

Karth Lake (62-0072) Rice Creek Watershed District

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

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

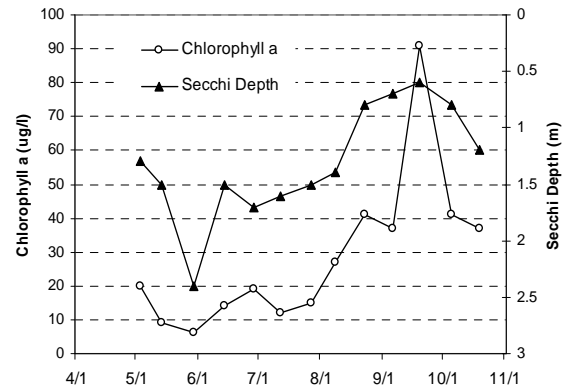
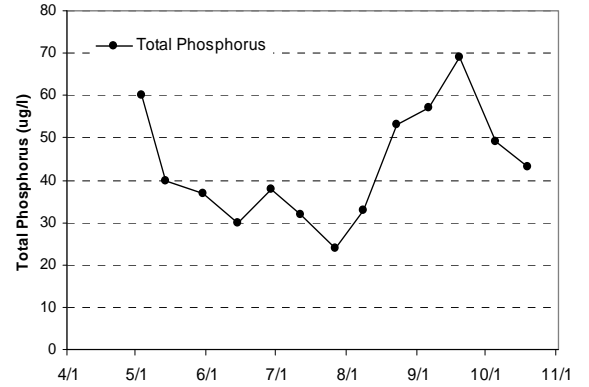
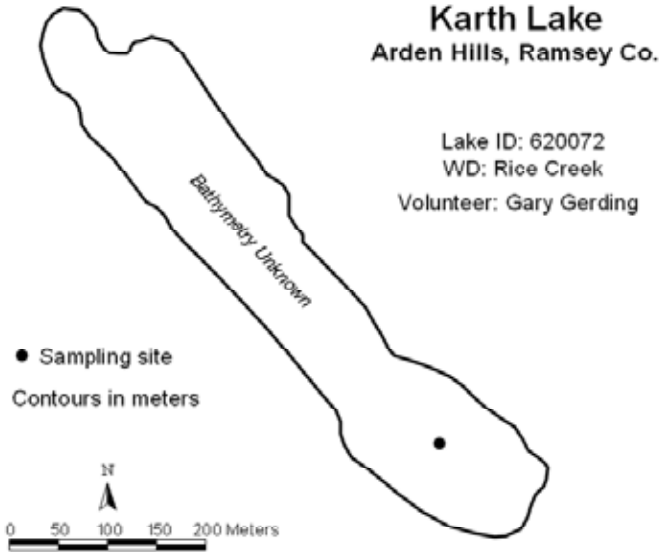
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	43.0	24.0	69.0	C
CLA ($\mu\text{g/l}$)	26.5	6.1	91.0	C
Secchi (m)	1.4	0.6	2.4	C
TKN (mg/l)	1.43	0.97	1.90	
			Lake Grade	C

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

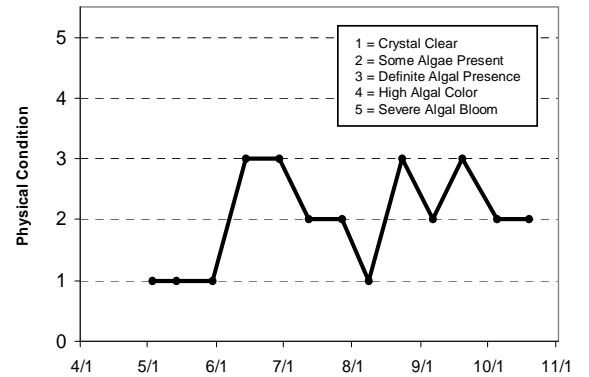
The volunteer(s) monitor ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. The mean perceived physical condition was 2.0 (some algae present), while the mean recreational suitability was 1.8 (between 1- "beautiful" and 2- "minor aesthetic problem").

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



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	12				20	60		1.3	1	1
5/14	16				9.2	40		1.5	1	1
5/30	19.7				6.1	37		2.4	1	1
6/14	22				14	30		1.5	3	3
6/29	24				19	38		1.7	3	2
7/12	24.4				12	32		1.6	2	2
7/27	27				15	24		1.5	2	2
8/6	26				27	33		1.4	1	1
8/23	25.3				41	53		0.8	3	3
9/6	22.4				37	57		0.7	2	2
9/19	21.8				91	69		0.6	3	2
10/5	16				41	49		0.8	2	2
10/19	14.2				37	43		1.2	2	2



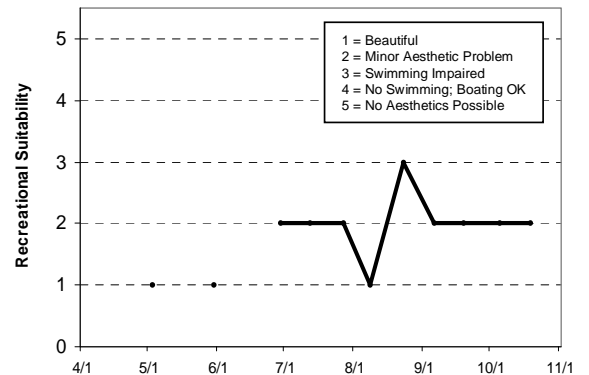
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Keller Lake is located in the cities of Apple Valley and Burnsville (Dakota County). The surface area of the lake is 55 acres. It has a maximum depth of 3.0 m (10 feet). The lake's mean depth of 1.1 m (3.7 feet) and surface area translates to an approximate lake volume of 203 ac-ft. Because the maximum depth is 3.0 m, the entire lake area is considered littoral, which is the area of aquatic plant dominance. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

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

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

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

2008 summer (May-September) data summary

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

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

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

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

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

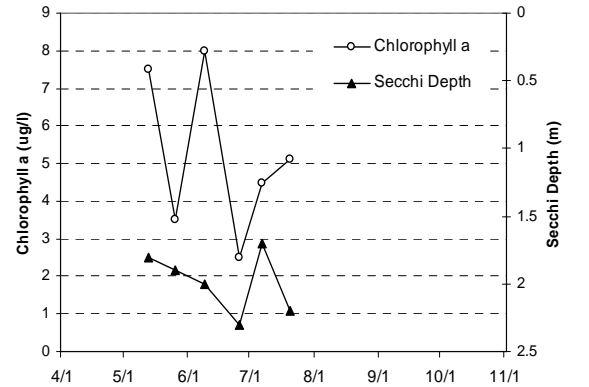
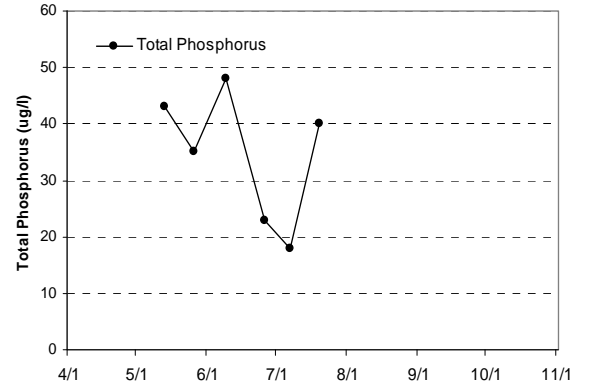
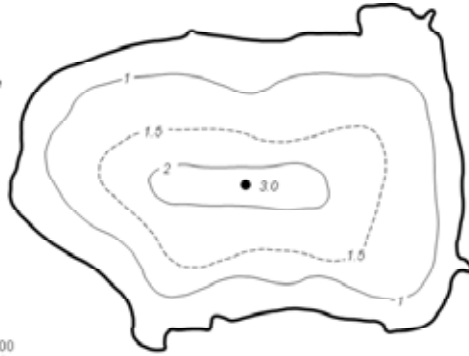
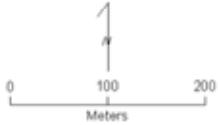
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Keller Lake
Burnsville, Dakota Co.

