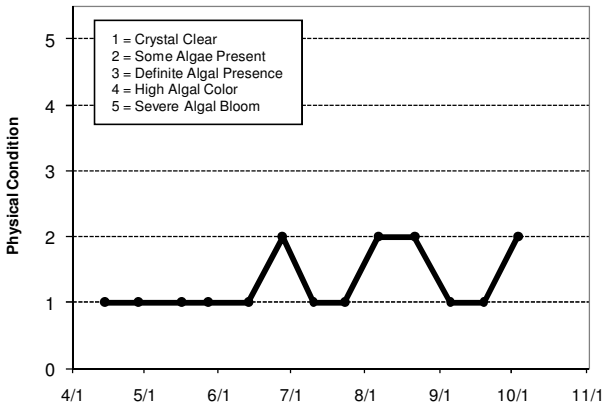






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/14	15.8				3.2	14		3.0	1	1
4/28	14.6				2.6	12		5.0	1	1
5/16	17.0				2.5	6		6.0	1	1
5/27	19.0				4.6	8		4.0	1	1
6/13	20.0				5.6	8		4.0	1	1
6/27	25.4				2.2	11		4.0	2	1
7/10	28.0				2.0	12		4.5	1	1
7/23	27.2				2.6	14		4.0	1	1
8/6	27.1				5.6	13		4.0	2	1
8/21	26.7				5.0	20		3.5	2	1
9/5	21.3				4.6	20		2.7	1	1
9/19	18.5				3.5	11		4.0	1	1
10/3	16.1					20		3.9	2	1
10/14	15.4				74.0	15				



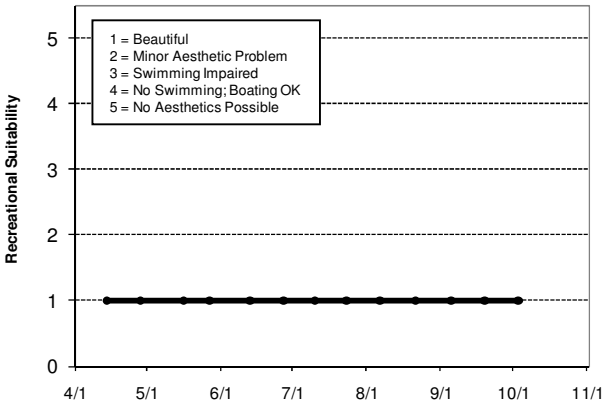
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Lochness Lake (2-0585) *Rice Creek Watershed District*

Lochness Lake is located in the City of Blaine (Anoka County). It has a surface area of 5.3 acres. There is little known morphological data available for the lake other than it has a maximum depth of 4.9 m (16 ft). Because of the shallowness of the lake, the entire area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. Also the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

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

2010 summer (May-September) data summary

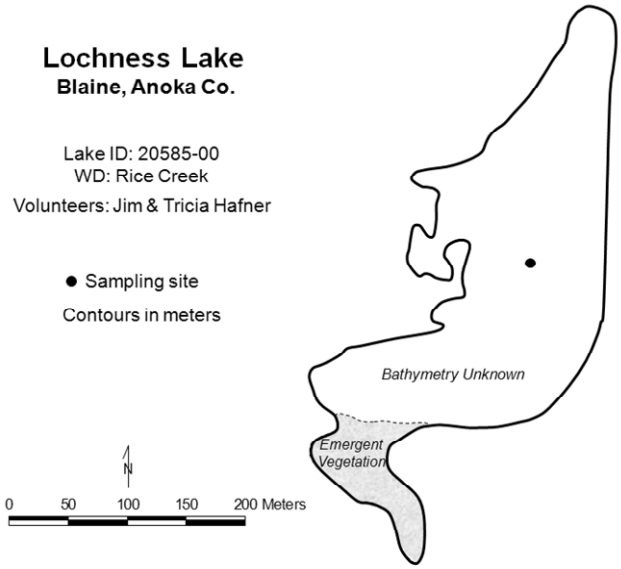
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	28.8	20.0	55.0	B
CLA (µg/l)	6.6	3.1	10.0	A
Secchi (m)	2.9	2.3	3.4	B
TKN (mg/l)	1.06	0.90	1.20	
			Lake Grade	B

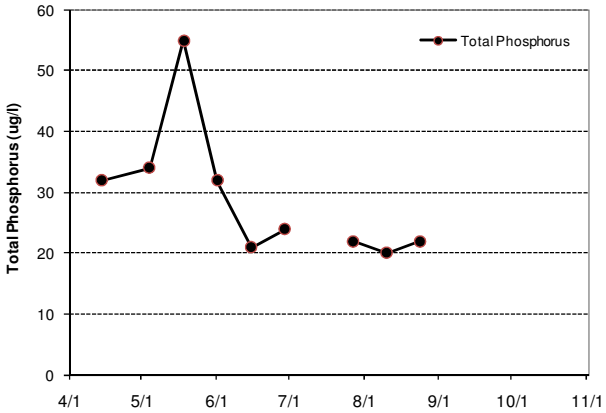
The lake received a lake grade of B for 2010, which is a return to water quality last observed in 2008. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

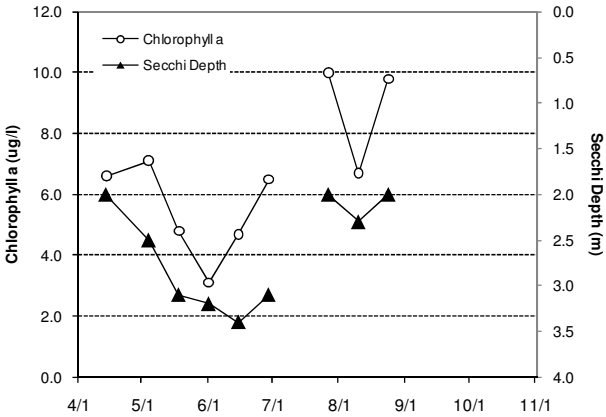
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake in 2005. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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



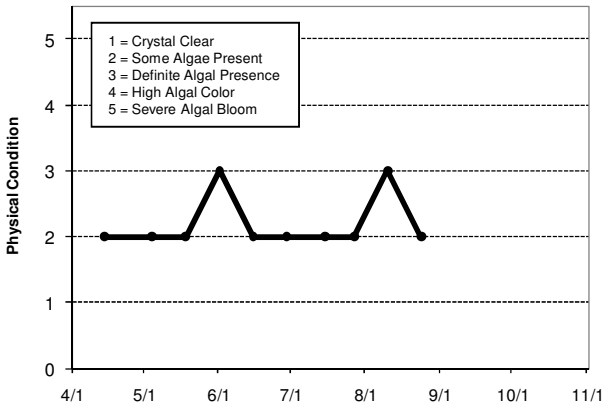




2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/14	14.3				6.6	32		2.0	2	4
5/4	13.2				7.1	34		2.5	2	4
5/18	19.2				4.8	55		3.1	2	4
6/1	22.6				3.1	32		3.2	3	4
6/15	18.9				4.7	21		3.4	2	4
6/29	23.2				6.5	24		3.1	2	4
7/15	25.3								2	4
7/27	26.8				10.0	22		2.0+	2	4
8/10	27.8				6.7	20		2.3	3	4
8/24	25.9				9.8	22		2.0+	2	4

+ Secchi Disk visible on lake bottom



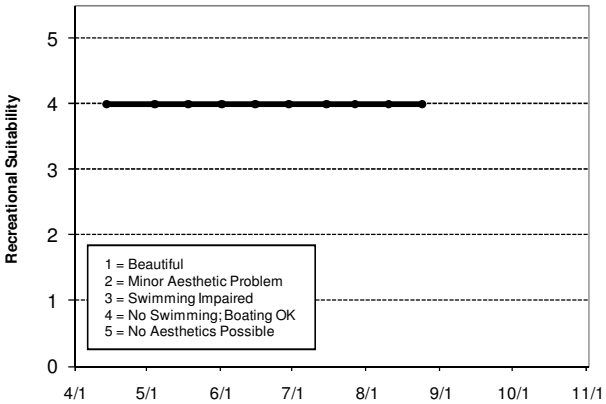
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	26.7	17.0	37.0	B
CLA (µg/l)	12.6	1.7	57.0	B
Secchi (m)	2.8	1.4	4.0	B
TKN (mg/l)	0.67	0.57	0.83	
			Lake Grade	B

The lake received a lake grade of B for 2010, 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/.

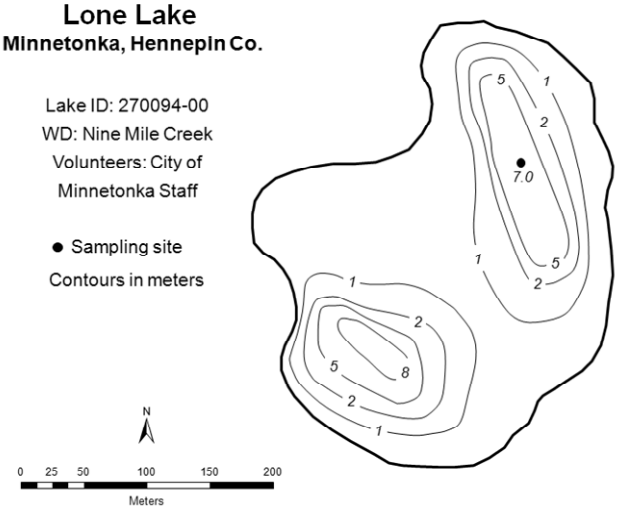
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

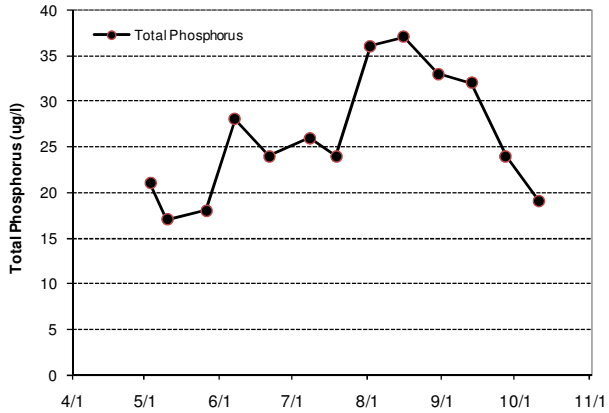
Lone Lake

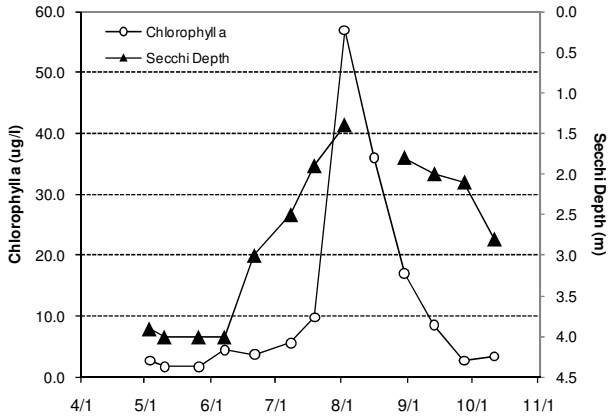
Minnetonka, Hennepin Co.

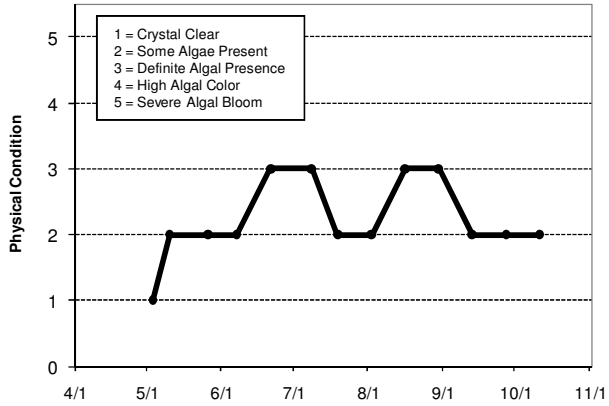
Lake ID: 270094-00
WD: Nine Mile Creek
Volunteers: City of Minnetonka Staff

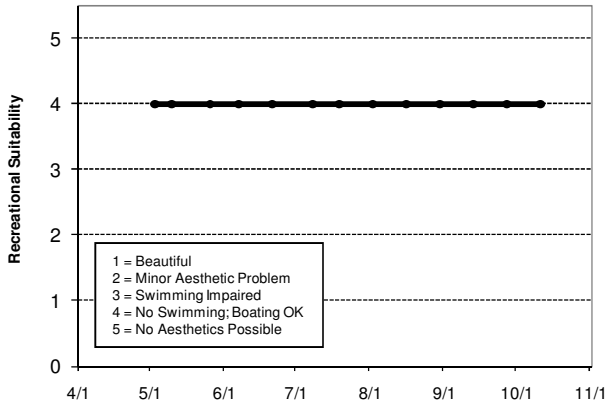
● Sampling site
Contours in meters











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/3	14.8				2.7	21		3.9	1	4
5/10	13.9				1.7	17		4.0	2	4
5/26	25.0				1.7	18		4.0	2	4
6/7	22.9				4.5	28		4.0	2	4
6/21	24.4				3.7	24		3.0	3	4
7/8					5.6	26		2.5	3	4
7/19	25.6				9.8	24		1.9	2	4
8/2	26.5				57.0	36		1.4	2	4
8/16	24.5				36.0	37			3	4
8/30	24.8				17.0	33		1.8	3	4
9/13	18.9				8.5	32		2.0	2	4
9/27	16.0				2.7	24		2.1	2	4
10/11	17.2				3.4	19		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												
Lake Grade												

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	167.7	98.0	297.0	F
CLA (µg/l)	66.5	4.5	130.0	D
Secchi (m)	0.3	0.2	0.5	F
TKN (mg/l)	2.40	1.10	3.60	
			Lake Grade	F

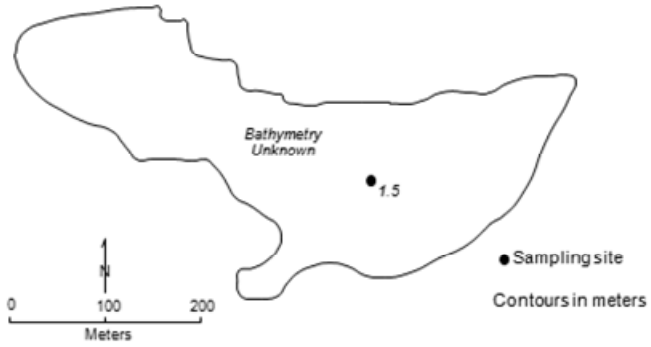
The lake received a lake grade of F for 2010, which is similar to those recorded in 2002-2009, and worse than the lake grade of D recorded in 1997. On the basis of the lake's historical water quality database, the water quality of the lake appears represented by a lake grade of F.

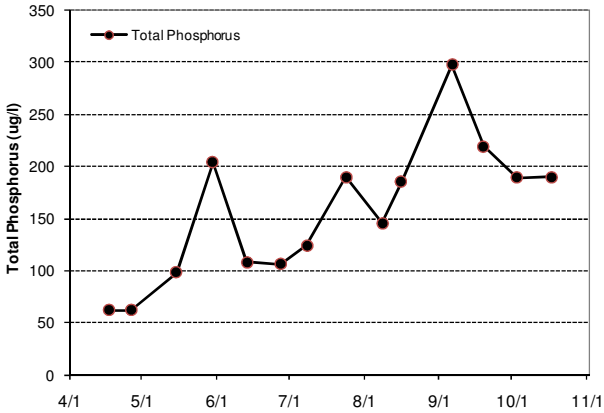
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

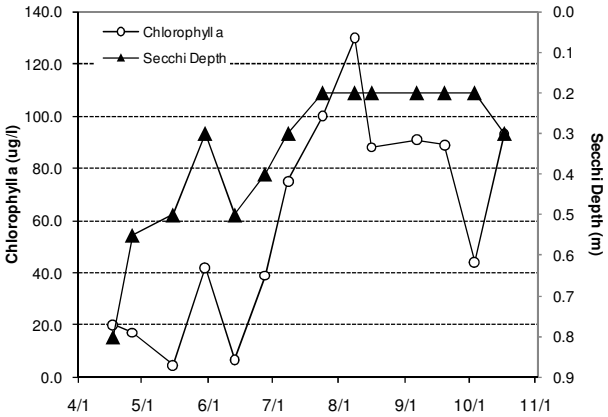
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Long Lake
Apple Valley, Dakota Co.

Lake ID: 190022-00
WMO: Vermillion River
Volunteers: Christy & Jake McGlocklin, Al Kettlekamp

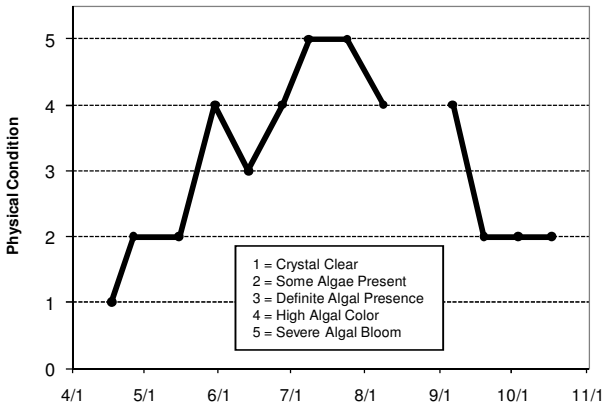






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/17	17.1				20.0	62		0.8	1	2
4/26	15.0				17.0	62		0.6	2	3
5/15	21.1				4.5	98		0.5	2	3
5/30	27.7				42.0	204		0.3	4	
6/13	20.2				6.7	108		0.5	3	4
6/27	26.5				39.0	106		0.4	4	
7/8	32.0				75.0	124		0.3	5	
7/24	29.5				100.0	190		0.2	5	5
8/8	35.5				130.0	146		0.2	4	5
8/16	37.0				88.0	185		0.2		
9/6	19.8				91.0	297		0.2	4	4
9/19	17.6				89.0	219		0.2	2	3
10/3	15.0				44.0	189		0.2	2	
10/17	13.3				93.0	190		0.3	2	

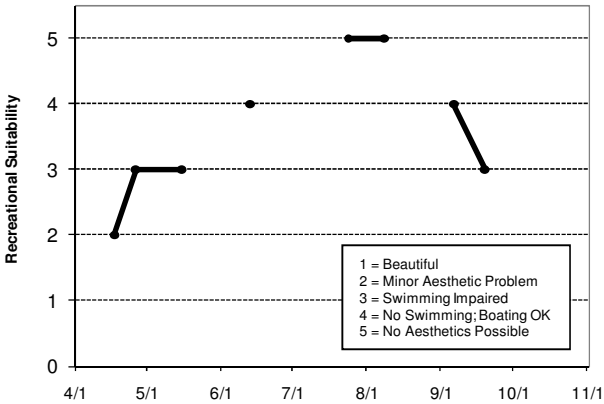


Lake Water Quality Grades Based on Summertime Averages

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	50.3	38.0	83.0	C
CLA (µg/l)	13.9	6.2	28.0	B
Secchi (m)	2.3	1.5	4.0	B
TKN (mg/l)	1.09	0.60	1.60	
			Lake Grade	B

The lake received a lake grade of B for 2010, which is the best lake grade in the lake's water quality database. The lake also received a Secchi grade of B, which is the best the lake has received. On the basis of the historical water quality database, the lake's annual water clarity grades, prior to the C recorded in 2004, have been near constant Fs. The year 2010 was the third year that the lake received a B grade for CLA. This year's water quality continues the improving trend since 2004.

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

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

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

Long Lake, Site 1
Stillwater, Washington Co.

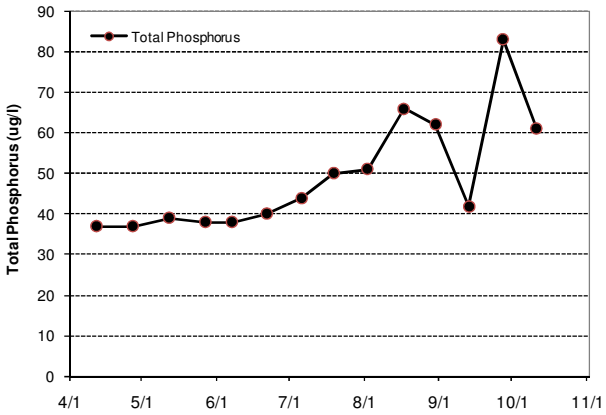
Lake ID: 820021-00
WD: Browns Creek
Volunteer: Washington Conservation District

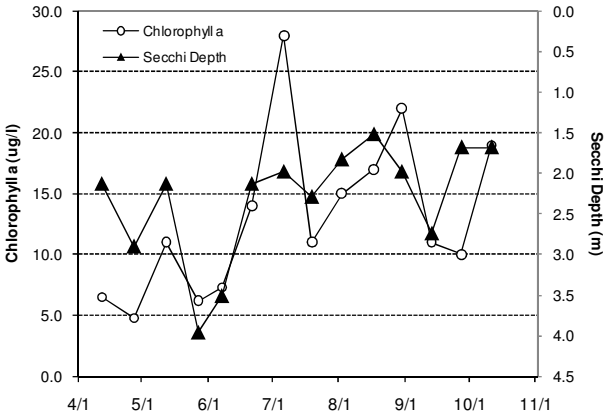
● Sampling site

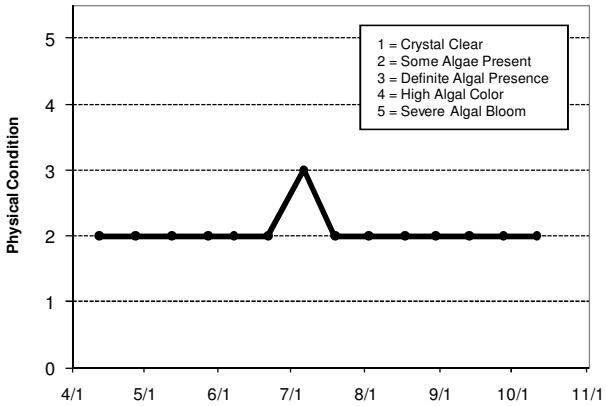
Contours in meters

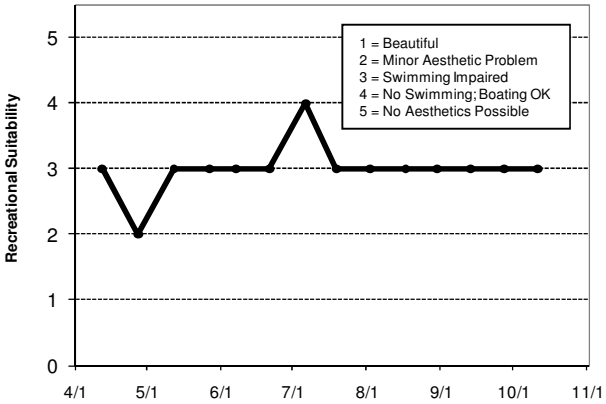
N

0 100 200
Meters









2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	13.6	6.1	10.4	0.0	6.5	37		2.1	2	3
4/27	16.2	6.7	9.0	0.0	4.8	37		2.9	2	2
5/12	12.2	7.1	9.9	0.0	11.0	39		2.1	2	3
5/27	23.9	8.1	9.9	0.1	6.2	38		4.0	2	3
6/7	23.0	9.7	10.3	0.1	7.3	38		3.5	2	3
6/21	24.5	10.7	11.7	0.0	14.0	40		2.1	2	3
7/6	26.9	10.3	8.8	0.0	28.0	44		2.0	3	4
7/19	25.7	10.7	5.4	0.0	11.0	50		2.3	2	3
8/2	26.2	11.9	6.4	0.1	15.0	51		1.8	2	3
8/17	25.7	11.2	4.6	0.1	17.0	66		1.5	2	3
8/30	25.6	12.8	6.9	0.1	22.0	62		2.0	2	3
9/13	19.7	15.2	7.7	0.0	11.0	42		2.7	2	3
9/27	16.1	12.8	5.8	0.1	10.0	83		1.7	2	3
10/11	18.4	12.0	11.1	0.1	19.0	61		1.7	2	3

Lake Water Quality Grades Based on Summertime Averages

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	115.0	62.0	171.0	
CLA (µg/l)	23.8	10.0	35.0	
Secchi (m)	1.4	1.2	1.7	
TKN (mg/l)	1.14	0.97	1.30	
			Lake Grade	

There was an insufficient quantity of data to calculate grades for this monitoring site in 2010. There were 4 montiroing events in 2010; 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.

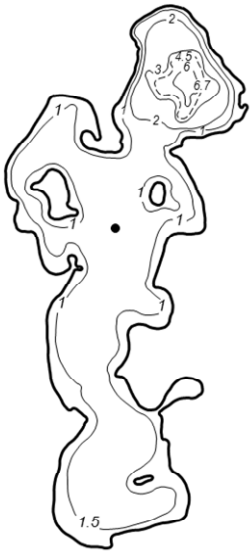
Lake ID: 820021-00
WD: Browns Creek
Volunteer: Washington Conservation District

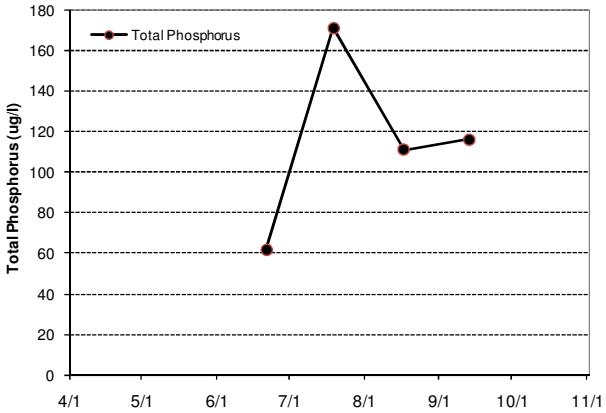
● Sampling site

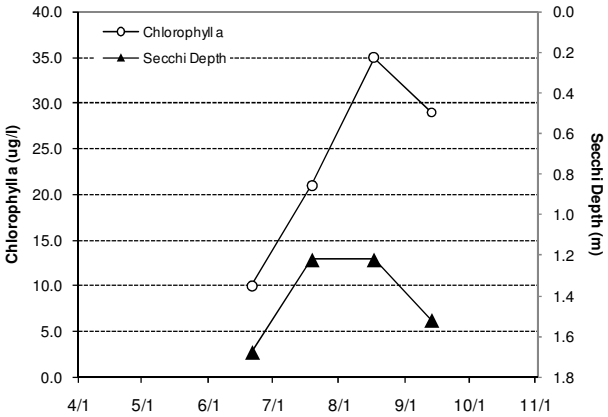
Contours in meters

N

0 100 200
Meters

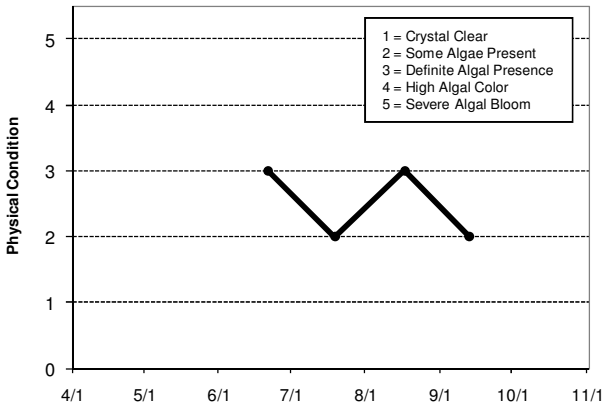






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
6/21	24.3	20.7	10.7	0.1	10.0	62		1.7	3	4
7/19	25.4	23.8	3.6	0.1	21.0	171		1.2	2	4
8/17	26.1	22.2	5.5	0.1	35.0	111		1.2	3	3
9/13	19.7	18.1	7.3	0.1	29.0	116		1.5	2	3



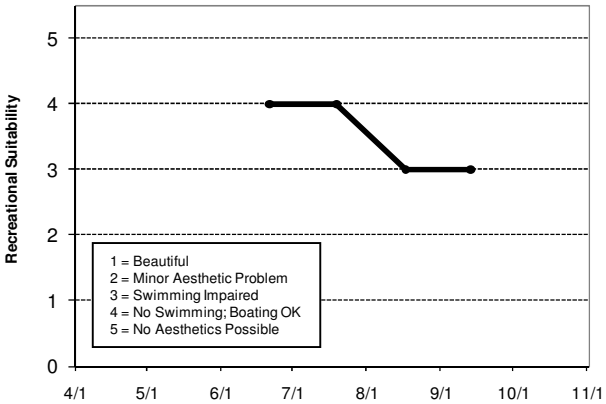
Lake Water Quality Grades Based on Summertime Averages

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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	93.3	70.0	114.0	
CLA (µg/l)	22.7	6.9	43.0	
Secchi (m)	1.1	1.1	1.2	
TKN (mg/l)	0.97	0.82	1.20	
			Lake Grade	

There was an insufficient quantity of data to calculate grades for this monitoring site in 2010. There were 4 montiroing events in 2010; 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/.

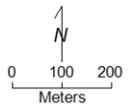
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

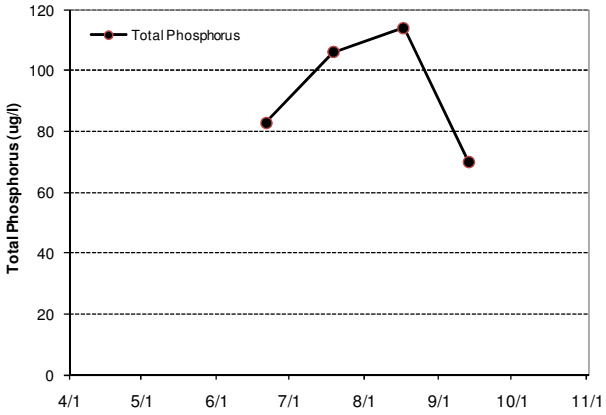
Long Lake, Site 3
Stillwater, Washington Co.

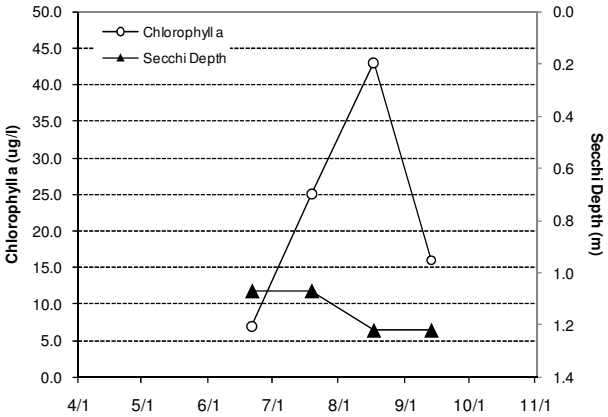
Lake ID: 820021-00
WD: Browns Creek
Volunteer: Washington Conservation District

● Sampling site

Contours in meters

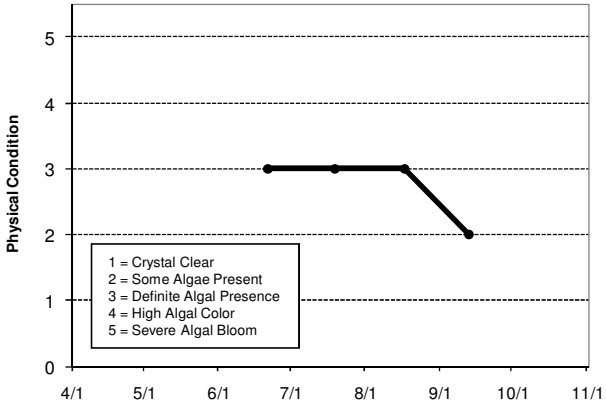






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
6/21	23.7	21.1	6.5	0.1	6.9	83		1.1	3	4
7/19	24.1	23.6	1.8	0.1	25.0	106		1.1	3	4
8/17	26.0	22.0	9.3	0.2	43.0	114		1.2	3	4
9/13	19.7	18.1	6.9	0.2	16.0	70		1.2	2	4



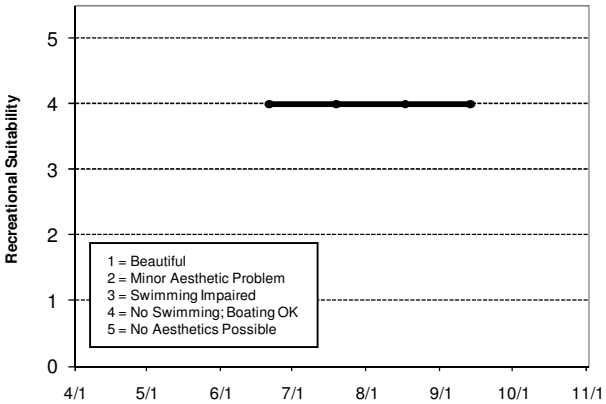
Lake Water Quality Grades Based on Summertime Averages

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

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

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

2010 summer (May-September) data summary

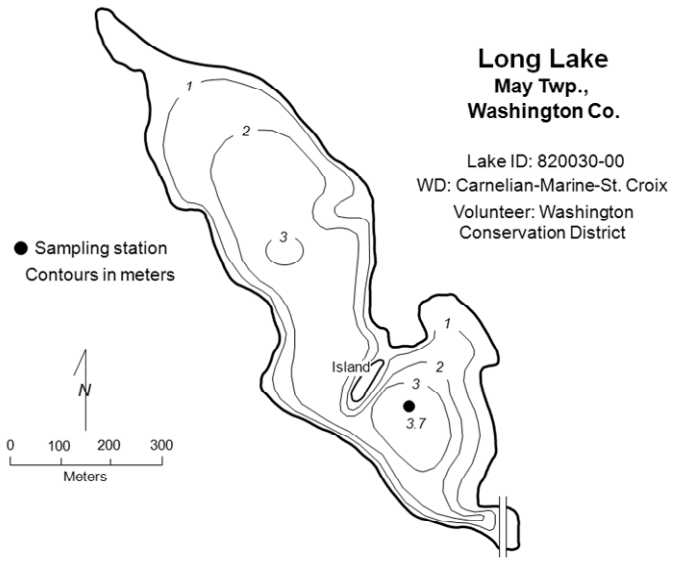
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	29.0	20.0	48.0	B
CLA (µg/l)	8.8	3.0	18.0	A
Secchi (m)	2.9	2.1	3.4	B
TKN (mg/l)	0.85	0.58	1.10	
			Lake Grade	B

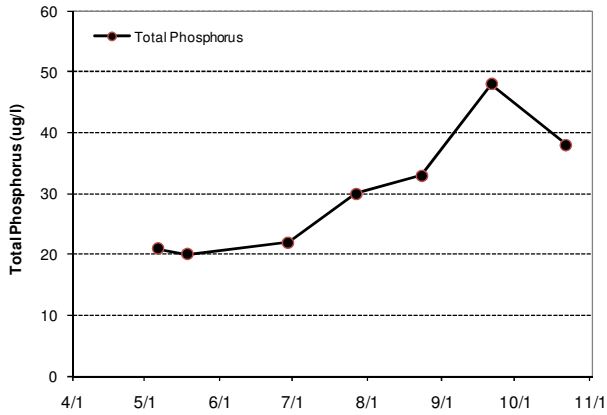
The lake received a lake grade of B for 2010, which is consistent with the lake grades received over the past decade. The lake's water quality is representative of a C+/B lake grade for the past decade.

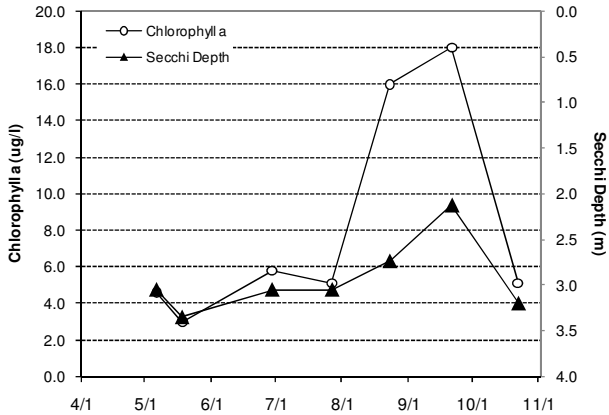
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

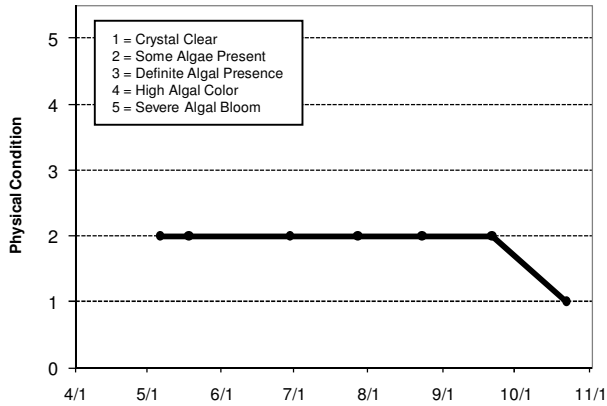






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/6	13.9	13.8	9.1	8.9	4.6	21		3.1	2	2
5/18	18.5	13.5	10.7	4.3	3.0	20		3.4	2	2
6/29	23.5	20.1	9.4	0.1	5.8	22		3.1	2	2
7/27	26.8	23.0	10.5	0.1	5.1	30		3.1	2	2
8/23	25.6	21.7	9.0	0.0	16.0	33		2.7	2	3
9/21	16.2	16.1	6.5	0.1	18.0	48		2.1	2	2
10/22	11.3	11.3	7.2	3.7	5.1	38		3.2	1	1



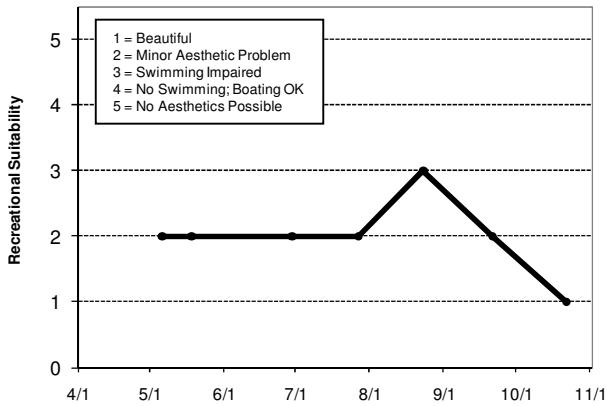
Lake Water Quality Grades Based on Summertime Averages

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

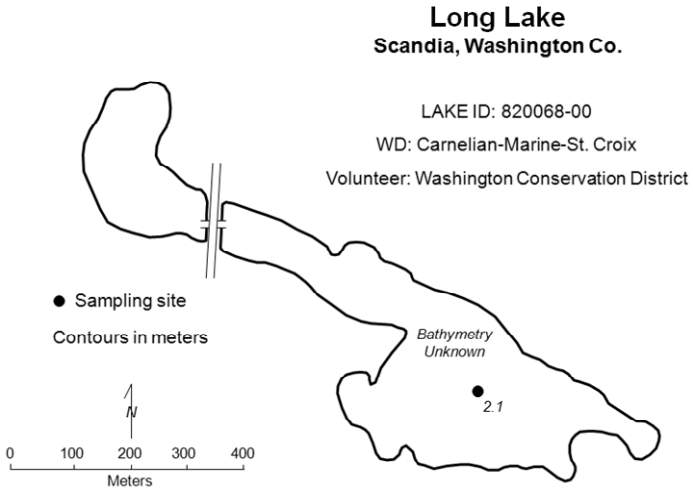
2010 summer (May-September) data summary

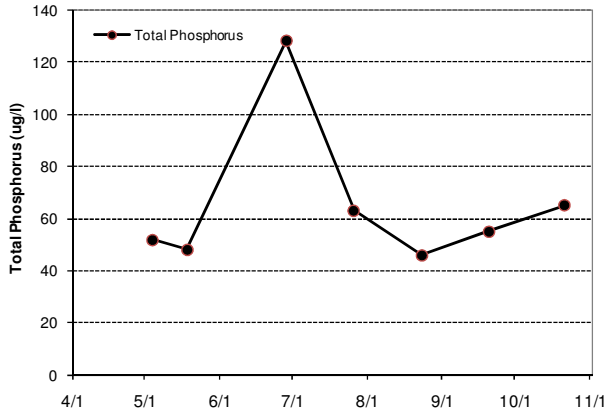
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	65.3	46.0	128.0	C
CLA (µg/l)	24.0	4.7	60.0	C
Secchi (m)	1.1	0.6	1.5	D
TKN (mg/l)	1.39	0.84	2.10	
			Lake Grade	C

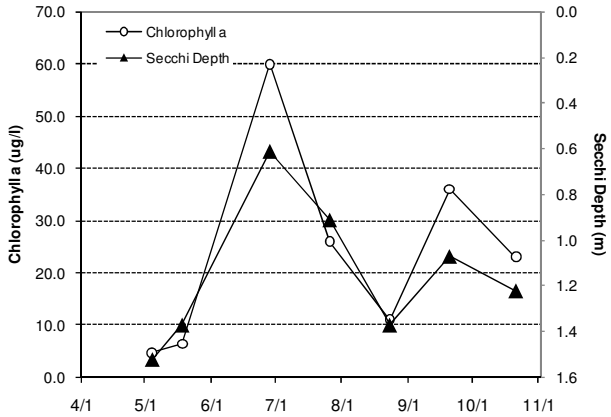
The lake received a lake grade of C for 2010. The lake grades have fluctuated in the range of F to B to D since 1998, which is quite variable. However, the F grades were received prior to 2004, suggesting that the lake's water quality is better than it was about 10 years ago.

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.

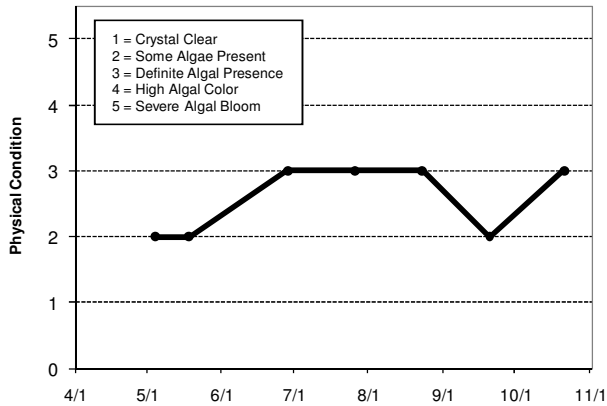






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/4	13.3	13.6	8.9	0.1	4.7	52		1.5	2	3
5/18	19.9	19.7	8.6	8.5	6.4	48		1.4	2	2
6/28	23.3	23.3	6.4	0.1	60.0	128		0.6	3	4
7/26	27.6	25.6	8.0	0.1	26.0	63		0.9	3	4
8/23	27.1	26.4	8.1	0.1	11.0	46		1.4	3	4
9/20	15.1	15.4	8.8	0.3	36.0	55		1.1	2	3
10/21	9.3	9.6	9.6	9.0	23.0	65		1.2	3	4



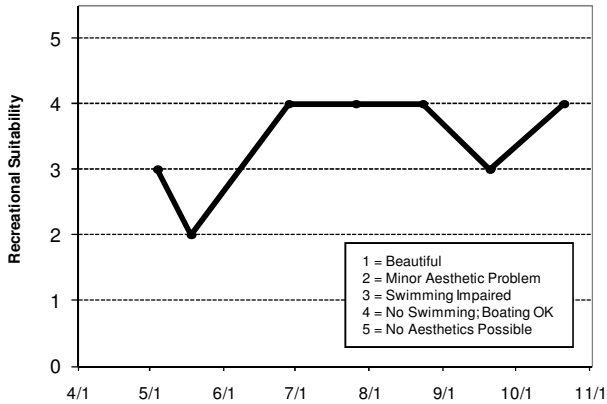
Lake Water Quality Grades Based on Summertime Averages

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

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.

2010 summer (May-September) data summary

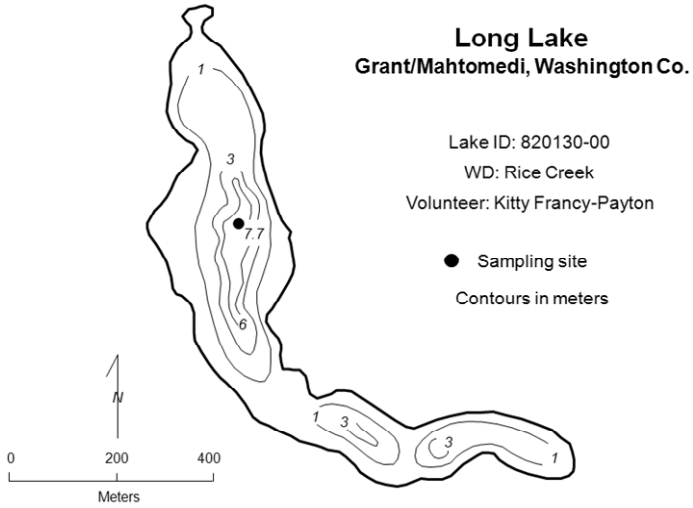
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	14.6	12.0	20.0	A
CLA (µg/l)	3.2	1.6	6.6	A
Secchi (m)	3.4	2.9	5.2	A
TKN (mg/l)	0.57	0.35	0.64	
			Lake Grade	A

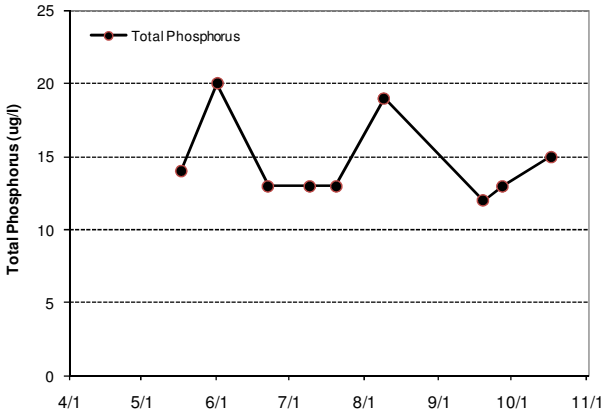
The lake received a lake grade of A for 2010, which is consistent with its historical database. The Secchi grade of A continues the improvement in water clarity the lake has experience recently. Additional years of monitoring are suggested to continue to build the water quality database so as to increase statistical power in determining potential water quality trends.

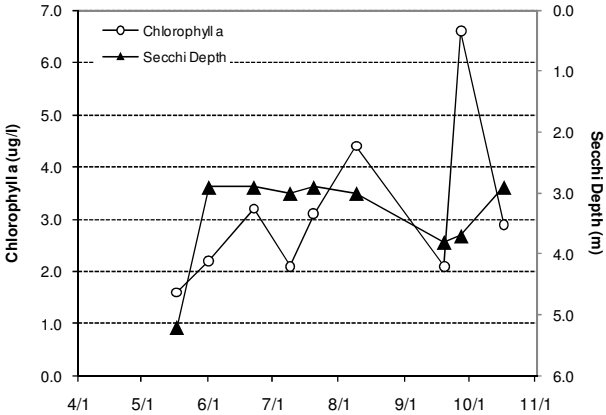
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

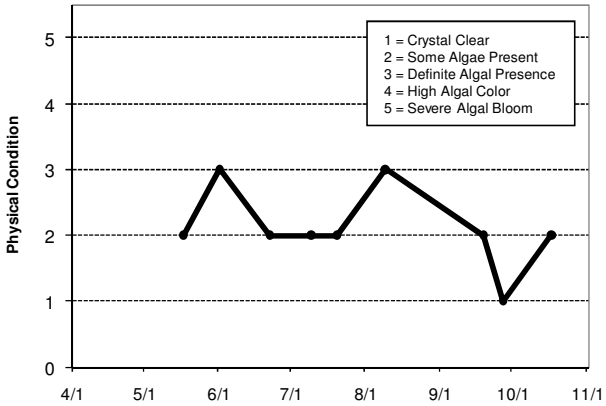






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/17	19.9				1.6	14		5.2	2	2
6/1	24.6				2.2	20		2.9	3	3
6/22	29.7				3.2	13		2.9	2	3
7/9	27.5				2.1	13		3.0	2	3
7/20	26.7				3.1	13		2.9	2	3
8/9	28.2				4.4	19		3.0	3	3
9/19	21.9				2.1	12		3.8	2	2
9/27	15.8				6.6	13		3.7	1	1
10/17	14.4				2.9	15		2.9	2	2



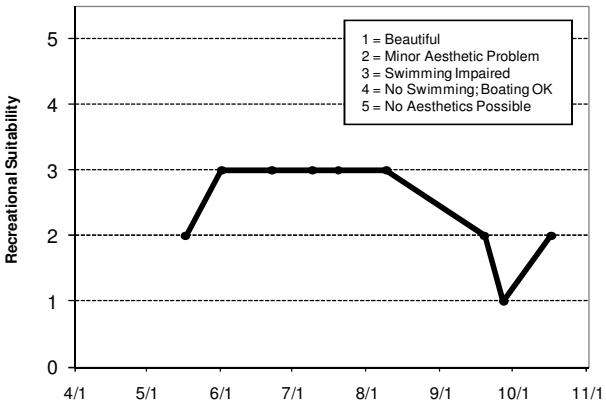
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	85.6	66.0	99.0	D
CLA (µg/l)	78.5	24.0	110.0	F
Secchi (m)	0.4	0.3	0.8	F
TKN (mg/l)	2.73	2.00	3.50	
			Lake Grade	F

The lake received a lake grade of F for 2010, which is consistent with the lake's historical water quality database. On the basis of the historical water quality database, this lake appears represented by a lake grade of F.

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

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

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

Loon Lake

Stillwater Twp., Washington Co.

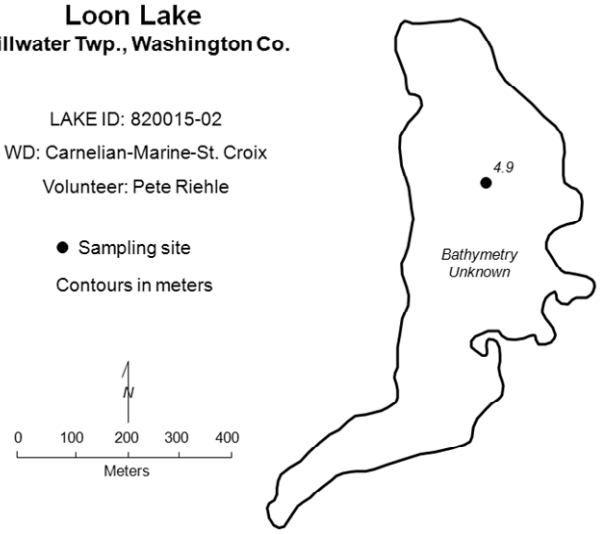
LAKE ID: 820015-02

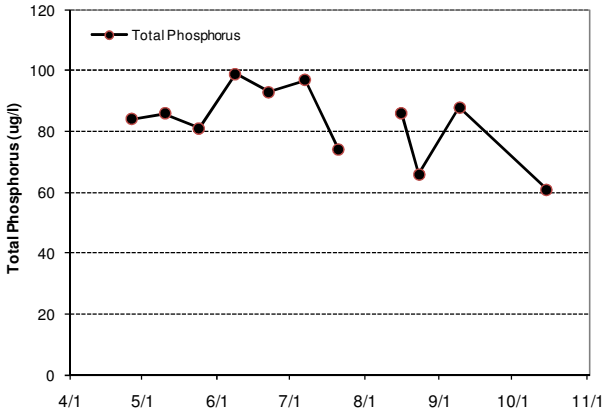
WD: Carnelian-Marine-St. Croix

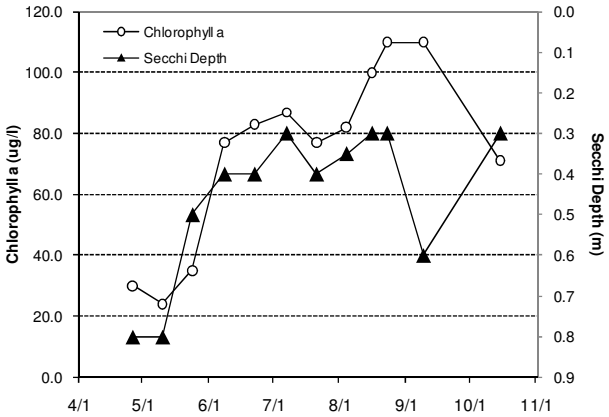
Volunteer: Pete Riehle

● Sampling site

Contours in meters

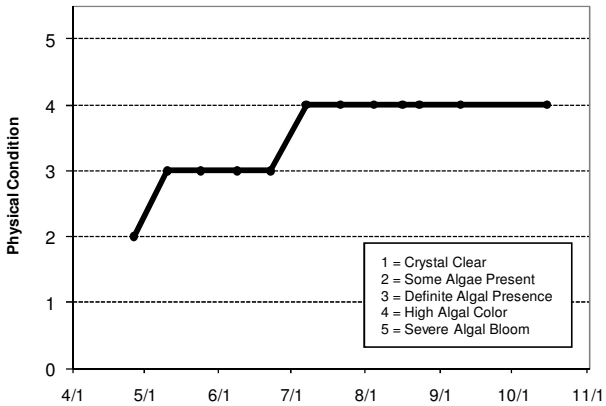






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/26	15.3				30.0	84		0.8	2	3
5/10	13.8				24.0	86		0.8	3	3
5/24	28.1				35.0	81		0.5	3	3
6/8	24.8				77.0	99		0.4	3	4
6/22	27.8				83.0	93		0.4	3	3
7/7	28.0				87.0	97		0.3	4	4
7/21	30.9				77.0	74		0.4	4	4
8/4	30.0				82.0			0.4	4	4
8/16	24.8				100.0	86		0.3	4	4
8/23	26.4				110.0	66		0.3	4	4
9/9	18.4				110.0	88		0.6	4	4
10/15	13.9				71.0	61		0.3	4	4



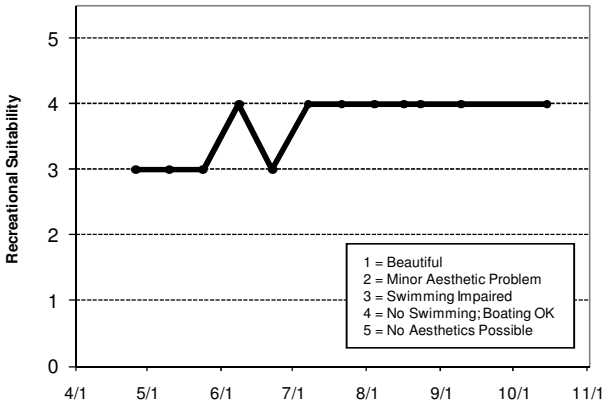
Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					F	F	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
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**

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	26.6	16.0	52.0	B
CLA (µg/l)	21.1	1.2	53.0	C
Secchi (m)	1.5	0.6	4.0	C
TKN (mg/l)	1.09	0.65	1.60	
			Lake Grade	C

The lake received a lake grade of C for 2010, which is consistent with previous years of lake grades, except for the D lake grade received in 2003. On the basis of the historical water quality database, the water quality of this lake appears represented well by a lake grade of C.

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

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

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

Lotus Lake
Chanhassen, Carver Co.

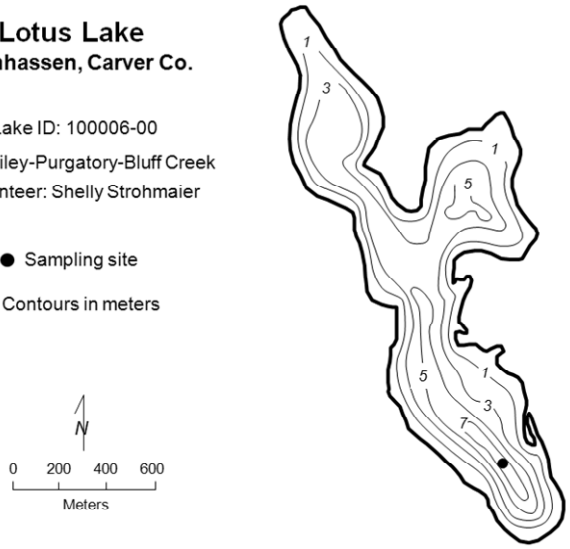
Lake ID: 100006-00

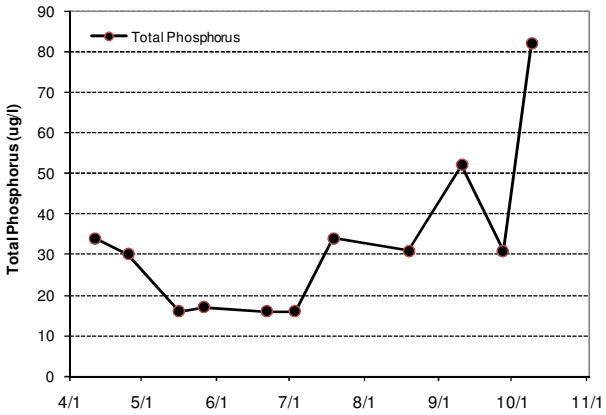
WD: Riley-Purgatory-Bluff Creek

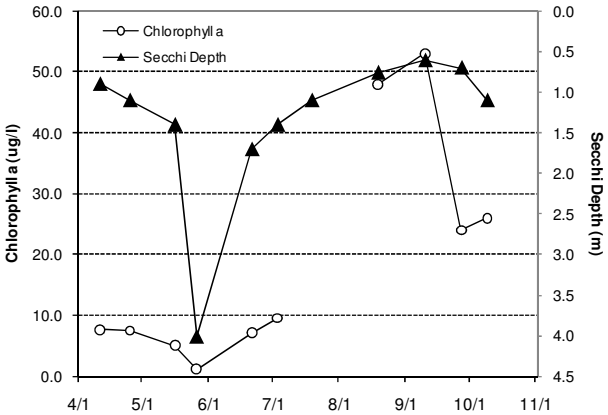
Volunteer: Shelly Strohmaier

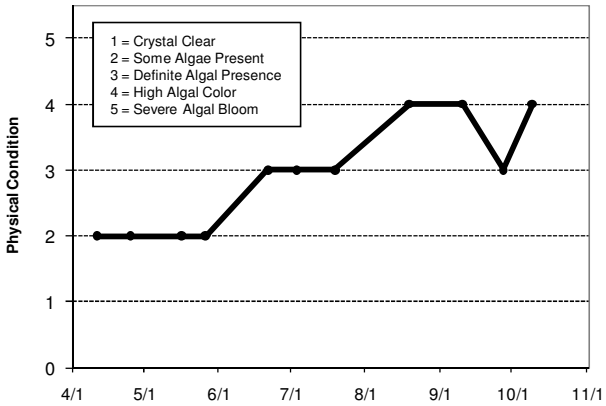
● Sampling site

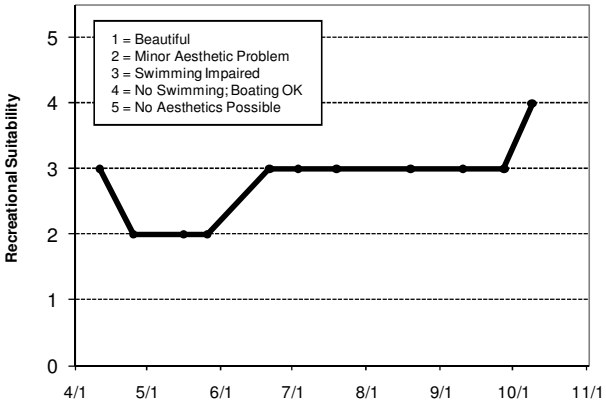
Contours in meters











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/11	11.6				7.7	34		0.9	2	3
4/25	14.3				7.5	30		1.1	2	2
5/16	15.0				5.1	16		1.4	2	2
5/26					1.2	17		4.0	2	2
6/21	23.4				7.1	16		1.7	3	3
7/3	24.2				9.6	16		1.4	3	3
7/19	26.7					34		1.1	3	3
8/19	27.4				48.0	31		0.8	4	3
9/10	19.1				53.0	52		0.6	4	3
9/27	16.6				24.0	31		0.7	3	3
10/9	16.6				26.0	82		1.1	4	4

Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	102.7	70.0	140.0	D
CLA (µg/l)	32.7	7.0	53.0	C
Secchi (m)	1.0	0.6	1.5	D
TKN (mg/l)	2.15	1.50	3.10	
			Lake Grade	D

The lake received a lake grade of D for 2010. The historical water quality database shows that the annual lake grades have varied from Cs to Ds. To better understand the lake's water quality and where it may be heading, more data are needed.

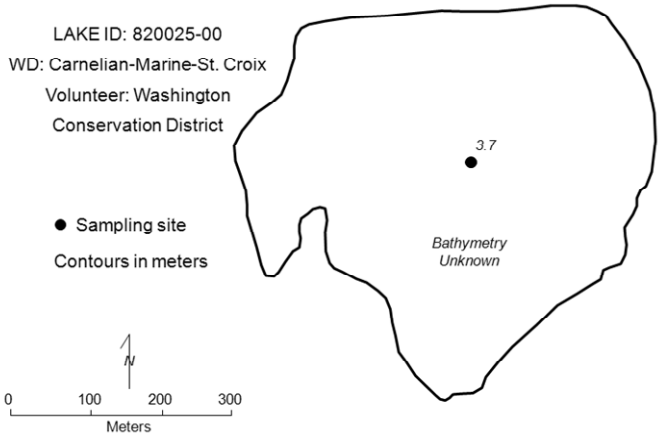
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

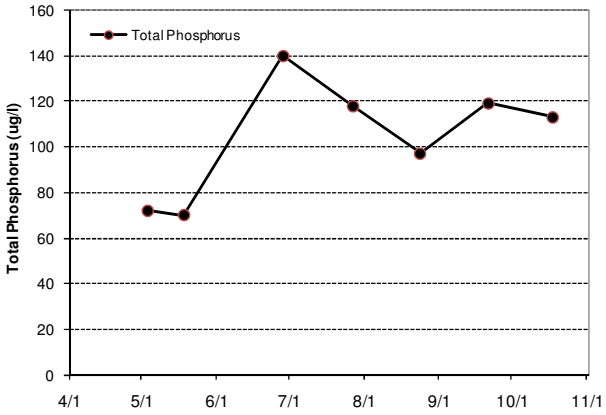
Lake Louise

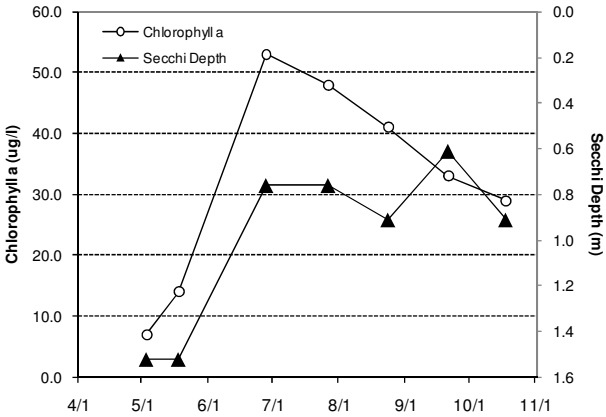
Stillwater Twp., Washington Co.

LAKE ID: 820025-00
WD: Carnelian-Marine-St. Croix
Volunteer: Washington
Conservation District



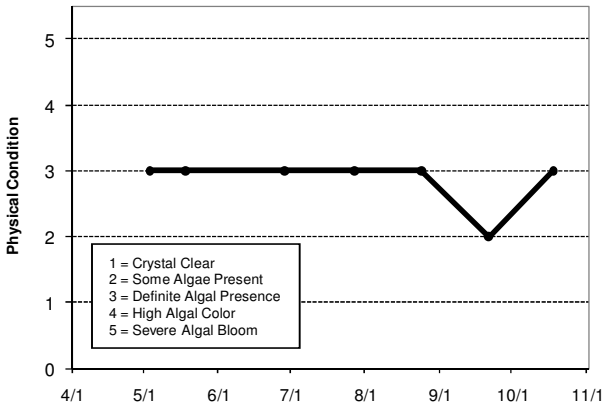
● Sampling site
Contours in meters





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/3	14.6	14.4	11.3	0.3	7.0	72		1.5	3	4
5/18	21.1	17.3	13.2	16.4	14.0	70		1.5	3	4
6/28	23.5	19.1	5.4	0.0	53.0	140		0.8	3	4
7/27	27.1	23.9	11.3	0.1	48.0	118		0.8	3	4
8/24	25.1	23.7	10.1	0.2	41.0	97		0.9	3	4
9/21	17.9	16.8	10.7	0.3	33.0	119		0.6	2	3
10/18	12.9	12.9	9.8	0.1	29.0	113		0.9	3	4

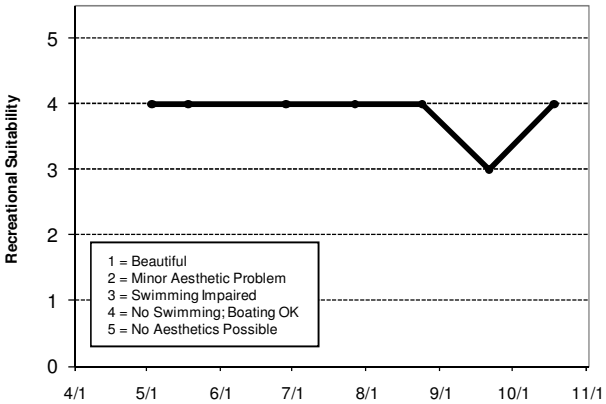


Lake Water Quality Grades Based on Summertime Averages

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



Source: Metropolitan Council and STORET data

Lucy Lake (10-0006) *City of Chanhassen*

Lucy Lake is located within the City of Chanhassen (Carver County). It has a surface area of 87 acres and a maximum depth of 6.4 m (21 ft). Ninety nine percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column. The MN DNR has designated the lake as being infested with 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	39.9	25.0	85.0	C
CLA (µg/l)	28.4	3.0	84.0	C
Secchi (m)	1.7	0.6	3.5	C
TKN (mg/l)	1.53	1.10	2.20	
			Lake Grade	C

The lake received a lake grade of C for 2010. Additional years of monitoring are suggested for continuing to build the water quality database for determining potential water quality trends.

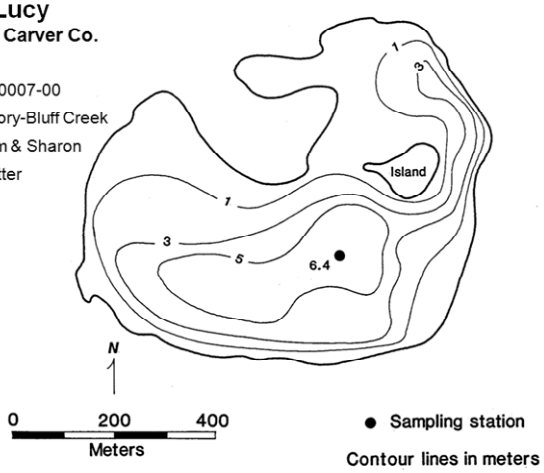
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

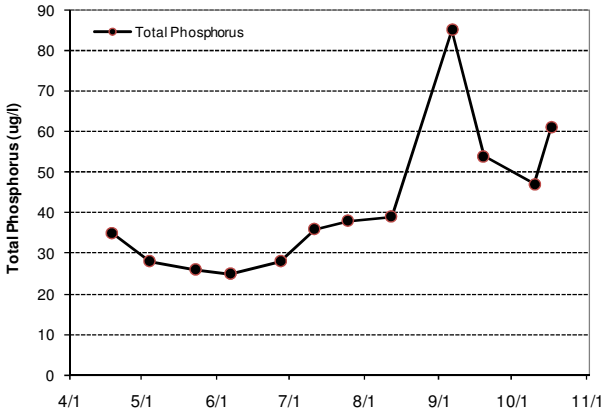
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

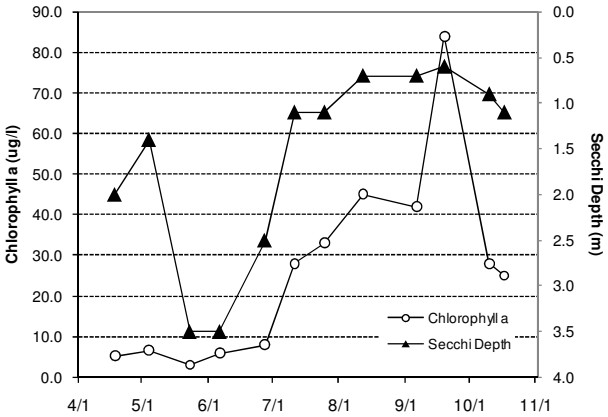
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lake Lucy
Chanhassen, Carver Co.

Lake ID: 100007-00
WD: Riley-Purgatory-Bluff Creek
Volunteers: Tim & Sharon McCotter

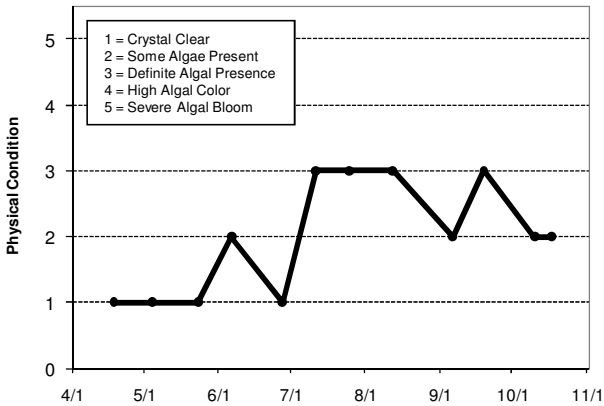






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	14.7				5.2	35		2.0	1	1
5/4	15.4				6.6	28		1.4	1	1
5/23	21.1				3.0	26		3.5	1	1
6/6	22.6				5.9	25		3.5	2	1
6/27	25.5				7.9	28		2.5	1	1
7/11	26.7				28.0	36		1.1	3	2
7/25	29.0				33.0	38		1.1	3	2
8/12	30.3				45.0	39		0.7	3	2
9/6	19.6				42.0	85		0.7	2	2
9/19	17.0				84.0	54		0.6	3	2
10/10	18.6				28.0	47		0.9	2	2
10/17	14.5				25.0	61		1.1	2	2



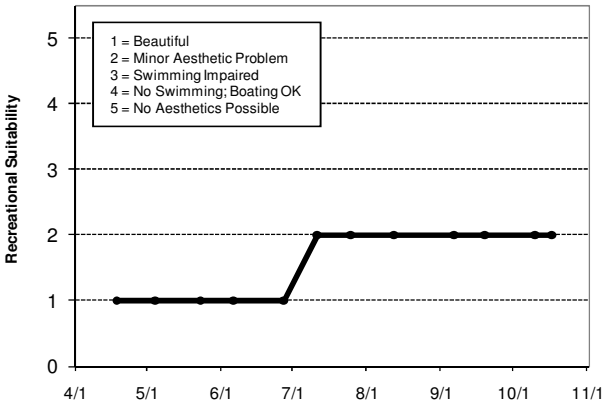
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus						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
Total Phosphorus						C	C
Chlorophyll a						C	C
Secchi Depth	D	D	C	C	D	C	C
Lake Grade						**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. There is little known morphological data available for the lake. Note that previous Annual lake reports (2006 – 2009) erroneously placed site #1 in the south basin. The actual monitoring 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.

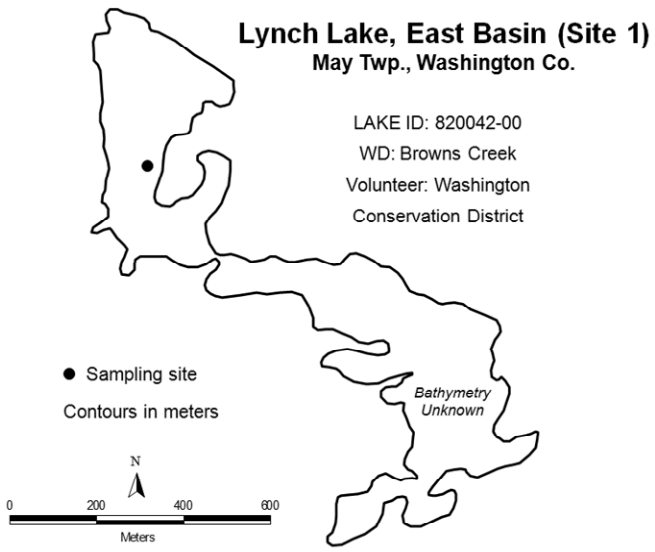
2010 summer (May-September) data summary

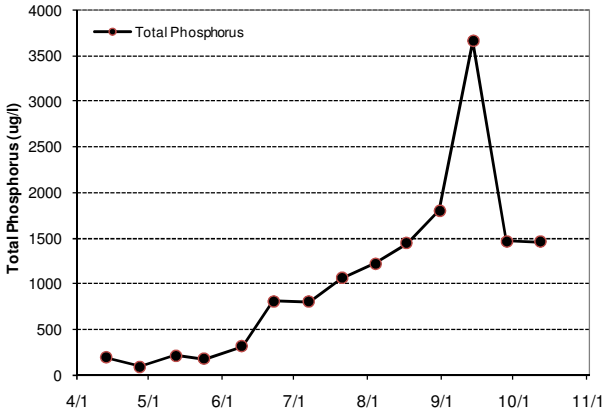
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	1179.5	175.0	3660.0	F
CLA (µg/l)	560.9	110.0	1200.0	F
Secchi (m)	0.1	0.0	0.2	F
TKN (mg/l)	15.52	2.30	40.00	
			Lake Grade	F

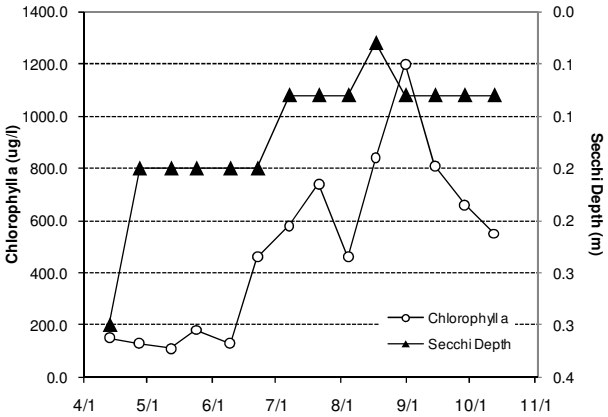
The lake received a lake grade of F for 2010. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

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.

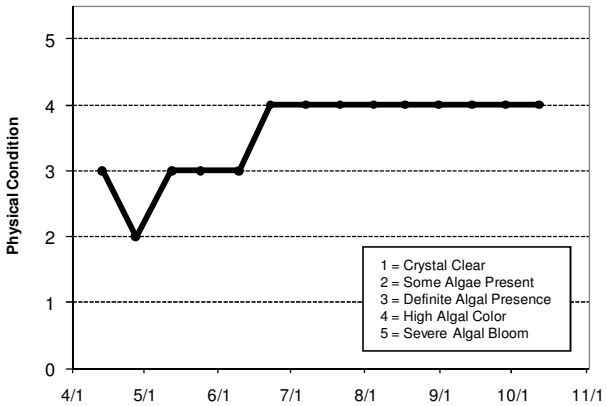






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	13.1	12.9	12.1	0.1	150.0	195		0.3	3	4
4/27	12.1		10.3		130.0	94		0.2	2	4
5/12	9.7		10.6		110.0	213		0.2	3	5
5/24	24.9		11.1		180.0	175		0.2	3	4
6/9	19.7	19.1	5.5	0.3	130.0	316		0.2	3	4
6/22	27.7	23.0	13.8	0.4	460.0	814		0.2	4	4
7/7	28.7	24.7	10.2	0.1	580.0	806		0.1	4	4
7/21	26.1	23.4	11.1	0.2	740.0	1060		0.1	4	4
8/4	25.8	24.3	5.1	0.1	460.0	1220		0.1	4	4
8/17	20.7	20.7	3.3	0.1	840.0	1440		0.0	4	4
8/31	24.4	23.8	5.0	2.0	1200.0	1800		0.1	4	5
9/14	18.0	17.7	6.6	0.4	810.0	3660		0.1	4	4
9/28	14.4	14.4	7.9	0.2	660.0	1470		0.1	4	4
10/12	17.4		7.7		550.0	1460		0.1	4	4



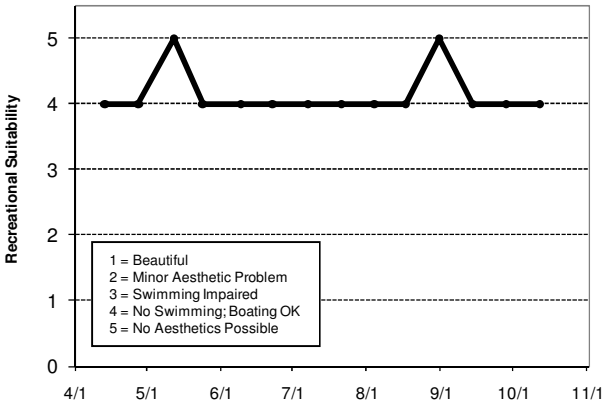
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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. There is little known morphological data available for the lake.

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

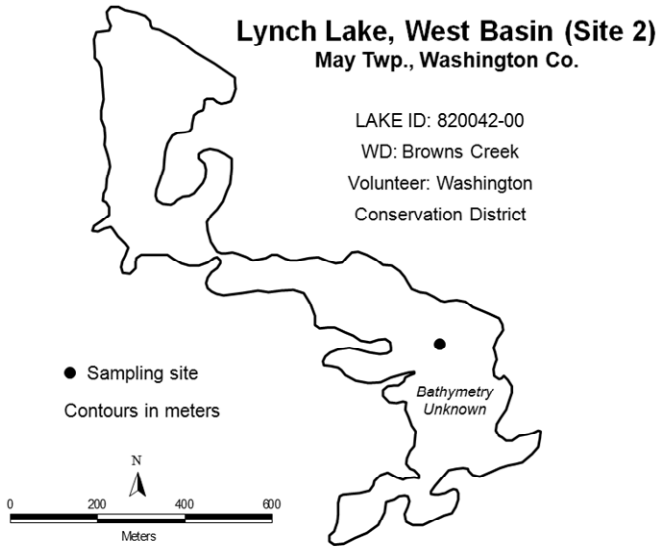
2010 summer (May-September) data summary

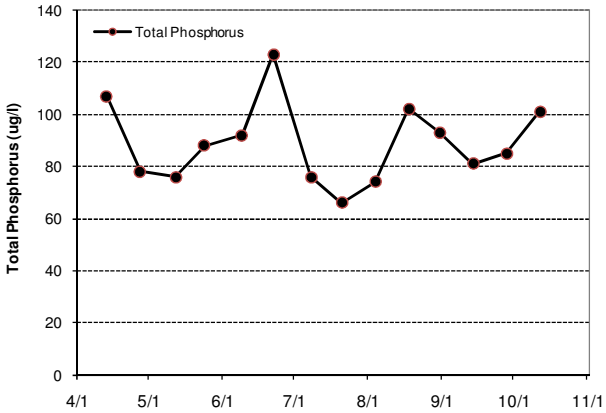
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	86.9	66.0	123.0	D
CLA (µg/l)	102.9	24.0	340.0	F
Secchi (m)	0.6	0.3	1.1	F
TKN (mg/l)	2.55	2.00	3.00	
			Lake Grade	F

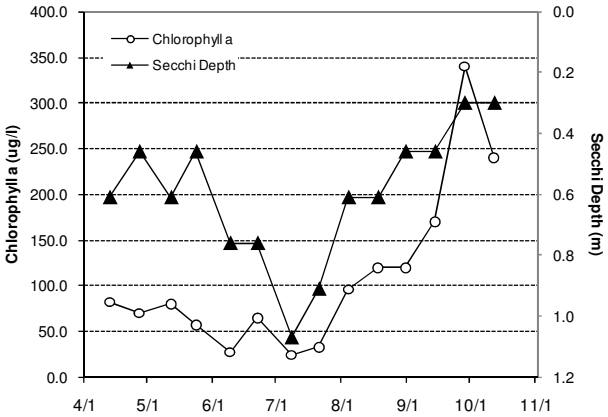
This was the first year that site #2 was monitored via the CAMP. The south site received a lake grade of F for 2010, but the mean values for all four parametes were noticeable less for the south site compared to the north site. Further monitoring is suggested to continue to build the water quality database 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.

