

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

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

This is the first year that Capaul's Pond was monitored as part of the CAMP. A search through the STORET system revealed no historical water monitoring data for this water body. The basin was monitored 7 times between April and mid October. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

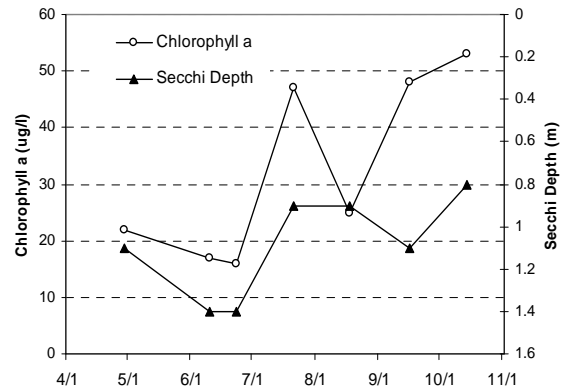
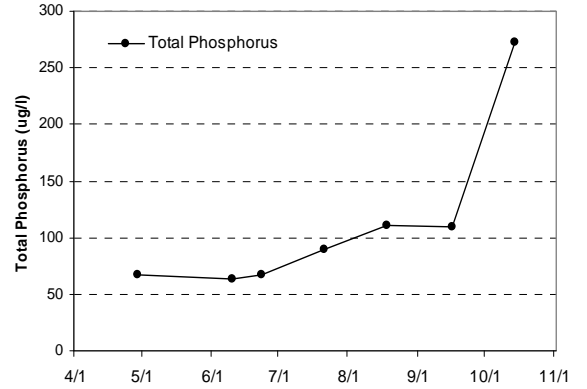
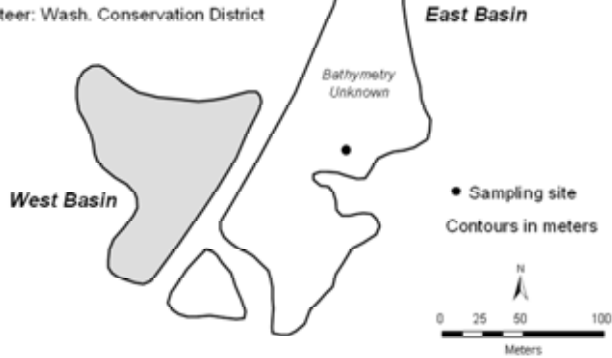
For 2008, the lake received a lake grade of D. Additional years of monitoring are suggested to build an historical water quality database for this lake.

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

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

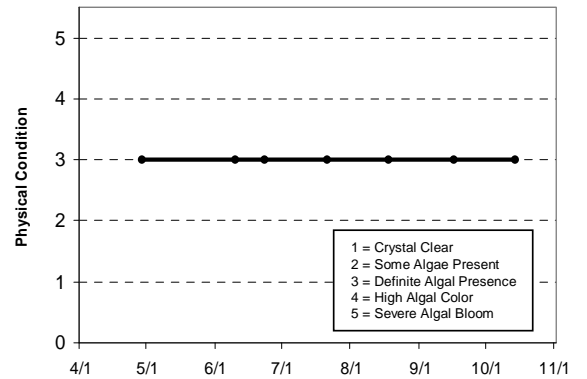
Capaul's Pond (East Basin)
Grant, Washington Co.

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



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/29	9.3	7.1	12.15	9.75	22	67		1.1	3	4
6/10	21.4	18.6	9.38	0.21	17	63		1.4	3	4
6/23	25.8	21.8	9.55	0.54	16	67		1.4	3	4
7/21	27.3	23.5	8.35	0.25	47	90		0.9	3	4
8/18	28.3	23.3	9.89	0.22	25	111		0.9	3	4
9/16	20.2	17.3	12.54	0.29	48	110		1.1	3	4
10/14	13.6	13.2	8.99	0.32	53	272		0.8	3	4



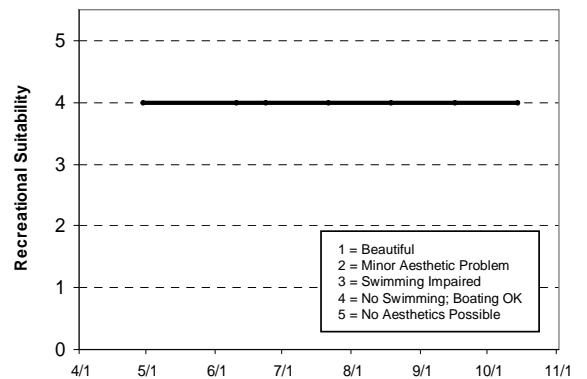
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

This is the first year that Capaul's Pond was monitored as part of the CAMP. A search through the STORET system revealed no historical water monitoring data for this water body. The basin was monitored 7 times between April and mid October. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

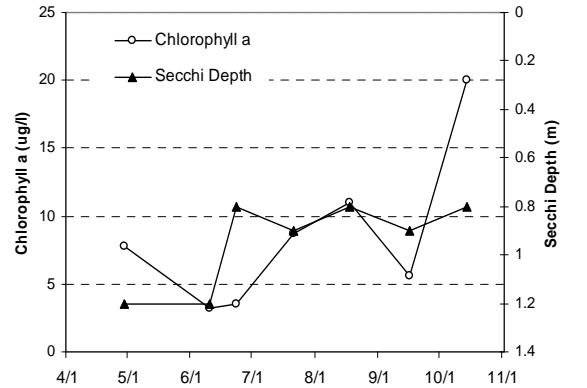
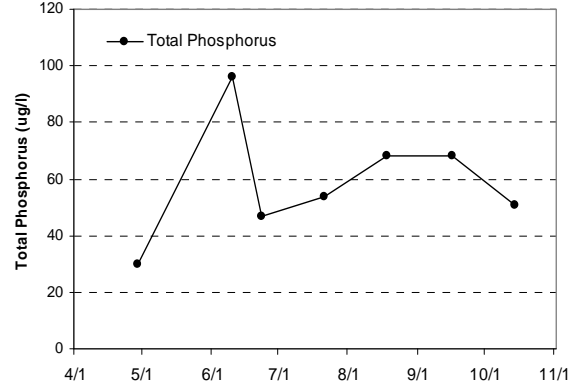
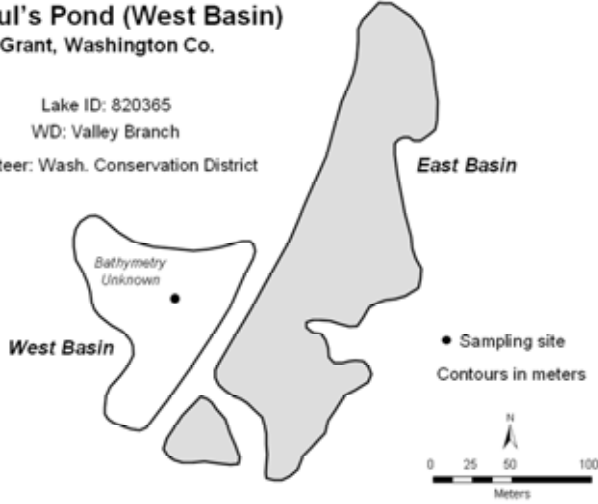
For 2008, the lake received a lake grade of C which is better water quality than the east basin. The concentration of CLA was notably less in the west basin than in the east basin but the water clarity was similar for both basins. This may indicate that the water clarity of the west basin may be more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

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

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

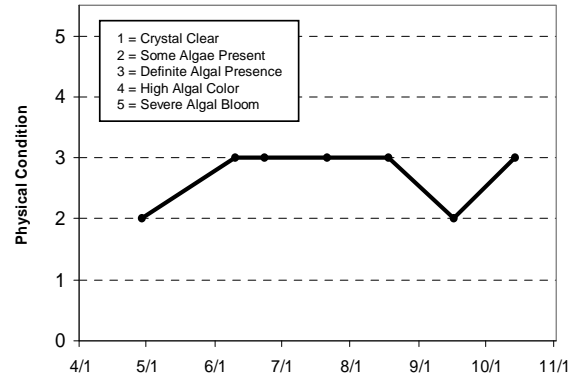
Capaul's Pond (West Basin)
Grant, Washington Co.

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



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/29	9	7.5	14.33	5.11	7.8	30		1.2	2	3
6/10	22.1	19.1	11.93	0.46	3.2	96		1.2	3	4
6/23	25.6	23.4	10.68	0.62	3.5	47		0.8	3	4
7/21	25.1	23.5	3.6	0.31	8.7	54		0.9	3	4
8/18	27	24.2	6.7	2.12	11	68		0.8	3	4
9/16	20.7	17.6	8.56	10.03	5.6	68		0.9	2	4
10/14	13.5	12.8	9.57	11.21	20	51		0.8	3	4



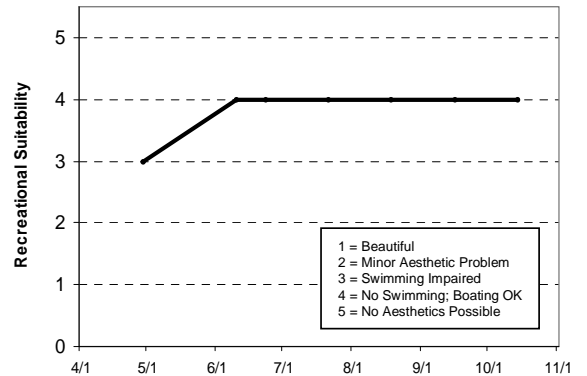
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

A search through the STORET nationwide water quality database for data on the lake revealed a fair amount of historic data (1996-2007). The lake was monitored 7 times from early may to late September 2008. On each sampling day the lake was monitored for Secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

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

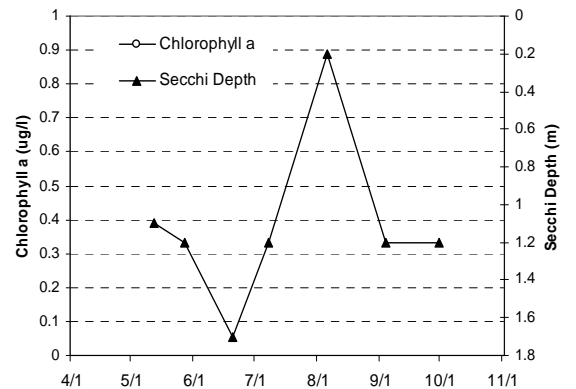
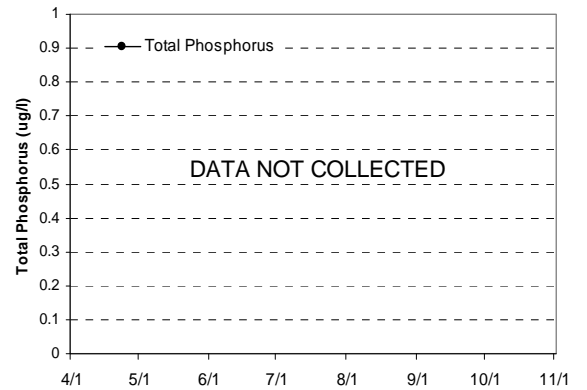
The last two graphs show seasonal variation in the lake’s perceived physical condition and recreational suitability. The average user perception rankings, on a 1-to-5 scale, were 2.6 for physical condition (between 2- “some algae present” and 3- “definite algae present”), and 3.4 for recreational suitability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

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

**Carol Lake
Stillwater Twp.,
Washington Co.**

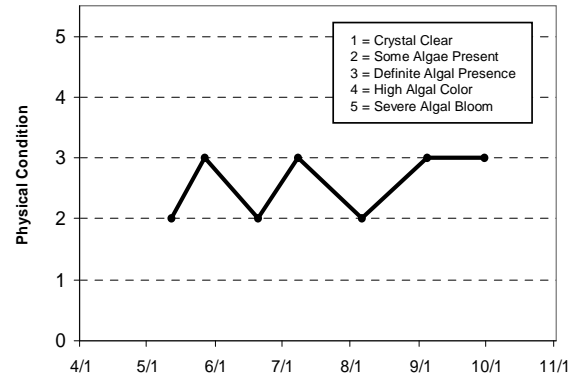
LAKE ID: 820017
WD: Carnelian-Marine-St. Croix
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/12	15.5	14.5	9.77	4.95				1.1	2	2
5/27	18.6	16.6	8.76	1.43				1.2	3	4
6/20	23.3	20.1	10.3	0.18				1.7	2	4
7/8	25.3	22.8	9.23	0.68				1.2	3	4
8/6	24.1	21.9	5.31	0.18				0.2	2	4
9/4	18.8	17.9	2.43	0.23				1.2	3	4
9/30	18.3	16.7	3.78	0.32				1.2	3	2



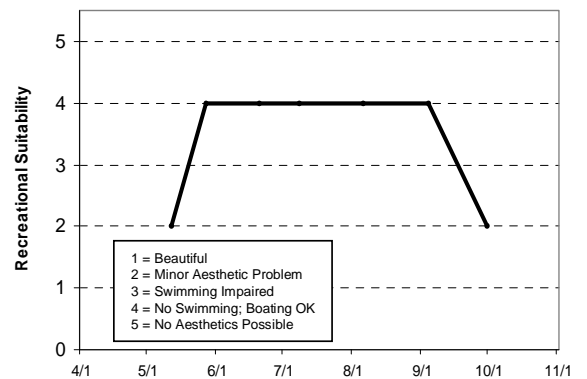
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Cates Lake is a 27-acre lake located in the City of Savage (Scott County). The maximum depth of the lake is 4.0 m (roughly 13 feet). Because of the shallowness of the lake, its entire area is considered littoral zone (the 0-15 foot depth area dominated by aquatic vegetation), and the lake does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake’s water column). The lake has no public access. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

The lake was monitored 12 times between mid-May and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

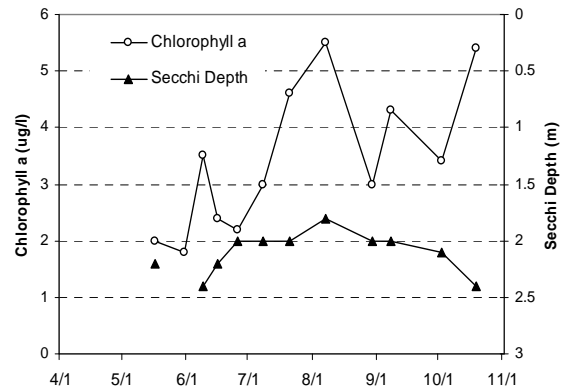
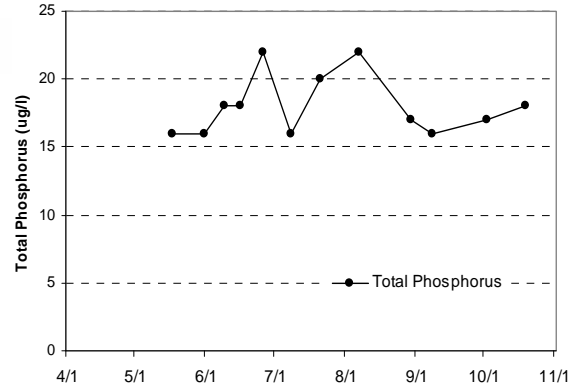
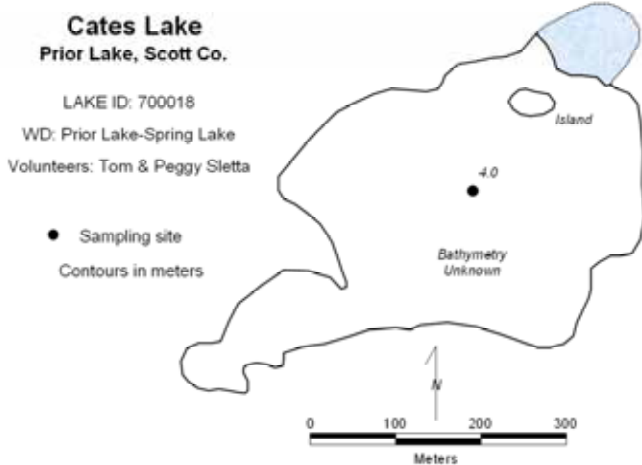
2008 summer (May-September) data summary

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

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

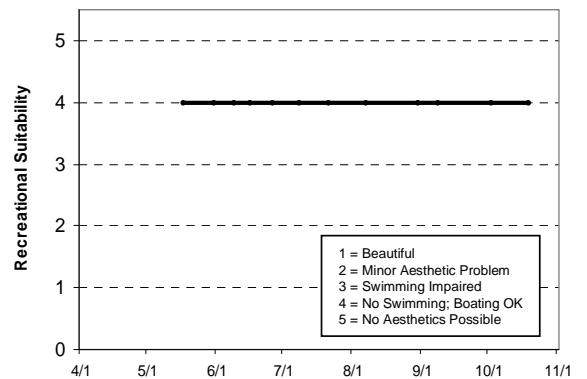
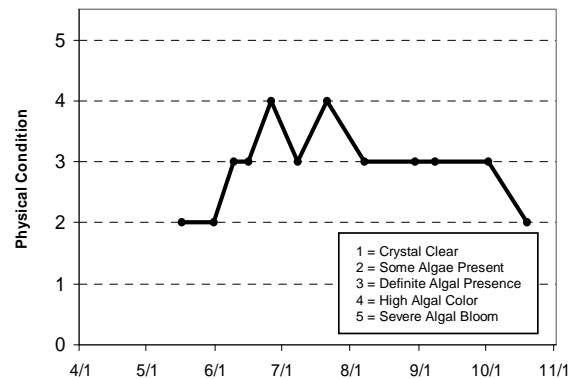
During each monitoring event, the volunteers’ opinion of the lake condition was ranked on a 1-to-5 scale as shown on the lake information sheet. The average score for physical condition was 3.0 (3- “definite algae present”), and 4.0 for recreational suitability (4 - “no swimming – boating ok”).