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

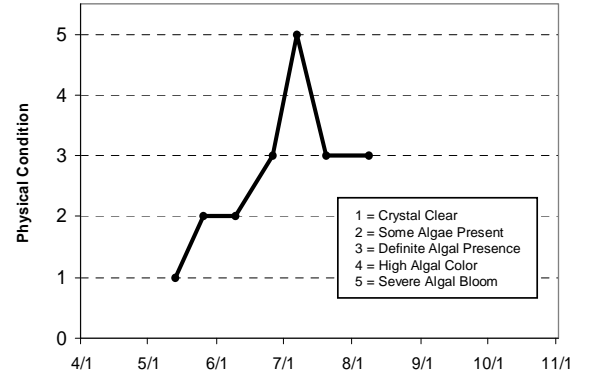
● Sampling site

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



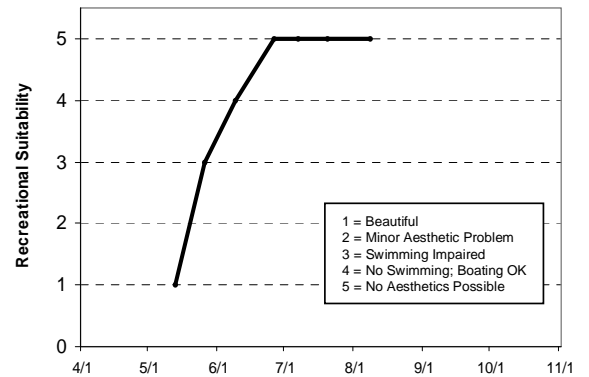
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Kingsley Lake is located in the northwestern corner of the City of Lakeville in Dakota County. The lake has a surface area of 44 acres (shoreline length of 1.7 miles), a maximum depth of 4.0 m (13 feet), and a contributing watershed of 193 acres. The resulting watershed-to-lake size ratio is a rather small at 4:1. The greater the ratio the greater affect of surface runoff has on the water quality of the lake. Because of the shallowness of the lake, the entire lake is considered littoral, which is area of aquatic vegetation dominance, and never develops and maintains a thermocline.

The lake was monitored by Council staff in 1993. Kingsley Lake was monitored 13 times between late April and mid October. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

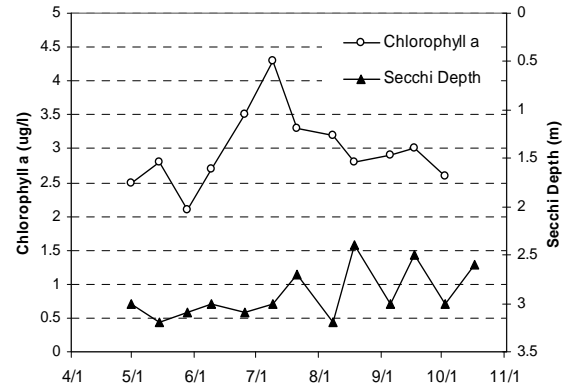
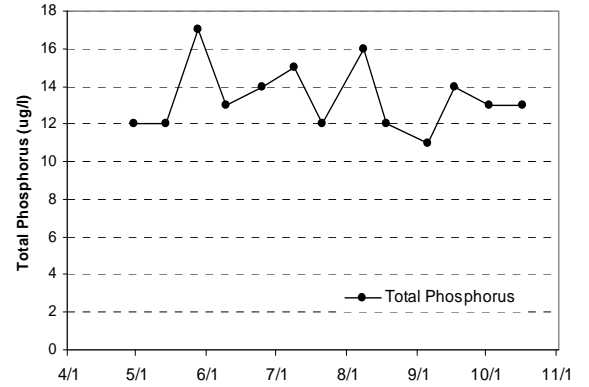
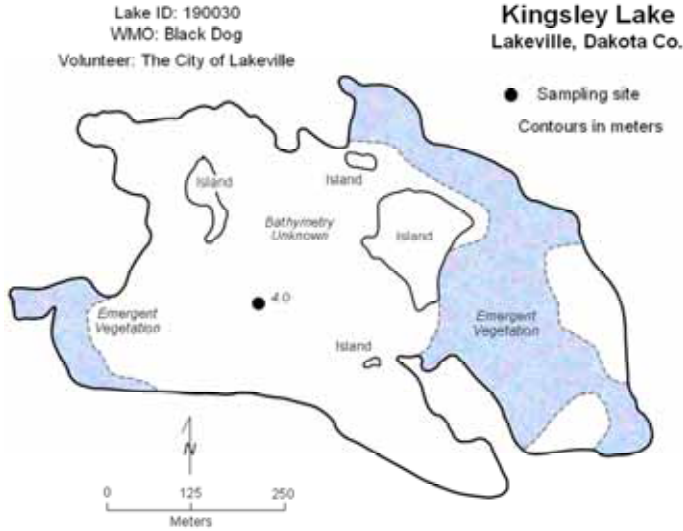
2008 summer (May-September) data summary

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

Similar to past years, the Secchi transparency in 2008 would have been greater except that on many monitoring events either the lake's excessive submergent macrophyte growth obscured the Secchi disk, or the Secchi was visible while resting on the lake bottom. For these reasons, the water clarity may have been actually that of an A grade. On the basis of the water quality database, the lake's water quality appears represented by a lake grade of A or B. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

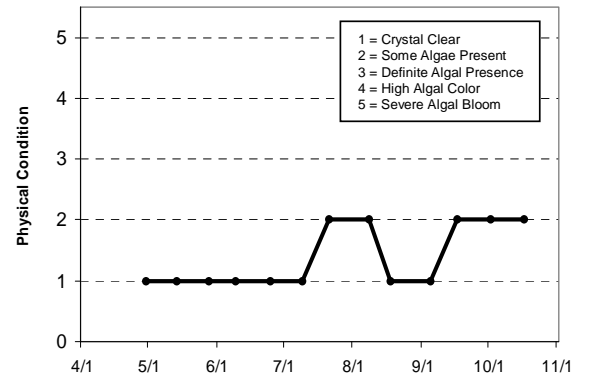
The physical and recreational conditions of the lake as perceived by the volunteer(s) were ranked on a 1-to-5 scale. The mean physical condition ranking was 1.3 (between 1- "crystal clear" and 2- "some algae present"), while the mean recreational suitability ranking was 1.1 (between 1-"beautiful" and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

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



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/30	11.7				2.5	12		3	1	1
5/14	16.1				2.8	12		3.2	1	1
5/28	17.2				2.1	17		3.1	1	1
6/9	20.6				2.7	13		3	1	1
6/25	26.7				3.5	14		3.1	1	1
7/9	25.6				4.3	15		3	1	1
7/21	26.7				3.3	12		2.7	2	1
8/8	25.6				3.2	16		3.2	2	2
8/18	24.1				2.8	12		2.4	1	1
9/5	19				2.9	11		3	1	1
9/17	19				3	14		2.5	2	1
10/2	13				2.6	13		3	2	1
10/17	11					13		2.6	2	1



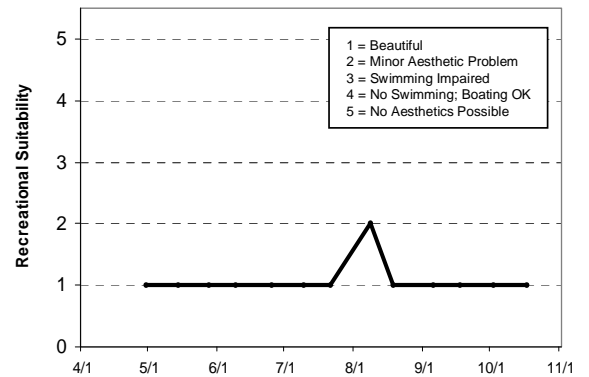
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Kismet Lake (82-0333) Browns Creek Watershed District

Kismet Lake is located in Washington County. This relatively small lake has a maximum depth of approximately 3.7 m (12 feet). Because of the shallowness of the lake the whole lake is considered littoral zone, which is the 0 – 15 feet depth zone dominated by aquatic vegetation. The known available lake data found through a search for historical water quality was the 1998-2007 CAMP data.