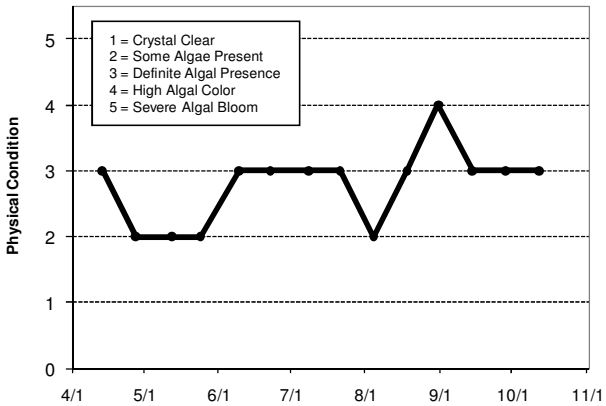






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	12.9	10.4	11.8	0.0	82.0	107		0.6	3	3
4/27	14.1	13.2	9.1	3.2	70.0	78		0.5	2	2
5/12	11.4	11.3	10.1	5.6	80.0	76		0.6	2	4
5/24	22.3	11.4	10.4	0.1	57.0	88		0.5	2	4
6/9	20.5	11.9	4.6	0.0	27.0	92		0.8	3	4
6/22	28.1	13.3	11.5	0.1	65.0	123		0.8	3	4
7/8	26.4	15.1	7.3	0.1	24.0	76		1.1	3	4
7/21	26.1	16.2	8.1	0.1	33.0	66		0.9	3	4
8/4	27.1	17.8	10.6	0.1	96.0	74		0.6	2	3
8/18	23.2	19.3	9.5	0.1	120.0	102		0.6	3	4
8/31	24.7	20.0	7.0	0.0	120.0	93		0.5	4	3
9/14	20.4	18.0	13.2	0.4	170.0	81		0.5	3	4
9/28	17.0	14.9	14.8	0.1	340.0	85		0.3	3	4
10/12	17.8	14.3	12.5	0.1	240.0	101		0.3	3	4



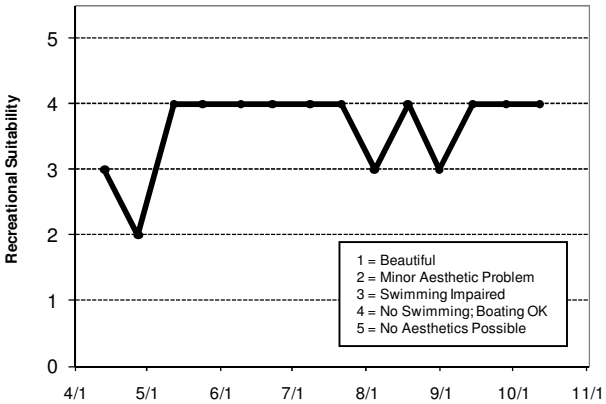
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Marion Lake (19-0026) *City of Lakeville*

Marion Lake is located in the City of Lakeville (Dakota County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (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.

2010 summer (May-September) data summary

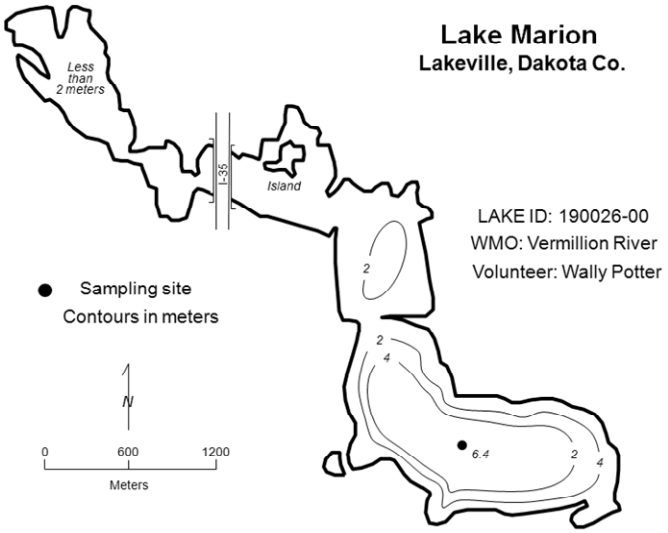
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	40.2	29.0	66.0	C
CLA (µg/l)	30.7	2.4	65.0	C
Secchi (m)	1.5	0.8	3.3	C
TKN (mg/l)	1.38	0.80	1.90	
			Lake Grade	C

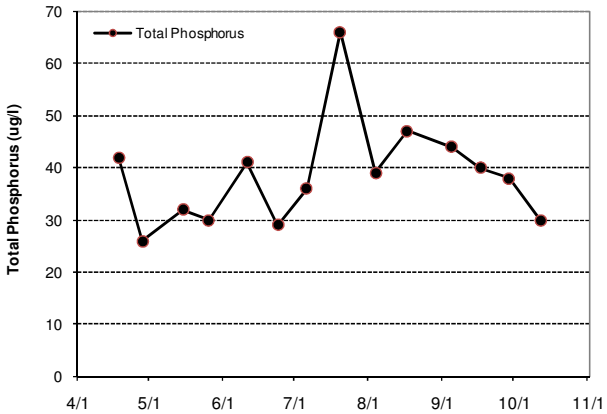
The lake received a lake grade of C for 2010, which is consistent with recent lake grades. On the basis of the historical water quality database, the surface water quality of the lake has varied from Bs to a D, with Cs being most common. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

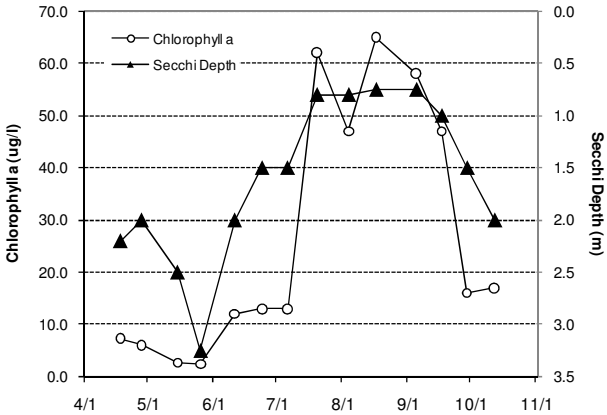
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

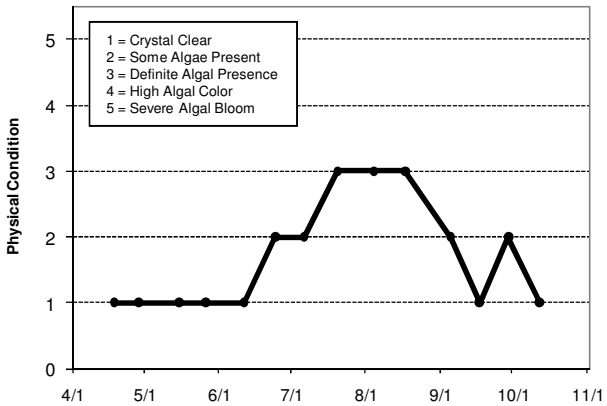
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

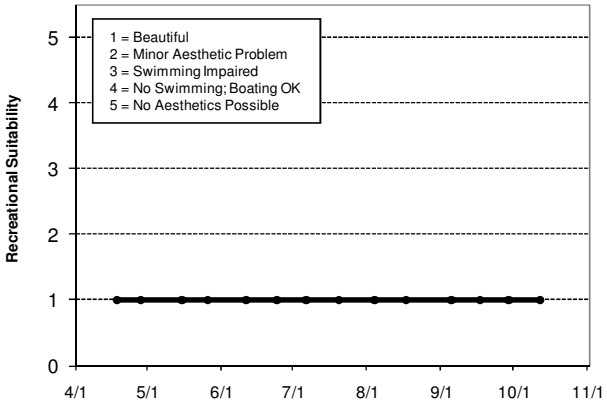
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	14.2				7.3	42		2.2	1	1
4/28	14.9				6.0	26		2.0	1	1
5/15	15.0				2.6	32		2.5	1	1
5/26	23.5				2.4	30		3.3	1	1
6/11	21.0				12.0	41		2.0	1	1
6/24	25.4				13.0	29		1.5	2	1
7/6	27.2				13.0	36		1.5	2	1
7/20	25.9				62.0	66		0.8	3	1
8/4	28.4				47.0	39		0.8	3	1
8/17	25.9				65.0	47		0.8	3	1
9/5	21.0				58.0	44		0.8	2	1
9/17	17.7				47.0	40		1.0	1	1
9/29	16.7				16.0	38		1.5	2	1
10/12	17.3				17.0	30		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	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
Total Phosphorus	C	C	C	C	C	C	C
Chlorophyll a	C	C	C	C	C	C	C
Secchi Depth	C	C	C	C	B	C	C
Lake Grade	**C**	**C**	**C**	**C**	**C**	**C**	**C**

Source: Metropolitan Council and STORET data

Markgrafs Lake (82-0089) *City of Woodbury*

Markgrafs Lake is located within the City of Woodbury (Washington County). It has a surface area of approximately 46 acres, and a maximum depth of 2.4 m (8 feet). The 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	209.3	138.0	316.0	F
CLA (µg/l)	142.7	42.0	590.0	F
Secchi (m)	0.3	0.3	0.4	F
TKN (mg/l)	3.63	2.70	5.30	
			Lake Grade	F

The lake received a lake grade of F for 2010. 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.

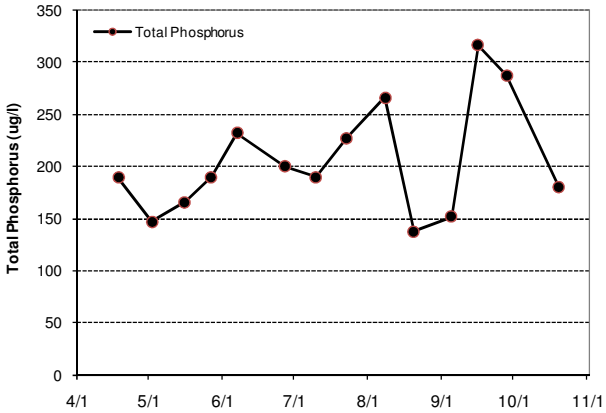
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

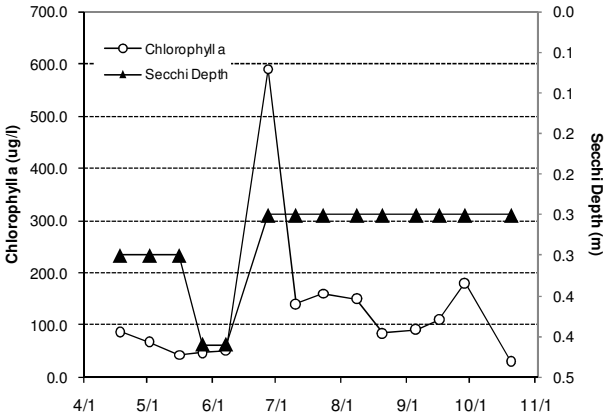
Markgrafs Lake

Woodbury, Washington Co.

Lake ID: 820089-00
WD: South Washington
Volunteer: Terry Riley

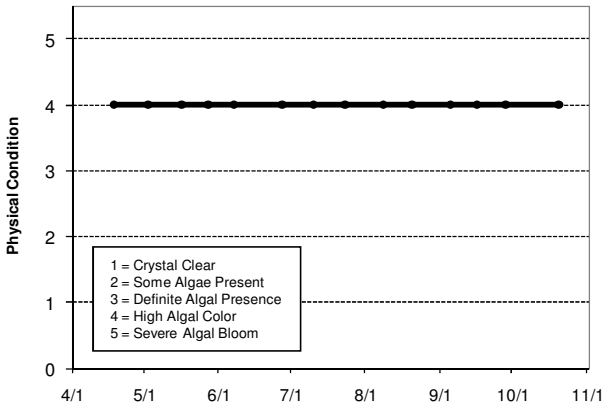
● Sampling site
Contours in meters





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	17.8				87.0	189		0.3	4	4
5/2	17.7				67.0	147		0.3	4	4
5/16	17.7				42.0	166		0.3	4	4
5/27	27.1				47.0	190		0.4	4	4
6/7	17.9				51.0	232		0.4	4	4
6/27	26.7				590.0	200		0.3	4	4
7/10	27.8				140.0	190		0.3	4	4
7/23	26.4				160.0	227		0.3	4	4
8/8	27.0				150.0	266		0.3	4	4
8/20	27.1				84.0	138		0.3	4	4
9/5	27.0				91.0	152		0.3	4	4
9/16	17.3				110.0	316		0.3	4	4
9/28	17.0				180.0	287		0.3	4	4
10/20	13.5				30.0	180		0.3	4	4



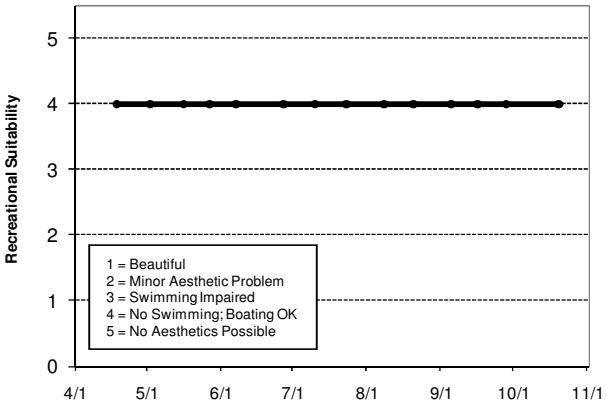
Lake Water Quality Grades Based on Summertime Averages

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

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	51.2	34.0	74.0	C
CLA (µg/l)	20.5	3.4	56.0	C
Secchi (m)	1.8	1.4	2.1	C
TKN (mg/l)	1.18	0.89	1.60	
			Lake Grade	C

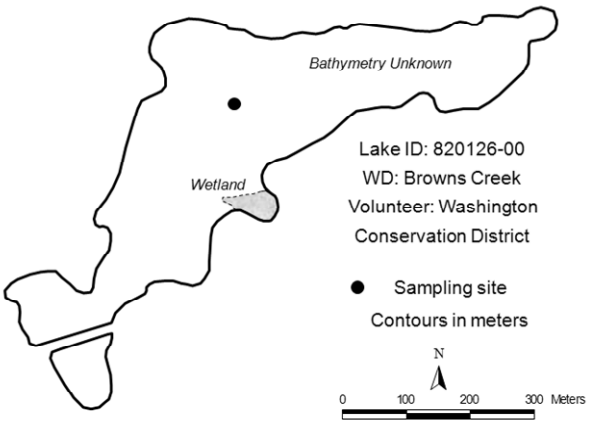
The lake received a lake grade of C for 2010, which is similar to the lake grades received in previous years. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

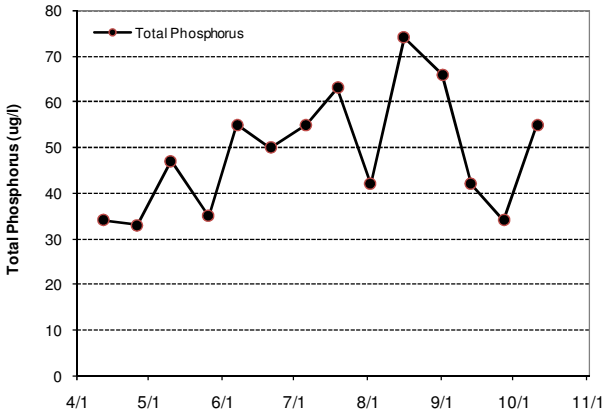
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

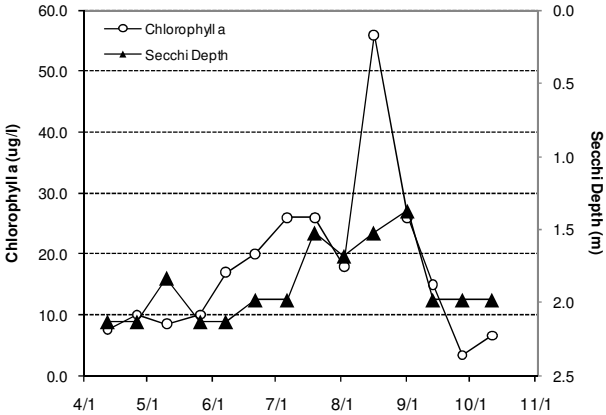
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Masterman Lake

Grant, Washington Co.

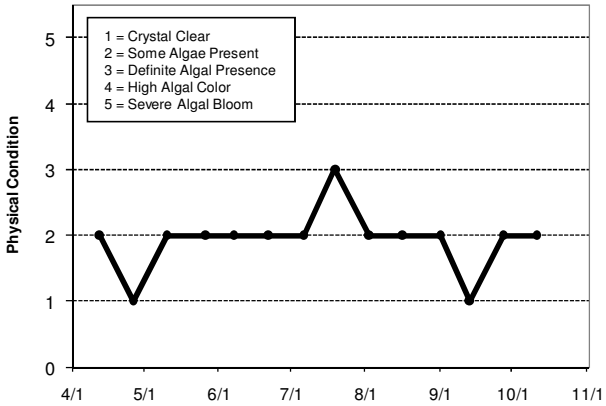






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	13.9	13.5	10.9	1.7	7.6	34		2.1	2	2
4/26	14.2	14.2	8.2	6.3	10.0	33		2.1	1	2
5/10	13.0	13.0	9.9	9.7	8.5	47		1.8	2	2
5/26	26.1	23.4	8.1	4.4	10.0	35		2.1	2	3
6/7	22.8	21.9	7.8	0.5	17.0	55		2.1	2	3
6/21	24.3	23.0	7.9	0.9	20.0	50		2.0	2	3
7/6	27.3	25.7	6.7	0.8	26.0	55		2.0	2	3
7/19	26.4	25.7	5.9	1.6	26.0	63		1.5	3	4
8/2	26.5	25.8	5.3	2.6	18.0	42		1.7	2	3
8/16	23.5	23.5	7.0	2.4	56.0	74		1.5	2	3
9/1	26.3	25.0	6.6	3.0	26.0	66		1.4	2	2
9/13	19.4	19.1	7.9	4.6	15.0	42		2.0	1	2
9/27	15.1	14.9	6.3	3.3	3.4	34		2.0	2	1
10/11	17.9	17.0	7.8	4.0	6.6	55		2.0	2	1



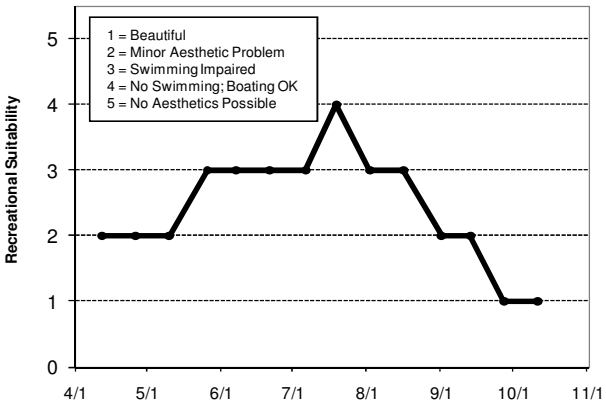
Lake Water Quality Grades Based on Summertime Averages

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

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

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

2010 summer (May-September) data summary

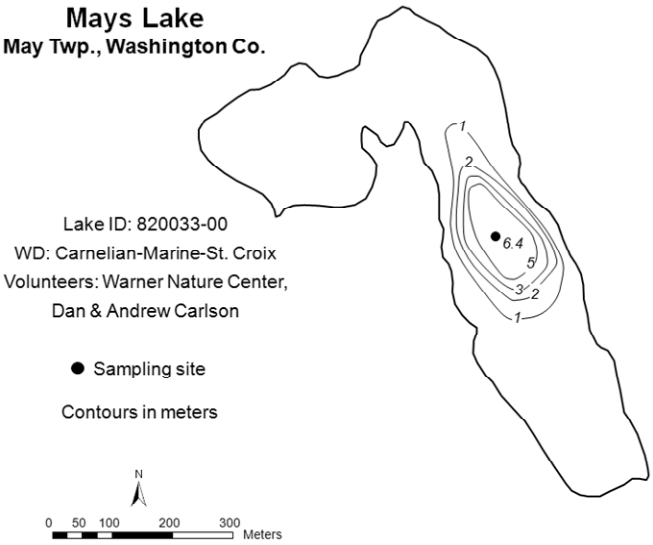
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	16.8	12.0	25.0	A
CLA (µg/l)	2.0	1.3	2.6	A
Secchi (m)	6.4	5.3	7.3	A
TKN (mg/l)	0.58	0.45	0.71	
			Lake Grade	A

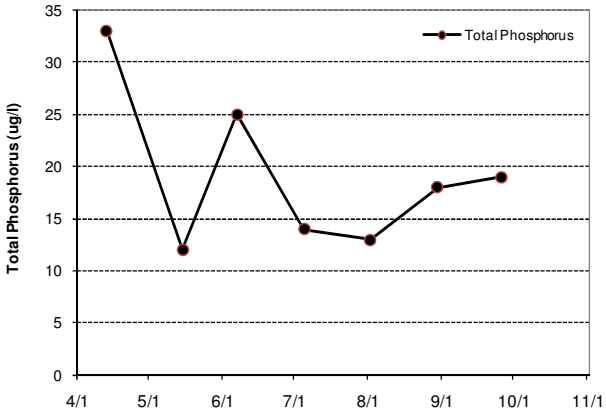
The lake received a lake grade of A for 2010. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends for this outstanding resource.

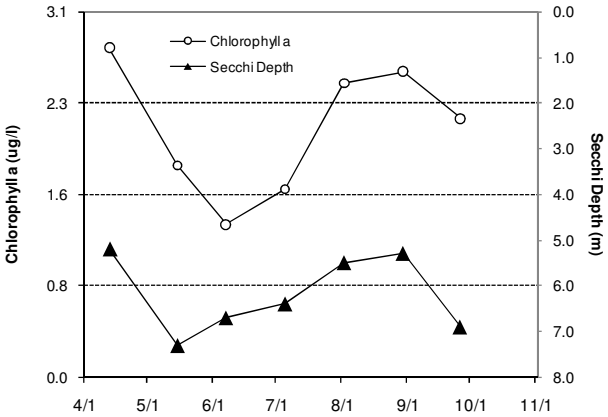
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

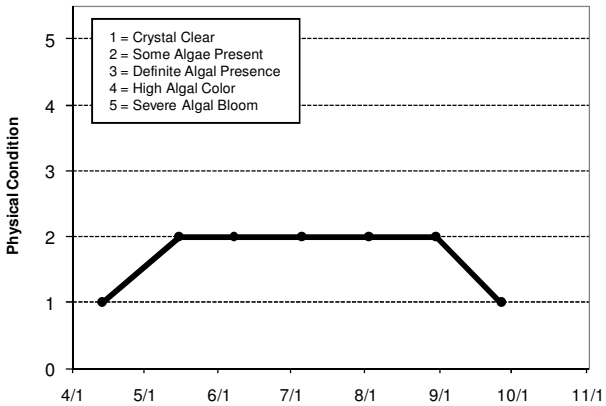






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	13.5				2.8	33		5.2	1	1
5/15	13.3				1.8	12		7.3	2	2
6/7	24.8				1.3	25		6.7	2	2
7/5	27.2				1.6	14		6.4	2	3
8/2	27.5				2.5	13		5.5	2	4
8/30	25.3				2.6	18		5.3	2	2
9/26	16.2				2.2	19		6.9	1	1



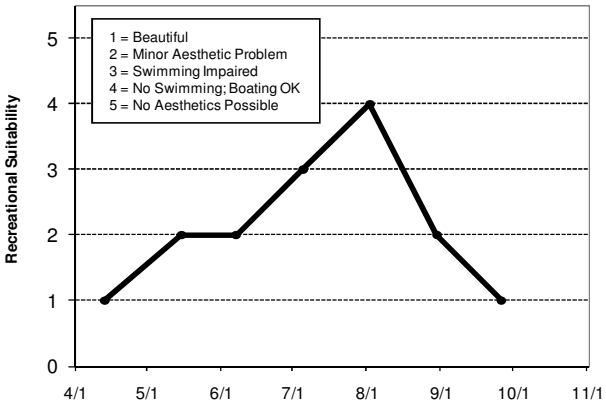
Lake Water Quality Grades Based on Summertime Averages

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

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.

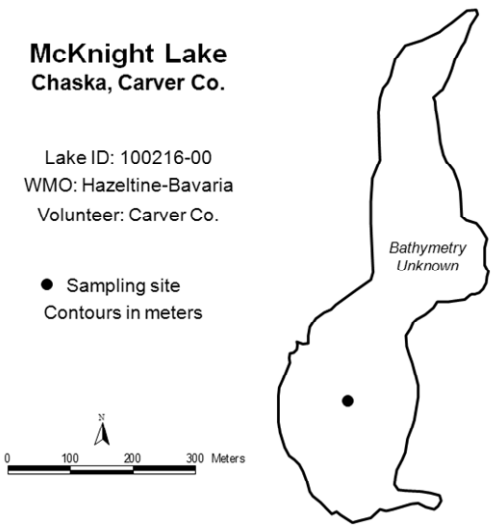
2010 summer (May-September) data summary

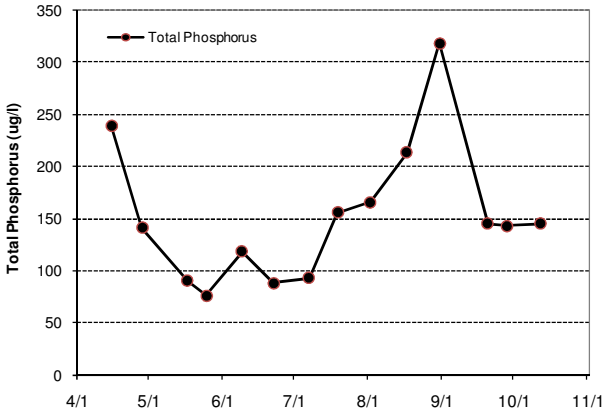
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	146.0	76.0	318.0	D
CLA (µg/l)	95.5	21.0	310.0	F
Secchi (m)	0.6	0.2	0.9	F
TKN (mg/l)	2.20	1.40	3.60	
			Overall Grade	F

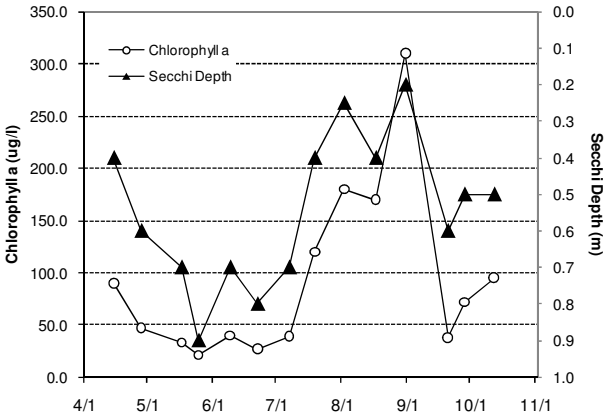
The lake received a lake grade of F for 2010, which is similar to previous years' lake grades. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

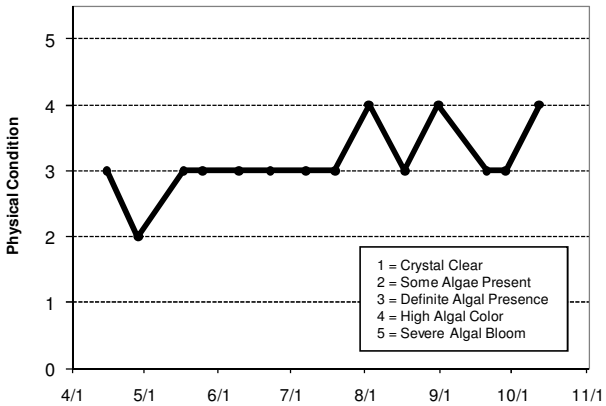






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/15	15.1	5.2	11.6	0.3	90.0	239		0.4	3	4
4/28	15.2	10.1	18.8	0.7	47.0	141		0.6	2	3
5/17	18.6	10.9	16.1	6.2	33.0	90		0.7	3	4
5/25	26.0	10.8	12.5	0.2	21.0	76		0.9	3	4
6/9	22.2	13.5	9.2	0.1	40.0	118		0.7	3	4
6/22	24.9	11.8	10.0	0.1	27.0	88		0.8	3	4
7/7	26.8	25.0	11.5	1.7	39.0	93		0.7	3	3
7/19	26.3	25.5	12.1	3.7	120.0	156		0.4	3	3
8/2	27.0	19.7	12.1	0.2	180.0	166		0.3	4	4
8/17	24.2	20.3	7.7	0.5	170.0	213		0.4	3	4
8/31	26.5	18.7	15.0	0.0	310.0	318		0.2	4	4
9/20	16.3	15.8	6.2	0.7	38.0	145		0.6	3	3
9/28	15.8	15.1	9.8	7.5	72.0	143		0.5	3	3
10/12	17.0	15.3	14.8	5.9	95.0	145		0.5	4	4



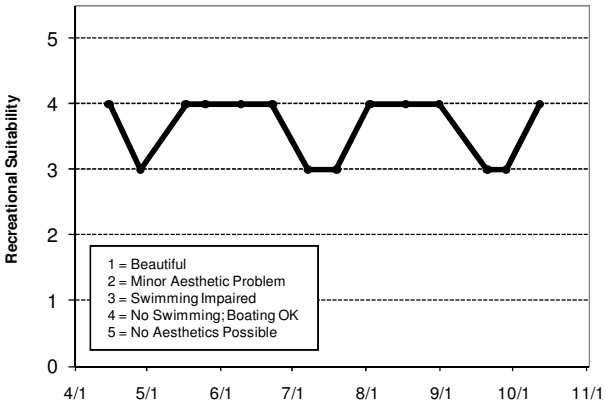
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



McKusick Lake (82-0020) *Middle St. Croix Watershed Management Organization*

Lake McKusick is located in the City of Stillwater (Washington County). The lake has surface area of 46 acres, and a maximum depth of 4.7 m (15 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

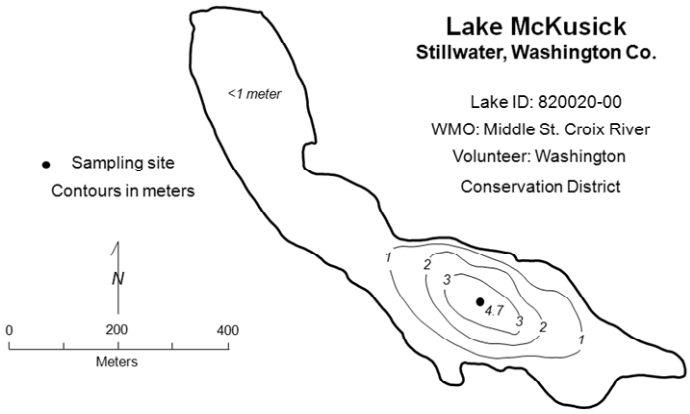
2010 summer (May-September) data summary

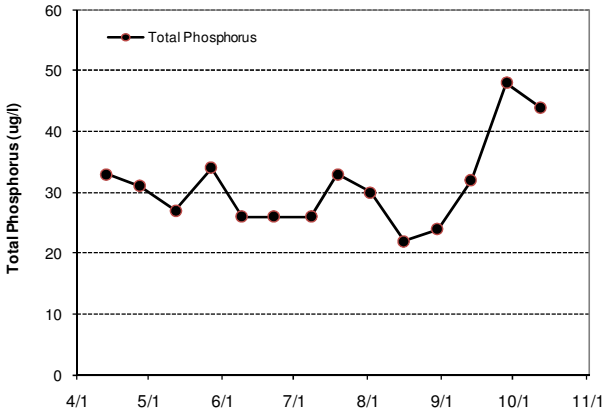
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	29.8	22.0	48.0	B
CLA (µg/l)	5.4	2.9	7.7	A
Secchi (m)	2.4	1.5	3.5	B
TKN (mg/l)	0.86	0.50	1.70	
			Lake Grade	B

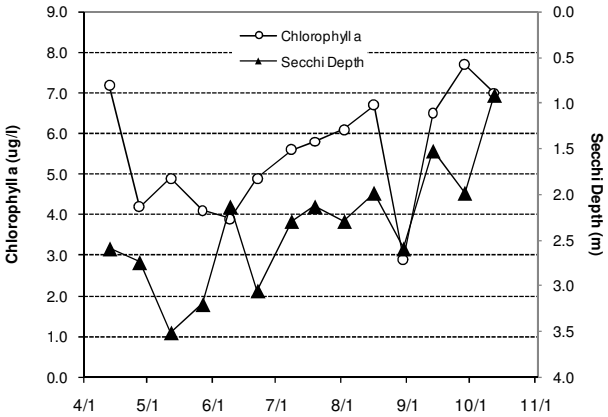
The lake received a lake grade of B for 2010, which is similar to lake grades received in some past years. The lake grades over the past 15 years or so have varied in the B to D range. The historical water quality database suggests that the lake has been represented by a lake grade of C or B for the 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.

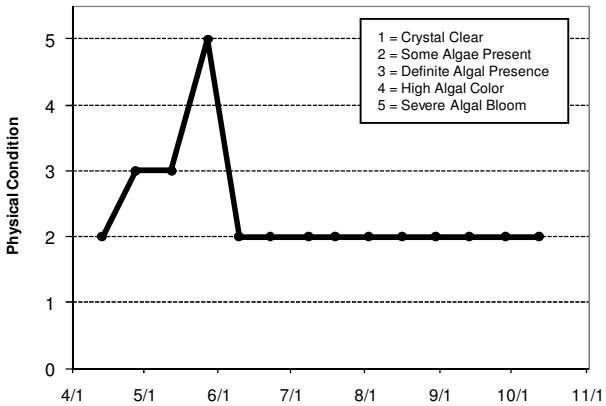






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	14.0	10.6	12.0	0.1	7.2	33		2.6	2	2
4/27	16.9	11.2	9.6	0.4	4.2	31		2.7	3	3
5/12	11.7	7.4	10.5	0.1	4.9	27		3.5	3	3
5/27	21.7	12.7	8.6	0.1	4.1	34		3.2	5	5
6/9	20.6	13.7	5.7	0.2	3.9	26		2.1	2	3
6/22	24.8	14.1	11.2	0.1	4.9	26		3.1	2	3
7/8	26.2	13.1	9.1	0.1	5.6	26		2.3	2	3
7/19	26.5	13.3	7.1	0.0	5.8	33		2.1	2	3
8/2	28.1	13.1	8.9	0.0	6.1	30		2.3	2	3
8/16	23.9	14.5	6.4	0.1	6.7	22		2.0	2	3
8/30	26.9	15.4	10.2	0.1	2.9	24		2.6	2	3
9/13	19.6	14.9	9.9	0.1	6.5	32		1.5	2	3
9/28	15.4	14.7	9.8	1.9	7.7	48		2.0	2	2
10/12	17.9	14.3	12.3	1.8	7.0	44		0.9	2	3



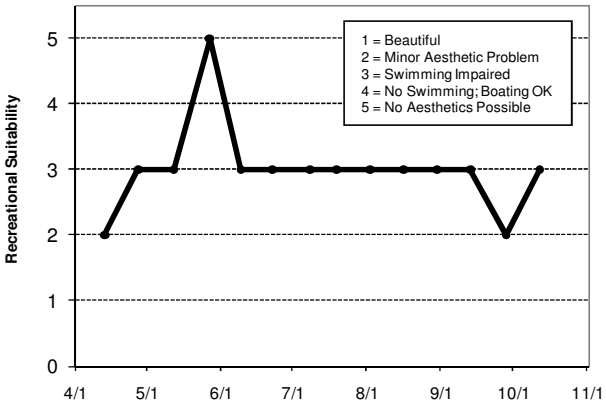
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



McMahon Lake (70-0050) *Scott County Watershed Management Organization*

McMahon Lake, also known as Carl's Lake, is located in Spring Lake Township (Scott County). The lake has a surface area of 110 acres and a maximum depth of 4.5 m (14 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	45.4	27.0	61.0	C
CLA (µg/l)	18.8	4.1	54.0	B
Secchi (m)	1.6	0.7	2.9	C
TKN (mg/l)	1.45	1.10	1.80	
			Lake Grade	C

The lake received a lake grade of C for 2010, which is the second 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. This year also saw the first B grade for CLA; previous years' grades have been C and below. 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.

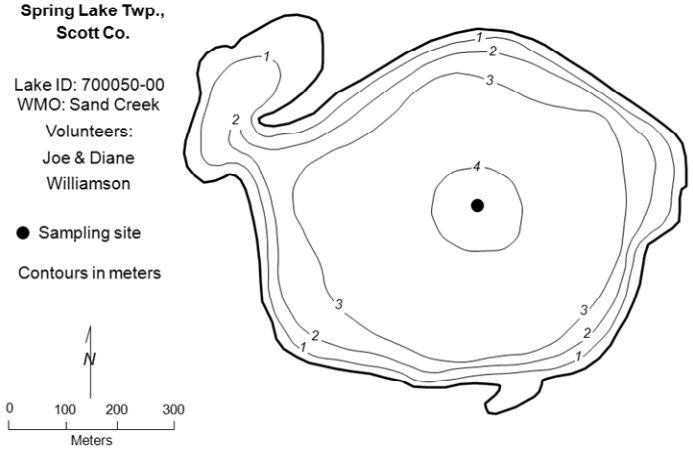
McMahon Lake

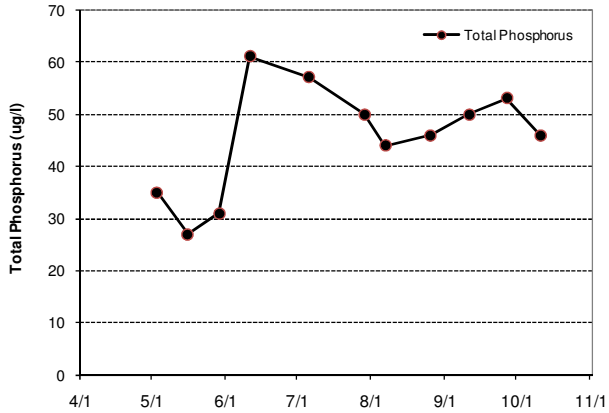
Spring Lake Twp., Scott Co.

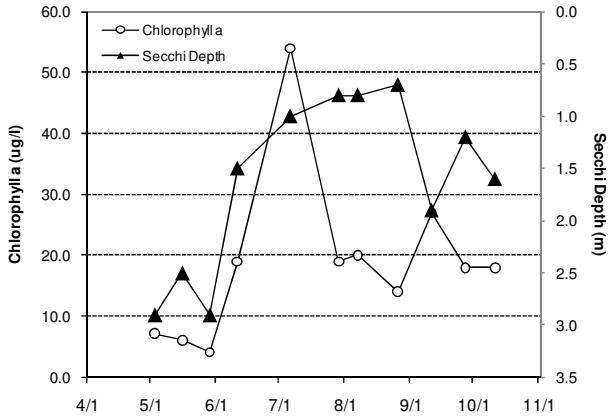
Lake ID: 700050-00
WMO: Sand Creek
Volunteers:
Joe & Diane Williamson

● Sampling site

Contours in meters

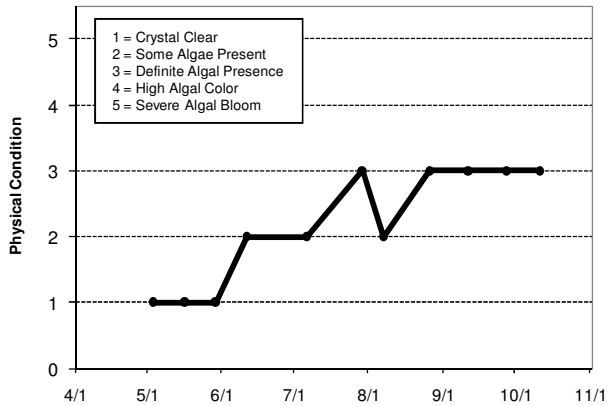






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/3	14.9				7.1	35		2.9	1	1
5/16	12.8				6.1	27		2.5	1	1
5/29	24.1				4.1	31		2.9	1	1
6/11	21.5				19.0	61		1.5	2	1
7/6	26.9				54.0	57		1.0	2	2
7/29	29.8				19.0	50		0.8	3	2
8/7	27.4				20.0	44		0.8	2	2
8/26	25.4				14.0	46		0.7	3	2
9/11	19.2				27.0	50		1.9	3	2
9/27	17.8				18.0	53		1.2	3	2
10/11	16.5				18.0	46		1.6	3	1

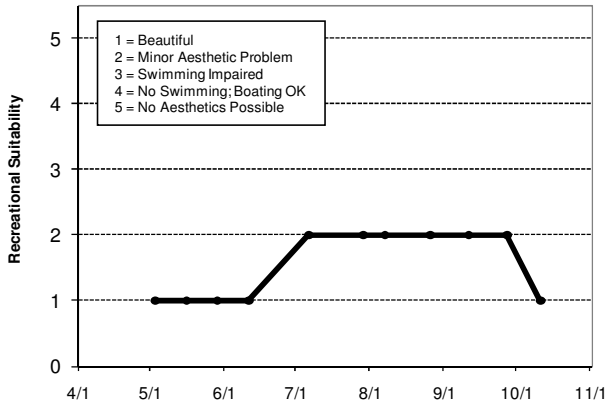


Lake Water Quality Grades Based on Summertime Averages

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



Source: Metropolitan Council and STORET data

Medicine Lake [Site 2, south 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.

2010 summer (May-September) data summary

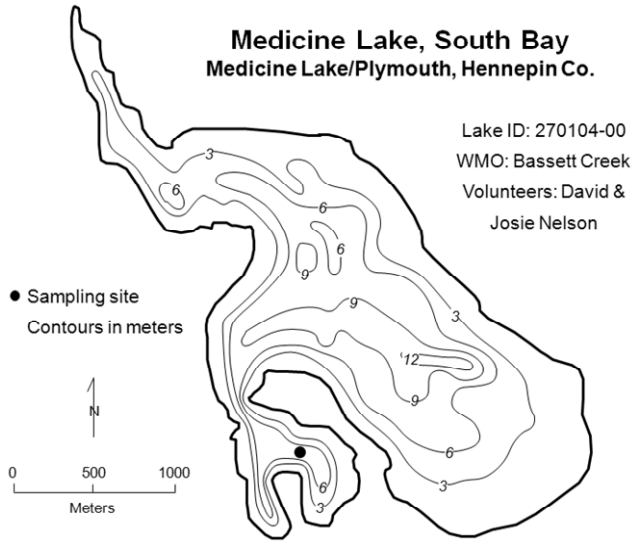
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	47.2	23.0	76.0	C
CLA (µg/l)	28.8	4.9	54.0	C
Secchi (m)	1.5	0.8	3.5	C
TKN (mg/l)	1.32	0.92	1.60	
			Lake Grade	C

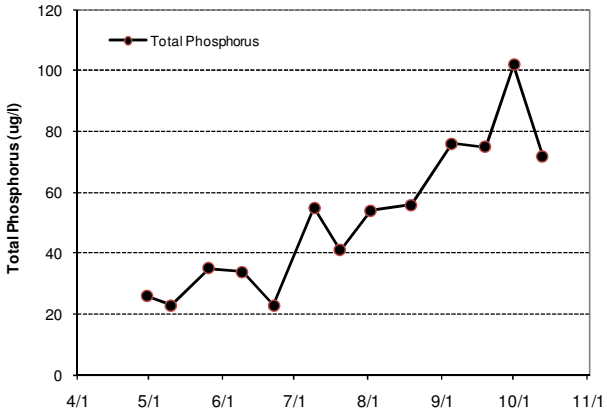
The lake received a lake grade of C for 2010, which is consistent with lake grades received since the early 1980s. Additional monitoring is recommended to continue to build the water quality database for this lake site.

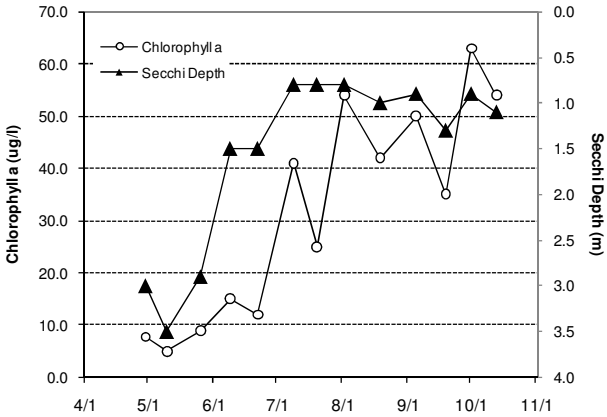
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

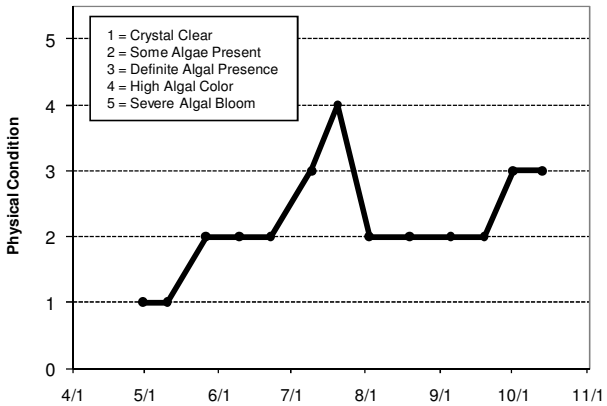






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/30	13.9				7.7	26		3.0	1	1
5/10	13.0				4.9	23		3.5	1	1
5/26	22.2				8.9	35		2.9	2	1
6/9	20.8				15.0	34		1.5	2	1
6/22	22.9				12.0	23		1.5	2	1
7/9	26.7				41.0	55		0.8	3	3
7/20	25.8				25.0	41		0.8	4	3
8/2	26.1				54.0	54		0.8	2	2
8/19	22.5				42.0	56		1.0	2	
9/5	20.8				50.0	76		0.9	2	1
9/19	17.2				35.0	75		1.3	2	1
10/1	16.8				63.0	102		0.9	3	1
10/13	16.5				54.0	72		1.1	3	1



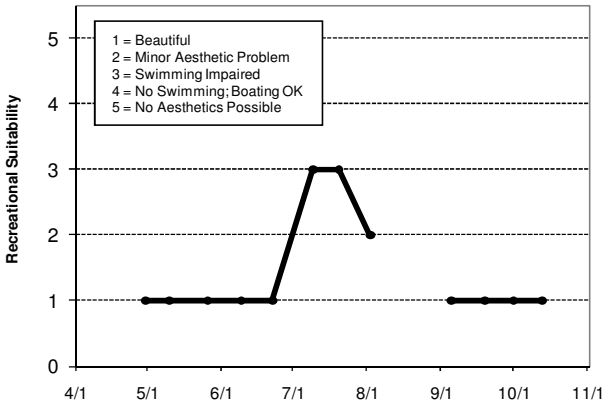
Lake Water Quality Grades Based on Summertime Averages

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

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	214.8	81.0	382.0	F
CLA (µg/l)	68.6	21.0	150.0	D
Secchi (m)	0.7	0.3	1.0	D
TKN (mg/l)	2.15	1.40	2.90	
			Lake Grade	D

The lake received a lake grade of F for 2010 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.

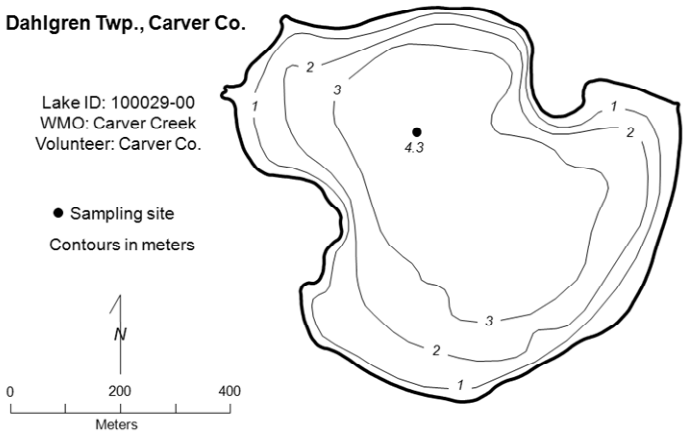
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

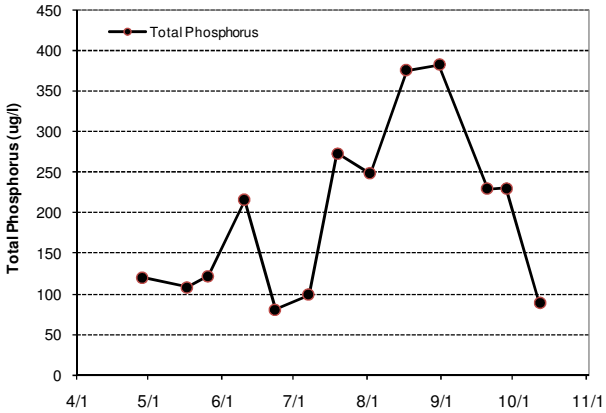
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

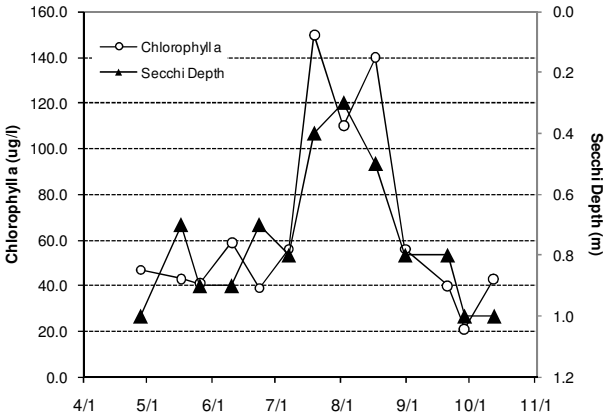
Miller Lake

Dahlgren Twp., Carver Co.

Lake ID: 100029-00
WMO: Carver Creek
Volunteer: Carver Co.

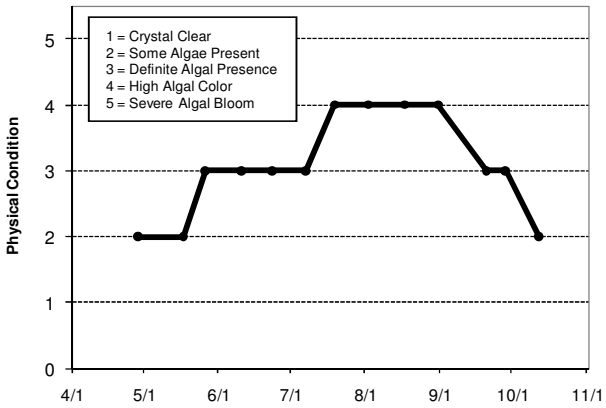






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/28	14.0	14.0	21.0	21.1	47.0	120		1.0	2	3
5/17	17.2	11.3	19.4	9.8	43.0	108		0.7	2	4
5/26	23.3	15.4	15.4	4.5	41.0	122		0.9	3	4
6/10	20.1	20.1	8.7	8.5	59.0	216		0.9	3	3
6/23	24.1	21.2	12.1	2.0	39.0	81		0.7	3	4
7/7	26.8	24.4	22.1	3.3	56.0	99		0.8	3	3
7/19	26.0	25.4	14.8	10.5	150.0	273		0.4	4	4
8/2	26.4	25.2	8.3	0.2	110.0	248		0.3	4	4
8/17	23.2	21.8	12.8	6.8	140.0	375		0.5	4	4
8/31	24.6	23.4	9.3	4.0	56.0	382		0.8	4	4
9/20	15.9	15.9	10.4	10.4	40.0	229		0.8	3	4
9/28	14.9	14.8	9.1	7.6	21.0	230		1.0	3	3
10/12	16.0	14.4	14.1	8.3	43.0	89		1.0	2	3

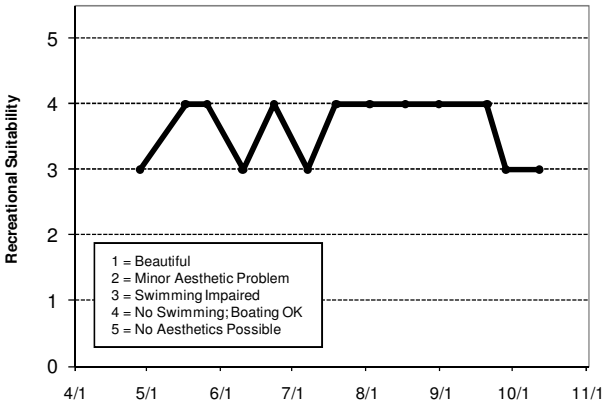


Lake Water Quality Grades Based on Summertime Averages

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

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



Source: Metropolitan Council and STORET data

Minnetoga Lake (27-0088) *Nine Mile Creek Watershed District*

Lake Minnetoga is located in Minnetonka, Hennepin County. The lake has a surface area of 14.4 acres, and an average depth of 3.9 m. 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	30.6	17.0	61.0	B
CLA (µg/l)	8.6	1.6	25.0	A
Secchi (m)	2.4	0.7	3.6	B
TKN (mg/l)	1.35	1.10	1.70	
			Lake Grade	B

The lake received a lake grade of B for 2010, which is similar to the grade received in 2008. Continued monitoring is suggested to build the 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.

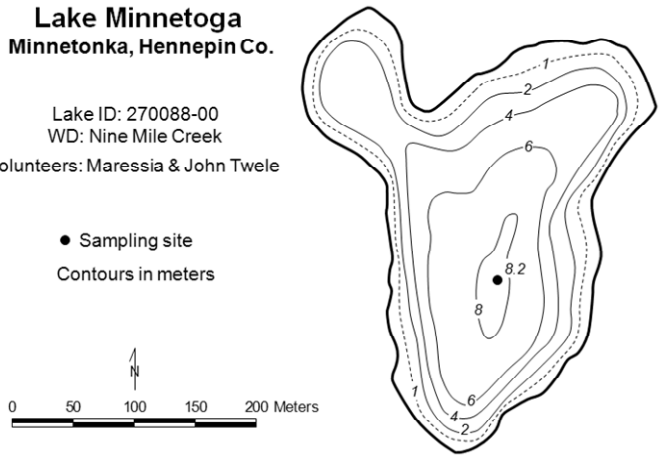
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

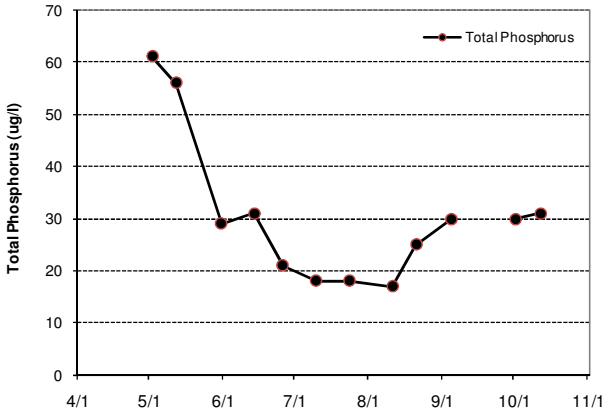
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

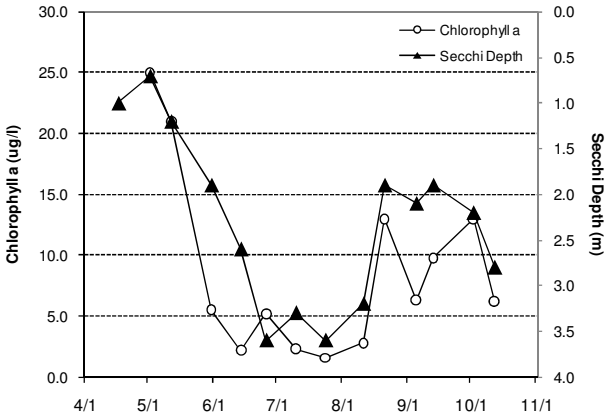
Lake Minnetoga
Minnetonka, Hennepin Co.

Lake ID: 270088-00
WD: Nine Mile Creek
Volunteers: Maressia & John Twele

● Sampling site
Contours in meters

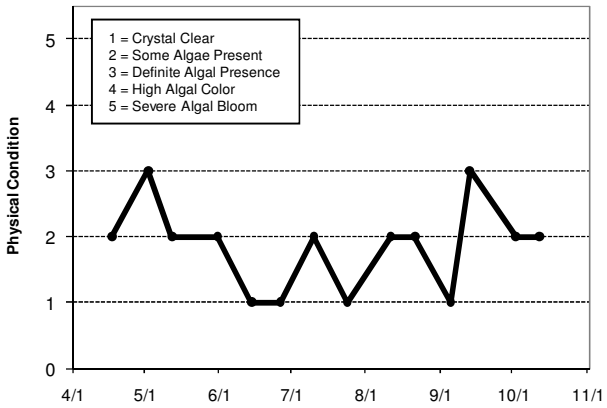






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/17	15.2							1.0	2	4
5/2	15.6				25.0	61		0.7	3	4
5/12	11.7				21.0	56		1.2	2	4
5/31	19.3				5.5	29		1.9	2	1
6/14	19.9				2.2	31		2.6	1	1
6/26	24.4				5.2	21		3.6	1	1
7/10	27.0				2.3	18		3.3	2	1
7/24	27.5				1.6	18		3.6	1	1
8/11	30.1				2.8	17		3.2	2	1
8/21	26.4				13.0	25		1.9	2	1
9/5	21.6				6.3	30		2.1	1	1
9/13	21.0				9.8			1.9	3	3
10/2	16.1				13.0	30		2.2	2	2
10/12	17.9				6.2	31		2.8	2	1



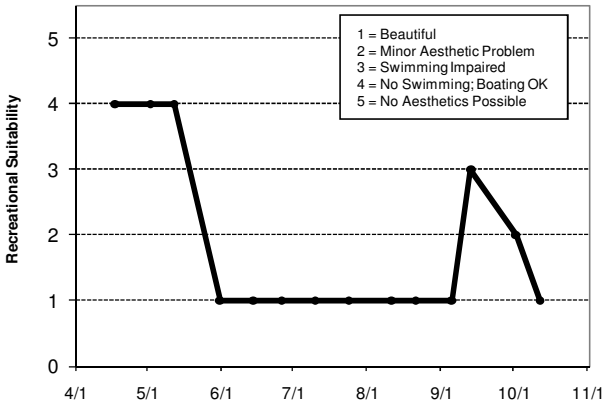
Lake Water Quality Grades Based on Summertime Averages

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

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.

2010 summer (May-September) data summary

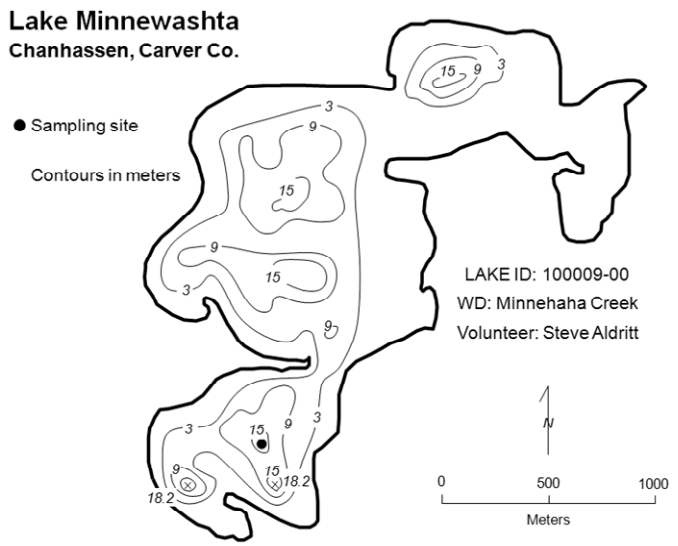
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	18.5	12.0	30.0	A
CLA (µg/l)	15.0	3.6	67.0	B
Secchi (m)	2.4	1.4	4.8	B
TKN (mg/l)	0.88	0.67	1.10	
			Lake Grade	B

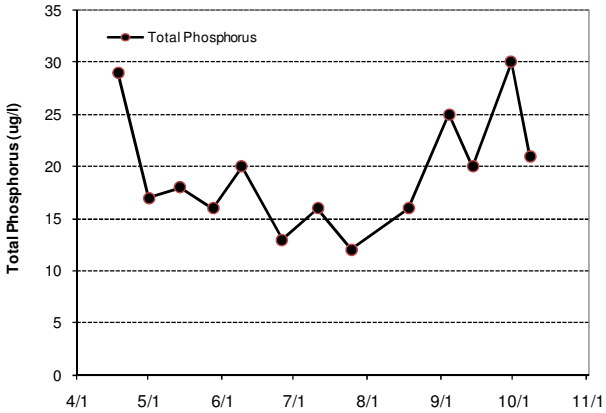
The south bay received a lake grade of B for 2010. Except for this year, only Secchi data has been collected at this lake site. Additional monitoring is recommended to continue to build the water quality database for this lake site.

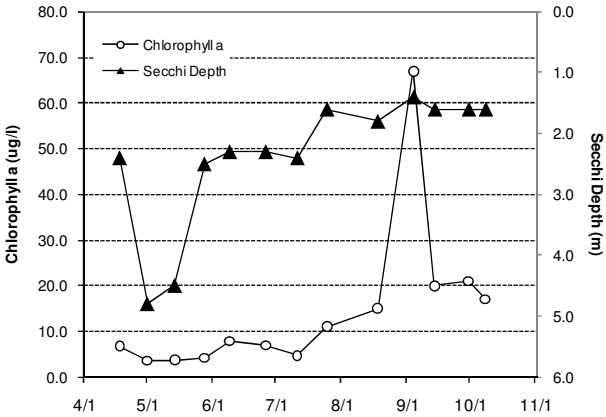
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

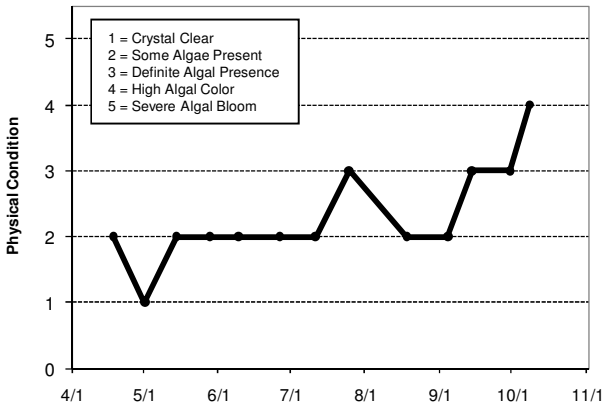






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	14.4				6.8	29		2.4	2	1
5/1	13.8				3.6	17		4.8	1	1
5/14	12.6				3.7	18		4.5	2	1
5/28	24.3				4.2	16		2.5	2	1
6/9	21.5				7.9	20		2.3	2	1
6/26	23.9				7.0	13		2.3	2	1
7/11	26.8				4.7	16		2.4	2	1
7/25	26.7				11.0	12		1.6	3	1
8/18	24.4				15.0	16		1.8	2	1
9/4	21.2				67.0	25		1.4	2	1
9/14	19.3				20.0	20		1.6	3	1
9/30	17.4				21.0	30		1.6	3	2
10/8	16.9				17.0	21		1.6	4	2



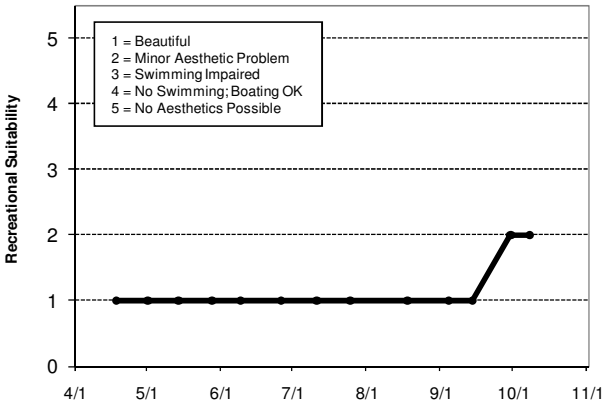
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Mitchell Lake (27-0070) *City of Eden Prairie*

Mitchell Lake is located in the City of Eden Prairie (Hennepin County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a surface area of 112 acres. The maximum depth of the lake is 5.8 m (19 feet). Approximately 97 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a substantial thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The Minnesota DNR has designated the lake as being infested with 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	41.2	20.0	78.0	C
CLA (µg/l)	25.6	1.8	96.0	C
Secchi (m)	2.0	0.6	4.5	C
TKN (mg/l)	1.34	0.92	2.00	
			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.

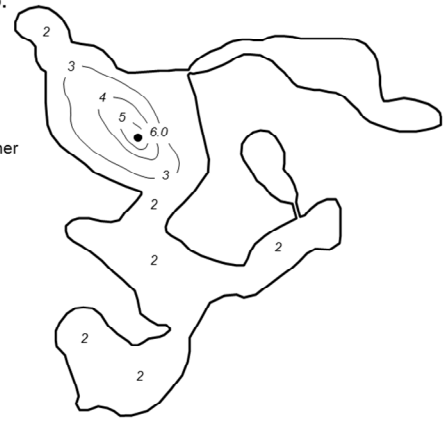
Lake Mitchell

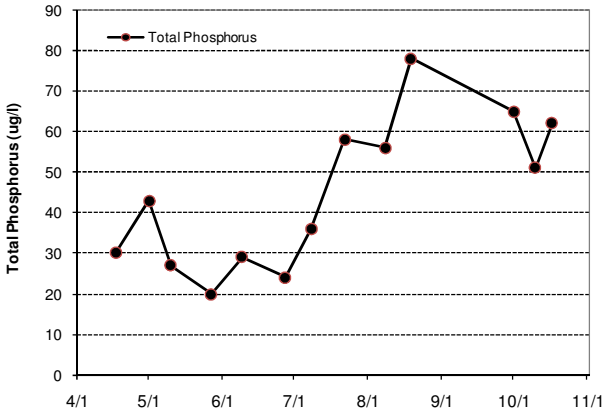
Eden Prairie, Hennepin Co.

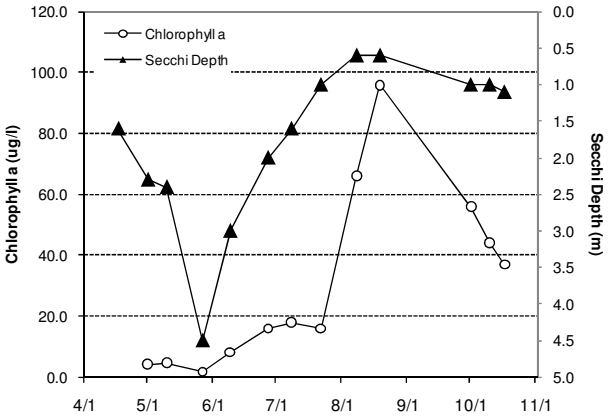
Lake ID: 270070-00
WD: Riley-Purgatory-Bluff Creek
Volunteers: Fran & Gordon Warner

● Sampling site

Contours in meters

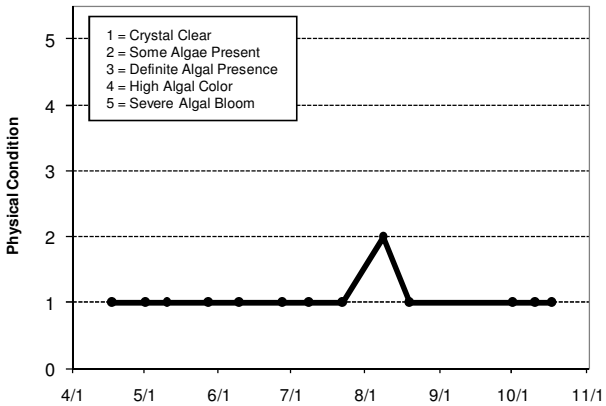






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/17	13.8					30		1.6	1	1
5/1	15.3				4.2	43		2.3	1	1
5/10	14.7				4.7	27		2.4	1	1
5/27	25.2				1.8	20		4.5	1	1
6/9	22.0				8.1	29		3.0	1	1
6/27	26.0				16.0	24		2.0	1	1
7/8	27.8				18.0	36		1.6	1	1
7/22	26.7				16.0	58		1.0	1	1
8/8	32.1				66.0	56		0.6	2	1
8/19	24.7				96.0	78		0.6	1	1
10/1	16.4				56.0	65		1.0	1	1
10/10	18.1				44.0	51		1.0	1	1
10/17	14.6				37.0	62		1.1	1	1



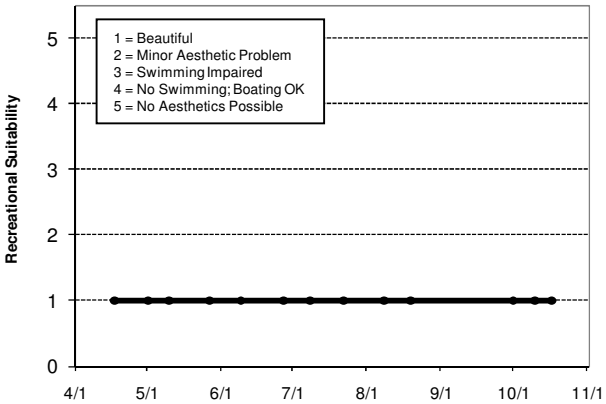
Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

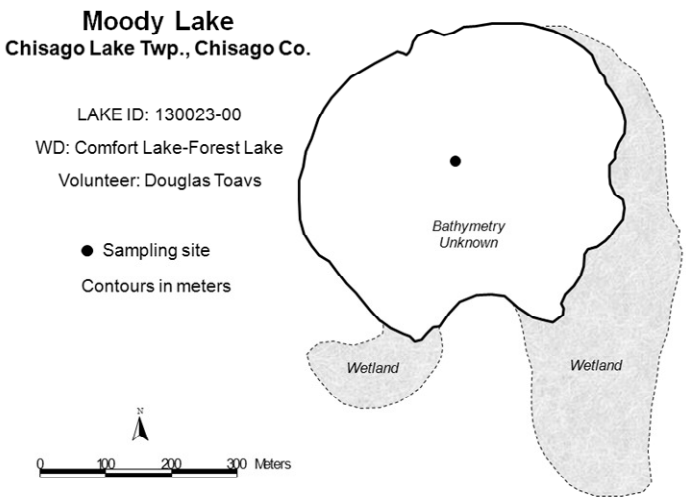
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	87.4	45.0	129.0	D
CLA (µg/l)	59.3	9.7	130.0	D
Secchi (m)	1.1	0.3	2.9	D
TKN (mg/l)	1.81	1.20	2.50	
			Overall Grade	D

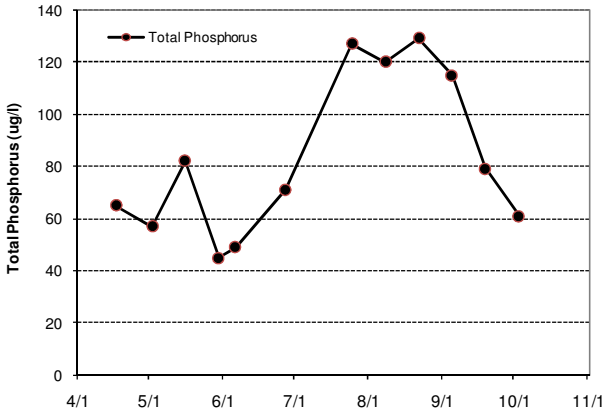
The lake received a D grade for 2010, which is consistent with its limited historical water quality database. Further monitoring is suggested to continue to build the water quality database for increasing statistical power to detect water quality trends.

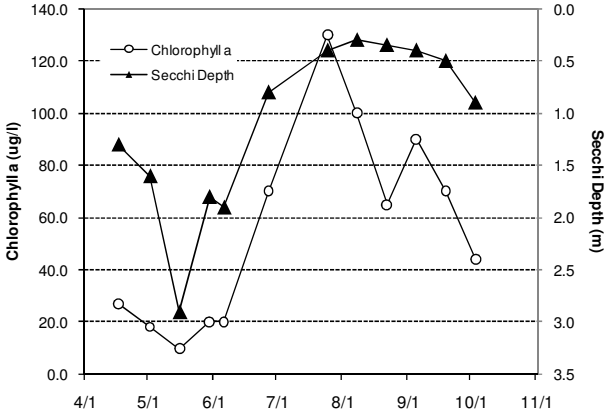
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

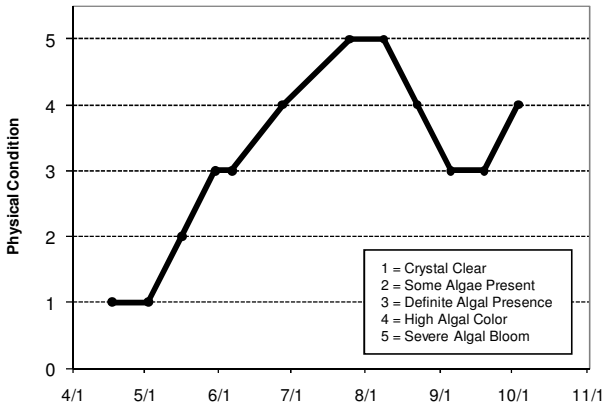






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/17	12.8				27.0	65		1.3	1	1
5/2	13.5				18.0	57		1.6	1	1
5/16	15.2				9.7	82		2.9	2	2
5/30	24.4				20.0	45		1.8	3	3
6/6	22.0				20.0	49		1.9	3	3
6/27	25.8				70.0	71		0.8	4	4
7/25	27.7				130.0	127		0.4	5	5
8/8	28.5				100.0	120		0.3	5	5
8/22	26.0				65.0	129		0.4	4	4
9/5	20.1				90.0	115		0.4	3	4
9/19	17.7				70.0	79		0.5	3	4
10/3	15.4				44.0	61		0.9	4	4



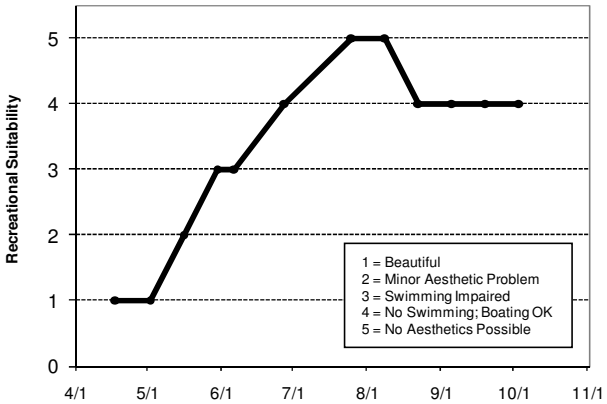
Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	72.6	36.0	109.0	D
CLA (µg/l)	30.6	9.8	50.0	C
Secchi (m)	0.8	0.5	1.1	D
TKN (mg/l)	1.65	1.20	2.10	
			Overall Grade	D

The lake received a D grade for 2010, which seems to be an improvement compared to its 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 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 (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.

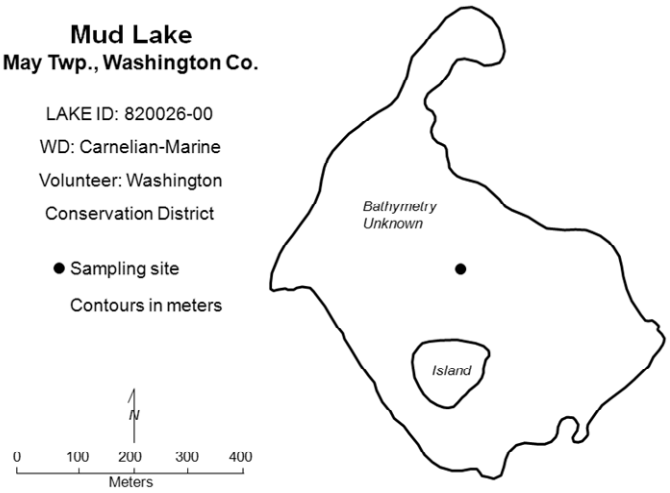
LAKE ID: 820026-00

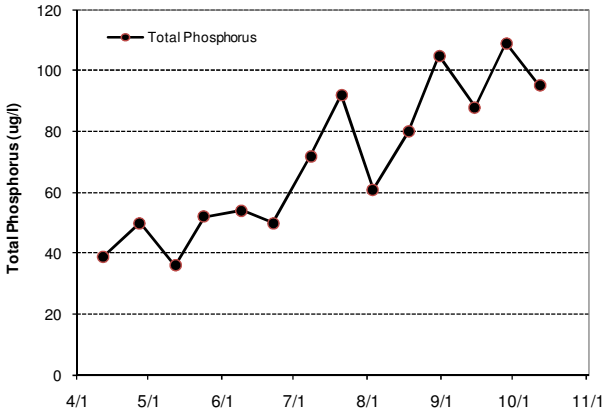
WD: Carnelian-Marine

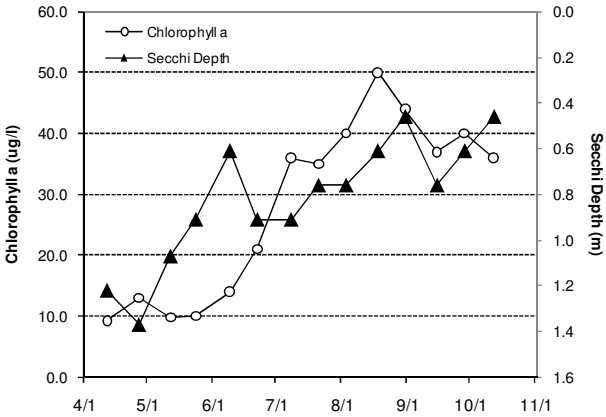
Volunteer: Washington Conservation District

● Sampling site

Contours in meters

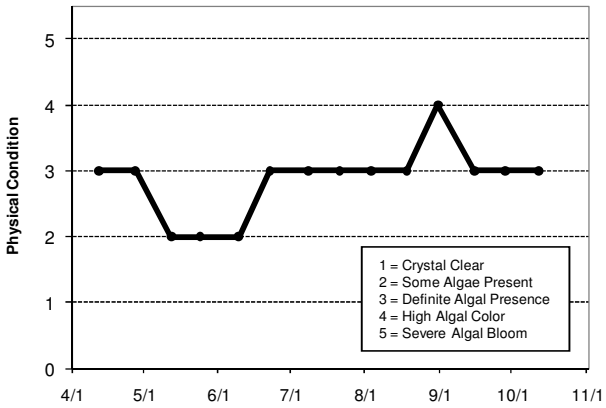






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	14.6	13.7	11.6	0.0	9.3	39		1.2	3	3
4/27	13.2	13.1	9.6	9.6	13.0	50		1.4	3	2
5/12	10.4	10.4	10.8	10.5	9.8	36		1.1	2	2
5/24	24.6	21.0	13.3	11.1	10.0	52		0.9	2	4
6/9	20.1	19.6	11.0	1.0	14.0	54		0.6	2	4
6/22	26.9	21.3	15.6	0.0	21.0	50		0.9	3	4
7/8	25.5	24.7	8.6	0.9	36.0	72		0.9	3	4
7/21	24.8	24.4	8.3	0.6	35.0	92		0.8	3	4
8/3	26.0	24.6	9.7	0.1	40.0	61		0.8	3	4
8/18	20.9	21.3	6.9	1.6	50.0	80		0.6	3	4
8/31	23.5	22.4	3.8	0.1	44.0	105		0.5	4	5
9/15	18.0	18.0	8.0	0.4	37.0	88		0.8	3	4
9/28	16.5	15.4	12.8	11.4	40.0	109		0.6	3	4
10/12	18.6	17.5	10.8	1.0	36.0	95		0.5	3	4



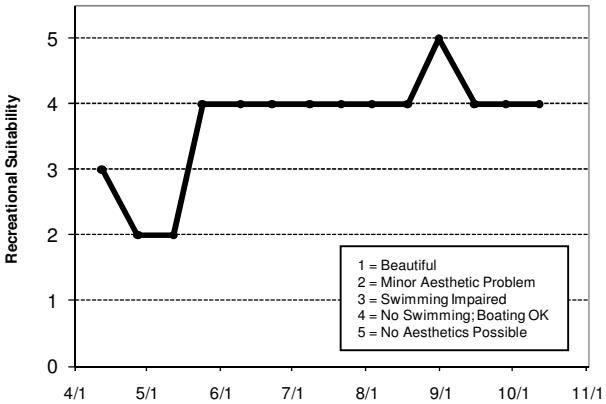
Lake Water Quality Grades Based on Summertime Averages

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	58.9	25.0	112.0	C
CLA (µg/l)	16.1	3.2	53.0	B
Secchi (m)	1.8	0.9	2.9	C
TKN (mg/l)	0.91	0.48	2.00	
			Lake Grade	C

The lake received a lake grade of C in 2010, which is consistent with its historical water quality database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

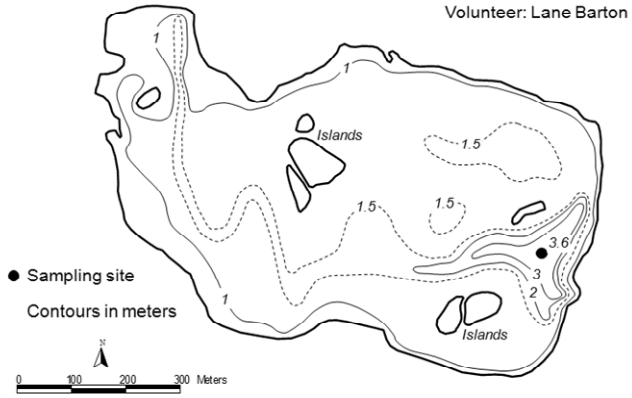
Normandale Lake (Nordmyr Lake)

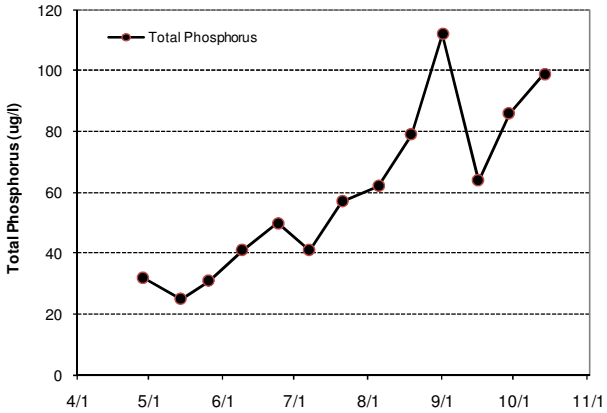
Bloomington, Hennepin Co.