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



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/17	18.2				2	16		2.2	2	4
5/31	19				1.8	16			2	4
6/9	21.2				3.5	18		2.4	3	4
6/16	21.8				2.4	18		2.2	3	4
6/26	25				2.2	22		2	4	4
7/8	25.4				3	16		2	3	4
7/21	26.5				4.6	20		2	4	4
8/7	26.1				5.5	22		1.8	3	4
8/30	22.5				3	17		2	3	4
9/8	18.9				4.3	16		2	3	4
10/2	16.5				3.4	17		2.1	3	4
10/19	13.3				5.4	18		2.4	2	4



Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data

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

Cedar Lake is located in Cedar Lake Township (Scott County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value. The lake has a surface area of 742 acres and has a maximum depth of 4.7 m (roughly 15 feet). The lake's mean depth of 2.1 m (6.9 feet) and surface area translates to an approximate lake volume of 5,194 ac-ft. Because the maximum depth is only 4.7 m (15 feet), the entire lake area is considered littoral (the area of aquatic plant dominance), and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column).

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

This is the third year that Cedar Lake has been enrolled in CAMP. The lake had been monitored by Council staff in the past. The lake was monitored 14 times between mid-April and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

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

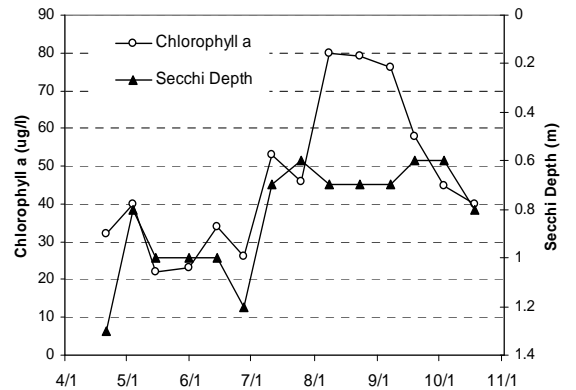
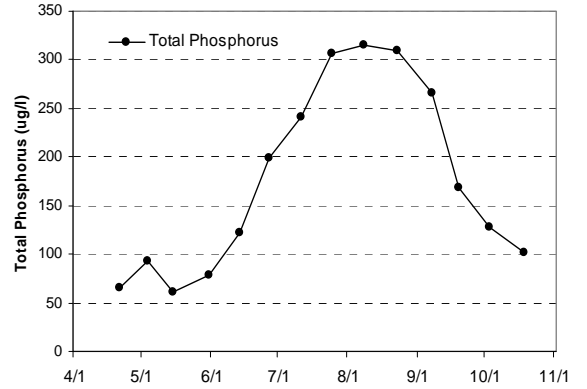
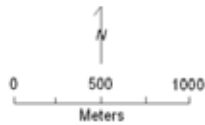
The volunteer monitor ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. The mean perceived physical condition was 2.4 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability was 2.2 (2- "minor aesthetic problem"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

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

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

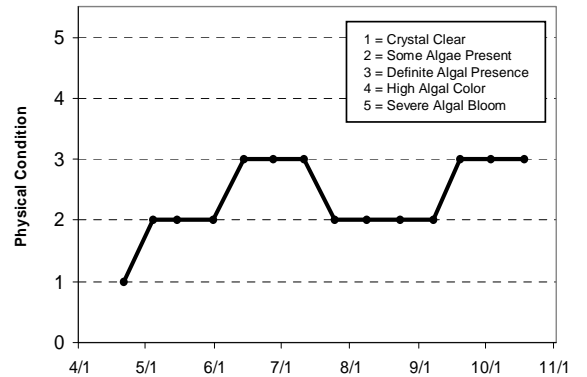
Cedar Lake
Cedar Lake Twp./Helena Twp.,
Scott Co.

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



2008 Data

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



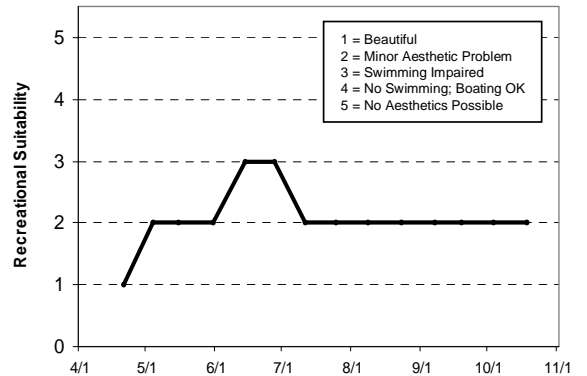
Lake Water Quality Grades Based on Summertime Averages

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

Cenaiko Lake was monitored 13 times between late April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

The lake received a water quality lake grade of B for 2008. The lake has received A grades for TP and CLA since 1997. The water clarity shows variation however. The annual mean summer-time water clarity grade has varied in the range of A to C. No apparent trends are evident from the lake's water quality database. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). The lake seems well represented by a lake grade of A/B on the basis of the historical database.

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

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

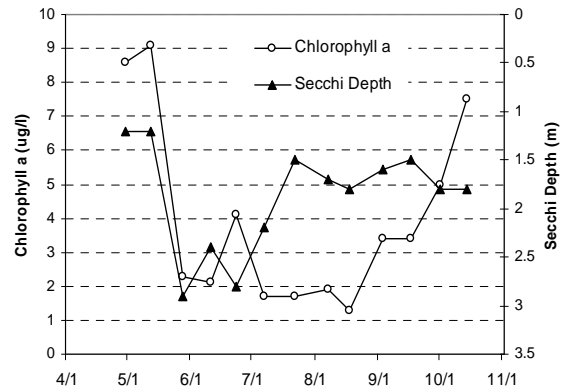
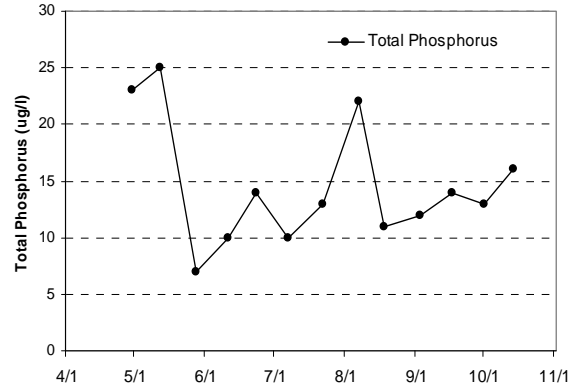
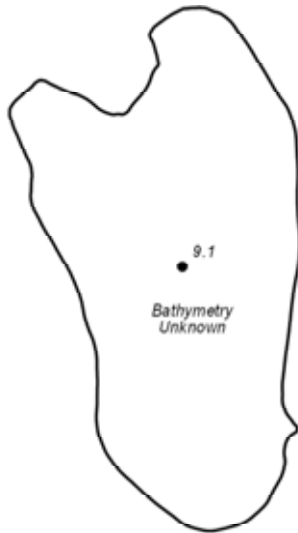
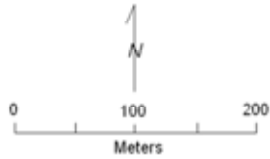
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lake Cenaiko
Coon Rapids, Anoka Co.

Lake ID: 20654
WD: Coon Creek

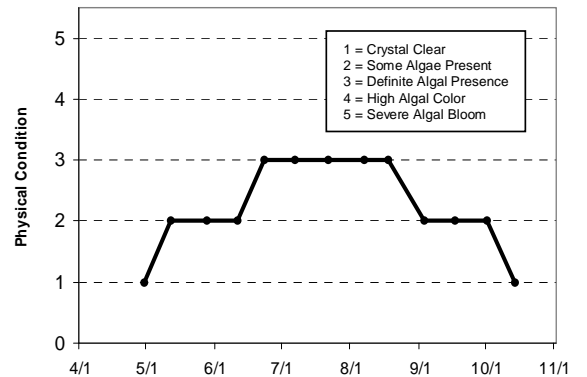
Volunteer: Anoka Co. Parks

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/30	10.7				8.6	23		1.2	1	1
5/12	14.4				9.1	25		1.2	2	1
5/28	19				2.3	7		2.9	2	1
6/11	20.1				2.1	10		2.4	2	1
6/23	24.7				4.1	14		2.8	3	2
7/7	26.8				1.7	10		2.2	3	3
7/22	28.5				1.7	13		1.5	3	3
8/7	26.1				1.9	22		1.7	3	3
8/18	26.3				1.3	11		1.8	3	3
9/3	22.5				3.4	12		1.6	2	2
9/17	22.7				3.4	14		1.5	2	2
10/1	16.9				5	13		1.8	2	1
10/14	14.5				7.5	16		1.8	1	1



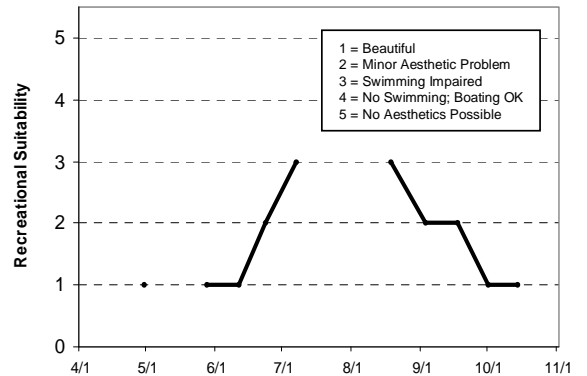
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

The lake was monitored 14 times between mid April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

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

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

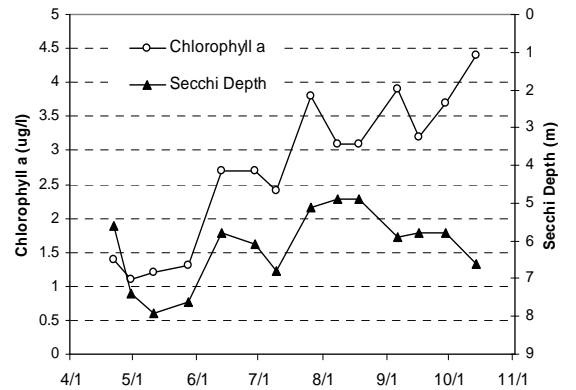
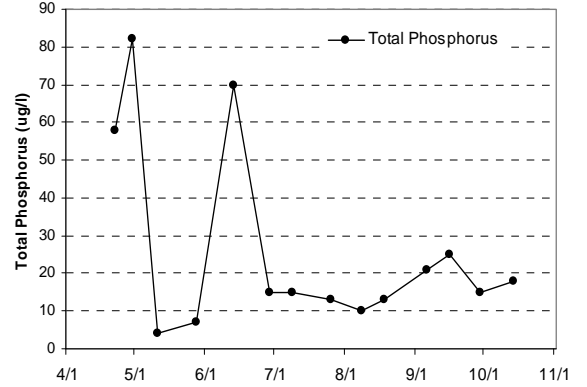
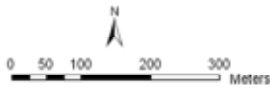
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Clear Lake
May Twp., Washington Co.

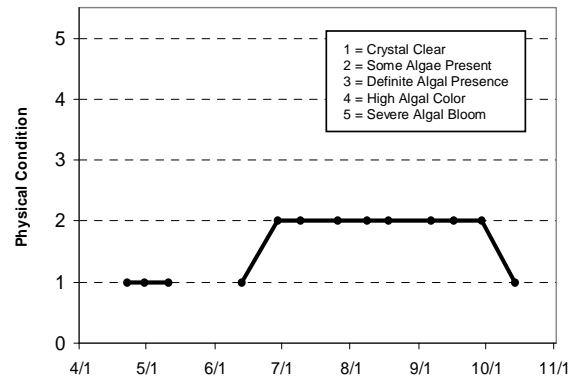
Lake ID: 820045
WD: Carnelian-Marine
Volunteer: Warner Nature Center

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	9.4				1.4	58		5.6	1	1
4/30	10.4				1.1	82		7.4	1	1
5/11	14.9				1.2	4		7.9	1	1
5/28	19				1.3	7		7.6		
6/13	21				2.7	70		5.8	1	1
6/29	26.3				2.7	15		6.1	2	1
7/9	26.5				2.4	15		6.8	2	2
7/26	26.5				3.8	13		5.1	2	2
8/8	26.5				3.1	10		4.9	2	2
8/18	26.5				3.1	13		4.9	2	2
9/6	21.9				3.9	21		5.9	2	1
9/16	20.2				3.2	25		5.8	2	2
9/29	18.8				3.7	15		5.8	2	1
10/14	14.2				4.4	18		6.6	1	1



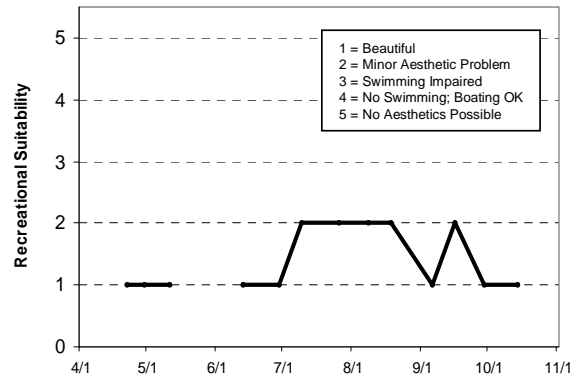
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Cloverdale Lake (82-0009) Valley Branch Watershed District

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

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

The lake was monitored 9 times between early May and early October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

The lake received a water quality lake grade of B for 2008. For 6 of the past 8 years, the lake has received an annual lake grade of B with a C and an A received in the other two years. The historical database suggests that the lake is best represented by a lake grade of B.

The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings, were 2.3 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 2.0 for recreational suitability (2- "minor aesthetic problem").

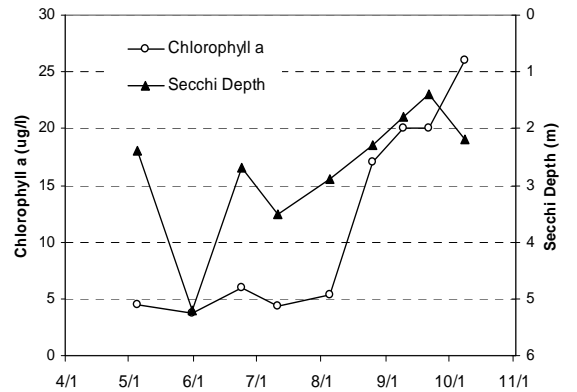
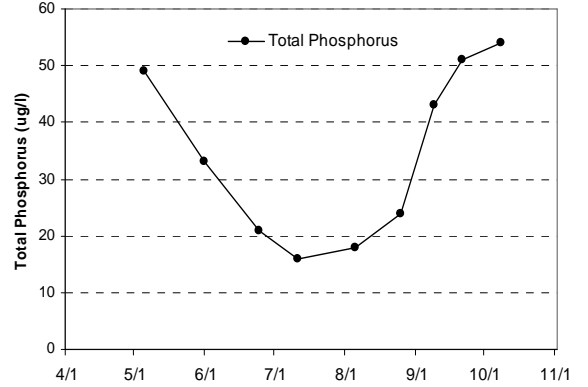
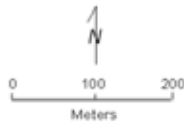
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Cloverdale Lake
Lake Elmo, Washington Co.