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

2008 summer (May-September) data summary

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

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

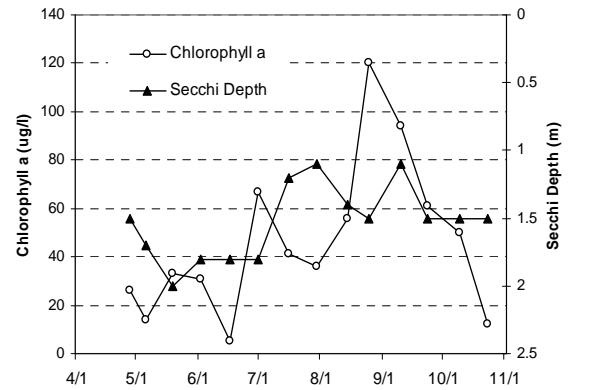
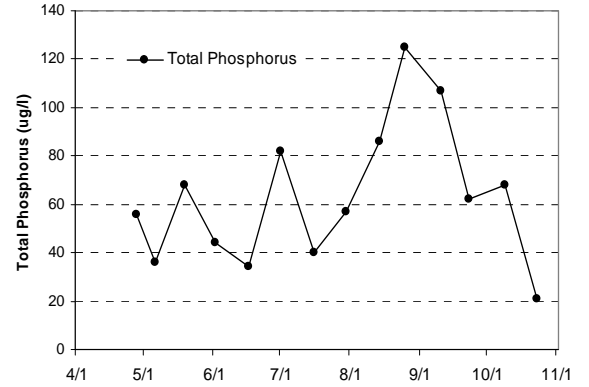
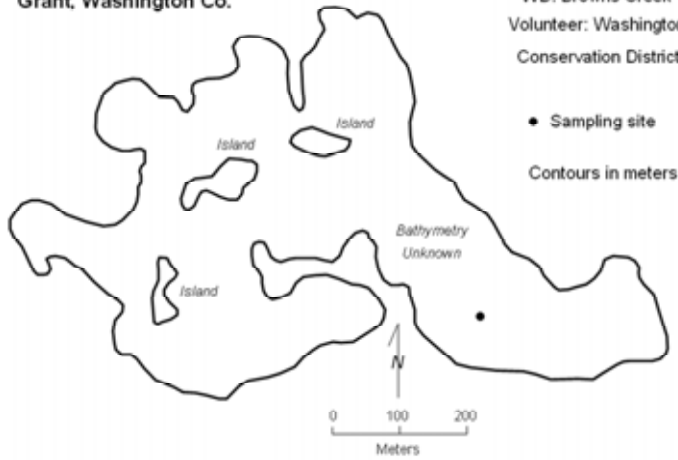
The perceived physical and recreational conditions of the lake, recorded by the volunteers, were ranked on a 1-to-5 scale. The mean physical condition ranking was 1.9 (between 1- “crystal clear” and 2- “some algae present”). The mean recreational suitability ranking was 2.2 (between 2- “minor aesthetic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

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

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

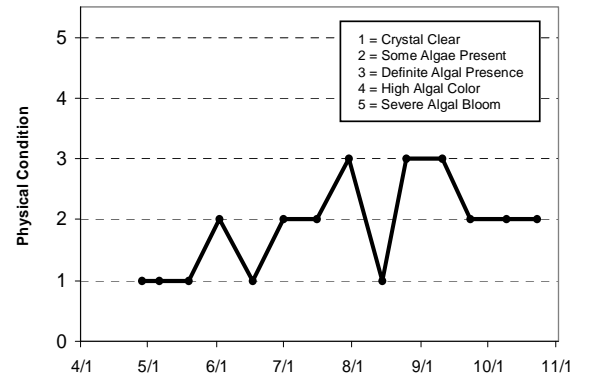
Kismet Lake
Grant, Washington Co.

Lake ID: 820334
WD: Browns Creek
Volunteer: Washington
Conservation District



2008 Data

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



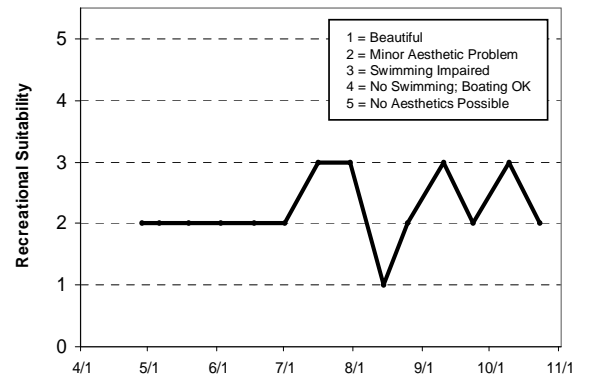
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Klawitter Pond (82-0368) Valley Branch Watershed District

Klawitter Pond is a 4.5-acre lake located within the City of Lake Elmo (Washington County). Because of the shallowness of the lake, it is considered entirely littoral, which is the 0-15 feet depth zone dominated by aquatic vegetation. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column. The lake's surface area and watershed area of 168 acres translate to a 37:1 watershed-to-lake area ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

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

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

2008 summer (May-September) data summary

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

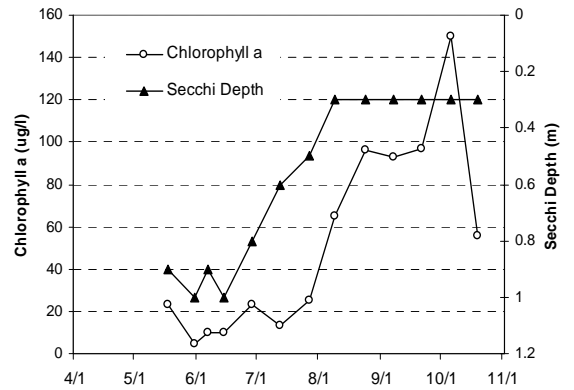
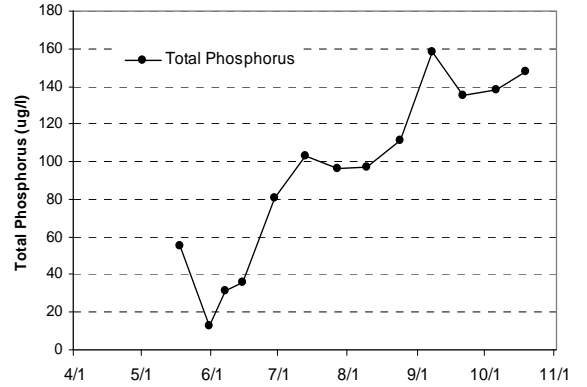
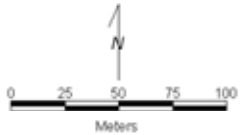
The lake received a lake grade of D for 2008, which is similar to previous years' lake grades. Based on the limited water quality database for the lake, it appears to be represented by a lake grade of D. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

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

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

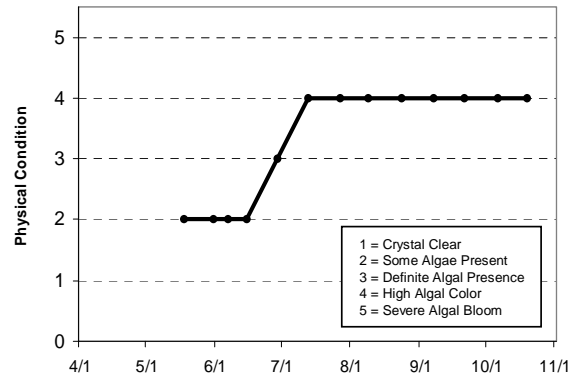
Klawitter Pond
Lake Elmo, Washington Co.

Lake ID: 820368
WD: Valley Branch
Volunteer: Bonnie Juran
● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/18	19.6				23	55		0.9	2	2
5/31	22.2				4.5	13		1	2	2
6/7	20.6				9.8	31		0.9	2	2
6/15	21.8				9.9	36		1	2	2
6/29	25.2				23	81		0.8	3	2
7/13	25.8				13	103		0.6	4	3
7/27	27.8				25	96		0.5	4	3
8/9	27.1				65	97		0.3	4	3
8/24	25.1				96	111		0.3	4	3
9/7	20.6				93	158		0.3	4	3
9/21	19.7				97	135		0.3	4	3
10/6	15.2				150	138		0.3	4	3
10/19	13.2				56	148		0.3	4	3



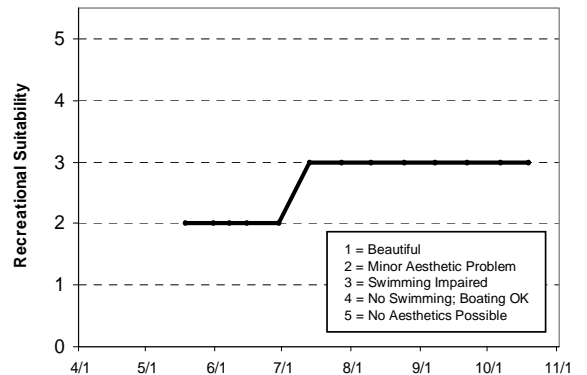
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Kramer Pond (82-0117) Valley Branch Watershed District

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

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

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	496.0	130.0	764.0	F
CLA ($\mu\text{g/l}$)	183.0	33.0	320.0	F
Secchi (m)	0.5	0.2	1.1	F
TKN (mg/l)	5.50	3.50	6.90	
			Lake Grade	F

The lake received a lake grade of F for 2008. Additional years of monitoring are suggested to build a water quality database so to better understand the lake's water quality and determine potential water quality trends.