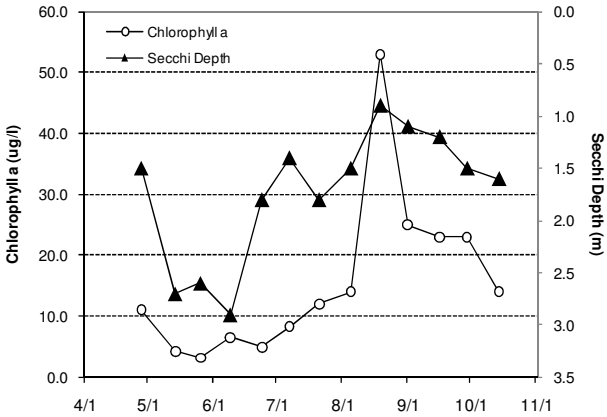
LAKE ID: 271045-00

WD: Nine Mile Creek

Volunteer: Lane Barton

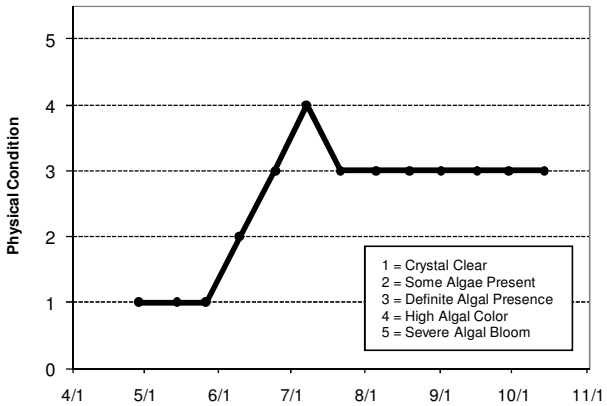






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/28	16.5				11.0	32		1.5	1	
5/14	11.5				4.2	25		2.7	1	4
5/26	26.5				3.2	31		2.6	1	4
6/9	21.4				6.5	41		2.9	2	4
6/24	27.3				4.9	50		1.8	3	4
7/7	27.2				8.3	41		1.4	4	4
7/21	29.7				12.0	57		1.8	3	4
8/5	26.9				14.0	62		1.5	3	4
8/19	23.4				53.0	79		0.9	3	4
9/1	25.7				25.0	112		1.1	3	4
9/16	17.7				23.0	64		1.2	3	4
9/29	17.2				23.0	86		1.5	3	4
10/14	16.2				14.0	99		1.6	3	4



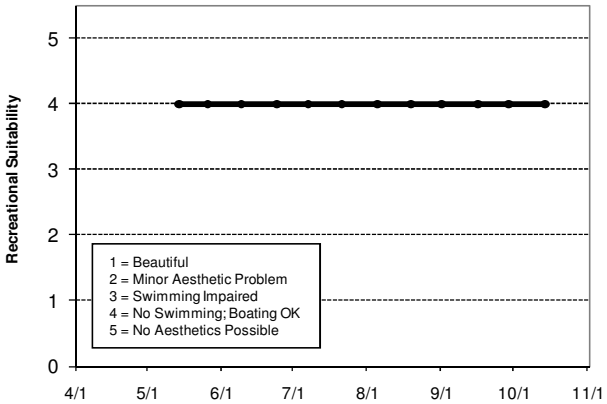
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



North Twin Lake (82-0018) *Carnelian - Marine Watershed District*

North Twin Lake is located in Stillwater Township (Washington County). It has a surface area of 69 acres. The maximum and mean depths of the lake are 1.8 m (5.9 ft) and 0.9 m (2.9 ft), respectively. The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
Secchi (m)	1.2	0.8	1.7	C

Only secchi depth, temperature, and dissolved oxygen were monitored in 2010. Therefore no lake grade can determined for this 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.

North Twin Lake

Stillwater Twp., Washington Co.

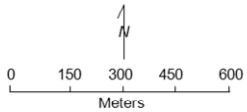
LAKE ID: 820018-00

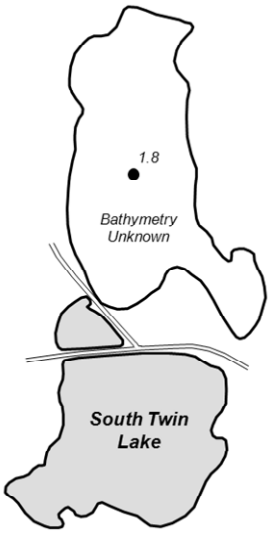
WD: Carnelian-Marine-St. Croix

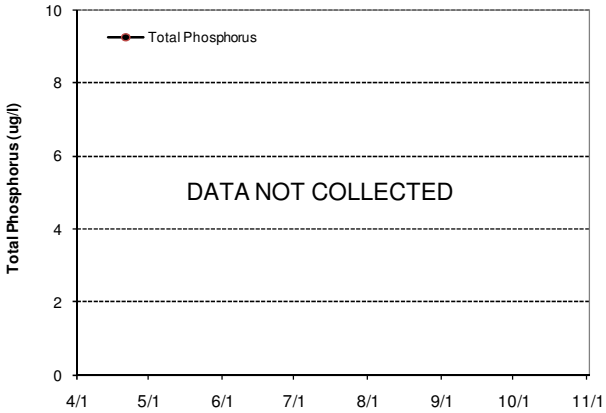
Volunteer: Washington Conservation District

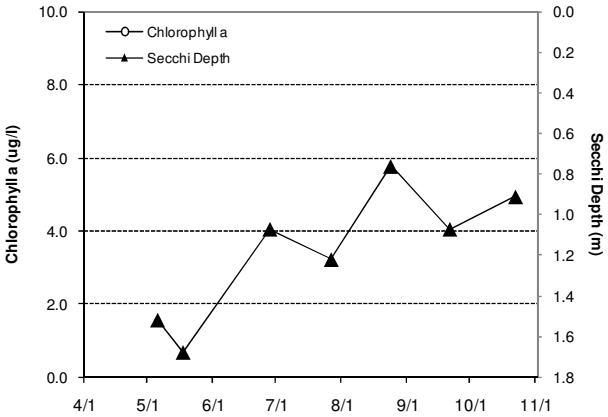
● Sampling site

Contours in meters



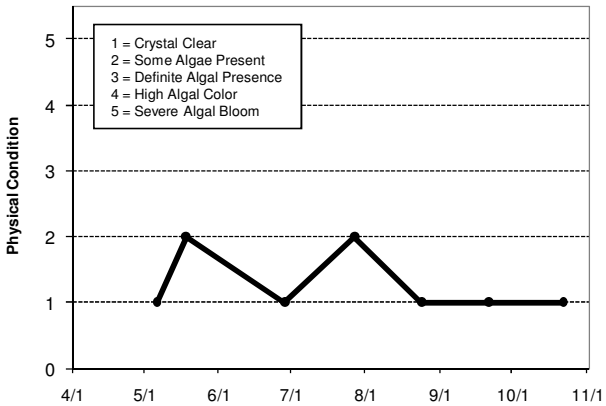






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/6	13.2	12.7	10.6	9.6				1.5	1	2
5/18	22.4	16.9	13.4	6.2				1.7	2	2
6/28	24.1	22.9	9.3	0.7				1.1	1	1
7/27	28.2	23.8	10.0	0.3				1.2	2	2
8/24	25.6	22.7	11.0	0.2				0.8	1	1
9/21	18.9	16.0	11.6	11.5				1.1	1	3
10/22	8.9	9.0	10.4	9.0				0.9	1	1



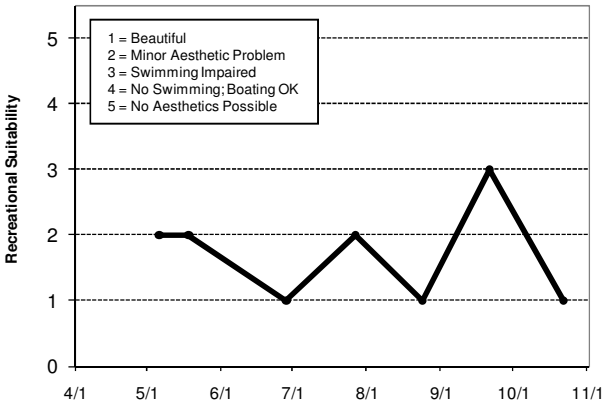
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



Northwood Lake (27-0627) *Bassett Creek Watershed Management Organization*

Northwood Lake is a 15-acre lake located within the City of New Hope (Hennepin County). The mean and maximum depths of the lake are 0.8 m (2.5 ft) and 1.5 m (4.9 ft), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake's 1,341-acre immediate watershed translates to a large watershed-to-lake area ratio of 89:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

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

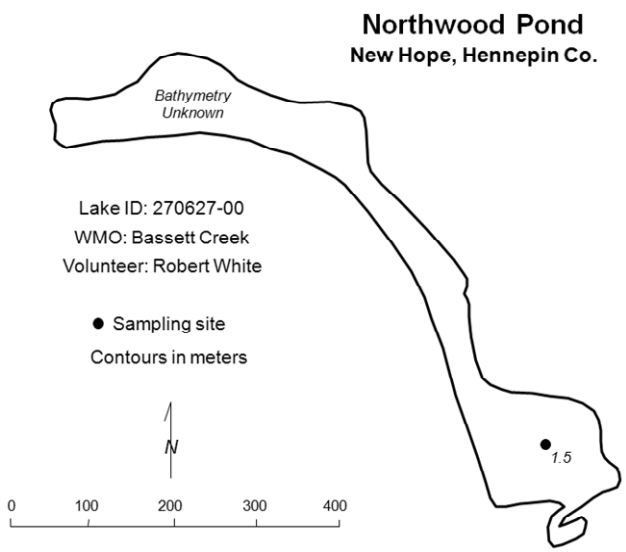
2010 summer (May-September) data summary

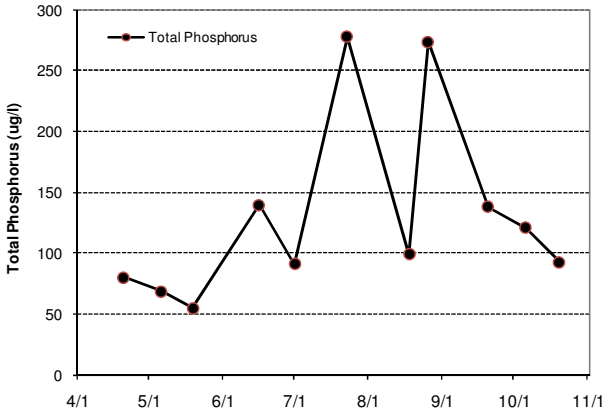
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	143.0	55.0	278.0	D
CLA (µg/l)	27.7	3.3	93.0	C
Secchi (m)	1.0	0.7	1.3	D
TKN (mg/l)	0.88	0.42	1.30	
			Lake Grade	D

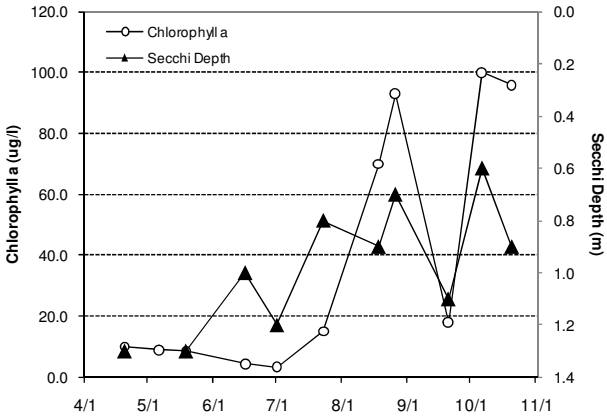
The lake received a lake grade of D in 2010 which is consistent with its historical database. Over the past 10 years, the lake grades appear to vary in the D and C range. Continued monitoring is suggested to build the water quality database for enhancing the ability to detect potential trends in water quality.

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

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

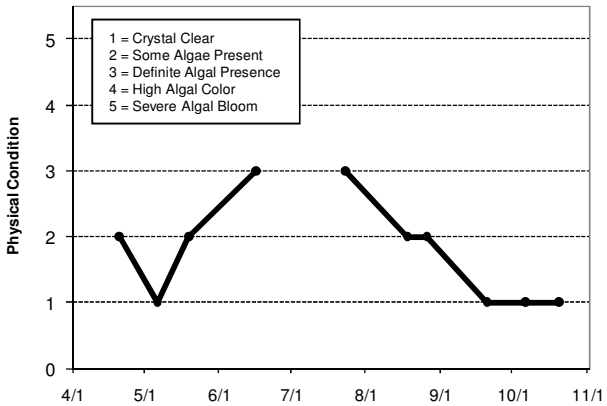






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20	19.5				10.0	80		1.3	2	4
5/6	13.1				9.0	69			1	4
5/19	23.7				8.6	55		1.3	2	4
6/16	28.6				4.4	140		1.0	3	5
7/1	29.2				3.3	91		1.2		5
7/23	30.6				15.0	278		0.8	3	5
8/18	22.8				70.0	99		0.9	2	5
8/26	24.6				93.0	274		0.7	2	5
9/20	17.9				18.0	138		1.1	1	5
10/6	16.2				100.0	121		0.6	1	5
10/20	12.7				96.0	93		0.9	1	5



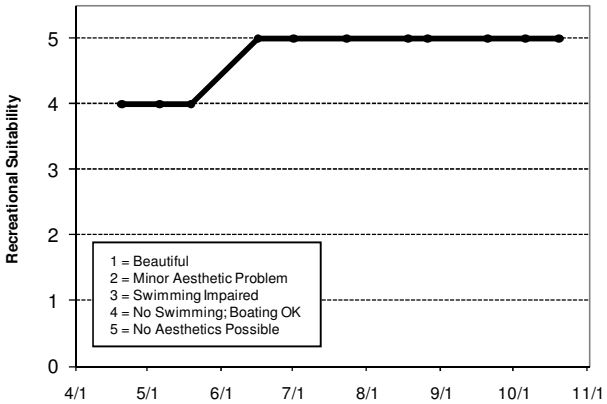
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
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
Total Phosphorus	D	D	F	F	D	F	D
Chlorophyll a	B	B	B	C	C	B	C
Secchi Depth	D	D	D	D	D	D	D
Lake Grade	**C**	**C**	**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 is little known morphological data available for the lake.

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

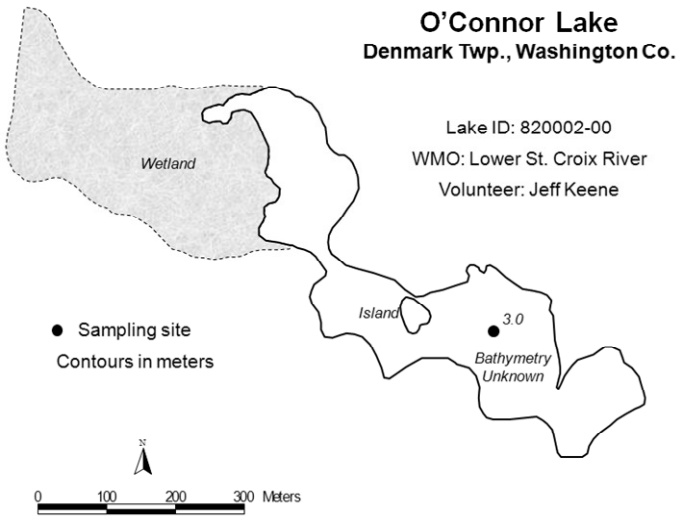
2010 summer (May-September) data summary

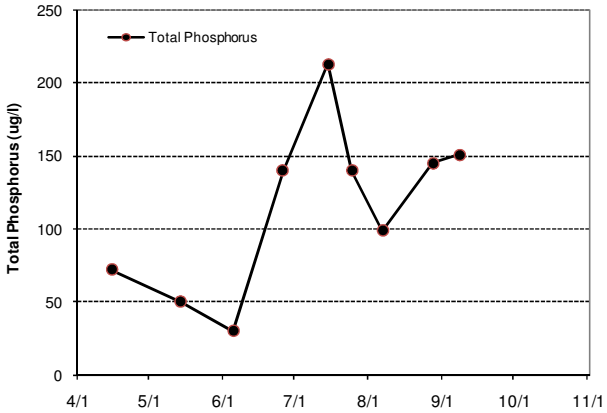
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	121.0	30.0	213.0	D
CLA (µg/l)	33.6	6.5	140.0	C
Secchi (m)	0.8	0.2	1.9	D
TKN (mg/l)	1.28	0.77	2.50	
			Lake Grade	D

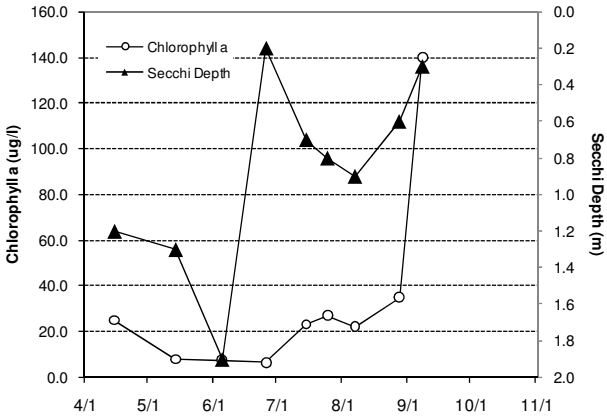
The lake received a lake grade of D for 2010, which continues the degradation in water quality, according to its limited monitoring history. Additionaly years of monitoring are recommended to keep track of the potential worsening water quality for this lake.

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.

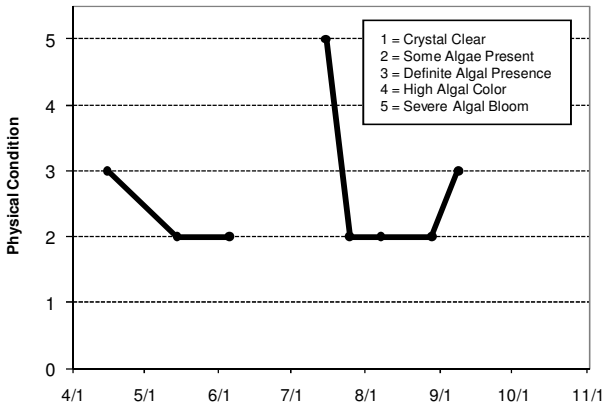






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/15	19.0				25.0	72		1.2	3	4
5/14	13.7				7.9	50		1.3	2	4
6/5	22.7				7.5	30		1.9	2	4
6/26	24.3				6.5	140		0.2		4
7/15	25.5				23.0	213		0.7	5	4
7/25	26.7				27.0	140		0.8	2	4
8/7	29.6				22.0	99		0.9	2	4
8/28	23.7				35.0	145		0.6	2	4
9/8	20.3				140.0	151		0.3	3	4



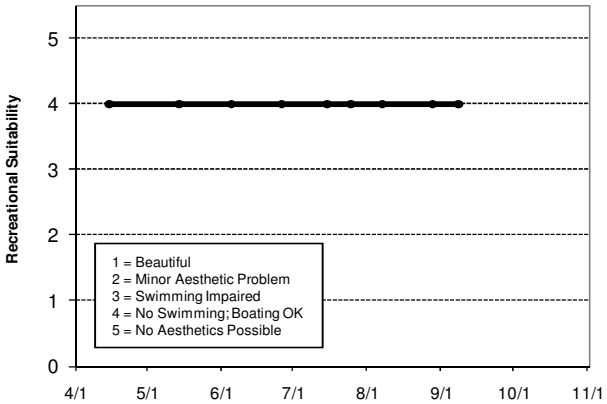
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



O'Dowd Lake (70-0095) *City of Shakopee*

O'Dowd Lake is located in both Louisville Township and the City of Shakopee (Scott County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake's surface area is 258 acres and has a maximum depth of 6.7 m (roughly 22 feet). Approximately 63 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The MN DNR has designated the lake as being infested with 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	34.4	20.0	54.0	C
CLA (µg/l)	29.4	2.2	66.0	C
Secchi (m)	1.6	0.7	4.0	C
TKN (mg/l)	1.41	0.96	1.80	
			Lake Grade	C

The lake received a lake grade of C for 2010. The lake's water quality seems to be represented by a lake grade of C with the occassional D. Continued monitoring is suggested to increase the ability to detect potential water quality trends.

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

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

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

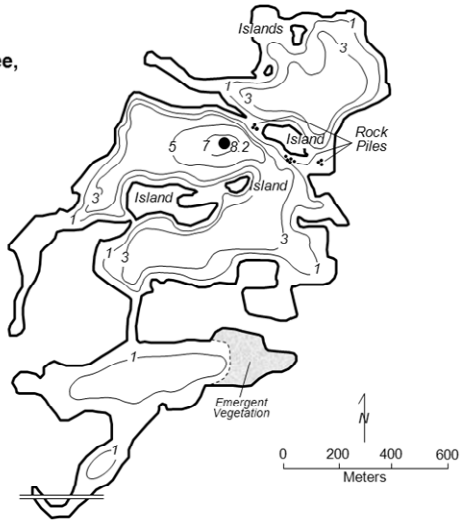
O'Dowd Lake

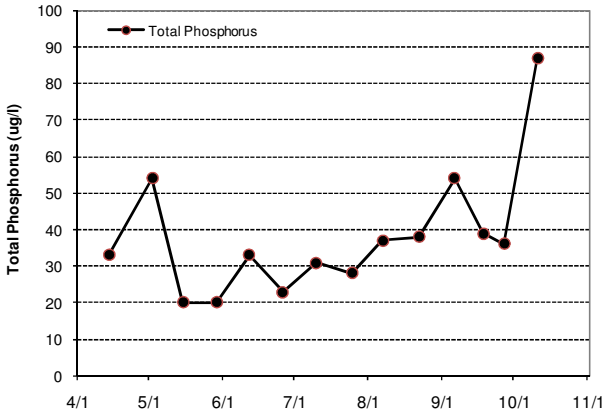
Louisville Twp./Shakopee, Scott Co.

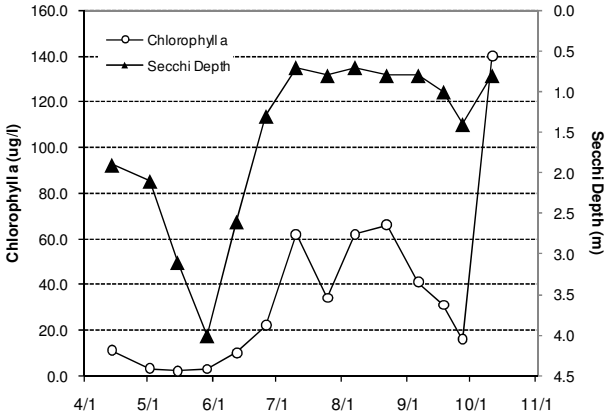
LAKE ID: 700095-00
WMO: Shakopee Basin
Volunteers: Sandy & Mike Boyce

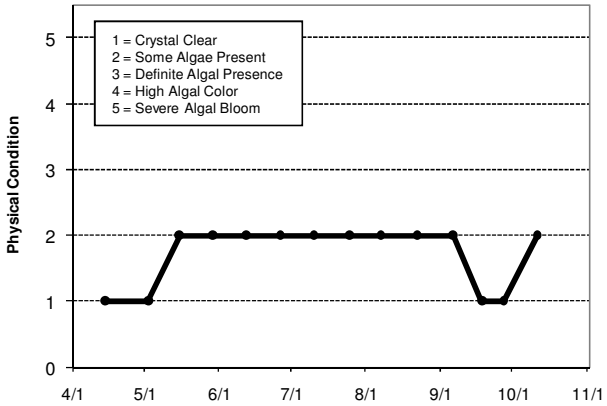
● Sampling site

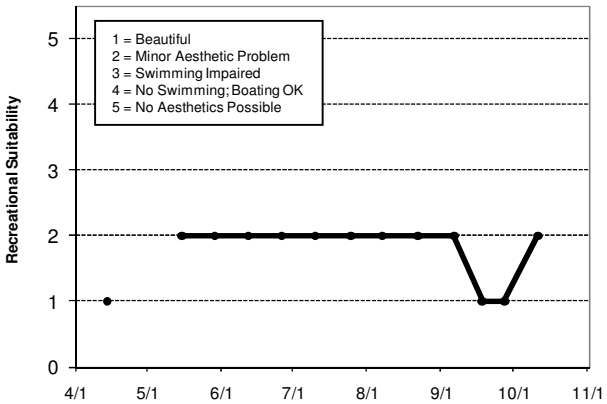
Contours in meters











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/14	13.9				11.0	33		1.9	1	1
5/2	15.1				3.2	54		2.1	1	
5/15	15.8				2.2	20		3.1	2	2
5/29	24.0				3.0	20		4.0	2	2
6/12	20.2				10.0	33		2.6	2	2
6/26	26.2				22.0	23		1.3	2	2
7/10	27.1				62.0	31		0.7	2	2
7/25	28.6				34.0	28		0.8	2	2
8/7	27.2				62.0	37		0.7	2	2
8/22	25.7				66.0	38		0.8	2	2
9/6	20.4				41.0	54		0.8	2	2
9/18	17.3				31.0	39		1.0	1	1
9/27	16.6				16.0	36		1.4	1	1
10/11	19.2				140.0	87		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					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
Total Phosphorus		C	D	C	C	C	C
Chlorophyll a		D	C	D	C	C	C
Secchi Depth		C	D	C	C	C	C
Lake Grade		**C**	**D**	**C**	**C**	**C**	**C**

Source: Metropolitan Council and STORET data

Olson Lake (82-0103) *Valley Branch Watershed District*

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	26.8	15.0	40.0	B
CLA (µg/l)	18.4	3.1	42.0	B
Secchi (m)	2.2	1.1	3.5	B
TKN (mg/l)	1.03	0.54	1.50	
			Lake Grade	B

The lake received a lake grade of B for 2010, which 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. More recently, the lake has recorded lake grades of an A in 2000, 2003, 2004, 2008, and 2009 before falling back to a lake grade of B in 2005, 2006, 2007, 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.

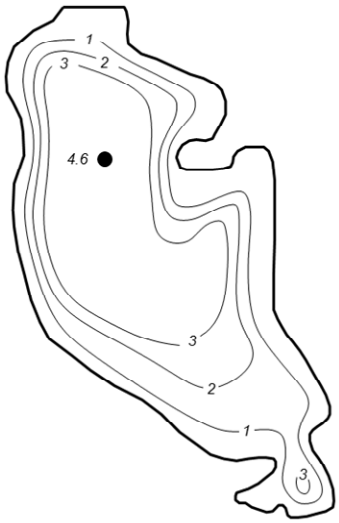
Lake Olson

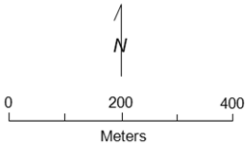
Lake Elmo, Washington Co.

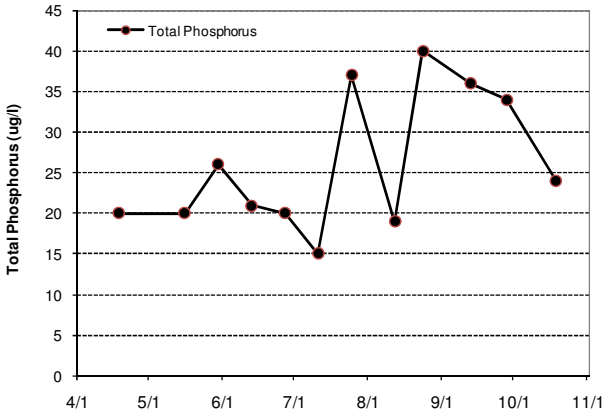
Lake ID: 820103-00
WD: Valley Branch
Volunteer: Bob Meier

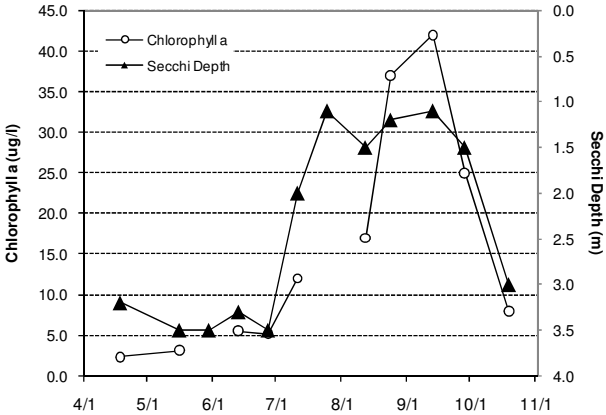
● Sampling site

Contours in meters



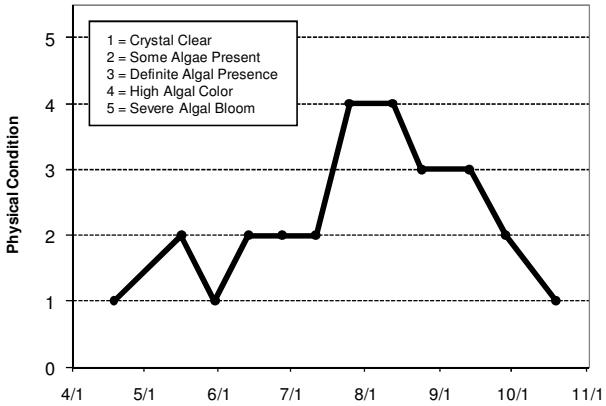






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	16.8				2.3	20		3.2	1	1
5/16	20.2				3.1	20		3.5	2	
5/30	24.5					26		3.5	1	1
6/13	21.4				5.5	21		3.3	2	1
6/27	26.1				5.2	20		3.5	2	
7/11	27.5				12.0	15		2.0	2	2
7/25	27.9					37		1.1	4	3
8/12	30.7				17.0	19		1.5	4	2
8/24	26.4				37.0	40		1.2	3	3
9/13	20.0				42.0	36		1.1	3	2
9/28	16.6				25.0	34		1.5	2	2
10/19	14.0				8.0	24		3.0	1	1



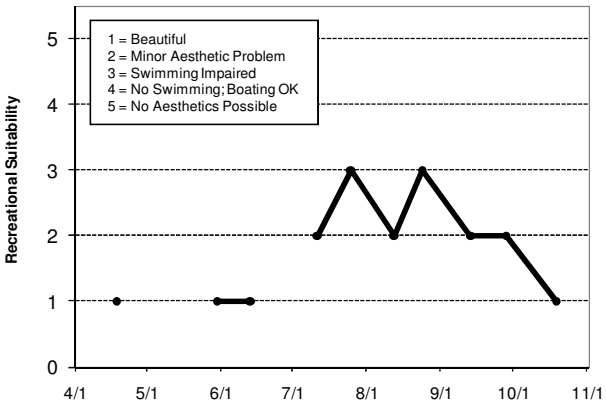
Lake Water Quality Grades Based on Summertime Averages

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	19.0	4.0	33.0	A
CLA (µg/l)	4.4	2.0	9.2	A
Secchi (m)	NM	NM	NM	
TKN (mg/l)	1.25	0.97	1.50	
			Lake Grade	

Secchi depth measurements were not made in 2010. Given the A grades for CLA and TP, it is likely that water clarity was exceptional also. The grades for TP and CLA are consistent with the grades received for the past decade.

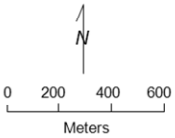
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

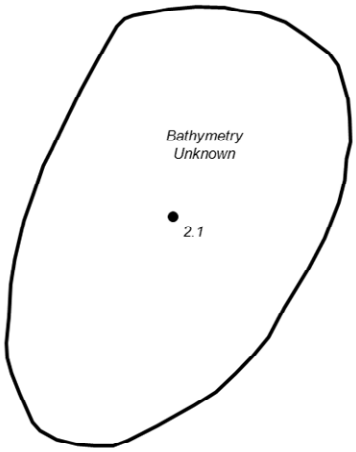
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

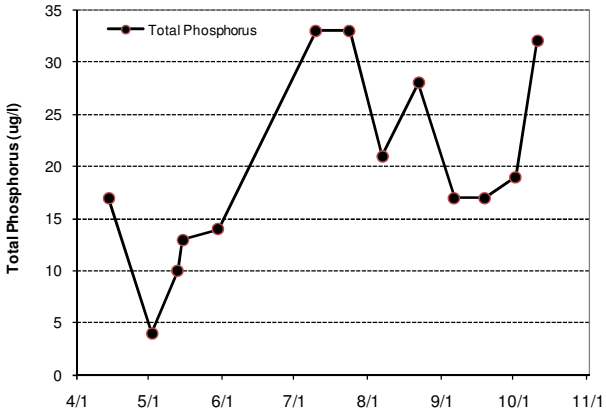
Oneka Lake
Hugo, Washington Co.

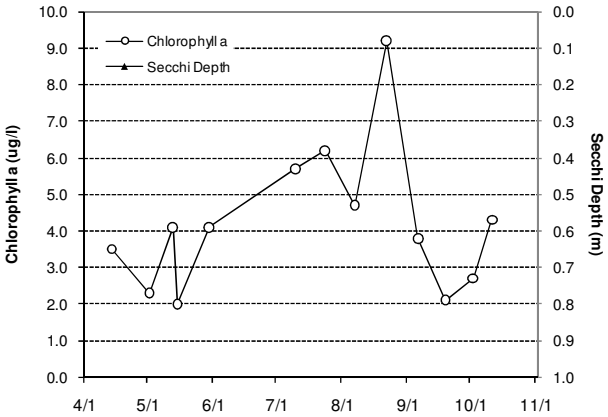
Lake ID: 820140-00
WD: Rice Creek
Volunteer: Paul Bolstad

● Sampling site
Contours in meters



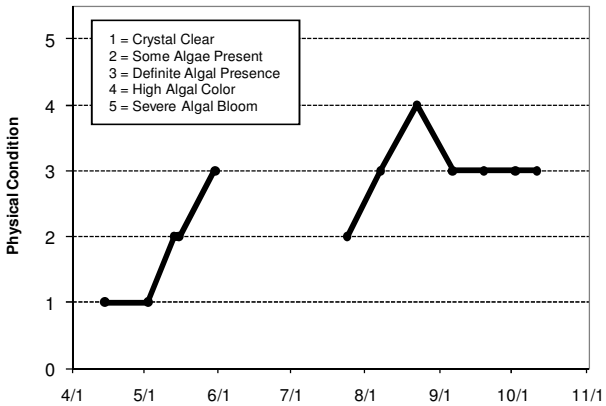






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/14	14.5				3.5	17			1	2
5/2	12.8				2.3	4			1	1
5/13	17.5				4.1	10			2	1
5/15	17.0				2.0	13			2	1
5/30	23.9				4.1	14			3	1
7/10	28.2				5.7	33				
7/24	25.6				6.2	33			2	1
8/7	26.2				4.7	21			3	3
8/22	24.7				9.2	28			4	4
9/6	18.3				3.8	17			3	4
9/19	18.6				2.1	17			3	3
10/2	11.1				2.7	19			3	4
10/11	20.9				4.3	32			3	4



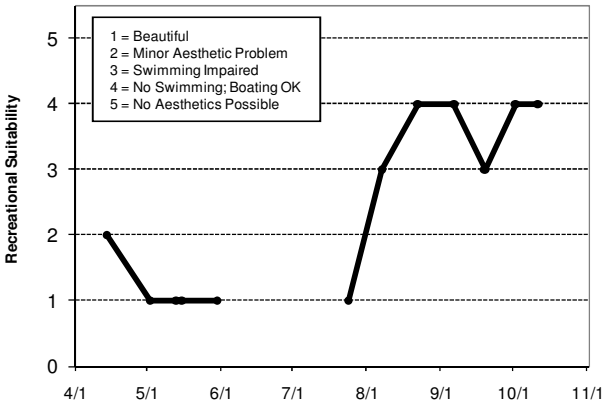
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Orchard Lake (19-0031) *Black Dog Lake Watershed Management Organization*

Orchard Lake is located in the City of Lakeville (Dakota County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). It has a surface area of 250 acres.

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

2010 summer (May-September) data summary

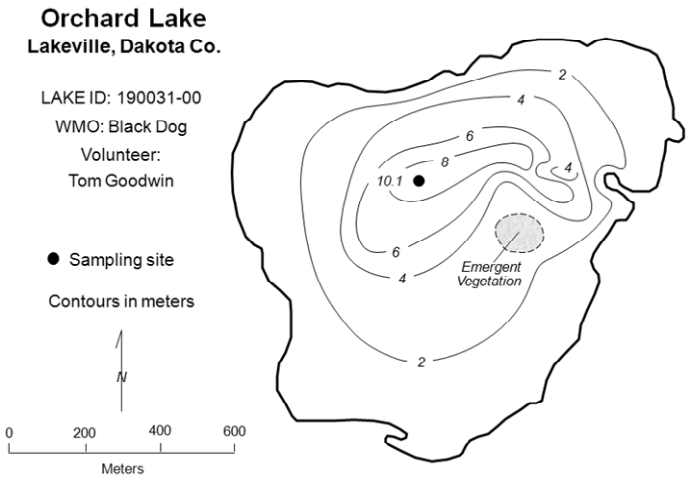
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	26.0	14.0	67.0	B
CLA (µg/l)	7.6	2.8	14.0	A
Secchi (m)	3.0	1.7	4.4	A
TKN (mg/l)	1.06	0.60	3.40	
			Lake Grade	A

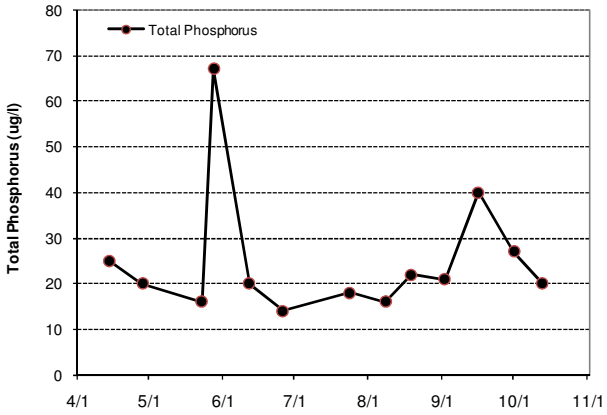
The lake received a lake grade of A for 2010, which is the third year in a row that the lake received an A grade. Continued monitoring is suggested to determine if the water quality of 2008 – 2010 is an indication of a potential improving water quality trend.

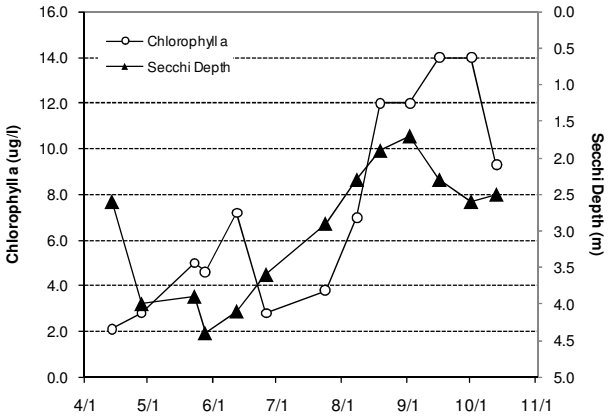
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

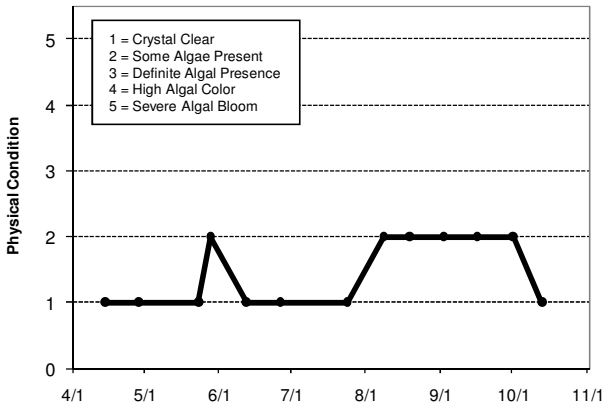






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/14	13.4				2.1	25		2.6	1	1
4/28	15.6				2.8	20		4.0	1	1
5/23	21.2				5.0	16		3.9	1	1
5/28	24.6				4.6	67		4.4	2	1
6/12	20.9				7.2	20		4.1	1	1
6/26	26.6				2.8	14		3.6	1	1
7/24	27.1				3.8	18		2.9	1	2
8/8	29.6				7.0	16		2.3	2	1
8/19	25.2				12.0	22		1.9	2	1
9/2	24.7				12.0	21		1.7	2	1
9/16	18.6				14.0	40		2.3	2	1
10/1	17.5				14.0	27		2.6	2	1
10/13	17.3				9.3	20		2.5	1	1



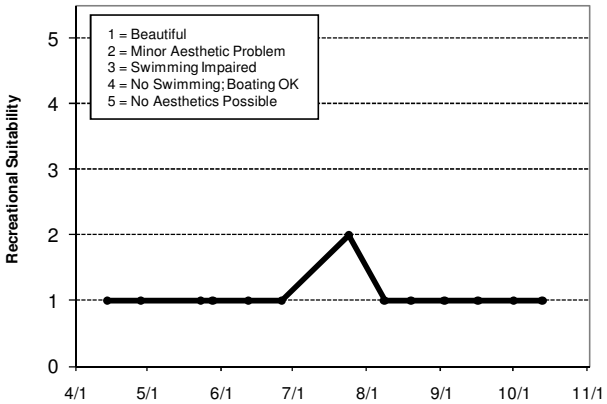
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Parkers Lake (27-0107) *Bassett Creek Watershed Management Organization*

Parkers Lake is located in the City of Plymouth (Hennepin County). It has a surface area of 97 acres. The mean and maximum depths of the lake are 3.7 m (12 ft) and 11.3 m (37 ft), respectively. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*). The lake is listed as impaired by the MPCA for mercury content in fish.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	20.0	10.0	30.0	A
CLA (µg/l)	5.7	1.3	12.0	A
Secchi (m)	3.0	2.2	5.1	B
TKN (mg/l)	0.72	0.45	1.30	
			Lake Grade	A

The lake received a lake grade of A for 2010, which is a return to water quality last seen in the early 2000s. The lake has received lake grades varying from C to A to B over the past 29 years as indicated by the historical water quality database, but the lake has not experienced a C lake grade since 1999. The lake has received only A and B lake grades from 2000 through 2010. Continued monitoring is suggested to determine potential trends in the lake's water quality.

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

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

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

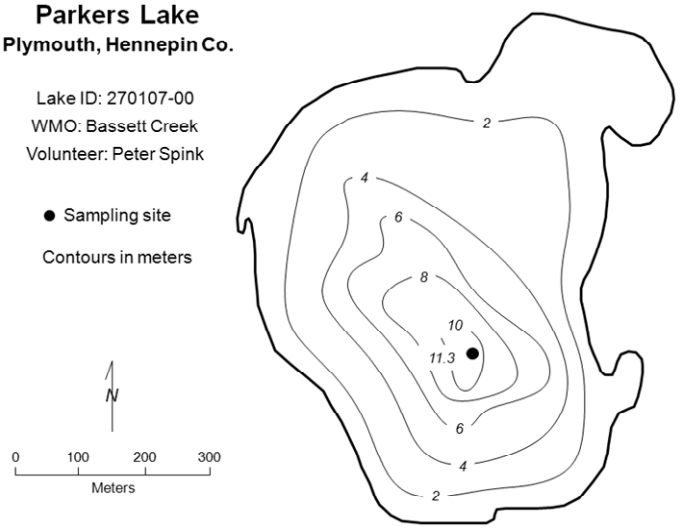
Parkers Lake

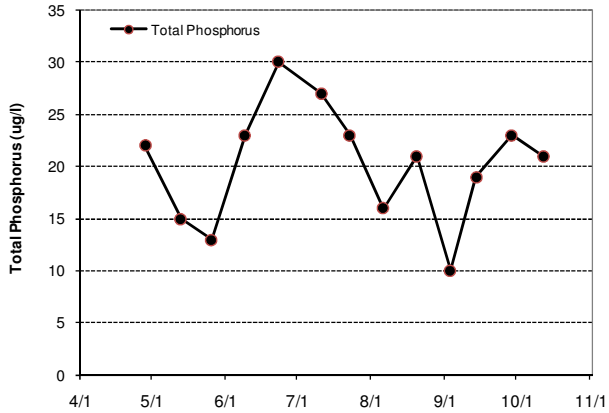
Plymouth, Hennepin Co.

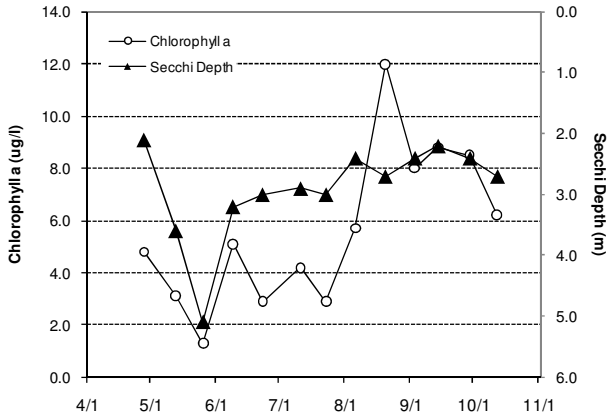
Lake ID: 270107-00
WMO: Bassett Creek
Volunteer: Peter Spink

● Sampling site

Contours in meters

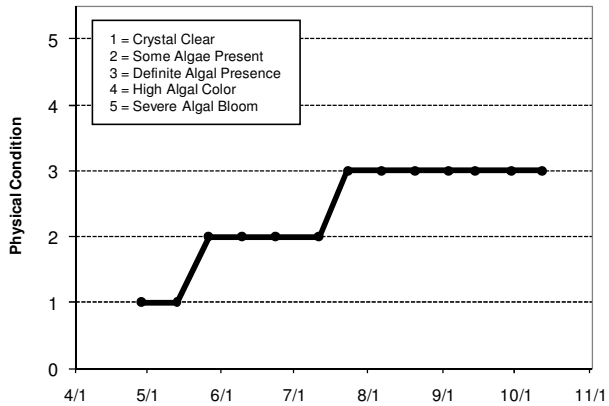






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/28	15.1				4.8	22		2.1	1	1
5/13	11.6				3.1	15		3.6	1	1
5/26	24.2				1.3	13		5.1	2	2
6/9	21.3				5.1	23		3.2	2	2
6/23	16.8				2.9	30		3.0	2	3
7/11	25.1				4.2	27		2.9	2	3
7/23	27.9				2.9	23		3.0	3	3
8/6	26.9				5.7	16		2.4	3	3
8/20	25.7				12.0	21		2.7	3	3
9/3	21.1				8.0	10		2.4	3	3
9/14	19.3				8.8	19		2.2	3	3
9/29	16.7				8.5	23		2.4	3	3
10/12	17.4				6.2	21		2.7	3	3



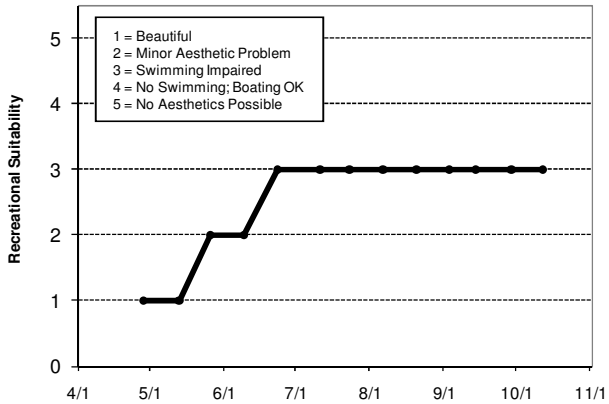
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Pat Lake (82-0125) *Browns Creek Watershed District*

Pat Lake is a small 13-acre lake located in Washington County. There is little known morphological data available for the lake.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	57.8	26.0	114.0	C
CLA (µg/l)	19.4	4.0	47.0	B
Secchi (m)	2.1	1.2	3.8	C
TKN (mg/l)	1.28	0.64	2.40	
			Lake Grade	C

The lake received a lake grade of C for 2010. There are only 4 monitoring seasons of data, so there are insufficient quantities of data to determine trends. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

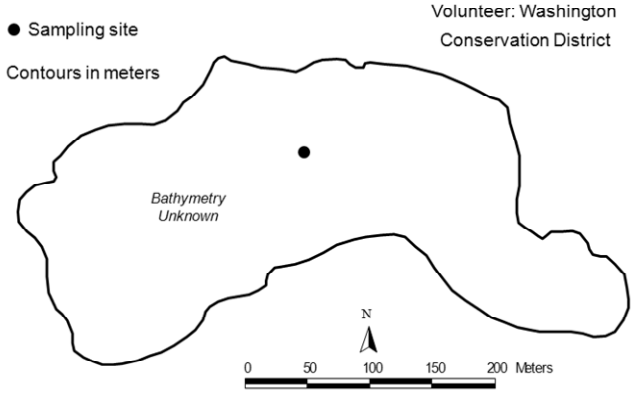
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

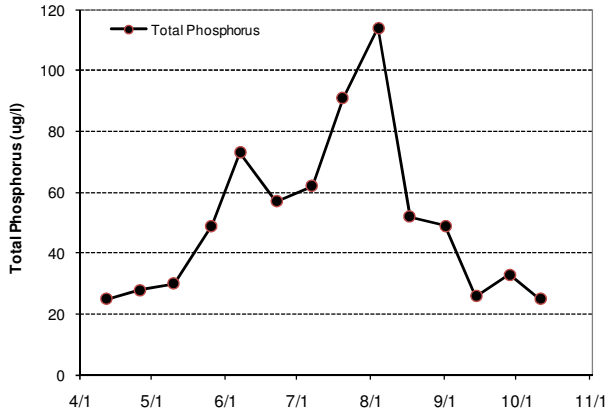
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

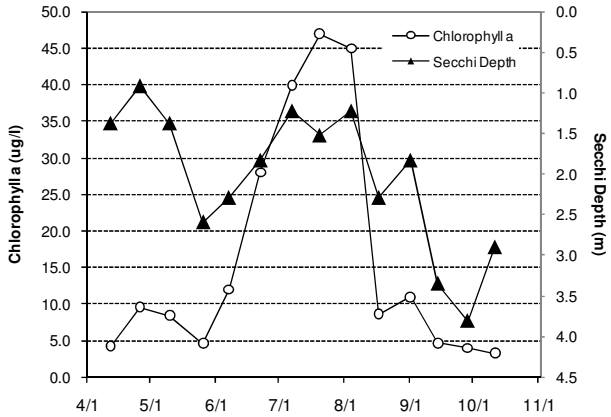
Pat Lake

Grant, Washington Co.

Lake ID: 820125-00
WD: Browns Creek
Volunteer: Washington Conservation District

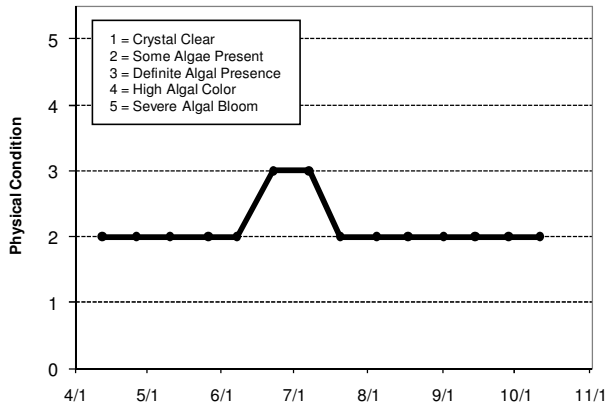






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	15.8	14.7	11.8	2.3	4.2	25		1.4	2	2
4/26	14.6	14.5	8.4	6.9	9.6	28		0.9	2	3
5/10	13.6	13.3	11.2	11.0	8.4	30		1.4	2	2
5/26	25.7	13.8	8.6	9.1	4.6	49		2.6	2	4
6/7	24.9	15.0	9.3	0.1	12.0	73		2.3	2	3
6/22	24.0	15.2	11.6	0.0	28.0	57		1.8	3	4
7/7	27.9	15.6	9.5	0.1	40.0	62		1.2	3	4
7/20	25.4	16.1	7.8	0.0	47.0	91		1.5	2	3
8/4	27.0	17.9	4.9	0.0	45.0	114		1.2	2	3
8/17	24.6	19.4	7.5	0.4	8.6	52		2.3	2	3
9/1	26.0	21.2	6.8	0.1	11.0	49		1.8	2	3
9/14	18.9	17.9	8.5	0.2	4.7	26		3.4	2	3
9/28	15.9	15.0	9.7	0.2	4.0	33		3.8	2	2
10/11	18.3	15.2	10.1	0.9	3.3	25		2.9	2	2



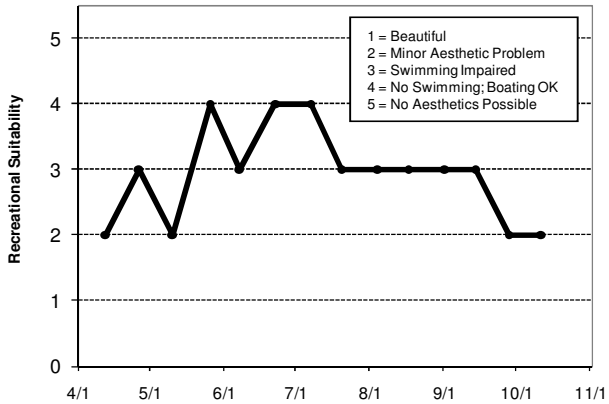
Lake Water Quality Grades Based on Summertime Averages

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

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

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

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.

2010 summer (May-September) data summary

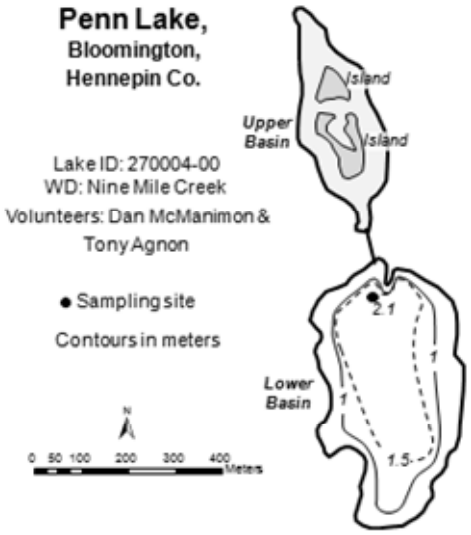
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	162.3	54.0	308.0	F
CLA (µg/l)	81.4	9.1	150.0	F
Secchi (m)	0.4	0.2	0.8	F
TKN (mg/l)	1.93	1.30	3.00	
			Lake Grade	F

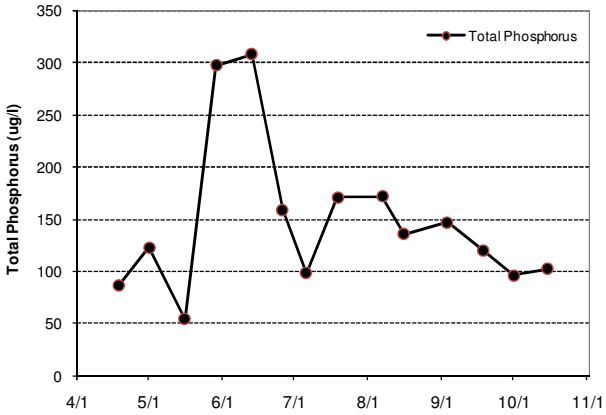
The lake received a lake grade of F in 2010. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

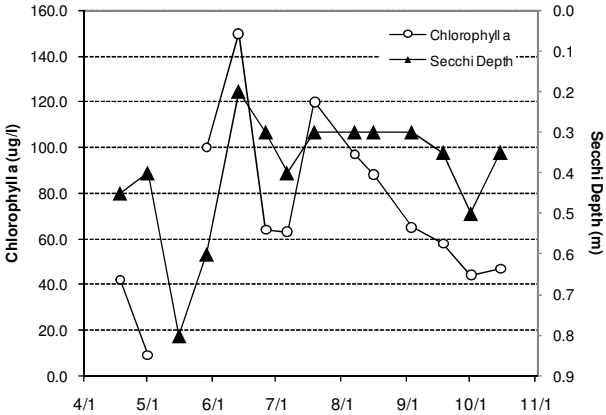
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

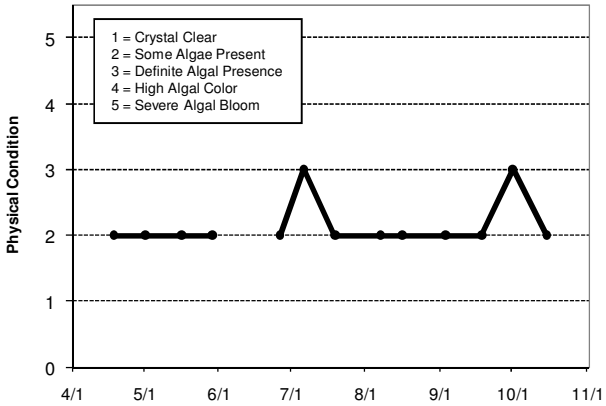






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	18.5				42.0	86		0.5	2	5
5/1	16.5				9.1	123		0.4	2	5
5/16	15.0					54		0.8	2	5
5/29	27.0				100.0	297		0.6	2	5
6/13	20.0				150.0	308		0.2		5
6/26	29.0				64.0	159		0.3	2	4
7/6	31.2				63.0	98		0.4	3	4
7/19	27.6				120.0	171		0.3	2	4
8/7	29.1				97.0	172		0.3	2	4
8/16	26.0				88.0	136		0.3	2	4
9/3	27.0				65.0	147		0.3	2	4
9/18	18.0				58.0	120		0.4	2	4
10/1	18.5				44.0	96		0.5	3	4
10/15	18.1				47.0	102		0.4	2	4



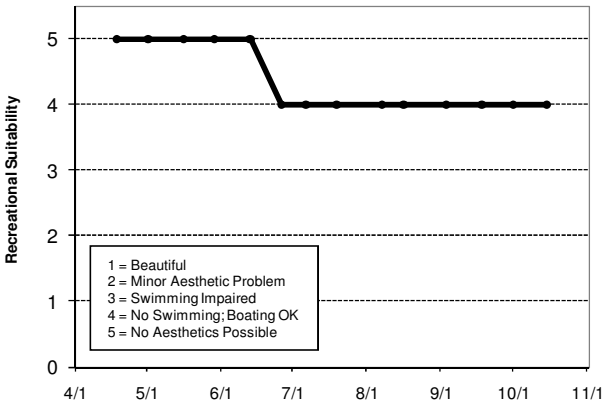
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Peter Lake (27-0147-02) *Pioneer Sarah Creek Watershed Management Commission*

Peter Lake is located in the City of Medina (Hennepin County). It has a maximum depth of 20.7 m (68 ft). This was the first year that the lake was part of the CAMP.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	38.0	28.0	47.0	
CLA (µg/l)	11.5	7.6	22.0	
Secchi (m)	3.1	2.0	4.0	
TKN (mg/l)	1.09	0.87	1.30	
			Lake Grade	

There was an insufficient quantity of data to calculate grades for the lake in 2010. At least 5 monitoring events during the summer-time period (May – September) are needed. Only 4 monitoring events occurred during that period. 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.

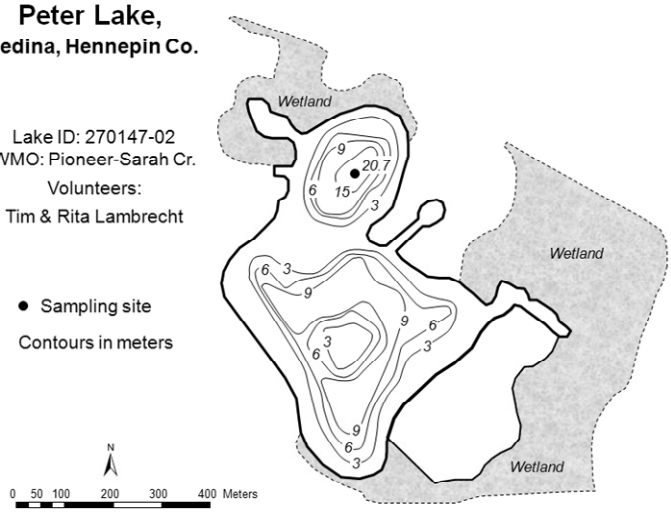
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

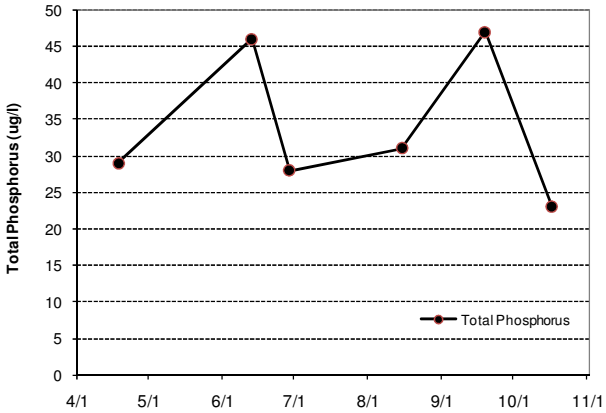
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

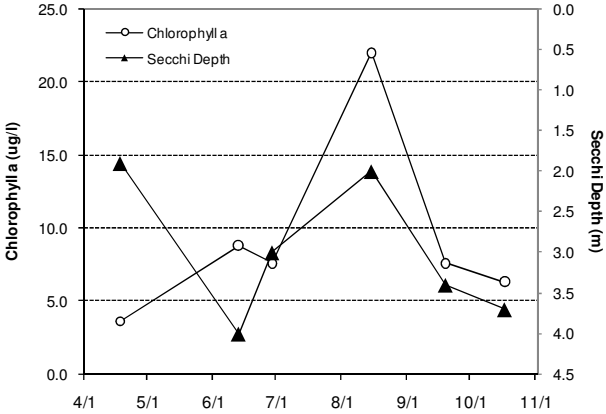
Peter Lake,
Medina, Hennepin Co.

Lake ID: 270147-02
WMO: Pioneer-Sarah Cr.
Volunteers:
Tim & Rita Lambrecht

● Sampling site
Contours in meters

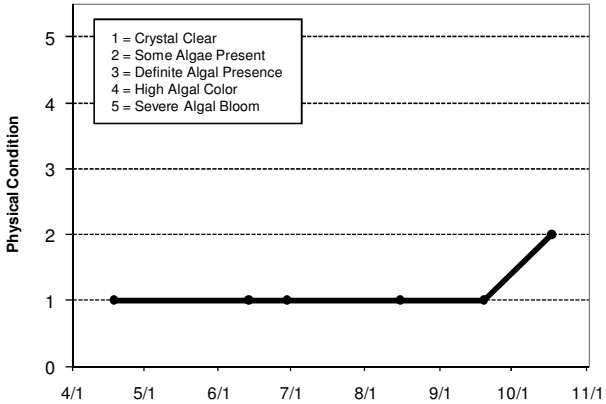






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	15.8				3.6	29		1.9	1	1
6/13	20.1				8.8	46		4.0	1	1
6/29	24.5				7.6	28		3.0	1	1
8/15	25.6				22.0	31		2.0	1	1
9/19	17.2				7.6	47		3.4	1	1
10/17	14.2				6.3	23		3.7	2	1



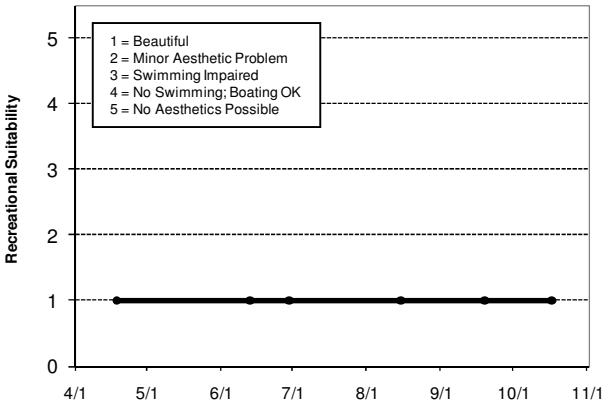
Lake Water Quality Grades Based on Summertime Averages

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	19.6	15.0	24.0	A
CLA (µg/l)	2.6	1.0	3.9	A
Secchi (m)	3.4	2.5	5.0	A
TKN (mg/l)	0.77	0.66	0.89	
			Lake Grade	A

The lake received a lake grade of A in 2010, which continues the recent improvement in water quality that was observed in 2009. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

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

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

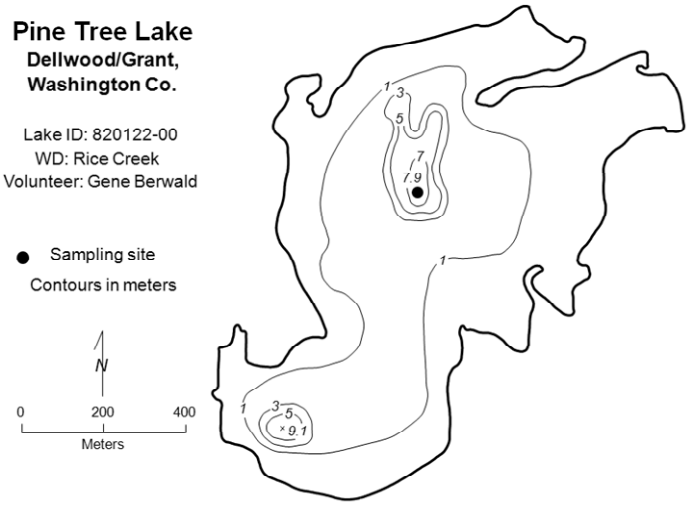
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

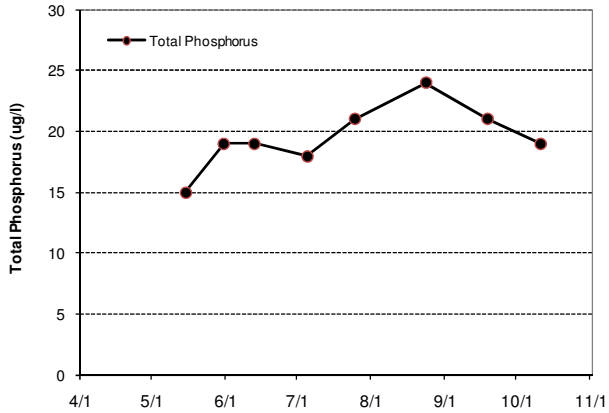
Pine Tree Lake

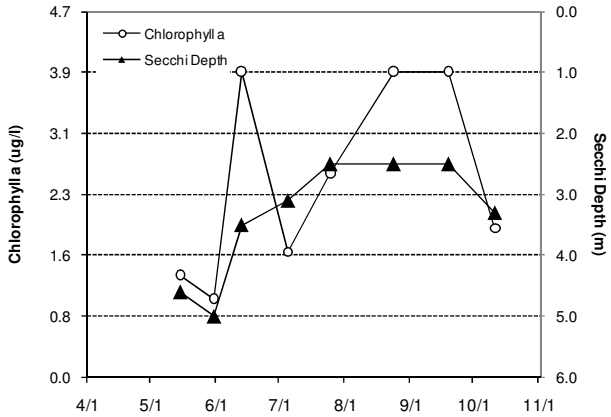
Dellwood/Grant, Washington Co.

Lake ID: 820122-00
WD: Rice Creek
Volunteer: Gene Berwald

● Sampling site
Contours in meters

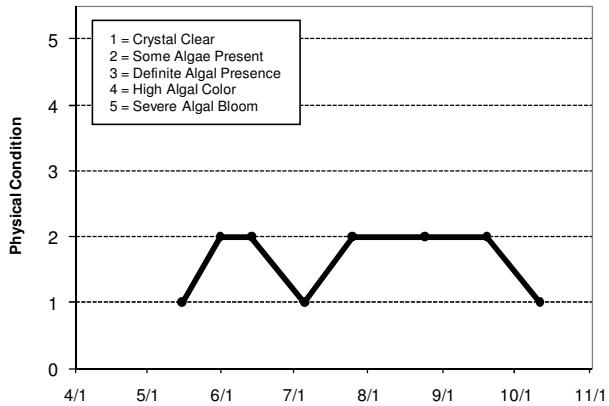






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/15	17.1				1.3	15		4.6	1	1
5/31	25.9				1.0	19		5.0	2	2
6/13	19.3				3.9	19		3.5	2	3
7/5	27.0				1.6	18		3.1	1	3
7/25	28.2				2.6	21		2.5	2	3
8/24	24.8				3.9	24		2.5	2	3
9/19	16.3				3.9	21		2.5	2	2
10/11	16.4				1.9	19		3.3	1	3



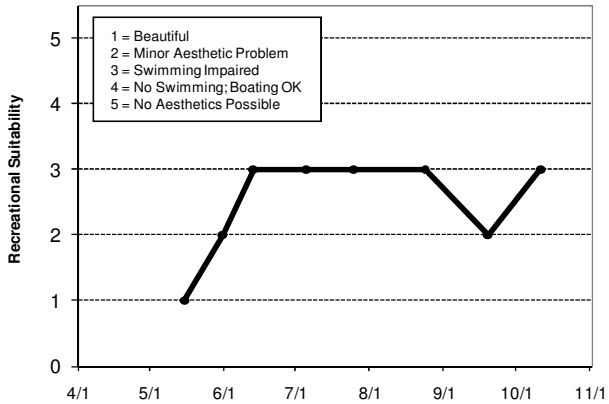
Lake Water Quality Grades Based on Summertime Averages

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

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.

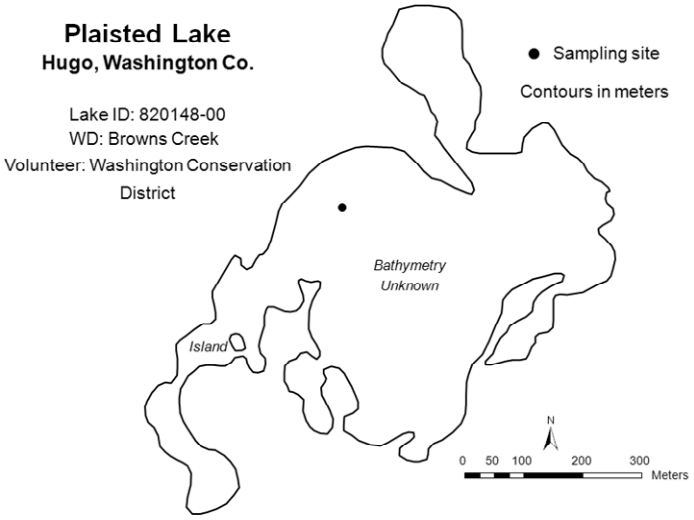
2010 summer (May-September) data summary

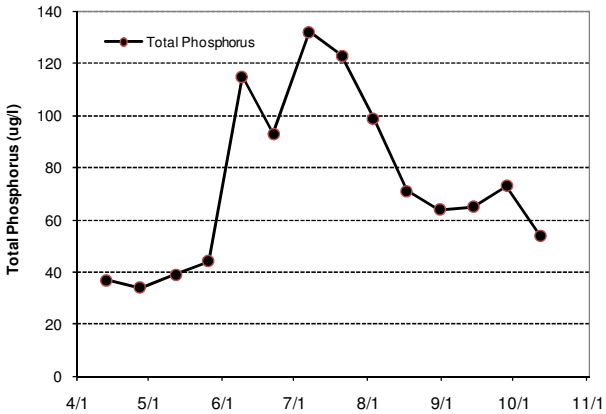
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	83.5	39.0	132.0	D
CLA (µg/l)	39.0	3.9	140.0	C
Secchi (m)	1.4	0.8	2.6	C
TKN (mg/l)	1.82	1.20	2.20	
			Lake Grade	C

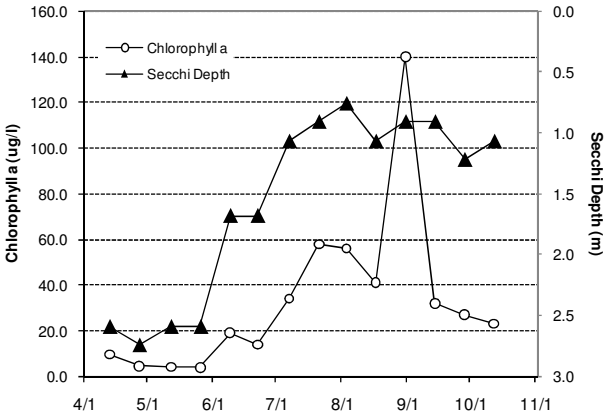
The lake received a lake grade of C in 2010, which is consistent with its limited water quality database. Continued monitoring is necessary to build the water quality database for this lake.

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

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

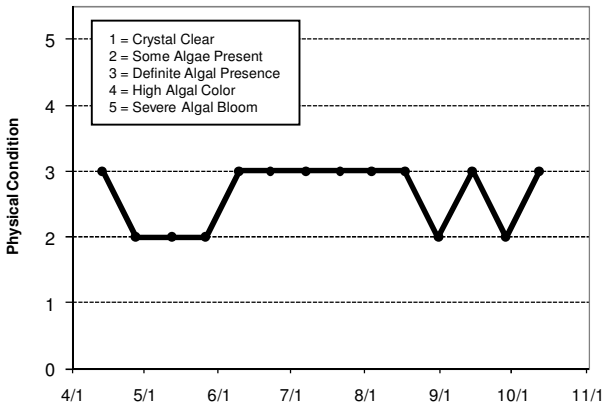






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	13.3	13.1	12.4	0.1	9.6	37		2.6	3	3
4/27	14.5	14.3	10.5	0.0	4.5	34		2.7	2	2
5/12	11.3	11.3	10.8	10.7	4.1	39		2.6	2	2
5/26	24.8	18.9	9.4	16.2	3.9	44		2.6	2	3
6/9	21.2	20.5	6.1	0.1	19.0	115		1.7	3	3
6/22	27.8	20.4	9.3	0.2	14.0	93		1.7	3	4
7/7	28.4	24.3	10.1	0.2	34.0	132		1.1	3	4
7/21	26.1	24.6	9.0	0.1	58.0	123		0.9	3	4
8/3	27.1	24.7	9.5	0.1	56.0	99		0.8	3	4
8/17	23.6	23.4	7.0	0.1	41.0	71		1.1	3	4
8/31	25.6	24.8	7.2	0.1	140.0	64		0.9	2	3
9/14	18.9	18.9	9.0	0.6	32.0	65		0.9	3	3
9/28	15.5	15.2	9.3	0.3	27.0	73		1.2	2	3
10/12	17.8	15.0	12.4	0.1	23.0	54		1.1	3	4



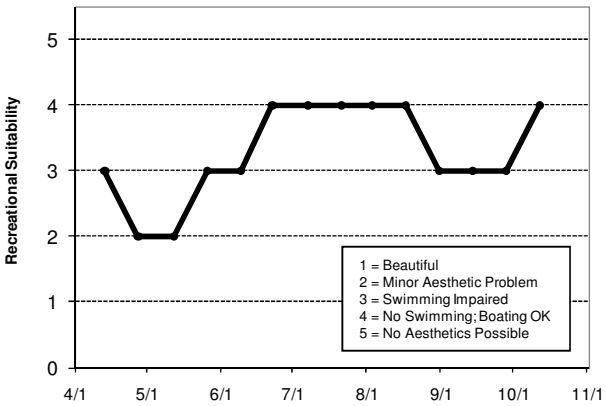
Lake Water Quality Grades Based on Summertime Averages

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

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

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

2010 summer (May-September) data summary

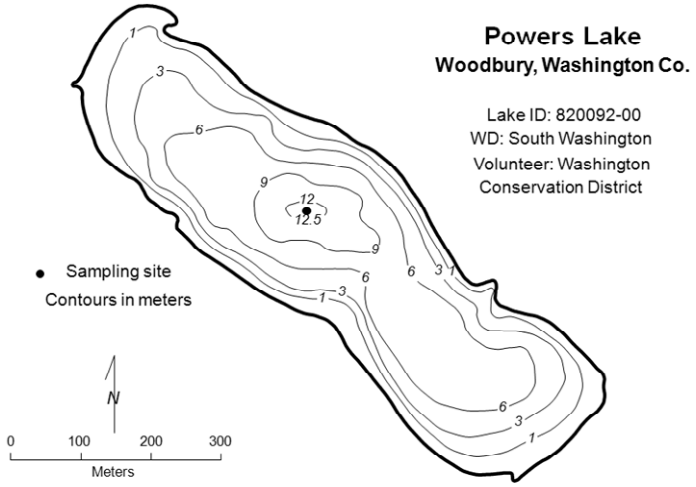
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	40.0	22.0	74.0	C
CLA (µg/l)	29.9	11.0	50.0	C
Secchi (m)	2.0	0.8	4.9	C
TKN (mg/l)	2.02	0.81	7.30	
			Lake Grade	C

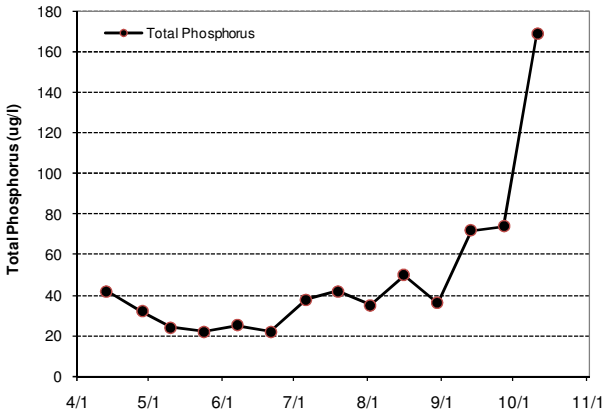
The lake received a lake grade of C for 2010. The lake seems to vary in range of A to C grades, although an A lake grade has not been observed since 1999. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

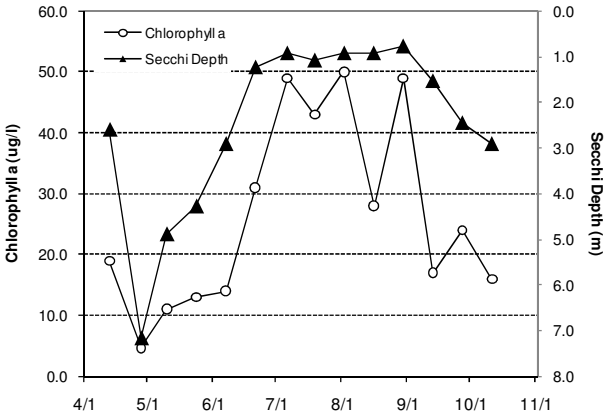
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

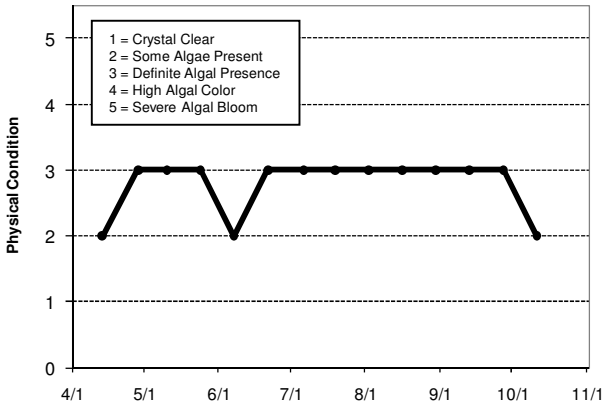
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

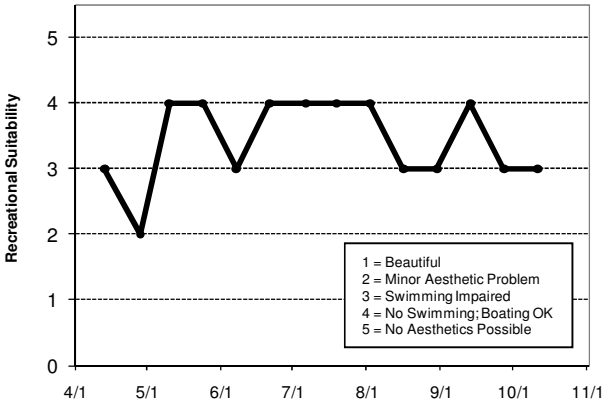
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	12.0	6.0	14.2	0.0	19.0	42	120	2.6	2	3
4/28	14.6	6.8	10.1	0.0	4.7	32	77	7.2	3	2
5/10	13.5	0.0	10.6	0.0	11.0	24	242	4.9	3	4
5/24	20.8	7.3	10.1	0.0	13.0	22		4.3	3	4
6/7	21.8	8.1	8.9	0.0	14.0	25	321	2.9	2	3
6/21	23.6	8.4	10.9	0.1	31.0	22	451	1.2	3	4
7/6	26.1	9.3	8.0	0.0	49.0	38	492	0.9	3	4
7/19	26.0	9.9	7.7	0.0	43.0	42	408	1.1	3	4
8/2	26.7	10.7	8.4	0.0	50.0	35	454	0.9	3	4
8/16	25.1	10.9	5.5	0.0	28.0	50	482	0.9	3	3
8/30	24.8	11.1	8.3	0.0	49.0	36	579	0.8	3	3
9/13	19.3	11.3	5.7	0.0	17.0	72	507	1.5	3	4
9/27	16.6	10.9	6.1	0.1	24.0	74	387	2.4	3	3
10/11	17.4	10.8	10.3	0.0	16.0	169	1260	2.9	2	3

Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	116.2	70.0	146.0	D
CLA (µg/l)	66.8	17.0	100.0	
Secchi (m)	0.6	0.4	1.0	F
TKN (mg/l)	2.00	1.50	2.80	
			Lake Grade	

There was an insufficient quantity of data to calculate a CLA grade. At least 5 monitoring events during the summer-time period (May – September) are needed. Only 4 samples were collected during the summer-time period. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends. The Secchi grade of F for 2009 is the same as the secchi grades received for previous monitoring seasons dating back to 1989.