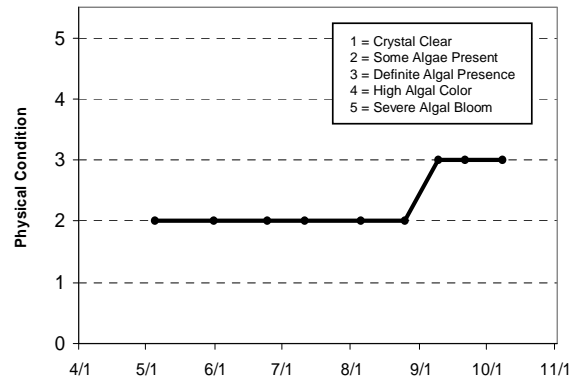
● Sampling site
Contours in meters

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



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/5	12.4				4.5	49		2.4	2	1
5/31	21				3.7	33		5.2	2	1
6/24	26				6	21		2.7	2	2
7/11	23.7				4.3	16		3.5	2	2
8/5	28.6				5.4	18		2.9	2	2
8/25	31.4				17	24		2.3	2	3
9/9	31.4				20	43		1.8	3	2
9/21	27.6				20	51		1.4	3	3
10/8	24.4				26	54		2.2	3	3



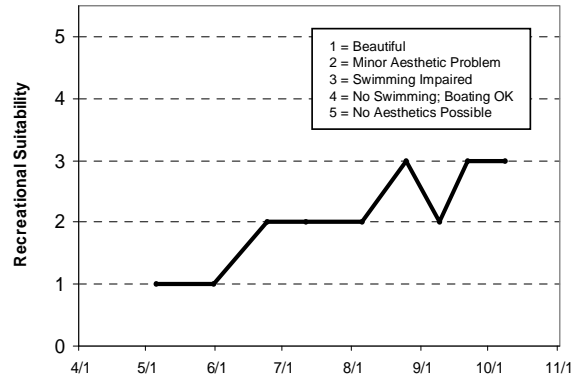
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

The lake was monitored 13 times between late April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

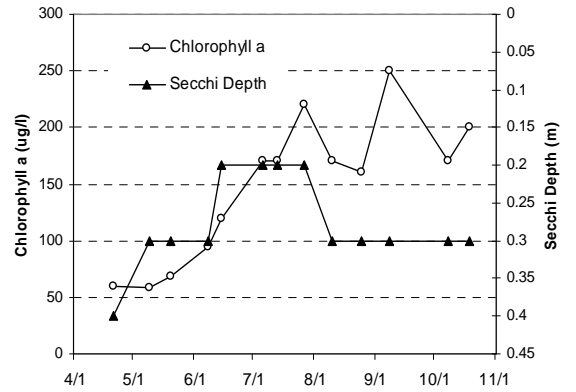
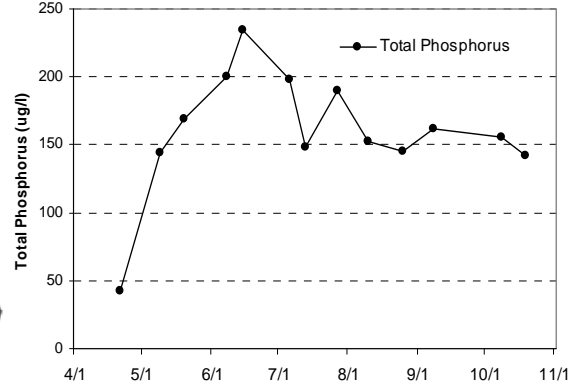
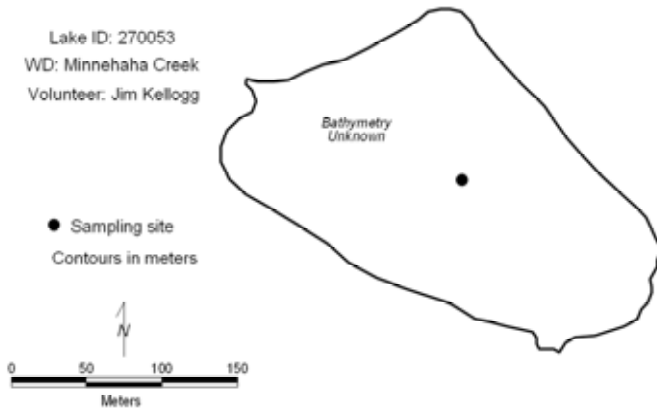
The lake's 2008 lake grade of F is consistent with the lake grades received for 2004-2007 and worse than the C received for 2002. For the past 5 years, the lake appears to be represented well by a lake grade of F.

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

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

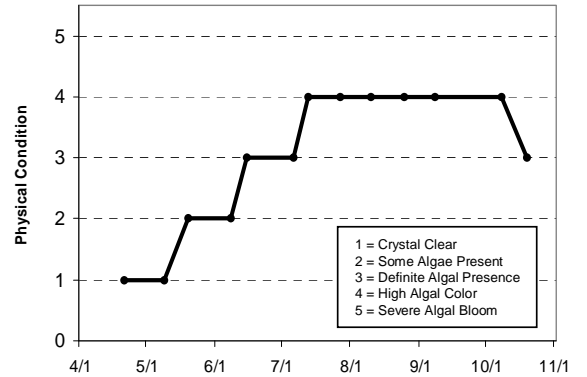
Cobble Crest Lake
St. Louis Park, Hennepin Co.

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



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	15.9				60	43		0.4	1	4
5/9	18.1				58	144		0.3	1	4
5/20	18.1				69	169		0.3	2	4
6/8	22.3				95	200		0.3	2	4
6/15	21.4				120	234		0.2	3	4
7/6	25.7				170	198		0.2	3	4
7/13	26.3				170	148		0.2	4	4
7/27	25.2				220	190		0.2	4	4
8/10	23.5				170	152		0.3	4	4
8/25	24.5				160	145		0.3	4	4
9/8	18.7				250	162		0.3	4	4
10/8	16.5				170	156		0.3	4	4
10/19	14.4				200	142		0.3	3	4



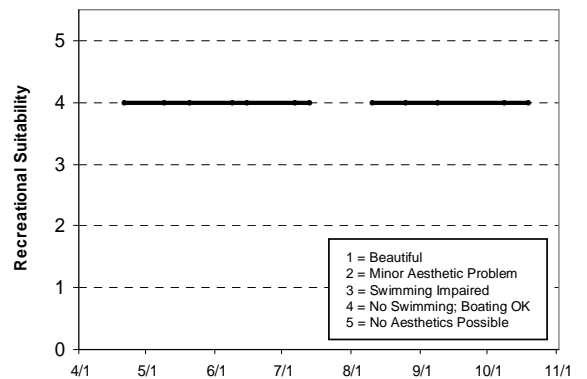
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Cobblestone Lake (19-0456) City of Apple Valley

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

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

The lake was monitored 14 times between mid-April and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

The lake received a lake grade of C for 2008 which is similar to the lake grades received for the previous two years. The water quality in the period from 2006-2008 was notably improved over the water quality conditions observed in 2005. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

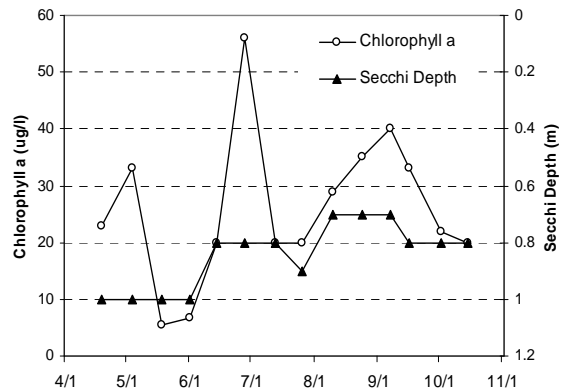
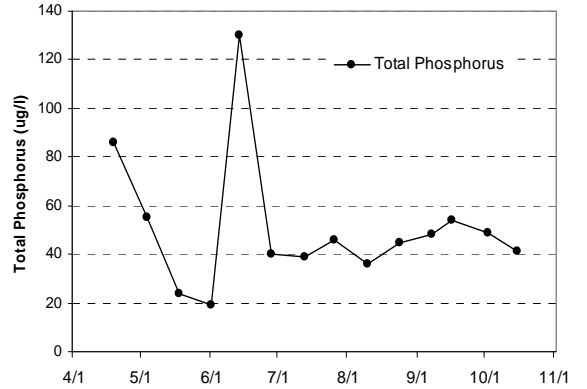
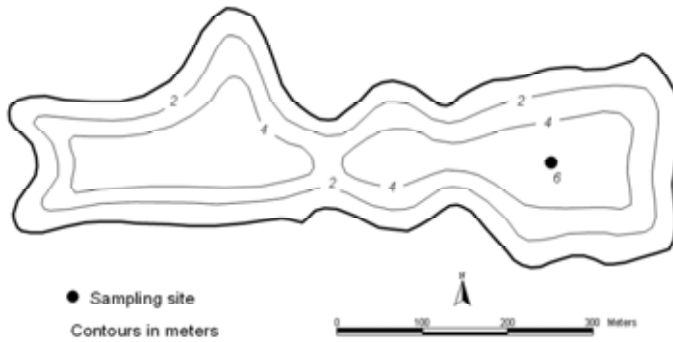
Throughout the monitoring period, the volunteers ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The resulting user perception rankings are shown on the information sheet. The mean physical condition ranking was 2.6 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability ranking was 2.4 (2- "minor aesthetic problem" and 3- "swimming impaired").

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

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

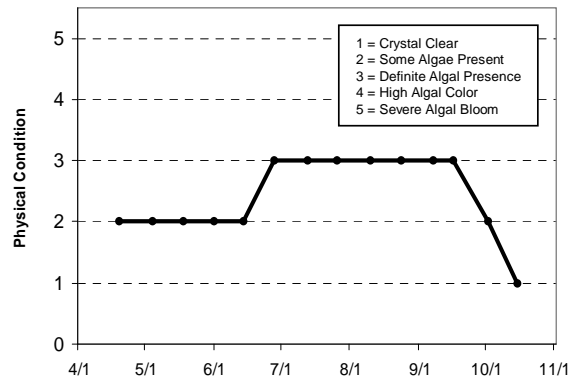
Cobblestone Lake
Apple Valley, Dakota Co.

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



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	6.2				23	86		1	2	2
5/4	12.1				33	55		1	2	2
5/18	15.2				5.6	24		1	2	2
6/1	19.5				6.6	19		1	2	2
6/14	20.6				20	130		0.8	2	2
6/28	21.8				56	40		0.8	3	2
7/13	18.7				20	39		0.8	3	3
7/26	20.3				20	46		0.9	3	3
8/10	19.6				29	36		0.7	3	3
8/24	22.2				35	45		0.7	3	3
9/7	16				40	48		0.7	3	3
9/16	17.9				33	54		0.8	3	3
10/2	14.6				22	49		0.8	2	2
10/15	13.5				20	41		0.8	1	4



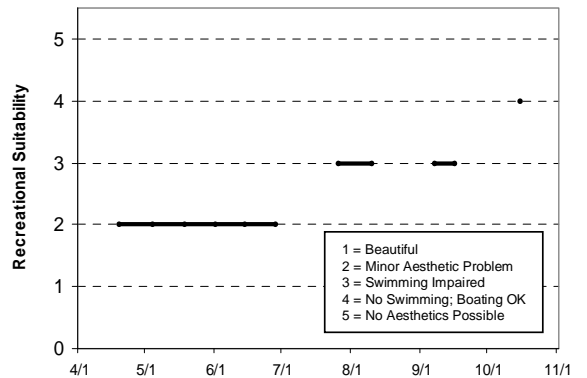
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Colby Lake (82-0094) City of Woodbury

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

The lake was monitored 9 times between late-April and mid September 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

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

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

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

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

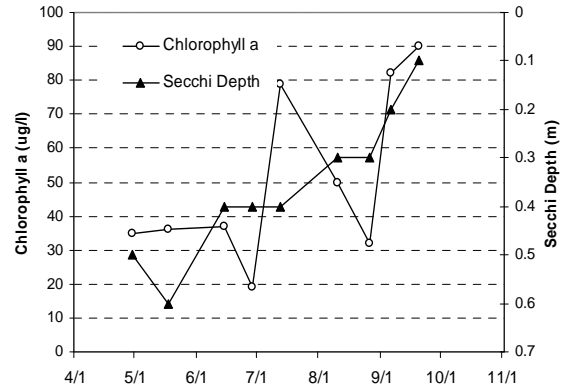
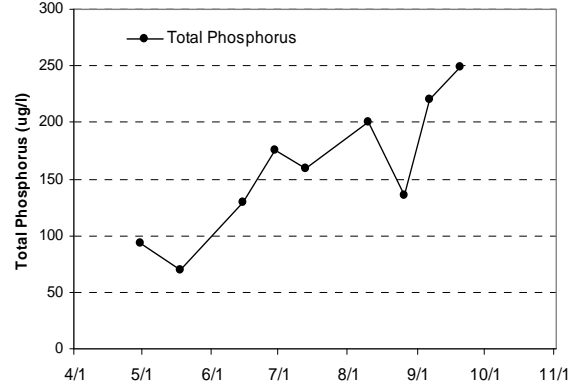
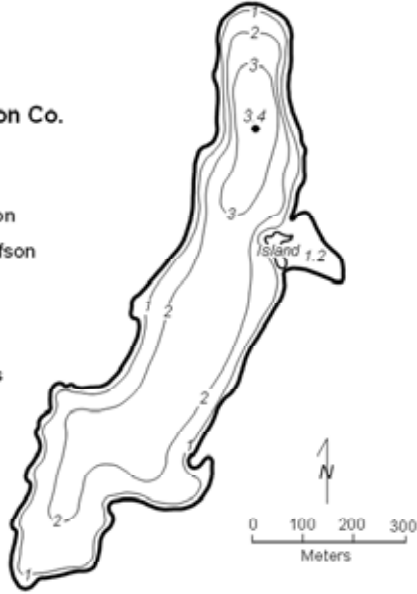
Colby Lake
Woodbury, Washington Co.

Lake ID: 820094

WD: South Washington

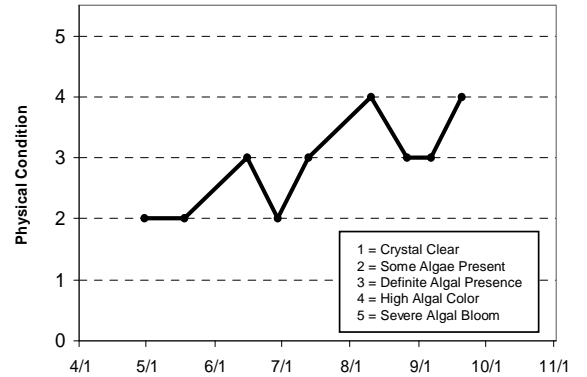
Volunteer: Annie Gustafson

• Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/30	11.9				35	93		0.5	2	4
5/18	16.6				36	70		0.6	2	4
6/15	21.4				37	130		0.4	3	4
6/29	24.8				19	175		0.4	2	4
7/13	24.2				79	159		0.4	3	4
8/10	25.4				50	201		0.3	4	4
8/26	19.7				32	136		0.3	3	4
9/6	19.5				82	220		0.2	3	4
9/20	19.7				90	249		0.1	4	4



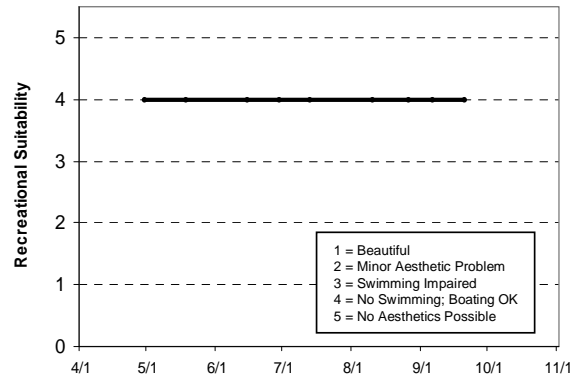
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Lake Cornelia is located in the City of Edina (Hennepin County). The lake has a surface area of approximately 52 acres, and has a maximum depth of 2.0 meters. Given the shallow depth of the lake, the entire lake is considered littoral zone.