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

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

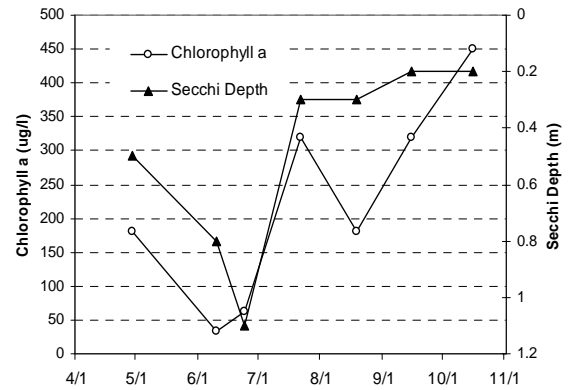
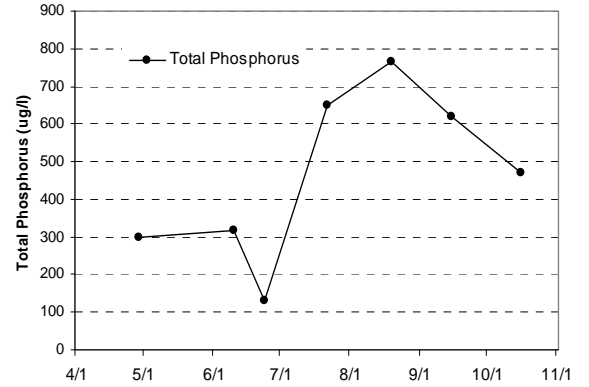
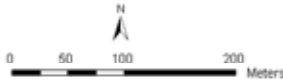
Kramer Pond
Lake Elmo, Washington Co.

Lake ID: 820117
WD: Valley Branch
Volunteer: Washington Conservation District



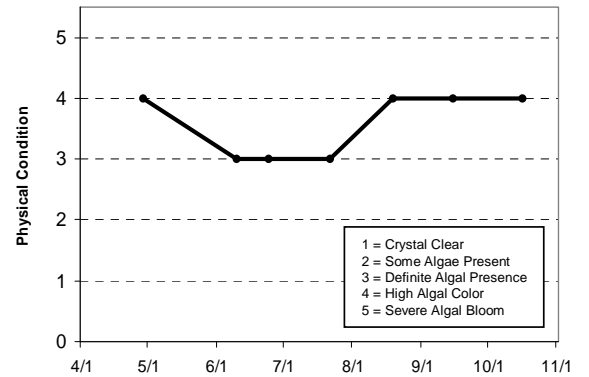
• Sampling site

Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/29	6.4	6.2	14.83	1.03	180	300		0.5	4	4
6/10	20.8	20.7	6.19	6.15	33	318		0.8	3	4
6/24	25.4	23.2	10.87	0.33	62	130		1.1	3	4
7/22	25.8	24.3	9.93	0.16	320	648		0.3	3	4
8/19	25	22.9	5.46	0.14	180	764		0.3	4	4
9/15	17.5	15.9	10.49	0.26	320	620		0.2	4	4
10/16	10.1	10.8	10.7	0.32	450	472		0.2	4	4



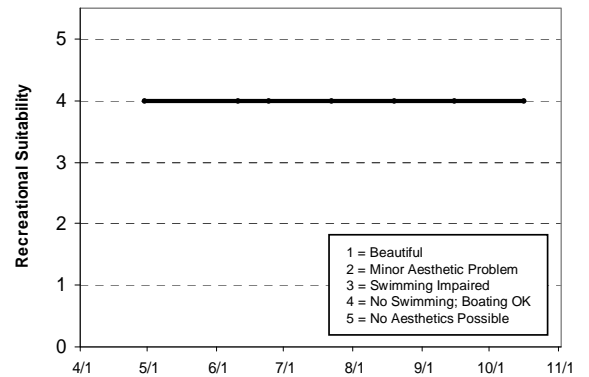
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



La Lake (82-0097) City of Woodbury

La Lake is located in the City of Woodbury (Washington County). The lake has a surface area of approximately 35 acres and a maximum depth of 3.5 m (11 feet). Because of the shallowness of the lake, it is considered littoral zone, which is the 0-15 feet depth zone of the lake dominated by aquatic vegetation. Furthermore, the lake does not maintain a thermocline which is a density gradient caused by changing water temperatures throughout the lake's water column.

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

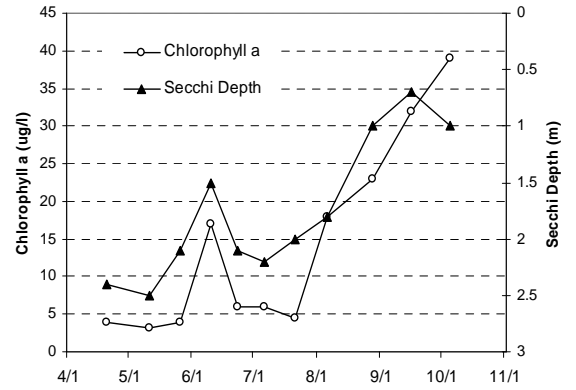
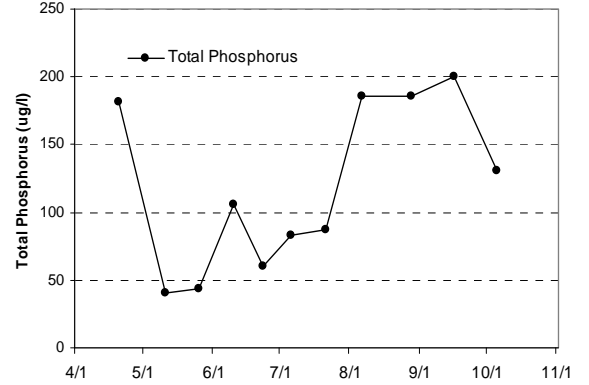
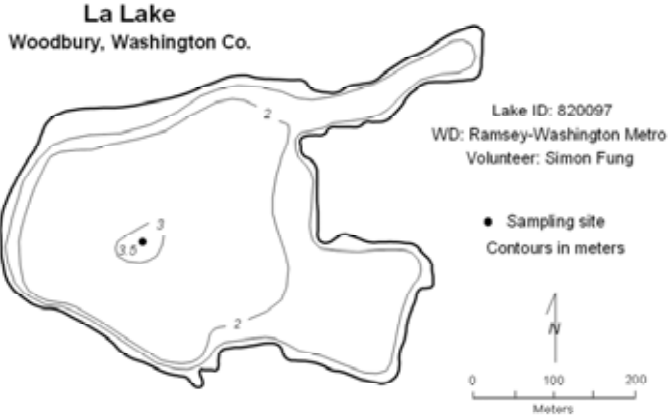
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	110.2	40.0	200.0	D
CLA ($\mu\text{g/l}$)	12.6	3.2	32.0	B
Secchi (m)	1.8	0.7	2.5	C
TKN (mg/l)	1.17	0.82	2.00	
Lake Grade				C

The lake received a lake grade of C for 2008. The 2008 lake grade and the parameter grades were a return to similar grades received in previous years (e.g. 2002, 1996). The water quality for 2008 appears to be an improvement over the water quality observed in 2007. Water quality for the lake has experienced annual variability as indicated by its water quality database. The lake's water quality seems to be represented by lake grades of C or B. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant declining trend in water clarity (MPCA 2008).

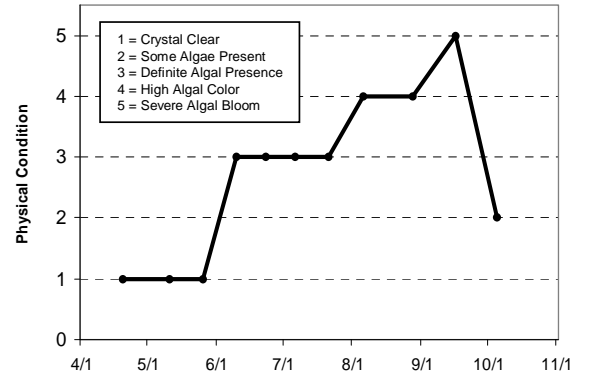
Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page. The mean physical condition ranking was 3.0 (3- "definite algae present"), while the mean recreational suitability ranking was 3.3 (between 3- "swimming slightly impaired" and 4- "no swimming; boating ok").

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



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/20	9.3				4	182		2.4	1	1
5/11	16.3				3.2	40		2.5	1	1
5/26	19.7				3.9	44		2.1	1	1
6/10	22.6				17	106		1.5	3	4
6/23	25				6	60		2.1	3	4
7/6	28.2				6	83		2.2	3	4
7/21	27				4.4	87		2	3	4
8/6	25.6				18	186		1.8	4	4
8/28	24				23	186		1	4	4
9/16	20.8				32	200		0.7	5	4
10/5	14.2				39	131		1	2	4



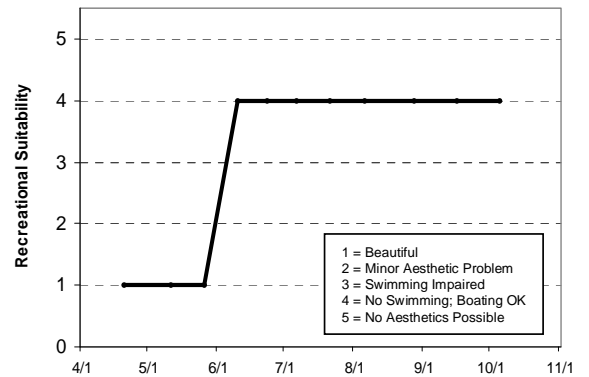
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Lac Lavon Lake (19-0446) Black Dog Watershed Management Commission

Lac Lavon is located within the City of Apple Valley (Dakota County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity. The lake is an abandoned gravel pit maintained by groundwater (MDNR 1996). The lake has a surface area of 55 acres and a maximum depth of 9.8 m (32 feet). Approximately 65 percent of the lake is considered littoral zone, which is the 0 – 15 feet depth zone of the lake that dominated by aquatic vegetation. The lake has been designated by the Minnesota DNR as being infested with the aquatic plants Eurasian Water Milfoil (*Myriophyllum spicatum*) and Brittle Naiad (*Najas minor*).