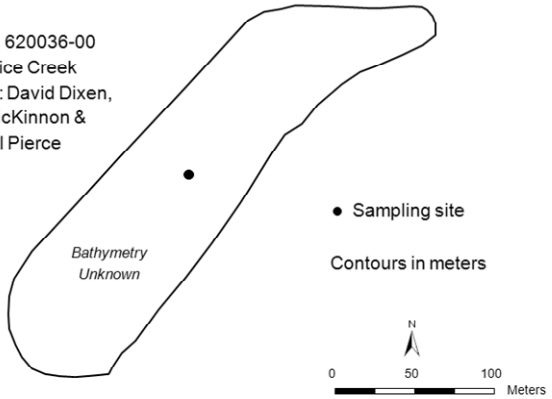
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

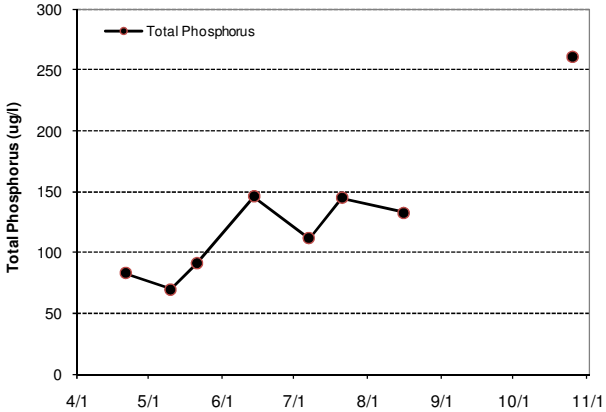
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

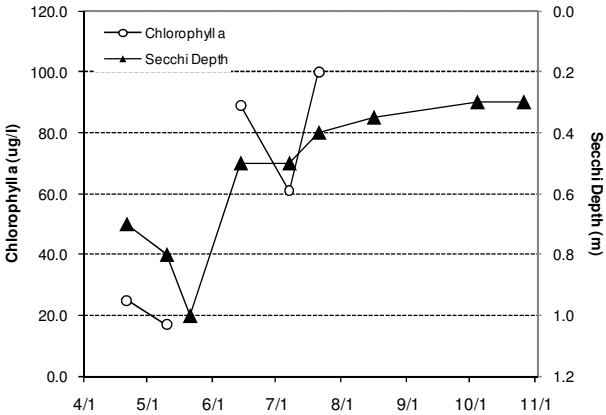
Priebe Lake

White Bear Lake, Ramsey Co.

Lake ID: 620036-00
WD: Rice Creek
Volunteers: David Dixen, Dawn McKinnon & Carol Pierce

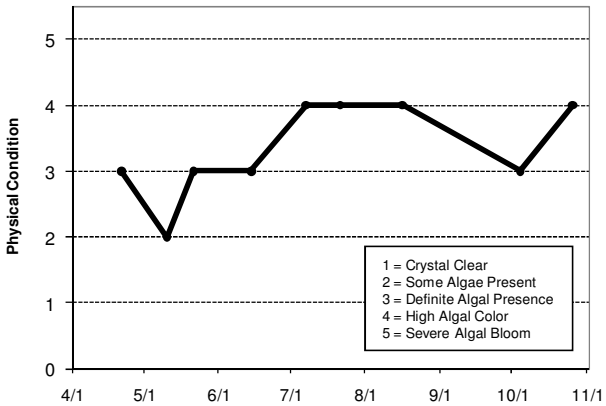






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/21	17.9				25.0	83		0.7	3	1
5/10	14.3				17.0	70		0.8	2	4
5/21	21.5					91		1.0	3	4
6/14	20.2				89.0	146		0.5	3	4
7/7	27.2				61.0	112		0.5	4	4
7/21	31.0				100.0	145		0.4	4	4
8/16	26.0					133		0.4	4	4
10/4	14.8							0.3	3	4
10/26	12.7					261		0.3	4	4



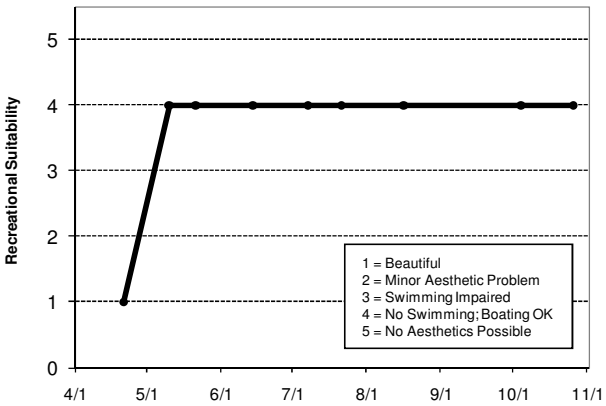
Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

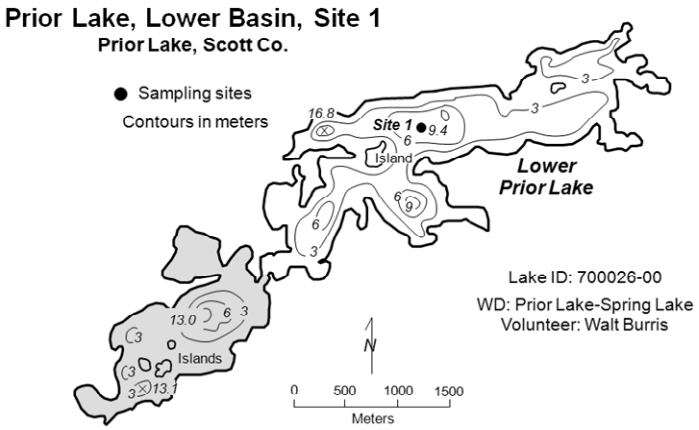
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	23.1	13.0	32.0	B
CLA (µg/l)	8.1	2.8	14.0	A
Secchi (m)	2.7	1.4	5.0	B
TKN (mg/l)	0.96	0.80	1.20	
			Lake Grade	B

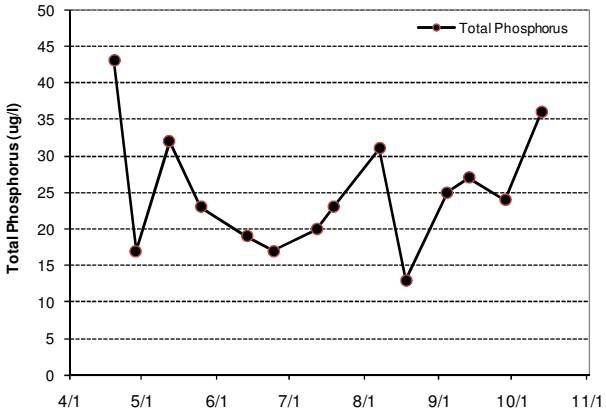
The lower basin received a lake grade of B for 2010. The historical lake grades appear to vary from A's to C's. With such variation, it is difficult to discern trends in the basin's water quality. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

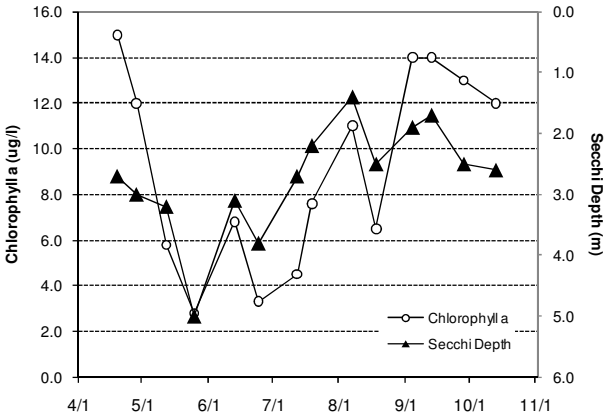
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

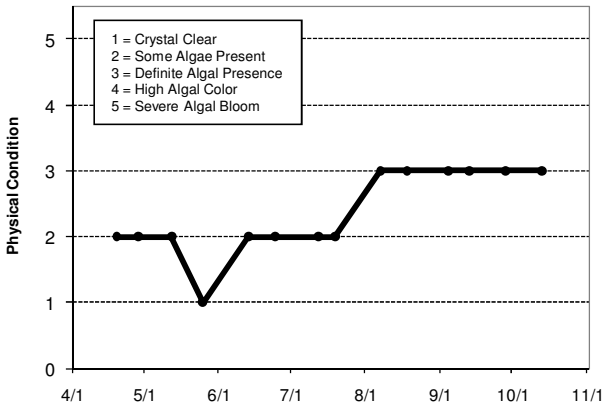






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	16.0				15.0	43		2.7	2	1
4/28	13.9				12.0	17		3.0	2	1
5/12	11.9				5.8	32		3.2	2	1
5/25	23.6				2.8	23		5.0	1	1
6/13	19.9				6.8	19		3.1	2	1
6/24	25.5				3.3	17		3.8	2	1
7/12	26.3				4.5	20		2.7	2	1
7/19	26.3				7.6	23		2.2	2	1
8/7	27.2				11.0	31		1.4	3	2
8/18	25.1				6.5	13		2.5	3	2
9/4	22.1				14.0	25		1.9	3	2
9/13	20.2				14.0	27		1.7	3	2
9/28	17.6				13.0	24		2.5	3	2
10/13	16.7				12.0	36		2.6	3	2



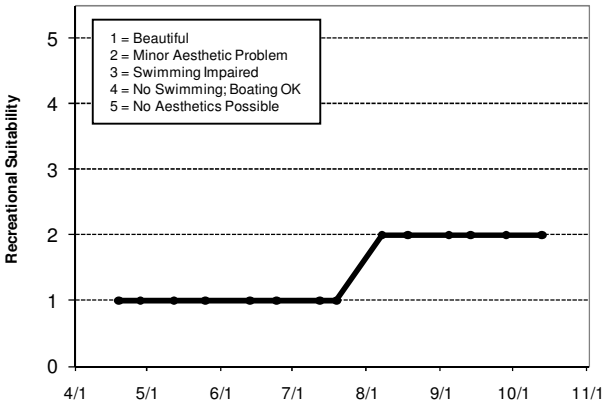
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total Phosphorus	C	A			B								C
Chlorophyll a	B				B					A	B		B
Secchi Depth	C	C	B	C	B	C	B	C	C	B	B	C	C
Lake Grade	**C**				**B**								**C**

Year	1993	1994	1995	1996	1997	1998 Site 1	1998 Site 2	1999 Site 1	1999 Site 2	2000 Site 1	2000 Site 2	2001 Site 1	2001 Site 2
Total Phosphorus				C	A	A	B	A	C	B	B	A	B
Chlorophyll a				A	A	B	C	A	B	B	B	B	C
Secchi Depth	B	B	B	B	B	C	C	B	C	B	C	B	C
Lake Grade				**B**	**A**	**B**	**C**	**A**	**C**	**B**	**B**	**B**	**C**

Year	2002 Site 1	2002 Site 2	2003 Site 1	2004 Site 1	2005 Site 1	2006 Site 1	2007 Site 1	2008 Site 1	2009 Site 1	2010 Site 1
Total Phosphorus	B	C	C	B	A	C	A	A	B	B
Chlorophyll a	B	C	A	B	A	B	B	B	A	A
Secchi Depth	B	C	A	B	A	B	B	B	A	B
Lake Grade	**B**	**C**	**B**	**B**	**A**	**B**	**B**	**B**	**A**	**B**

Source: Metropolitan Council and STORET data



Prior Lake [upper basin, site-1] (70-0072) *Prior Lake - Spring Lake Watershed District*

Prior Lake (upper basin) is located in the City of Prior Lake (Scott County). The upper basin is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	43.8	27.0	79.0	C
CLA (µg/l)	49.0	13.0	100.0	D
Secchi (m)	1.3	0.6	2.4	C
TKN (mg/l)	1.57	1.10	2.00	
			Lake Grade	C

The upper basin received a lake grade of C for 2010. Historical data for the upper basin indicate that the water quality of the basin has varied between lake grades of C and D. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

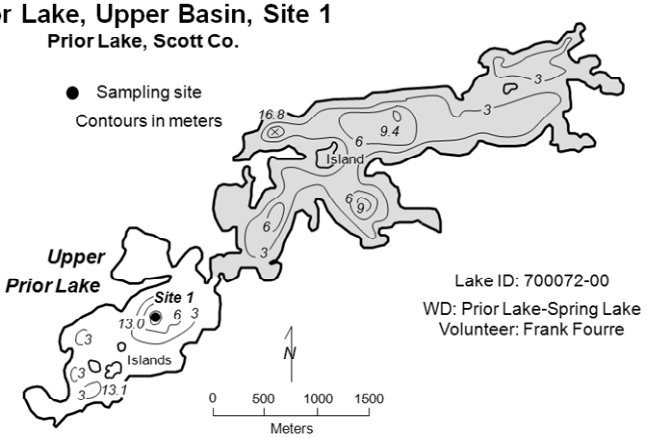
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

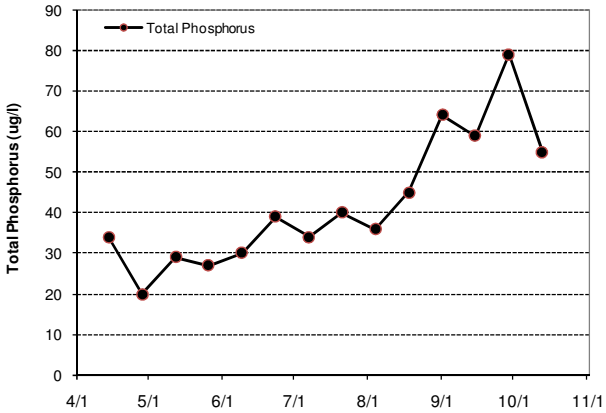
Prior Lake, Upper Basin, Site 1

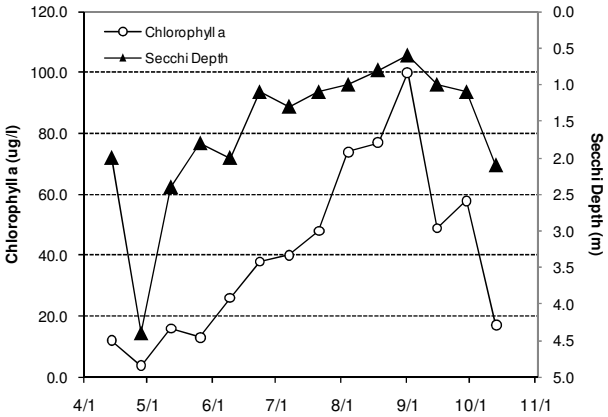
Prior Lake, Scott Co.



Lake ID: 700072-00

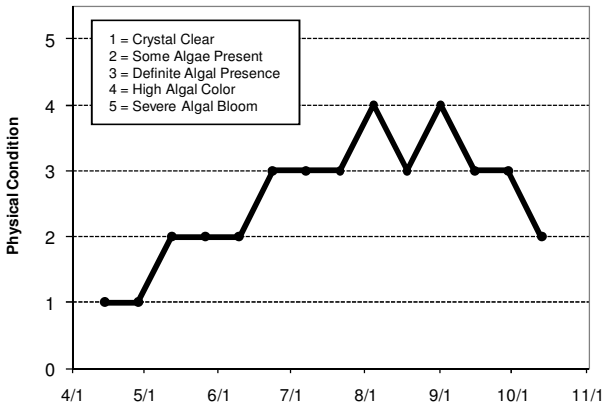
WD: Prior Lake-Spring Lake
Volunteer: Frank Fourre





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/14	11.7				12.0	34		2.0	1	1
4/28	14.2				3.7	20		4.4	1	1
5/12	12.0				16.0	29		2.4	2	1
5/26	23.4				13.0	27		1.8	2	2
6/9	22.8				26.0	30		2.0	2	2
6/23	24.5				38.0	39		1.1	3	2
7/7	27.0				40.0	34		1.3	3	2
7/21	27.3				48.0	40		1.1	3	2
8/4	28.2				74.0	36		1.0	4	3
8/18	24.5				77.0	45		0.8	3	3
9/1	24.8				100.0	64		0.6	4	3
9/15	18.5				49.0	59		1.0	3	3
9/29	17.0				58.0	79		1.1	3	3
10/13	16.7				17.0	55		2.1	2	2



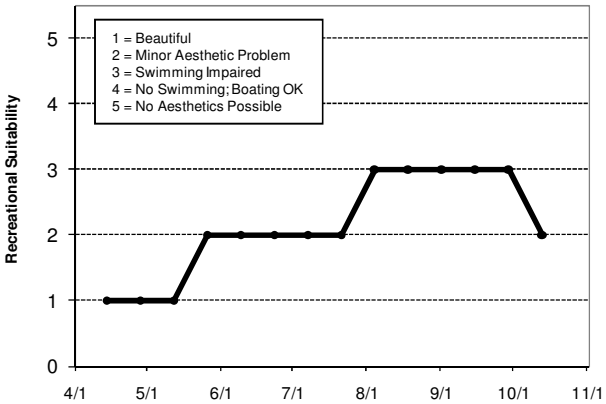
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Regional Park Lake (82-0087) *South Washington Watershed District*

Regional Park Lake is a 16-acre lake located within the City of Cottage Grove (Washington County). The maximum depth of the lake is 5.8 m. 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	63.7	45.0	103.0	C
CLA (µg/l)	25.0	5.8	68.0	C
Secchi (m)	1.8	0.8	3.4	C
TKN (mg/l)	1.08	0.83	1.50	
			Lake Grade	C

The lake received a lake grade of C for 2010. 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.

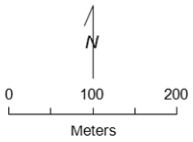
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

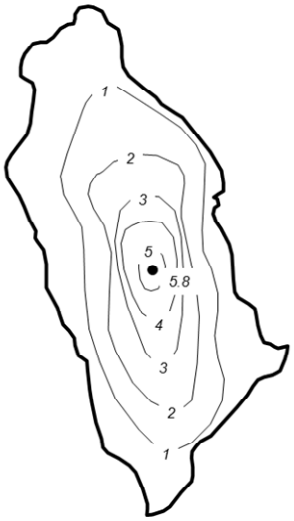
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

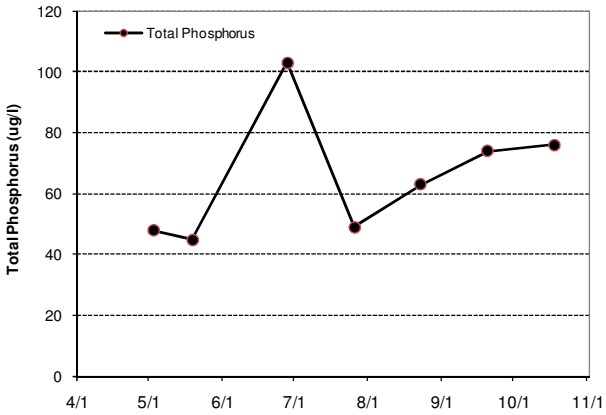
Regional Park Lake
Cottage Grove, Washington Co.

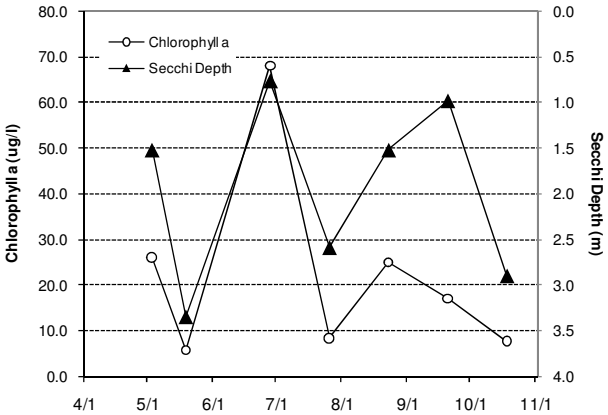
Lake ID: 820087-00
WD: South Washington
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



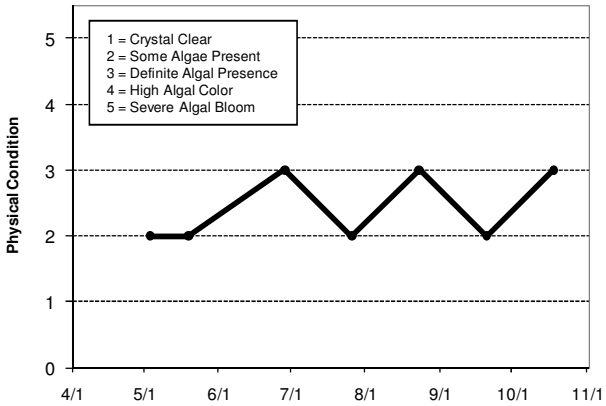






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/3	15.2	9.0	11.7	0.1	26.0	48		1.5	2	3
5/19	20.4	10.3	10.7	0.2	5.8	45		3.4	2	4
6/28	24.9	14.4	9.4	0.0	68.0	103		0.8	3	4
7/26	28.0	14.1	11.0	0.1	8.4	49		2.6	2	3
8/23	27.3	14.5	13.6	0.0	25.0	63		1.5	3	4
9/20	16.4	15.8	6.9	0.1	17.0	74		1.0	2	2
10/18	14.0	13.3	7.0	0.1	7.7	76		2.9	3	3



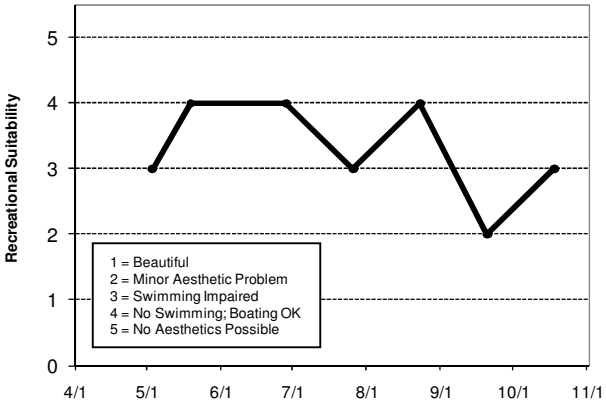
Lake Water Quality Grades Based on Summertime Averages

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							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
Total Phosphorus	C	C	D	C	D	C	C
Chlorophyll a	C	C	C	B	C	B	C
Secchi Depth	D	C	C	C	C	B	C
Lake Grade	**C**	**C**	**C**	**C**	**C**	**B**	**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.

2010 summer (May-September) data summary

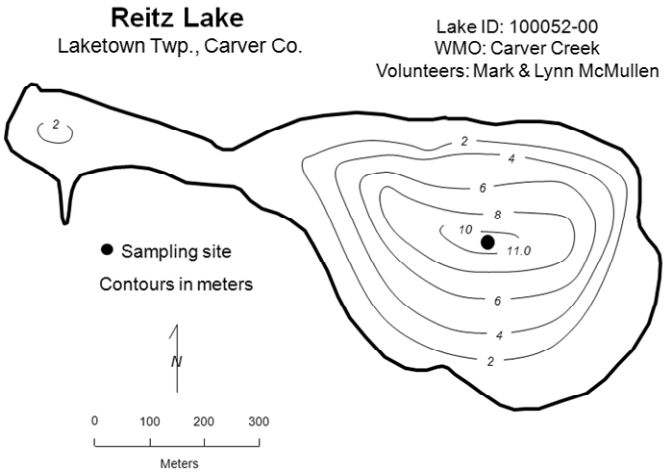
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	51.1	21.0	154.0	C
CLA (µg/l)	17.1	2.7	50.0	B
Secchi (m)	2.3	1.4	3.4	B
TKN (mg/l)	1.57	1.10	2.70	
			Lake Grade	B

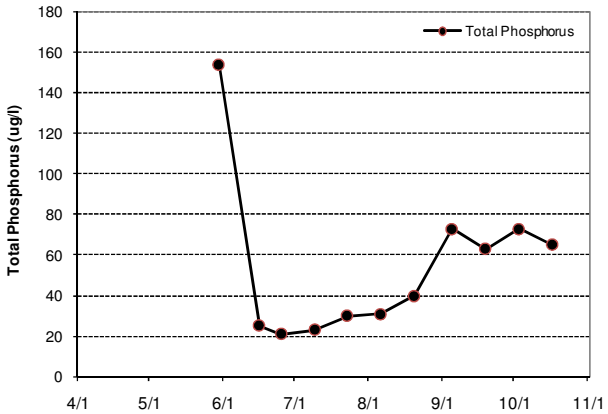
The lake received a lake grade of B for 2010, which is better than most lake grades received in previous years. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

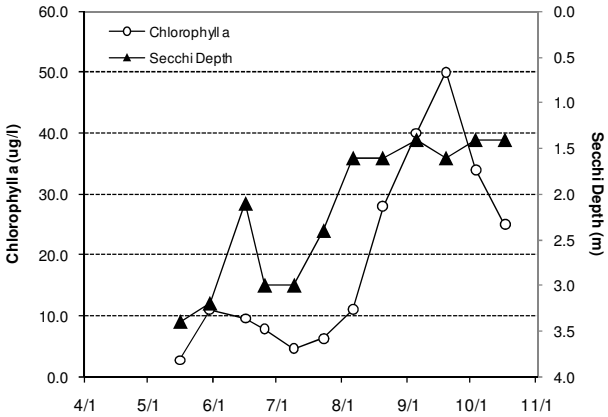
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

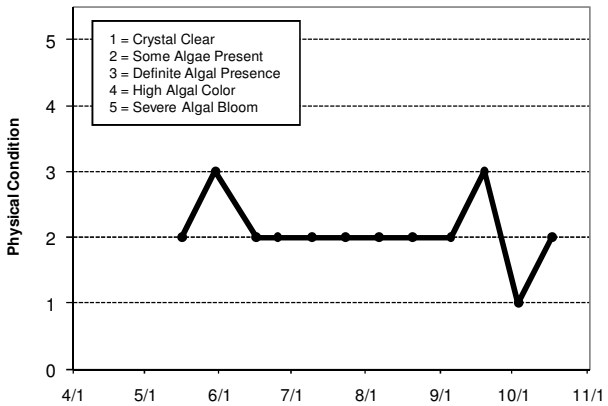
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

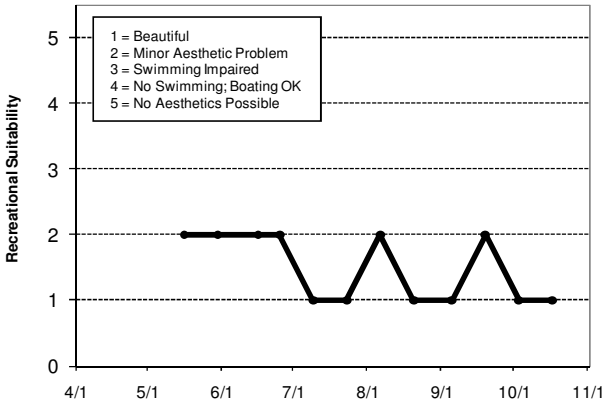
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/16	18.0				2.7			3.4	2	2
5/30	24.0				11.0	154		3.2	3	2
6/16	22.0				9.6	25		2.1	2	2
6/25	26.0				7.8	21		3.0	2	2
7/9	29.0				4.6	23		3.0	2	1
7/23	28.0				6.3	30		2.4	2	1
8/6	28.0				11.0	31		1.6	2	2
8/20	27.0				28.0	40		1.6	2	1
9/5	20.0				40.0	73		1.4	2	1
9/19	17.0				50.0	63		1.6	3	2
10/3	17.0				34.0	73		1.4	1	1
10/17	17.0				25.0	65		1.4	2	1

Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data

Reshanau Lake (02-0009) *Rice Creek Watershed District*

Reshanau Lake is located in the City of Lino Lakes (Anoka County). The 336-acre lake has a mean and maximum depth of 3.2 m (10.5 feet) and 4.9 m (16 feet). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	84.3	29.0	292.0	D
CLA (µg/l)	43.8	8.5	100.0	C
Secchi (m)	0.9	0.3	1.8	D
TKN (mg/l)	2.14	1.60	4.20	
			Lake Grade	D

The lake received a lake grade of D for 2010, which is similar to the lake grades received in the previous two years. Continued monitoring is recommended to continue to build the water quality database for this lake.

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

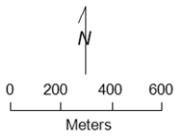
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

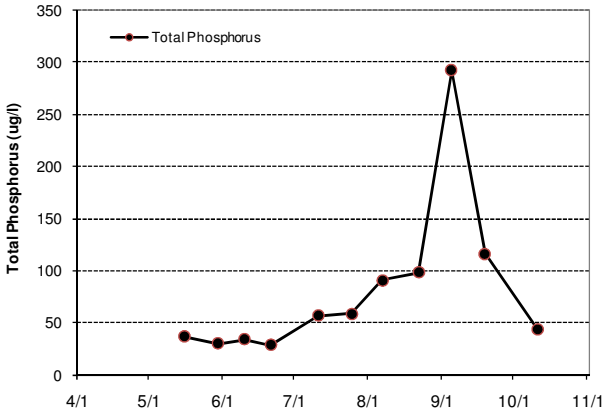
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

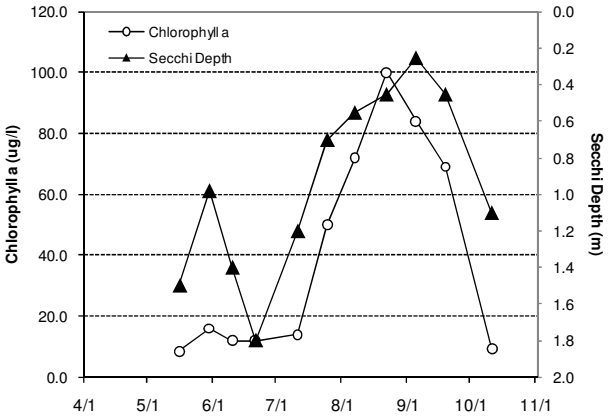
Reshanau Lake
Lino Lakes, Anoka Co.

Lake ID: 20009-00
WD: Rice Creek
Volunteer: Lori Fredlund

● Sampling site
Contours in meters

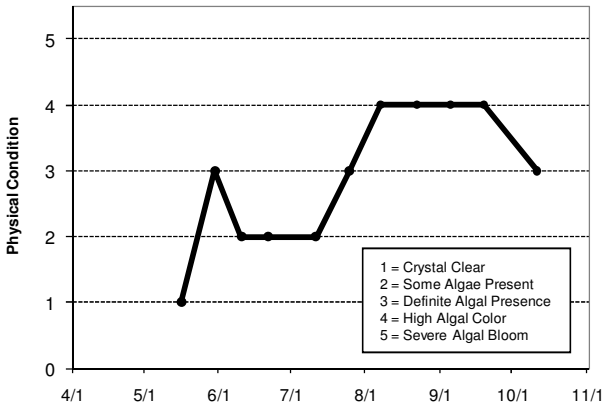






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/16	19.8				8.5	37		1.5	1	1
5/30	24.6				16.0	30		1.0	3	3
6/10	24.7				12.0	34		1.4	2	4
6/21	24.9				12.0	29		1.8	2	3
7/11	27.9				14.0	57		1.2	2	2
7/25	27.8				50.0	59		0.7	3	2
8/7	25.5				72.0	91		0.6	4	3
8/22	23.7				100.0	98		0.5	4	3
9/5	18.5				84.0	292		0.3	4	4
9/19	16.5				69.0	116		0.5	4	3
10/11					9.4	44		1.1	3	3



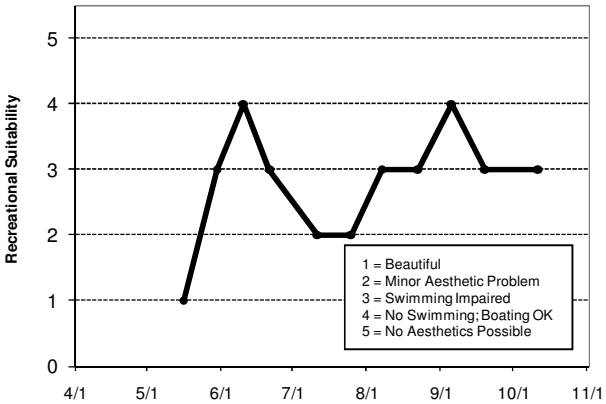
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
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
Total Phosphorus			D	D	D	D	D
Chlorophyll a			C	C	D	C	C
Secchi Depth			F	F	F	F	D
Lake Grade			**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 is little morphological information for the pond. The pond's surface area and watershed area (17,781 acres) translates to a large 157:1 watershed-to-pond area ratio. Generally the larger the ratio, the greater the potential stress on the pond from surface runoff.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	208.5	115.0	398.0	F
CLA (µg/l)	32.4	17.0	54.0	C
Secchi (m)	0.6	0.5	0.7	F
TKN (mg/l)	1.56	1.00	2.40	
			Lake Grade	D

The pond received a lake grade of D for 2010. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

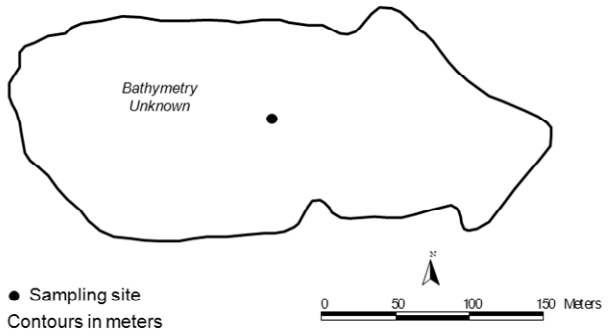
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page (although limited in data).

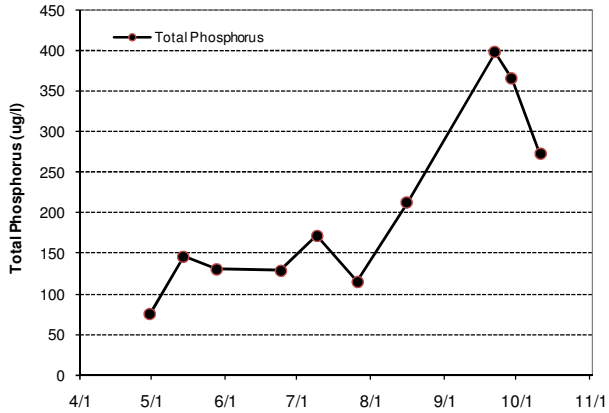
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

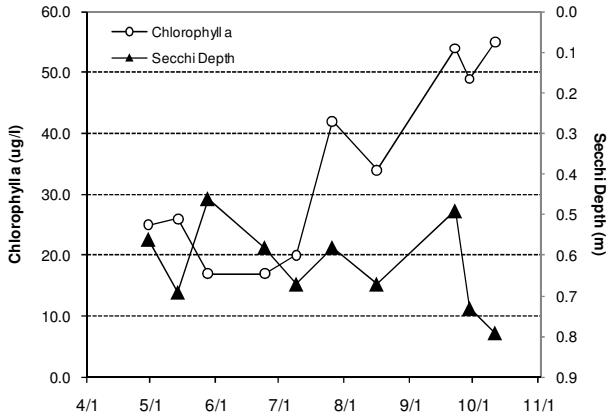
Rest Area Pond

West Lakeland Twp., Washington Co.

Lake ID: 820514-00
WD: Valley Branch
Volunteers: MnDOT Staff

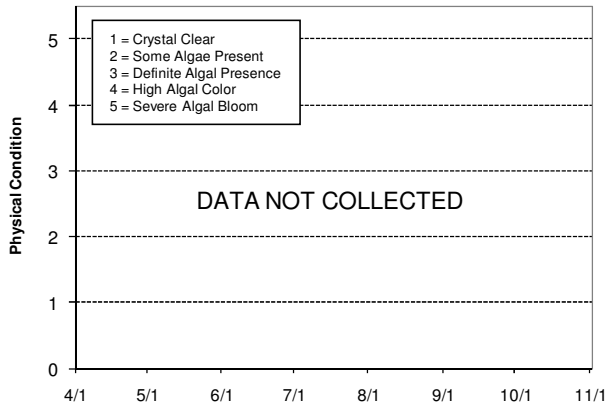






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/30	15.0				25.0	76		0.6		
5/14	11.6				26.0	146		0.7		
5/28	24.1				17.0	131		0.5		
6/24	27.6				17.0	129		0.6		
7/9	27.9				20.0	172		0.7		
7/26	31.4				42.0	115		0.6		
8/16	24.6				34.0	212		0.7		
9/22	17.4				54.0	398		0.5		
9/29	16.4				49.0	365		0.7		
10/11	17.4				55.0	272		0.8		



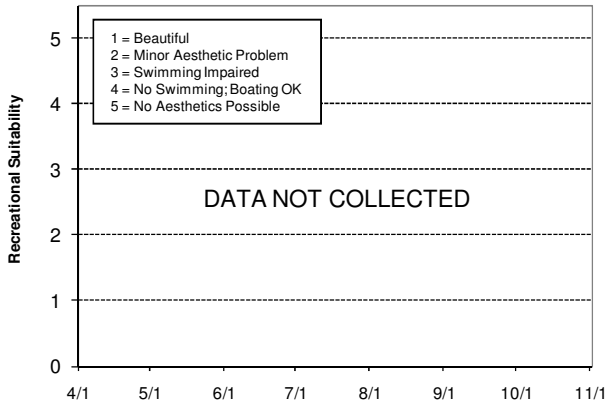
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Rice Lake lies within the City of Maple Grove. The lake has a surface area of 252 acres. 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	226.6	76.0	480.0	F
CLA (µg/l)	57.3	6.1	140.0	D
Secchi (m)	1.0	0.5	2.2	D
TKN (mg/l)	1.73	0.90	2.70	
			Lake Grade	D

The lake received a lake grade of D for 2010. 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.

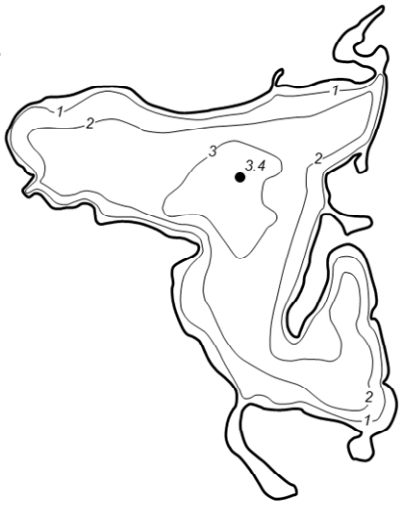
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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.

Rice Lake

Maple Grove, Hennepin Co.

Lake ID: 270116-01
WMO: Elm Creek
Volunteer: George Schneider

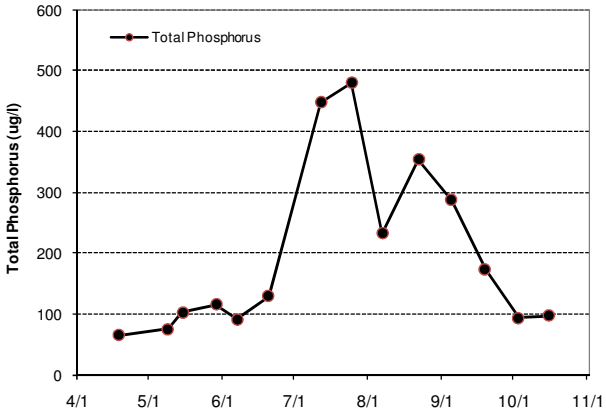


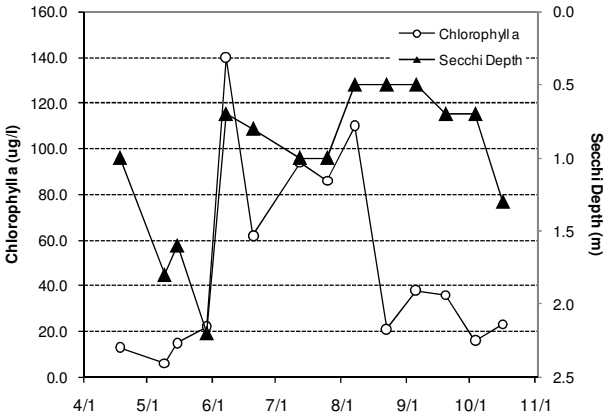
● Sampling site

Contours in meters

N

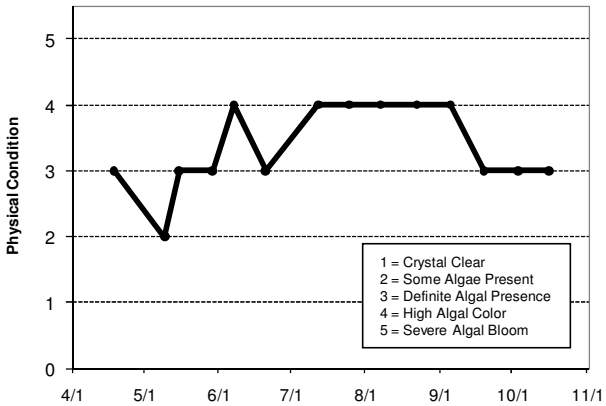
0 200 400 Meters





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	17.0				13.0	65		1.0	3	3
5/9	14.0				6.1	76		1.8	2	2
5/15	17.0				15.0	103		1.6	3	3
5/29	24.0				22.0	116		2.2	3	2
6/7	24.3				140.0	92		0.7	4	3
6/20	25.0				62.0	130		0.8	3	3
7/12	26.0				94.0	448		1.0	4	4
7/25	29.0				86.0	480		1.0	4	4
8/7	27.0				110.0	233		0.5	4	4
8/22	27.0				21.0	354		0.5	4	4
9/5	20.0				38.0	287		0.5	4	4
9/19	17.0				36.0	174		0.7	3	3
10/3	15.0				16.0	94		0.7	3	3
10/16	14.0				23.0	98		1.3	3	3



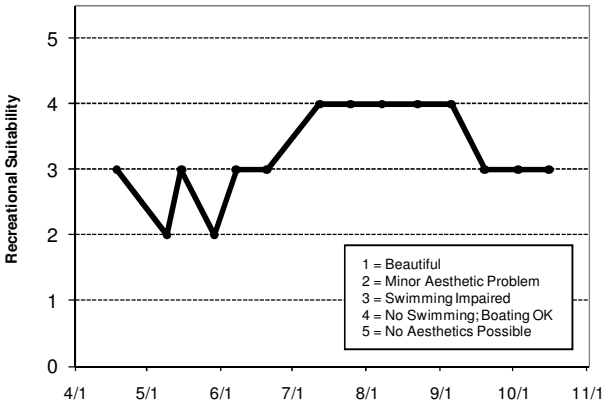
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Riley Lake (10-0002) *City of Chanhassen*

Riley Lake is located with the cities of Chanhassen and Eden Prairie (Carver and Hennepin counties). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (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.

2010 summer (May-September) data summary

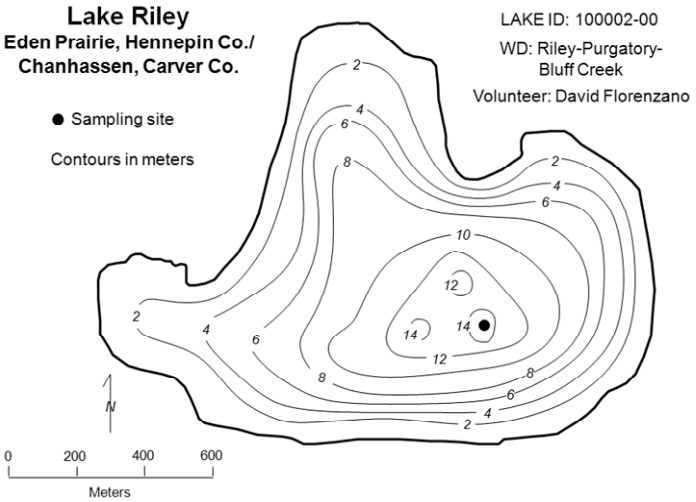
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	36.0	20.0	67.0	C
CLA (µg/l)	26.4	3.5	51.0	C
Secchi (m)	1.7	0.9	3.8	C
TKN (mg/l)	1.37	0.78	1.80	
			Lake Grade	C

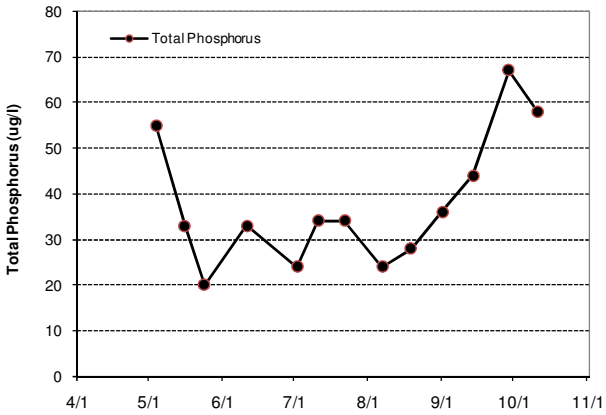
The lake received a lake grade of C for 2010, which is consistent with most years of monitoring dating back to 1980. The lake appears to be characterized as a C lake grade.

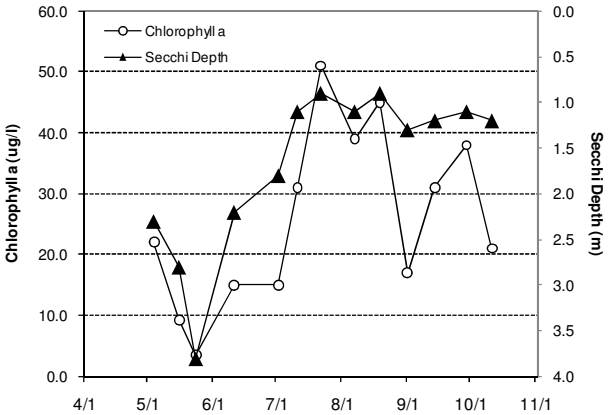
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

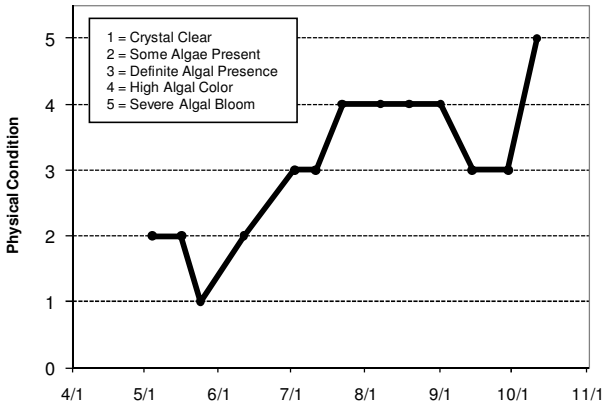
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

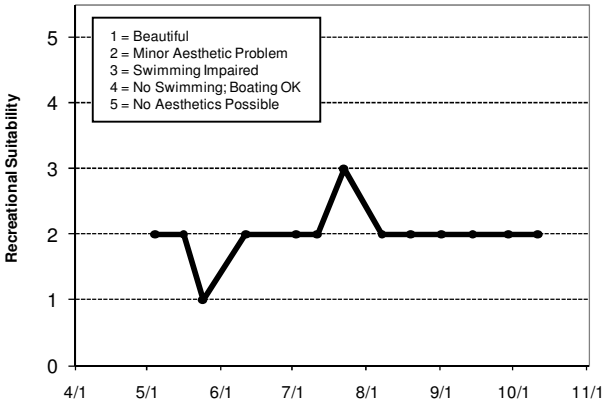
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/4	13.3				22.0	55		2.3	2	2
5/16	15.1				9.3	33		2.8	2	2
5/24	19.3				3.5	20		3.8	1	1
6/11	19.0				15.0	33		2.2	2	2
7/2	24.3				15.0	24		1.8	3	2
7/11	26.8				31.0	34		1.1	3	2
7/22	26.3				51.0	34		0.9	4	3
8/7	26.8				39.0	24		1.1	4	2
8/19	24.4				45.0	28		0.9	4	2
9/1	25.0				17.0	36		1.3	4	2
9/14	19.4				31.0	44		1.2	3	2
9/29	17.1				38.0	67		1.1	3	2
10/11	19.7				21.0	58		1.2	5	2

Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	38.6	22.0	64.0	C
CLA (µg/l)	6.0	1.8	14.0	A
Secchi (m)	1.4	1.1	1.7	C
TKN (mg/l)	1.19	0.98	1.40	
			Lake Grade	B

The lake received a lake grade of B for 2010. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

The water clarity grade of C does not correlate well with the chlorophyll-a grade of A. A possible explanation may be that the water clarity may be affected by higher levels of total suspended solids from surface runoff from the surrounding urbanized watershed. It is possible for higher 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.

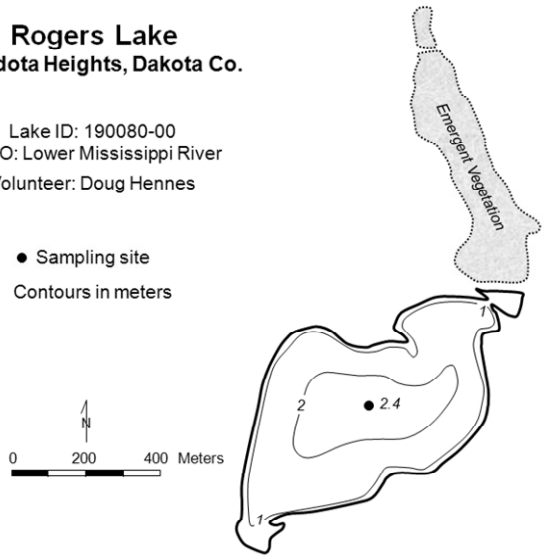
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

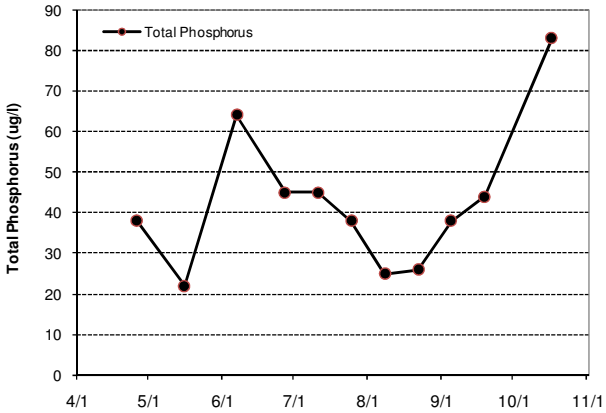
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

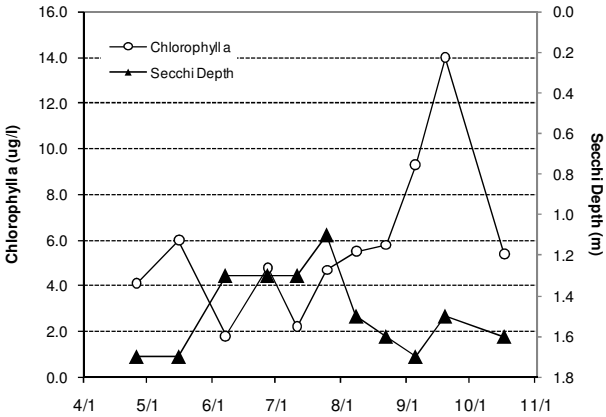
Rogers Lake
Mendota Heights, Dakota Co.

Lake ID: 190080-00
WMO: Lower Mississippi River
Volunteer: Doug Hennes

● Sampling site
Contours in meters

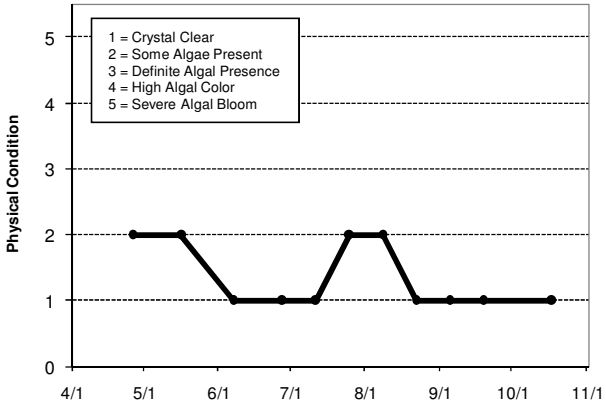






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/26	15.2				4.1	38		1.7	2	1
5/16	20.9				6.0	22		1.7	2	2
6/7	25.2				1.8	64		1.3	1	2
6/27	25.5				4.8	45		1.3	1	1
7/11	27.1				2.2	45		1.3	1	1
7/25	27.3				4.7	38		1.1	2	2
8/8	28.0				5.5	25		1.5	2	1
8/22	27.0				5.8	26		1.6	1	1
9/5	20.0				9.3	38		1.7	1	1
9/19	17.0				14.0	44		1.5	1	1
10/17	15.1				5.4	83		1.6	1	



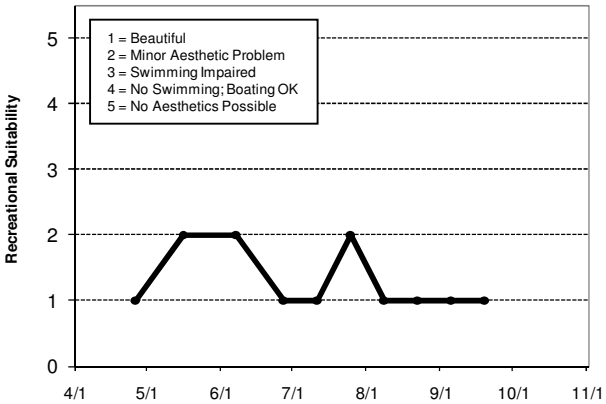
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Rose Lake [Site 1, north basin] (82-0012) *Washington Conservation District*

Rose Lake is a small lake located in the City of Lake Elmo (Washington County). There are little known morphological data available for the lake.

On each sampling day Site 1 was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

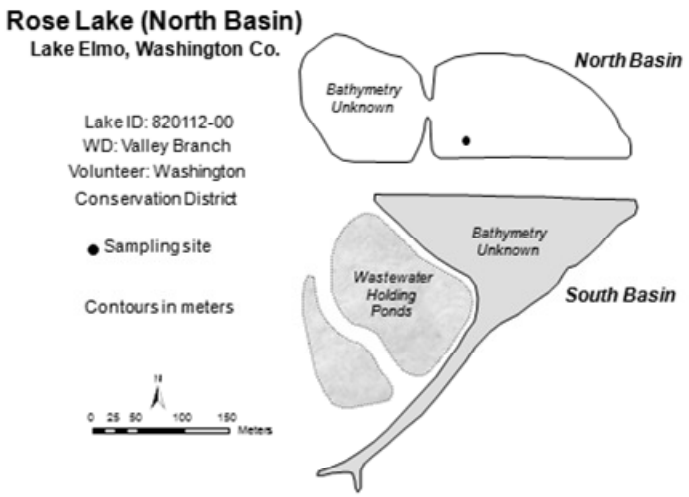
2010 summer (May-September) data summary

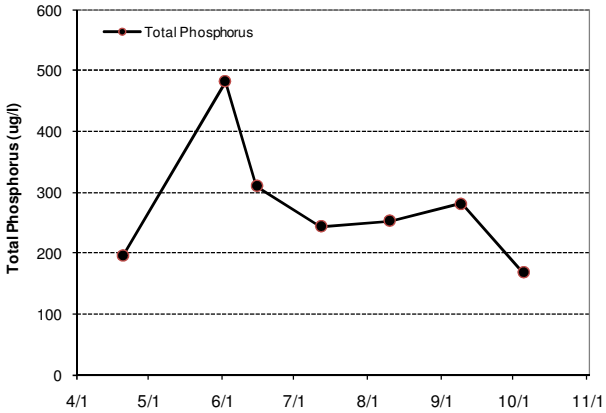
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	314.4	244.0	482.0	F
CLA (µg/l)	212.0	150.0	280.0	F
Secchi (m)	0.3	0.2	0.5	F
TKN (mg/l)	4.16	2.80	5.20	
			Lake Grade	F

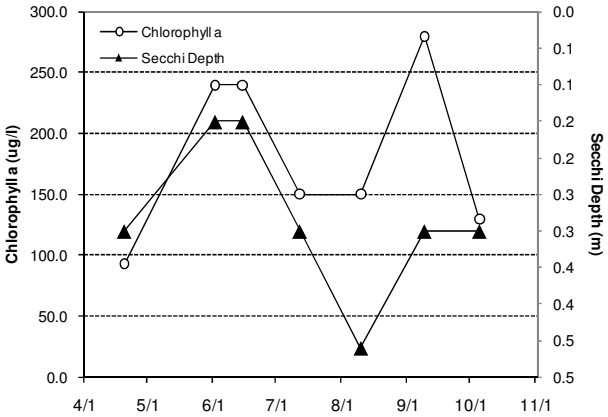
Site 1 received a lake grade of F for 2010. Additional monitoring is suggested to continue to build the water quality database.

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

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

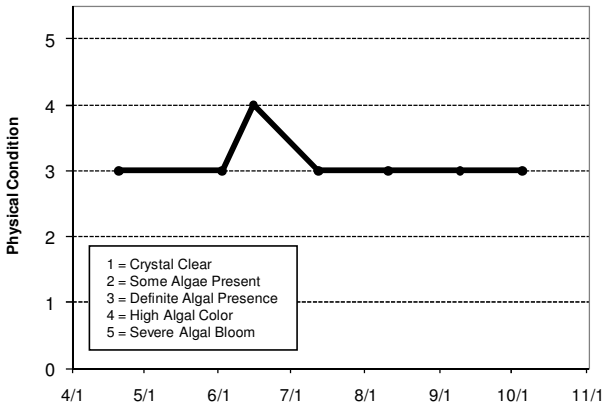






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20	15.7	13.0	12.5	0.1	93.0	197		0.3	3	4
6/2	21.4	18.2	7.1	0.1	240.0	482		0.2	3	4
6/15	20.1	16.3	13.4	0.0	240.0	311		0.2	4	5
7/12	25.8	20.8	15.8	0.0	150.0	244		0.3	3	4
8/10	27.4	21.9	8.2	0.2	150.0	253		0.5	3	4
9/9	16.9	16.7	10.5	0.1	280.0	282		0.3	3	4
10/5	12.8	12.8	8.9	0.2	130.0	169		0.3	3	4



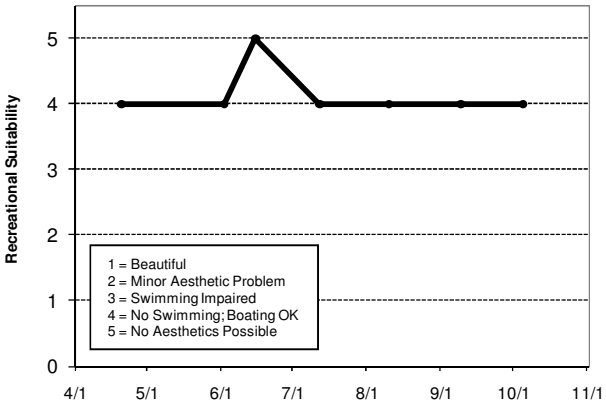
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Rose Lake [Site 2, south basin] (82-0012) *Washington Conservation District*

Rose Lake is a small lake located in the City of Lake Elmo (Washington County). There are little known morphological data available for the lake.

On each sampling day Site 2 was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

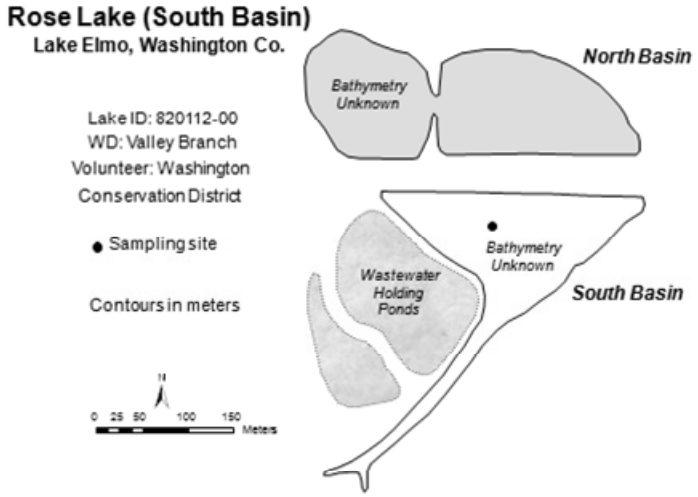
2010 summer (May-September) data summary

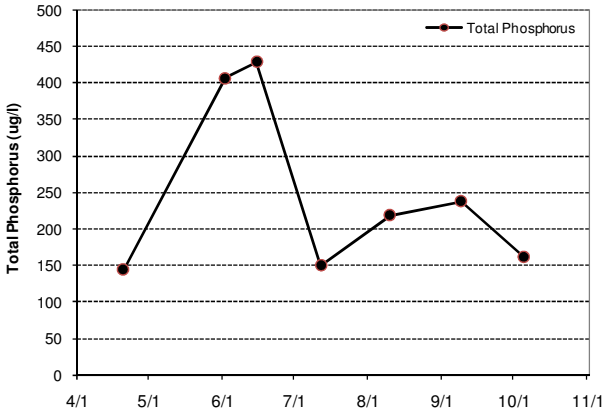
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	288.6	150.0	429.0	F
CLA (µg/l)	148.0	110.0	190.0	F
Secchi (m)	0.3	0.2	0.5	F
TKN (mg/l)	3.36	2.50	4.40	
			Lake Grade	F

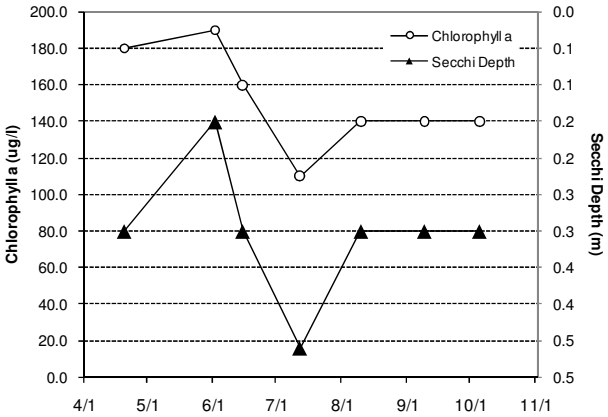
Site 2 received a lake grade of F for 2010. Additional monitoring is suggested to continue to build the water quality database.

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

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

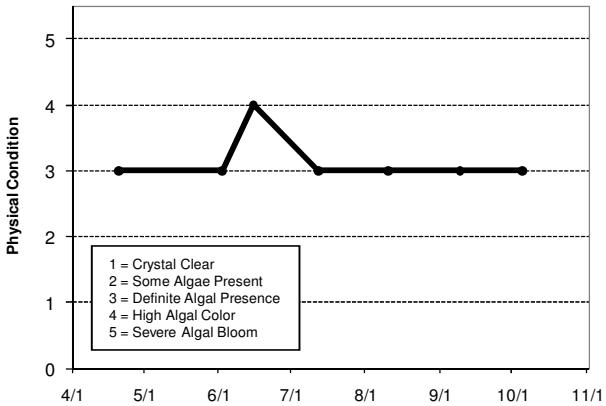






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20	15.8	11.6	12.9	0.0	180.0	144		0.3	3	4
6/2	21.5	12.9	7.7	0.0	190.0	407		0.2	3	4
6/15	19.9	14.9	11.4	0.0	160.0	429		0.3	4	4
7/12	27.8	16.5	11.6	0.0	110.0	150		0.5	3	4
8/10	27.4	18.7	10.6	0.0	140.0	219		0.3	3	4
9/9	17.6	17.3	10.6	0.1	140.0	238		0.3	3	4
10/5	13.5	13.4	7.6	0.2	140.0	162		0.3	3	4



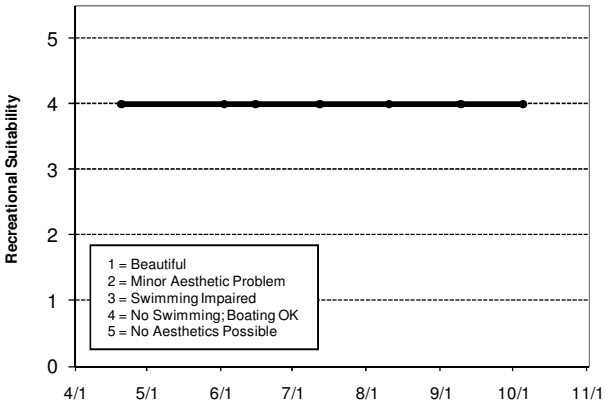
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Rutz Lake (10-0080) *Carver County Environmental Services*

Rutz Lake is a 61-acre lake located within Waconia Township (Carver County). The maximum depth of the lake is 4.0 m (roughly 13 feet). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	128.8	69.0	195.0	
CLA (µg/l)	101.1	8.2	290.0	
Secchi (m)	1.9	1.5	2.1	
TKN (mg/l)	2.93	1.90	5.00	
			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 four monitoring events occurred during this period. 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.

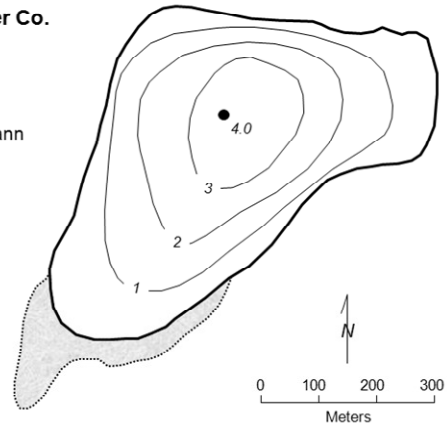
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

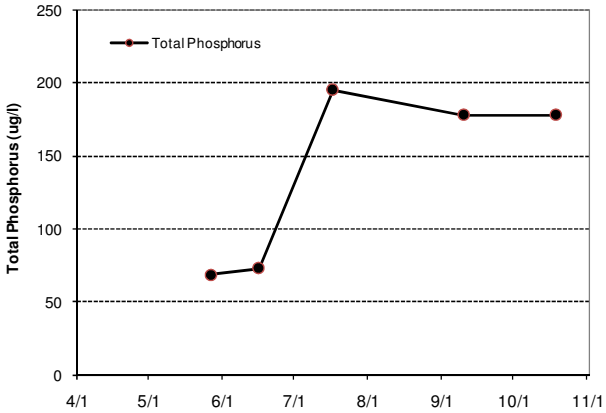
Rutz Lake

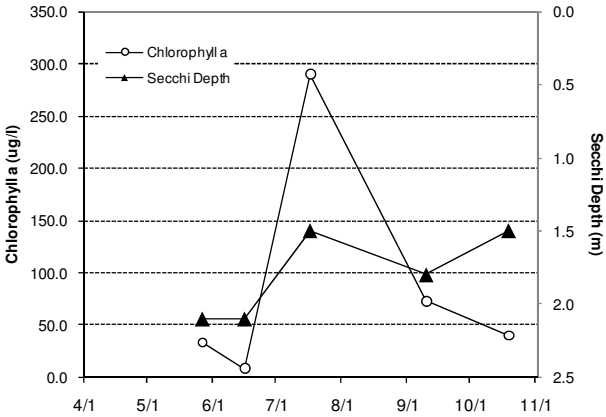
Waconia Twp., Carver Co.

Lake ID: 100080-00
WMO: Carver Creek
Volunteer: Marty Ziermann

● Sampling site
Contours in meters

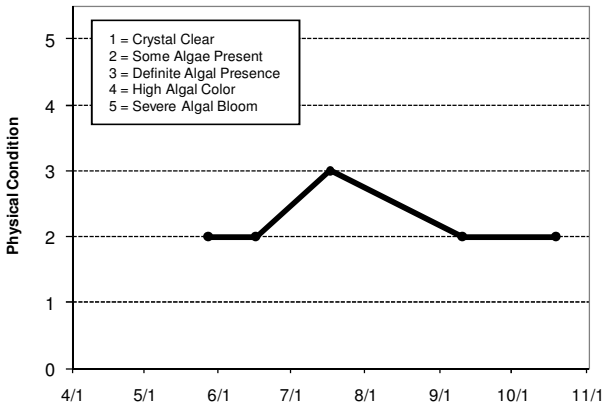






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/27	24.8				33.0	69		2.1	2	3
6/16	25.9				8.2	73		2.1	2	3
7/17	32.0				290.0	195		1.5	3	3
9/10	24.9				73.0	178		1.8	2	3
10/19	12.9				40.0	178		1.5	2	4



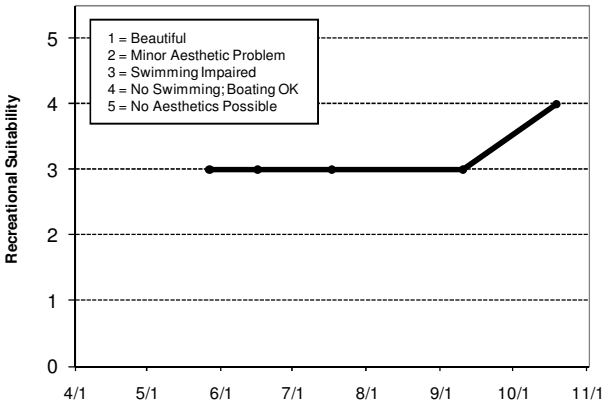
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Ryan Lake (27-0058) *Shingle Creek Watershed Management Commission*

Ryan Lake is located in the City of Robbinsdale (Hennepin County). The 35-acre lake has a maximum depth of approximately 10.7 m (35 ft). The watershed for the lake has an area of 5,510 acres. These areas give a watershed-to-lake area ratio of 157:1, which is relatively large. 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.

2008 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	49.4	33.0	95.0	C
CLA (µg/l)	9.0	2.2	17.0	A
Secchi (m)	1.8	0.8	3.5	C
TKN (mg/l)	1.55	1.10	2.30	
			Lake Grade	B

The lake received a lake grade of B for 2010, which is consistent with grades received since 2002. The lake grades have fluctuated from C to B to D and back to B over the previous 13 years. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

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

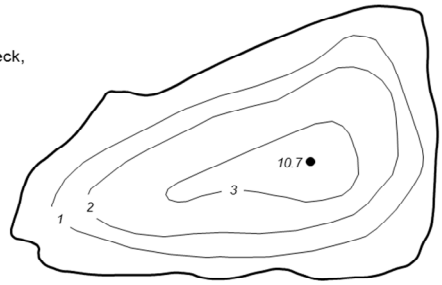
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 297-4916 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

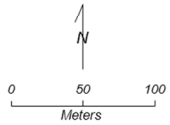
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

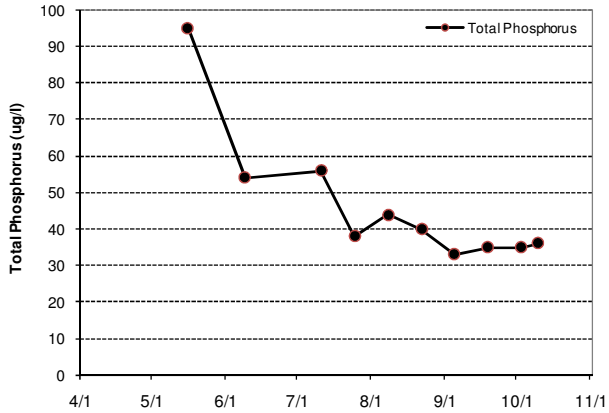
Ryan Lake
Crystal, Hennepin Co.

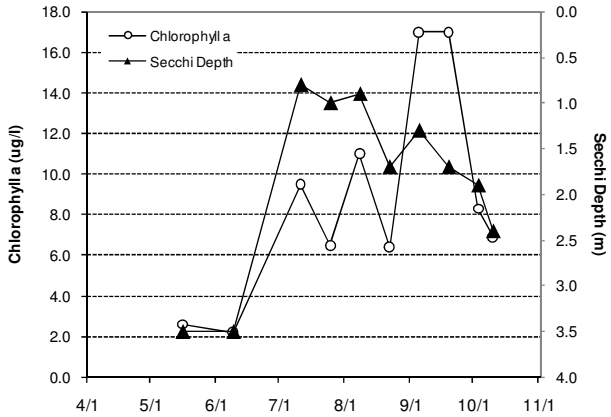
Lake ID: 270058-00
WMO: Shingle Creek
Volunteers: Travis & Cheri Kolbeck, Andrew Shepherd

● Sampling site
Contours in meters



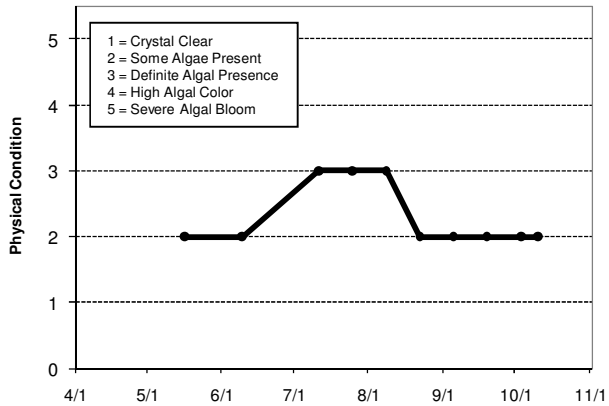






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/16	19.2				2.6	95		3.5	2	1
6/9	21.8				2.2	54		3.5	2	1
7/11	27.9				9.5	56		0.8	3	2
7/25	29.3				6.5	38		1.0	3	2
8/8	28.0				11.0	44		0.9	3	2
8/22	28.5				6.4	40		1.7	2	2
9/5	20.2				17.0	33		1.3	2	2
9/19	17.0				17.0	35		1.7	2	2
10/3	15.9				8.3	35		1.9	2	2
10/10	17.4				6.9	36		2.4	2	2



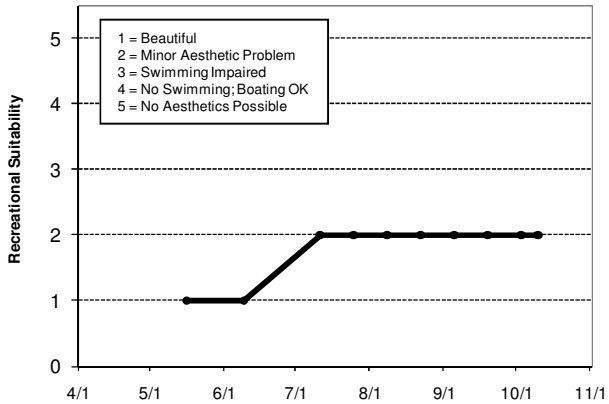
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



Sand Lake (82-0067) *Marine on St. Croix Watershed Management Organization*

S 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	32.7	16.0	49.0	C
CLA (µg/l)	14.4	4.1	29.0	B
Secchi (m)	2.2	1.2	3.5	C
TKN (mg/l)	1.00	0.58	1.40	
			Lake Grade	C

The lake received a lake grade of C for 2010. The lake appears to be characterized as a C lake, though it occassionaly has received B lake 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.

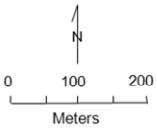
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

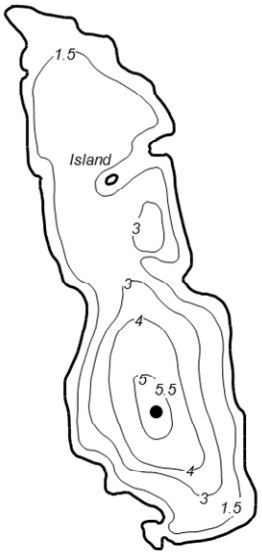
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

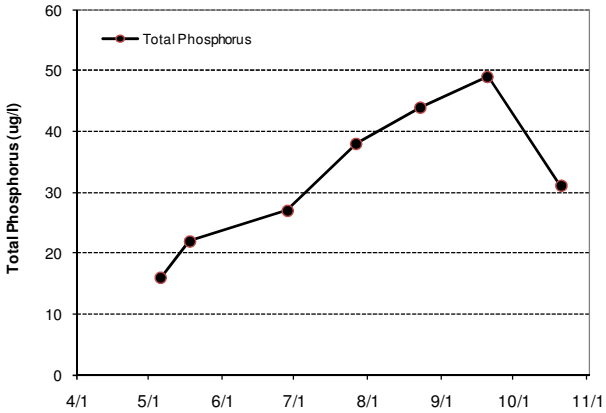
Sand Lake
Scandia, Washington Co.

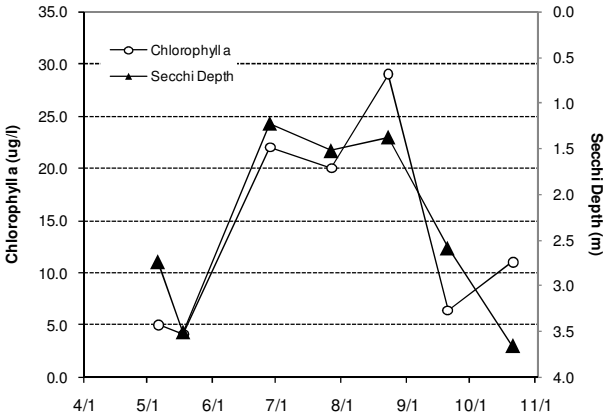
Lake ID: 820067-00
WD: Carnelian-Marine-St. Croix
Volunteer: Washington Conservation District

● Sampling site
Contours in meters



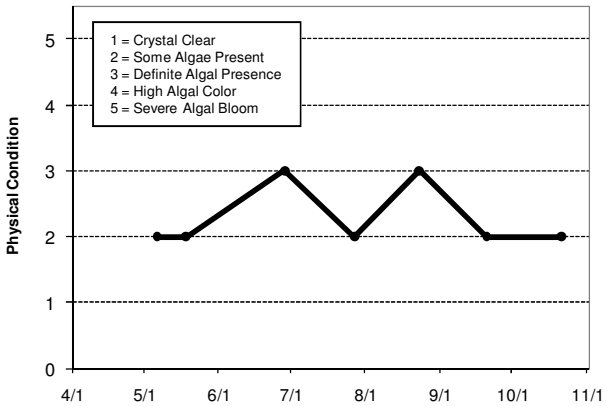






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/6	13.8	13.7	9.3	8.9	5.0	16		2.7	2	2
5/18	18.5	13.4	10.1	10.6	4.1	22		3.5	2	2
6/28	24.5	18.2	8.9	0.1	22.0	27		1.2	3	3
7/27	27.0	20.4	10.5	0.1	20.0	38		1.5	2	3
8/23	25.7	21.5	10.9	0.0	29.0	44		1.4	3	4
9/20	16.5	16.4	6.8	4.1	6.4	49		2.6	2	2
10/21	12.2	12.1	9.3	0.2	11.0	31		3.7	2	2



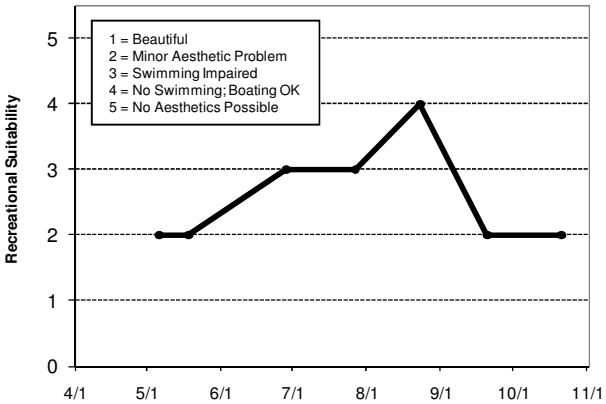
Lake Water Quality Grades Based on Summertime Averages

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

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.

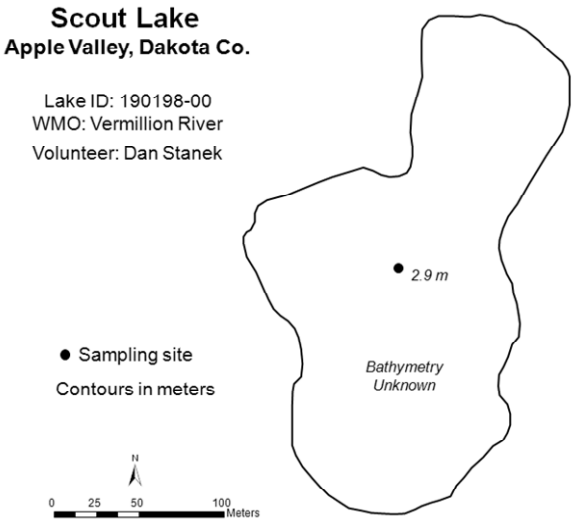
2010 summer (May-September) data summary

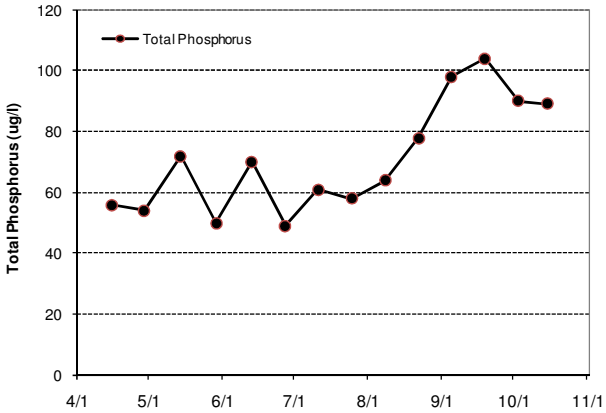
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	70.4	49.0	104.0	D
CLA (µg/l)	53.5	17.0	88.0	D
Secchi (m)	0.8	0.6	1.0	D
TKN (mg/l)	1.81	1.50	2.80	
			Lake Grade	D

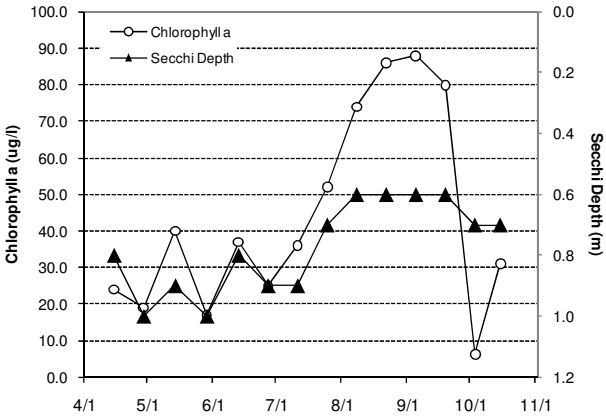
The lake received a lake grade of D for 2010. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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.