The lake was monitored 13 times between late April and early October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

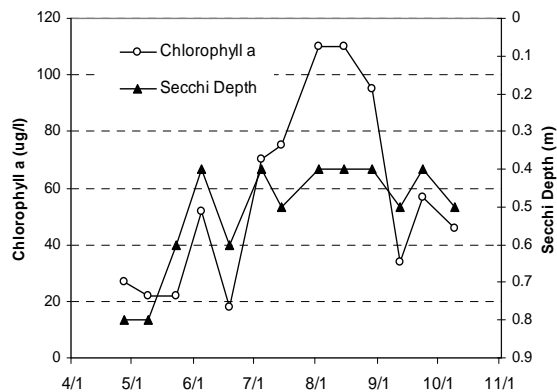
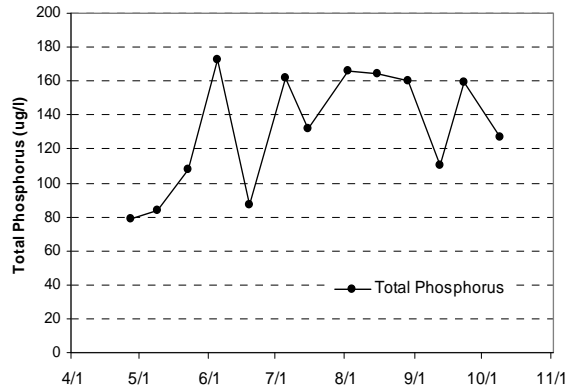
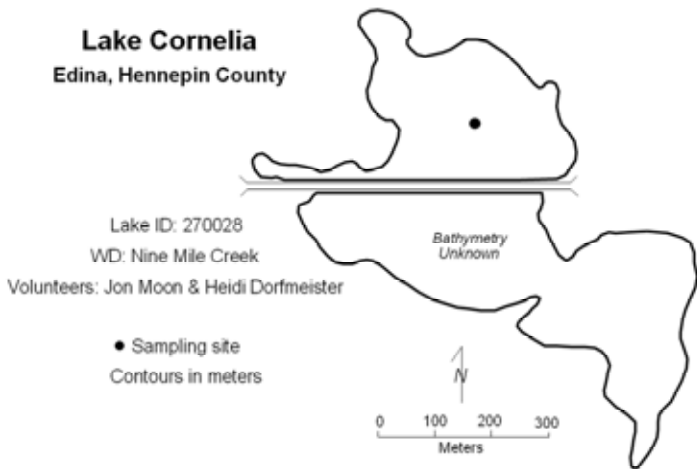
2008 summer (May-September) data summary

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

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

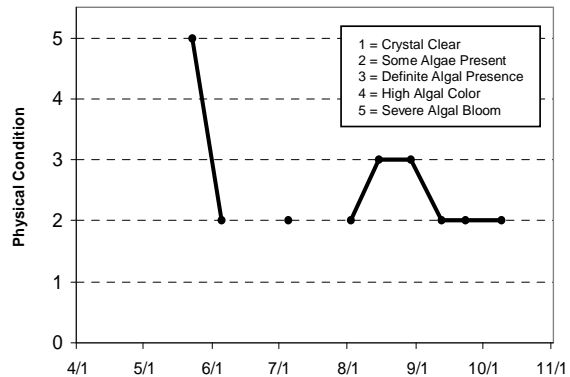
Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 2.6 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 4.1 for recreational suitability (between 4- "no swimming – boating ok" and 5- "no aesthetics possible").

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



2008 Data

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



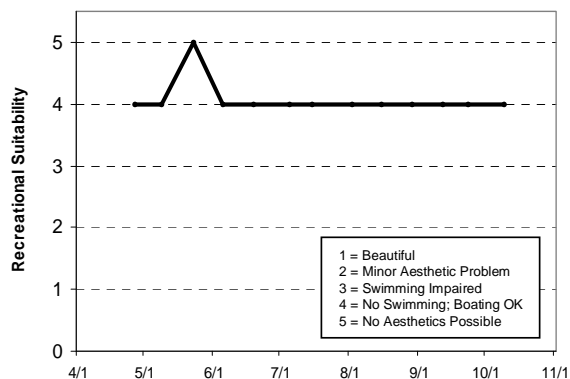
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Courthouse Lake (10-0005) Carver County Environmental Services

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

The only data available for Courthouse Lake are a result of CAMP monitoring from 1996-2008. Courthouse Lake was monitored 14 times between mid-April and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	19.5	11.0	45.0	A
CLA ($\mu\text{g/l}$)	4.1	1.2	12.0	A
Secchi (m)	3.9	1.2	5.1	A
TKN (mg/l)	0.95	0.55	2.00	
			Lake Grade	A

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

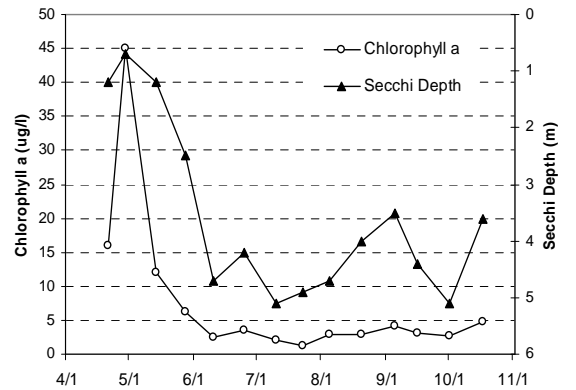
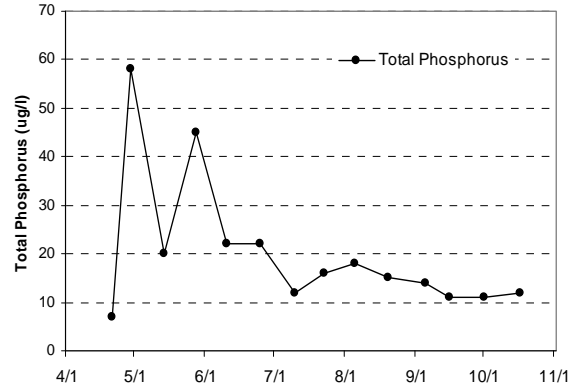
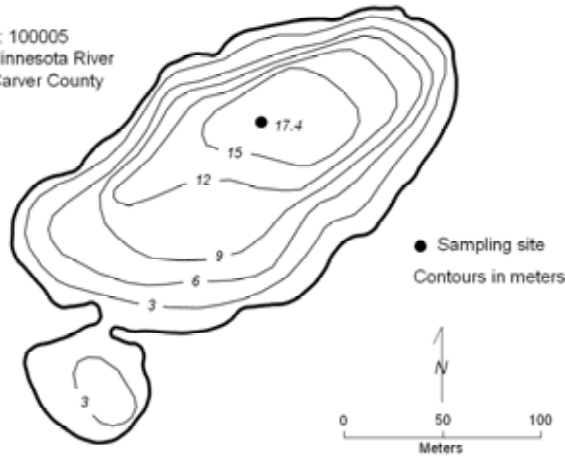
The average user perception rankings, on a 1-to-5 scale, were 1.7 for physical condition (between 1- "crystal clear" and 2- "some algae present"), and 1.8 for recreational suitability (between 1- "beautiful" and 2- "minor aesthetic problem").

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

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

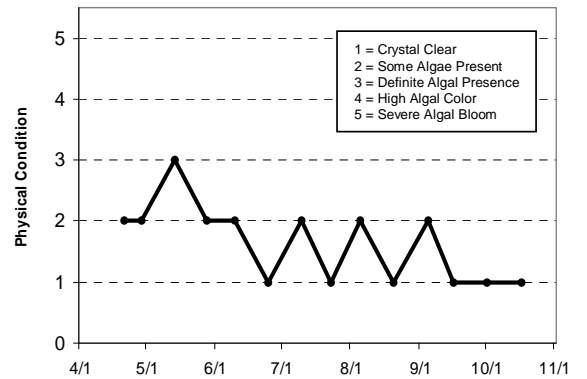
Courthouse Lake
Chaska, Carver Co.

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



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	12.72		13.96		16	7		1.2	2	2
4/29	8.73		12.72		45	58		0.7	2	4
5/14	14.46		14.25		12	20		1.2	3	4
5/28	17.85		9.28		6.3	45		2.5	2	2
6/10	20.51		7.94		2.5	22		4.7	2	2
6/25	25.13		9.52		3.5	22		4.2	1	2
7/10	25.61		8.28		2	12		5.1	2	1
7/23	26.64		6.64		1.2	16		4.9	1	1
8/5	26.45		6.95		3	18		4.7	2	2
8/20	26.38		7.59		3	15		4	1	1
9/5	22.79		9.06		4.1	14		3.5	2	2
9/16	19.54		7.14		3.1	11		4.4	1	1
10/1	19		7.55		2.8	11		5.1	1	1
10/17	14.93		7.6		4.7	12		3.6	1	1



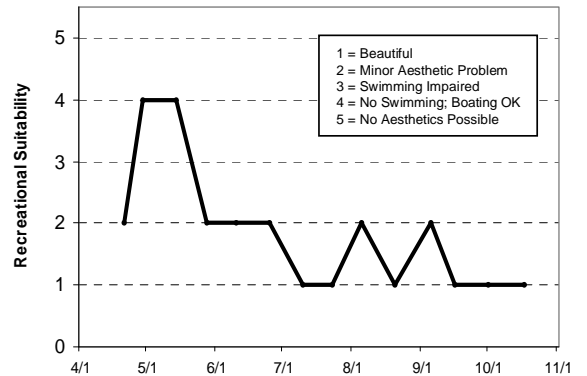
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Crystal Lake located mainly in the City of Burnsville (Dakota County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value. The lake has a surface area of 292 acres, with 5.3 miles of shoreline. The maximum and mean depths of the lake are 11.3 m (37 feet) and 3.1 m (10 feet), respectively. The lake's surface area and mean depth translate to an approximate lake volume of 2,920 acre-feet. The lake's watershed covers approximately 2,001 acres of which roughly two-thirds is urban/developed. The watershed and lake surface areas translate to a moderate watershed-to-lake size ratio of 7:1 (the smaller the ratio the less stress on the lake from surface runoff).

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

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

The lake was monitored 14 times between mid-April and mid-October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

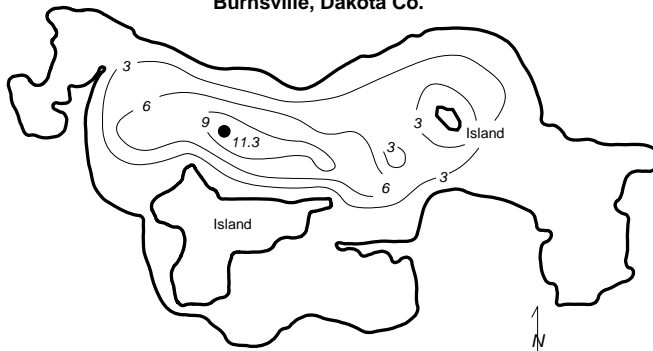
The lake received a lake grade of C for 2008. This lake grade is similar to those recorded from 1994-2000, and 2002-2007, and worse than the B's recorded in 1983, 1989, and 2001. The lake's water quality seems well represented by a lake grade of C with the occasional B. A trend analysis conducted by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

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

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

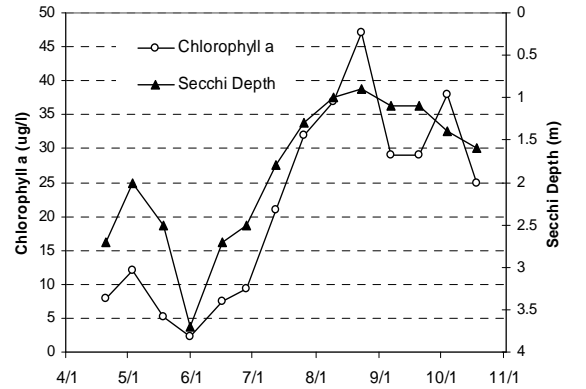
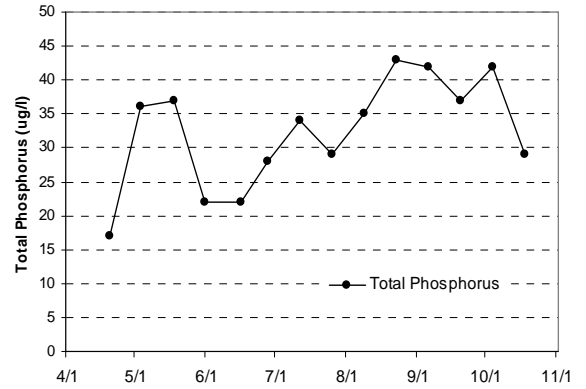
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

**Crystal Lake,
Burnsville, Dakota Co.**



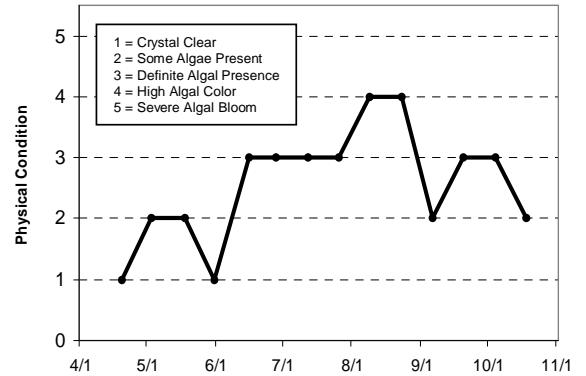
● Sampling site
Contours in meters

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



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/20	5.9				7.9	17		2.7	1	1
5/3	10				12	36		2	2	2
5/18	16.2				5.1	37		2.5	2	2
5/31	18				2.3	22		3.7	1	1
6/16	21				7.4	22		2.7	3	2
6/28	23.8				9.4	28		2.5	3	2
7/12	24.9				21	34		1.8	3	2
7/26	26.1				32	29		1.3	3	2
8/9	26.6				37	35		1	4	3
8/23	24				47	43		0.9	4	3
9/6	21.4				29	42		1.1	2	2
9/20	21				29	37		1.1	3	2
10/4	16.8				38	42		1.4	3	2
10/18	13.3				25	29		1.6	2	1



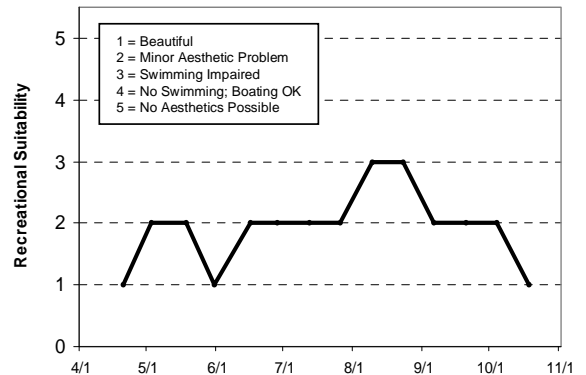
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2008 summer (May-September) data summary

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

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

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

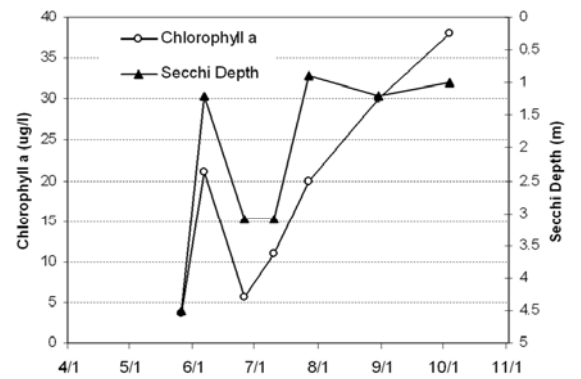
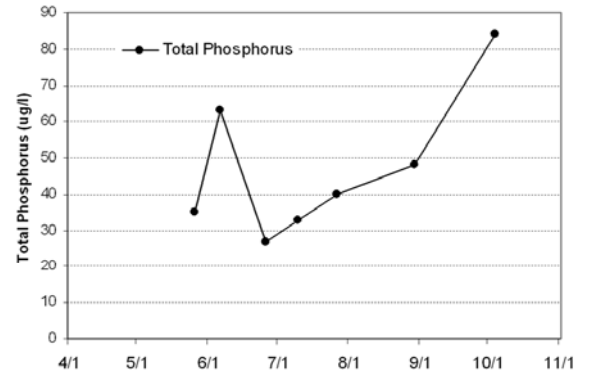
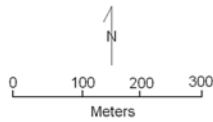
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Crystal Lake
Robbinsdale, Hennepin Co.