This was the twelfth year that Lac Lavon has been involved in the CAMP. The only other known water quality data available for the lake were Secchi transparency data collected in 1989-1991.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	33.3	11.0	151.0	C
CLA (µg/l)	5.8	2.4	17.0	A
Secchi (m)	3.3	1.9	4.6	A
TKN (mg/l)	1.30	0.51	3.10	
Lake Grade				B

The lake received a lake grade of B for 2008, which is the first year the lake received a lake grade other than A. The main cause for the lower lake grade was the elevated concentrations of TP observed during the month of June 2008. There were two elevated TP concentrations for the sampling weeks in June. They were of sufficient magnitude to shift the TP grade from a typical A to a C. The TP concentrations for the other months in 2008, which are indicative of a TP grade of A, were similar in magnitude as the same months in previous years. It is possible that the elevated TP concentrations were caused by enhanced TP loading from one or more surface runoff events during late May or early June. A trend analysis conducted by the MPCA on the lake’s Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

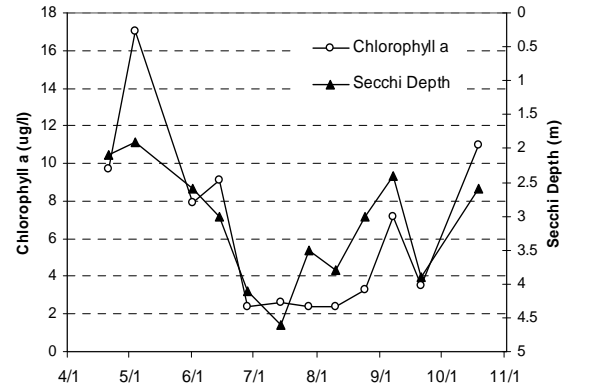
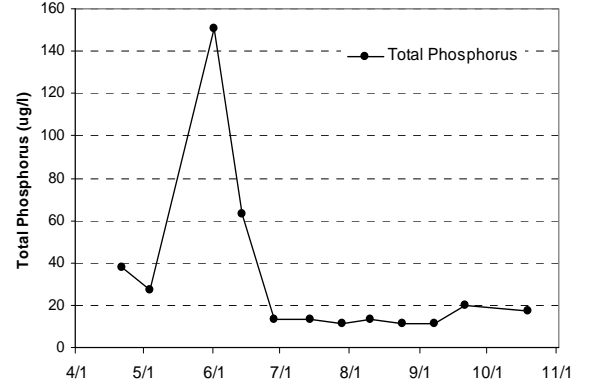
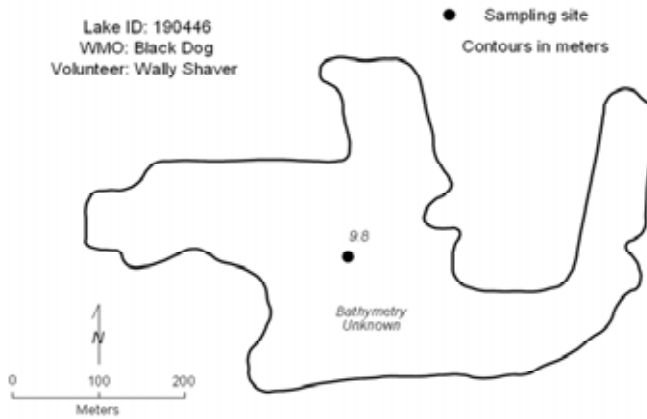
Throughout the monitoring period, the volunteers’ opinions of the lake’s physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The mean physical condition ranking was 1.0 (1-“crystal clear”), while the mean recreational suitability ranking was 1.0 (1- “beautiful”).

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

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

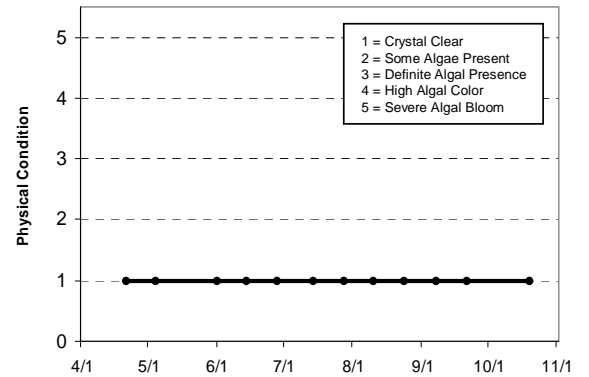
Lac Lavon
Apple Valley/Burnsville, Dakota Co.

Lake ID: 190446
WMO: Black Dog
Volunteer: Wally Shaver



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	10.8				9.7	38		2.1	1	1
5/4	10.2				17	27		1.9	1	1
6/1	19.8				7.9	151		2.6	1	1
6/14	19.7				9.1	63		3	1	1
6/28	23.5				2.4	13		4.1	1	1
7/14	25.8				2.6	13		4.6	1	1
7/28	27				2.4	11		3.5	1	1
8/10	25.6				2.4	13		3.8	1	1
8/24	24.7				3.3	11		3	1	1
9/7	20.5				7.2	11		2.4	1	1
9/21	20.6				3.5	20		3.9	1	1
10/19	13.8				11	17		2.6	1	1



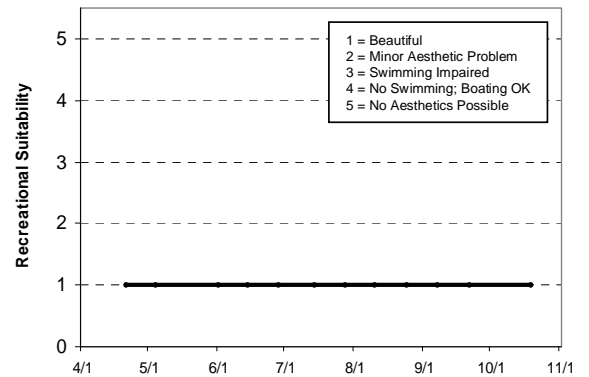
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Lake Forest (62-0187) Rice Creek Watershed District

Lake Forest is located within the City of New Brighton (Ramsey County). Little morphological information is available for the lake. No historical water quality data for the lake was available in the STORET nationwide water quality database.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	174.2	62.0	348.0	F
CLA (µg/l)	151.3	9.0	340.0	F
Secchi (m)	0.7	0.2	1.5	F
TKN (mg/l)	3.15	1.40	5.10	
Lake Grade				F

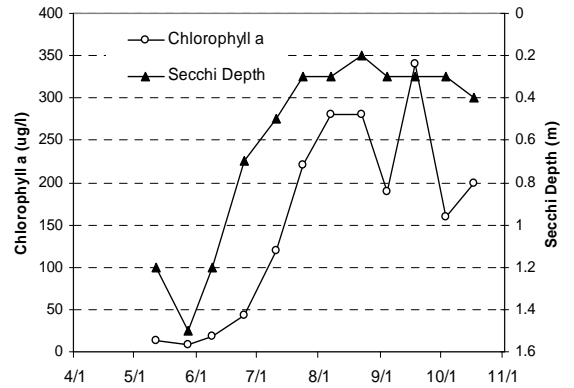
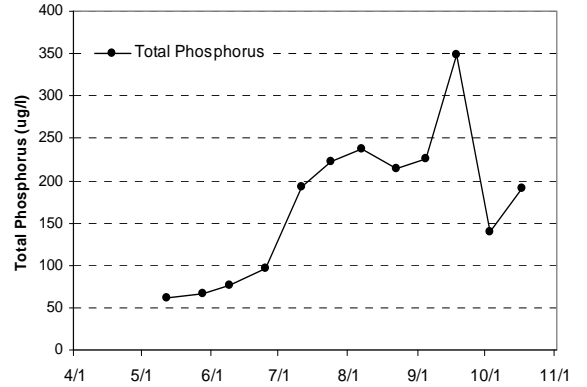
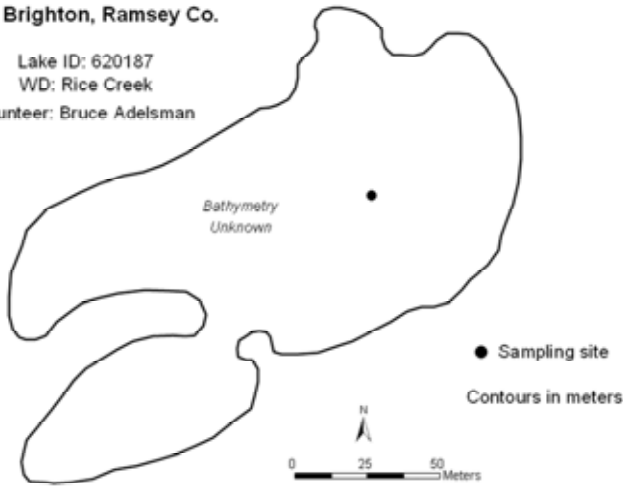
The lake received a lake grade of F for 2008. Additional years of monitoring are suggested to build a water quality database to better understand the lake's water quality and determine potential water quality trends.

Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page. The mean physical condition ranking was 3.2 (between 3- "definite algae present" and 4- "high algal color"), while the mean recreational suitability ranking was 3.2 (between 3- "swimming slightly impaired and 4- "no swimming/boating ok").

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

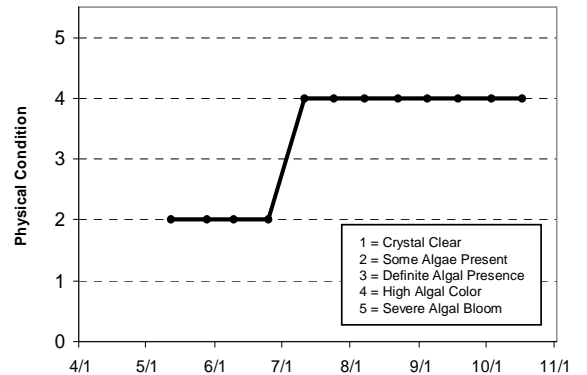
Lake Forest
New Brighton, Ramsey Co.

Lake ID: 620187
WD: Rice Creek
Volunteer: Bruce Adelsman



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/12	16				13	62		1.2	2	2
5/28	19.5				9	67		1.5	2	2
6/9	23				18	76		1.2	2	2
6/25	26.1				43	96		0.7	2	2
7/11	24				120	193		0.5	4	4
7/24	24.7				220	223		0.3	4	4
8/7	24.3				280	238		0.3	4	4
8/22	24				280	214		0.2	4	4
9/4	19.9				190	225		0.3	4	4
9/18	17.9				340	348		0.3	4	4
10/3	14.1				160	139		0.3	4	4
10/17	11.9				200	191		0.4	4	4



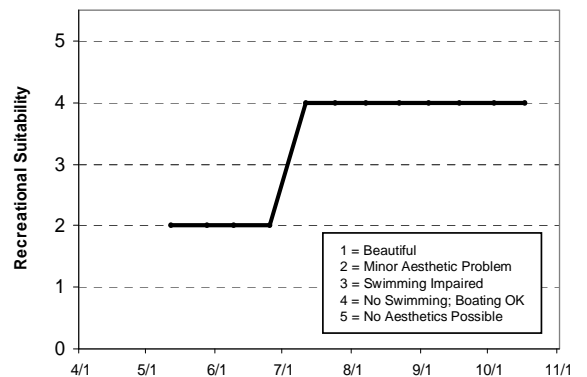
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Langton Lake is divided into two basins. The monitoring results for each of the sites will be discussed individually. The entire 30-acre lake is located within the City of Roseville (Ramsey County). The maximum depth of the lake is 1.5 m (4.9 ft). The mean depth is 1.2 m (3.9 feet). The volume is approximately 120 ac-ft. Because of the shallowness of the lake, its entire surface area is considered littoral zone, which is the 0-15 feet depth zone dominated by aquatic vegetation. The lake's contributing watershed is 257 acres, which translates to a watershed-to-lake area ratio of 9:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

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

A search through the STORET nationwide water quality database for historical data provided Secchi transparency data for 1984, 1985, 1987, 1988, and 1990.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	66.8	31.0	131.0	C
CLA (µg/l)	21.3	4.0	56.0	C
Secchi (m)	1.2	0.8	1.6	D
TKN (mg/l)	1.73	1.20	2.70	
Lake Grade				C

The basin received a lake grade of C for 2008, which is similar to past years of lake grades. There are no other nutrient and chlorophyll-a data available for Site-1 other than the 2005-2008 CAMP data. Additional monitoring is suggested to continue to build the water quality database for determining possible trends in water quality.

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 2.1 for physical condition (between 2- "some algae present" and 3- "definite algae present"). The ranking of recreational suitability was made during only one monitoring event for 2008, so the average ranking is not reported.

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

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

Langton Lake, Site 1

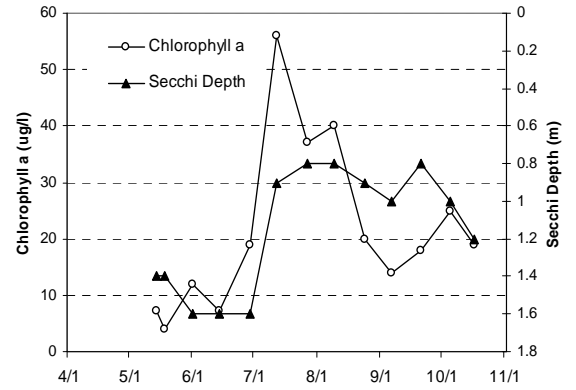
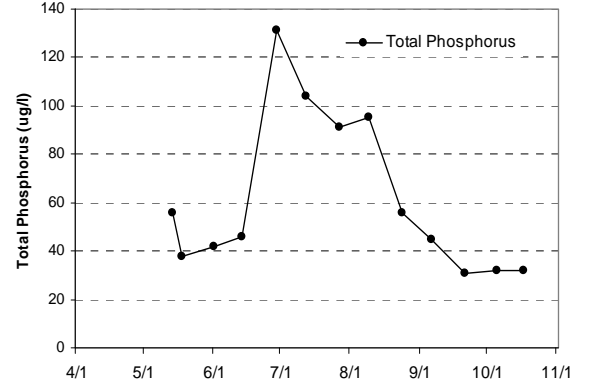
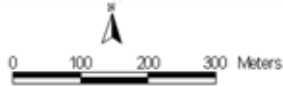
Roseville, Ramsey Co.

Lake ID: 620049-01

WD: Rice Creek

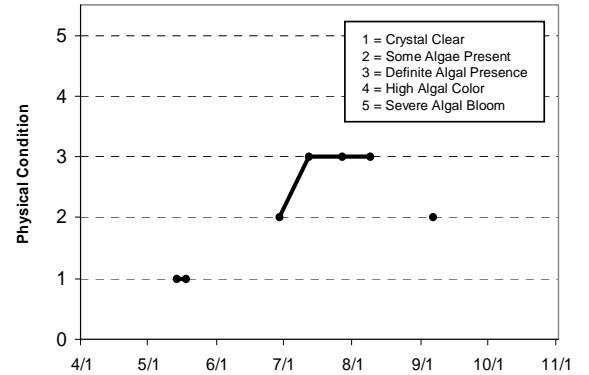
Volunteers: Tam & Dick McGehee; Yul Yost

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/14	14.6				7.1	56		1.4	1	
5/18	17.5				4	38		1.4	1	1
6/1	21.9				12	42		1.6		
6/14	23.8				7.1	46		1.6		
6/29	25.7				19	131		1.6	2	
7/1	25.7				56	104		0.9	3	
7/27	25.9				37	91		0.8	3	
8/9	26.5				40	95		0.8	3	
8/24	23.8				20	56		0.9		
9/6	21.1				14	45		1	2	
9/21	22.8				18	31		0.8		
10/5	14.2				25	32		1		
10/17	12.4				19	32		1.2		



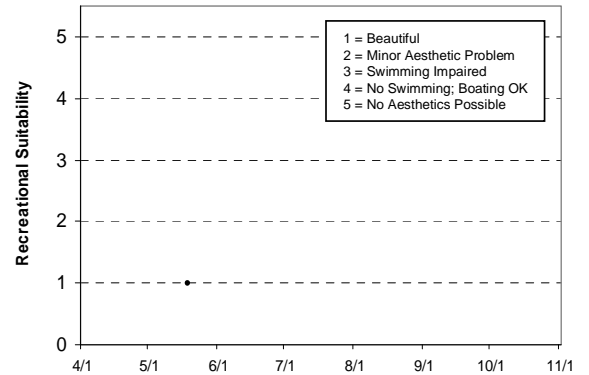
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Langton Lake [south basin, site-2] (62-004-02) Rice Creek Watershed District

Langton Lake is divided into two distinct basins. The monitoring results will be discussed individually for each of the basins. For a description of the entire lake, refer to the discussion for Site 1 of Langton Lake.