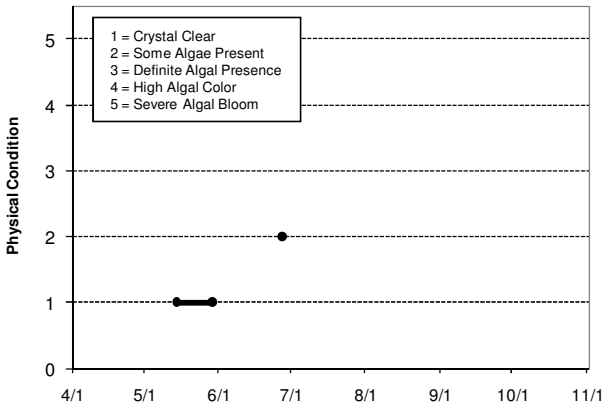






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/15	18.2				24.0	56		0.8		1
4/29	15.9				19.0	54		1.0		
5/14	15.9				40.0	72		0.9	1	
5/29	27.5				17.0	50		1.0	1	2
6/13	20.1				37.0	70		0.8		
6/27	27.1				25.0	49		0.9	2	
7/11	28.2				36.0	61		0.9		
7/25	28.3				52.0	58		0.7		
8/8	30.7				74.0	64		0.6		
8/22	29.4				86.0	78		0.6		
9/5	21.6				88.0	98		0.6		
9/19	18.8				80.0	104		0.6		
10/3	15.5				6.3	90		0.7		
10/15	15.6				31.0	89		0.7		



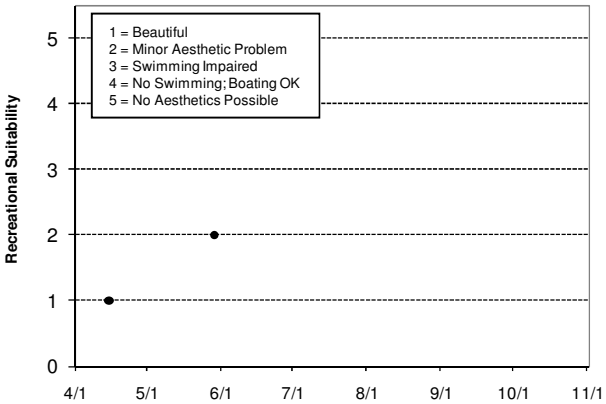
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Seidl's Lake (19-0095) Cities of ***Inver Grove Heights and South St. Paul***

Seidl's Lake is a 14-acre lake located in the City of Inver Grove Heights (Dakota County) which receives inflow from five inlets. The maximum depth of the lake is approximately 5.0 m (17 feet). There are little known morphological data available.

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

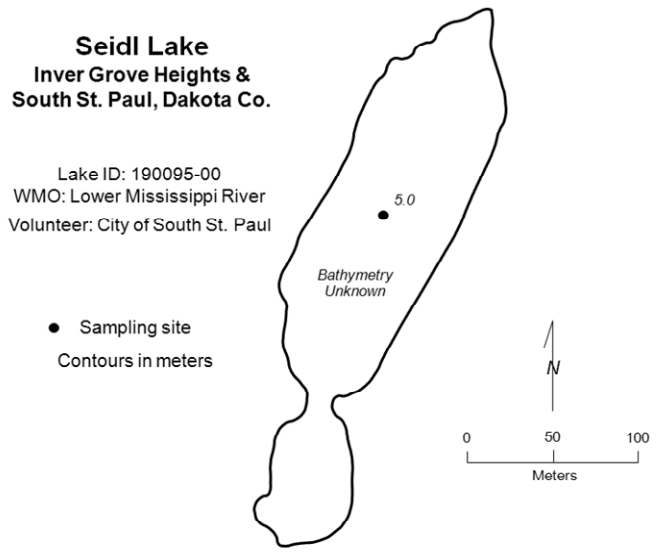
2010 summer (May-September) data summary

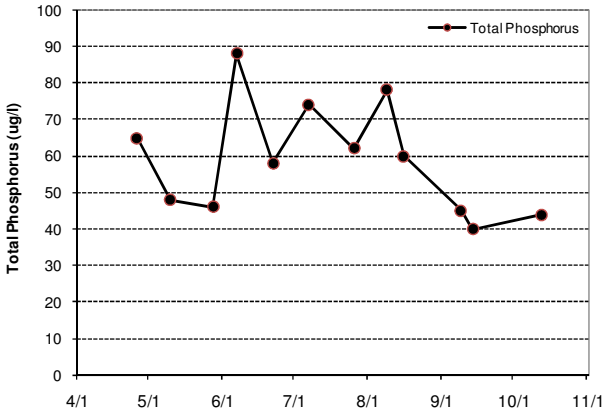
Parameter	***Mean***	***Minimum***	***Maximum***	***Grade***
TP (µg/l)	59.9	40.0	88.0	C
CLA (µg/l)	33.3	17.0	64.0	C
Secchi (m)	0.8	0.5	1.1	D
TKN (mg/l)	1.19	0.85	2.00	
			Lake Grade	C

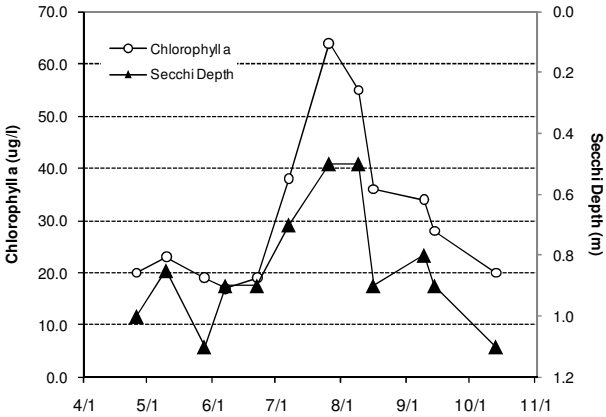
The lake received a C lake grade in 2010, which is consistent with its historical database over the past decade.

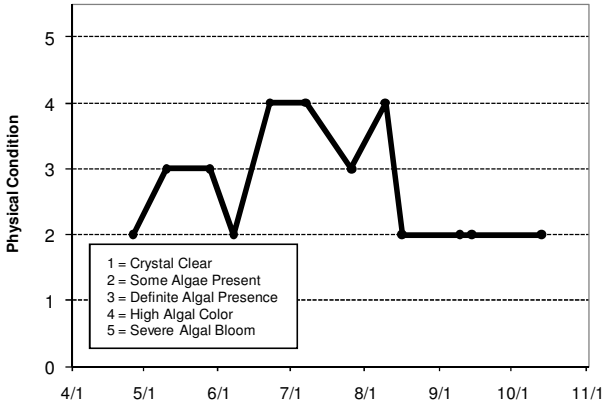
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

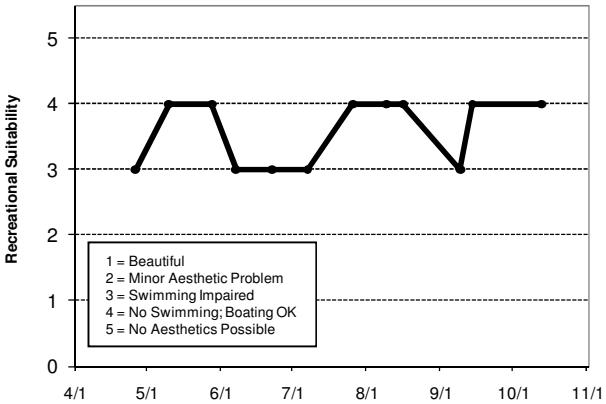
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/26	14.2				20.0	65		1.0	2	3
5/10	13.8				23.0	48		0.9	3	4
5/28	23.2				19.0	46		1.1	3	4
6/7	21.9				17.0	88		0.9	2	3
6/22	24.8				19.0	58		0.9	4	3
7/7	26.8				38.0	74		0.7	4	3
7/26	26.9				64.0	62		0.5	3	4
8/9	27.6				55.0	78		0.5	4	4
8/16	24.4				36.0	60		0.9	2	4
9/9	18.8				34.0	45		0.8	2	3
9/14	19.5				28.0	40		0.9	2	4
10/13	15.8				20.0	44		1.1	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
Total Phosphorus	D	C	D	D			C
Chlorophyll a	B	C	C	C			C
Secchi Depth	C	D	F	F			D
Lake Grade	**C**	**C**	**D**	**D**		**NA**	**C**

Source: Metropolitan Council and STORET data

Shady Oak Lake (27-0089-02) *City of Minnetonka*

Shady Oak Lake is located in the City of Minnetonka (Hennepin County). It has a maximum depth of 10.7 m (35 feet). The lake has 3 distinct basins. The monitoring for 2010 occurred in the middle basin, which is also the deepest basin.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	17.7	10.0	48.0	A
CLA (µg/l)	3.5	1.9	4.9	A
Secchi (m)	3.6	2.6	4.2	A
TKN (mg/l)	0.56	0.38	0.67	
			Lake Grade	A

The lake received a lake grade of A in 2010. 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.

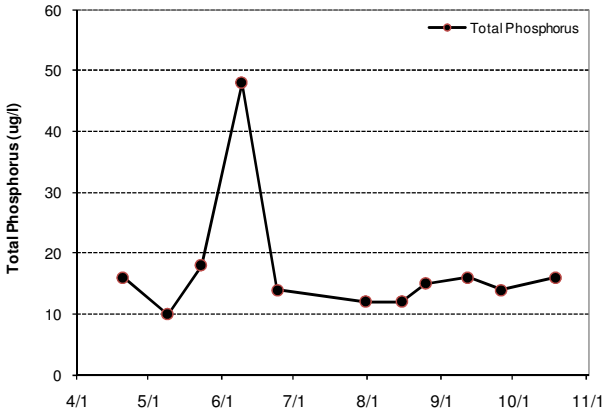
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

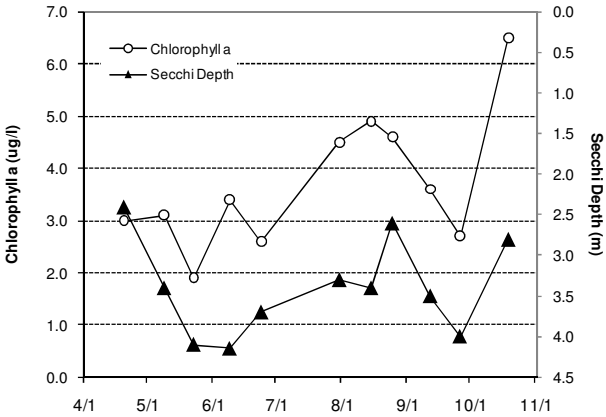
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Shady Oak Lake
Minnetonka, Hennepin Co.

Lake ID: 270089-02
WD: Nine Mile Creek
Volunteer: Nina Norum

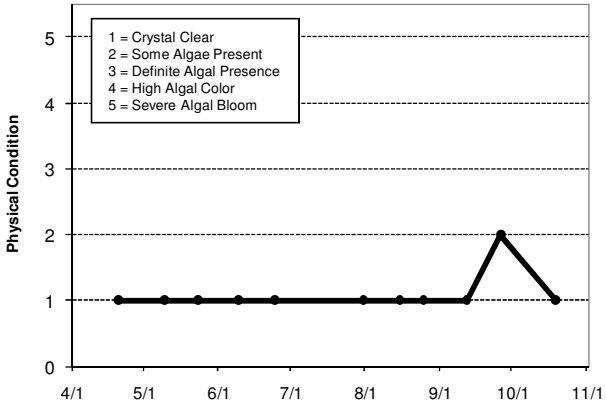
● Sampling site
Contours in meters





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20	19.2				3.0	16		2.4	1	1
5/9	15.1				3.1	10		3.4	1	1
5/23	23.8				1.9	18		4.1	1	2
6/9					3.4	48		4.2	1	1
6/24	26.1				2.6	14		3.7	1	1
7/31	26.8				4.5	12		3.3	1	
8/15	27.3				4.9	12		3.4	1	1
8/25	26.4				4.6	15		2.6	1	1
9/12	20.6				3.6	16		3.5	1	1
9/26	18.7				2.7	14		4.0	2	1
10/19	14.8				6.5	16		2.8	1	1



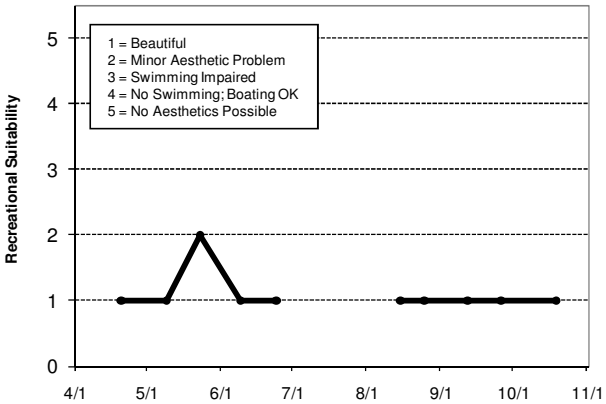
Lake Water Quality Grades Based on Summertime Averages

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												
Chlorophyll a												
Secchi Depth					A	A						
Lake Grade												

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

Source: Metropolitan Council and STORET data



Silver Lake [Washington County] (82-0016) *Carnelian - Marine Watershed District*

Silver Lake is a 98-acre lake located within Stillwater Township (Washington County). The maximum and mean depths of the lake are 3.4 m (11 ft) and 1.7 m (5.6 ft), respectively. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
Secchi (m)	1.6	1.4	1.8	C

The lake received a Secchi grade of C for 2010. The water quality database shows that the lake has varied in range from B to D grades since 1996. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

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

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

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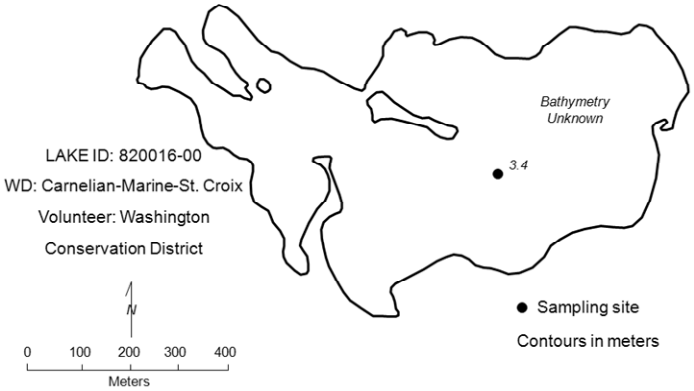
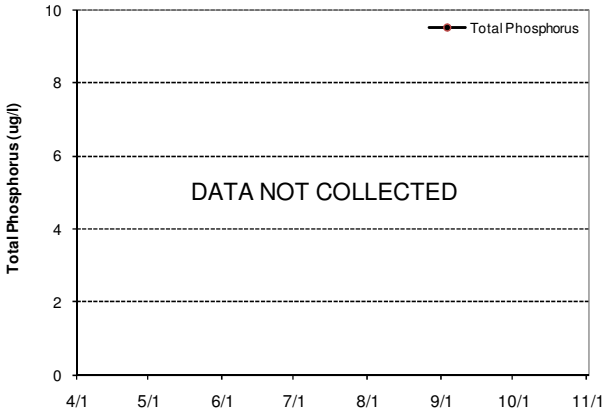
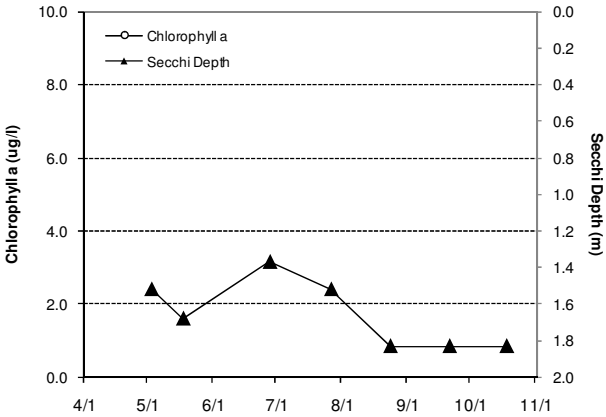
Silver Lake
Stillwater Twp., Washington Co.

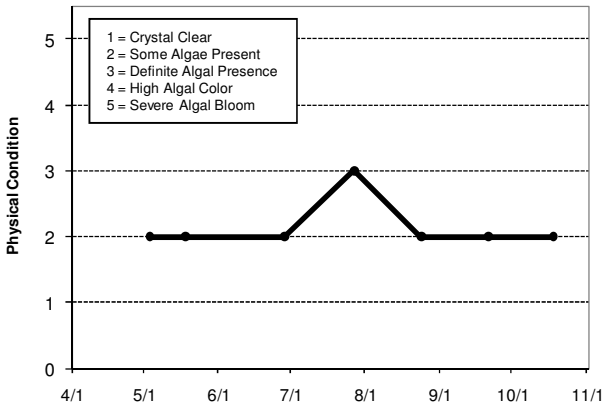






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/3	14.7	14.7	10.5	3.0				1.5	2	3
5/18	21.2	14.5	11.3	10.3				1.7	2	3
6/28	24.4	20.5	9.1	0.1				1.4	2	3
7/27	28.3	23.7	9.8	0.6				1.5	3	4
8/24	26.1	24.1	8.4	0.1				1.8	2	2
9/21	18.0	16.6	7.9	2.2				1.8	2	2
10/18	13.5	13.1	9.5	5.0				1.8	2	3



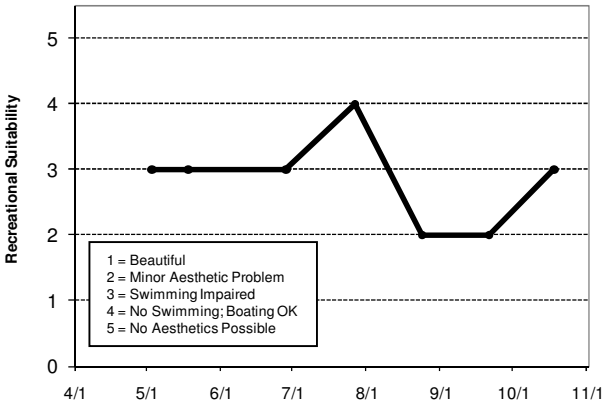
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



South Oak Lake (27-0661) *City of St. Louis Park*

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

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	56.9	18.0	185.0	C
CLA (µg/l)	14.1	3.6	29.0	B
Secchi (m)				
TKN (mg/l)	0.91	0.66	1.20	
			Lake Grade	

The summer-time mean Secchi depth was not calculated because the Secchi disk was visible on the lake bottom for most monitoring events. Therefore a lake grade could not be determined. This year's CLA grade of B was the best grade received for this lake according to its historical water quality database. Continued monitoring is suggested to determine if this may be a start 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.

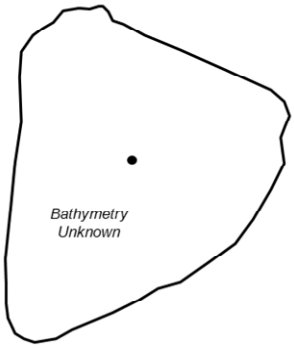
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

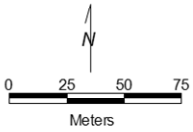
South Oak Lake

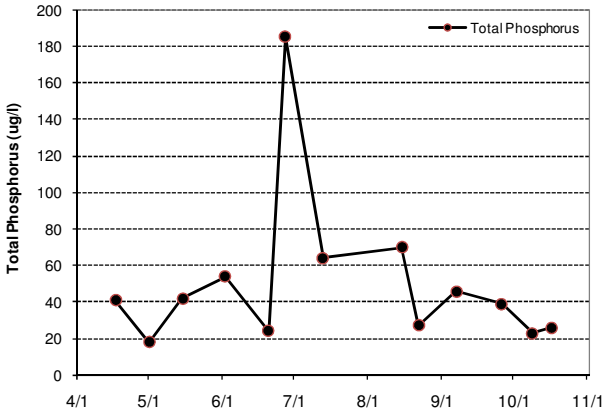
St. Louis Park, Hennepin Co.

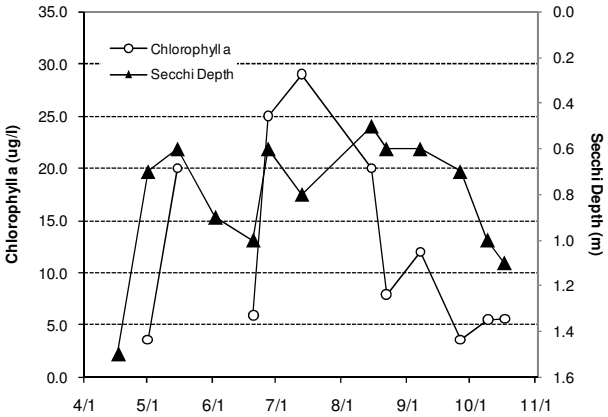
Lake ID: 270661-00
WD: Minnehaha Creek
Volunteers: The Gerlachs

● Sampling site
Contours in meters





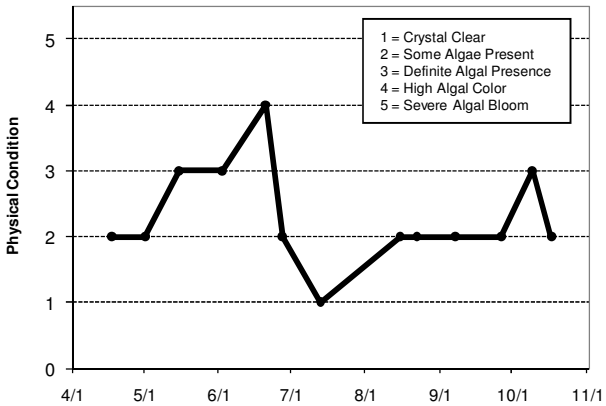




2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/17	16.0					41		1.5	2	5
5/1	15.5				3.6	18		0.7+	2	5
5/15	19.3				20.0	42		0.6+	3	5
6/2	22.3					54		0.9+	3	5
6/20					5.9	24		1.0	4	5
6/27					25.0	185		0.6	2	5
7/13	26.0				29.0	64		0.8	1	5
8/15	26.0				20.0	70		0.5+	2	5
8/22	29.5				7.9	27		0.6+	2	5
9/7	19.0				12.0	46		0.6+	2	5
9/26	17.0				3.6	39		0.7+	2	5
10/9	16.0				5.5	23		1.0+	3	5
10/17	14.0				5.6	26		1.1+	2	5

+ Secchi Disk visible on lake bottom



Lake Water Quality Grades Based on Summertime Averages

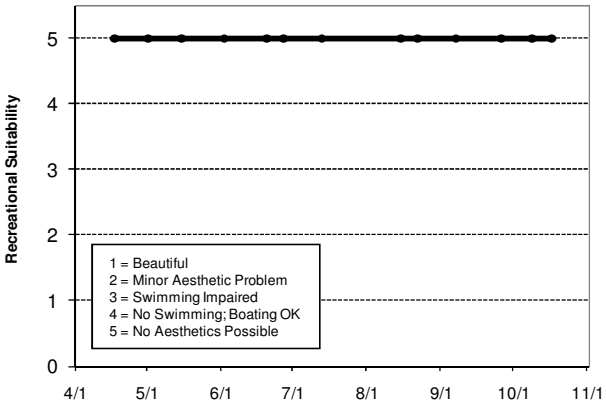
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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

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

+ Secchi Disk visible on lake bottom

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	59.0	21.0	107.0	C
CLA (µg/l)	45.8	4.1	100.0	C
Secchi (m)	1.7	0.5	3.8	C
TKN (mg/l)	1.40	0.55	2.20	
			Lake Grade	C

The lake received a lake grade of B for 2009, which is consistent with its historical water quality database. Except for last year's B lake grade, the lake has consistently received C lake grades during monitoring years since 1995.

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

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

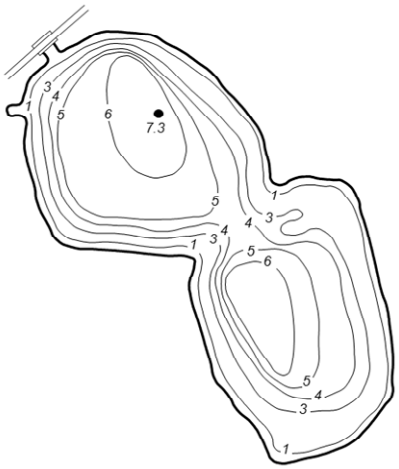
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

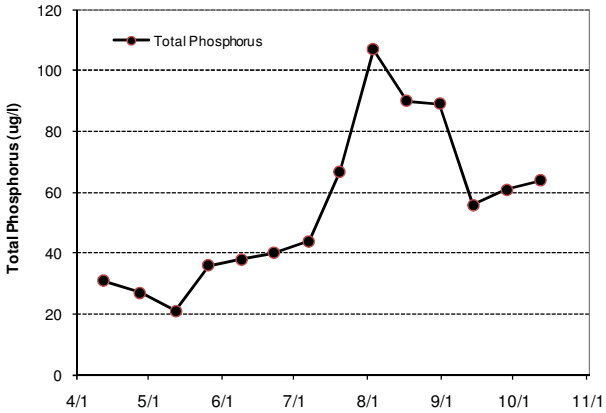
South School Section Lake,
Hugo, Washington Co.

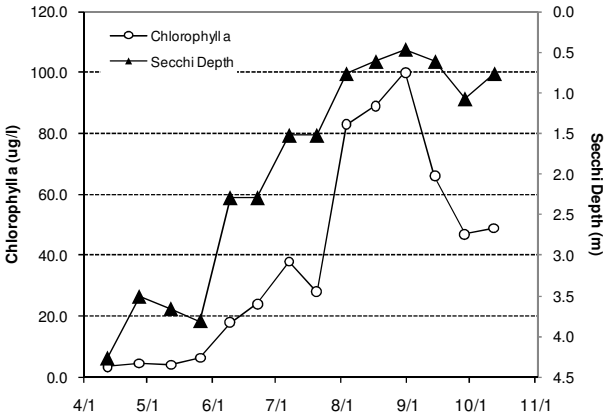
Lake ID: 820151-00
WD: Browns Creek
Volunteer: Washington Conservation District

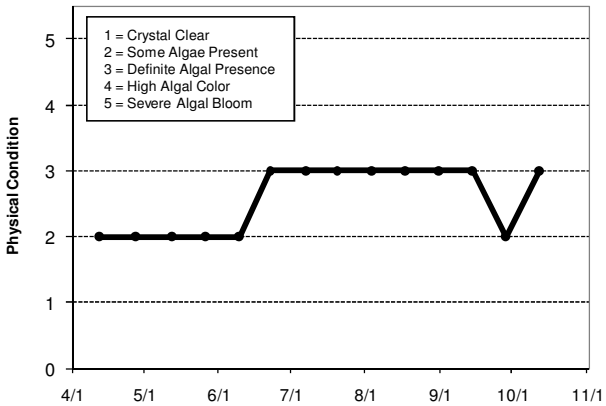
● Sampling site

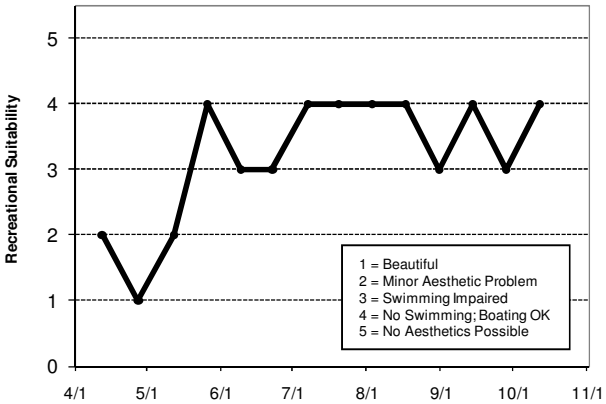
Contours in meters











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	12.4	11.2	11.6	0.1	3.5	31		4.3	2	2
4/27	14.5	13.8	9.4	9.2	4.5	27		3.5	2	1
5/12	11.8	11.8	9.8	9.4	4.1	21		3.7	2	2
5/26	22.8	17.2	9.6	9.7	6.4	36		3.8	2	4
6/9	21.2	18.6	8.1	0.1	18.0	38		2.3	2	3
6/22	23.8	19.9	10.4	0.1	24.0	40		2.3	3	3
7/7	26.7	20.1	9.6	0.1	38.0	44		1.5	3	4
7/20	26.7	22.3	8.2	0.1	28.0	67		1.5	3	4
8/3	27.0	23.0	10.6	0.1	83.0	107		0.8	3	4
8/17	23.8	23.7	6.6	0.1	89.0	90		0.6	3	4
8/31	25.1	24.0	8.7	0.0	100.0	89		0.5	3	3
9/14	18.5	18.4	9.0	0.1	66.0	56		0.6	3	4
9/28	15.5	15.5	8.5	0.2	47.0	61		1.1	2	3
10/12	17.3	14.9	10.6	0.1	49.0	64		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				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
Total Phosphorus		C	C	C	C	C	C
Chlorophyll a		C	C	C	B	B	C
Secchi Depth		B	C	C	C	B	C
Lake Grade		**C**	**C**	**C**	**C**	**B**	**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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	37.2	32.0	43.0	C
CLA (µg/l)	7.8	4.6	14.0	A
Secchi (m)	2.2	1.8	2.6	B
TKN (mg/l)	1.20	1.00	1.40	
			Lake Grade	B

The lake received a lake grade of B for 2010, which is the best lake grade the lake has received according to its water quality database. This year's CLA and Secchi grades of A and B, respectively, are the best grades received thus far as well. Further monitoring is suggested to determine if this year's improvement is an indication of potential 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.

South Twin Lake
Stillwater Twp., Washington Co.

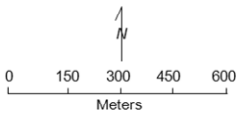
LAKE ID: 820019-00

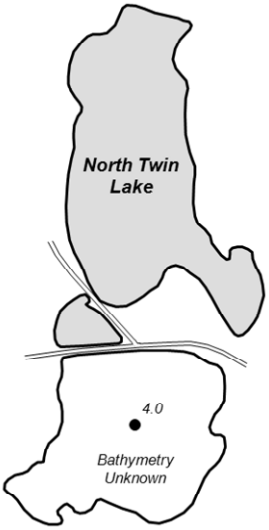
WD: Carnelian-Marine-St. Croix

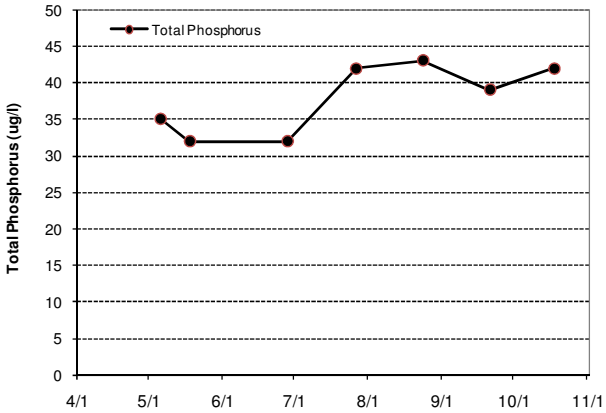
Volunteer: Washington Conservation District

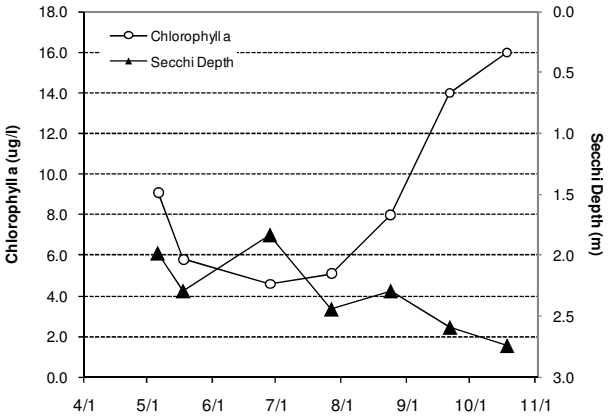
● Sampling site

Contours in meters



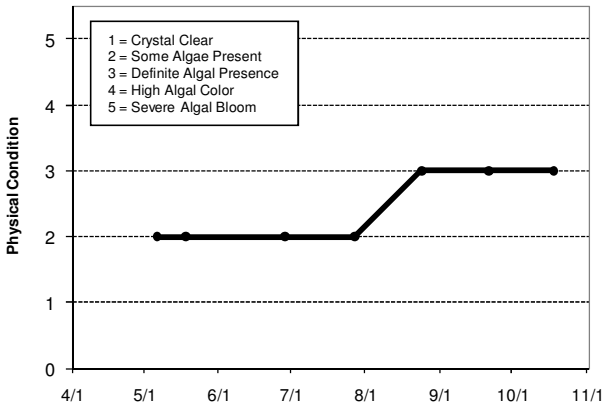






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/6	14.2	13.3	10.6	10.7	9.1	35		2.0	2	4
5/18	21.1	14.8	11.7	21.7	5.8	32		2.3	2	4
6/28	24.7	20.9	10.4	0.1	4.6	32		1.8	2	2
7/27	29.8	23.9	9.0	0.1	5.1	42		2.4	2	4
8/24	25.3	24.1	5.5	0.1	8.0	43		2.3	3	4
9/21	17.6	16.9	9.0	0.2	14.0	39		2.6	3	4
10/18	13.9	13.8	10.5	0.1	16.0	42		2.7	3	4



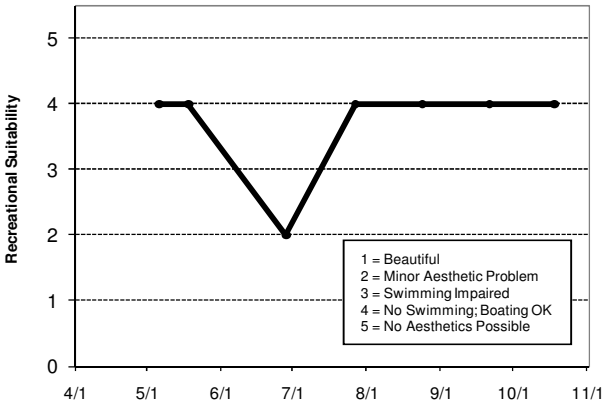
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



Spring Lake (70-0054) *Prior Lake - Spring Lake Watershed District*

Spring Lake is located in Spring Lake Township (Scott County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value (METC 2007). The lake has a surface area of 630 acres. The maximum and mean depths of the lake are 11.3 and 5.6 m (37 and 18 feet), respectively.

In an attempt to improve the lake's water quality, a ferric chloride ($FeCl_3$) 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	68.6	28.0	152.0	D
CLA (µg/l)	36.4	6.0	82.0	C
Secchi (m)	0.9	0.5	2.3	D
TKN (mg/l)	1.90	0.86	2.80	
			Lake Grade	D

The lake received a lake grade of D in 2010. 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.

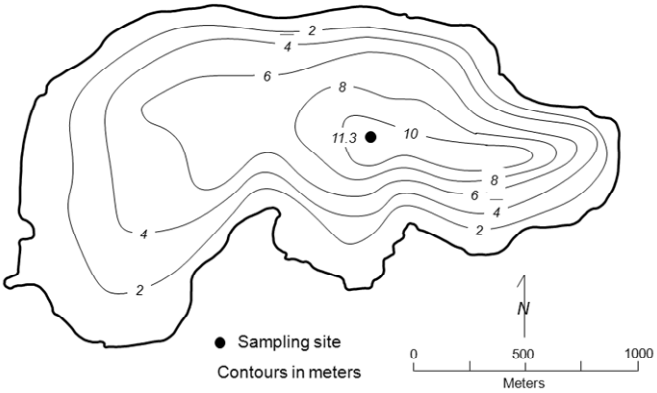
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

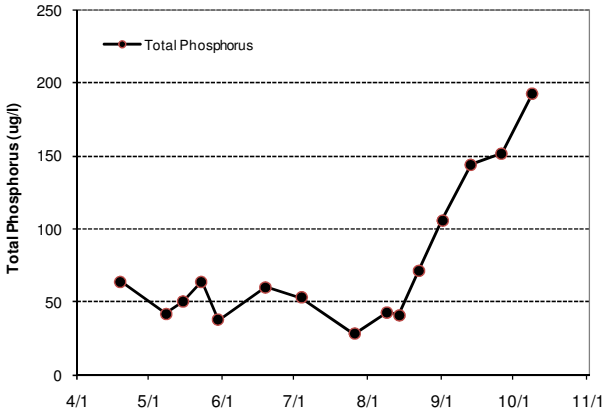
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

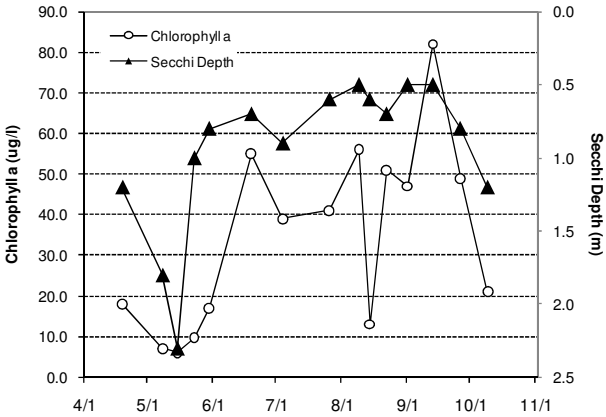
Spring Lake

Prior Lake/Spring Lake Twp., Scott Co.

Lake ID: 700054-00
WD: Prior Lake-Spring Lake
Volunteer: Jim Weninger

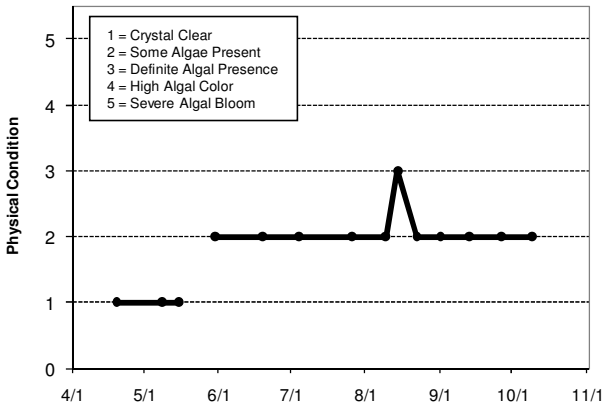






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	14.4				18.0	64		1.2	1	1
5/8	15.5				7.0	42		1.8	1	1
5/15	14.9				6.0	50		2.3	1	1
5/23	19.8				9.7	64		1.0		
5/30	23.8				17.0	38		0.8	2	2
6/19	22.4				55.0	60		0.7	2	1
7/4	25.5				39.0	53		0.9	2	2
7/26	27.5				41.0	28		0.6	2	2
8/9	30.5				56.0	43		0.5	2	2
8/14	27.0				13.0	41		0.6	3	2
8/22	26.7				51.0	71		0.7	2	2
9/1	24.5				47.0	106		0.5	2	1
9/13	19.5				82.0	144		0.5	2	1
9/26	16.7				49.0	152		0.8	2	2
10/9	18.0				21.0	193		1.2	2	



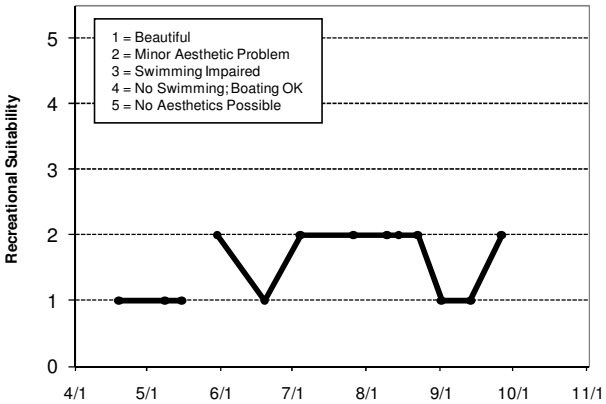
Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

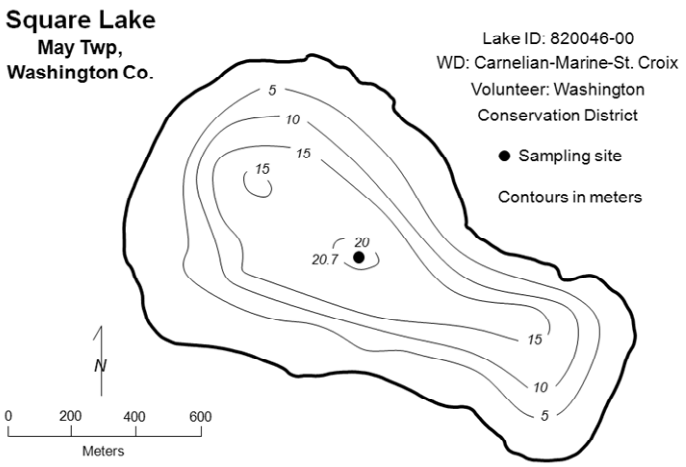
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	13.3	8.0	21.0	A
CLA (µg/l)	3.8	2.4	5.9	A
Secchi (m)	5.3	3.7	7.6	A
TKN (mg/l)	0.54	0.37	0.70	
			Lake Grade	A

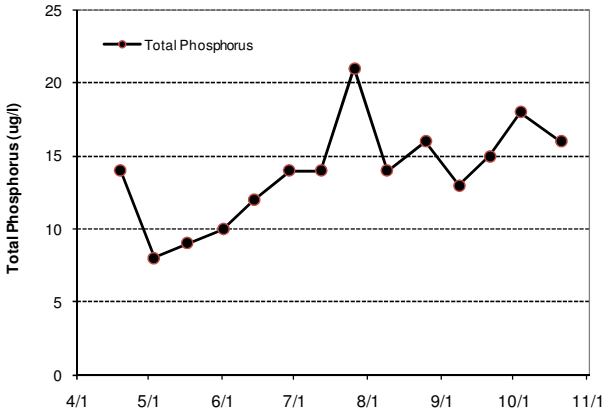
The lake continues to receive A lake grades. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends for this outstanding water resource

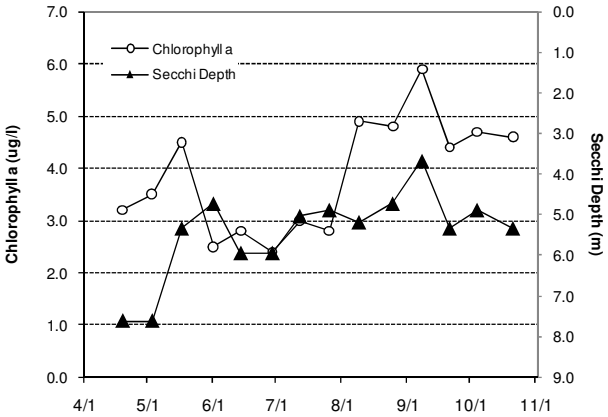
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.

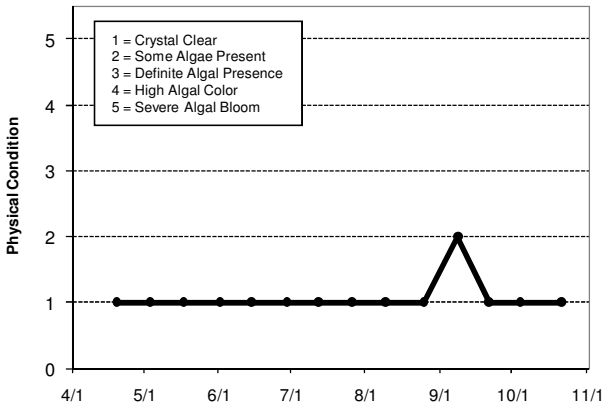






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	12.5	5.0	11.8	0.0	3.2	14		7.6	1	1
5/3	13.6	5.4	11.5	0.0	3.5	8		7.6	1	1
5/17	15.7	5.6	12.1	0.0	4.5	9		5.3	1	1
6/1	23.3	6.0	9.7	0.1	2.5	10		4.7	1	1
6/14	19.5	5.9	9.4	0.0	2.8	12		5.9	1	1
6/29	23.9	6.2	9.3	0.1	2.4	14		5.9	1	1
7/12	26.1	6.2	8.0	0.0	3.0	14		5.0	1	1
7/26	26.8	6.7	8.9	0.0	2.8	21		4.9	1	1
8/9	27.9	6.4	7.7	0.1	4.9	14		5.2	1	1
8/25	24.7	6.4	9.5	0.1	4.8	16		4.7	1	1
9/8	19.7	6.8	8.3	0.0	5.9	13		3.7	2	1
9/21	17.8	7.0	8.2	0.1	4.4	15		5.3	1	1
10/4	15.7	6.9	9.2	0.1	4.7	18		4.9	1	1
10/21	13.8	7.1	9.0	0.1	4.6	16		5.3	1	1



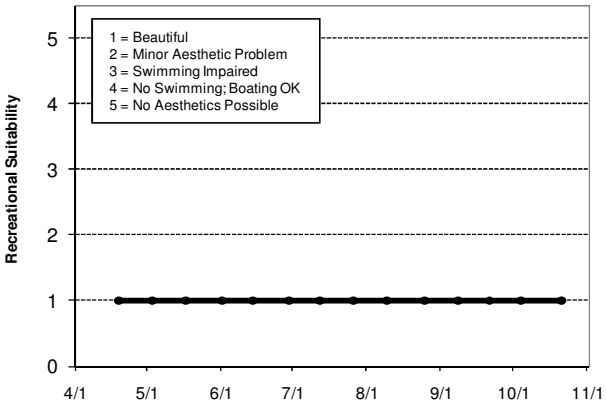
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	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
Total Phosphorus	A	A	A	A			A
Chlorophyll a	A	A	A	A			A
Secchi Depth	A	A	A	A	A	A	A
Lake Grade	**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 2010. 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 2010 was the sixth 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	56	23	95	C
CLA (µg/l)	17	5	41	B
Secchi (m)	1.4	0.8	3.0	C
TKN (mg/l)	0.96	0.66	1.50	
			Lake Grade	C

The whole lake received a lake grade of C for 2010, 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*
Total Phosphorus	D	D	C	C			C	C	C	C	B	C
Chlorophyll a	B	C	C	C			B	B	C	B	C	B
Secchi Depth	C	C	C	C			C	C	C	C	C	C
Overall	**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/.

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

St. Croix Lake [Bayport Pool-Site 1] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Bayport Pool-Site 1] was monitored 12 times in 2010. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

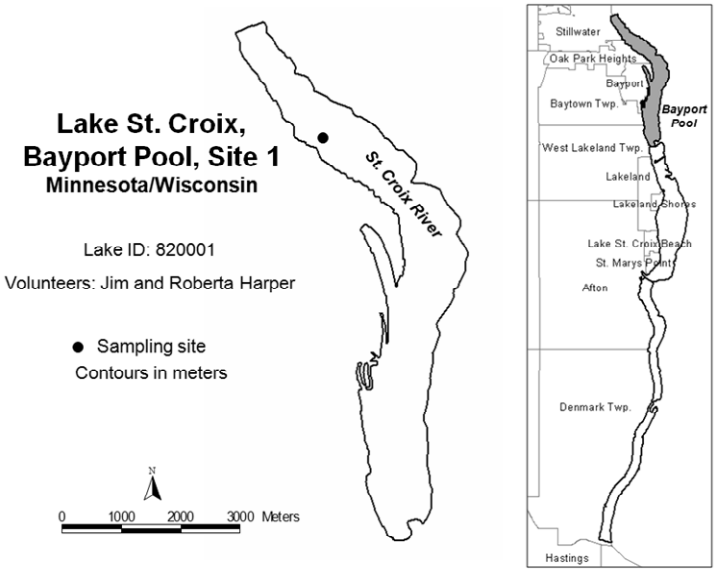
2010 summer (May-September) data summary

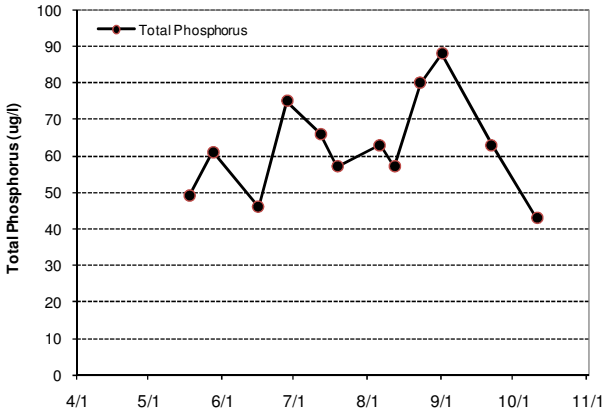
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	64	46	88	C
CLA (µg/l)	22	11	37	C
Secchi (m)	1.1	0.8	1.6	D
TKN (mg/l)	1.03	0.74	1.20	
			Lake Grade	C

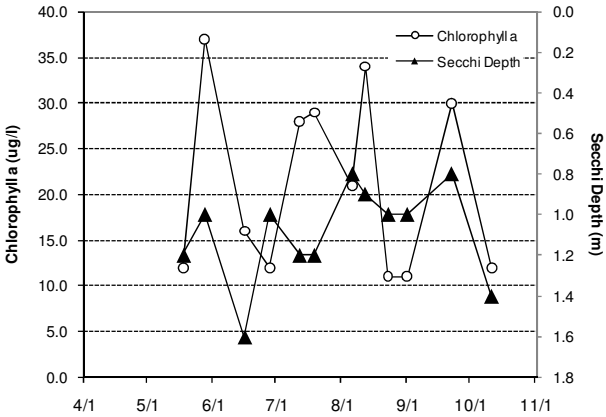
This lake site received a lake grade of C for 2010, which is the second year that Site #1 was enrolled in the CAMP. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

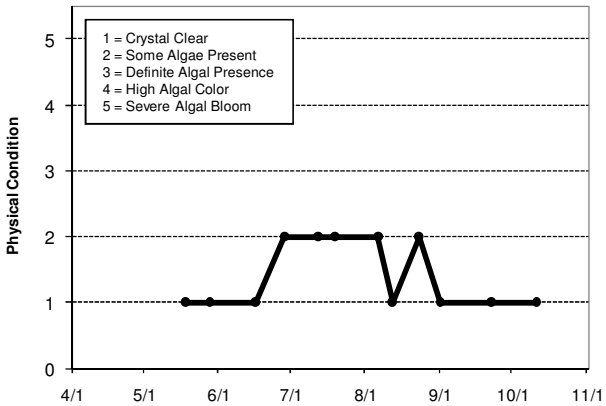






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/18	18.0				12.0	49		1.2	1	1
5/28	25.6				37.0	61		1.0	1	1
6/16	20.8				16.0	46		1.6	1	1
6/28	24.3				12.0	75		1.0	2	1
7/12	27.7				28.0	66		1.2	2	1
7/19	27.2				29.0	57		1.2	2	1
8/6	26.7				21.0	63		0.8	2	1
8/12	29.8				34.0	57		0.9	1	1
8/23	24.3				11.0	80		1.0	2	1
9/1	25.3				11.0	88		1.0	1	1
9/22	16.9				30.0	63		0.8	1	1
10/11	15.7				12.0	43		1.4	1	1



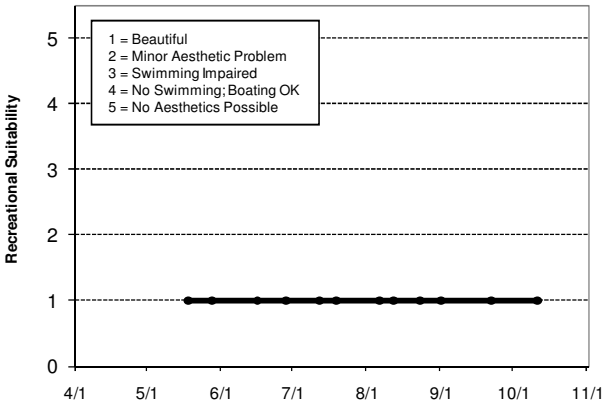
Lake Water Quality Grades Based on Summertime Averages

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												
Chlorophyll a												
Secchi Depth												
Lake Grade												

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

Source: Metropolitan Council and STORET data



St. Croix Lake [Bayport Pool-Site 2] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Bayport Pool-Site 2] was monitored 12 times in 2010. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	68	43	95	C
CLA (µg/l)	18	8.4	41	B
Secchi (m)	1.1	1.0	1.4	D
TKN (mg/l)	1.07	0.76	1.40	
			Lake Grade	C

The pool received a lake grade of C for 2010, which is similar to lake grades received in the past. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

Lake St. Croix, Bayport Pool, Site 2

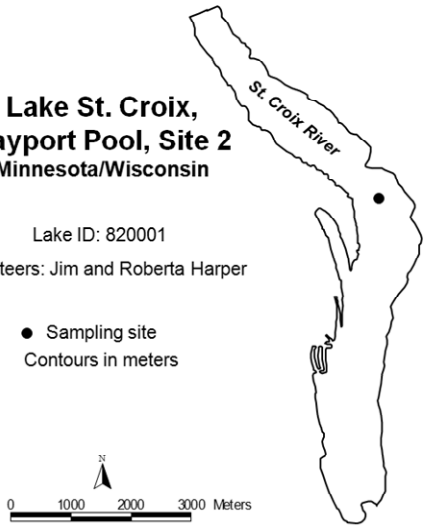
Minnesota/Wisconsin

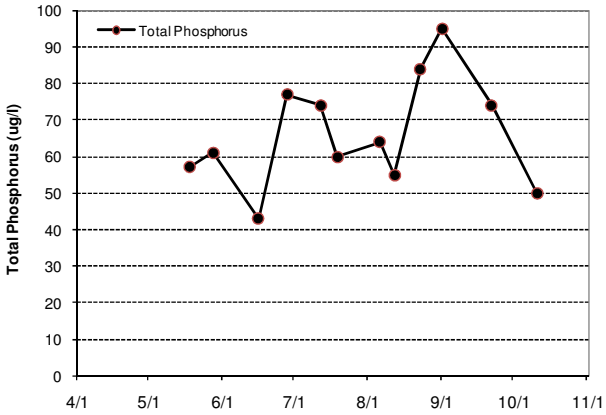
Lake ID: 820001

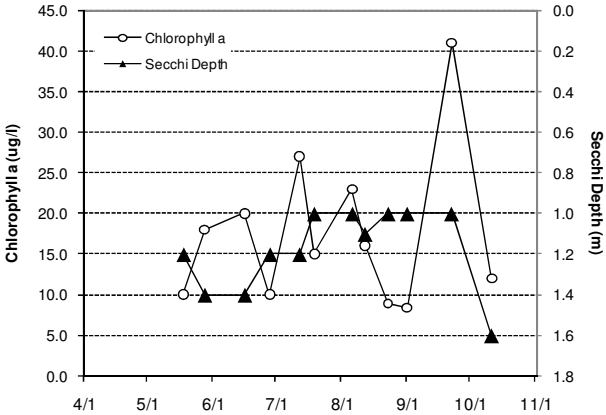
Volunteers: Jim and Roberta Harper

● Sampling site

Contours in meters

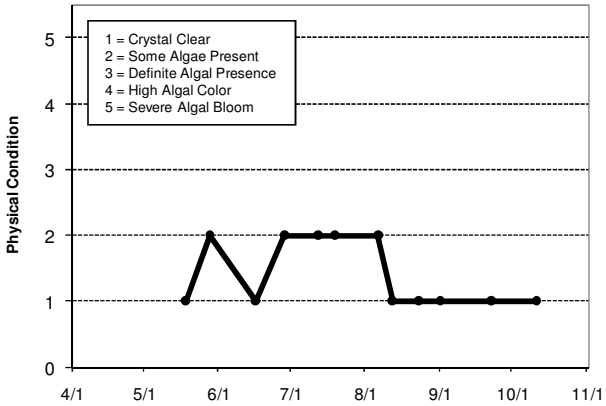






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/18	20.9				10.0	57		1.2	1	1
5/28	26.9				18.0	61		1.4	2	2
6/16	23.6				20.0	43		1.4	1	1
6/28	26.2				10.0	77		1.2	2	1
7/12	28.2				27.0	74		1.2	2	1
7/19	28.1				15.0	60		1.0	2	1
8/6	26.7				23.0	64		1.0	2	1
8/12	29.7				16.0	55		1.1	1	1
8/23	26.7				8.9	84		1.0	1	1
9/1	28.0				8.4	95		1.0	1	1
9/22	22.3				41.0	74		1.0	1	1
10/11	20.6				12.0	50		1.6	1	1



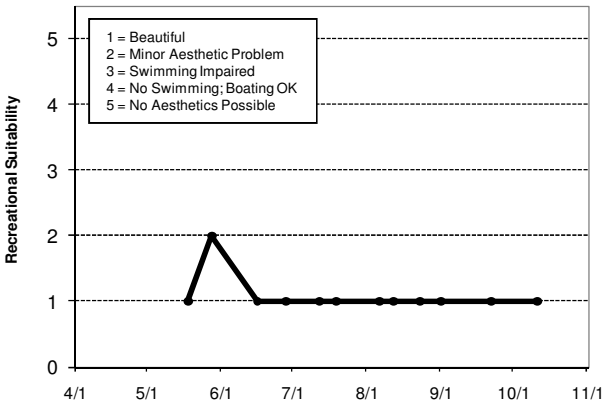
Lake Water Quality Grades Based on Summertime Averages

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

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

Lake St. Croix [Troy Beach Pool-Site 3] was monitored 12 times in 2010. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	59	32	89	C
CLA (µg/l)	17	9.9	35	B
Secchi (m)	1.2	0.8	1.8	C
TKN (mg/l)	0.85	0.66	1.1	
			Lake Grade	C

The site received a lake grade of C for 2010, which is consistent with its historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

Lake St. Croix, Troy Beach Pool, Site 3

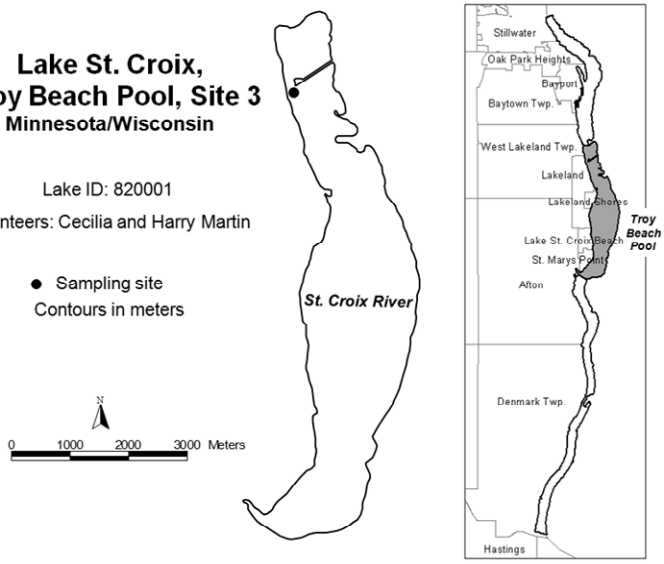
Minnesota/Wisconsin

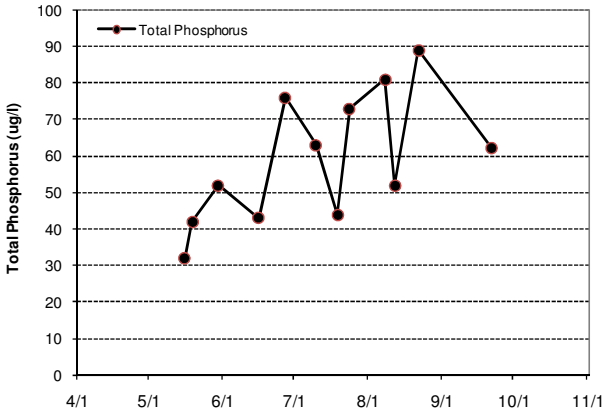
Lake ID: 820001

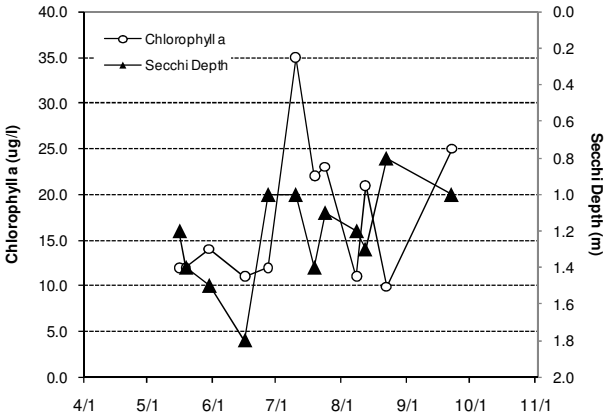
Volunteers: Cecilia and Harry Martin

● Sampling site

Contours in meters

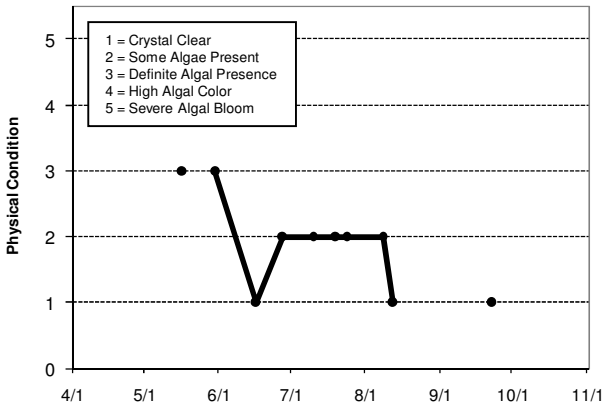






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/16	14.7				12.0	32		1.2	3	2
5/19	17.3				12.0	42		1.4		1
5/30	24.2				14.0	52		1.5	3	2
6/16	20.5				11.0	43		1.8	1	1
6/27	25.6				12.0	76		1.0	2	2
7/10	27.3				35.0	63		1.0	2	2
7/19	26.8				22.0	44		1.4	2	1
7/24	27.1				23.0	73		1.1	2	2
8/8	25.9				11.0	81		1.2	2	2
8/12	28.5				21.0	52		1.3	1	1
8/22	23.7				9.9	89		0.8		
9/22	18.4				25.0	62		1.0	1	1



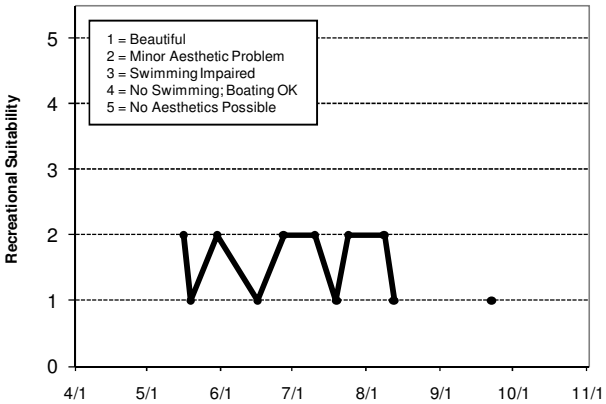
Lake Water Quality Grades Based on Summertime Averages

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	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
Total Phosphorus		C	C	C	C	B	C
Chlorophyll a		B	B	C	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



St. Croix Lake [Troy Beach Pool-Site 4] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Troy Beach Pool-Site 4] was monitored 6 times in 2010. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	60	39	86	C
CLA (µg/l)	18	11	31	B
Secchi (m)	1.4	1.2	1.8	C
TKN (mg/l)	0.95	0.88	1.00	
			Lake Grade	C

The site received a lake grade of C, which is consistent with its historical water quality database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

Lake St. Croix, Troy Beach Pool, Site 4

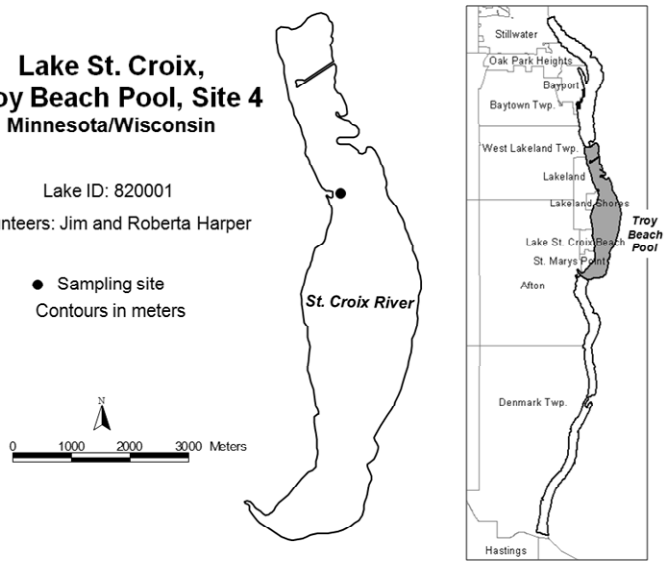
Minnesota/Wisconsin

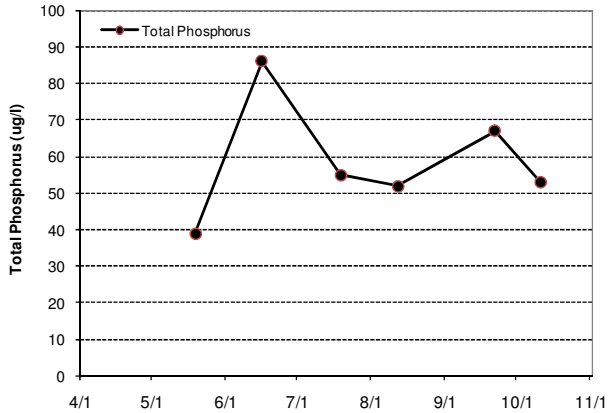
Lake ID: 820001

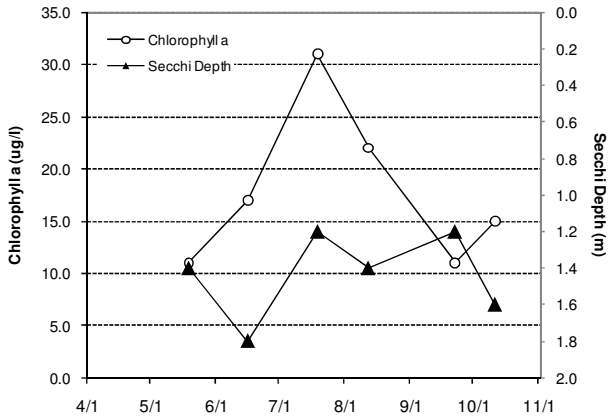
Volunteers: Jim and Roberta Harper

● Sampling site

Contours in meters

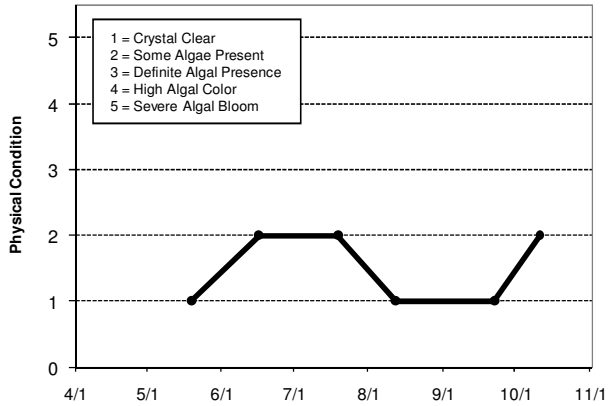






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/19	17.6				11.0	39		1.4	1	1
6/16	21.5				17.0	86		1.8	2	1
7/19	27.1				31.0	55		1.2	2	2
8/12	28.5				22.0	52		1.4	1	1
9/22	19.0				11.0	67		1.2	1	1
10/11	17.3				15.0	53		1.6	2	2



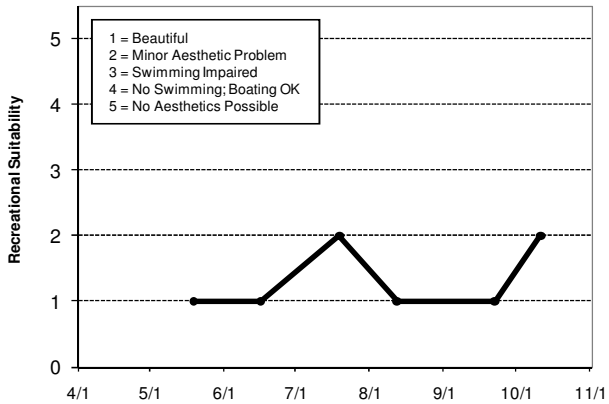
Lake Water Quality Grades Based on Summertime Averages

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								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
Total Phosphorus		C	C	C	C	B	C
Chlorophyll a		B	B	C	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



St. Croix Lake [Troy Beach Pool-Site 5] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Troy Beach Pool-Site 5] was monitored 15 times in 2010. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	52	23	92	C
CLA (µg/l)	16	4.6	31	B
Secchi (m)	1.5	0.8	2.5	C
TKN (mg/l)	0.93	0.76	1.20	
			Lake Grade	C

The site received a lake grade of C, which is consistent with its historical water quality database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

Lake St. Croix, Troy Beach Pool, Site 5

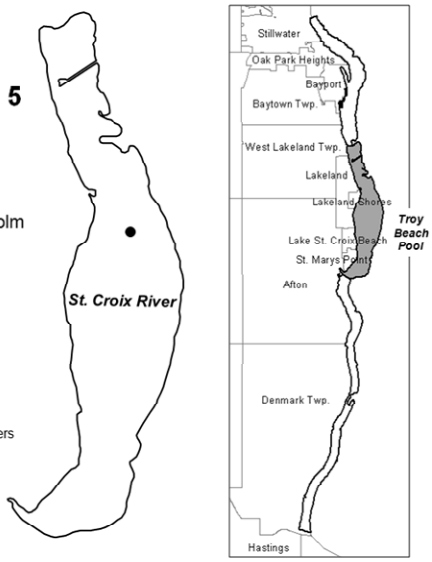
Minnesota/Wisconsin

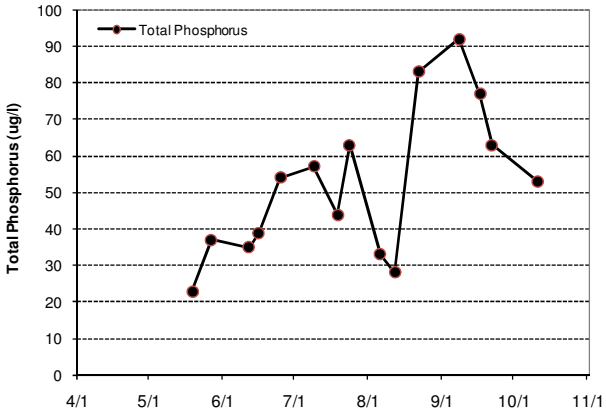
Lake ID: 820001

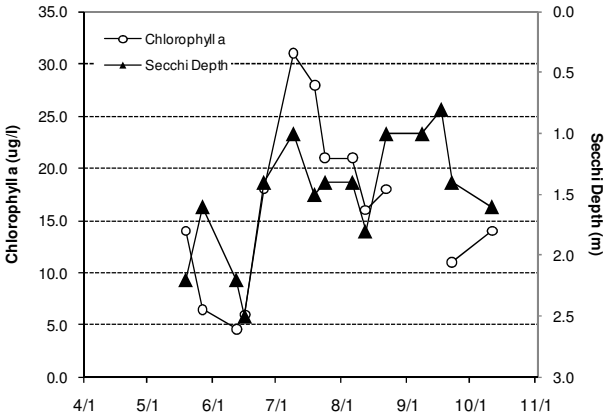
Volunteers: Richard & Sheryl Lindholm

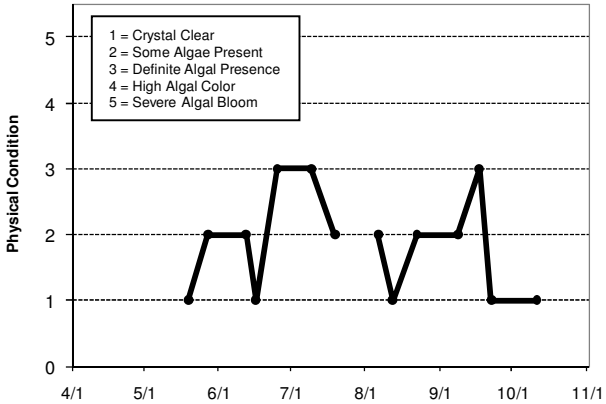
● Sampling site

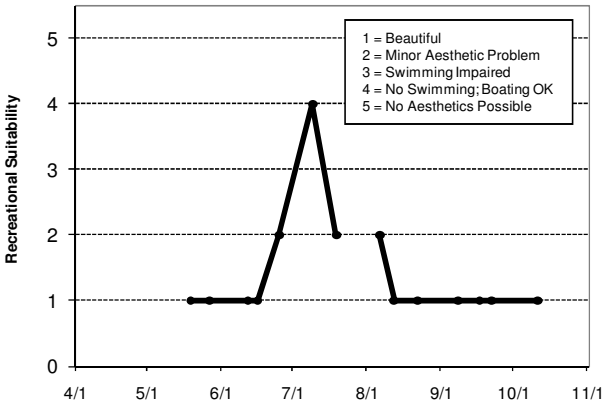
Contours in meters











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/19	19.1				14.0	23		2.2	1	1
5/27	24.2				6.5	37		1.6	2	1
6/12	21.1				4.6	35		2.2	2	1
6/16	21.8				6.0	39		2.5	1	1
6/25	24.5				18.0	54		1.4	3	2
7/9	26.8				31.0	57		1.0	3	4
7/19	27.7				28.0	44		1.5	2	2
7/24	26.4				21.0	63		1.4		
8/6	27.5				21.0	33		1.4	2	2
8/12	29.0				16.0	28		1.8	1	1
8/22	26.6				18.0	83		1.0	2	1
9/8	21.8					92		1.0	2	1
9/17	18.5					77		0.8	3	1
9/22	19.3				11.0	63		1.4	1	1
10/11	19.0				14.0	53		1.6	1	1

Lake Water Quality Grades Based on Summertime Averages

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

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

St. Croix Lake [Black Bass Pool-Site 6] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Black Bass Pool-Site 6] was monitored 16 times in 2010. On each sampling day the lake was monitored for TP, CLA, TKN, and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data and graphs appear on the next page.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	52	24	88	C
CLA (µg/l)	15	8	28	B
Secchi (m)	1.7	1.0	2.6	C
TKN (mg/l)	1.00	0.67	1.50	
			Lake Grade	C

The site received a lake grade of C for 2010. The TP grade returned to a more typical C grade this year, compared to last year's A grade. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

Lake St. Croix, Black Bass Pool, Site 6

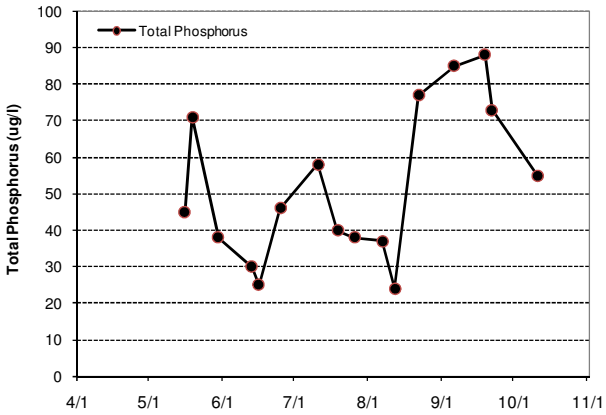
Minnesota/Wisconsin

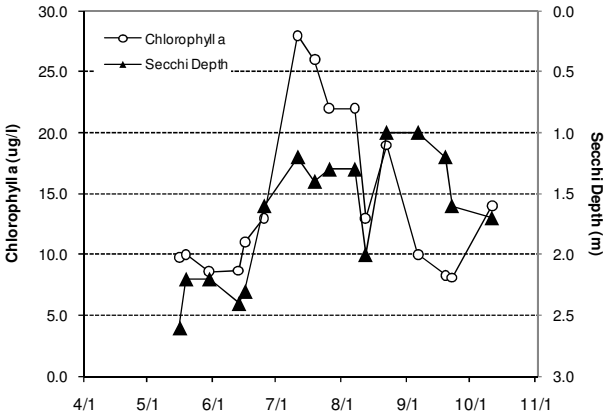
Lake ID: 820001

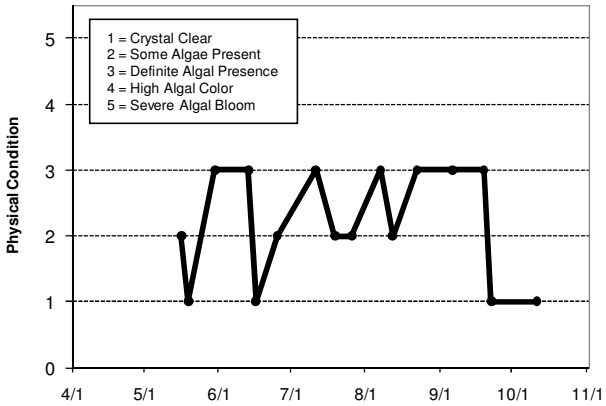
Volunteer: Rick Meierotto

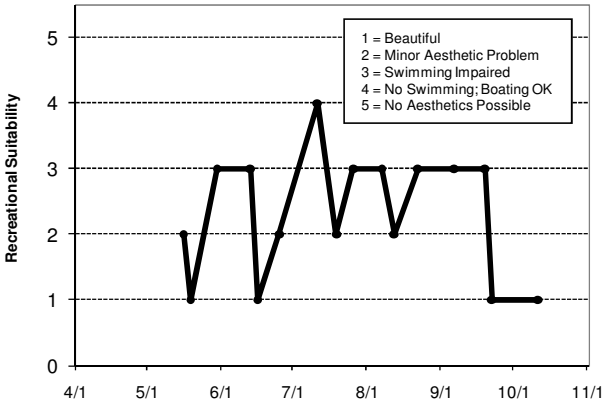
● Sampling site

Contours in meters









2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/16	16.1				9.8	45		2.6	2	2
5/19	20.7				10.0	71		2.2	1	1
5/30	23.4				8.6	38		2.2	3	3
6/13	21.2				8.7	30		2.4	3	3
6/16	22.3				11.0	25		2.3	1	1
6/25	23.2				13.0	46		1.6	2	2
7/11	25.3				28.0	58		1.2	3	4
7/19	27.0				26.0	40		1.4	2	2
7/26	27.7				22.0	38		1.3	2	3
8/7	26.4				22.0	37		1.3	3	3
8/12	28.2				13.0	24		2.0	2	2
8/22	25.2				19.0	77		1.0	3	3
9/6	21.0				10.0	85		1.0	3	3
9/19	18.9				8.3	88		1.2	3	3
9/22	19.2				8.1	73		1.6	1	1
10/11	17.9				14.0	55		1.7	1	1

Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data

St. Croix Lake [Kinnickinnic Pool-Site 7] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Kinnickinnic Pool-Site 7] was monitored 13 times in 2010. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	43	24	70	C
CLA (µg/l)	15	5.3	33	B
Secchi (m)	1.7	1.2	3.0	C
TKN (mg/l)	0.90	0.73	1.10	
			Lake Grade	C

The site received a lake grade of C for 2010. The TP grade returned to a more typical C grade this year, compared to last year's A grade. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

Lake St. Croix, Kinnickinnic Pool, Site 7

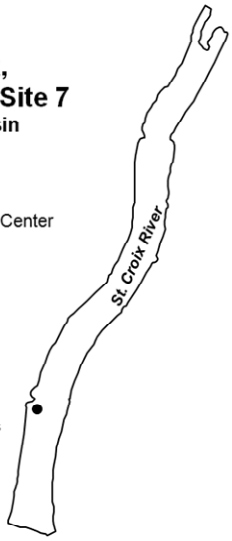
Minnesota/Wisconsin

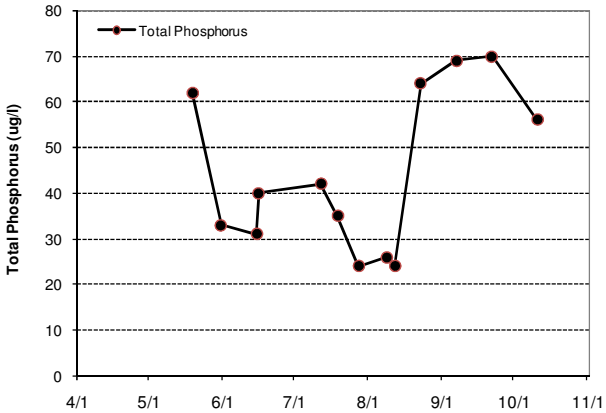
Lake ID: 820001

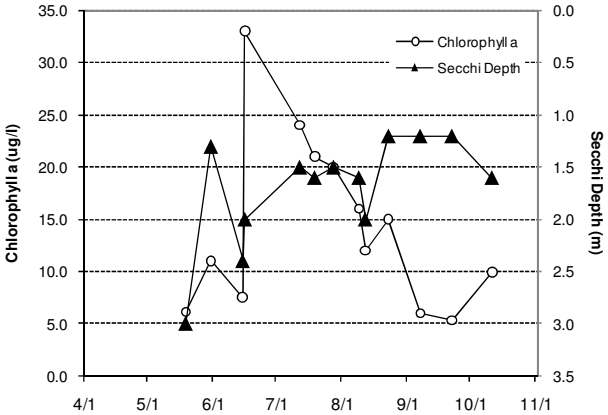
Volunteer: Carpenter Nature Center

● Sampling site

Contours in meters

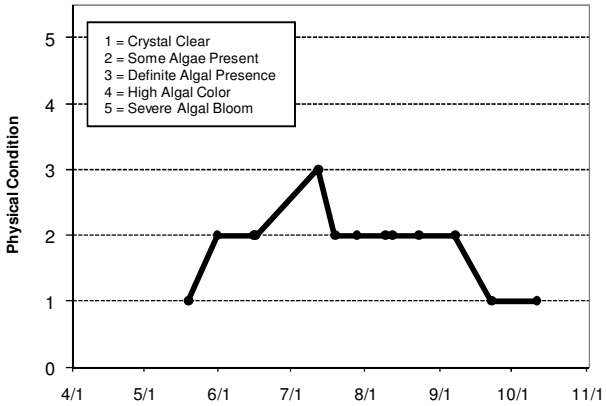






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/19	18.7				6.1	62		3.0	1	1
5/31	25.4				11.0	33		1.3	2	2
6/15	22.3				7.5	31		2.4	2	2
6/16	24.2				33.0	40		2.0	2	1
7/12	25.4				24.0	42		1.5	3	3
7/19	26.9				21.0	35		1.6	2	2
7/28	27.4				20.0	24		1.5	2	2
8/9	31.4				16.0	26		1.6	2	2
8/12	27.3				12.0	24		2.0	2	2
8/23	26.7				15.0	64		1.2	2	2
9/7	21.7				6.0	69		1.2	2	2
9/22	19.7				5.3	70		1.2	1	1
10/11	18.3				9.9	56		1.6	1	1



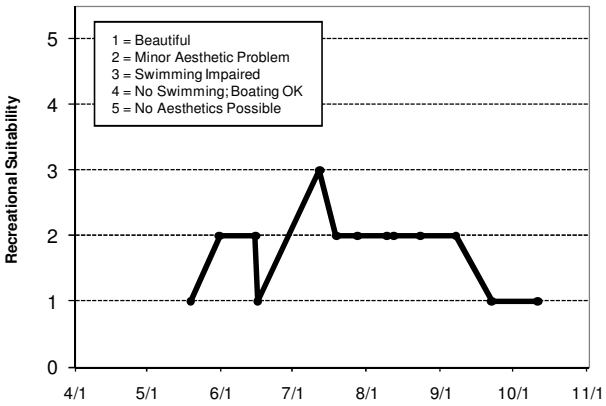
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



St. Joe Lake (10-0011) *City of Chanhassen*

St. Joe Lake is a 14-acre lake located within the City of Chanhassen (Carver County). It has a maximum depth of 15.9 m (52 ft).