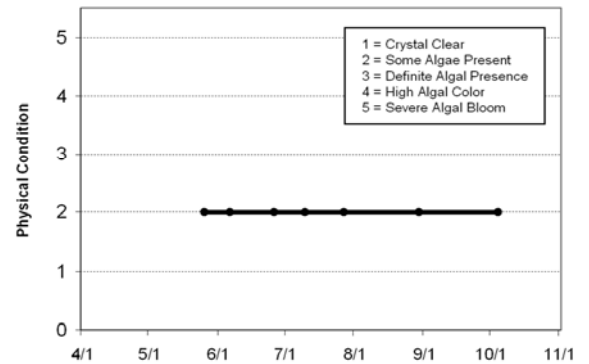
Lake ID: 270034
WMO: Shingle Creek
Volunteers: Wayne, Luke and Leif Sicora

● Sampling site
Contours in meters



2008 Data

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



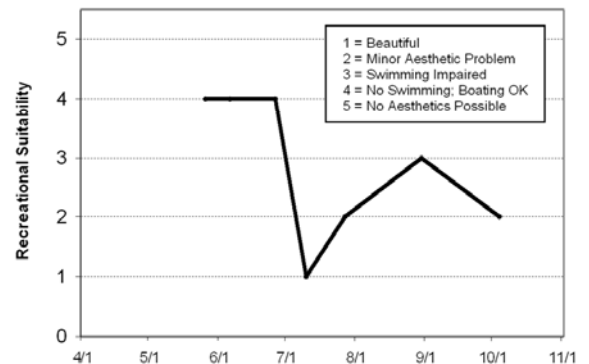
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Dean Lake (70-0074) City of Shakopee

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

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

2008 summer (May-September) data summary

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

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

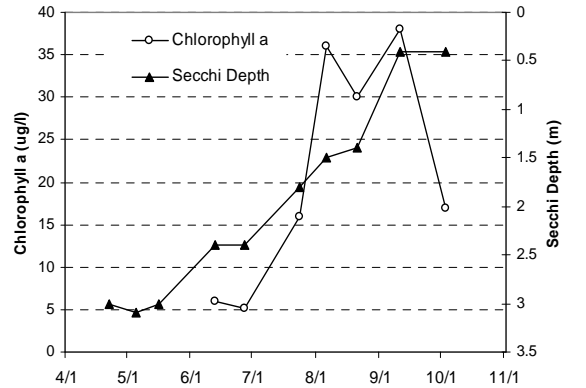
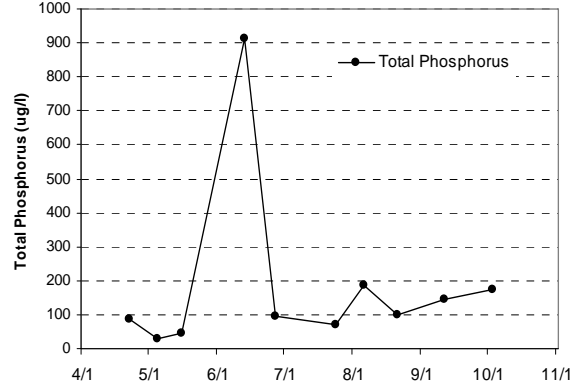
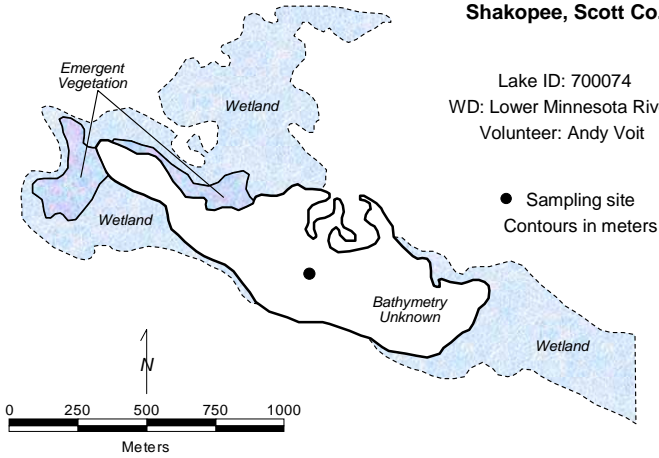
But the 2008 summer-time mean TP concentration remained high relative to CLA and water clarity. The summer-time mean TP concentration of 198.5 mg/L was heavily influenced by a single TP concentration of 914 mg/L observed on June 13. This spike of TP occurred immediately after a rain event. The spike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

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

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

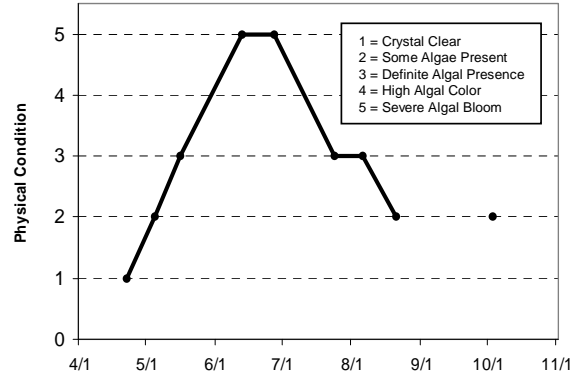
Dean Lake, Shakopee, Scott Co.

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



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	15.3					89		3	1	1
5/5	14.5					29		3.1	2	1
5/16	20.4					47		3	3	1
6/13	20				6	914		2.4	5	4
6/27	26.6				5.2	97		2.4	5	4
7/24	27				16	69		1.8	3	4
8/6	28				36	185		1.5	3	2
8/21	25.7				30	101		1.4	2	2
9/11	19.7				38	146		0.4	2	2
10/3	17.6				17	174		0.4	2	1



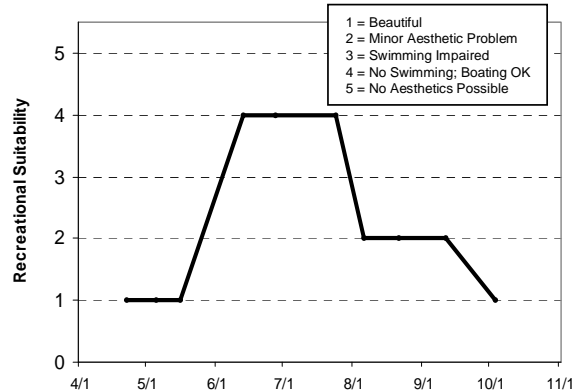
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



DeMontreville Lake (82-0101) Valley Branch Watershed District

Primary Report

Lake DeMontreville is located in Lake Elmo (Washington County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value and exceptional water clarity. The 160-acre lake has a mean and maximum depth of 2.4 m (~8 feet) and 7.3 m (24 feet). Roughly 90 percent of the lake's area is considered littoral zone (the 0-15 foot depth area of aquatic vegetation dominance). The lake's size and mean depth results in an approximate lake volume of 1,280 ac-ft. The lake's surface area and watershed size (1,108 acres) translates to a 7:1 watershed-to-lake size ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

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

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

The lake was monitored 13 times between early May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

The lake received a lake grade of A for 2008. Historically, with the exception of the year 2007, the lake grades for the years 1980 through 2008 show that the quality of the lake has improved over the past 25 years (see lake information sheet on the following page). A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

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

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

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

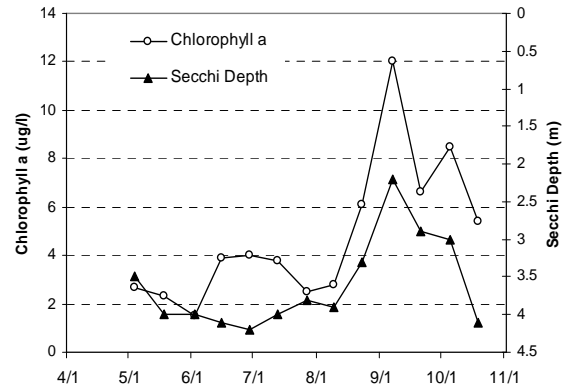
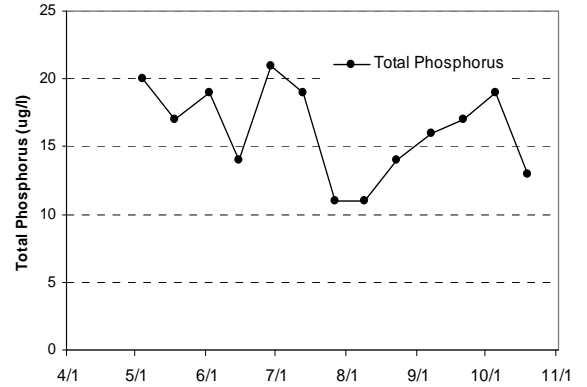
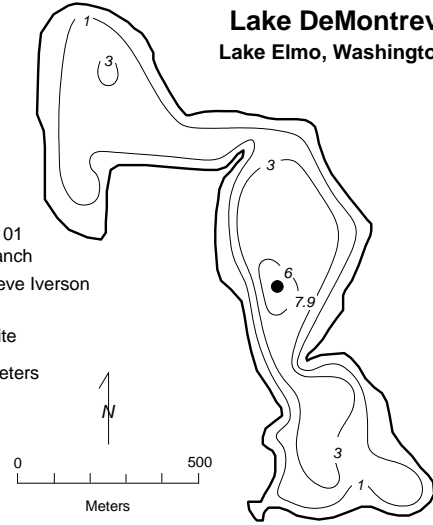
Lake DeMontreville Lake Elmo, Washington Co.

Primary Report

Lake ID: 820101
WD: Valley Branch
Primary Volunteer: Steve Iverson

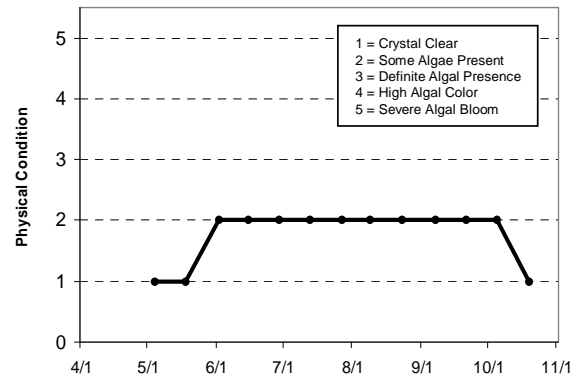
● Sampling site

Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/4	11.2				2.7	20		3.5	1	1
5/18	16.3				2.3	17		4	1	1
6/2	19.8				1.5	19		4	2	1
6/15	21.4				3.9	14		4.1	2	1
6/29	23.8				4	21		4.2	2	1
7/13	24.1				3.8	19		4	2	1
7/27	26.4				2.5	11		3.8	2	1
8/9	26.9				2.8	11		3.9	2	1
8/23	25.1				6.1	14		3.3	2	1
9/7	21.2				12	16		2.2	2	1
9/21	21				6.6	17		2.9	2	1
10/5	16.1				8.5	19		3	2	1
10/19	13.3				5.4	13		4.1	1	1



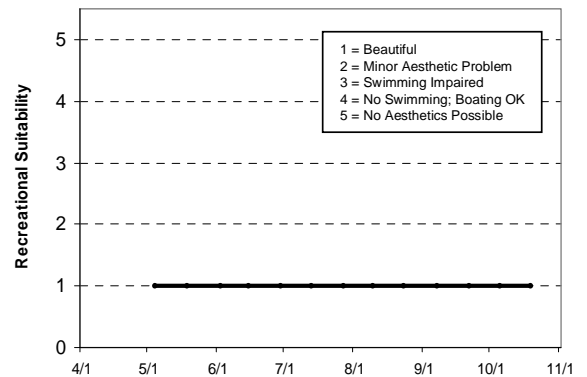
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



DeMontreville Lake (82-0101) Washington Conservation District

Secondary Report

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

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

2008 summer (May-September) data summary

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

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

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

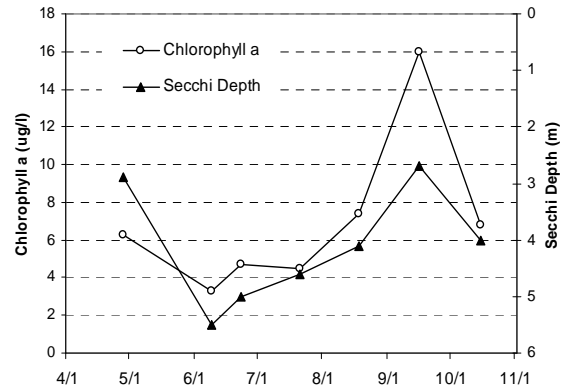
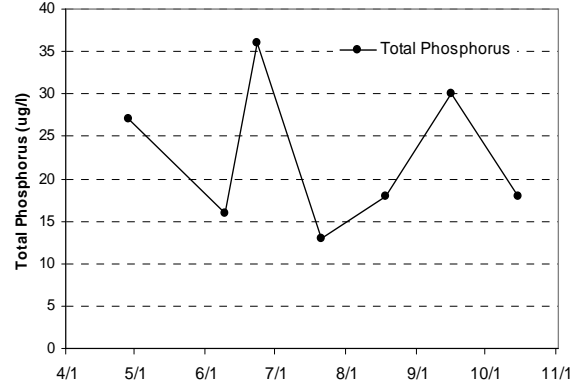
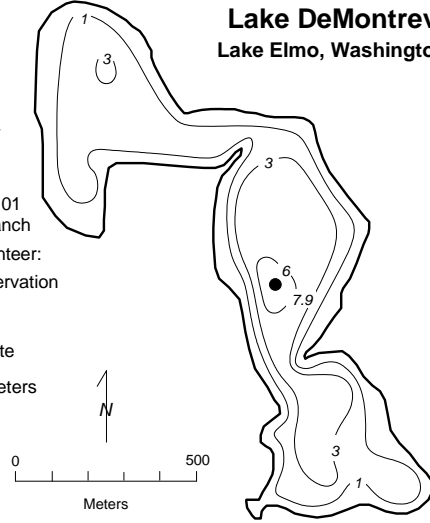
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lake DeMontreville
Lake Elmo, Washington Co.

Secondary Report

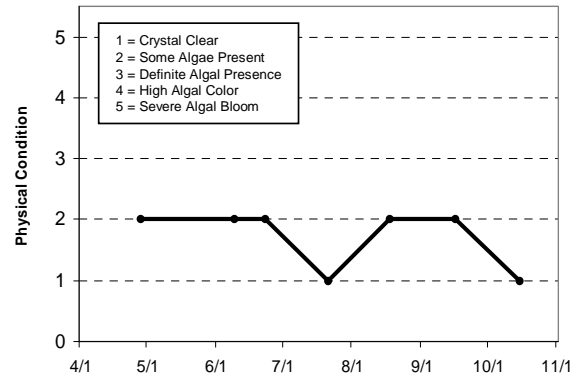
Lake ID: 820101
WD: Valley Branch
Secondary Volunteer:
Washington Conservation
District

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	7.3	7.3	11.39	11.41	6.3	27		2.9	2	1
6/9	20.2	11	8.08	0.22	3.3	16	50	5.5	2	2
6/23	23.2	11.9	8.46	0.63	4.7	36	52	5	2	2
7/21	25.5	13.2	6.86	0.32	4.5	13	242	4.6	1	1
8/18	25.2	13.9	7.43	0.31	7.4	18	168	4.1	2	2
9/16	18.9	18.2	8.21	0.28	16	30	18	2.7	2	3
10/15	14.6	14.6	8.08	0.31	6.8	18	16	4	1	1



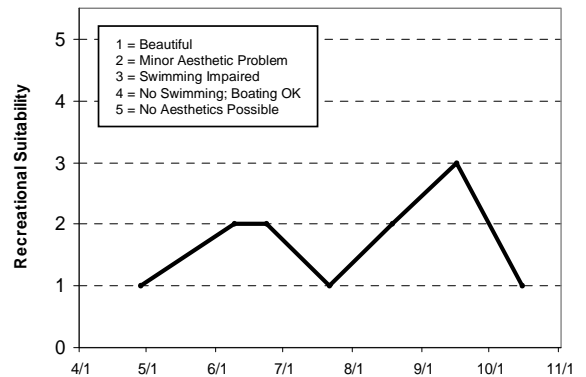
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Downs Lake (82-0110) Valley Branch Watershed District

Downs Lake is located in Lake Elmo (Washington County). The mean and maximum depths of the 35-acre lake are 1.5 m (5 feet) and 2.1 m (7 feet), respectively. The lake's size and mean depth results in an approximate lake volume of 175 ac-ft. Because of the shallowness of the lake, the entire lake is considered littoral zone (area of aquatic plant dominance) and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column). The lake's 2,400-acre watershed translates to a large watershed-to-lake size ratio of 69:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 2 times in May 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

There were fewer than 5 monitoring events during the summer period, so there were insufficient data to calculate letter grades. Furthermore, there were insufficient data to make comparisons of 2008 data to previous monitoring years.