A search through STORET revealed many years of Secchi transparency data from 1984 and 1995-2007. There are no other nutrient and chlorophyll data available for Site-2 other than the 2005-2008 CAMP data.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	64.2	24.0	166.0	C
CLA ($\mu\text{g/l}$)	20.4	3.7	55.0	C
Secchi (m)	1.1	0.6	1.6	D
TKN (mg/l)	2.03	1.00	4.60	
			Lake Grade	C

The lake received a lake grade of C for 2008 which is similar to the two previous years. The lake site has also received identical letter grades for each of the three parameters for the years 2005-2007. A recent MPCA-conducted trend analysis on the lake's Secchi transparency data revealed a statistically significant improvement in recent water clarity (MPCA 2008). Additional monitoring is suggested to continue to build the water quality database for determining possible trends in water quality beyond just water clarity.

Throughout the monitoring period, the volunteer(s) ranked their opinions of the lake's physical and recreational conditions on a 1-to-5 scale. The average user perception rankings were 2.8 for physical condition (between 2- "some algae present" and 3- "definite algae present"). The ranking of recreational suitability was made during only one monitoring event for 2008, so the average ranking is not reported.

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

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

Langton Lake, Site 2

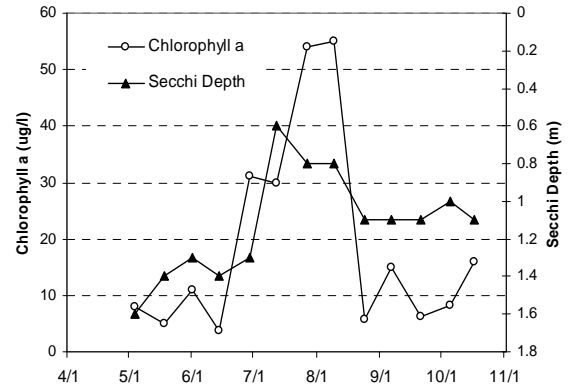
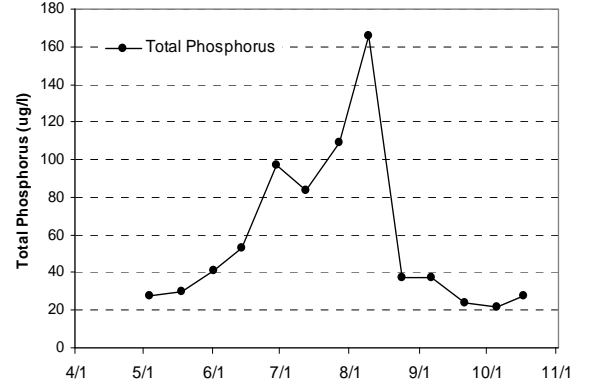
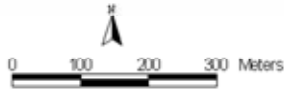
Roseville, Ramsey Co.

Lake ID: 620049-02

WD: Rice Creek

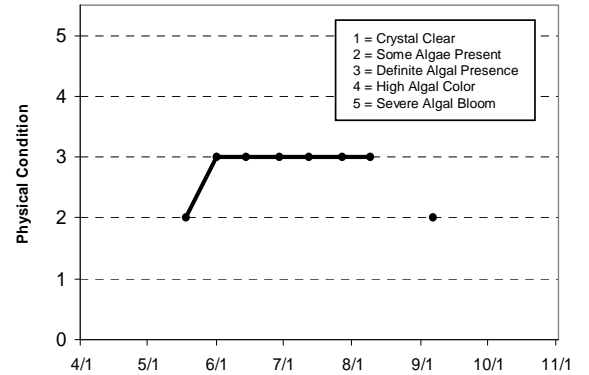
Volunteers: Tam & Dick McGehee; Yul Yost

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/4	14.4				7.9	28		1.6		
5/18	17.2				5.1	30		1.4	2	1
6/1	22.1				11	41		1.3	3	
6/14	23.3				3.7	53		1.4	3	
6/29	25.6				31	97		1.3	3	
7/12	25.9				30	84		0.6	3	
7/27	27				54	109		0.8	3	
8/9	27.4				55	166		0.8	3	
8/24	24.4				5.7	37		1.1		
9/6	21.1				15	37		1.1	2	
9/21	22.8				6.3	24		1.1		
10/5	14				8.1	22		1		
10/17	12.2				16	28		1.1		



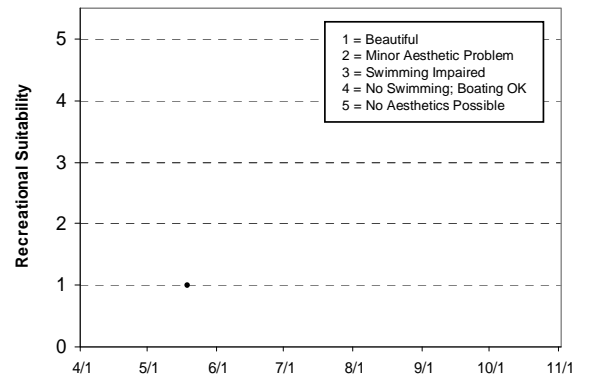
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Lee Lake (19-0029) City of Lakeville

Lee Lake is located in Lakeville (Dakota County). The lake has a surface area of 25 acres with a maximum depth of 5.2 m (17 ft). The lake is landlocked with no natural outlet. The watershed of the lake has an area of 324 acres, and it has mostly developed as urban landuse. The watershed to lake area ratio is 13:1. The higher the ratio, the greater the potential affects of surface runoff have on the water quality of the lake. An abundance of submerged aquatic vegetation (Curlyleaf pondweed) has been a continuing problem in the lake. Not only is it an aesthetic and recreational problem, but the decaying of plants in late-summer adds to concentrations of phosphorus in the water column.

In an attempt to inhibit algal populations within the lake, barley straw has been added annually since 2003. Barley straw has been used for algal control in the United Kingdom for many years. A recent study on Valley Lake in Lakeville, Minnesota has suggested that carbon from the decaying barley straw inhibits algal populations via microbial competition for phosphorus (McComas and Anhorn 2004). The results of the report are discussed in more detail in Valley Lake section of this report.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	41.1	26.0	66.0	C
CLA ($\mu\text{g/l}$)	19.2	5.0	47.0	B
Secchi (m)	1.5	1.0	2.4	C
TKN (mg/l)	1.60	1.10	2.30	
			<i>Lake Grade</i>	C

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

The volunteer(s) ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. These rankings are shown on the lake's information sheet on the following page. The mean physical condition ranking was 2.4 (between 2- "some algae present and 3- "definite algae present"), while the mean recreational suitability ranking was 2.8 (between 2- "minor aesthetic problem" and 3- "swimming impaired").

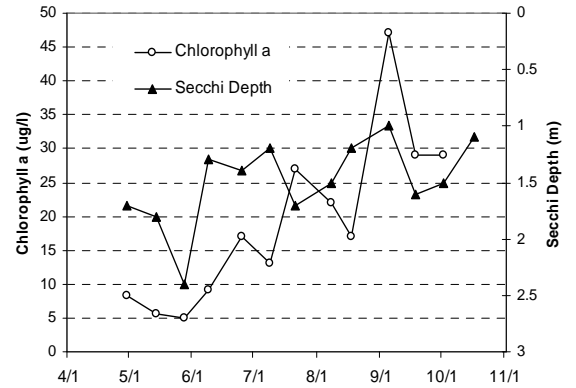
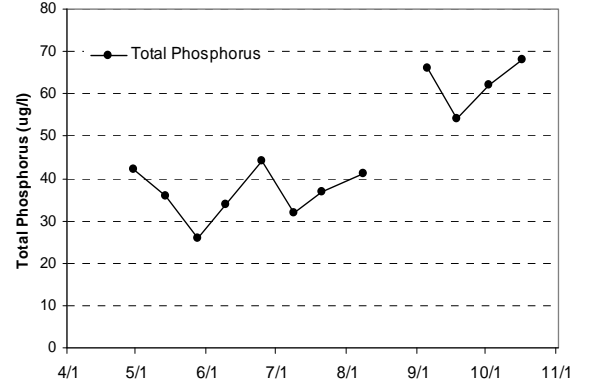
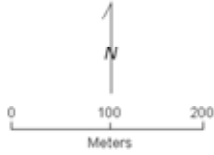
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Lee Lake
Lakeville, Dakota Co.