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	20.4	10.0	25.0	A
CLA (µg/l)	8.4	2.1	15.0	A
Secchi (m)	2.3	1.4	3.6	B
TKN (mg/l)	0.79	0.60	0.91	
			Lake Grade	A

The lake received a lake grade of A for 2010, 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.

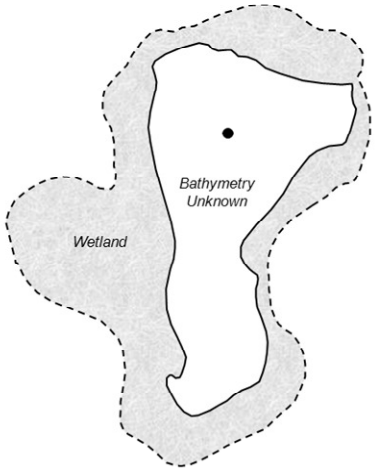
LAKE ID: 100011-00

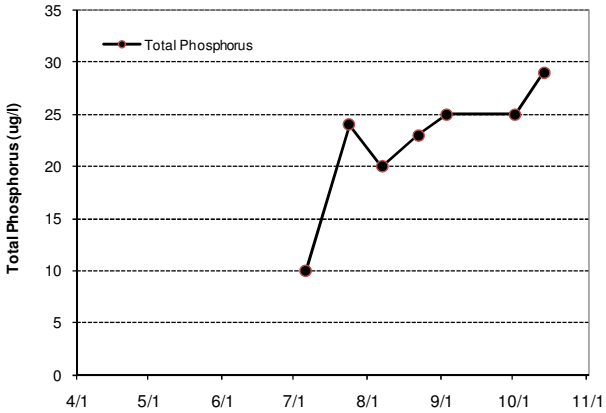
WD: Minnehaha Creek

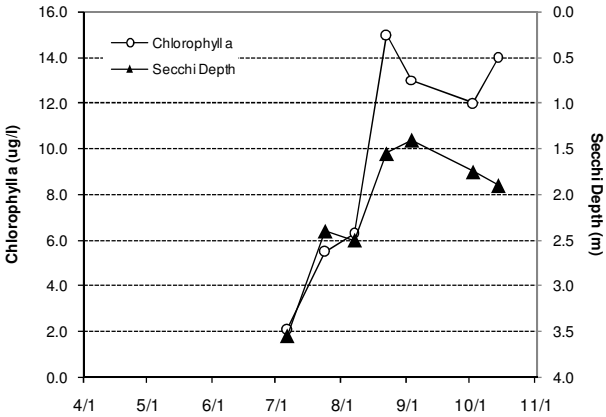
Volunteers: Sue Morgan and Linda Scott

● Sampling site

Contours in meters

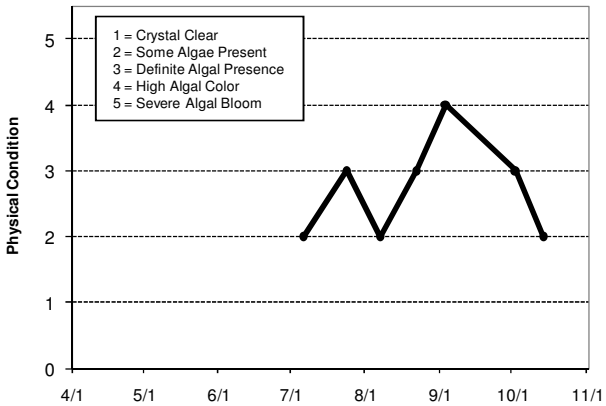






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
7/6	29.0				2.1	10		3.6	2	1
7/24	26.8				5.5	24		2.4	3	1
8/7	27.9				6.3	20		2.5	2	1
8/22	25.6				15.0	23		1.6	3	4
9/3	22.3				13.0	25		1.4	4	4
10/2	16.0				12.0	25		1.8	3	2
10/14	16.2				14.0	29		1.9	2	



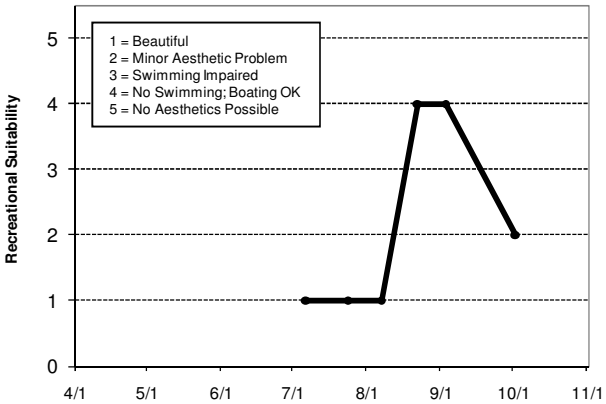
Lake Water Quality Grades Based on Summertime Averages

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												
Chlorophyll a												
Secchi Depth			C		B							
Lake Grade												

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	45.9	11.0	88.0	C
CLA (µg/l)	38.1	2.7	96.0	C
Secchi (m)	2.3	0.6	6.0	B
TKN (mg/l)	1.21	0.58	1.90	
			Lake Grade	C

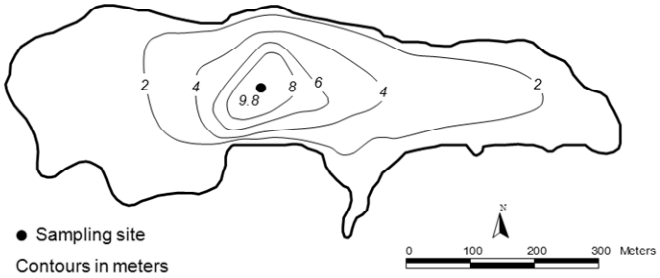
The lake received a lake grade of C for 2010. The Secchi grade of B for this year and last year indicates better water clarity conditions in comparison to 2006 – 2008. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

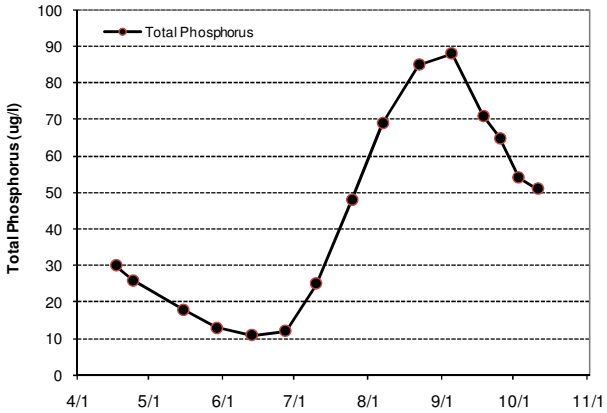
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

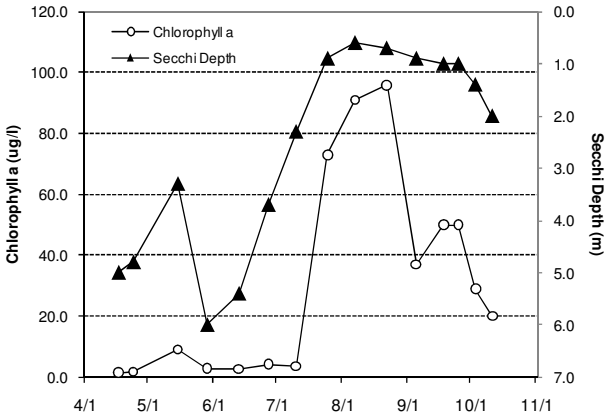
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Sunfish Lake
Sunfish Lake, Dakota Co.

Lake ID: 190050-00
WMO: Lower Mississippi River
Volunteer: Jim Stowell

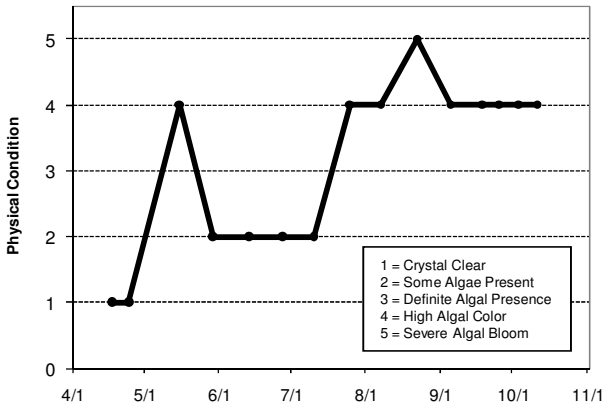






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/17	15.2				1.4	30		5.0	1	1
4/24	13.6				1.8	26		4.8	1	2
5/15	13.2				9.1	18		3.3	4	3
5/29	23.3				2.8	13		6.0	2	2
6/13	20.2				2.7	11		5.4	2	1
6/27	25.1				4.2	12		3.7	2	2
7/10	28.6				3.6	25		2.3	2	1
7/25	26.4				73.0	48		0.9	4	1
8/7	25.9				91.0	69		0.6	4	3
8/22	24.5				96.0	85		0.7	5	4
9/5	20.7				37.0	88		0.9	4	3
9/18	15.7				50.0	71		1.0	4	3
9/25	15.7				50.0	65		1.0	4	3
10/3	15.8				29.0	54		1.4	4	2
10/11	17.6				20.0	51		2.0	4	4



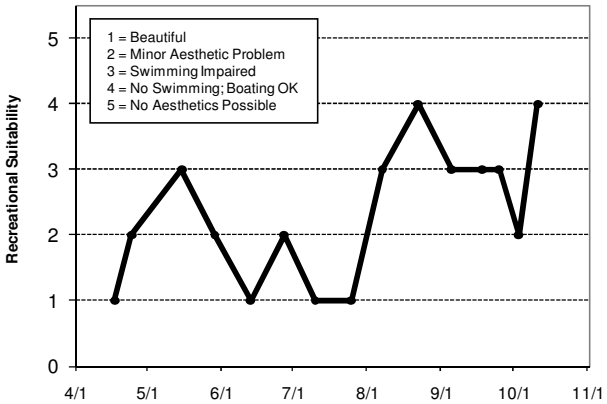
Lake Water Quality Grades Based on Summertime Averages

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	18.6	14.0	26.0	A
CLA (µg/l)	6.7	1.9	15.0	A
Secchi (m)	2.6	1.8	3.8	B
TKN (mg/l)	0.79	0.67	1.10	
			Lake Grade	A

The lake received a lake grade of A for 2010, which is the third year in a row the lake received such an A. The total phosphorus concentrations were generally lower in 2008 – 2010 in comparison to previous years. Additional monitoring is suggeseted to provide data for evaluating potential trends in water quality.

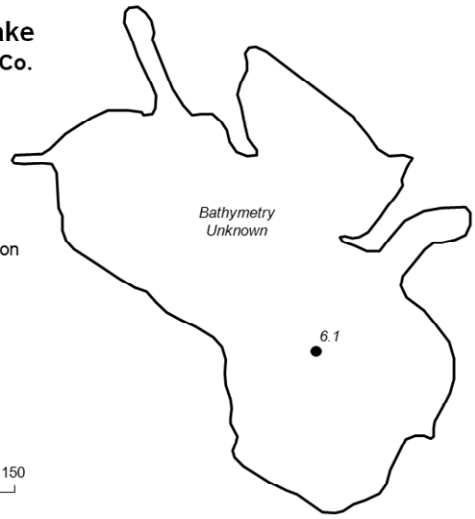
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

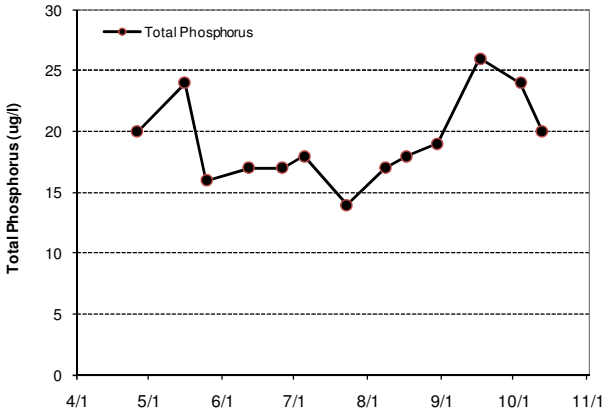
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

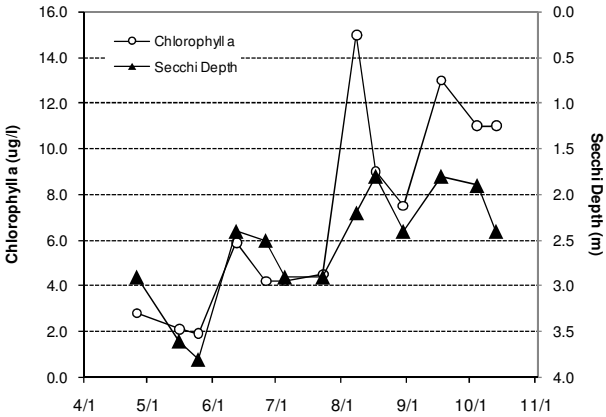
Sunnybrook Lake
Grant, Washington Co.

Lake ID: 820133-00
WD: Valley Branch
Volunteer: Arnie Johnson

● Sampling site
Contours in meters

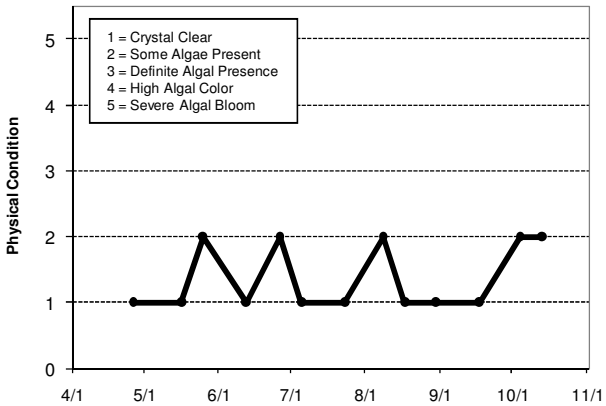






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/26	15.2				2.8	20		2.9	1	1
5/16	17.8				2.1	24		3.6	1	1
5/25	24.9				1.9	16		3.8	2	1
6/12	20.1				5.9	17		2.4	1	1
6/26	27.3				4.2	17		2.5	2	2
7/5	27.3				4.2	18		2.9	1	1
7/23	26.2				4.5	14		2.9	1	1
8/8	29.7				15.0	17		2.2	2	2
8/17	26.3				9.0	18		1.8	1	1
8/30	25.9				7.5	19		2.4	1	1
9/17	17.8				13.0	26		1.8	1	1
10/4	15.3				11.0	24		1.9	2	1
10/13	16.2				11.0	20		2.4	2	1



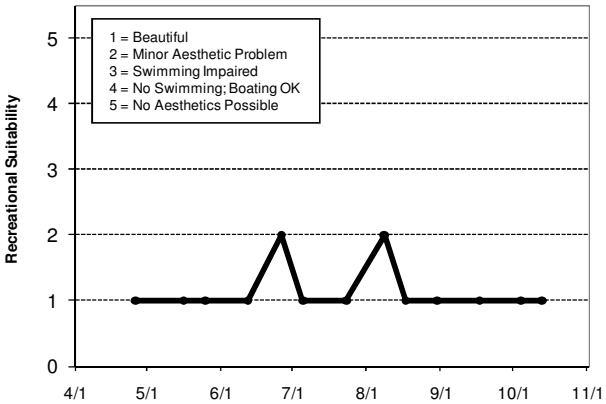
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Sunset Lake (82-0153) *Rice Creek Watershed District*

Sunset Lake is located in the southern portion of the City of Hugo (Washington County). It has a surface area of 124 acres and a maximum depth of 5.2 m (17 ft). Nearly the entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

Sunset Lake has been involved in CAMP since 1993. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	21.0	16.0	26.0	A
CLA (µg/l)	3.8	2.2	7.6	A
Secchi (m)	3.2	3.0	3.5	A (estimated)
TKN (mg/l)	0.76	0.64	0.87	
			Lake Grade	A (estimated)

The Secchi grade this year was estimated on the available Secchi data. During some monitoring events in 2010, the lake's excessive submergent macrophyte growth obscured the secchi disk, preventing the volunteer from taking a measurement. The other two water quality parameter received A grades. Therefore, giving an A for the Secchi grade is justified.

The lake received a lake grade of A for 2010, which is consistent with grades received over the past decade. According to the historical water quality database, the water quality of the lake has improved over the past 25 years, as demonstrated by the shift from mostly C lake grades received in the period 1993-1999 to A lake grades in the period 2001-2010. 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.

Throughout the monitoring period, the volunteer's opinions of the lake'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/.

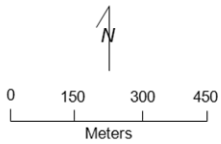
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

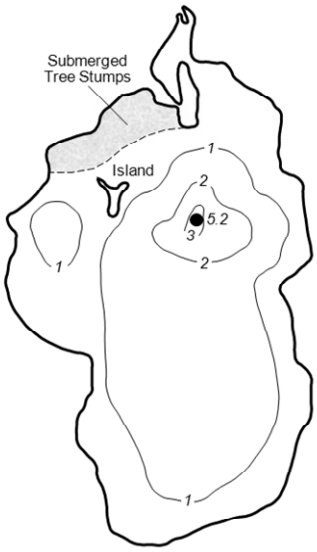
Sunset Lake

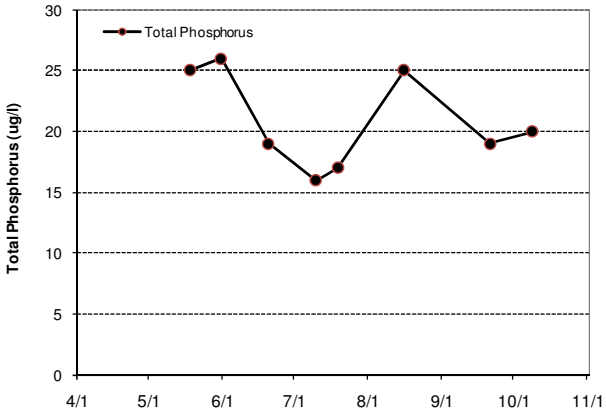
Hugo, Washington Co.

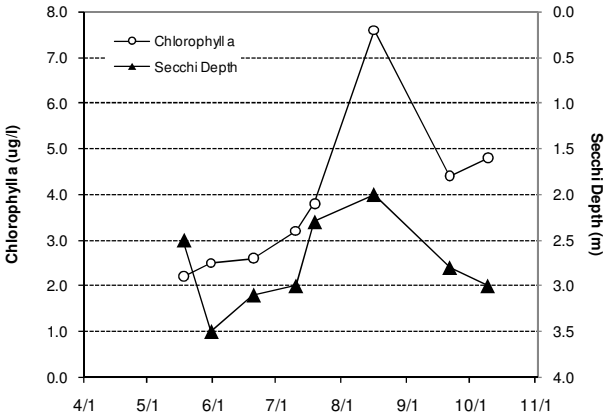
Lake ID: 820153-00
WD: Rice Creek
Volunteer:
Dianne Coderre

● Sampling site
Contours in meters





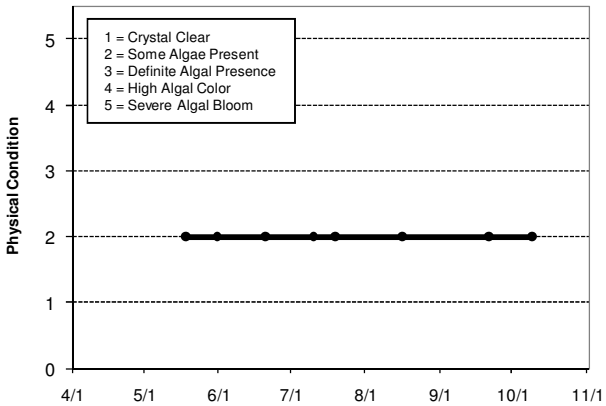




2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/18	21.2				2.2	25		2.5+	2	3
5/31	26.5				2.5	26		3.5	2	4
6/20	26.5				2.6	19		3.1	2	
7/10	28.0				3.2	16		3.0	2	
7/19	26.9				3.8	17		2.3+	2	
8/16	25.4				7.6	25		2.0+	2	
9/21	19.0				4.4	19		2.8+	2	
10/9	19.6				4.8	20		3.0	2	

\+ Secchi Disk visible on lake bottom



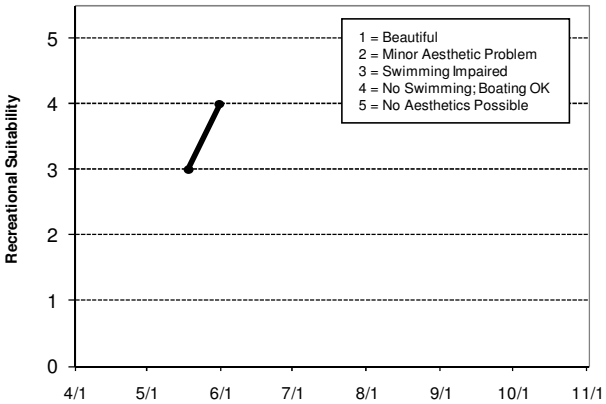
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Sunset Pond (19-0451) *Black Dog Watershed Management Commission*

Sunset Pond, a 60-acre man-made lake, is located in the City of Burnsville (Dakota County). It has been involved in CAMP since 1994 (with an omission in 1999). The pond has a normal maximum depth of 3.7 m (12 ft). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The pond collects drainage from a portion of the 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	61.7	27.0	125.0	C
CLA (µg/l)	8.0	3.3	18.0	A
Secchi (m)	2.2	1.8	2.4	C
TKN (mg/l)	0.77	0.57	0.97	
			Lake Grade	B

The pond received a lake grade of B for 2010. 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/.

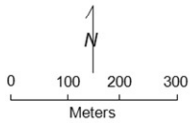
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

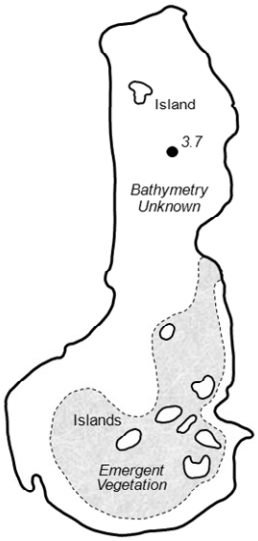
Sunset Pond

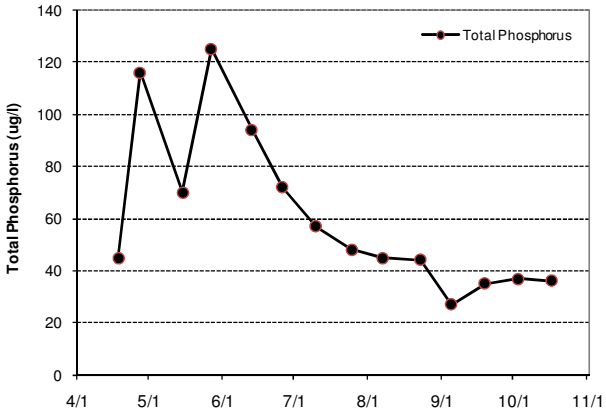
Burnsville, Dakota Co.

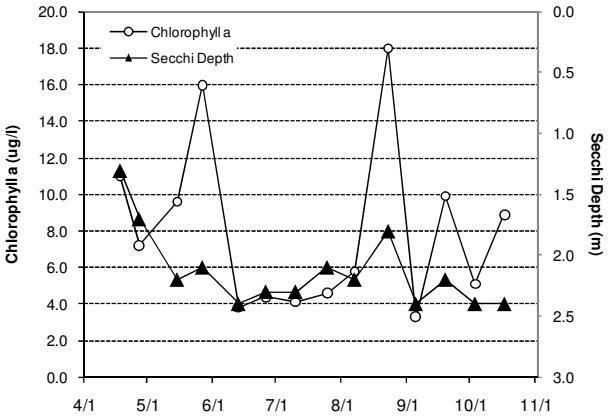
Lake ID: 190451-00
WMO: Black Dog
Volunteer: Dan Wallace

● Sampling site
Contours in meters



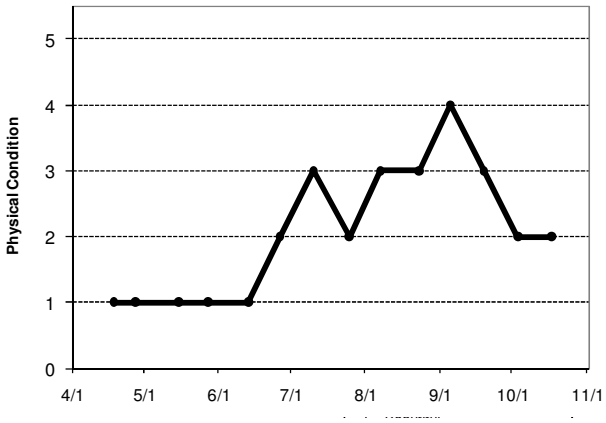






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	18.1				11.0	45		1.3	1	1
4/27	16.7				7.2	116		1.7	1	1
5/15	14.0				9.6	70		2.2	1	1
5/27	25.1				16.0	125		2.1	1	2
6/13	19.3				3.8	94		2.4	1	2
6/26	24.6				4.4	72		2.3	2	3
7/10	27.8				4.1	57		2.3	3	4
7/25	25.9				4.6	48		2.1	2	3
8/7	26.1				5.8	45		2.2	3	5
8/23	25.4				18.0	44		1.8	3	4
9/5	17.4				3.3	27		2.4	4	4
9/19	15.1				9.9	35		2.2	3	3
10/3	13.7				5.1	37		2.4	2	2
10/17	13.2				8.9	36		2.4	2	2



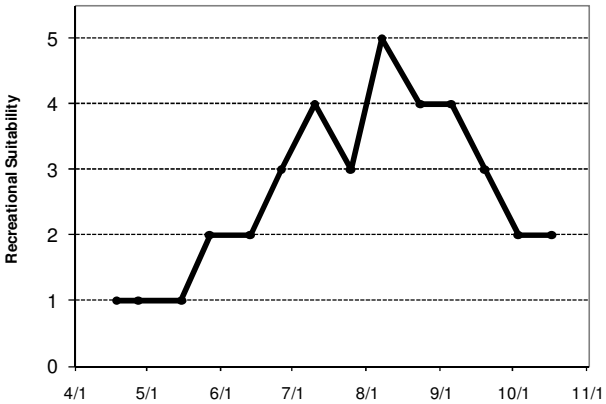
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Susan Lake (10-0013) *City of Chanhassen*

Susan Lake, located in the City of Chanhassen (Carver County), covers an area of 93 acres and has a maximum depth of 5.2 m (17 feet). Approximately 81 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

Susan Lake is involved in a study on the common carp (*Cyprinus carpio*), which is an invasive, non-native fish species, originally from central Asia. The study is being lead by Dr. Peter Sorensen of the the University of Minnesota. The purpose of the study is to develop an integrated management plan for the Riley chain-of-lakes (including Susan Lake) so as to improve the water quality of the lake chain. The activity and feeding behavior of the common carp can wreak havoc on the water quality and ecology of lakes by causing a litany of problems including reduced water clarity, decreased abundance of rooted aquatic vegetation, increase in algal populations, resuspension of sediment, increased internal loading of phosphorus, and negative changes in native fish populations. The long-term goal of the study is to develop a carp management strategy that can be applied to other lakes beyond the study lakes. For more information on this project, please refer to Dr. Sorensen's website at: http://fwcb.cfans.umn.edu/sorensen/research/index.html

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	66.7	26.0	146.0	C
CLA (µg/l)	25.9	2.3	79.0	C
Secchi (m)	1.8	0.7	3.0	C
TKN (mg/l)	1.26	0.78	2.00	
			Lake Grade	C

The lake received a lake grade of C for 2010, 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.

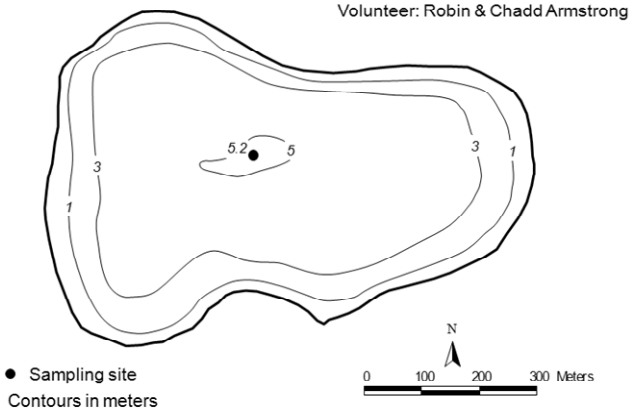
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

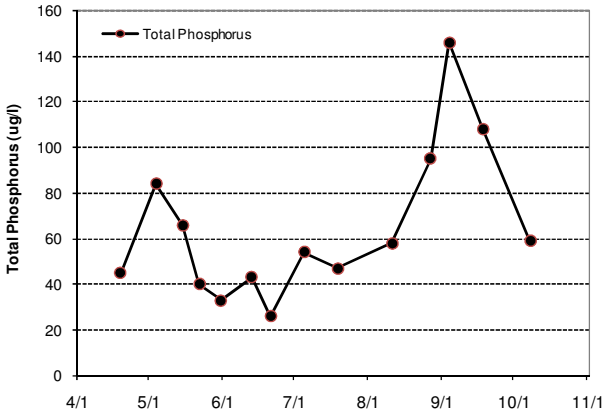
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

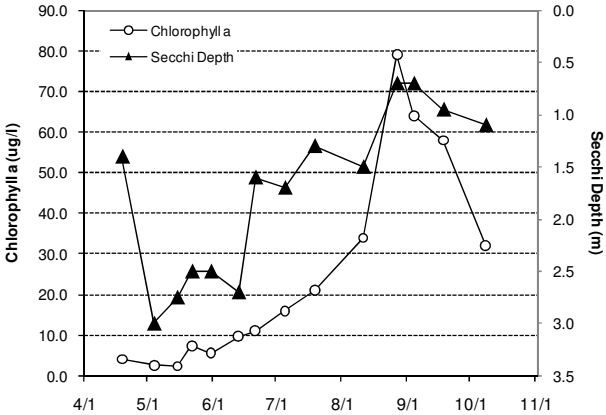
Lake Susan

Chanhassen, Carver Co.

Lake ID: 100013-00
WD: Riley-Purgatory-Bluff Creek
Volunteer: Robin & Chadd Armstrong

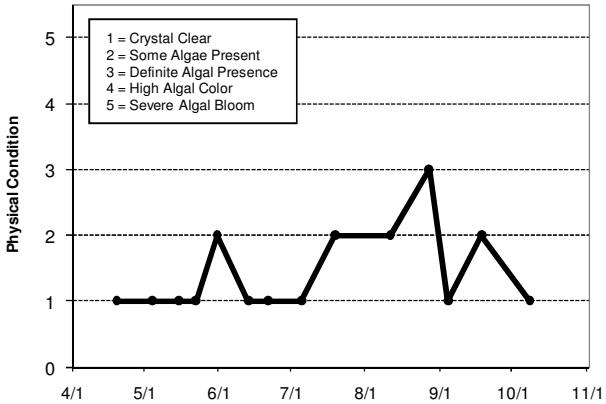






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	18.0				4.1	45		1.4	1	3
5/4	14.9				2.6	84		3.0	1	4
5/15	17.0				2.3	66		2.8	1	1
5/22	19.4				7.4	40		2.5	1	1
5/31	25.0				5.5	33		2.5	2	1
6/13	27.0				9.7	43		2.7	1	1
6/21	25.3				11.0	26		1.6	1	1
7/5	27.0				16.0	54		1.7	1	1
7/19	26.3				21.0	47		1.3	2	1
8/11	27.3				34.0	58		1.5	2	2
8/27	24.8				79.0	95		0.7	3	2
9/4	21.2				64.0	146		0.7	1	1
9/18	17.4				58.0	108		1.0	2	2
10/8	18.5				32.0	59		1.1	1	1



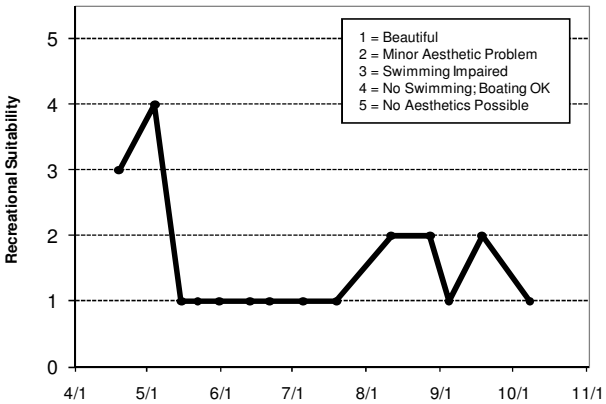
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	468.0	180.0	1130.0	F
CLA (µg/l)	140.9	7.2	670.0	F
Secchi (m)	0.5	0.3	0.7	F
TKN (mg/l)	5.49	3.00	12.00	
			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.

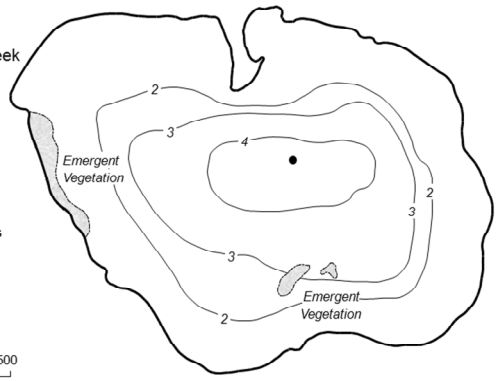
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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.

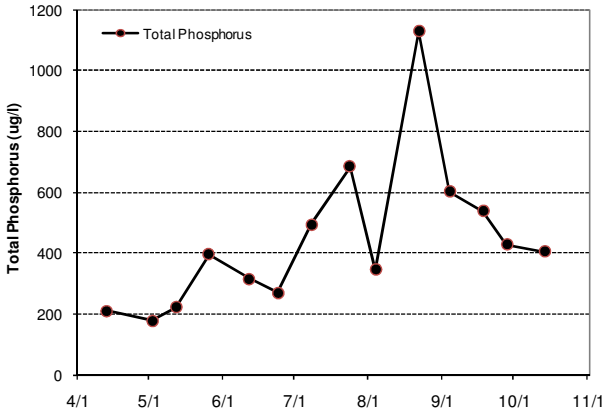
Lake ID: 100095-00
WMO: Pioneer-Sarah Creek
Volunteer:
Wayne Hubin

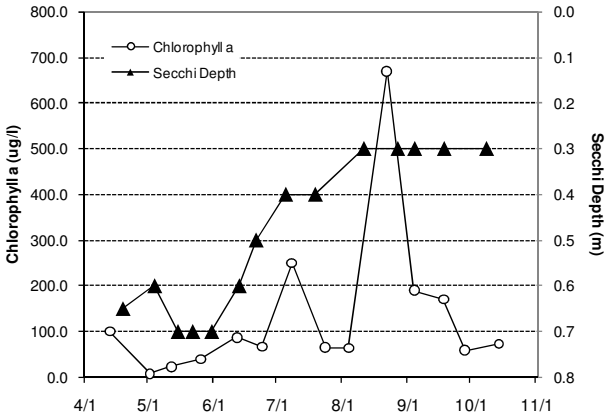


● Sampling site
Contours in meters

N

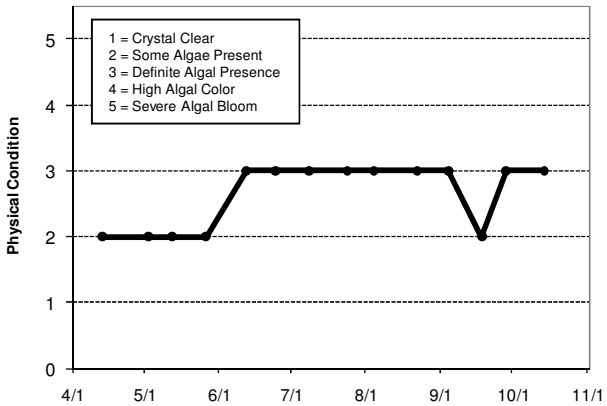
0 250 500
Meters





2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	17.0				100.0	212		0.7	2	4
5/2	17.0				7.2	180		0.6	2	4
5/12	12.0				23.0	224		0.7	2	4
5/26	24.0				39.0	398		0.7	2	4
6/12	20.0				87.0	317		0.7	3	4
6/24	26.0				67.0	271		0.6	3	4
7/8	26.0				250.0	495		0.5	3	4
7/24	32.0				65.0	686		0.4	3	4
8/4	28.0				64.0	347		0.4	3	4
8/22	29.0				670.0	1130		0.3	3	4
9/4	21.0				190.0	602		0.3	3	4
9/18	21.0				170.0	539		0.3	2	4
9/28	18.0				59.0	428		0.3	3	4
10/14	17.0				73.0	405		0.3	3	4



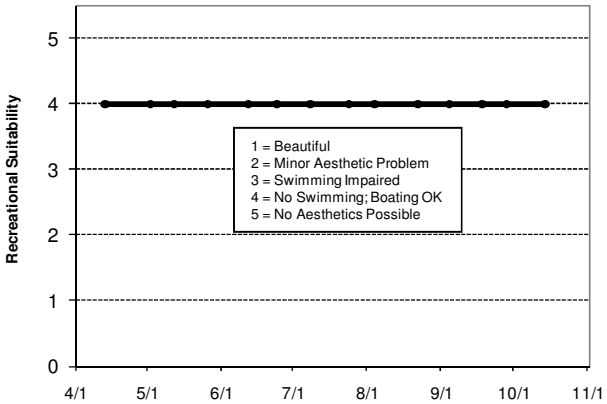
Lake Water Quality Grades Based on Summertime Averages

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

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

2010 summer (May-September) data summary

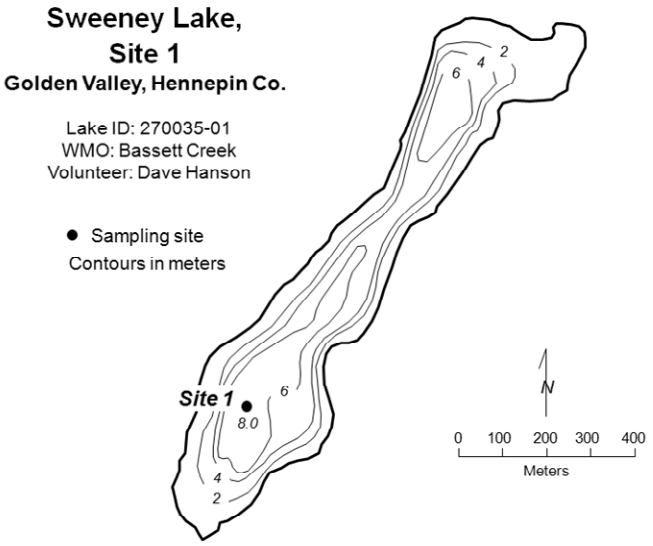
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	63.0	14.0	303.0	C
CLA (µg/l)	19.0	2.8	35.0	B
Secchi (m)	1.4	0.9	2.2	C
TKN (mg/l)	0.86	0.57	1.10	
			Lake Grade	C

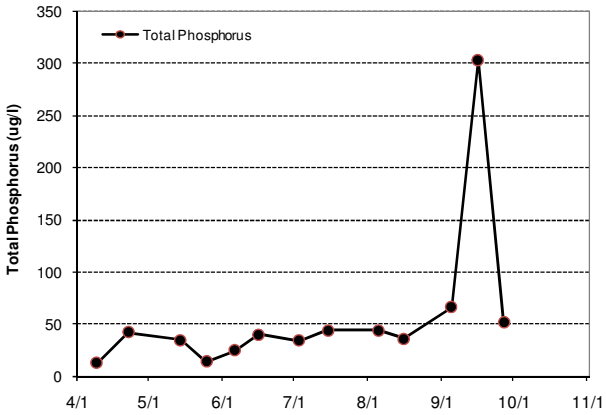
The south site received a lake grade of C, which is consistent with its historical database. Over the period of the monitoring database, the water quality of the lake seems represented by a lake grade of C. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

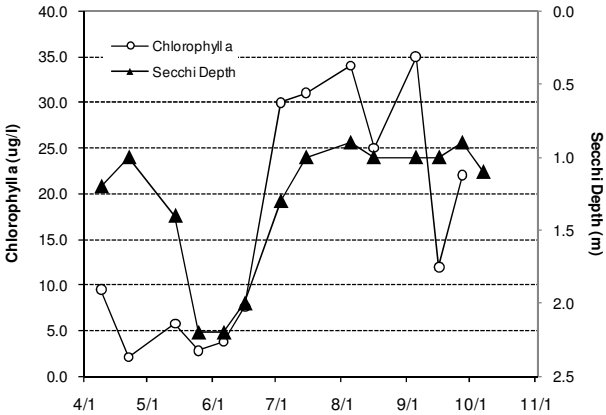
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

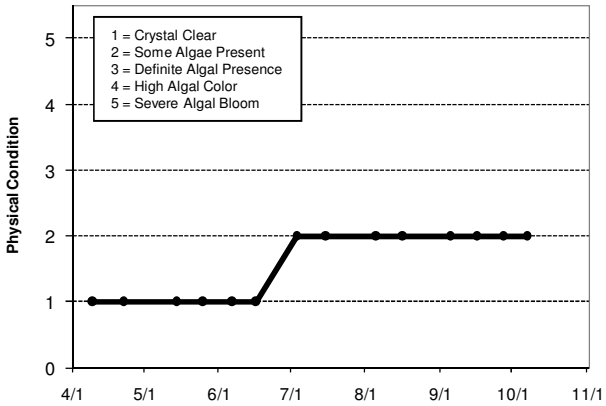
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

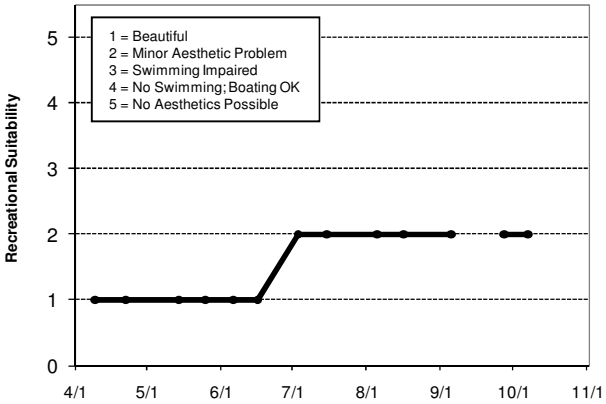
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/9	9.8				9.5	13		1.2	1	1
4/22	15.8				2.1	42		1.0	1	1
5/14	12.6				5.8	35		1.4	1	1
5/25	21.4				2.8	14		2.2	1	1
6/6	22.8				3.8	25		2.2	1	1
6/16	23.5				7.6	40		2.0	1	1
7/3	25.7				30.0	34		1.3	2	2
7/15	25.8				31.0	44		1.0	2	2
8/5	27.6				34.0	44		0.9	2	2
8/16	26.4				25.0	36		1.0	2	2
9/5	22.7				35.0	66		1.0	2	2
9/16	18.8				12.0	303		1.0	2	
9/27	16.6				22.0	52		0.9	2	2
10/7	16.4							1.1	2	2

Lake Water Quality Grades Based on Summertime Averages

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

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.

2010 summer (May-September) data summary

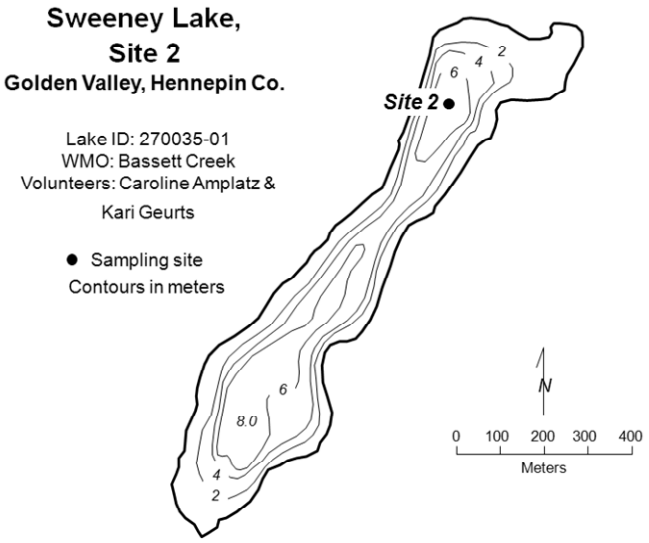
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	46.0	20.0	83.0	C
CLA (µg/l)	24.4	2.1	46.0	C
Secchi (m)	1.2	0.7	2.3	C
TKN (mg/l)	0.76	0.47	0.99	
			Lake Grade	C

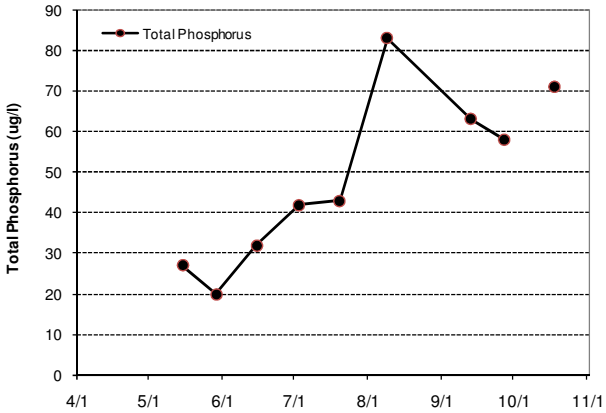
The north site received a lake grade of C, which is consistent with its limited historical database. Over the period of the monitoring database, the water quality of the lake seems represented by a lake grade of C.

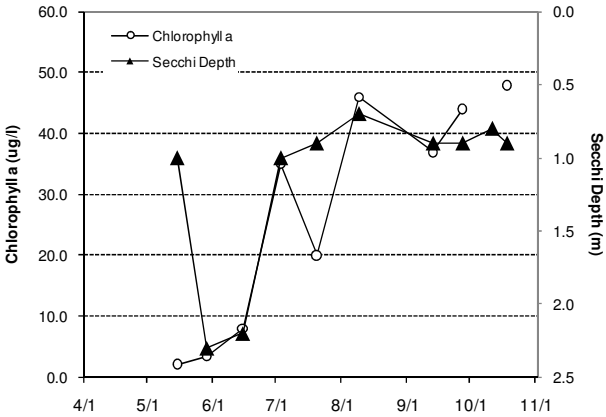
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

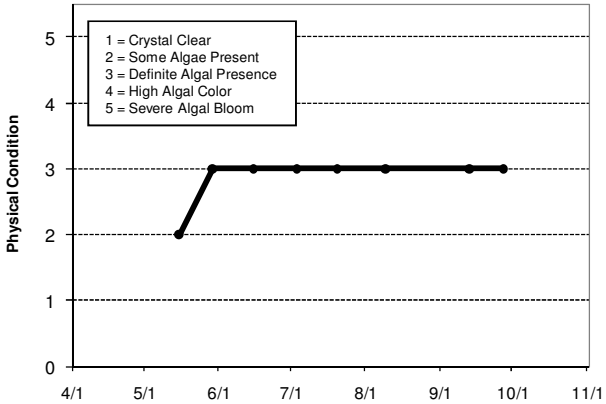
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

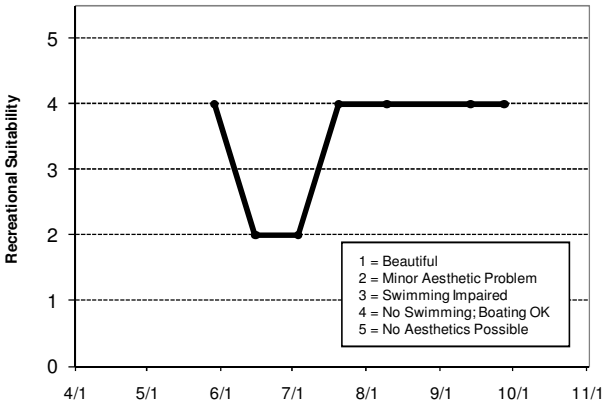
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/15	17.8				2.1	27		1.0	2	
5/29	25.2				3.4	20		2.3	3	4
6/15					8.0	32		2.2	3	2
7/3	27.0				35.0	42		1.0	3	2
7/20	28.6				20.0	43		0.9	3	4
8/9	29.9				46.0	83		0.7	3	4
9/13	21.4				37.0	63		0.9	3	4
9/27	18.0				44.0	58		0.9	3	4
10/11	18.0							0.8		
10/18	15.8				48.0	71		0.9		

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

Source: Metropolitan Council and STORET data

Sylvan Lake [Half Breed Lake] (82-0080) *Comfort Lake-Forest Lake Watershed District*

Sylvan Lake (also known as Half Breed Lake) is a 75-acre lake located in Forest Lake Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007).

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

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	13.8	12.0	16.0	A
CLA (µg/l)	2.9	1.9	7.3	A
Secchi (m)	5.1	3.2	6.5	A
TKN (mg/l)	0.61	0.50	0.68	
			Lake Grade	A

The lake received a lake grade of A for 2010, 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.

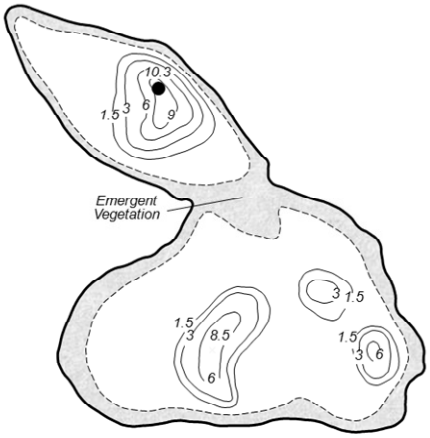
LAKE ID: 820080-00

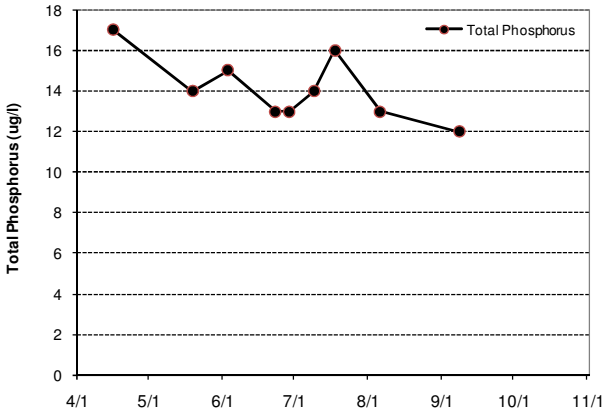
WD: Comfort Lake - Forest Lake

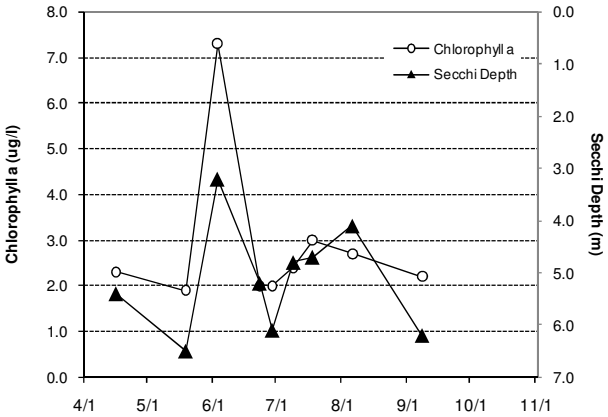
Volunteer: Curt Sparks

● Sampling station

Contours in meters

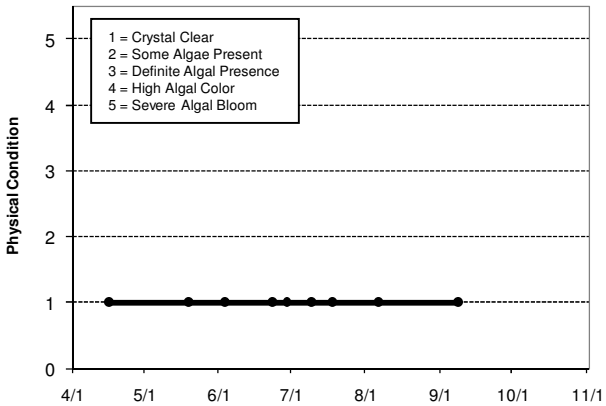






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/16	13.8				2.3	17		5.4	1	1
5/19	21.3				1.9	14		6.5	1	1
6/3	24.3				7.3	15		3.2	1	1
6/23	24.7				2.0	13		5.2	1	1
6/29	24.5				2.0	13		6.1	1	1
7/9	27.4				2.4	14		4.8	1	1
7/18	26.2				3.0	16		4.7	1	1
8/6	26.8				2.7	13		4.1	1	1
9/8	18.7				2.2	12		6.2	1	1



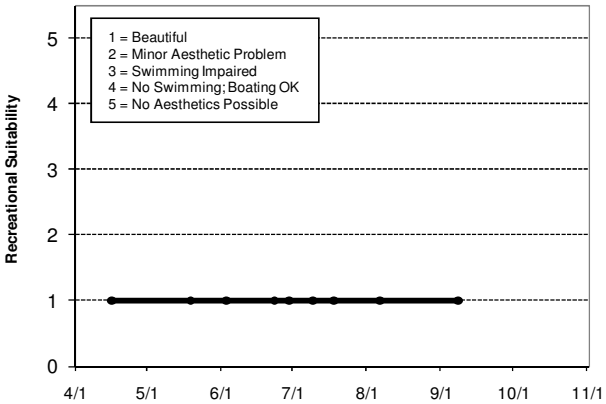
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



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.

2010 summer (May-September) data summary

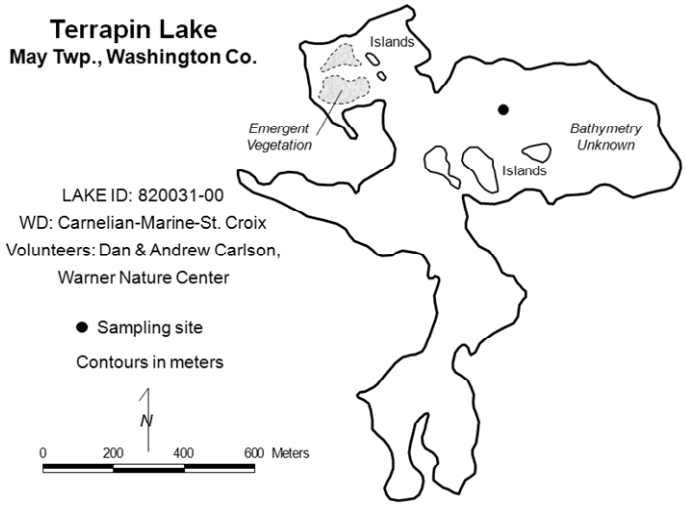
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	18.3	13.0	23.0	A
CLA (µg/l)	4.1	1.8	10.0	A
Secchi (m)		2.7	+ 3.8	A
TKN (mg/l)	0.71	0.50	0.84	
			Lake Grade	A

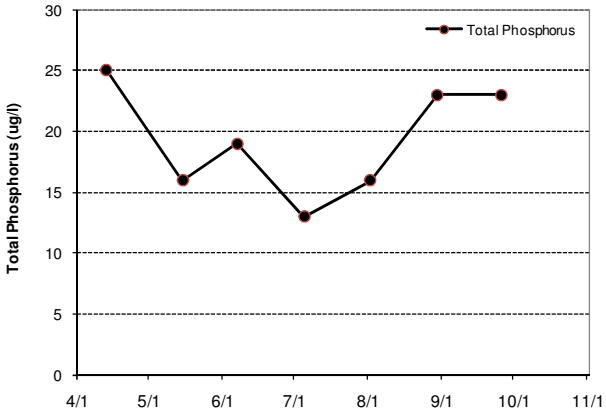
The Secchi disk was visible while resting on the lake bottom during some monitoring events, so the Secchi depth would have been greater during these monitoring events. Regardless, the Secchi depths were greater than 3.0 m in these cases. The lake received a lake grade of A for 2010, which is consistent with the historical water quality database. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

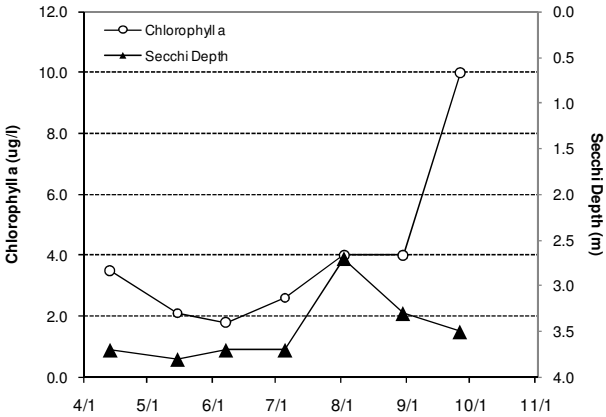
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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.



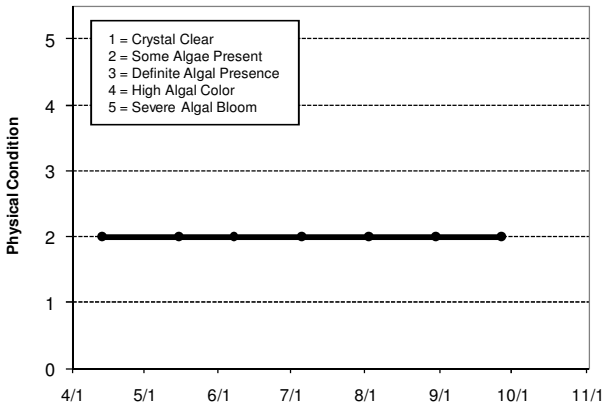




2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	13.8				3.5	25		3.7	2	2
5/15	12.9				2.1	16		3.8+	2	3
6/7	24.7				1.8	19		3.7+	2	3
7/5	27.4				2.6	13		3.7+	2	4
8/2	27.2				4.0	16		2.7	2	4
8/30	25.2				4.0	23		3.3	2	3
9/26	15.2				10.0	23		3.5	2	2

+ Secchi Disk visible on lake bottom



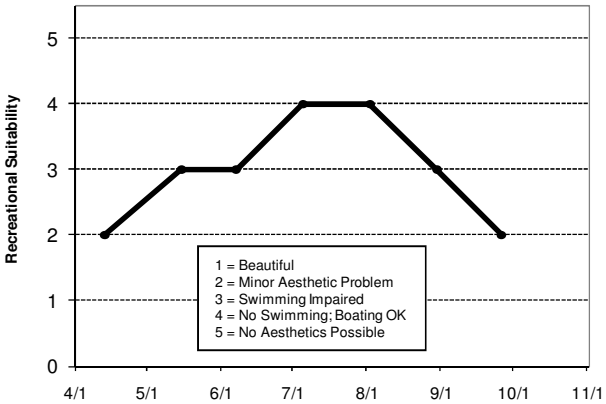
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Turtle Lake (82-0036) *Carnelian - Marine Watershed District*

Turtle Lake is located in May Township (Washington County). The lake has a surface area of 44 acres, and has maximum and mean depths of 2.4 m (7.9 ft) and 1.2 m (3.9 ft), respectively. The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2010 summer (May-September) data summary

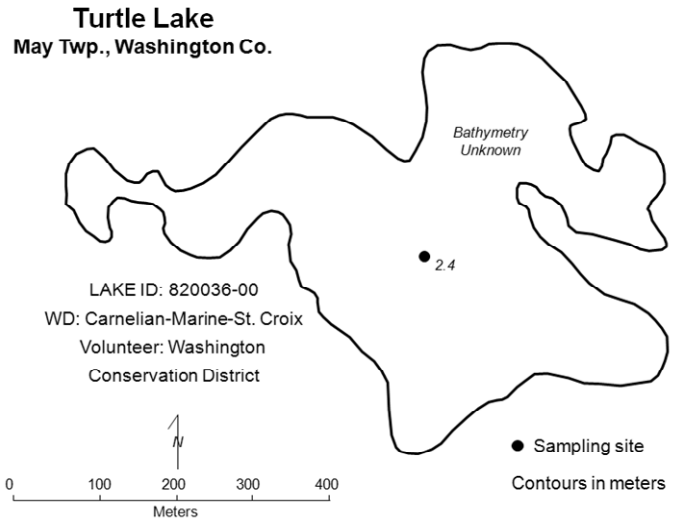
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
Secchi (m)	1.5	1.4	1.7	C

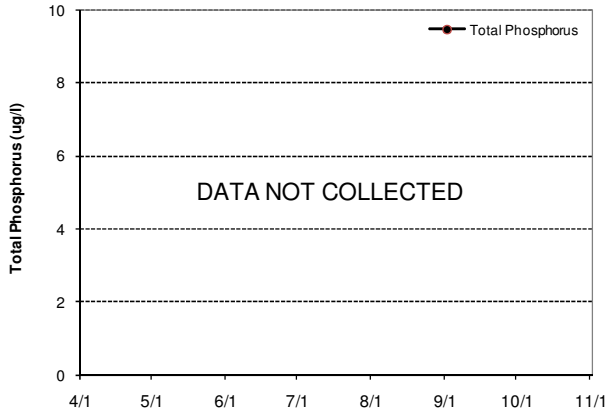
The lake received a Secchi grade of C for 2010, which is consistent with the historical water quality database for the monitoring years since 1999. No lake grade was given for the lake this year because total phosphorus and chlorophyll were not monitored.

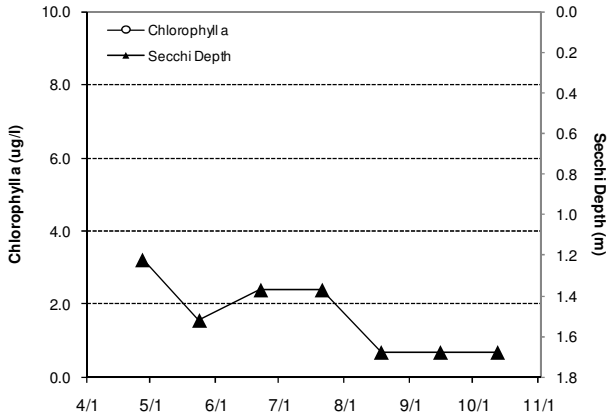
Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

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.

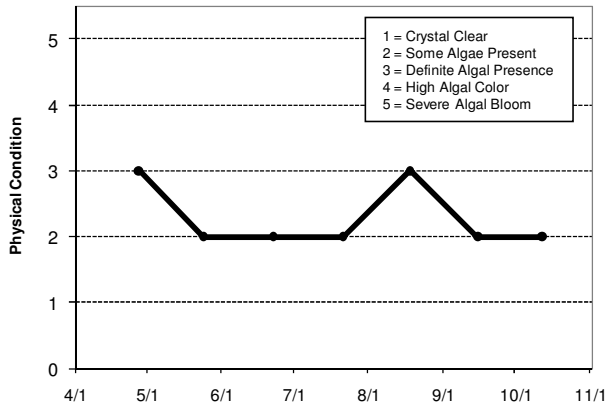






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/27	13.0	12.9	8.9	9.1				1.2	3	4
5/24	23.2	23.0	10.0	10.1				1.5	2	4
6/22	25.2	23.9	12.6	0.3				1.4	2	4
7/21	25.1	23.9	6.6	0.1				1.4	2	4
8/18	21.8	21.8	6.7	5.3				1.7	3	4
9/15	18.0	18.1	9.3	6.8				1.7	2	3
10/12	17.9	16.9	11.1	1.0				1.7	2	4



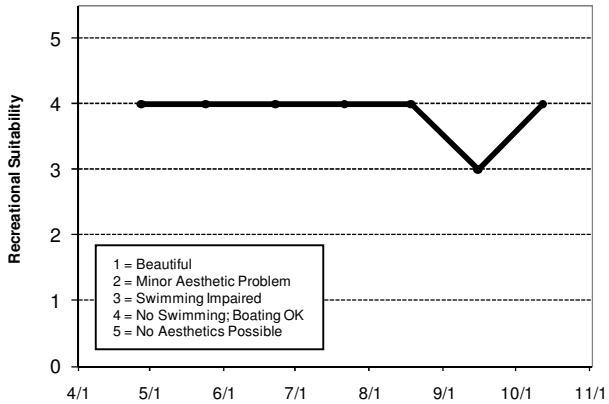
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Twin Lake [Burnsville] (19-0028) *Black Dog Watershed Management Commission*

Twin Lake is an 11-acre lake located in the City of Burnsville (Dakota County). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has been designated by the MN DNR 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.

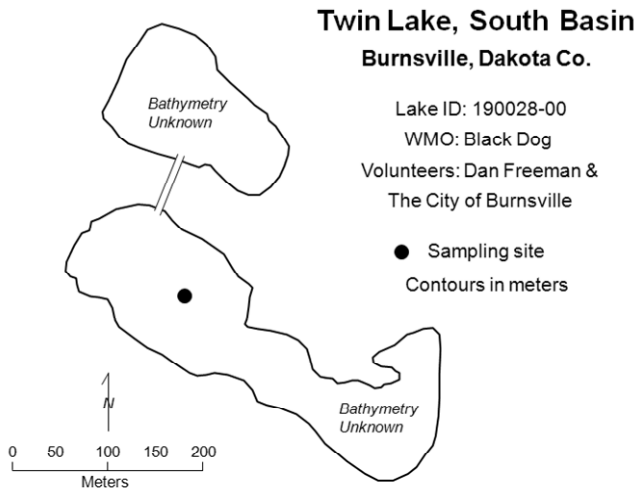
2010 summer (May-September) data summary

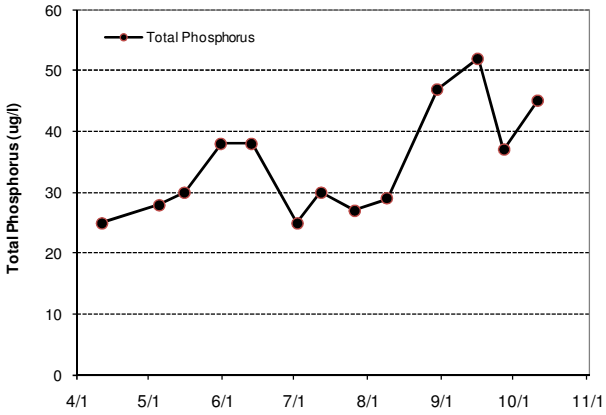
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	34.6	25.0	52.0	C
CLA (µg/l)	20.2	6.1	44.0	C
Secchi (m)	1.6	0.9	2.1	C
TKN (mg/l)	0.95	0.63	1.30	
			Lake Grade	C

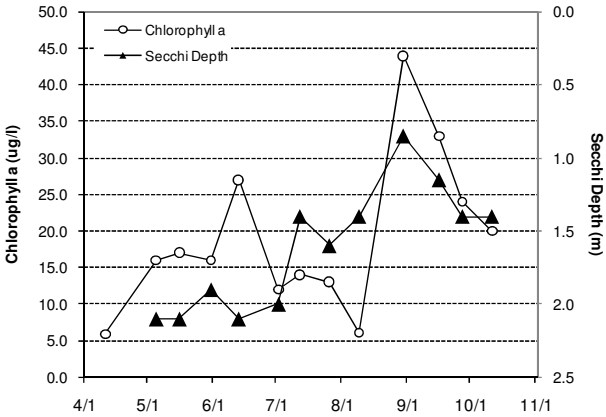
The lake received a lake grade of C for 2010. The lake grades received in the past have varied in the B and C range. Since 2005 CLA grades have varied widely from an A in 2005, to a C in 2006, back to an A in 2007, to Bs in 2008 and 2009. The CLA grade returned to a C in 2010. The water clarity grades have remained a C since 2001.

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

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

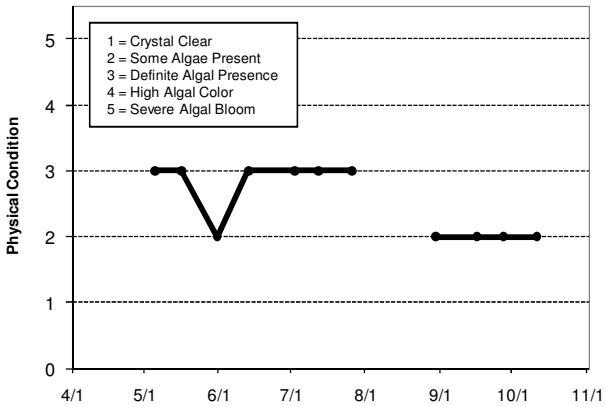






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/11					5.9	25				
5/5	15.1				16.0	28		2.1	3	
5/16	20.1				17.0	30		2.1	3	4
5/31	27.0				16.0	38		1.9	2	
6/13	20.1				27.0	38		2.1	3	4
7/2	23.7				12.0	25		2.0	3	
7/12	27.9				14.0	30		1.4	3	
7/26	28.2				13.0	27		1.6	3	4
8/9	30.2				6.1	29		1.4		4
8/30	24.8				44.0	47		0.9	2	4
9/16	17.1				33.0	52		1.2	2	4
9/27	15.3				24.0	37		1.4	2	3
10/11	16.7				20.0	45		1.4	2	4



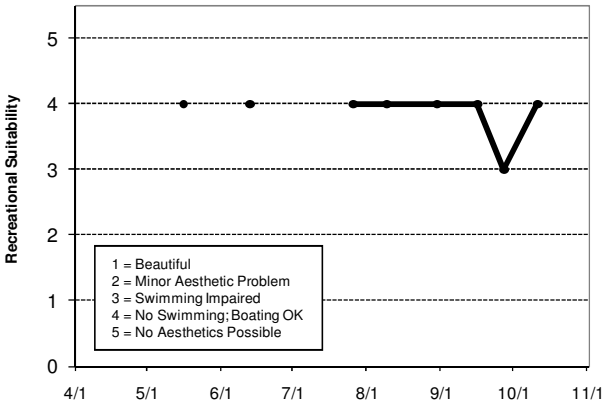
Lake Water Quality Grades Based on Summertime Averages

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

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

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	18.3	14.0	24.0	A
CLA (µg/l)	2.6	1.0	4.6	A
Secchi (m)	3.4	2.3	4.5	A
TKN (mg/l)	0.71	0.48	0.88	
			Lake Grade	A

The lake received a lake grade of A for 2010. This was the first year that this lake was enrolled in the CAMP. 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/.

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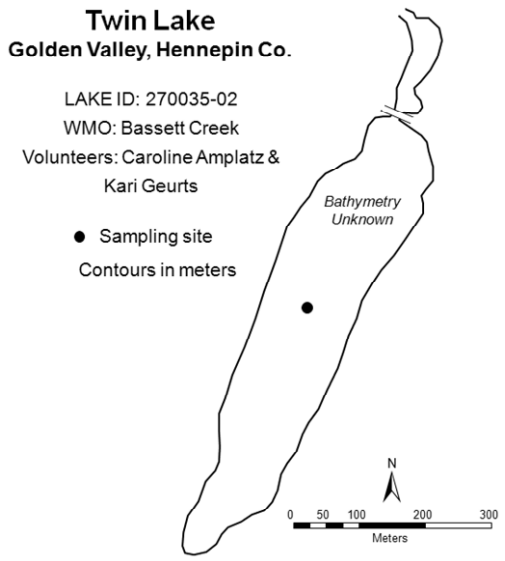
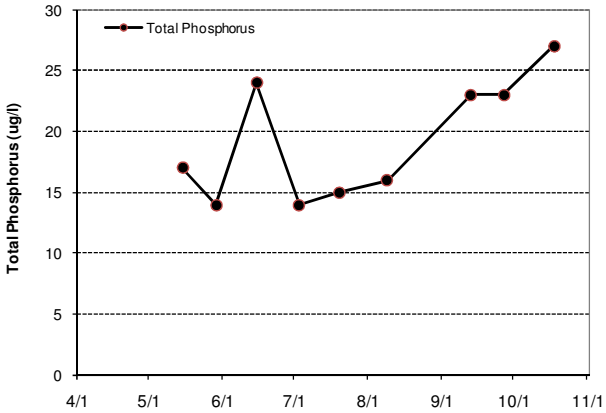
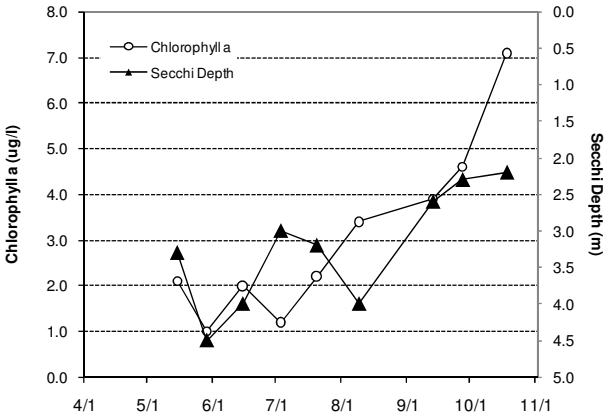
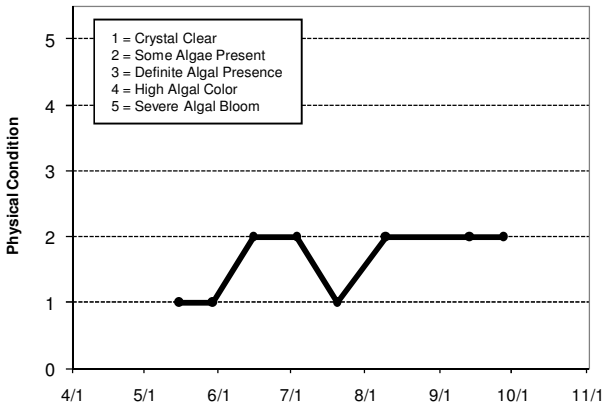






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/15	17.5				2.1	17		3.3	1	1
5/29	26.6				1.0	14		4.5	1	1
6/15	21.8				2.0	24		4.0	2	1
7/3	26.5				1.2	14		3.0	2	2
7/20	27.8				2.2	15		3.2	1	1
8/9	29.9				3.4	16		4.0	2	2
9/13	21.1				3.9	23		2.6	2	1
9/27	17.2				4.6	23		2.3	2	1
10/18	14.7				7.1	27		2.2		



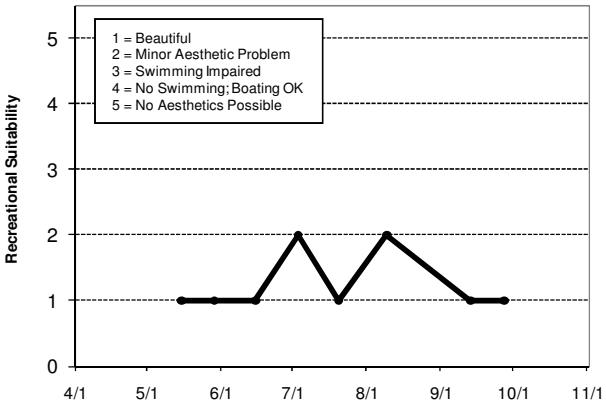
Lake Water Quality Grades Based on Summertime Averages

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

Source: Metropolitan Council and STORET data



Twin Lake [upper basin] (27-0042-01) *Shingle Creek Watershed Management Commission*

The upper basin of Twin Lake is located in the City of Brooklyn Park (Hennepin County). It has a maximum depth of 2.4 m (8 ft) and a mean depth of 0.9 m (3 ft). The entire surface area of the basin is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The basin does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

Twin Lake consists of 3 basins: upper, middle, and lower. The lake has a surface area of approximately 215 acres. Approximately 80 percent of the lake's surface area is considered littoral zone. The 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	123.9	57.0	170.0	D
CLA (µg/l)	64.6	6.2	130.0	D
Secchi (m)	0.5	0.2	1.1	F
TKN (mg/l)	2.07	1.10	2.90	
			Lake Grade	D

The basin received a lake grade of D for 2010, which is consistent with its historical water quality database. On the basis of the historical water quality database, the water quality of this basin has fluctuated between lake grades D and F. 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.

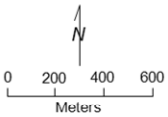
Twin Lake, Upper Basin,

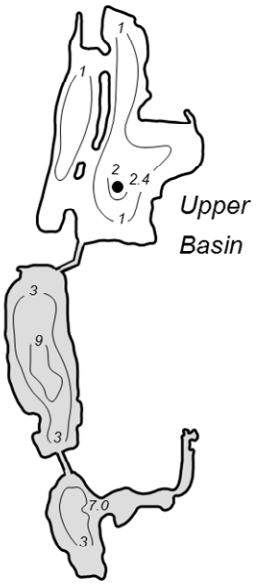
Brooklyn Center, Hennepin Co.

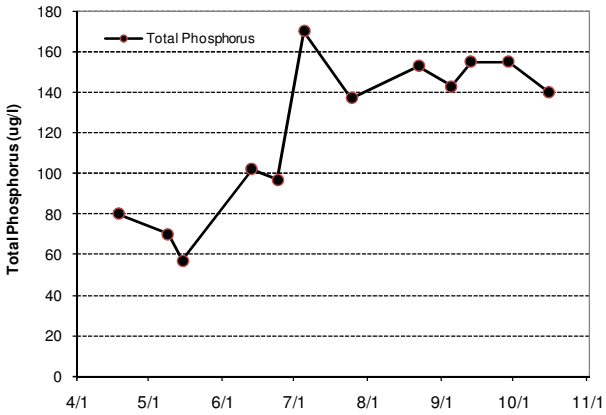
Lake ID: 270042-01
WMO: Shingle Creek
Volunteer: Kris Mann

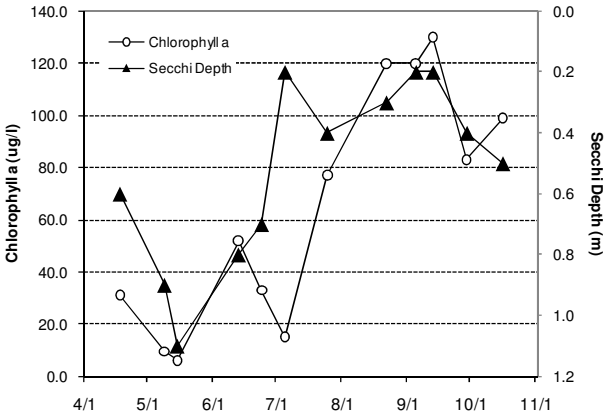
● Sampling site

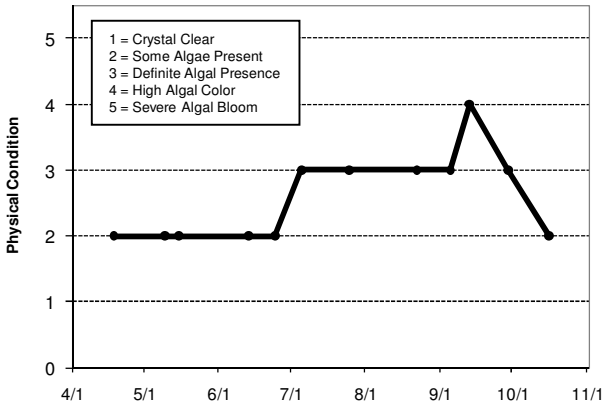
Contours in meters

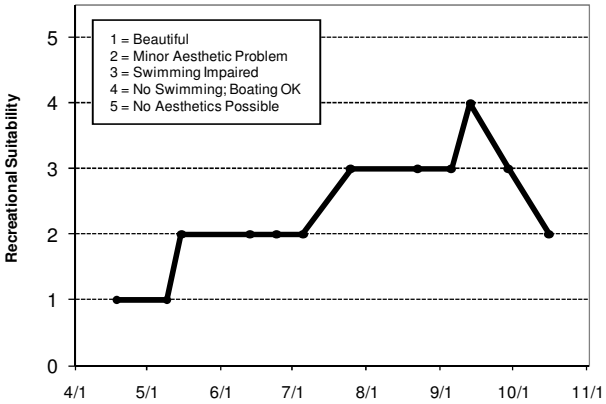












2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/18	16.0				31.0	80		0.6	2	1
5/9	15.0				9.5	70		0.9	2	1
5/15	16.0				6.2	57		1.1	2	2
6/13	20.0				52.0	102		0.8	2	2
6/24	28.0				33.0	97		0.7	2	2
7/5	28.0				15.0	170		0.2	3	2
7/25	29.0				77.0	137		0.4	3	3
8/22	27.0				120.0	153		0.3	3	3
9/5	20.0				120.0	143		0.2	3	3
9/13	20.0				130.0	155		0.2	4	4
9/29	16.0				83.0	155		0.4	3	3
10/16	14.0				99.0	140		0.5	2	2

Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data

Twin Lake [middle basin] (27-0042-02) *Shingle Creek Watershed Management Commission*

The middle basin of Twin Lake is located in the City of Crystal (Hennepin County). It has a maximum depth of 14 m (46 ft) and a mean depth of 4.9 m (16 ft).