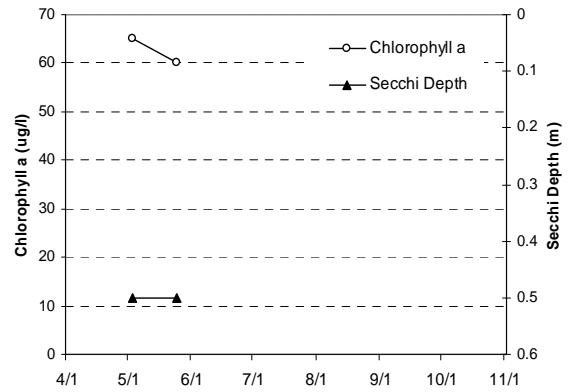
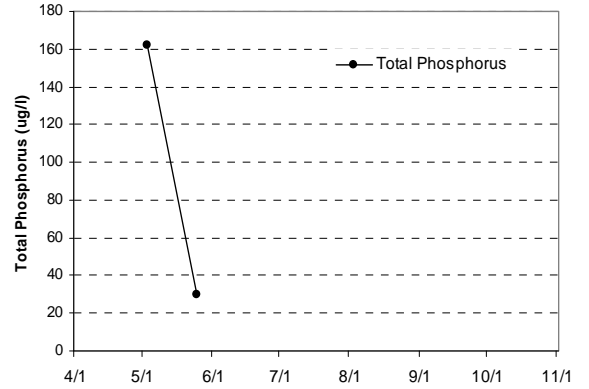
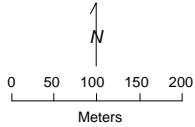
The volunteer(s) opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The average user perception rankings were 2.0 for physical condition (2- "some algae present"), and 4.0 for recreational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

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

Downs Lake
Lake Elmo, Washington Co.

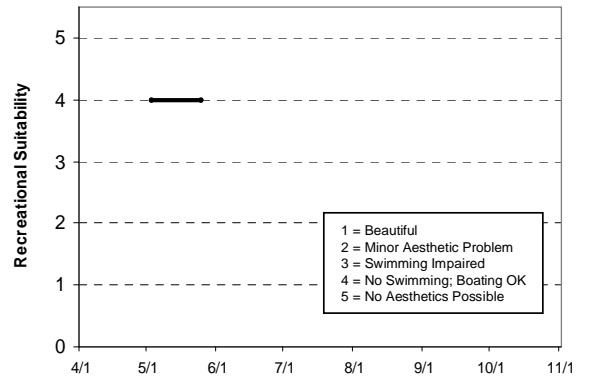
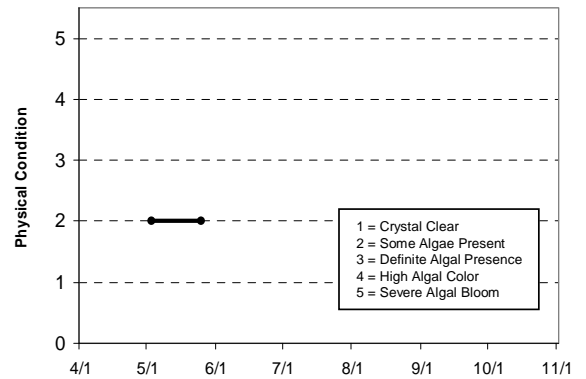
Lake ID: 820110
WD: Valley Branch
Volunteers: Wesley Sly Family

● Sampling site
Contours in meters



2008 Data

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



Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data

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

Eagle Lake is located in Young America Township in Carver County. The lake is considered a Priority Lake by the Metropolitan Council for its high regional recreation value. The lake has a surface area of 233-acres and a maximum and mean depth of 7.9 m (26 feet) and 1.2 m (4 feet), respectively. Because of the shallowness of the lake, the entire area is considered littoral, (the shallow [0-15 foot depth] area dominated by aquatic vegetation) and does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake’s water column). The DNR has designated the lake as being infested with Eurasian Water Milfoil (*Myriophyllum spicatum*).

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

This was the tenth year that Eagle Lake has been involved in CAMP, although it has been previously monitored by Council staff (as recently as 2004). The lake was monitored 13 times between early May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

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

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

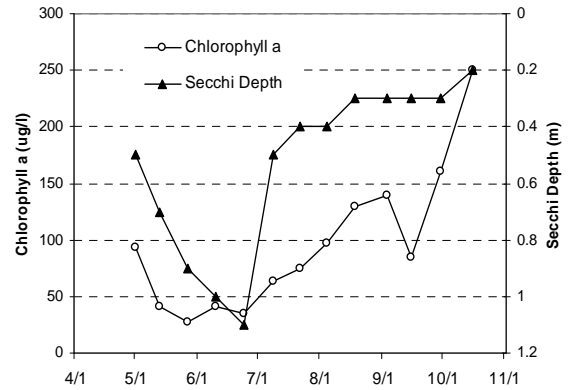
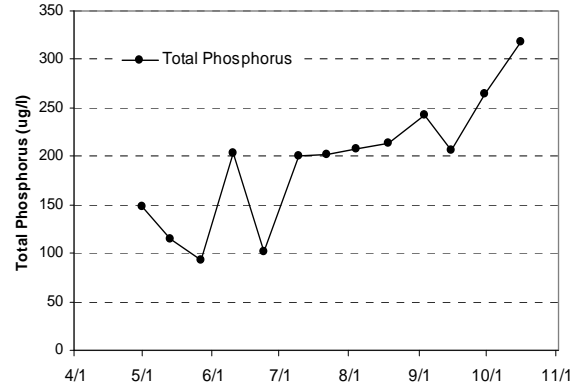
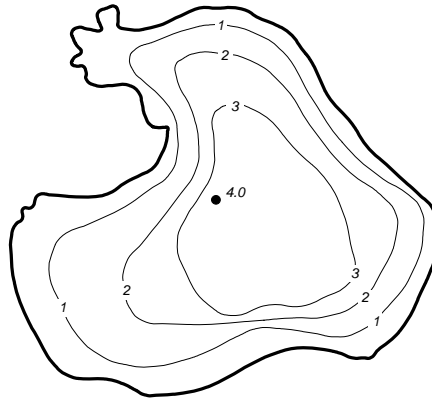
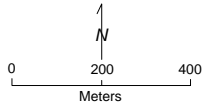
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

**Eagle Lake,
Camden Twp. Carver Co.**

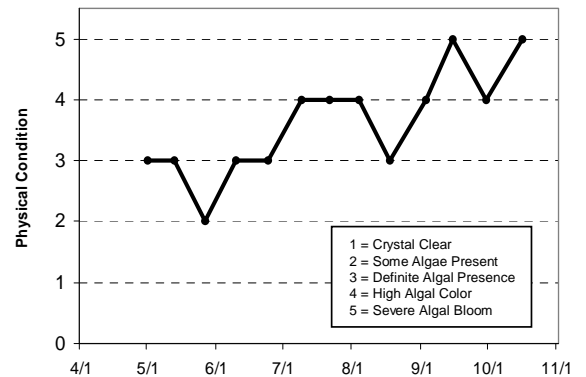
Lake ID: 100121
WMO: Carver County
Volunteer: Carver County

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/1	9.15		16.12		93	148		0.5	3	4
5/13	13.38		13.29		41	115		0.7	3	4
5/27	16.76		8.01		27	93		0.9	2	2
6/10	19.25		7.77		41	203		1	3	3
6/24	23.35		15.92		35	101		1.1	3	4
7/9	25.17		9.39		64	200		0.5	4	4
7/22	26.64		10.89		75	202		0.4	4	4
8/4	25.36		4.98		97	207		0.4	4	5
8/18	25.72		13.1		130	213		0.3	3	3
9/3	21.64		7.34		140	242		0.3	4	4
9/15	17.33		7.1		85	206		0.3	5	4
9/30	17.35		6.54		160	264		0.3	4	4
10/16	13.88		9.96		250	318		0.2	5	5



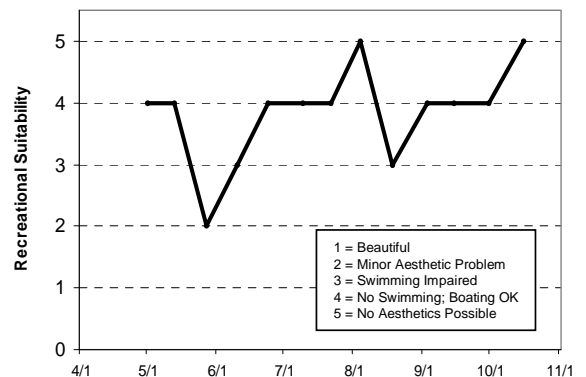
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Eagle Point Lake is located within the City of Lake Elmo (Washington County). It has a surface area of approximately 120-acres. The mean and maximum depths of the lake are 0.9 m (3 feet) and 1.8 m (roughly 6 feet), respectively. The lake's size and mean depth gives an approximate lake volume of 360 ac-ft. Because of the shallowness of the lake, the entire lake is considered littoral zone (area of aquatic plant dominance) and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column).

The lake's 11,502-acre watershed translates to a large watershed-to-lake size ratio of 96:1, which is a large ratio. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 2 times in 2007, once in June and once in August 2008. Low lake water levels prevented access to open water for most of the year because of drought conditions. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

There were fewer than 5 monitoring events during the summer period, so there were insufficient data to calculate letter grades. Furthermore, there were insufficient data to make comparisons of 2008 data to previous monitoring years. There are insufficient data to determine trends in the lake's water quality. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

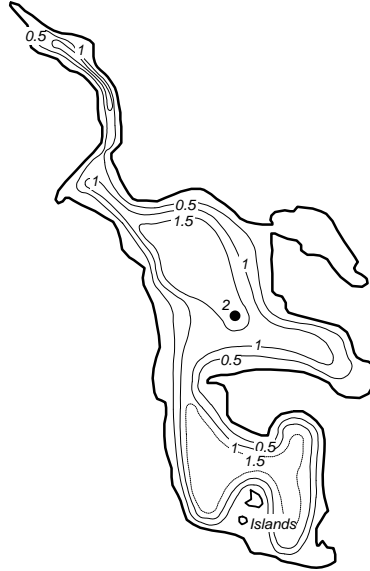
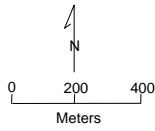
The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings, were 3.0 for physical condition (3- "definite algae present"), and 4.0 for recreational suitability (4- "no swimming – boating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

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

Eagle Point Lake
Lake Elmo, Washington Co.

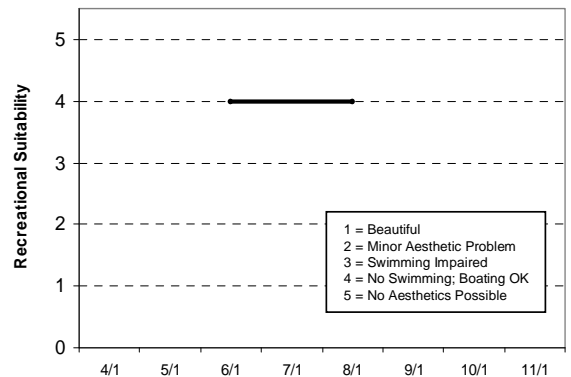
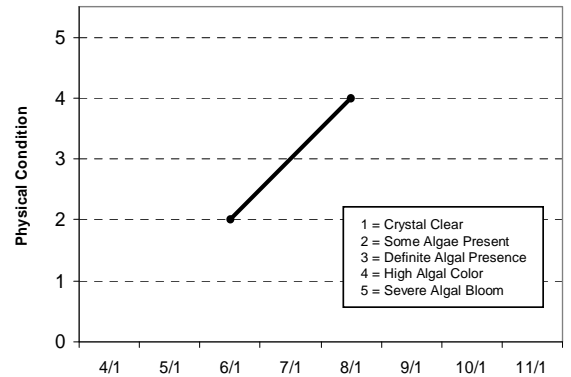
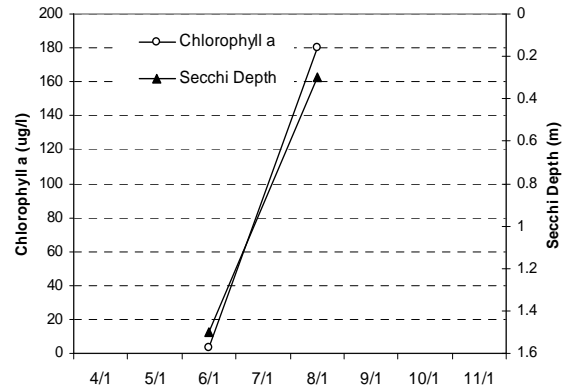
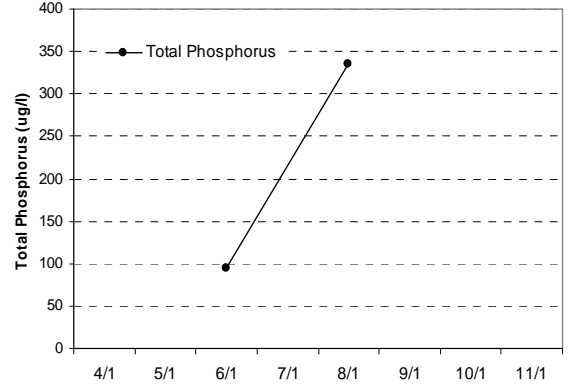
Lake ID: 820109
WD: Valley Branch
Volunteer: Bob Schumacher

● Sampling station
Contours in meters



2008 Data

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



Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data

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

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

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

Earley Lake has been enrolled in CAMP since 1994. The lake was monitored 9 times between early May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

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

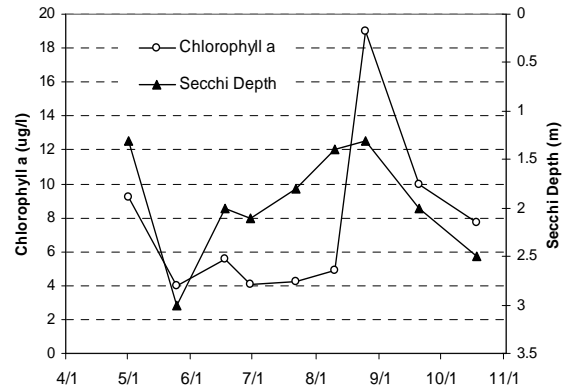
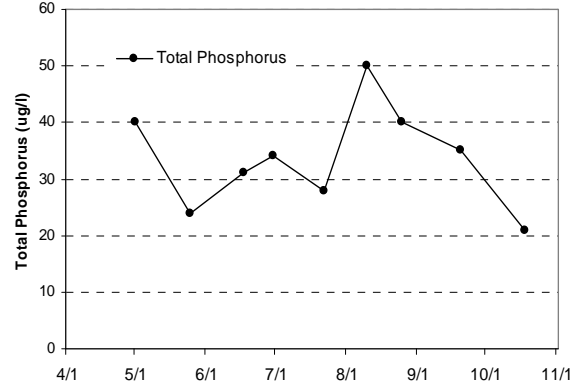
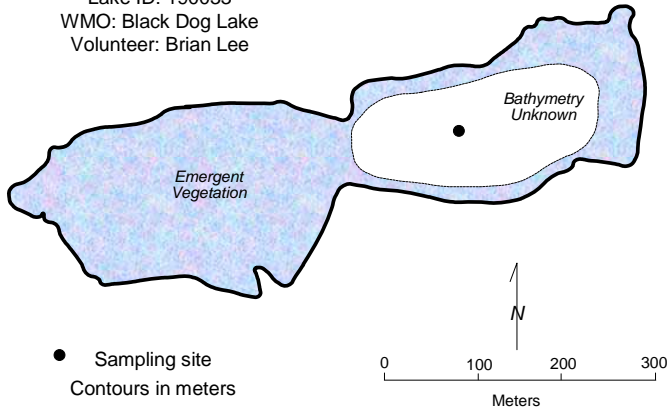
Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. The mean physical condition ranking was 3.3 (between 3- "definite algae present" and 4- "high algal color"), while the mean recreational suitability ranking was 4.1 (between 4- "no swimming – boating ok" and 5- "no aesthetics possible").

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

Earley Lake

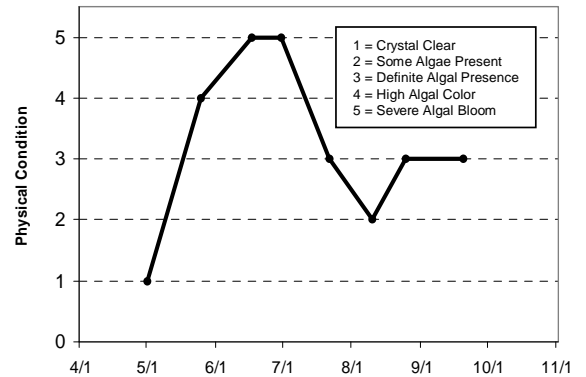
Burnsville, Dakota Co.