Twin Lake consists of 3 basins: upper, middle, and lower. The lake has a surface area of approximately 215 acres. Approximately 80 percent of the lake's surface area is considered littoral zone. The 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	48.0	36.0	74.0	C
CLA (µg/l)	18.4	5.9	44.0	B
Secchi (m)	1.3	0.5	3.4	C
TKN (mg/l)	1.45	1.10	1.90	
			Lake Grade	C

The basin received a lake grade of C for 2010, which is consistent with the lake grades received over the past decade. The basin has received B and D lake grades in the past. Since 1985 the annual lake grades have varied between B to D but have been consistently C over the past decade. Continued monitoring is suggested to determine if the lake grades of the past decade indicate that the water quality of the basin is stabilizing at a C lake grade.

Throughout the monitoring period, the volunteer's opinions of the lake'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.

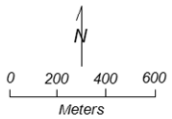
Twin Lake, Middle Basin,

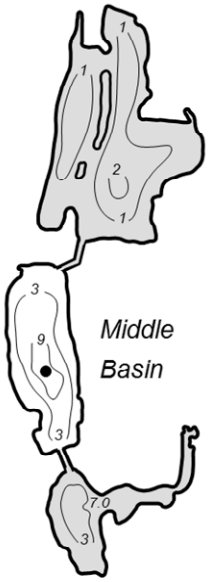
Crystal, Hennepin Co.

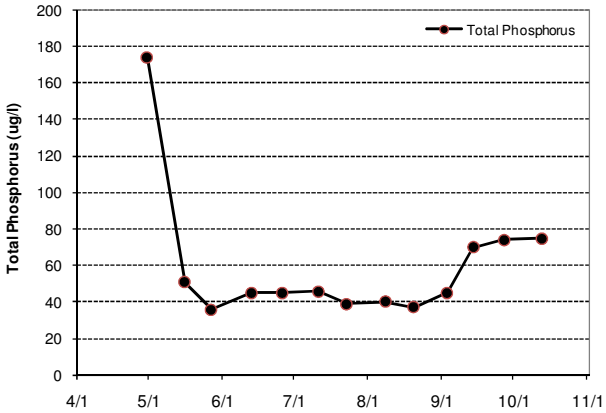
Lake ID: 270042-02
WMO: Shingle Creek
Volunteer: Janet Moore

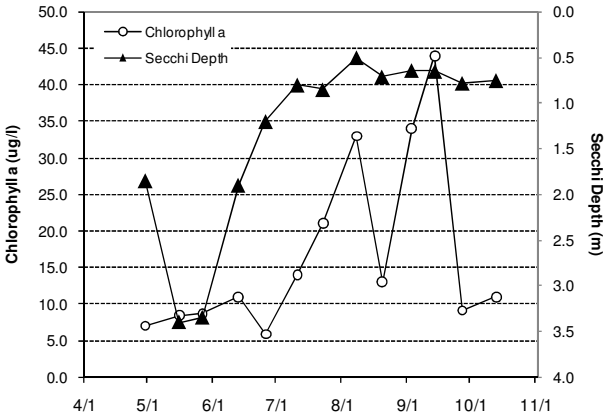
● Sampling site

Contours in meters



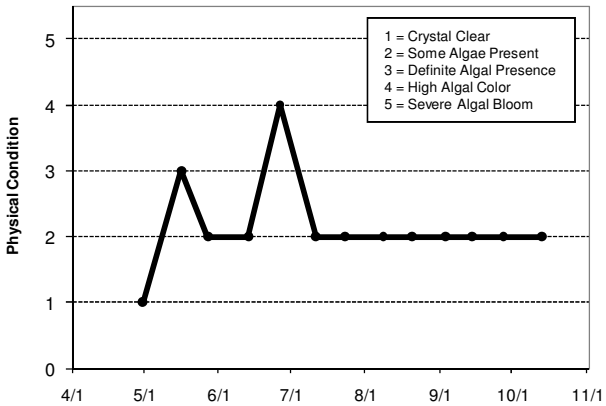






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/30	16.0				7.0	174		1.9	1	1
5/16	20.5				8.4	51		3.4	3	3
5/27	20.7				8.7	36		3.4	2	3
6/13	20.8				11.0	45		1.9	2	3
6/26	26.5				5.9	45		1.2	4	4
7/11	28.3				14.0	46		0.8	2	3
7/23	27.9				21.0	39		0.9	2	4
8/8	28.2				33.0	40		0.5	2	4
8/20	27.5				13.0	37		0.7	2	4
9/3	19.4				34.0	45		0.6	2	4
9/14	18.9				44.0	70		0.7	2	4
9/27	18.8				9.1	74		0.8	2	4
10/13	18.0				11.0	75		0.8	2	4



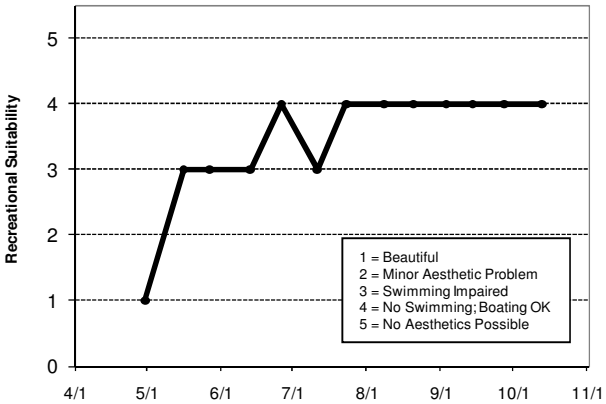
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Twin Lake [lower basin] (27-0042-03) *Shingle Creek Watershed Management Commission*

The lower basin of Twin Lake is located in the City of Robbinsdale (Hennepin County). It has a maximum depth of 7 m (23 ft) and a mean depth of 1.2 m (4 ft).

Twin Lake consists of 3 basins: upper, middle, and lower. The entire lake has a surface area of approximately 215 acres. Approximately 80 percent of the lake's surface area is considered littoral zone. 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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	31.9	24.0	41.0	B
CLA (µg/l)	14.1	5.7	30.0	B
Secchi (m)	1.5	0.8	2.9	C
TKN (mg/l)	1.39	0.85	1.90	
			Lake Grade	B

The basin received a lake grade of B for 2010, which is the best grade that the lake has received in its historical water quality database (going back to 1991). The basin has received just C lake grades in the past. 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.

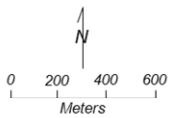
Twin Lake, Lower Basin,

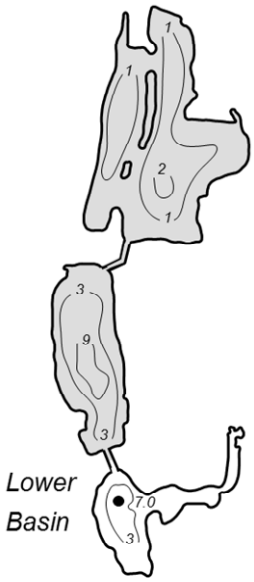
Robbinsdale, Hennepin Co.

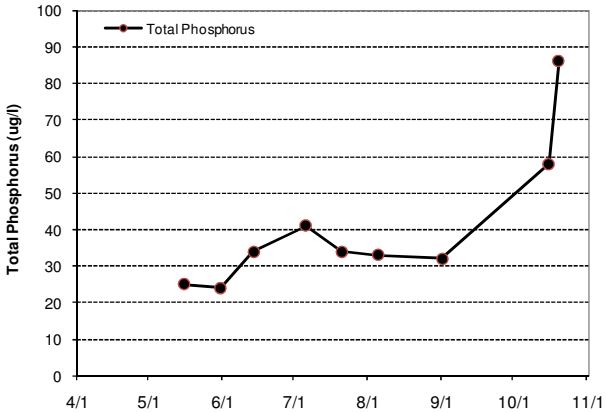
Lake ID: 270042-03
WMO: Shingle Creek
Volunteer: Rob Fitzpatrick

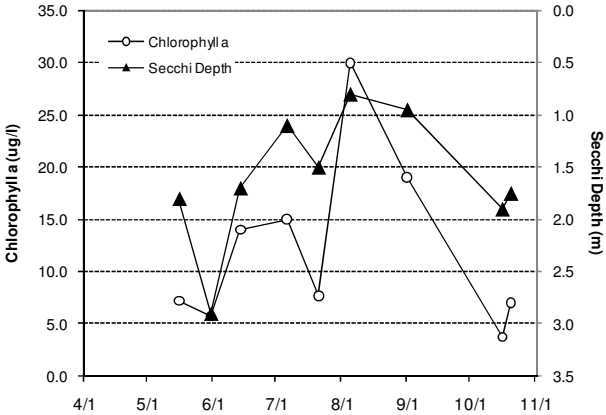
● Sampling site

Contours in meters



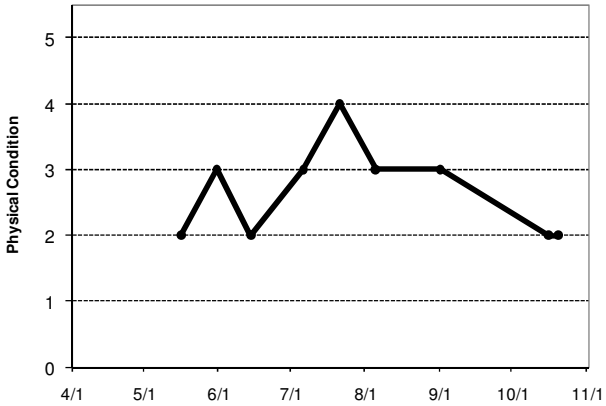






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/16	16.8				7.2	25		1.8	2	4
5/31	24.8				5.7	24		2.9	3	4
6/14	19.9				14.0	34		1.7	2	3
7/6	28.4				15.0	41		1.1	3	4
7/21	27.9				7.7	34		1.5	4	4
8/5	26.7				30.0	33		0.8	3	4
9/1	25.4				19.0	32		1.0	3	4
10/16	14.8				3.7	58		1.9	2	3
10/20	13.2				7.0	86		1.8	2	2

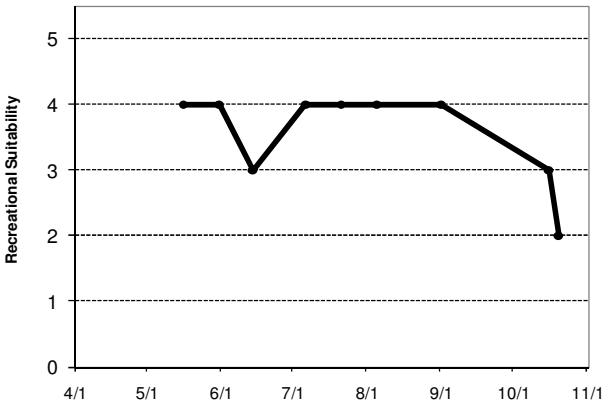


Lake Water Quality Grades Based on Summertime Averages

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

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus		C			C		C		D			C
Chlorophyll a		C			C		B		C			B
Secchi Depth		D			C		C		C			C
Lake Grade		**C**			**C**		**C**		**C**			**C**

Year	2004	2005	2006	2007	2008	2009	2010
Total Phosphorus		C					B
Chlorophyll a		C					B
Secchi Depth		C					C
Lake Grade		**C**					**B**



Source: Metropolitan Council and STORET data

Twin Lake [St. Louis Park] (27-0656) *City of St. Louis Park*

Twin Lake is a small shallow lake located within the city of St. Louis Park (Hennepin County). Bathymetric information is unknown for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

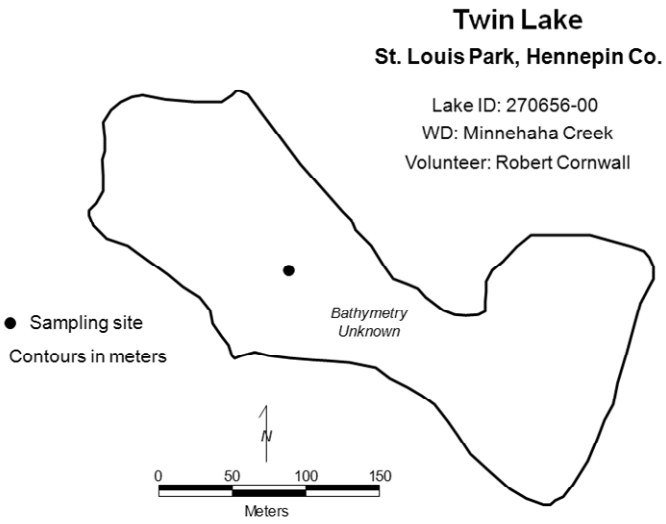
2010 summer (May-September) data summary

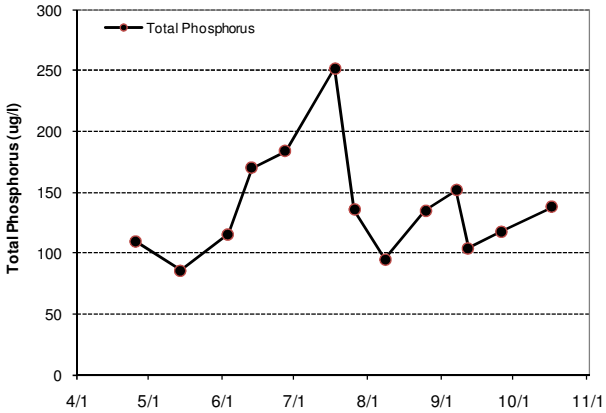
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	140.7	86.0	252.0	D
CLA (µg/l)	62.2	19.0	180.0	D
Secchi (m)	0.7	0.5	1.0	F
TKN (mg/l)	1.32	0.81	1.90	
			Lake Grade	D

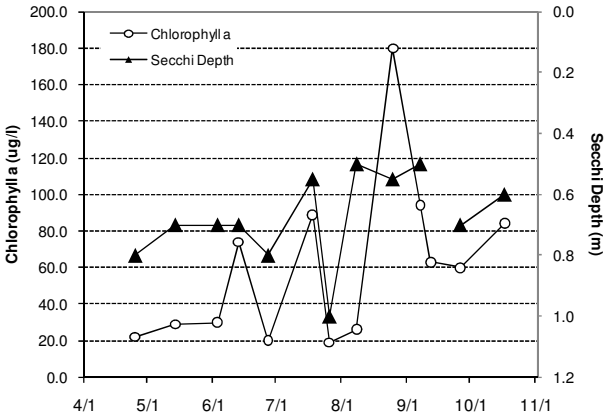
The lake received a lake grade of D for 2010, which is consistent with its water quality database. The Secchi grade remains poor with a grade of F. Secchi grades in 2002-2004 were Ds, but since then water clarity grades degressed to Fs. Also, the CLA grades have reduced from a B grade in 2002, to C grades in 2003, 2005, and 2006, and then to D grades in 2007, 2008, and 2010. These observations seem to indicate that the water quality for Twin Lake has degraded since 2002. 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.

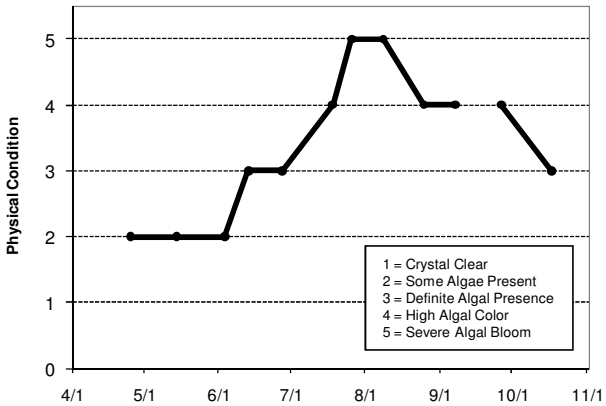






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/25	15.8				22.0	110		0.8	2	4
5/14	15.1				29.0	86		0.7	2	4
6/3	25.5				30.0	116		0.7	2	4
6/13	18.6				74.0	170		0.7	3	4
6/27	22.3				20.0	184		0.8	3	4
7/18	24.1				89.0	252		0.6	4	4
7/26	28.8				19.0	136		1.0	5	5
8/8	32.3				26.0	95		0.5	5	5
8/25	22.6				180.0	135		0.6	4	4
9/7	18.1				94.0	152		0.5	4	4
9/12					63.0	104				
9/26	16.4				60.0	118		0.7	4	4
10/17	14.1				84.0	138		0.6	3	4



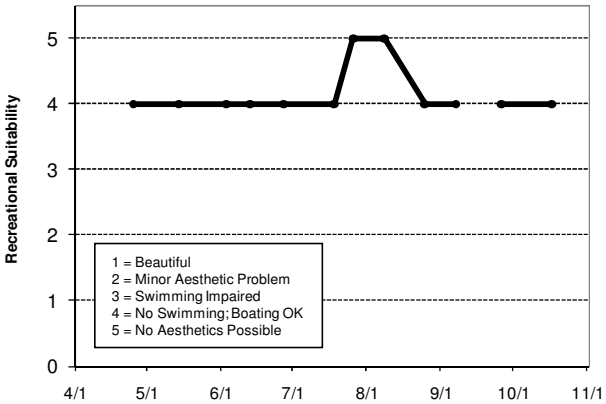
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus											F	F
Chlorophyll a											B	C
Secchi Depth											D	D
Lake Grade											**D**	**D**

Year	2004	2005	2006	2007	2008	2009	2010
Total Phosphorus	F	F	D	F	D	F	D
Chlorophyll a	D	C	C	D	D	F	D
Secchi Depth	D	F	F	F	F	F	F
Lake Grade	**D**	**D**	**D**	**F**	**D**	**F**	**D**

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.

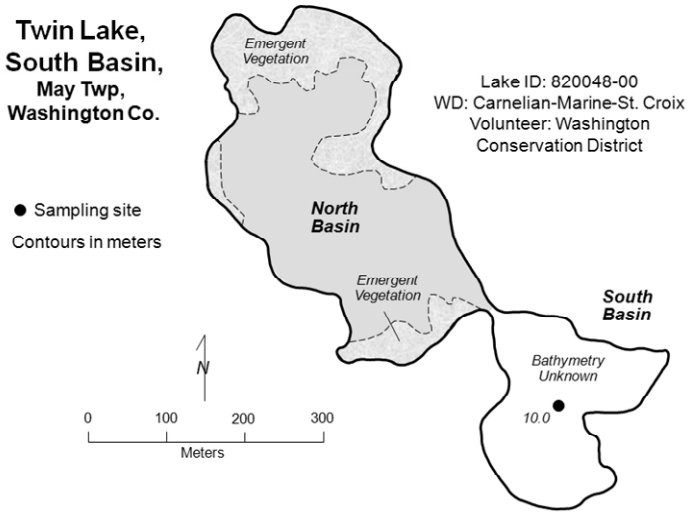
2010 summer (May-September) data summary

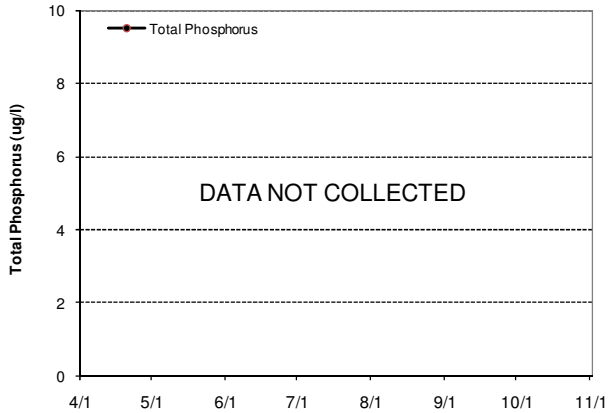
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
Secchi (m)	4.5	3.5	6.1	A

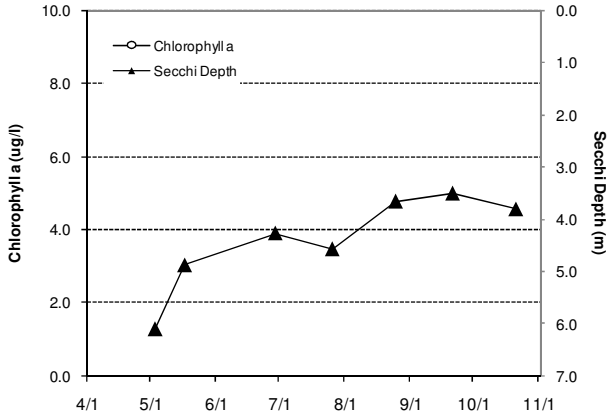
The lake received a Secchi grade of A for 2010, which is consistent with its limited historical database. A lake grade was not determined because TP and CLA were not monitored. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality 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.

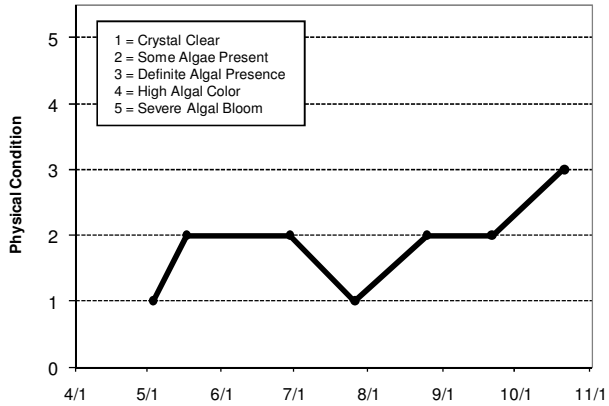






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/3	14.8	6.6	10.8	0.1				6.1	1	1
5/17	16.9	7.0	10.8	0.1				4.9	2	2
6/29	25.5	9.2	9.3	0.3				4.3	2	1
7/26	27.7	10.7	9.0	0.1				4.6	1	1
8/25	25.7	11.0	8.4	0.1				3.7	2	1
9/21	18.5	10.9	8.3	0.0				3.5	2	2
10/21	13.3	12.6	8.2	0.1				3.8	3	3



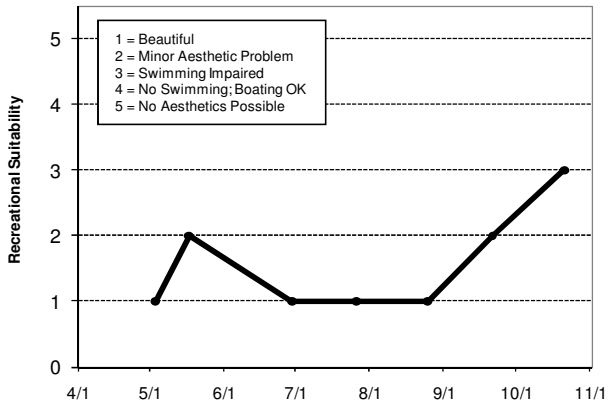
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus						A	A					
Chlorophyll a						A	A					
Secchi Depth						A	A					
Lake Grade						**A**	**A**					

Year	2004	2005	2006	2007	2008	2009	2010
Total Phosphorus					A	A	
Chlorophyll a					A	A	
Secchi Depth					A	A	A
Lake Grade					**A**	**A**	

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	73.4	32.0	112.0	D
CLA (µg/l)	51.2	1.6	150.0	D
Secchi (m)	1.5	0.6	3.3	C
TKN (mg/l)	1.28	0.59	2.00	
			Lake Grade	D

The lake received a lake grade of D for 2010, which is in stark contrast to last year's B grade. The lake grades have varied in the range of B to D for the past 16 years. Furthermore, the 2010 CLA grade of D, compared to the 2009 CLA grade of A, indicates that algal abundance increased substantially in 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.

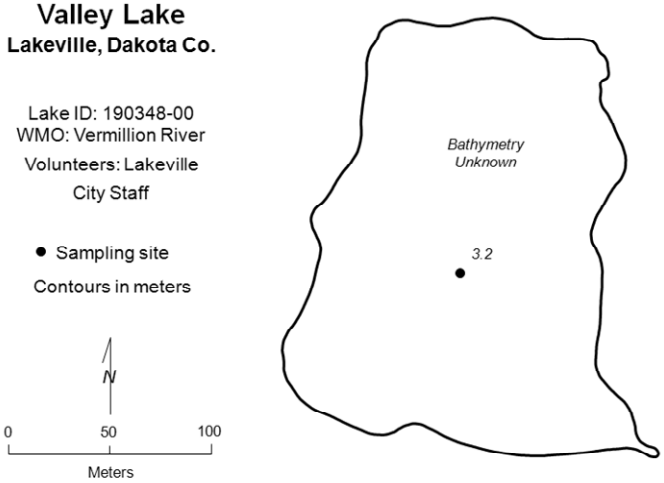
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

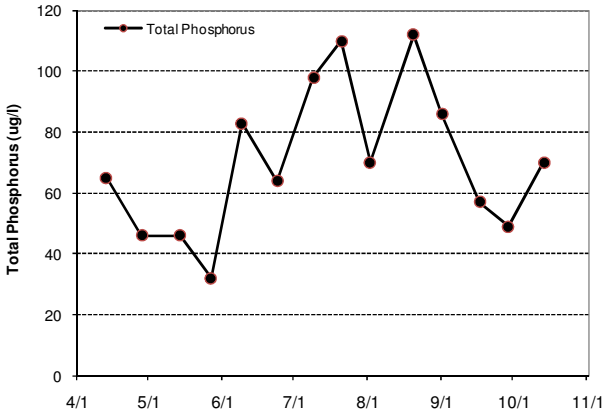
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

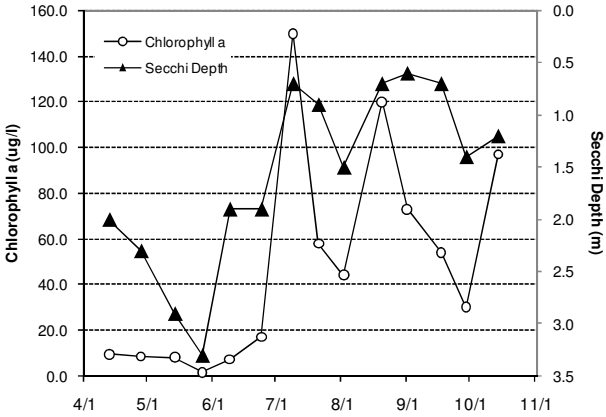
Valley Lake
Lakeville, Dakota Co.

Lake ID: 190348-00
WMO: Vermillion River
Volunteers: Lakeville City Staff

● Sampling site
Contours in meters

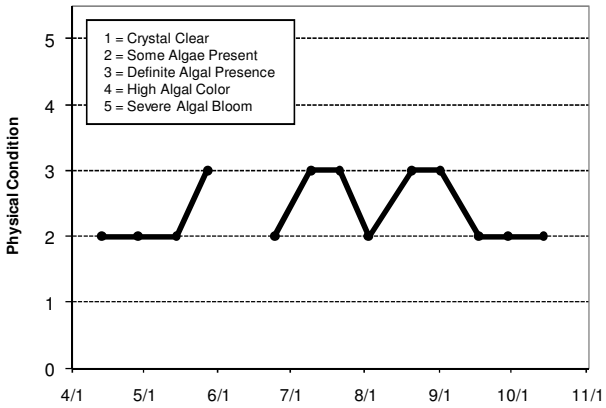






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/13	11.0				9.5	65		2.0	2	2
4/28	14.0				8.5	46		2.3	2	2
5/14	9.4				8.0	46		2.9	2	2
5/27	22.0				1.6	32		3.3	3	3
6/9	20.0				7.3	83		1.9		
6/24	22.0				17.0	64		1.9	2	2
7/9	24.0				150.0	98		0.7	3	3
7/21	25.0				58.0	110		0.9	3	3
8/2	26.0				44.0	70		1.5	2	2
8/20	24.0				120.0	112		0.7	3	3
9/1	22.0				73.0	86		0.6	3	3
9/17	15.0				54.0	57		0.7	2	2
9/29	14.0				30.0	49		1.4	2	1
10/14	16.0				97.0	70		1.2	2	1



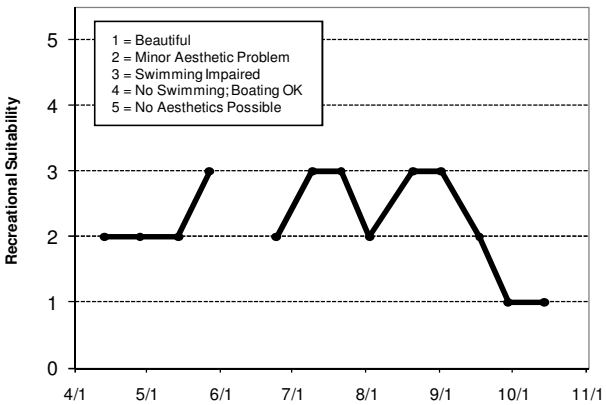
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
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
Total Phosphorus	C	C	D	D	C	C	D
Chlorophyll a	C	C	D	C	C	A	D
Secchi Depth	C	C	D	C	C	B	C
Lake Grade	**C**	**C**	**D**	**C**	**C**	**B**	**D**

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.

2010 summer (May-September) data summary

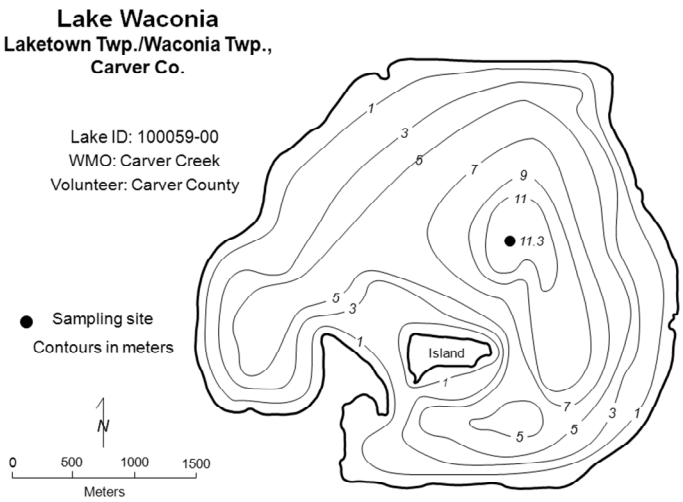
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	36.0	15.0	71.0	C
CLA (µg/l)	25.7	2.9	67.0	C
Secchi (m)	2.2	1.1	4.8	C
TKN (mg/l)	1.16	0.75	1.50	
			Lake Grade	C

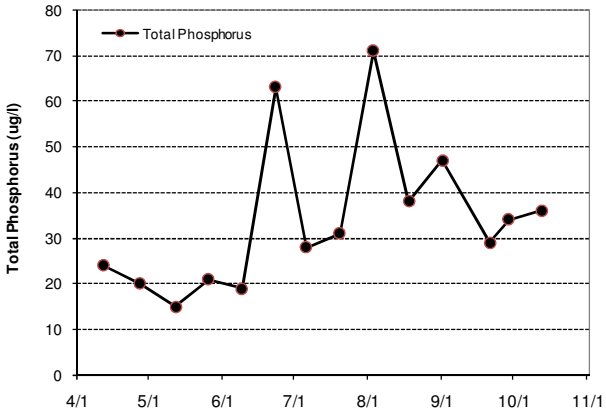
The lake received a lake grade of C for 2010, which is consistent with its historical database. The lake grades fluctuate from year to year, but generally the lake receives either a B or C lake grade.

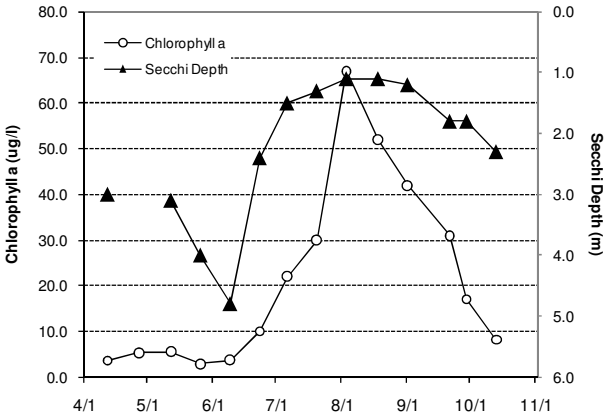
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

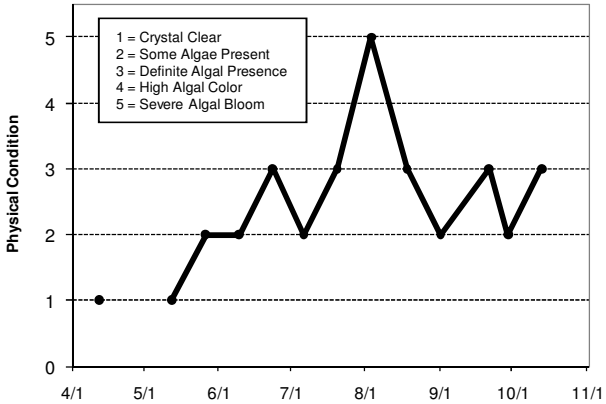
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

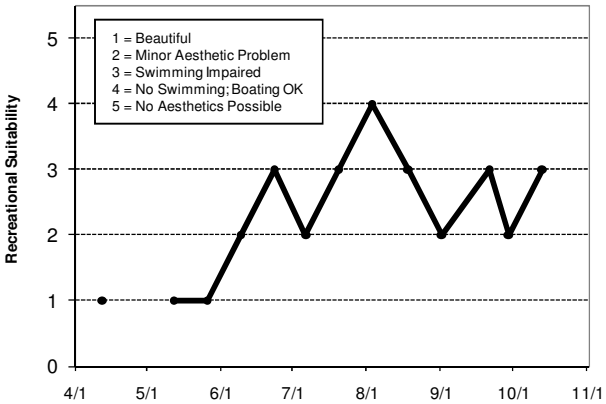
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	9.1	8.2	11.7	10.8	3.6	24		3.0	1	1
4/27	13.0	12.6	15.9	15.5	5.3	20				
5/12	11.3	11.3	11.9	11.4	5.5	15		3.1	1	1
5/26	21.8	13.5	10.7	10.0	2.9	21		4.0	2	1
6/9	20.1	14.7	9.2	4.6	3.7	19		4.8	2	2
6/23	22.8	19.8	9.9	6.0	10.0	63		2.4	3	3
7/6	25.7	21.0	14.0	1.2	22.0	28		1.5	2	2
7/20	25.5	24.2	11.6	2.4	30.0	31		1.3	3	3
8/3	27.5	24.0	12.3	0.1	67.0	71		1.1	5	4
8/18	24.1	23.9	9.4	8.2	52.0	38		1.1	3	3
9/1	24.1	23.6	10.8	9.1	42.0	47		1.2	2	2
9/21	17.3	16.7	9.3	8.5	31.0	29		1.8	3	3
9/29	15.7	15.6	9.0	9.0	17.0	34		1.8	2	2
10/13	16.0	15.4	9.7	9.6	8.2	36		2.3	3	3

Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus	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
Total Phosphorus	B	B	C	C	C	C	C
Chlorophyll a	B	B	C	B	C	A	C
Secchi Depth	C	A	B	C	B	A	C
Lake Grade	**B**	**B**	**C**	**C**	**C**	**B**	**C**

Source: Metropolitan Council and STORET data

Weber Pond (82-0119) *Valley Branch Watershed District*

Weber Pond is located in the City of Mahtomedi (Washington County). It has a surface area of 7.5 acres and a maximum depth of 2.0 m (6.5 ft). Other bathymetric information is unknown. The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

2010 summer (May-September) data summary

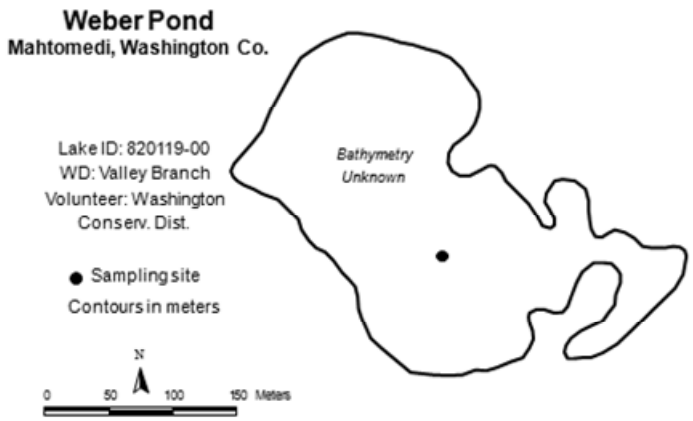
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	33.6	29.0	44.0	C
CLA (µg/l)	8.2	2.0	14.0	A
Secchi (m)	1.3	1.1	1.7	C
TKN (mg/l)	1.04	0.94	1.10	
			Lake Grade	B

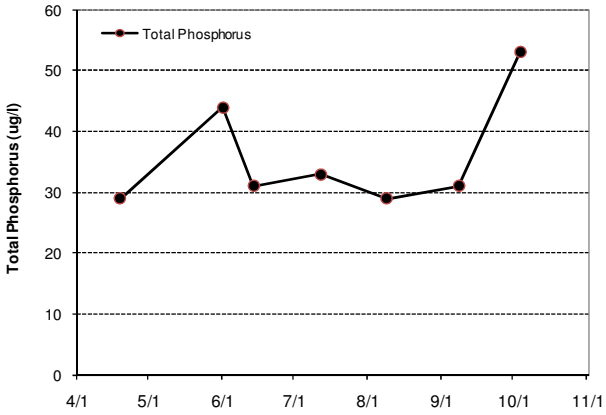
The lake received a lake grade of B for 2010. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

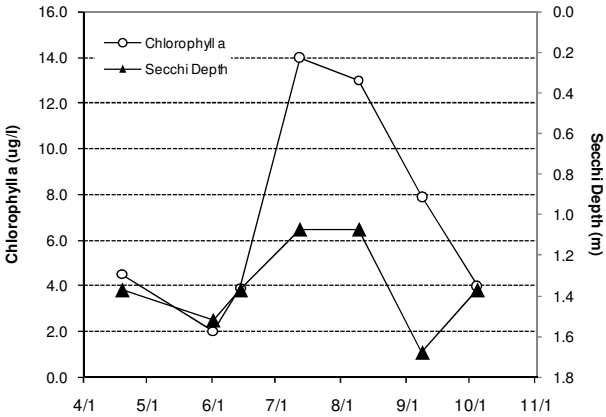
The water clarity grade of D does not correlate well with the CLA grade of A. A possible explanation may be that the water clarity may be affected by higher levels of total suspended solids from surface runoff from storm sewers and the surrounding suburban watershed. It may be that higher loadings of suspended solids have decreased water clarity which would decrease light penetration thereby inhibiting algal growth.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

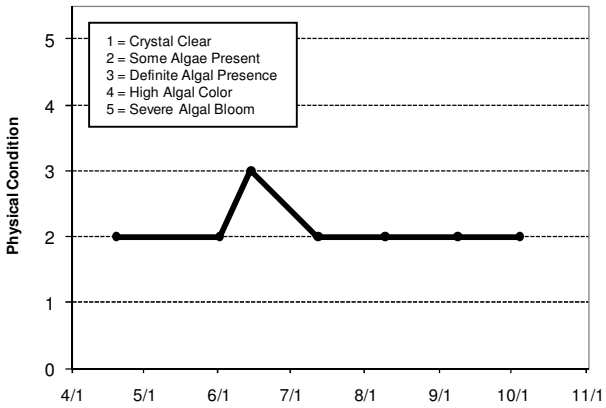






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	15.5	15.0	10.7	5.5	4.5	29		1.4	2	3
6/1	23.6	23.6	6.4	2.2	2.0	44		1.5	2	4
6/14	18.3	17.7	9.2	2.5	3.9	31		1.4	3	3
7/12	24.7	24.1	5.6	0.7	14.0	33		1.1	2	4
8/9	27.0	22.4	6.7	0.0	13.0	29		1.1	2	4
9/8	16.5	16.3	9.2	1.4	7.9	31		1.7	2	4
10/4	13.2	13.1	10.1	0.1	4.0	53		1.4	2	4



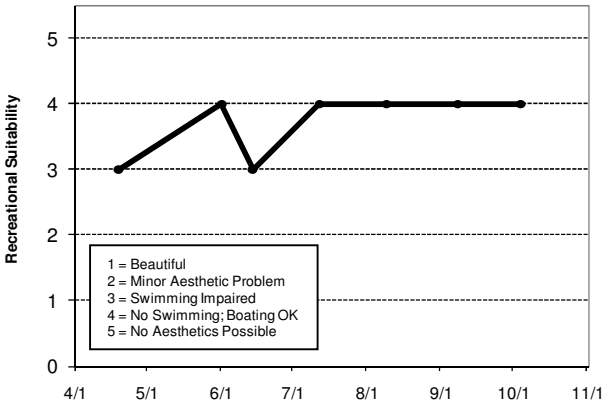
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	2004	2005	2006	2007	2008	2009	2010
Total Phosphorus			D			B	C
Chlorophyll a			A		A	A	A
Secchi Depth			D		D	D	C
Lake Grade			**C**			**B**	**B**

Source: Metropolitan Council and STORET data



West Boot Lake (82-0044) *Carnelian - Marine Watershed District*

West Boot Lake is located in May Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007). The 110-acre lake has mean and maximum depths of 5.9 m (19 ft) and 11.9 m (39 ft), respectively. The lake's 209-acre immediate watershed translates to a relatively small 2:1 watershed-to-lake area ratio. The greater the ratio, the greater the potential stress on the lake from surface runoff.

On each sampling day the lake was monitored for secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

2010 summer (May-September) data summary

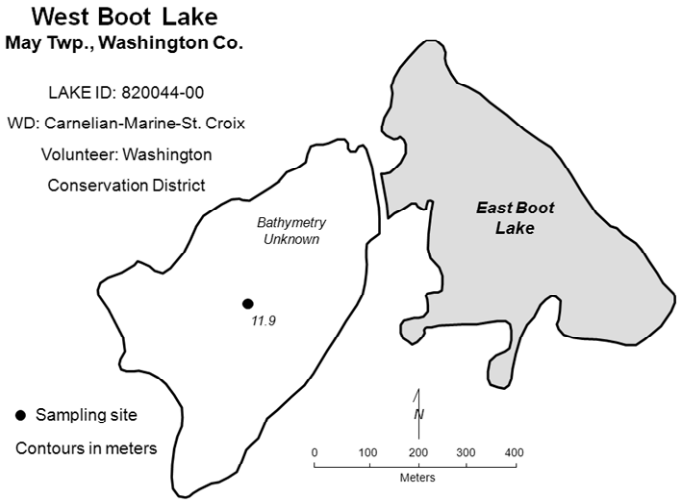
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
Secchi (m)	4.7	3.2	6.6	A

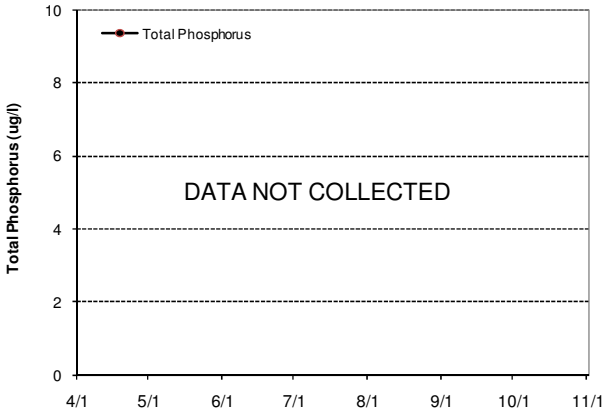
The Secchi grade of A for 2009 is consistent with the A grades received since 1999. A lake grade was not given this year because total phosphorus and CLA samples were not collected in 2009.

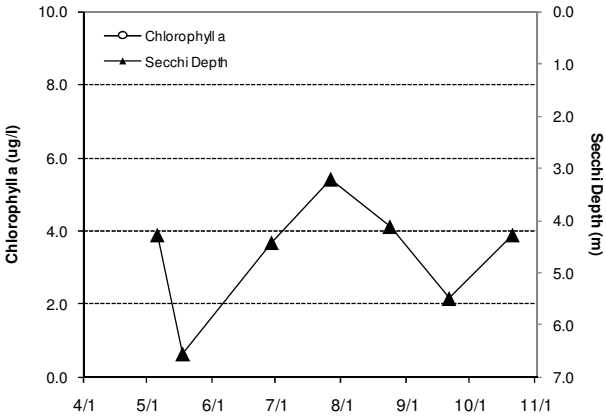
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

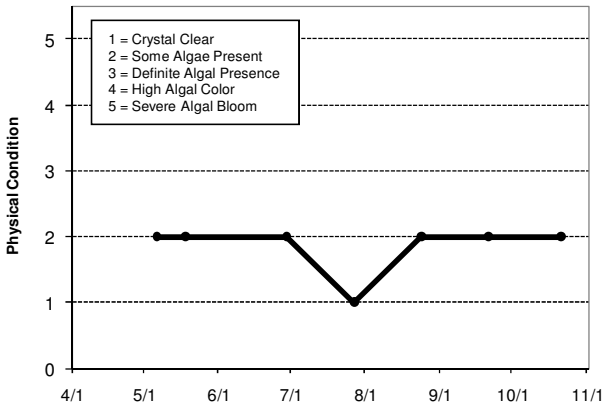






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
5/6	14.1	4.6	9.6	0.0				4.3	2	2
5/18	19.3	4.6	10.9	0.0				6.6	2	2
6/29	23.6	5.0	7.8	0.1				4.4	2	2
7/27	26.5	5.0	6.8	0.0				3.2	1	1
8/24	24.9	5.1	6.1	0.0				4.1	2	1
9/21	16.6	5.3	6.2	0.1				5.5	2	1
10/21	12.6	5.3	7.2	0.0				4.3	2	2



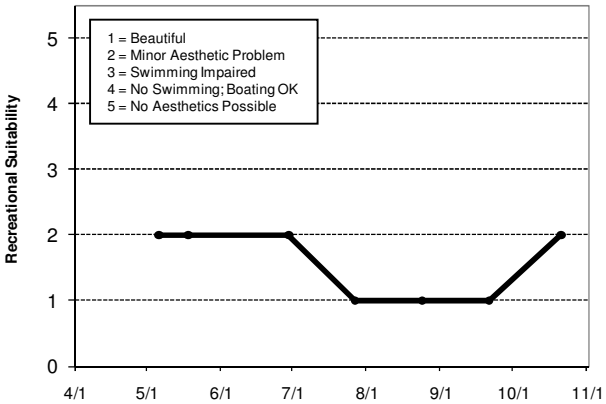
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												C
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus					B	C	A	A	A	A	A	B
Chlorophyll a					A	B	C	A	A	A	A	A
Secchi Depth					B	C	B	A	A	A	A	A
Lake Grade					**B**	**C**	**B**	**A**	**A**	**A**	**A**	**A**

Year	2004	2005	2006	2007	2008	2009	2010
Total Phosphorus	A	A	A	B			
Chlorophyll a	A	A	A	A			
Secchi Depth	A	A	A	A	A	A	A
Lake Grade	**A**	**A**	**A**	**A**			

Source: Metropolitan Council and STORET data



West Lakeland Storage Site [north basin] (82-0488) *Valley Branch Watershed District*

The West Lakeland Storage Site is located in West Lakeland Township (Washington County). The storage site consists of three basins: north, middle, and south. The north basin has a maximum depth of 5.8 m (19 ft). Other bathymetric information for the basin is unknown. Most of the area of the basin is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

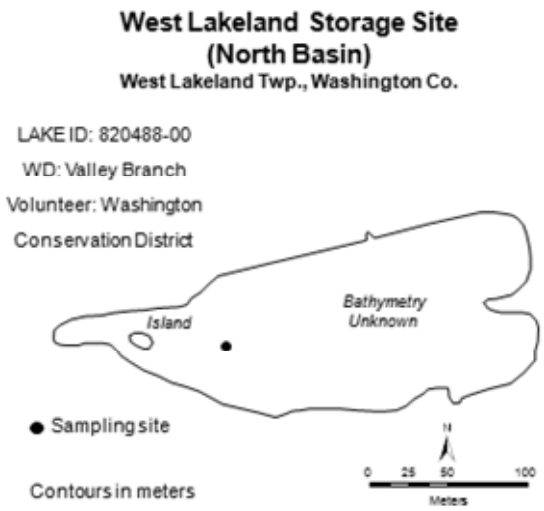
2010 summer (May-September) data summary

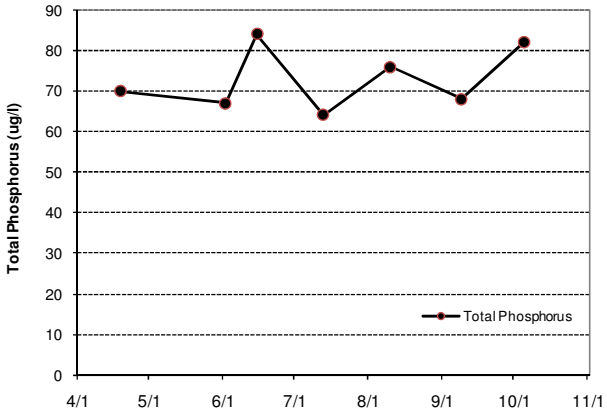
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	71.8	64.0	84.0	D
CLA (µg/l)	34.4	21.0	50.0	C
Secchi (m)	0.7	0.6	0.8	D
TKN (mg/l)	1.24	1.00	1.30	
			Lake Grade	D

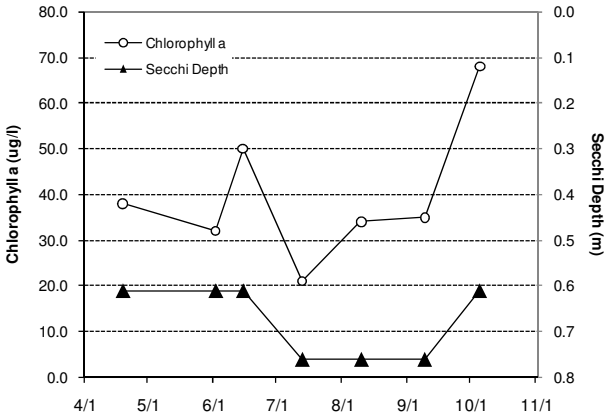
The north basin received a lake grade of D for 2010. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

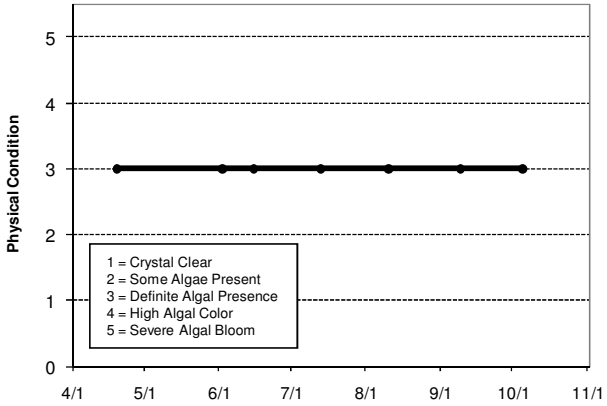
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

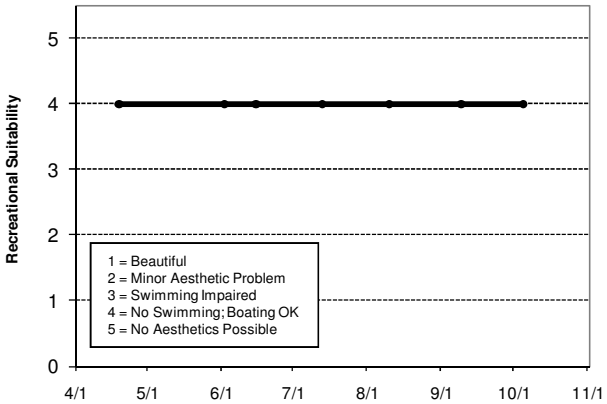
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	17.9	12.3	13.6	0.1	38.0	70		0.6	3	4
6/2	23.3	17.8	8.8	3.1	32.0	67		0.6	3	4
6/15	20.5	19.4	10.9	0.1	50.0	84		0.6	3	4
7/13	26.2	22.9	7.2	0.1	21.0	64		0.8	3	4
8/10	28.3	26.9	9.5	1.4	34.0	76		0.8	3	4
9/9	19.3	18.3	12.4	0.3	35.0	68		0.8	3	4
10/5	13.9	13.6	10.2	8.4	68.0	82		0.6	3	4

Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	2004	2005	2006	2007	2008	2009	2010
Total Phosphorus					C	C	D
Chlorophyll a					B	C	C
Secchi Depth					C	C	D
Lake Grade					**C**	**C**	**D**

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	21.1	19.0	26.0	A
CLA (µg/l)	3.0	1.0	5.8	A
Secchi (m)	1.3	1.0	1.7	C
TKN (mg/l)	1.15	0.97	1.20	
			Lake Grade	B

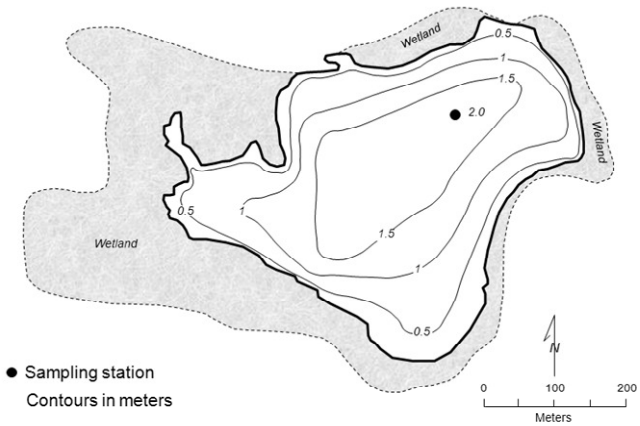
The lake received a lake grade of B in 2010, which is consistent with its historical database. The lake grades have varied mainly in the Cs and Bs. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

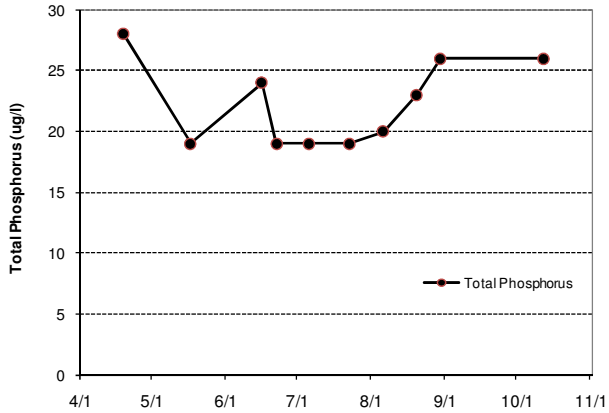
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

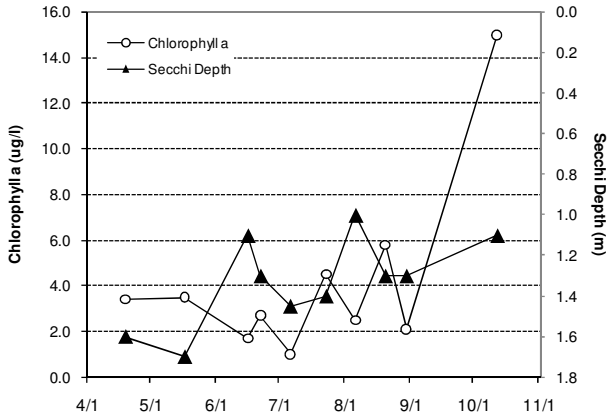
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

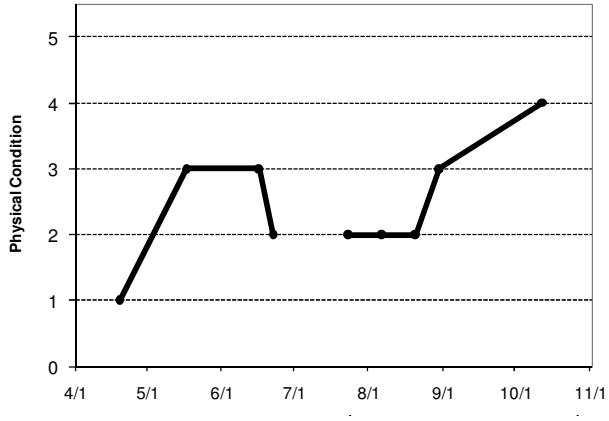
Lake ID: 270711-00
WMO: Bassett Creek
Volunteer: Westwood Nature Center

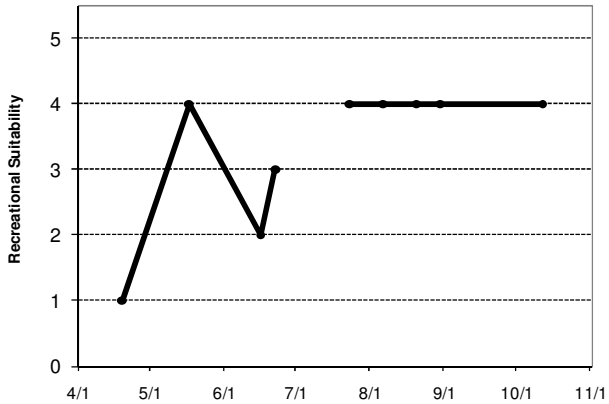
Westwood Lake,
St. Louis Park, Hennepin Co.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/19	17.6				3.4	28		1.6	1	1
5/17	21.6				3.5	19		1.7	3	4
6/16	24.6				1.7	24		1.1	3	2
6/22	26.6				2.7	19		1.3	2	3
7/6	30.2				1.0	19		1.5		
7/23	25.5				4.5	19		1.4	2	4
8/6					2.5	20		1.0	2	4
8/20					5.8	23		1.3	2	4
8/30					2.1	26		1.3	3	4
10/12					15.0	26		1.1	4	4

Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus			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
Total Phosphorus	C	D	D	C	B	C	A
Chlorophyll a	A	C	B	B	A	B	A
Secchi Depth	C	C	C	C	D	D	C
Lake Grade	**B**	**C**	**C**	**C**	**B**	**C**	**B**

Source: Metropolitan Council and STORET data

White Rock Lake (82-0072) *Rice Creek Watershed District*

White Rock Lake is a 65-acre lake located in Washington County. There is no other known morphological data for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2010 summer (May-September) data summary

Parameter	**Mean**	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	64.9	40.0	88.0	C
CLA (µg/l)	20.5	4.4	46.0	C
Secchi (m)	1.0	0.6	1.8	D
TKN (mg/l)	1.96	1.30	2.60	
			Lake Grade	C

The lake received a lake grade of C in 2010, which is the best lake grade received according to 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.

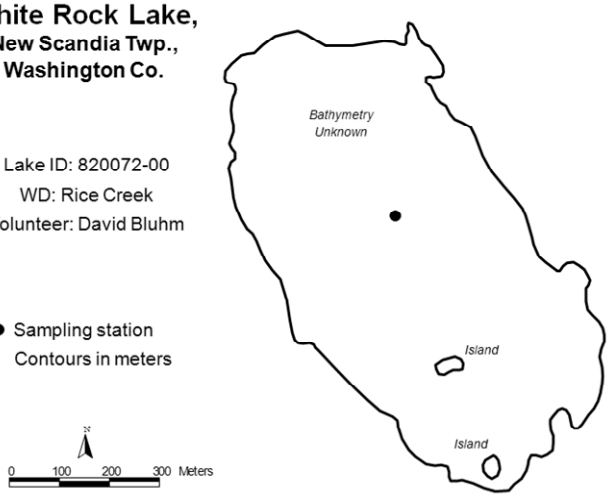
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

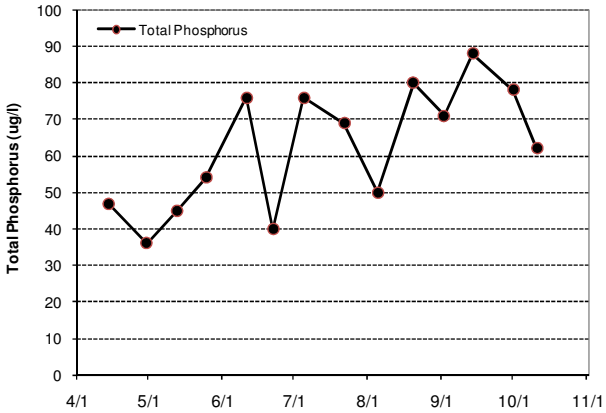
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

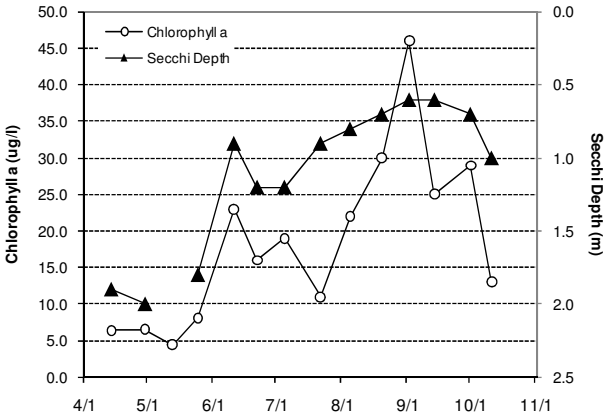
White Rock Lake,
New Scandia Twp., Washington Co.

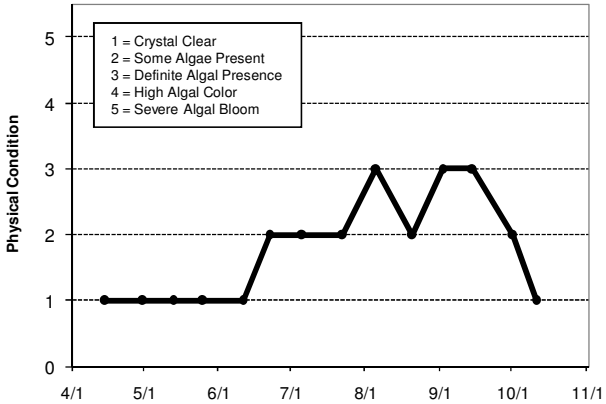
Lake ID: 820072-00
WD: Rice Creek
Volunteer: David Bluhm

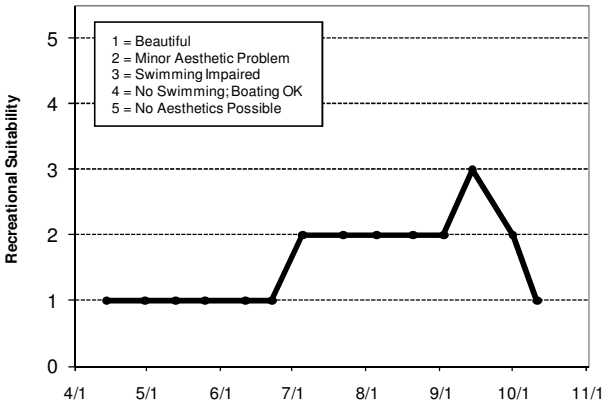
● Sampling station
Contours in meters











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/14	13.7				6.4	47		1.9	1	1
4/30	15.4				6.5	36		2.0	1	1
5/13	11.0				4.4	45			1	1
5/25	26.3				8.1	54		1.8	1	1
6/11	20.0				23.0	76		0.9	1	1
6/22	25.4				16.0	40		1.2	2	1
7/5	26.7				19.0	76		1.2	2	2
7/22	25.6				11.0	69		0.9	2	2
8/5	25.6				22.0	50		0.8	3	2
8/20	25.2				30.0	80		0.7	2	2
9/2	23.6				46.0	71		0.6	3	2
9/14	20.5				25.0	88		0.6	3	3
10/1	16.0				29.0	78		0.7	2	2
10/11	19.9				13.0	62		1.0	1	1

Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	2004	2005	2006	2007	2008	2009	2010
Total Phosphorus			D	D	D	D	C
Chlorophyll a			C	C	C	C	C
Secchi Depth			F	F	D	D	D
Lake Grade			**D**	**D**	**D**	**D**	**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.

2010 summer (May-September) data summary

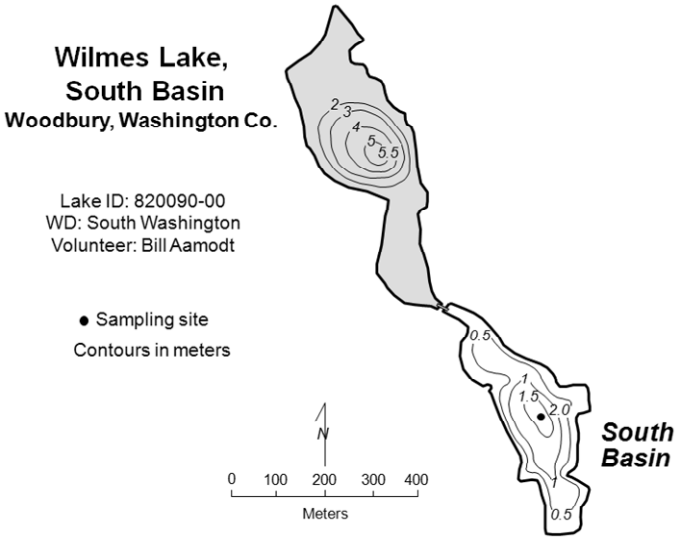
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	85.0	35.0	120.0	D
CLA (µg/l)	31.0	2.9	100.0	C
Secchi (m)	1.7	0.9	3.2	C
TKN (mg/l)	1.21	0.84	1.70	
			Lake Grade	C

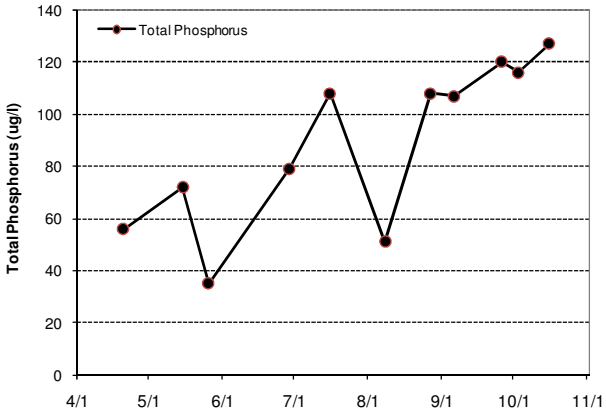
The lake received a lake grade of C for 2010, which is consistent with its historical water quality database. The water quality of the lake varies between a lake grade of C and D

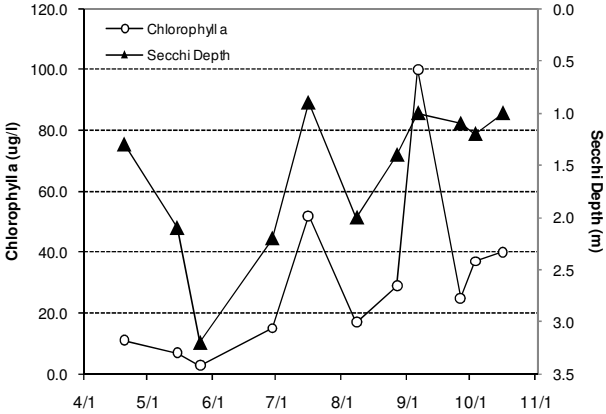
The 1994 and 1995 CAMP monitoring was performed in the northern basin of Wilmes Lake, while the 1996-2009 monitoring was performed in the lake's south basin. Comparisons between the 1994-1995 data and the 1996-2009 data should not be made because they are from different basins.

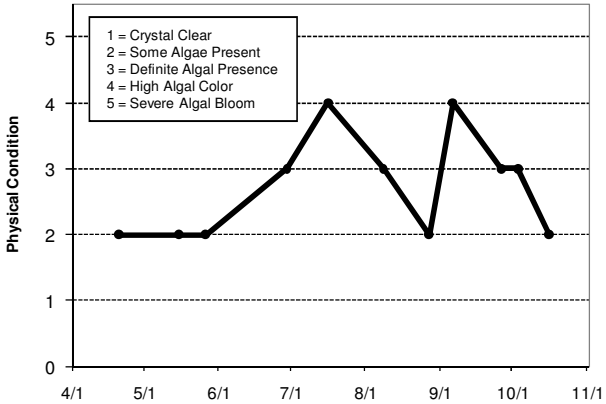
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

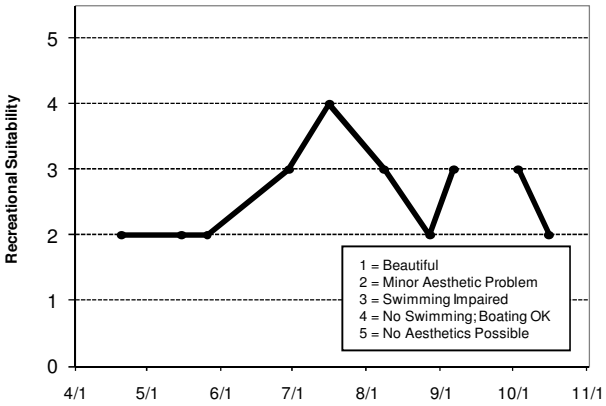
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/20	19.1				11.0	56		1.3	2	2
5/15	16.4				7.0	72		2.1	2	2
5/26	26.0				2.9	35		3.2	2	2
6/29	24.1				15.0	79		2.2	3	3
7/16	27.1				52.0	108		0.9	4	4
8/8	27.4				17.0	51		2.0	3	3
8/27	24.4				29.0	108		1.4	2	2
9/6	20.4				100.0	107		1.0	4	3
9/26	17.8				25.0	120		1.1	3	
10/3	15.6				37.0	116		1.2	3	3
10/16	14.4				40.0	127		1.0	2	2

Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
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
Total Phosphorus	C	D	D	D	C	C	D
Chlorophyll a	C	C	C	C	C	C	C
Secchi Depth	C	D	C	C	D	C	C
Lake Grade	**C**	**D**	**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 is little known morphological data available for the lake.

On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

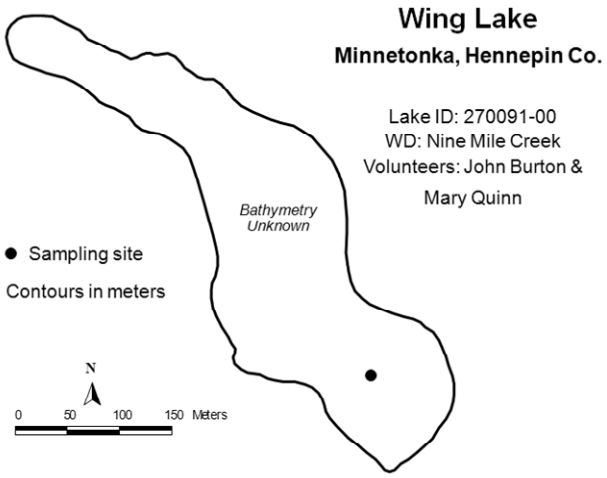
2010 summer (May-September) data summary

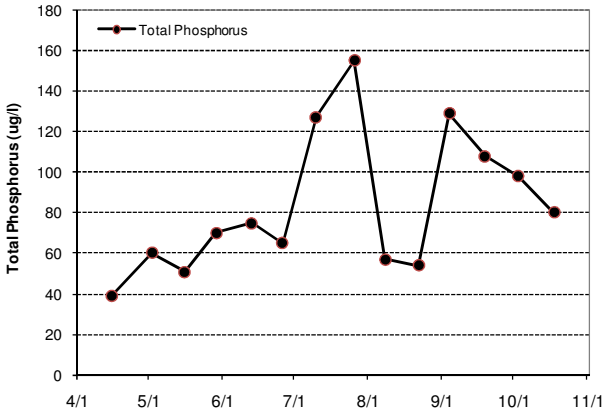
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	86.5	51.0	155.0	D
CLA (µg/l)	48.0	13.0	93.0	D
Secchi (m)	0.9	0.6	1.2	D
TKN (mg/l)	1.38	0.66	1.80	
			Lake Grade	D

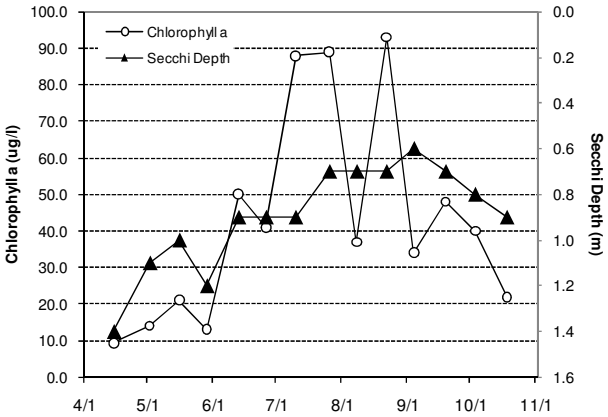
The lake received a lake grade of D for 2010, which is consistent with its limited historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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.

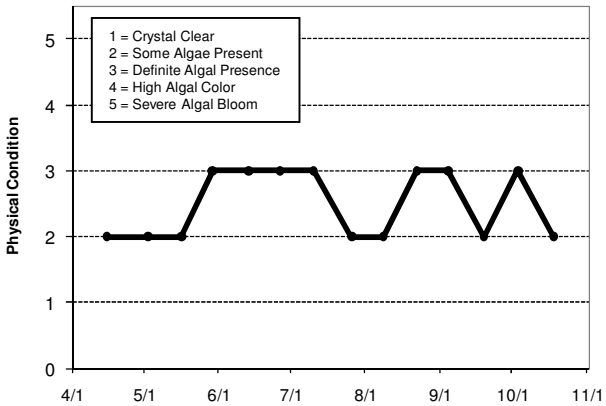






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/15	18.0				9.3	39		1.4	2	4
5/2	17.0				14.0	60		1.1	2	4
5/16	18.0				21.0	51		1.0	2	4
5/29	23.0				13.0	70		1.2	3	5
6/13	17.0				50.0	75		0.9	3	5
6/26	25.3				41.0	65		0.9	3	4
7/10	29.5				88.0	127		0.9	3	5
7/26	26.1				89.0	155		0.7	2	5
8/8	30.2				37.0	57		0.7	2	5
8/22	24.0				93.0	54		0.7	3	5
9/4	20.0				34.0	129		0.6	3	4
9/19	14.0				48.0	108		0.7	2	5
10/3	15.0				40.0	98		0.8	3	4
10/18	13.0				22.0	80		0.9	2	4



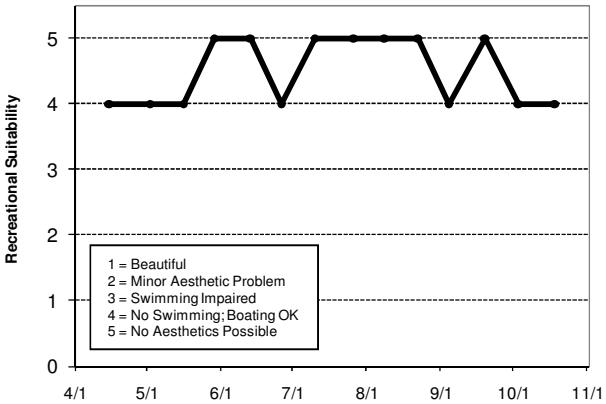
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	2004	2005	2006	2007	2008	2009	2010
Total Phosphorus			D	D	D	D	D
Chlorophyll a			C	C	C	C	D
Secchi Depth			D	D	D	D	D
Lake Grade			**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.

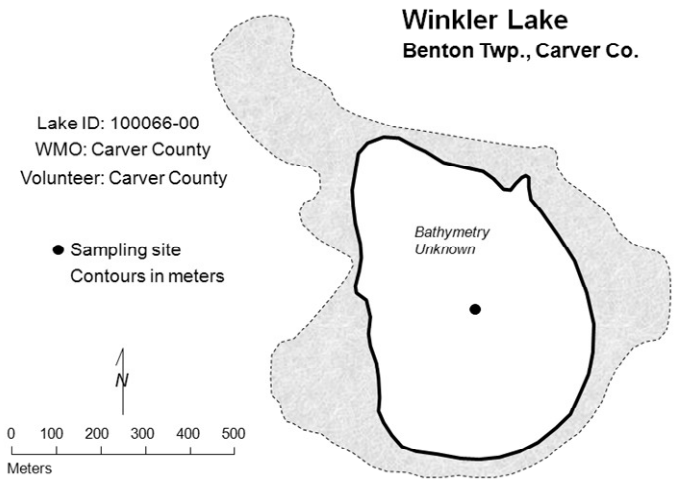
2008 summer (May-September) data summary

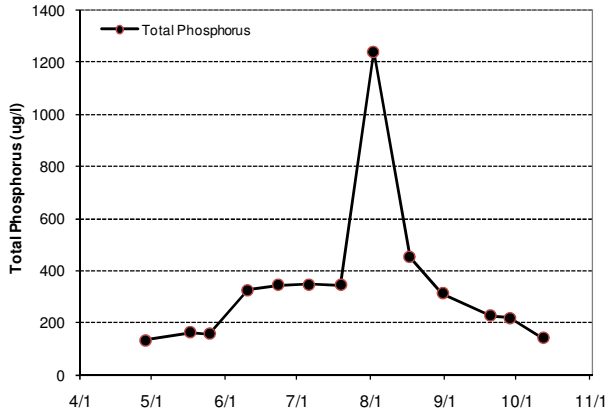
Parameter	Mean	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	376.5	158.0	1240.0	F
CLA (µg/l)	121.5	47.0	350.0	F
Secchi (m)	0.4	0.2	0.6	F
TKN (mg/l)	3.91	2.10	15.00	
			Lake Grade	F

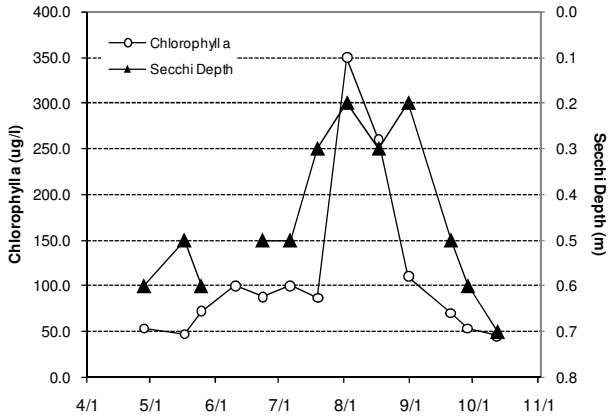
The lake received a lake grade of F for 2010. The lake appears to fluctuate between lake grades of D and F, except that F lake grades are more common. The lake received a lake grade of C in 1995, so to better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

Throughout the monitoring period, the volunteer's opinions of the lake'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.

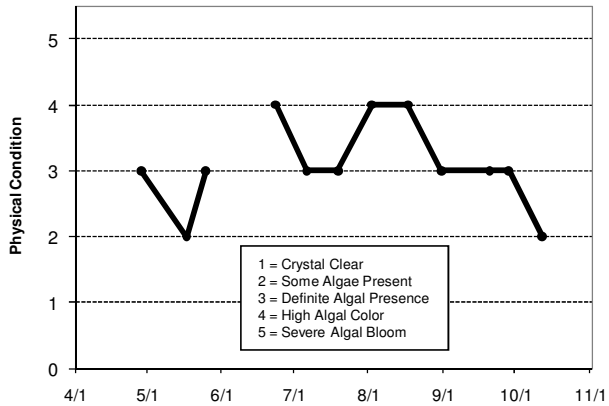






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/28	15.5		34.9		53.0	133		0.6	3	4
5/17	18.2	16.5	26.9	8.0	47.0	164		0.5	2	4
5/25	25.6	24.2	18.1	12.4	72.0	158		0.6	3	4
6/10	18.8	18.8	10.7	10.5	100.0	326				
6/23	25.8	25.7	5.7	3.3	88.0	346		0.5	4	4
7/6	28.1		19.5		100.0	349		0.5	3	4
7/19	24.6		9.7		87.0	346		0.3	3	4
8/2	26.5		15.3		350.0	1240		0.2	4	4
8/17	20.9	20.7	11.9	10.9	260.0	452		0.3	4	4
8/31	24.3		7.8		110.0	313		0.2	3	3
9/20	14.6		10.6		70.0	228		0.5	3	4
9/28	13.9	13.8	10.5	10.2	53.0	220		0.6	3	3
10/12	16.0		12.1		45.0	141		0.7	2	4



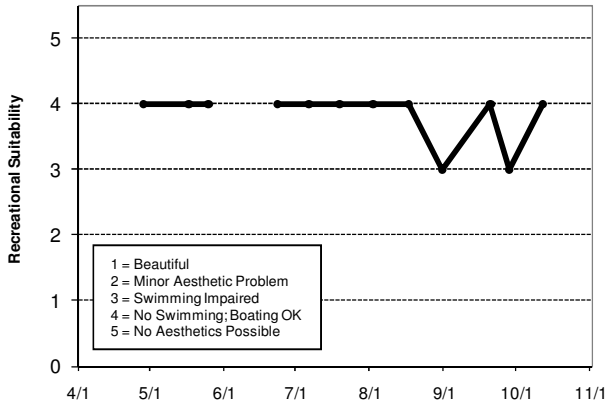
Lake Water Quality Grades Based on Summertime Averages

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				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
Total Phosphorus		F		F	F		F
Chlorophyll a		F		C	F		F
Secchi Depth		F		F	F		F
Lake Grade		**F**		**D**	**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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	35.8	13.0	65.0	C
CLA (µg/l)	20.9	1.7	57.0	C
Secchi (m)	2.4	0.4	3.8	B
TKN (mg/l)	1.19	0.62	1.80	
			Lake Grade	C

The lake received a lake grade of C for 2010, which is consistent with its historical database. The lake appears to be represented by a lake grade of C.

Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

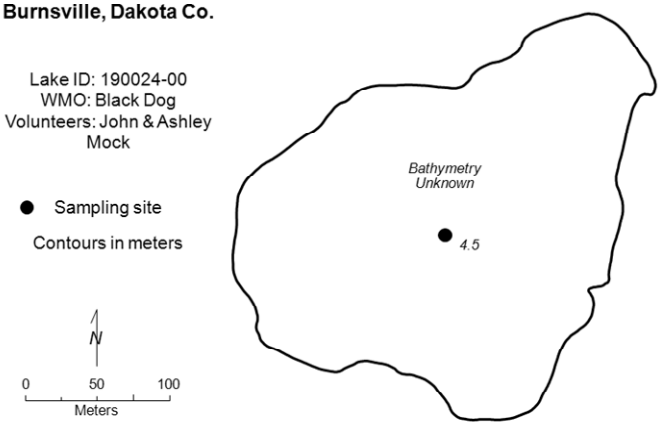
Wood Pond

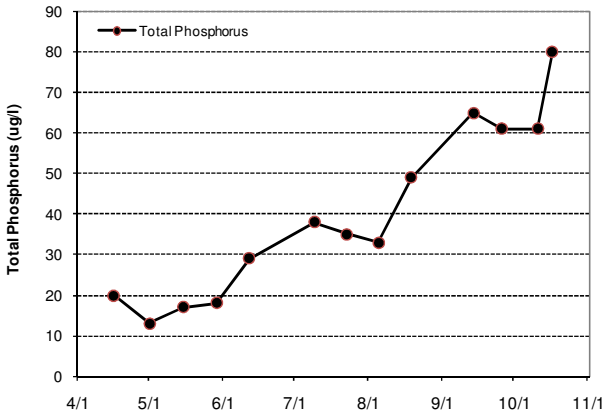
Burnsville, Dakota Co.

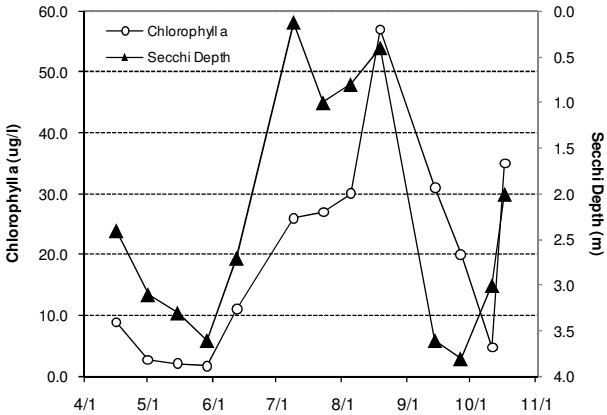
Lake ID: 190024-00
WMO: Black Dog
Volunteers: John & Ashley Mock

● Sampling site

Contours in meters

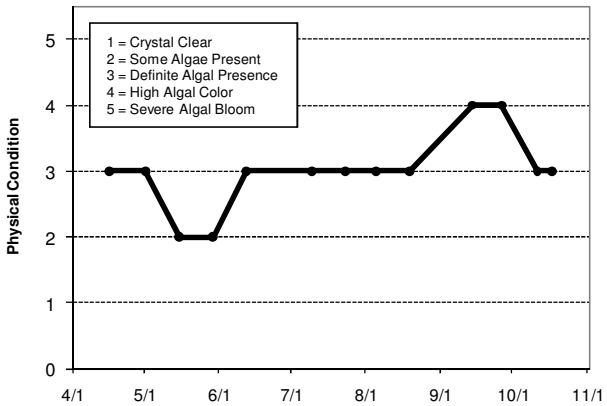






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/16	14.1				8.9	20		2.4	3	4
5/1	15.6				2.7	13		3.1	3	2
5/15	15.8				2.1	17		3.3	2	2
5/29	25.1				1.7	18		3.6	2	2
6/12	20.3				11.0	29		2.7	3	3
7/9	28.4				26.0	38		0.1	3	3
7/23	29.5				27.0	35		1.0	3	3
8/5	27.5				30.0	33		0.8	3	4
8/19	24.7				57.0	49		0.4	3	4
9/14	16.1				31.0	65		3.6	4	4
9/26	15.1				20.0	61		3.8	4	4
10/11	15.1				4.8	61		3.0	3	4
10/17	14.6				35.0	80		2.0	3	4



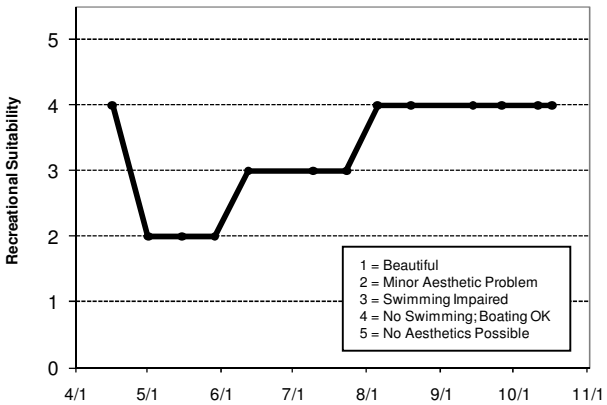
Lake Water Quality Grades Based on Summertime Averages

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					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
Total Phosphorus	C	C	D	C	C	C	C
Chlorophyll a	B	C	C	B	B	B	C
Secchi Depth	C	C	C	C	C	C	B
Lake Grade	**C**	**C**	**C**	**C**	**C**	**C**	**C**

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.

2010 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	61.1	25.0	117.0	C
CLA (µg/l)	27.5	2.3	64.0	C
Secchi (m)	2.0	0.6	6.1	C
TKN (mg/l)	1.49	0.86	2.80	
			Lake Grade	C

The lake received a lake grade of C for 2010, 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.

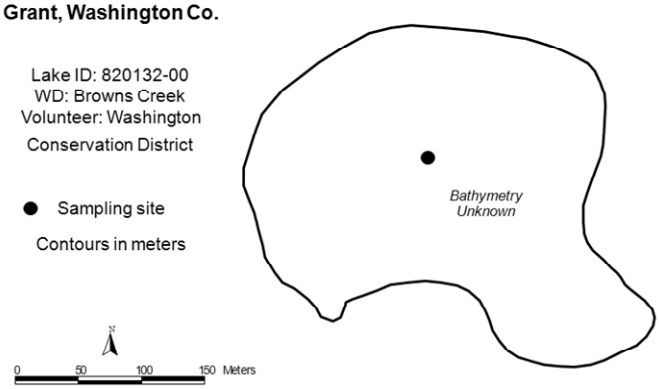
Woodpile Lake

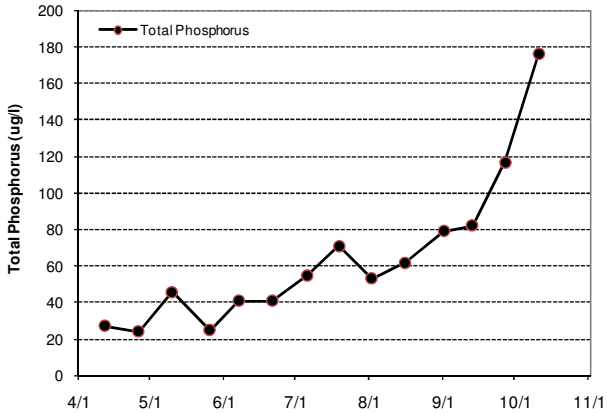
Grant, Washington Co.

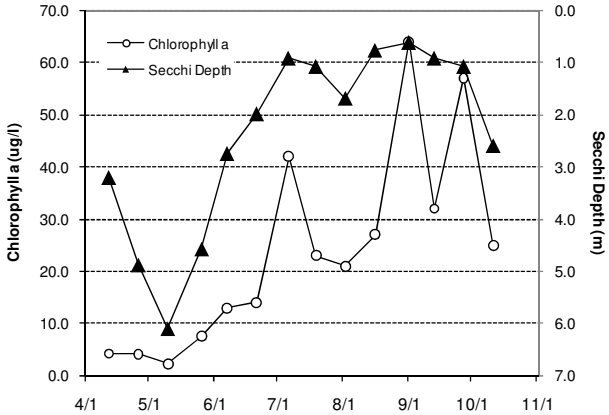
Lake ID: 820132-00
WD: Browns Creek
Volunteer: Washington
Conservation District

● Sampling site

Contours in meters

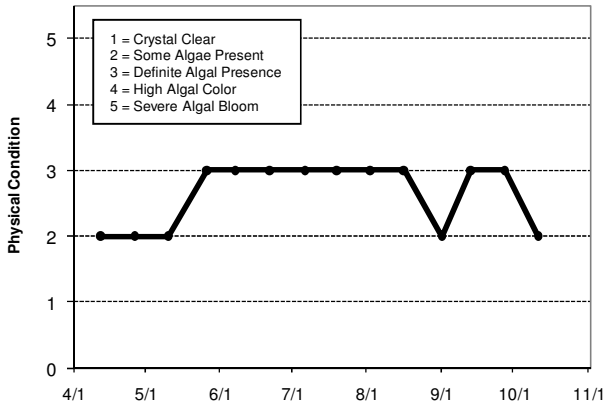






2010 Data

DATE	SURF TEMP (°C)	BOT TEMP (°C)	SURF DO (mg/l)	BOT DO (mg/l)	CLA (µg/l)	SURF TP (µg/l)	BOT TP (µg/l)	SECCHI (m)	PC	RS
4/12	13.1	5.8	11.8	0.3	4.2	27		3.2	2	3
4/26	14.4	6.3	9.0	0.1	4.1	24		4.9	2	2
5/10	13.2	7.0	10.6	0.1	2.3	46		6.1	2	2
5/26	25.4	7.8	9.8	0.1	7.5	25		4.6	3	3
6/7	22.9	9.1	9.9	0.1	13.0	41		2.7	3	3
6/21	24.2	9.4	10.3	0.1	14.0	41		2.0	3	3
7/6	27.0	9.4	9.8	0.0	42.0	55		0.9	3	4
7/19	26.2	10.1	6.6	0.0	23.0	71		1.1	3	4
8/2	26.3	10.1	5.8	0.0	21.0	53		1.7	3	4
8/16	24.7	10.1	6.6	0.0	27.0	62		0.8	3	4
9/1	25.4	10.3	8.9	0.1	64.0	79		0.6	2	2
9/13	19.1	10.5	7.6	0.0	32.0	82		0.9	3	4
9/27	15.6	10.6	9.7	0.1	57.0	117		1.1	3	3
10/11	16.9	10.8	10.4	0.1	25.0	176		2.6	2	3



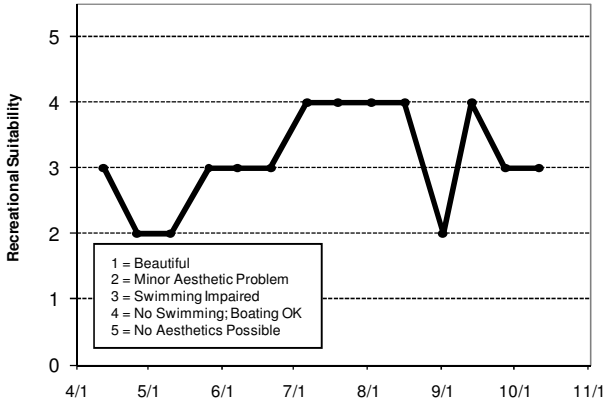
Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

Year	2004	2005	2006	2007	2008	2009	2010
Total Phosphorus			D	C	C	C	C
Chlorophyll a			B	B	C	B	C
Secchi Depth			C	B	C	B	C
Lake Grade			**C**	**B**	**C**	**B**	**C**

Source: Metropolitan Council and STORET data



REFERENCES

APHA 1998. American Public Health Association, American Water Works Association, and Water Environment Federation. *Standard Methods for the Examination of Water and Wastewater*. 20th ed.

Anhorn, R.J. 2003a. *Handbook for the Citizen-Assisted Lake Monitoring Program*. Metropolitan Council. St. Paul, MN.

Anhorn, R.J. 2003b. A 2002 Study of the Water Quality of 137 Metropolitan Area Lakes. Metropolitan Council. Pub. no. 32-03-019.

Blue Water Science and Bonestroo, Rosene, Anderlik and Assoc. 2005. *Lake Management Plan for Alimagnet Lake, Dakota County, Minnesota.* Blue Water Science, St. Paul, MN.

Carlson, R.E. 1977. *Trophic Status Index Indicator of Lakes*. Limnology Oceanography 22:361-369.

Hartsoe, J.A. and R.A Osgood. 1991. *A 1991 Study of the Water Quality of 17 Metropolitan Area Lakes*. Metropolitan Council Publ. 590-92-006.

McComas, S. and Stuckert, J. 2008. Aquatic Plant Surveys for Lee Lake, Lakeville, Minnesota, 2008. Blue Water Science. St. Paul, MN.

McComas, S. and Stuckert, J. 2009a. Barley Straw Installation and Water Quality Conditions in Lee Lake, Lakeville, Minnesota, 2008. Blue Water Science. St. Paul, MN.

McComas, S. and Stuckert, J. 2009b. Barley Straw Installation and Water Quality Conditions in Valley Lake, Lakeville, Minnesota, 2008. Blue Water Science. St. Paul, MN.

METC 2007. *2030 Water Resources Management Policy Plan*. Metropolitan Council. Publ. no. 32-04-065

MDNR 1996. *Report on the Status of the DNR Metro Region Trout Resources*. A Metro Region Trout Committee Report. Minnesota Department of Natural Resources. St. Paul, MN.

Nichols, A.B. 1992. *Citizens Monitor Water Quality*. Water Environment and Technology. March, 1993. pp.55-59.

Osgood, R.A. 1982. *Using Carlson's Trophic State Indices in Regional Water Quality Assessment*. Water Resources Bulletin 18:67-74.

Osgood, R.A. 1988. *The Limnology, Ecology and Management of Twin Cities Metropolitan Area Lakes*. Metropolitan Council Publ. No. 590-88-123.

Osgood, R.A. 1989a. *An Evaluation of Lake and Stream Monitoring Programs in the Twin Cities Metropolitan Area*. Metropolitan Council Publ. 590-89-128.

Osgood, R.A. 1989b. *A 1989 Study of the Water Quality of 20 Metropolitan Area Lakes*. Metropolitan Council Publ. No. 590-89-129.

USGS 2002. *Response of the St. Croix River Pools, Wisconsin and Minnesota, to Various Phosphorus-Loading Scenarios.* Water-Resources Investigations Report 02-4181. U.S. Geological Survey.

APPENDIX A

Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2010

APPENDIX A

Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2010

(Numbers indicate monitoring events per year. A "v" indicates monitoring performed by volunteers.)

Lake	DNR ID	Location	LAKE_NAME	Site	LakeSite	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
Acorn Lake	82010200		ACRN	451	ACRN451																											v14		v 6	v 6	v 7
Alimagnet Lake	19002100		ALIM	451	ALIM451																v 12	v10	v10	v10	v10	v10	v8	v9	v12	v10	v10	v8	v10	v 12	v 10	v 13
Anderson Pond	19009400		ANDERSON	451	ANDERSON451																															v 12
Ann Lake	10001200		ANN	451	ANN451						5				13													13								
Ardmore Lake	27015300		ARDMORE	451	ARDMORE451																												v4	v 11	v 14	v 12
Armstrong Lake	82011602	south basin	ARMS	451	ARMS451																			v15	v10	v13	v14	v15	v14	v14	v14	v7	v7	v 7	v 14	v 7
Assumption Lake	10006300		ASSU	451	ASSU451																				v1											
Auburn Lake	10004401	west	ABNW	451	ABNW451				10			17	18				12			13																
Auburn Lake	10004402	east	ABNE	451	ABNE451				10																											
Aue Lake	10002800		AUE	451	AUE451																				v1											
Bald Eagle Lake	62000200	site 1	BALD	451	BALD451	4	5		5																					13	13					
Bald Eagle Lake	62000200	site 2	BALD	452	BALD452																									13	13					
Barker Lake	82007600		BARK	451	BARK451																					v5	v5	v7	v7	v7	v7	v7	v7	v 7	v 7	
Barnes Lake	10010900		BARN	451	BARN451																				v1											
Bass Lake	27001500	St. Louis Park	BSLP	451	BSLP451																							v12			v12	v2				
Bass Lake	27009800	Plymouth	BASS	451	BASS451	4														v16			v15		v15		v13		v9		v15		v14		v 12	
Bass Lake	82003500	May Township	BASW	451	BASW451																					v14	v5	v7	v7	v7	v7	v7	v7	v 7	v 7	
Bass Lake	82012300	west [Grant Twnshp]	BSSW	451	BSSW451																											v7	v8	v 7	v 7	v 14
Bass Lake	82012400	east [Grant Twnshp]	BSSE	451	BSSE451																											v7	v7	v 7	v 7	v 14
Battle Creek Lake	82009100		BCRK	451	BCRK451														v14	v13	v11	v13														
Bavaria Lake	10001900		BAVR	451	BAVR451				5			17	18							13		v11	v12	v15	v12	v14	v14	v14	v19	v16	v18	v16	v14	v 14	v 14	v 15
Bay Pond	82001100		BAYP	451	BAYP451																											v14	v14	v 11	v 7	v 7
Benton Lake	10006900		BENT	451	BENT451																				v13	v14	v14		v15		v14		v13	v 14	v 14	v 14
Benz Lake	82012000		BENZ	451	BENZ451																			v8							v14	v14	v14	v 14	v 14	v 14
Berliner Lake	10010300		BERL	451	BERL451																				v1											
Beutel Pond	82039900		BEUTEL	451	BEUTEL451																													v 7	v 5	v 3
Big Carnelian Lake	82004900		BIGC	451	BIGC451					5					13					13			13			v14	v7	v14	v14	v14	v14	v7	v7	v 6	v 7	v 7
Big Comfort Lake	13005300		BCMF	451	BCMF451																		v3			v14	v14	v14	v14	v14	v13	v14	v14	v 14	v 13	v 14
Big Marine Lake	82005200		BIGM	451	BIGM451	4	5			5					13					13			13			v14	v7	v14	v14	v14	v14	v7	v7	v 7	v 7	4 & v 7
Big Marine Lake	82005200		BIGM	402	BIGM402																															4
Birch Lake	13004200		BRCH	451	BRCH451																										v10	v7	v7			
Birch Lake	62002400		BIRC	451	BIRC451	2																									v14					
Bluebill Bay Lake	19044900		BLBB	451	BLBB451																		v8													
Bone Lake	82005400		BONE	451	BONE451					5					13				v7		v14		v14	v14	v14		v14	v14	v14	v14	v14	13	v10	v 15	v 12	v 11
Brand Lake	10011000		BRND	451	BRND451																				v1											
Braunworth Lake	10010700		BRNW	451	BRNW451																				v1											
Brick Pond	82030800		BRICK	451	BRICK451																													v 7	v 6	v 7
Brickyard Clayhole Lake	10022500		BRCK	451	BRCK451																							v14	v13	v14	v14	v14	v13	v 14	v 15	v 14
Bryant Lake	27006700		BRYN	451	BRYN451	2	5	16		5					13	13	12																			
Burandt Lake	10008400		BURN	451	BURN451																				v7	v13	v9			v18	v22				v 4	v 14
Bush Lake	27004700		BUSH	451	BUSH451					5									13	13					13		13			13		v13	v15	v 13	v 13	v 13
Byllesby Lake	19000600		BYLL	451	BYLL451														v14	v14	v13															
Calhoun Lake	27003100		CALN	451	CALN451		5			5																										

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Campbell Lake	10012700		CAMB	451	CAMB451																				v2	v14		v10			v14	v14				
Capaul Pond	82036500	east basin	CAPAUL	451	CAPAUL451																													v 7	v 3	v 7
Capaul Pond	82036500	west basin	CAPAUL	452	CAPAUL452																													v 7	v 1	
Carol Lake	82001700		CARO	451	CARO451																					v5	v5	v7	v7	v7	v7	v7	v7	v 7	v 6	
Carver Lake	82016600		CARV	451	CARV451									20					v15	v15	v16	v9														
Cates Lake	70001800		CATE	451	CATE451																							v14	v13	v15	v13	v14	v13	v 12	v 13	v 13
Cedar Island Lake	27011900		CEDI	451	CEDI451																v13						v13		v11			v9			v 11	
Cedar Lake	27003900	Minneapolis	CEDM	451	CEDM451					5																										
Cedar Lake	70009100	Scott Co.	CEDS	451	CEDS451	4	5			5						13			14					13			13				13	v14	v14	v 14	v 14	v 14
Cenaiko Lake	2065400		CENK	451	CENK451																		v12	v11	v13	v11	v13	v12	v12	v14	v14	v14	v12	v 13	v 13	v 13
Centerville Lake	2000600		CNTR	401	CNTR401	4	5		5																	13	13/v4	v1	13	13					2	
Charley Lake	62006200		CHRL	451	CHRL451						5																									
Christmas Lake	27013700		CHRS	451	CHRS451	4	5				5												13	13	13			13	13							
Chub Lake	19002000		CHUB	401	CHUB401	2													v14	v14	v11															10
Clear Lake	82004500	May Township	CLEAR_MAY	451	CLEAR_MAY451																													v 14	v 14	v 7
Clear Lake	82009900	north lobe [Lake Elmo]	CLEAR_ELMO	451	CLEAR_ELMO451																														v 4	
Clear Lake	82009900	south lobe [Lake Elmo]	CLEAR_ELMO	452	CLEAR_ELMO452																														v 6	
Clear Lake	82016300	Forest Lake	CLER	401	CLER401	4				5						13			v11	v12	v12	v11	v10	v11	v10	v9	v12	v12	v12	v6		13			3	
Cleary Lake	70002200		CLRY	451	CLRY451					5																										
Cloverdale Lake	82000900		CLVR	451	CLVR451																						v10	v10	v11	v13	v12	v11	v10	v 9	v 11	v 10
Cobblecrest Lake	27005300		COBB	451	COBB451																							v4		v14	v16	v13	v13	v 13	v 10	v 9
Cobblestone Lake	19045600		CSTN	451	CSTN451																										v14	v14	v12	v 14	v 13	v 14
Cody Lake	66006100		CODY	451	CODY451																												v3			
Colby Lake	82009400		COLB	451	COLB451															v13	v14	v13	v13	v12	v12	v9	v10	v10	v10	v10	v6	v7	v7	v 9	v 3	v 9
Coon Lake	2004200		COON	401	COON401	4				5										13			13												2	
Cornelia Lake	27002800		CORN	451	CORN451																								v7		v11	v14	v14	v 13	v 14	
Courthouse Lake	10000500	Chaska	CRTH	451	CRTH451																	v2	v14	v13	v13	v14	v14	v14	v14	v14	v14	v13	v13	v 14	v 14	v 14
Cowley Lake	27016900		COWL	451	COWL451																	v12										v10	v1		v 4	v 6
Crane Lake	27073400		CRAN	451	CRAN451														v9																	
Crooked Lake	2008400		CROK	451	CROK451				5						13				v15	v15	v14	v14	v12	v14	v14											
Crystal Lake	19002700	Burnsville	CRYB	451	CRYB451	2			5						13					13	13	13	13	13	v12	v10	v14	v15	v15	v15	v16	v14	v14	v 14	v 14	v 14
Crystal Lake	27003400	Robbinsdale	CRYR	451	CRYR451							17	19	19						v15			v11				v8				v7			v 7		v 8
Crystal Lake	70006100	Spring Lake	CRYS	451	CRYS451																		v12		v11											
Cynthia Lake	70005200		CYNT	451	CYNT451	2																														
Dan Patch Lake	70001600		DANP	451	DANP451																		v15													
Dean Lake	70007400		DEAN	451	DEAN451																							v7	v7	v6	v7	v8	v9	v 10	v 12	v 8
Deeg Lake	19011700		DEEG	451	DEEG451																						v12									
Deep Lake	62001800		DEEP	451	DEEP451						5																									
Demontreville Lake	82010100		DEMT	451	DEMT451	4				5							12		v15		14					13			13	v14	v7	v7	v11	v 20	v 12	v 14
Diamond Lake	27012500	Dayton	DIAM	451	DIAM451	2														v13										13						
Downs Lake	82011000		DOWN	451	DOWN451																				v14		v9	v9	v6	v7	v9	v7	v5	v 2	v 9	v 1
Dutch Lake	27018100		DTCH	451	DTCH451					5																										
Eagle Lake	10012100	Young America	EAGC	451	EAGC451	4	5				5											12		v15	v14	v14	v12	v14	v14	13	v14	v14	v13	v 13	v 14	v 14
Eagle Lake	27011101	Maple Grove	EAGL	451	EAGL451	4			5			17	18				11		v15			v14	v14	v14		v6		v4			v6				v 6	

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Eagle Point Lake	82010900		EGLP	451	EGLP451			2											v14													v5	v2	v 2	v 2	
Earley Lake	19003300		EARL	451	EARL451															v10	v11	v9	v10	v10	v9	v8	v6	v10	v9	v6	v7	v9	v12	v 9	v 10	v 11
East Boot Lake	82003400		EBOO	451	EBOO451																					v14	v14	v14	v14	v14	v14	v7	v7	v 7	v 7	v 7
East Lake	19034900		EAST	451	EAST451																										v13	v6	v14	v 13		v 14
East Twin Lake	2013300		ETWN	401	ETWN401	2	5		5						13						13			13											3	6
Echo Lake	82013500		ECHO	451	ECHO451																											v10	v8	v 4		v 7
Edina Lake	27002900		EDIN	451	EDIN451																									v10	v10					
Edith Lake	82000400		EDTH	451	EDTH451																										v6	v12	v12	v 15	v 17	
Egg Lake	82014700		EGG	451	EGG451																						v3									
Elmo Lake	82010600		ELMO	451	ELMO451	4	5	16		5				19			12			v11											v9	v8	v8	v 18	v 9	v 19
Fahlstrom Pond	82000500	east basin	FAHLS	451	FAHLS451																													v 3	v 8	v 4
Fahlstrom Pond	82000500	west basin	FAHLS	452	FAHLS452																													v 5	v 5	v 5
Farquhar Lake	19002300		FARQ	451	FARQ451	4														v15	v16	v14	v15		v15	v13	v11	v13	v14	v14	v15	v13	v13	v 13	v 14	v 14
Fireman's Clayhole Lake	10022600		FIRE	451	FIRE451																						v12	v14	v14	v14	v14	v13	v13	v 14	v 14	v 14
Fish Lake	19005700	Eagan	FISD	451	FISD451										13																					
Fish Lake	27011800	Maple Grove	FISH	451	FISH451	4	5	16			5					13																				
Fish Lake	70006900	Scott Co.	FISS	451	FISS451	4				5						13					13		v2	v13	v8	v12	v9	v14	v13	v11	v13	v11	v13	v 11	v 12	v 11
Fish Lake	82006400	Washington Co.	FSHW	451	FSHW451																					v5	v14	v7	v7	v7	v7	v7	v7	v 7	v 8	v 7
Fish Lake	82009300	Woodbury	FISHWBRY	451	FISHWBRY451																															v 14
Fish Lake	82013700	Grant Township	FSHG	451	FSHG451																							v5	v5	v4						
Forest Lake	82015900	west basin	FORW	451	FORW451					5						13			v7			v12	v14	v15	v14	v14	v14	v14	v14	v14	v14	13	v14	v 14	v 14	v 14
Forest Lake	82015900	middle basin	FORM	452	FORM452					5						13			v7			v12						13			13	13			v 11	
Forest Lake	82015900	east basin	FORE	453	FORE453	4				5						13			v7			v12						13			13	13			v 8	v 8
French Lake	27012700		FRNC	451	FRNC451																						v11	v10	v7	v7						
Friedrich's Pond	82010800		FRED	451	FRED451																											v13	v14	v 11	v 1	
Gables Lake	82008200		GABL	451	GABL451																			v8	v5											
Gaystock Lake	10003100		GAYS	451	GAYS451																				v2	v14	v14				v14	v14				
George Lake	2009100		GEOG	451	GEOG451	4	5	16		5					13					13				13											v 14	
George Watch Lake	2000500		GWAT	451	GWAT451																	v14	v12	v11	v11	v6	v7	v8	v9	v10	v12	v7	v8	v 12	v 14	v 14
German Lake	82005600		GERM	451	GERM451																							v7	v7	v7	v7	v7	v7	v 7	v 7	
Gervais Lake	62000700		GRVS	451	GRVS451						5																									
Glen Lake	27009300		GLEN	451	GLEN451																											v13	v7	v 4		
Goetschel Lake	82031300		GOET	451	GOET451																							v11	v9	v4	v15	v9	v5	v 7	v 7	v 7
Goggins Lake	82007700		GOGG	451	GOGG451																				v13	v14	v14	v14	v14	v14	v14	v14	v14	v 14	v 14	v 14
Golden Lake	2004500		GOLD	451	GOLD451	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	GOOW	451	GOOW451																v9	v7	v15	v15	v14	v11	v14	v14	v14	v14	v14	v14	v13	v 14	v 14	v 14
Goose Lake	19036000	Lakeville	GOOL	451	GOOL451																v13	v13														
Goose Lake	82005900	New Scandia	GOOS	451	GOOS451															v15	v15	v13	v13	v15						v7	v7	v7	v7	v 14	v 7	v 7
Goose Lake	82011301	north basin [Lake Elmo]	GSLE	451	GSLE451																													v 7	v 7	v 7
Goose Lake	82011302	south basin [Lake Elmo]	GSLE	452	GSLE452																													v 7	v 7	v 7
Grace Lake	10021800		GRCE	451	GRCE451																							v11	v14	v14		v14		v 14	v 14	v 14
Grass Lake	27068100		GRAS	451	GRAS451																		v12													
Hafften Lake	27019900		HAFF	451	HAFF451																					13	13			13	v15	v13				v 13
Ham Lake	2005300		HAM	451	HAM451					5									v15	v13		v13	v9	v14												

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Harriet Lake	27001600		HARR	451	HARR451					5																										
Hart Lake	2008100		HART	451	HART451																									v6	v4	v8				
Harvey Lake	27067000		HARV	451	HARV451																									v10						
Haughey Lake	27018700		HUGH	451	HUGH451																							v4								
Hay Lake	82006500		HAY	451	HAY451																			v14	v13	v14	v14	v4	v7	v7	v7	v7	v7	v 14	v 7	v 7
Hazeltine Lake	10001400		HAZE	451	HAZE451																				v1	v14	v14				v14	v14			v 14	v 14
Heims Lake	13005600		HEIMS	451	HEIMS451																														v 10	
Henry Lake	27017500		HENR	451	HENR451																v10										v11	v11	v6	v 7	v 7	v 5
Herber Pond	82001501		HERB	451	HERB451																									v14	v14	v7	v7			
Highland Lake	2007900		HIGH	451	HIGH451																				v13	v11	v13	v12	v12	v14	v14	v14	v12			
Holland Lake	19006500		HOLL	451	HOLL451				10	16	15			20					13						13											
Hornbeam Lake	19004700		HORN	451	HORN451																											v11	v8	v 7	v 5	v 2
Horseshoe Lake	19003200	Dakota Co.	HORS	451	HORS451																v11	v10												v 1		
Horseshoe Lake	19005100	Sunfish Lake	HRSE	451	HRSE451																											v11	v11	v 8	v 14	v 13
Horseshoe Lake	82007400	Site 1 (center)	HORW	451	HORW451																				v1											
Horseshoe Lake	82007400	Site 2 (north basin)	HORW	452	HORW452																														v 8	
Horseshoe Lake	82007400	Site 3 (south basin)	HORW	453	HORW453																														v 7	v 7
Hydes Lake	10008800		HYDE	451	HYDE451						5						12		13			12			v11	v4	v9	v14	v15	v14	v14	v14	v13	v 13	v 14	v 14
Independence Lake	27017600		INDP	451	INDP451	4	5		5							13			v14	v15																
Isabelle Lake	19000400		ISBL	451	ISBL451															v14																
Island Lake	2002200	Linwood	ISLA	451	ISLA451				7																				v12	v14	v14	v14	v13	v 13	v 14	v 14
Jackson WMA	82030500		JACKSON	451	JACKSON451																															v 14
Jane Lake	82010400		JANE	451	JANE451					5		17	18				12			v12						13				v15	v13	v10	v12	v 16	v 11	v 9
Jellums Lake	82005202	Site 1	JELL	451	JELL451																					v14	v14	v12	v14	v14	v14	v7	v7	v 7	v 7	v 7
Jellums Lake	82005202	Site 2	VERN	451	VERN451																							v11	v11							
Johanna Lake	62007800		JHNA	451	JHNA451		5				5				13																					
Jonathan Lake	10021700		JNTH	451	JNTH451																							v13				v14		v 14	v 14	v 14
Josephine Lake	62005700		JOSE	451	JOSE451						5				13																					
Jubert Lake	27016500		JBRT	451	JBRT451																					v11										
July Lake	82031800		JULY	451	JULY451																											v7	v7	v 7	v 5	
Karth Lake	62007200		KARTH	451	KARTH451																												v11	v 13	v 14	v 14
Keller Lake	19002500	Burnsville	KELB	451	KELB451																	13	13	v13	v15	v14	v12	v13	v15	v15	v14	\14	v12	v 8		v 14
Keller Lake	62001000	Maplewood	KELL	451	KELL451						5																								v 12	
Kingsley Lake	19003000		KING	451	KING451														5		v11	v10	v9			v14	v14	v15	v14	v15	v16	v14	v14	v 13	v 14	v 14
Kismet Lake	82033400		KISM	451	KISM451																			v14	v13	v14	v14	v14	v14	v14	v13	v14	v14	v 14	v 14	v 14
Klawitter Pond	82036800		KLAW	451	KLAW451																							v13	v13	v14	v13	v12	v12	v 13	v 14	v 11
Kohlman Lake	62000600		KOHL	451	KOHL451						5																									
Kramer Pond	82011700		KRAMER	451	KRAMER451																													v 7	v 7	v 7
La Lake	82009700		LA	451	LA451															v13	v11	v13	v11	v10	v10	v8	v6	v5	v6	v3	v13	v12	v14	v 11	v 12	v 10
Lac Lavon Lake	19044600		LACL	451	LACL451																		v11	v10	v10	v9	v2	v7	v12	v12	v12	v12	v13	v 12	v 14	v 13
Laddie Lake	2007200		LADD	451	LADD451	4													v13	v14	v12					v13	v13	v14	v10							
Lake Forest	82018700		LK_FOREST	451	LK_FOREST451																													v 12	v 11	
Lake Minnetonka	27013302	lower	MINL	451	MINL451	4	5																													
Lake Minnetonka	27013305	upper	MINU	451	MINU451	2	5																													

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Lake	DNR ID	Location	LAKE_NAME	Site	LakeSite	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
Langdon Lake	27018200		LANG	451	LANG451					5																										
Langton Lake	62004901	site 1	LGTN	451	LGTN451																										v14	v7	v13	v 13	v 13	v 13
Langton Lake	62004902	site 2	LGTN	452	LGTN452																										v14	v13	v13	v 13		
Langton Lake	62020400	north basin	LGTO	451	LGTO451																										v14					
Lee Lake	19002900		LEE	451	LEE451															v14	v15	v14	v13			v12	v13	v11	v9	v15	v9	v14	v14	v 13	v 14	v 14
Legion Pond	82046200		LEGN	451	LEGN451																										v14	v10		v 7	v 2	
Lemay Lake	19008200		LEMAY	451	LEMAY451																												v11	v 11	v 9	v 11
LeVander Pond	19008800		LEVANDER	451	LEVANDER451																															v 11
Libbs Lake	27008500		LIBB	451	LIBB451																									v10						
Lily Lake	82002300		LILY	451	LILY451																v15	v14	v14	v15	v13	v14	v14	v14	v7	v7	v7	v7	v7	v 14	v 12	v 9
Linwood Lake	2002600		LINW	451	LINW451	4	5		7						13					13			13											v 13		
Lippert Lake	10010400		LIPP	451	LIPP451																				v1											
Little Carnelian Lake	82001400		LCAR	451	LCAR451																					v14	v7	v14	v14	v14	v14	v7	v7	v 7	v 7	v 7
Little Comfort Lake	13005400		LCMF	451	LCMF451																											v14	v13	v 12	v 12	v 12
Little Johanna Lake	62005800		LJOH	451	LJOH451																						v12	v16	v15	v8	v6	v3		v 14	v 13	v 12
Little Long Lake	27017901		LLON	451	LLON451	4				5						13								13			13		13			v11	v2		v 13	v 14
Lochness Lake	2058500		LOCHNESS	451	LOCHNESS451																												v12	v 11	v 13	v 10
Lone Lake	27009400		LONE	451	LONE451																														v 15	v 13
Long Lake	10001600	Carver Co.	LONC	451	LONC451																				v2		v13		v5							
Long Lake	19002200	Apple Valley	LGAV	451	LGAV451																		v16					v11	v13	v12	v15	v14	v13	v 14	v 13	v 14
Long Lake	27016000	Orono	LONG	451	LONG451				5																											
Long Lake	62006700	north site [New Brighton]	LONN	451	LONN451						5																									
Long Lake	62006700	south site [New Brighton]	LONS	451	LONS451						5																									
Long Lake	82002100	north basin [Stillwater]	LGST	451	LGST451																v14	v7		v14	v13	v14	v14	v14	v14	v14	v14	v14	v14	v 14	v 14	v 14
Long Lake	82002100	middle basin [Stillwater]	LGST	452	LGST452																														v 4	v 4
Long Lake	82002100	south basin [Stillwater]	LGST	453	LGST453																														v 4	v 4
Long Lake	82003000	May Township	LGMY	451	LGMY451														v14	v14	v14	v13	v14		v14	v14	v14	v14	v14	v7	v7	v7	v7	v 7	v 7	v 7
Long Lake	82006800	Scandia	LNGW	451	LNGW451																					v5	v14	v7	v7	v7	v7	v7	v7	v 8	v 6	v 7
Long Lake	82011800	Pine Springs	LGPS	451	LGPS451														v14										13	v15	v14	v14	v14	v 14	v 14	
Long Lake	82013000	Mahtomedi	LONM	451	LONM451																								v11	v9	v12	v10	v10	v 10	v 10	v 9
Loon Lake	82001502		LOON	451	LOON451																					v14	v14	v7	v7	v7	v7	v7	v7	v 14	v 7	v 12
Lost Lake	27010300		LOST	451	LOST451														v13																	
Lost Lake	82013401	north basin	LSTM	451	LSTM451																											v13	v13	v 11		
Lotus Lake	10000600		LOTU	451	LOTU451						5					13									13	13			v5	v10	v8	v11	v9	v 11	v 10	v 11
Louise Lake	82002500		LOUS	451	LOUS451																					v5	v5	v7	v7	v7	v7	v7	v7	v 14	v 7	v 7
Lucy Lake	10000700		LUCY	451	LUCY451						5																								v 13	v 12
Lynch Lake	82004200	north	LNCH	451	LNCH451																												v7	v 14	v 13	v 14
Lynch Lake	82004200	south	LNCH	452	LNCH452																															v 14
MacDonald Lake	82006200		MACD	451	MACD451																									v14	v14	v7	v7			
Magda Lake	27006500		MAGD	451	MAGD451																				v14	v13			v11			v12			v 9	
Maple Marsh Lake	82003800		MMAR	451	MMAR451																					v5	v5	v7	v7	v7	v7	v7	v7			
Marcott Lakes	19004100	south	MAR2	451	MAR2451																v15	v13	v10	v10	v12	v10	v6	v5								
Marcott Lakes	19026300	north	MAR1	451	MAR1451																v15															
Maria Lake	10005800		MARI	451	MARI451																				v2	v14	v14				v13					

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Marion Lake	19002601		MARN	451	MARN451	2	5		5						13					v15					v15	v14	v13	v14	v14	v15	v16	v15	v14	v 13	v 14	v 14
Markgraf Lake	82008900		MRGF	451	MRGF451															v15	v11	v12	v10	v15	v10	v10	v9	v13	v14	v14	v14	v15	v14	v 14	v 13	v 14
Markley Lake	70002100		MKLY	451	MKLY451																		v11	v13	v12	v14	v13	v9	v6	v4		v10	v7			
Marsh Lake	10005400		MRSH	451	MRSH451																				v1											
Marshan Lake	2000700		MARS	451	MARS451																	v10	v13	v10	v9	v8	v7									
Martin Lake	2003400		MART	451	MART451				7															13										v 13		
Masterman Lake	82012600		MSTR	451	MSTR451																											v14	v14	v 14	v 14	v 14
Mays Lake	82003300		MAYS	451	MAYS451																													v 14	v 14	v 7
McCarrons Lake	62005400		MCCR	451	MCCR451					12	20	17	18	19	13	13	12		14	13	16	13			18	13	13	13		13	13					
McDonald Lake	82001000		MCDD	451	MCDD451																				v11		v14	v9	v12	v12	v14	v10	v9	v 15	v 7	
McDonough Lake	19007600		MCDN	451	MCDN451						5														13											
McKnight Lake	10021600		MKNT	451	MKNT451																											v14		v 14	v 14	v 14
McKusick Lake	82002000		MCSK	451	MCSK451															v14	v14	v14	v14	v14	v13	v14	v14	v14	v14	v14	v14	v14	v14	v 15	v 14	v 14
McMahon Lake	70005000		MCMN	451	MCMN451	2				5											13			13			13				13	v14	v10	v 11	v 10	v 11
Meadow Lake	27005700		MEAD	451	MEAD451																	v12			v12			v9			v10			v 14		
Medicine Lake	27010400	main lake	MEDC	401	MEDC401	4	5		10							13	12																			
Medicine Lake	27010400	southwest bay	MEDC	451	MEDC451																															v 13
Mergens Pond	82048200		MERG	451	MERG451																					v10			v3	v2	v6			v 6	v 1	
Meuwissen Lake	10007000		MEUW	451	MEUW451																				v1									v 11		
Miller Lake	10002900		MILL	451	MILL451																	v6	v13		v12	v14	v13	v13	v14	v14	v14	v12	v13	v 14	v 14	v 13
Minnetoga Lake	27008800		MINNETOGA	451	MINNETOGA451																												v14	v 12		v 14
Minnewashta Lake	10000900	main lake	MINW	401	MINW401					5						13			13				13	13	13			13	13							
Minnewashta Lake	10000900	south bay	MINW	452	MINW452																															v 13
Mitchell Lake	27007000		MITC	451	MITC451																13				13	13			13	v14	v14	v14	v13	v 13	v 14	v 13
Moody Lake	13002300		MOOD	451	MOOD451																										v14	v14	v14			v 12
Mooney Lake	27013400		MOON	451	MOON451														v14	v10																
Moore Lake	2007502		MOOR	451	MOOR451																				v14											
Mud Lake	82002602		MUD	451	MUD451																					v5	v5	v7	v7	v7	v7	v7	v7			v 14
Myers Lake	10006800		MYRS	451	MYRS451																				v1											
Nokomis Lake	27001900		NOKM	451	NOKM451	4				5																										
Normandale Lake	27104500		NORM	451	NORM451																											v5	v3		v 11	v 13
North Twin Lake	82001800		NTWN	451	NTWN451																					v5	v5	v7	v7	v7	v7	v7	v7	v 7	v 7	v 7
Northwood Lake	27062700		NRTH	451	NRTH451																					v12	v10	v13	v12	v12	v10	v10	v10	v 9	v 11	v 11
Oak Lake	10009300	site 1	OAK	451	OAK451																				v2		v14	v13	v12	v14	v14	v14		v 15		
Oak Lake	10009300	site 2	OAK	452	OAK452																											v10				
Oak Lake	10009300	site 3	OAK	453	OAK453																											v10				
O'Connor Lake	82000200		OCON	451	OCON451																										v8	v15	v12	v 15	v 10	v 9
O'dowd Lake	70009500		ODWD	451	ODWD451					5										13			13			13		13			13	v12	v13	v 14	v 14	v 14
Olson Lake	82010300		OLSN	451	OLSN451												12		v15		14					13			13	v14	v7	v7	v11	v 19	v 13	v 12
Oneka Lake	82014000		ONEK	451	ONEK451																				v13	v11	v11	v9	v6	v5						v 13
Orchard Lake	19003100		ORCH	451	ORCH451	4	5		5						13				13					13	v15	v13	v13		v14	v14	v14	v14	v14	v 12	v 14	v 13
Otter Lake	2000300		OTTR	451	OTTR451	2			5																											
Owasso Lake	62005600		OWSO	451	OWSO451	4			5																											
Ox Yoke Lake	27017800		OXYOKE	451	OXYOKE451																													v 1		

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Pamela Lake	27067500		PMLA	451	PMLA451																										v10					
Parkers Lake	27010700		PARK	451	PARK451	4										13					13				13	v12		v14	v15	v15	v15	v14	v14	v 13	v 14	v 13
Parley Lake	10004200		PARL	451	PARL451					5		17	18				12					12			13		13		13			13				
Pat Lake	82012500		PAT	451	PAT451																											v7	v7	v 8	v 7	v 14
Patterson Lake	10008600		PATT	451	PATT451																				v2											
Peltier Lake	2000400		PELT	451	PELT451				5										v14	v16	v15	v14	v14	v13	v13	v14	v13	v17	v15	v15	v16	v17	v16			
Penn Lake	27000400		PENN	451	PENN451																														v 14	v 14
Pepin Lake	40002800		PEPIN	451	PEPIN451																												v13			
Peter Lake	27014702	north bay	PETER	451	PETER451																														v 13	v 6
Phalen Lake	62001300		PHAL	451	PHAL451	4	5				5																									
Pickerel Lake	2013000		PICK	401	PICK401	2															13															6
Pierson Lake	10005300		PIER	451	PIER451	2	5		5						13						13						13	13	13			13				
Pike Lake	27011102	Maple Grove	PIKE	451	PIKE451																	v14	v15	v13		v13							v4		v 8	
Pike Lake	62006900	Ramsey Co.	PIKR	451	PIKR451																				v14	v10	v14	v14	v14	v15	v15	v11	v14	v 13		
Pike Lake	70007600	site 1 [Scott Co.]	PIKS	451	PIKS451																		v9		v10	v9	v9	v11	v15	v15	v13					
Pike Lake	70007600	site 2 [Scott Co.]	PIKS	452	PIKS452																							v11								
Pine Tree Lake	82012200		PINE	451	PINE451						5								v14	v14	v16	v14	v15	v15	v13	v14	v9	v12	v7	v8	v12	v10	v9	v 7	v 12	v 8
Plaisted Lake	82014800		PLAISTED	451	PLAISTED451																													v 7	v 8	v 14
Pleasant Lake	62004600	North Oaks	PLST	451	PLST451						5																									
Pleasant Lake	70009800	New Prague	PLTS	401	PLTS401														13																	5
Pomerleau Lake	27010000		POMR	451	POMR451																	v9			v10		v6		v3							
Powers Lake	82009200		POWR	451	POWR451															v12	v13	v13	v12	v9	v10	v8	v5	v7	v14	v14	v14	v14	v14	v 14	v 14	v 14
Priebe Lake	62003600		PRIEBE	451	PRIEBE451																													v 13	v 10	v 9
Prior Lake - Lower	70002600	Site 1	PRIL	451	PRIL451					5						13						13	v15	v14	v13	v9	v14	v16	v13	v12	v12	v12	v12	v 12	v 14	v 14
Prior Lake - Lower	70002600	Site 2	PRIL	452	PRIL452																			v14	v13	v9	v14	v15								
Prior Lake - Upper	70007200	Site 1	PRIU	451	PRIU451	4	5			5						13						13	v15	v14	v13	v9	v14	v12	v13	v10	v9	v9	v5	v 11	v 14	v 14
Prior Lake - Upper	70007200	Site 2	PRIU	452	PRIU452																							v12								
Raven Lake	19036900		RAVE	451	RAVE451																v13	v6	v8													
Rebecca Lake	27019200		REBE	451	REBE451				10	12	12																									
Red Rock Lake	27007600		RRCK	451	RRCK451																				12	13			13	13		13				
Regional Park Lake	82008700		REGP	451	REGP451																			v12	v14	v12	v13	v14	v15	v15	v14	v7	v7	v 7	v 7	v 7
Reitz Lake	10005200		RETZ	451	RETZ451						5						12		13						v15	v13	v7	v13	v14	v14	15	v14	v14	v 11	v 11	v 12
Reshanau Lake	2000900		RESH	451	RESH451	2																			v7	v1	v6					v13	v9	v 7	v 9	v 11
Rest Area Pond	82051400		REST	451	REST451																											v13	v10	v 13	v 12	v 10
Rice Lake	10007800	Carver Co.	RICE	451	RICE451	2																			v1											
Rice Lake	27011600	Maple Grove	RICE_ELM	451	RICE_ELM451																												v10	v 10	v 12	v 14
Riley Lake	10000200		RILE	451	RILE451	2	5	16			5	17	18			13	12		13				13			13		13	v14	v15	v14	v10	v15	v 12	v 14	v 13
Rogers Lake	19008000		ROGERS	451	ROGERS451																												v12	v 9	v 11	v 11
Rose Lake	27009200	Minnetonka	ROSE	451	ROSE451																											v14	v13	v 13		
Rose Lake	82011200	north basin [Lake Elmo]	ROSE_ELMO	451	ROSE_ELMO451																													v 7	v 7	v 7
Rose Lake	82011200	south basin [Lake Elmo]	ROSE_ELMO	452	ROSE_ELMO452																													v 7	v 7	v 7
Rutz Lake	10008000		RUTZ	451	RUTZ451																				v1	v14	v14	v14				v14	v7	v 5	v 8	v 5
Ryan Lake	27005800		RYAN	451	RYAN451																	v14		v5		v9		v4	v6					v 13		v 10
Sanborn Lake	40002700		SANB	451	SANB451																												v2			

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Sand Lake	82006700		SAND	451	SAND451														v7	v14	v14	v13						v14	v7	v7	v7	v7	v7	v 14	v 7	v 7
Sarah Lake	27019100		SARA	451	SARA451	4			5																											
Scheuble Lake	10008500		SCHB	451	SCHB451																				v1											
Schmidt Lake	27010200		SCHM	451	SCHM451																v14			v12		v12	v9			v14	v9		v9			
School Lake	13005700		SCHL	451	SCHL451																										v14	v7	v7		v 6	
Schroeder Pond	82030100		SRDR	451	SRDR451																									v14	v14	v7	v7			
Schultz Lake	19007500		SCHZ	451	SCHZ451					5	5														13											
Schutz Lake	10001800		SCHU	451	SCHU451					5																v6	v10	v6	v8	v9	v11					
Scout Lake	19019800		SCOUT	451	SCOUT451																												v14	v 14	v 14	v 14
Sea Lake	82005300		SEA	451	SEA451																													v 12	v 7	
Seidl Lake	19009500		SEDL	451	SEDL451																v15	v14	v14	v15	v16	v14	v14	v15	v8	v14	v14	v14	v8	v 4	v 2	v 12
Shady Oak Lake	27008902	middle bay	SHADYOAK	451	SHADYOAK451																														v 12	v 11
Shavers Lake	27008600	east basin	SHAV	451	SHAV451																										v14	v13				
Shavers Lake	27008600	west basin	SHAV	452	SHAV452																											v6				
Shields Lake	82016200		SHLD	451	SHLD451														v6	v14	v14	v13	v13	v14	v14	v14	v14	v14	v14	v14	v14	v14	v7			
Silver Lake	62000100	North St. Paul	SILV	451	SILV451																											v12				
Silver Lake	82001600	Washington Co.	SLVR	451	SLVR451																					v14	v5	v7	v7	v7	v7	v7	v7	v 7	v 7	v 7
Simley Lake	19003700		SIMY	451	SIMY451																v10	v16	v14	v15	v16	v14	v12	v14								
Snail Lake	62007300		SNAL	451	SNAL451	4					5																									
South Oak Lake	27066100		SOAK	451	SOAK451																							v12	v15			v9	v8	v 5	v 7	v 13
South Rice Lake	27064500		SRIC	451	SRIC451																					v9	v14	v15	v14	v14	v15	v14	v12	v 6		
South School Section Lake	82015100		SSSC	451	SSSC451																v14	v7		v14							v14	v14	v14	v 14	v 14	v 14
South Twin Lake	82001900		STWN	451	STWN451																					v5	v5	v7	v7	v7	v7	v7	v7	v 7	v 7	v 7
Spring Lake	2007100	Anoka Co.	SPGA	451	SPGA451																						v11									
Spring Lake	70005400	Prior Lake	SPRG	451	SPRG451	4	5	16		5						13						13	v12			v6	v11	v13	v14	v14	v13	v9	v8	v 5	v 10	v 15
Square Lake	82004600		SQAR	451	SQAR451	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
St. Croix Lake	82000100	S-1 upper basin	STCROIX	451	STCROIX451																											v2				v 12
St. Croix Lake	82000100	S-2 upper basin	STCROIX	452	STCROIX452																										v10	v10	v9	v 9		v 12
St. Croix Lake	82000100	S-3 mid basin	STCROIX	453	STCROIX453																										v11	v9	v9	v 10		v 12
St. Croix Lake	82000100	S-4 mid basin	STCROIX	454	STCROIX454																															v 6
St. Croix Lake	82000100	S-5 mid basin	STCROIX	455	STCROIX455																										v8	v10	v7	v 8		v 15
St. Croix Lake	82000100	S-6 lower basin	STCROIX	456	STCROIX456																										v11	v10	v10	v 9		v 16
St. Croix Lake	82000100	S-7 lower basin	STCROIX	457	STCROIX457																										v8	v8	v10	v 5		v 13
St. Joe Lake	10001100		STJO	451	STJO451																									v17	v8	v9	v9	v 9	v 5	v 7
Staples Lake	82002800		STAP	451	STAP451																					v14	v5	v7	v7	v7	v7	v7	v7	v 7	v 7	
Staring Lake	27007800		STAR	451	STAR451	4					5										13				13		13			13		13				
Stieger Lake	10004500		STGR	451	STGR451					12					13						13															
Success Lake	27063400		SUCC	451	SUCC451																	v10							v11			v11		v 10		
Sucker Lake	62002800		SUKR	451	SUKR451						5																									
Sullivan Lake	2008000		SULL	451	SULL451														v14	v14	v15		v15	v14	v13	v11	v11	v12	v12							
Sunfish Lake	19005000	Sunfish Lake	SNFH	451	SNFH451																											v13	v13	v 13	v 14	v 15
Sunfish Lake	82010700	Lake Elmo	SUNF	451	SUNF451																					v10					v13	v11		v 7		
Sunnybrook Lake	82013300		SUNN	451	SUNN451																				v14		v13	v10	v12	v10	v16	v14	v14	v 14	v 14	v 13
Sunset Lake	82015300		SUNS	451	SUNS451					5									v14	v14	v12	v13	v16	v12	v10	v13	v13	v18	v20	v15	v17	v12	v10	v 9	v 7	v 8

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Lakes Sampled by Metropolitan Council Staff and the CAMP, 1980 - 2010

(Numbers indicate monitoring events per year. A "v" indicates monitoring performed by volunteers.)

Lake	DNR ID	Location	LAKE_NAME	Site	LakeSite	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
Sunset Pond	19045100		SUNP	451	SUNP451															v14	v14	v14	v12	v10		v13	v11	v10	v12	v11		v14	v14	v 14	v 14	v 14
Susan Lake	10001300		SUSN	451	SUSN451																											v7	v11	v 12	v 13	v 14
Swan Lake	10008200		SWAN	451	SWAN451																				v1											
Swede Lake	10009500		SWED	451	SWED451	2																13					13	v14	v16	v13	v14	v14	v13	v 14	v 14	v 14
Sweeney Lake	27003501		SWTW	451	SWTW451																					v11	v9	v14	v13	v14	v11	v10	v15	v 12	v 13	v 14
Sweeney Lake	27003501		SWTW	452	SWTW452																					v11	v9									v 10
Sylvan Lake	27017100	Hennepin Co.	SYLVAN	451	SYLVAN451																													v 10		
Sylvan Lake	82008000	Washington Co.	HAFB	451	HAFB451														v7			v14		v15	v14	v14	v14	v14	v14	v14	v14		v11	v 9	v 9	v 9
Tamarack Lake	10001000		TMRK	451	TMRK451																						v10	v11	v12	v11	v11	v13	v14	v 11	v 13	
Tanners Lake	82011500		TANN	451	TANN451	2								20					v14	v13	v12	v14														
Terrapin Lake	82003100		TERP	451	TERP451																									v7	v7	v7	v7	v 7	v 7	v 7
Thole Lake	70012001		THOL	401	THOL401					5										13			13			13		13			13	v14			2	7
Thomas Lake	19006700		THOM	451	THOM451	2																														
Tiger Lake	10010800		TIGR	451	TIGR451																				v1											
Turtle Lake	62006100	Ramsey Co.	TURT	451	TURT451	4	5		5																											
Turtle Lake	82003600	Washington Co.	TRTL	451	TRTL451																					v5	v5	v7	v7	v7	v7	v7	v7	v 7	v 7	v 7
Twin Lake	19002800	Burnsville	TWNB	451	TWNB451																				v6		v13	v11	v6	v2	v11	v8	v8	v 14	v 14	v 13
Twin Lake	27003502	Golden Valley	TWINGV	451	TWINGV451																															v 9
Twin Lake	27004201	upper [Br. Center]	TWNU	451	TWNU451												12		v14			11		v15		v11		v13		v14		v13		v 12		v 12
Twin Lake	27004202	middle [Crystal]	TWNM	451	TWNM451						5						12					13	v11		v13	13			v13		v8			v 13		v 13
Twin Lake	27004203	lower [Robbinsdale]	TWNL	451	TWNL451												12		v14			13		v5		13			v13		v8					v 9
Twin Lake	27065600	St. Louis Park	TSLP	451	TSLP451																							v12	v14	v14	v11	v14	v10	v 10	v 11	v 13
Twin Lake	82004800	south [May Twnshp]	TWNS	451	TWNS451																		v13	v13										v 14	v 7	v 7
Vadnais Lake	62003801		VADE	451	VADE451						5																									
Valentine Lake	62007100		VALN	451	VALN451																						v14	v13	v12	v12	v9	v10	v12	v 13		
Valley Lake	19034800		VALL	451	VALL451																v15	v14	v11		v8	v14	v14	v14	v14	v14	v13	v14	v14	v 13	v 14	v 14
Virginia Lake	10001500		VIRG	451	VIRG451																					v11	v12	v14	v12	v15	v13					
Wabasso Lake	62008200		WABS	451	WABS451	4	5		5						12																					
Waconia Lake	10005900		WACN	451	WACN451	4	5				5					13				v16	v13	v15	v17	v15	v14	v14	v14	v15	v14		12	v14	v14	v13	v 13	v 14	v 14
Wasserman Lake	10004800		WASS	451	WASS451				5			17	18							13			13	13	13			13	13				13				
Weaver Lake	27011700		WEVR	451	WEVR451				5			17	18																							
Weber Lake	82011900		WEBR	451	WEBR451																											v12		v 7	v 7	v 7
West Boot Lake	82004400		WBOO	451	WBOO451																					v14	v14	v14	v14	v14	v14	v7	v7	v 7	v 7	v 7
West Lakeland Storage Site	100	south basin	WLND	452	WLND452																													v 3		
West Lakeland Storage Site	82048800	north basin	WLND	451	WLND451																					v2								v 7	v 7	v 7
Westwood Lake	27071100		WEST	451	WEST451														v13							v15	v14	v10	v9	v7	v7	v8	v8	v 7	v 7	v 10
Whaletail Lake	27018401		WHAL	401	WHAL401																									13	13				3	
Whaletail Lake	27018402		WHAL	402	WHAL402	4				5														13			13			13	13				3	
White Bear Lake	82016700		WHIT	451	WHIT451	4	5			5																										
White Rock Lake	82007200		WRCK	451	WRCK451																											v11	v14	v 13	v 15	v 14
Wilmes Lake	82009000		WILM	451	WILM451															v14	v15	v14	v15	v15	v14	v13	v13	v10	v12	v12	v10	v12	v11	v 11	v 11	v 11
Windsor Lake	27008200		WNSR	451	WNSR451																									v12	v14					
Wing Lake	27009100		WING	451	WING451																											v14	v14	v 12	v 9	v 14
Winkler Lake	10006600		WINK	451	WINK451																				v8	v6	v6		v13		v14		v13	v 13		v 13

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Lake	DNR ID	Location	LAKE_NAME	Site	LakeSite	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
Wolsfeld Lake	27015700		WOLS	451	WOLS451	4																														
Wood Lake	19002400		WOOD	451	WOOD451																	v10	v14	v15	v15	v14	v13	v14	v14	v14	v14	v13	v13	v 12	v 9	v 13
Woodpile Lake	82013200		WPLE	451	WPLE451																											v7	v7	v 15	v 14	v 14
Young America Lake	10010500		YNGA	451	YNGA451																				v1											
Zumbra Lake	10004100		ZUMB	451	ZUMB451					5						13												13								

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Lake Characteristics

Lake Name & DNR ID#	Surface Area (ac)	Watershed Area (ac)	Watershed to Surface Area Ratio	Max Depth (m)	Mean Depth (m)	Volume (ac-ft)	% Littoral	# Inlets	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
Acorn 82-102	44	296	6.7	3.0	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 19-0094	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		
Barker 82-76	45	823	18.3	9.0	4.4	648			Y	N		
Bass (Hennepin) 27-98	194	3,100	16.0	9.4	3.1	1,979	82		Y	N	2.3	
Bass (St. Louis Park) 27-15	95											
Bass (Washington) 82-35	81			4.3			100		N	N		
Bass, east (Wash) 82-124	24						100		N	N		
Bass, west (Wash) 82-123	47						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			
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	11			1.5					N			

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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	24											
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	42											
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

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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		
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	24			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 (Grant) 82-137	21			10.4			67		Y			
Fish (Scott) 70-69	171	660	3.9	8.5	4.4	2,468	43		Y	Y		Centrarchid
Fish (Washington) 82-64	72	683	9.5	3.0	1.5	360	100		N	N		
Fish (Woodbury) 82-0093	5.2											
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									

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Gaystock 10-31	105			5.0			100		N	N		
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 27-670	5.9			0.7			100		N	N		
Hay 82-65	33									N		
Hazeltine 10-14	236			2.0			100		N	N		
Heims 13-56												
Henry 10-175	77			1.5			100		N	N		
Herbers Pond 82-15-01 (south bay of Loon Lake)				2.0			100		N	N		
Highland 2-79	22			1.0			100		N	N		
Hornbean 19-47	22											

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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 82-5202	72	333	4.6	4.9	2.4	569	100		N	N		
Jonathon 10-217	24											
July 82-318	14											
Karth 62-0072	17											
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	
Kismet 82-333	40									N		
Klawitter 82-368	4.5	168	37.3				100					
Kramer Pond 82-117	13											
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						
Libbs 27-85	23			2.1			100		N	N		

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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								
Lone 27-94	22			8.2			18		Y	Y		
Long (Apple Valley) 19-22	36			3.5			100		N	N		
Long (Mahtomedi) 82-130	48			7.7			92		Y	N		
Long (May) 82-30	88			3.7			100		N	Y		
Long (Pine Springs) 82-118	62	2,060	33.2	10.4	3.6	744	55		Y	N		
Long (Stillwater) 82-21	71			6.7			96		N	N		
Long (Wash) 82-68	35	381	10.9	2.1	1.1	126	100		N	N		
Loon 82-15	64	407	6.4	4.9	2.4	206	100		N	N		
Lost 82-134	9.1			7.9			82					
Lotus 10-6	246	1,033	4.2	8.8	4.3	3,500	74		Y	Y		
Louise 82-25	48	616	12.8	3.7	1.8	283	100		N	N		
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		

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Maria 10-58	169			1.0			100		Y	N		
Marion 19-26	560			6.4			81		Y	Y		
Markgrafs 82-89	46	413	9.0	2.4			100		N	N	2.6	Rearing
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	30											
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		
Minnetoga 27-88	14.4			8.2	3.9	183						
Minnewashta 10-9	677			21.3					Y	Y		
Mitchell 27-70	112			5.8			97		N	Y		
Moody 13-23	35			14.6			63		Y	N		
Mud 82-26-02	62	899	14.5	2.1	1.1	224	100		N	N		
Normandale 21-1045	103			3.7			100		N			
North Twin 82-18	69	187	2.7	1.8	0.9	207	100		N	N		
Northwood 27-627	15	1,341	89.4	1.5	0.8	41	100		N	N		
O'Connor 82-2	38									N		

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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
Pike (Ramsey) 62-69	35			4.9	2.1	252	100		N	N		Gamefish
Pike (Scott) 70-76	57	1,991	34.9	2.7			100		N	N		
Pine Tree 82-122	174			7.9	3	1,740	91		Y	N		Centrarchid
Powers 82-92	57	1,238	21.7	12.5			57	2	Y	N	1.8	Centrarchid
Priebe 62-36	5.1			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
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		

APPENDIX B
Lake Characteristics

Lake Name & DNR ID#	Surface Area (ac)	Watershed Area (ac)	Watershed to Surface Area Ratio	Max Depth (m)	Mean Depth (m)	Volume (ac-ft)	% Littoral	# Inlets	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
Reshnanau 2-9	336			4.9			100		N	Y		
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											
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	47			3.0			100		N	N		
Schutz 10-18	105	943	9.0	15.0	6	2,100	27		Y	N		
Scout 19-198	8.1			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	3.1									N		

APPENDIX B
Lake Characteristics

Lake Name & DNR ID#	Surface Area (ac)	Watershed Area (ac)	Watershed to Surface Area Ratio	Max Depth (m)	Mean Depth (m)	Volume (ac-ft)	% Littoral	# Inlets	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
South Rice 27-645	3.2	63	19.7	2.5	0.5	5	100		N	N		
South Twin 82-19	54	63	1.2	4.0	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	7.7											
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	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		
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			

APPENDIX B
Lake Characteristics

Lake Name & DNR ID#	Surface Area (ac)	Watershed Area (ac)	Watershed to Surface Area Ratio	Max Depth (m)	Mean Depth (m)	Volume (ac-ft)	% Littoral	# Inlets	Thermo-cline?	Public Access	Shore Length (miles)	DNR Classification
Twin, upper (Brkln. Park) 27-42-01	137	3,657	26.7	2.4	0.9	397	100		Y	N	2.8	Centrarchid
Twin, middle (Crystal) 27-42-02	69	4,053	58.7	14.0	4.9	918	57		Y	Y	1.4	Centrarchid
Twin, lower (Robbinsdale) 27-42-03	46	5,322	115.7	6.7	2.3	340	83		Y	Y	1.2	Centrarchid
Twin (St. Louis Pk) 27-656	12.4									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											
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

2010 CAMP Volunteers and Sponsors

Sponsor	LAKE	DNR ID	Volunteer Name
Anoka County Parks	Cenaiko	2065400	Anoka County Parks Staff
Anoka County Parks	Island	2002200	Anoka County Parks Staff
Apple Valley, City of	Cobblestone	19045600	Jeff Sluiter and City of Apple Valley Staff
Apple Valley, City of	Farquar	19002300	Jeff Christianson
Apple Valley, City of	Long	19002200	Christy McGlocklin, Jake McGlocklin, and Al Kettelkamp
Apple Valley, City of	Scout	19019800	Dan Stanek
Basset Creek WMO	Medicine	27010400	David Nelson and Josie Nelson
Basset Creek WMO	Northwood	27062700	Robert White
Basset Creek WMO	Parkers	27010700	Peter Spink
Basset Creek WMO	Sweeney	27003501	Caroline Amplatz and Kari Geurts
Basset Creek WMO	Sweeney	27003501	Dave Hanson
Basset Creek WMO	Twin	27003502	Caroline Amplatz and Kari Geurts
Basset Creek WMO	Westwood	27071100	Westwood Nature Center
Black Dog WMO	Crystal	19002700	Carroll Arnett, PhD
Black Dog WMO	Keller	19002500	Glenn Gramse
Black Dog WMO	Kingsley	19003000	City of Lakeville Staff
Black Dog WMO	Lac Lavon	19044600	Wally Shaver
Black Dog WMO	Orchard	19003100	Tom Goodwin
Black Dog WMO	Sunset Pond	19045100	Dan Wallace
Burnsville, City of	Aligmagnet	19002100	John Ritter
Burnsville, City of	Earley	19003300	Jeff Thayer
Burnsville, City of	Twin Lake south	19002800	Dan Freeman and City of Burnsville Staff
Burnsville, City of	Wood Pond	19002400	John Mock and Ashley Mock
Carver County	Bavaria	10001900	John Ryski
Carver County	Benton	10006900	Jacob Steinbauer and Don Smith
Carver County	Brickyard	10022500	Carver County Staff
Carver County	Burandt	10008400	Carver County Staff
Carver County	Courthouse	10000500	Carver County Staff
Carver County	Eagle	10012100	Carver County Staff
Carver County	Firemans	10022600	Carver County Staff
Carver County	Goose	10008900	Carver County Staff
Carver County	Grace	10021800	Carver County Staff
Carver County	Hazeltine	10001400	Carver County Staff
Carver County	Hydes	10008800	Carver County Staff
Carver County	Jonathan	10021700	Carver County Staff
Carver County	McKnight	10021600	Carver County Staff
Carver County	Miller	10002900	Carver County Staff
Carver County	Reitz	10005200	Mark McMullen and Lynne McMullen
Carver County	Rutz	10008000	Marty Ziermann
Carver County	Swede	10009500	Wayne Hubin
Carver County	Waconia	10005900	Carver County Staff
Carver County	Winkler	10006600	Carver County Staff

Sponsor	LAKE	DNR ID	Volunteer Name
Chanhassen, City of	Lotus	10000600	Shelley Strohmaier
Chanhassen, City of	Lucy	10000700	Tim McCotter and Sharon McCotter
Chanhassen, City of	Minnewashta	10000900	Steve Aldritt
Chanhassen, City of	Riley	10000200	David Florenzano
Chanhassen, City of	St. Joe	10001100	Sue Morgan and Linda Scott
Chanhassen, City of	Susan	10001300	Robin Armstrong and Chadd Armstrong
CLFLWD	Bone	82005400	Jon Hafner, Don Jack, and Teresa Hafner
CLFLWD	Comfort	13005300	Wally Ostlie
CLFLWD	Forest Lake West	82015900	Steve Schmaltz
CLFLWD	Little Comfort	13005400	Steve Schreiber
CLFLWD	Moody	13002300	Douglas Toavs
CLFLWD	Sylvan	82008000	Curt Sparks
Eden Prairie, City of	Mitchell	27007000	Gordon Warner and Fran Warner
Elm Creek WMC	Cowley	27016900	Lori Ende
Elm Creek WMC	Henry	27017500	George Christ and Pam Christ
Elm Creek WMC	Rice	27011601	George Schneider
Lakeville, City of	East	19034900	City of Lakeville Staff
Lakeville, City of	Lee	19002900	City of Lakeville Staff
Lakeville, City of	Marion	19002601	Wally Potter
Lakeville, City of	Valley	19034800	City of Lakeville Staff
Mendota Heights, City of	Lemay	19008200	City of Mendota Heights Staff
Mendota Heights, City of	Rogers	19008000	Doug Hennes
Minnetonka, City of	Lone	27009400	City of Minnetonka Staff
Minnetonka, City of	Shady Oak	27008900	Nina Norum
Nine Mile Creek WD	Bush	27004700	Gregg Thompson
Nine Mile Creek WD	Minnetoga	27008800	John Twele and Maressia Twele
Nine Mile Creek WD	Normandale	27104500	Lane Barton
Nine Mile Creek WD	Penn (lower)	27000400	Dan McManimon and Tony Aguon
Nine Mile Creek WD	Wing	27009100	John Burton and Mary Quinn
Pioneer-Sarah WMC	Ardmore	27015300	Greg Durand
Pioneer-Sarah WMC	Hafften	27019900	Jim VanSomeren and Kris VanSomeren
Pioneer-Sarah WMC	Little Long	27017901	Garrett Genereux
Pioneer-Sarah WMC	Peter (north basin)	27014702	Tim Lambrecht and Rita Lambrecht
Prior Lake Spring Lake WD	Cates	70001800	Tom Sletta
Prior Lake Spring Lake WD	Fish	70006900	Steve Pierson
Prior Lake Spring Lake WD	Prior, lower	70002600	Walt Burris
Prior Lake Spring Lake WD	Prior, upper	70007200	Frank Fourre

Sponsor	LAKE	DNR ID	Volunteer Name
Prior Lake Spring Lake WD	Spring	70005400	Jim Weninger
Rice Cr WD	George Watch	2000500	Wargo Nature Center
Rice Cr WD	Golden	2004500	David Phipps
Rice Cr WD	Karth	62007200	Gary Gerding, Noah Gerding, and Joe Johnson
Rice Cr WD	Langton	62004901	Tam McGehee and Dick McGehee
Rice Cr WD	Little Johanna	62005800	Fred Fox
Rice Cr WD	Lochness	2058500	Jim Hafner and Tricia Hafner
Rice Cr WD	Long	82013000	Kitty Francy-Payton
Rice Cr WD	Oneka	82014000	Paul Bolstad
Rice Cr WD	Pine Tree	82012200	Gene Berwald
Rice Cr WD	Priebe	62003600	David Dixen, Dawn McKinnon, and Carol Pierce
Rice Cr WD	Reshanau	2000900	Lori Fredlund
Rice Cr WD	Sunset	82015300	Dianne Coderre
Rice Cr WD	White Rock	82007200	David Bluhm
Saint Louis Park	Cobblecrest	27005300	Jim Kellogg
Saint Louis Park	South Oak	27066100	The Gerlachs
Saint Louis Park	Twin	27065600	Robert Cornwall
Scott County	Cedar	70009100	Kurth Schroeder and Steve Fjelstad
Scott County	McMahon	70000500	Joe Williamson and Diane Williamson
Shakopee	Dean	70007400	Andy Voit, Andrew Voit, and Alyssa Voit
Shakopee	O'Dowd	70009500	Sandy Boyce and Mike Boyce
Shingle Creek WMC	Crystal	27003400	Wayne Sicora, Luke Sicora, and Leif Sicora
Shingle Creek WMC	Ryan	27005800	Travis Kolbeck, Cheri Kolbeck, and Andrew Shepherd
Shingle Creek WMC	Twin, lower	27004203	Rob FitzPatrick
Shingle Creek WMC	Twin, middle	27004202	Janet Moore
Shingle Creek WMC	Upper Twin	27004201	Kris Mann
South St. Paul, City of	Anderson Pond	NA	City of South St. Paul Staff
South St. Paul, City of	LeVander Pond	NA	City of South St. Paul Staff
South St. Paul, City of	Seidl	19009500	City of South St. Paul Staff
Sunfish Lake, City of	Hornbeam	19004700	Dave Johnson
Sunfish Lake, City of	Horseshoe	19005100	Jim Nayes
Sunfish Lake, City of	Sunfish	19005000	Jim Stowell
VBWD	Cloverdale	82000900	Dr. Kevin Bjork
VBWD	DeMontreville	82010100	Steve Iverson
VBWD	Downs	82011000	Diane Willer-Sly and Wesley Sly
VBWD	Echo	82013500	WCD

Sponsor	LAKE	DNR ID	Volunteer Name
VBWD	Elmo	82010600	Scott Knudson, Terry Bouthilet, and Wendy Griffin and Jeff Berg
VBWD	Jane	82010400	Chuck Taylor
VBWD	Klawitter Pond	82036800	Bonnie Juran and Pat Barrett
VBWD	Olson	82010300	Bob Meier
VBWD	Rest Area Pond	NA	MN DOT staff
VBWD	Sunnybrook	82013300	Arnie Johnson
Washington CD	Armstrong Lake	82011600	Todd Heruth
Washington CD	Bass East	82012400	Washington CD Staff
Washington CD	Bass West	82012300	Washington CD Staff
Washington CD	Benz	82012000	Washington CD Staff
Washington CD	Big Carnelian	82004900	Tom Koontz
Washington CD	Big Marine	82005200	Washington CD Staff
Washington CD	Brick Pond	82030800	Washington CD Staff
Washington CD	Clear	82004500	Dan Carlson, Andrew Carlson, and Warner Nature Center
Washington CD	Cottage Grove Park	82008700	Washington CD Staff
Washington CD	East Boot	82003400	Washington CD Staff
Washington CD	Fish Lake	82009300	Washington CD Staff
Washington CD	Fish Lake	82006400	Washington CD Staff
Washington CD	Goggins	82007700	Washington CD Staff
Washington CD	Goose	82005900	Washington CD Staff
Washington CD	Hay	82006500	Washington CD Staff
Washington CD	Jackson WMA	82030500	Washington CD Staff
Washington CD	Jellum's Lake	82005202	Washington CD Staff
Washington CD	July Avenue	82031800	Washington CD Staff
Washington CD	Kismet	82033400	Washington CD Staff
Washington CD	Lily	82002300	Tom Koontz
Washington CD	Little Carnelian	82001400	Washington CD Staff
Washington CD	Long	82003000	Washington CD Staff
Washington CD	Long	82002100	Washington CD Staff
Washington CD	Long	82002100	Washington CD Staff
Washington CD	Long	82002100	Washington CD Staff
Washington CD	Long Lake	82006800	Washington CD Staff
Washington CD	Loon	82001502	Pete Riehle
Washington CD	Louise	82002500	Washington CD Staff
Washington CD	Lynch	82004200	Washington CD Staff
Washington CD	Lynch	82004200	Washington CD Staff
Washington CD	Masterman	82012600	Washington CD Staff
Washington CD	Mays	82003300	Dan Carlson, Andrew Carlson, and Warner Nature Center
Washington CD	McKusick	82002000	Washington CD Staff
Washington CD	Mud	82002600	Washington CD Staff
Washington CD	North Twin	82001800	Washington CD Staff
Washington CD	O'Conners Lake	82000200	Jeff Keene
Washington CD	Pat Lake	82012500	Washington CD Staff
Washington CD	Plaisted	82014800	Washington CD Staff

Sponsor	LAKE	DNR ID	Volunteer Name
Washington CD	Sand	82006700	Washington CD Staff
Washington CD	Silver	82001600	Washington CD Staff
Washington CD	South School Section	82015100	Washington CD Staff
Washington CD	South Twin	82001900	Washington CD Staff
Washington CD	Square	82004600	Washington CD Staff
Washington CD	Terrapin	82003100	Dan Carlson, Andrew Carlson, and Warner Nature Center
Washington CD	Turtle	82003600	Washington CD Staff
Washington CD	Twin	82004800	Washington CD Staff
Washington CD	West Boot	82004400	Washington CD Staff
Washington CD	Woodpile	82013200	Washington CD Staff
Woodbury, City of	Colby	82009400	Annie Gustafson
Woodbury, City of	La	82009700	Tim Weber
Woodbury, City of	Markgrafs	82008900	Terry Riley
Woodbury, City of	Powers	82009200	Washington CD Staff
Woodbury, City of	Wilmes	82009000	Bill Aamodt

APPENDIX D

2010 CAMP Quality Control Data

Appendix D
CAMP Quality Control Data 2010

Lake Name	DNR ID#	Date	TP ug/L	CLA ug/L	Secchi Depth m
Bavaria Lake	10001900	10/15/2010	45	22	1.3
Big Comfort Lake	13005300	10/4/2010	42	25	2.1
Bone Lake	82005400	10/4/2010	34	34	1.5
Bush Lake	27004700	10/15/2010	19	7.5	3.3
Cedar Lake	70009100	9/16/2010	156	110	0.6
Crystal Lake	19002700	9/16/2010	51	41	0.8
Marion Lake	19002601	9/16/2010	38	47	0.8
Olson Lake	82010300	10/1/2010	27	20	1.9
Orchard Lake	19003100	9/16/2010	26	12	2.6
Riley Lake	10000200	10/15/2010	77	16	2.1
Waconia Lake	10005900	10/15/2010	34	13	2.5