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



2008 Data

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



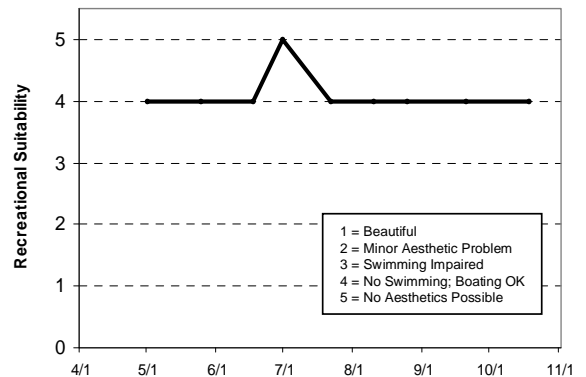
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



East Lake (19-0349) City of Lakeville

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

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

The lake was monitored 14 times between mid-April and late October 2007. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

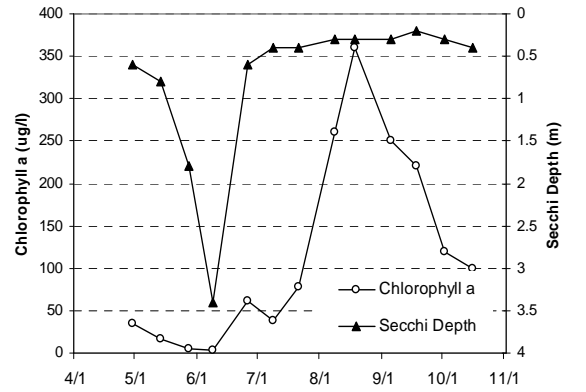
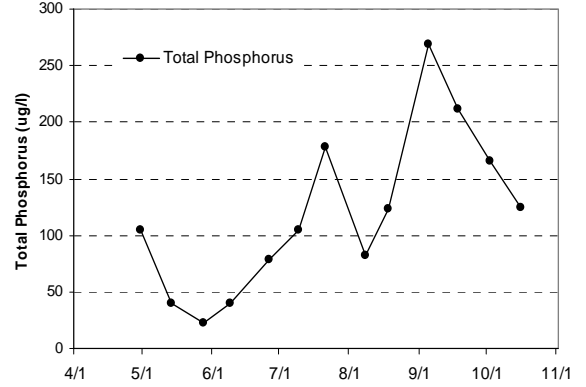
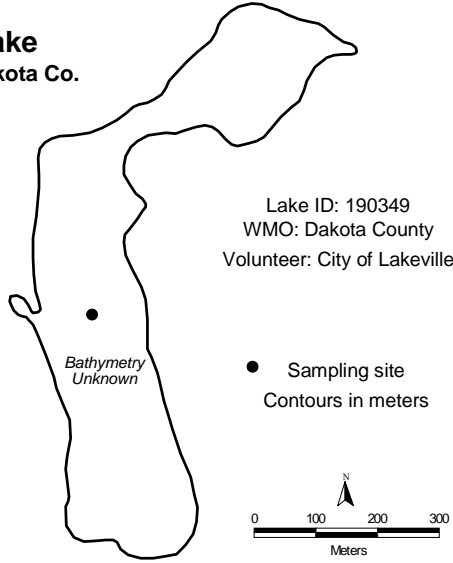
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	114.9	23.0	269.0	D
CLA (µg/l)	129.2	4.0	360.0	F
Secchi (m)	0.9	0.2	3.4	D
TKN (mg/l)	3.10	1.10	7.60	
			Lake Grade	D

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

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

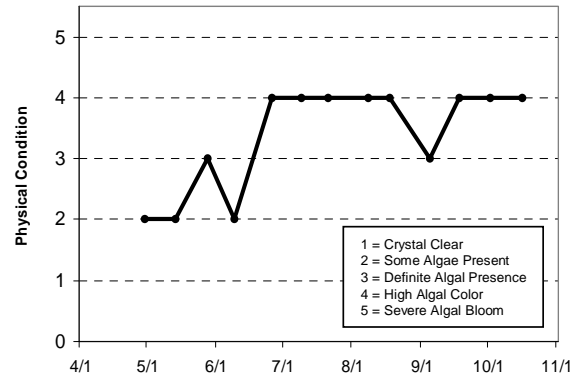
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

East Lake
Lakeville, Dakota Co.



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/30	11.7				35	105		0.6	2	2
5/14	16.1				16	40		0.8	2	4
5/28	18.3				5	23		1.8	3	4
6/9	20.6				4	40		3.4	2	4
6/26	26.1				61	78		0.6	4	4
7/9	26.1				38	104		0.4	4	4
7/21	28.3				78	178		0.4	4	4
8/8	26.7				260	82		0.3	4	4
8/18	26.6				360	123		0.3	4	4
9/5	69				250	269		0.3	3	4
9/18	19				220	212		0.2	4	4
10/2	14				120	165		0.3	4	4
10/16	11				99	124		0.4	4	4



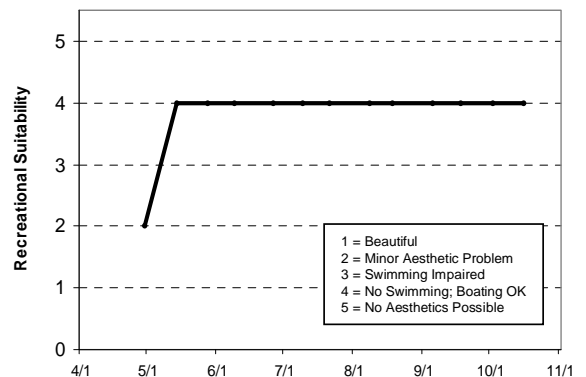
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

East Boot Lake is located in May Township (Washington County). The mean and maximum depths of the 47-acre lake are 8.2 m (27 feet) and 0.9 m (3 feet), respectively. The lake's size and mean depth results in an approximate lake volume of 282 ac-ft. Because of the overall shallowness of the lake, roughly 82 percent of the lake's surface area is considered littoral zone (area of aquatic plant dominance), the majority of the lake does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake's water column). The lake's small 93-acre immediate watershed translates to a small watershed-to-lake size ratio of 2:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

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

2008 summer (May-September) data summary

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

The lake received a lake grade of B for 2008. The lake grade and grades received for the individual water quality parameters were typical of those received since 2004. The lake continues to achieve better water quality than it used to receive in the period from the mid 1990s and early 2000s. Additional monitoring is suggested to help determine if the lake continues to improve.

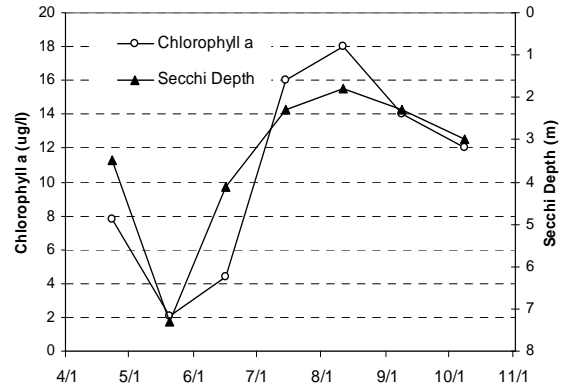
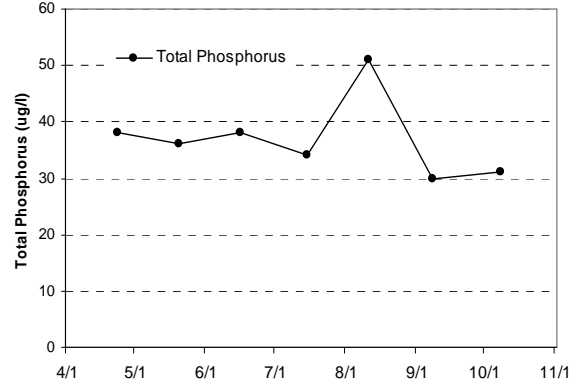
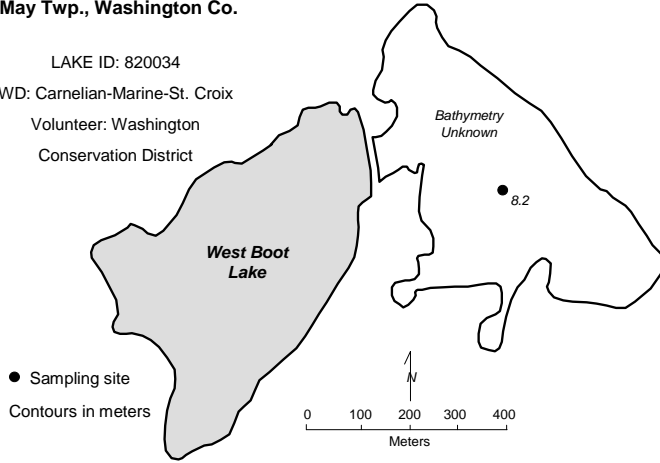
The last two graphs show seasonal variation in the lake's perceived physical condition and recreational suitability. The average user perception rankings, on a 1-to-5 scale, were 2.6 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 3.2 for recreational suitability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

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

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

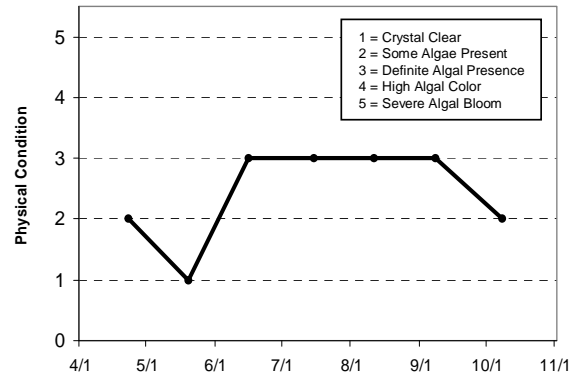
East Boot Lake
May Twp., Washington Co.

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



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/23	9	5.1	12	1.06	7.8	38		3.5	2	2
5/20	15.4	6.3	9.31	0.24	2.1	36	467	7.3	1	1
6/16	20.9	7.1	8.57	0.26	4.4	38	552	4.1	3	4
7/15	24.3	7.6	7.67	0.56	16	34	1000	2.3	3	3
8/11	24.9	9.9	6.85	0.36	18	51	1400	1.8	3	4
9/8	20	8.2	6.06	0.28	14	30	1910	2.3	3	4
10/8	15.1	8.3	6.77	0.32	12	31	1910	3	2	2



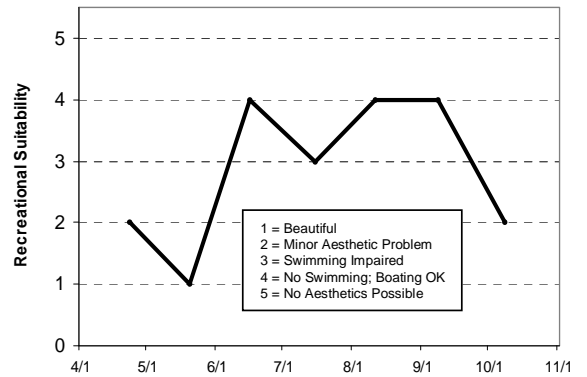
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Echo Lake (82-0135) Valley Branch Watershed District

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

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

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

The lake was monitored 8 times between early-May and late-October 2007. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

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

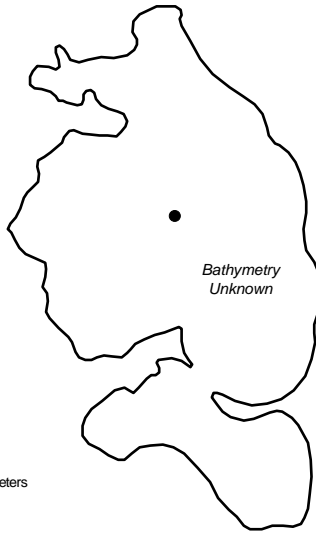
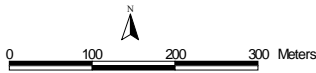
The perceived physical and recreational conditions (ranked on a 1-to-5 scale) are shown on the lake's information sheet on the next page. The average user perception rankings, were 3.0 for physical condition (3- "definite algae present"), and 4.0 for recreational suitability (4- "no swimming – boating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

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

Echo Lake
Mahtomedi, Washington Co.

LAKE ID: 820135
WD: Valley Branch
Volunteer: Jim Serley

● Sampling site
Contours in meters



2008 Data

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

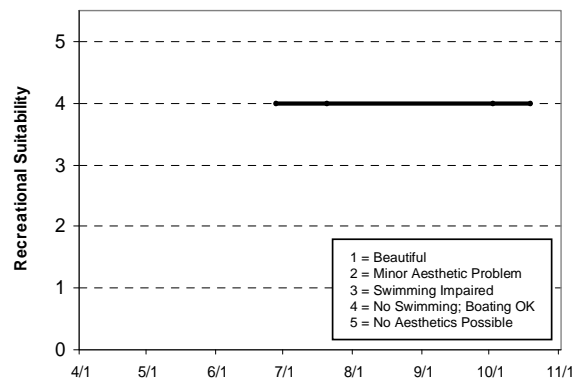
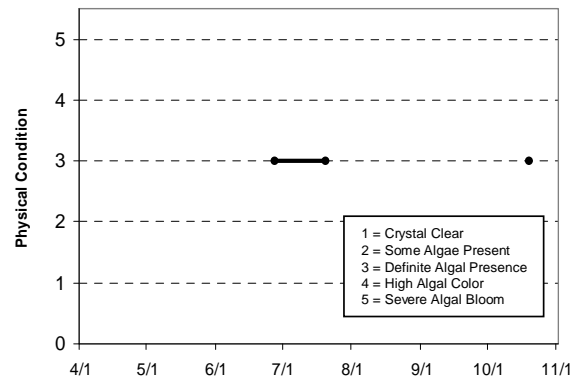
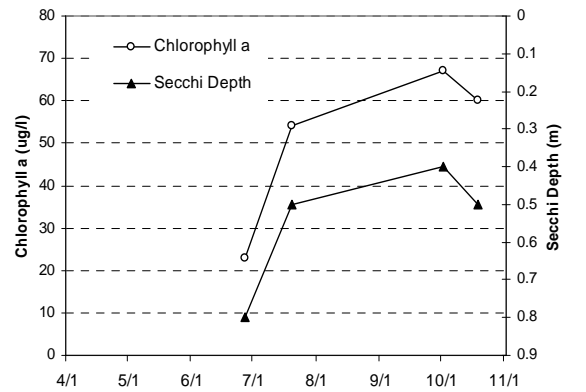
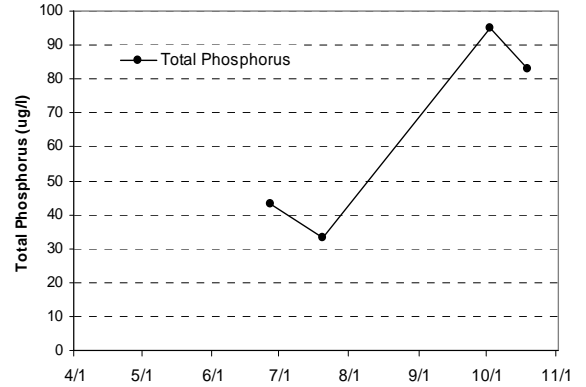
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Edith Lake (82-0004) Valley Branch Watershed District

Primary Report

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

A search through the STORET nationwide water quality database for historic data on the lake revealed only the CAMP data. Therefore, 2005 – 2008 are the only known years where data are available. The lake was monitored 10 times between early May and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

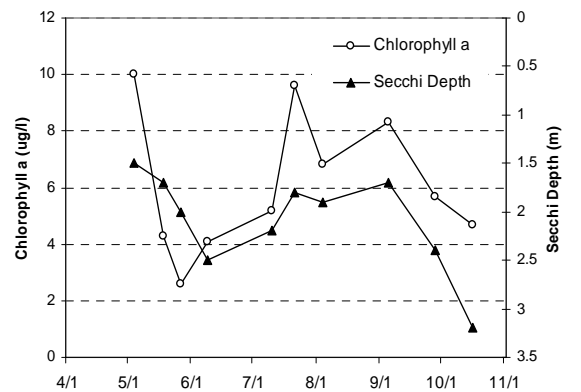
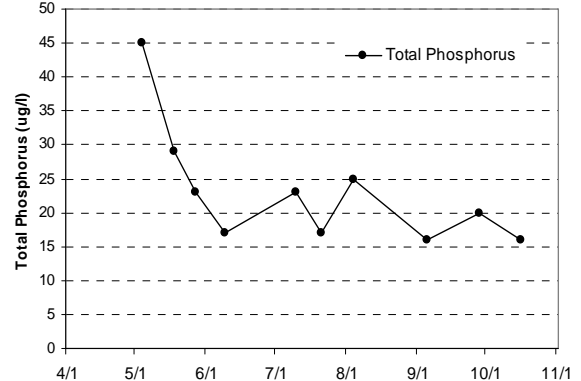
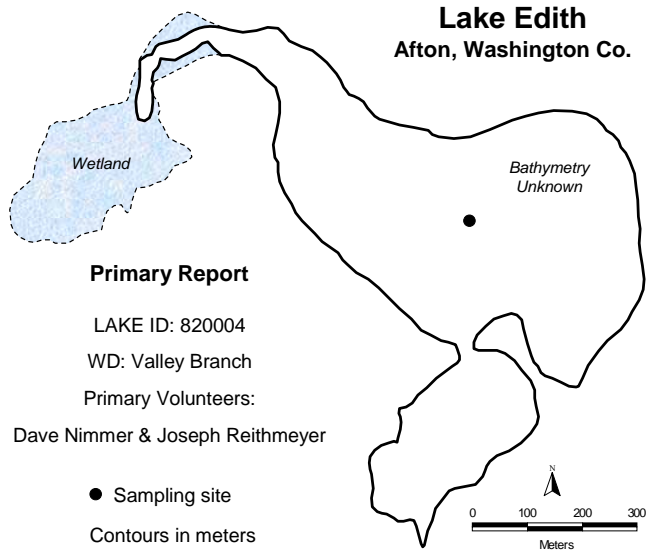
The lake received a lake grade of B for 2008, which is similar to the grade it received in 2006. For the four years that the lake has been monitored via the CAMP, the lake has fluctuated between a lake grade of A and B. Continued monitoring is suggested to help determine the long term nature of the water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

The lake experienced a relatively low CLA summer-time mean concentration compared to the Secchi depth mean summer-time value (which yielded a CLA grade of A versus the C grade for water clarity). The relatively low CLA concentrations indicate that something other than algae was causing the diminished water clarity. Suspended particulates may be a possible cause of the low water clarity during 2008. Likely causes may be either that lake sediment was resuspended in the water column because of frequent mixing events, or the lake received significant quantities of suspended solids from the watershed via runoff events, or both. In either case, the increase turbidity would decrease available light via reduced water clarity, and thereby suppress algal growth.

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

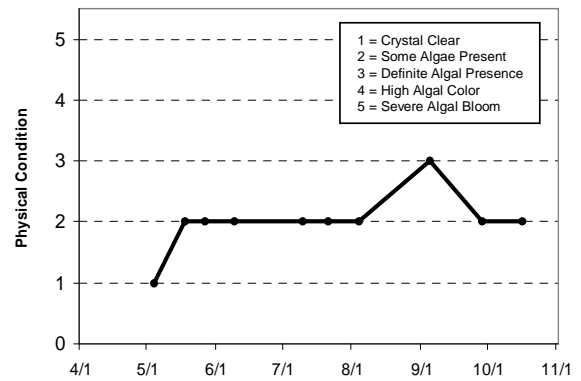
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at <http://www.dnr.state.mn.us/lakefind/>.

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



2008 Data

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



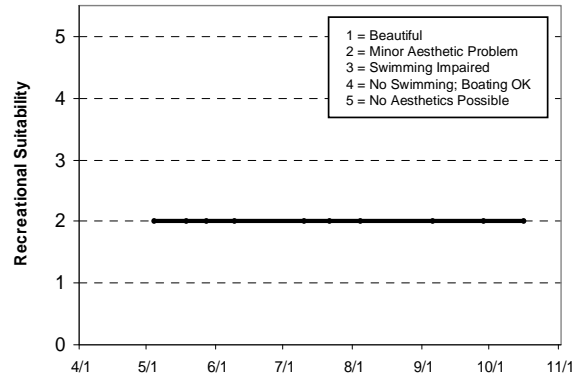
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Edith Lake (82-0004) Washington Conservation District

Secondary Report

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

The lake was monitored 7 times between late April and mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles of temperature and dissolved oxygen were also collected. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

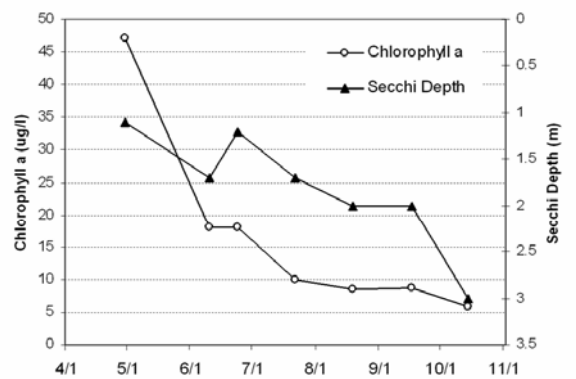
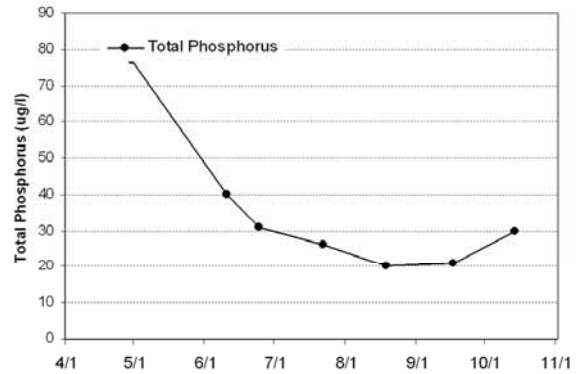
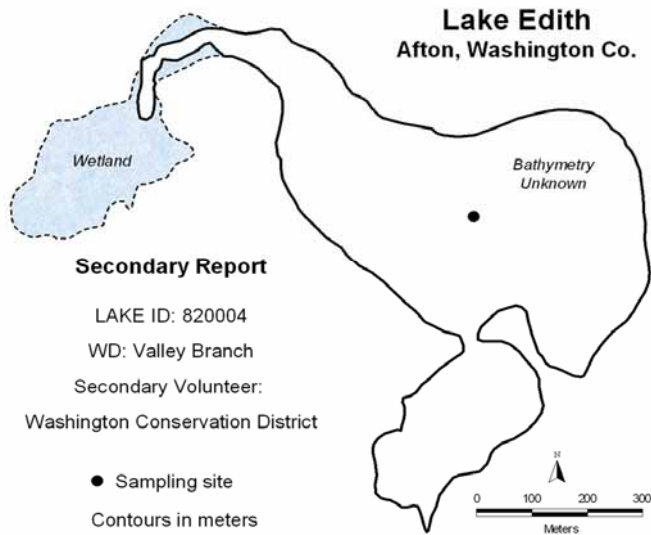
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	27.6	20.0	40.0	B
CLA ($\mu\text{g/l}$)	12.7	8.6	18.0	B
Secchi (m)	1.7	1.2	2.0	C
TKN (mg/l)	1.03	0.81	1.40	
			Lake Grade	B

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

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

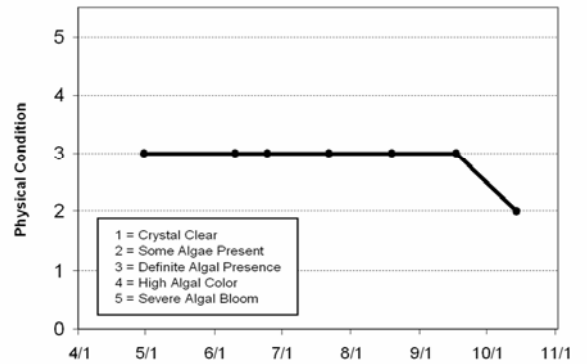
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at <http://www.dnr.state.mn.us/lakefind/>.

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



2008 Data

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



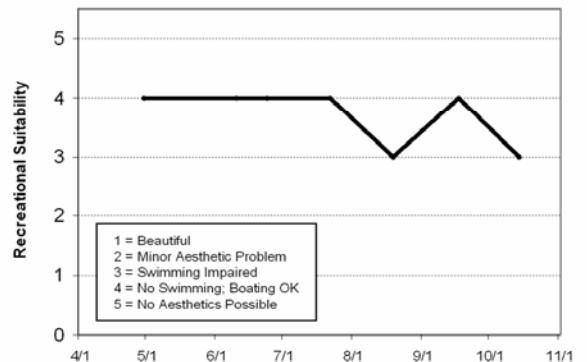
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Lake Elmo (82-0106) Valley Branch Watershed District

Primary Report

Lake Elmo is located in Lake Elmo (Washington County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value and exceptional water clarity. The lake has a public access associated with the Lake Elmo Regional Park located on the west side of the lake. The 284-acre lake has a maximum depth of 41.7 m (roughly 140 feet [deepest in the TCMA]). Roughly 22 percent of the lake's surface area is considered littoral zone (the 0-15 foot depth area of aquatic plant dominance).

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

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

The lake was monitored 11 times from late April to mid October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

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

The lake received a lake grade of A for 2008, which is similar to the lake grades it has received for the past 20 years. The lake's database indicates that the lake's recent water quality is well represented by a lake grade of A. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

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

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

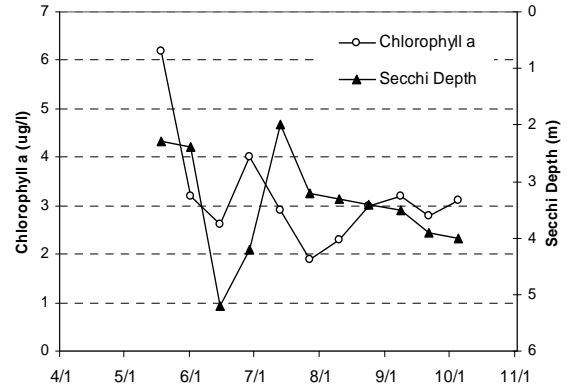
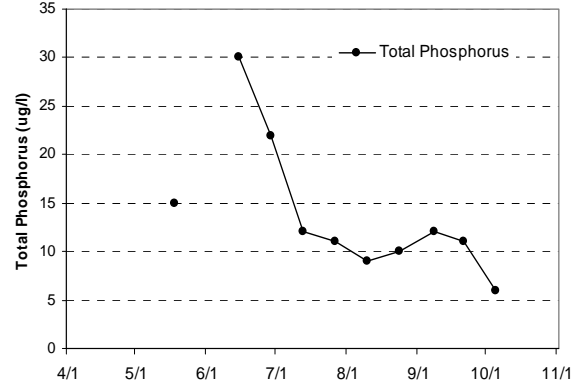
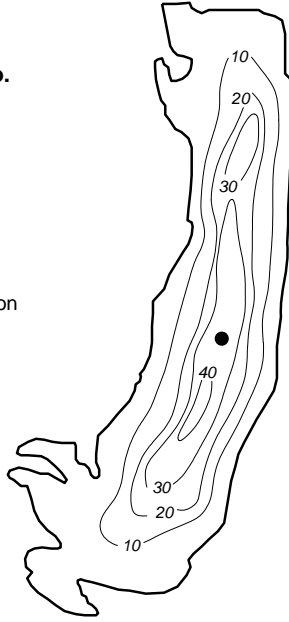
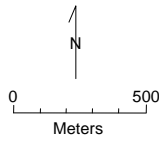
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lake Elmo
Lake Elmo, Washington Co.

Primary Report

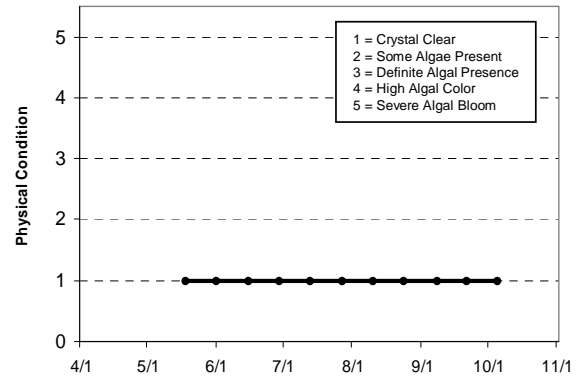
Lake ID: 820106
WD: Valley Branch
Primary Volunteer: Scott Knudson

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/18	14.9				6.2	15		2.3	1	1
6/1	20.2				3.2			2.4	1	1
6/15	20.9				2.6	30		5.2	1	1
6/29	24.1				4	22		4.2	1	1
7/13	24.2				2.9	12		2	1	1
7/27	26.5				1.9	11		3.2	1	1
8/10	26				2.3	9		3.3	1	1
8/24	25				3	10		3.4	1	1
9/8	21.4				3.2	12		3.5	1	1
9/21	21.3				2.8	11		3.9	1	1
10/5	17				3.1	6		4	1	1



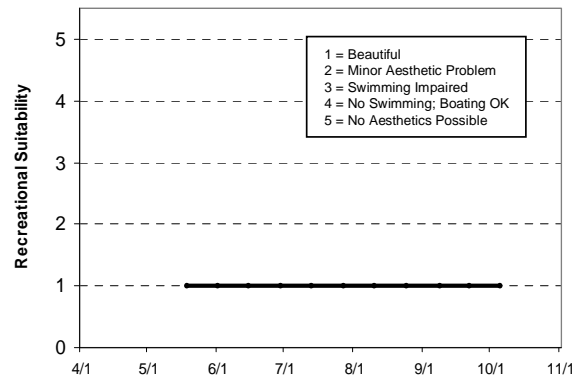
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Lake Elmo (82-0106) Washington Conservation District

Secondary Report

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

The lake was monitored 11 times from mid May to early October 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles of dissolved oxygen and temperature were also collected. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	17.8	13.0	24.0	A
CLA ($\mu\text{g/l}$)	3.4	2.8	4.1	A
Secchi (m)	4.3	3.4	5.0	A
TKN (mg/l)	0.64	0.48	0.76	
			<i>Lake Grade</i>	A

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

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

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

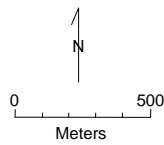
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lake Elmo
Lake Elmo, Washington Co.

Secondary Report

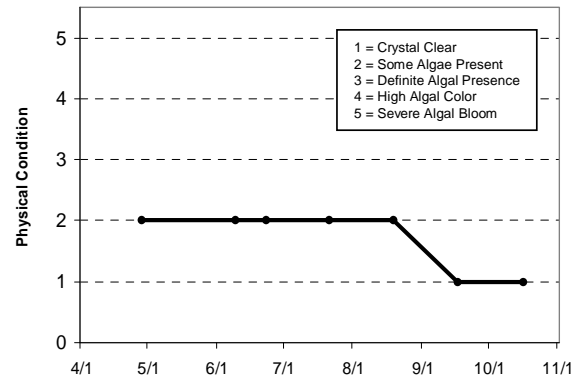
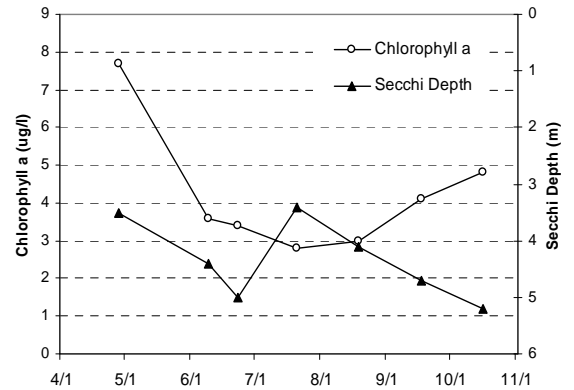
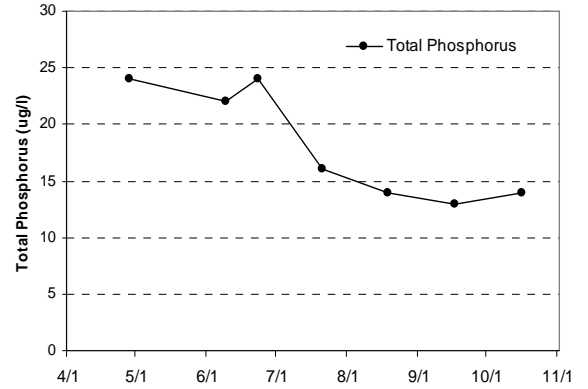
Lake ID: 820106
WD: Valley Branch
Secondary Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 Data

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



Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data