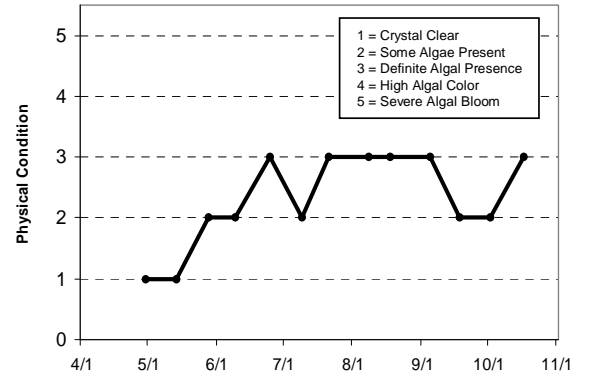
Lake ID: 190029
WMO: Black Dog
Volunteer: City of Lakeville

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/30	10				8.4	42		1.7	1	1
5/14	13.9				5.5	36		1.8	1	1
5/28	17.2				5	26		2.4	2	1
6/9	20.6				9.1	34		1.3	2	4
6/25	27.2				17	44		1.4	3	3
7/9	27.2				13	32		1.2	2	3
7/21	27.2				27	37		1.7	3	4
8/8	26.1				22	41		1.5	3	3
8/18	25.5				17			1.2	3	2
9/5	20				47	66		1	3	4
9/18	20				29	54		1.6	2	3
10/2	15				29	62		1.5	2	1
10/17	11					68		1.1	3	4



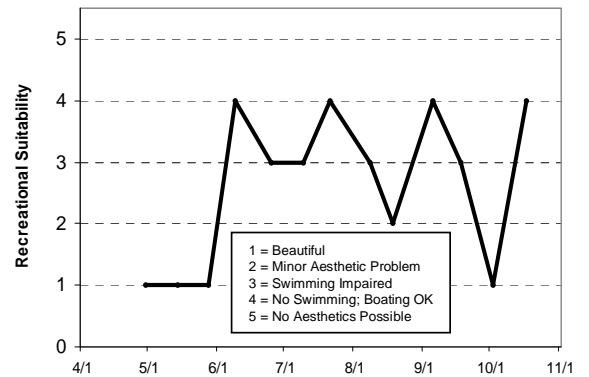
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Legion Pond (82-0462) Valley Branch Watershed District

Legion Pond is located in the City of Lake Elmo (Washington County). The lake has a surface area of 16 acres. The watershed of the lake has an area of 224 acres, which results in a watershed-to-lake area ratio of 14:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

A search through the STORET nationwide database for historic water quality data showed only past CAMP data. The years 2005, 2006, and 2008 are the only known years of available data. The lake was monitored 7 times between late April and mid October. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2006 summer (May-September) data summary

Parameter	Mean	Minimum	Maximum	Grade
TP (µg/l)	158.4	85.0	368.0	F
CLA (µg/l)	72.8	8.8	280.0	D
Secchi (m)	0.8	0.5	0.9	D
TKN (mg/l)	2.26	1.30	4.20	
Overall Grade				D

The lake received a lake grade of D for 2008. The TP grade of F and the CLA grade of D are the worst grades for these parameters that the lake received in the three years of CAMP monitoring. It appears that the 2008 water quality was less than that observed in 2005 and 2006. Continued monitoring is suggested to continue to build the water quality database to determine potential trends in the lake's water quality.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 2.6 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 3.2 for recreational suitability (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

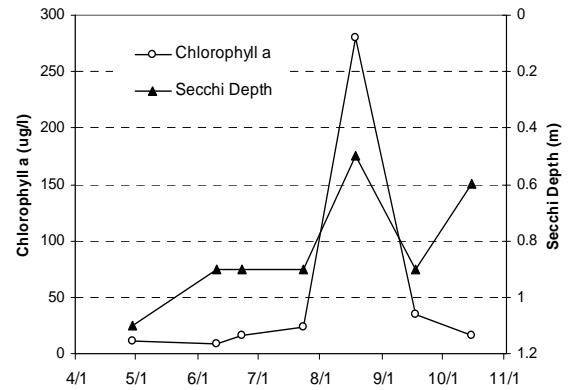
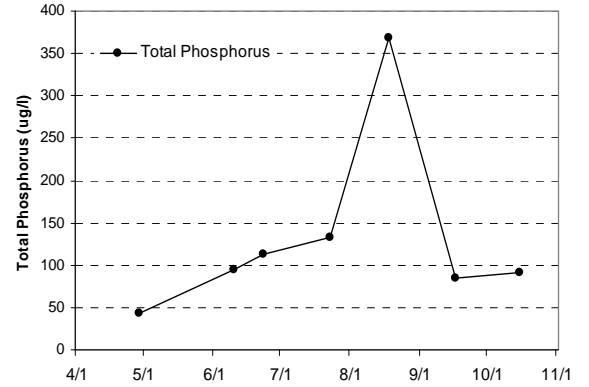
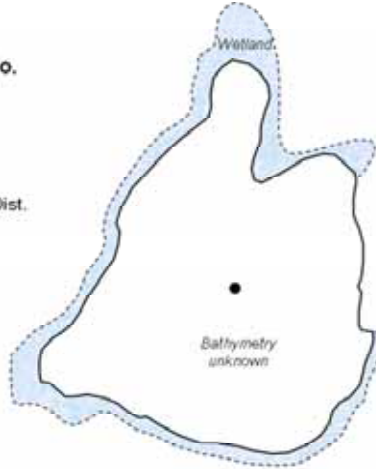
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Legion Pond Lake Elmo, Washington Co.

Lake ID: 820462
WD: Valley Branch

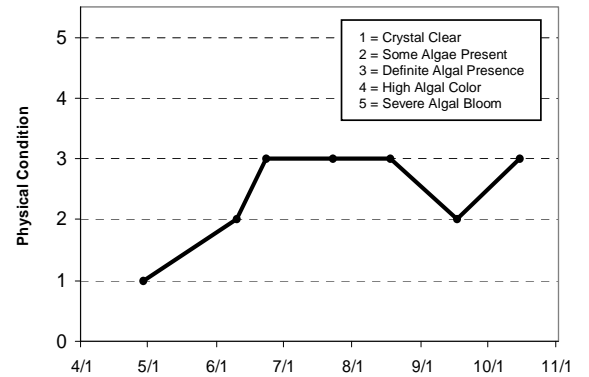
Volunteer: Washington Conserv. Dist.

● 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
4/29	7.1		12.7		11	43		1.1	1	2
6/10	22.6	21.9	7.15	0.97	8.8	94		0.9	2	4
6/23	28.6	25.8	7.35	2.2	16	113		0.9	3	3
7/23	25.6	24.9	3.47	4.3	24	132		0.9	3	2
8/18	25.4	24.9	8.48	0.28	280	368		0.5	3	4
9/17	19.8	19.8	8.9	0.56	35	85		0.9	2	3
10/15	12.8	12.8	8.84	7.8	16	91		0.6	3	4



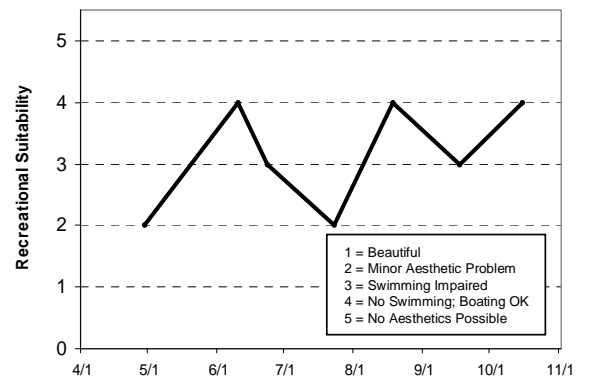
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



LeMay Lake (19-0082) Gun Club Lake Watershed Management Organization

LeMay Lake is located in the City of Mendota Heights. It has a surface area of 34 acres and an average depth of 1.6 m (5.1 ft), which gives it a volume of 173 acre-feet. The maximum depth is 4.0 m (13 ft).

A search through the STORET nationwide water quality database provided Secchi transparency data for sporadic dates in 1998, 2000-2003, and 2005-2007. The 2007 CAMP data was also found in the STORET system.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	31.1	26.0	40.0	B
CLA ($\mu\text{g/l}$)	7.0	2.2	15.0	A
Secchi (m)	1.8	1.0	2.3	C
TKN (mg/l)	1.54	1.20	1.90	
			Lake Grade	B

The lake received a lake grade of B for 2008, which is an improvement over last year's C lake grade. All three water quality parameters received one letter grade better for 2008 than for 2007. Continued monitoring is suggested to continue to build the historical database for determining water quality trends.

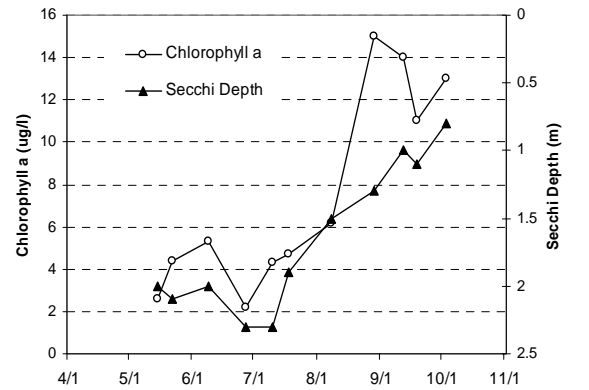
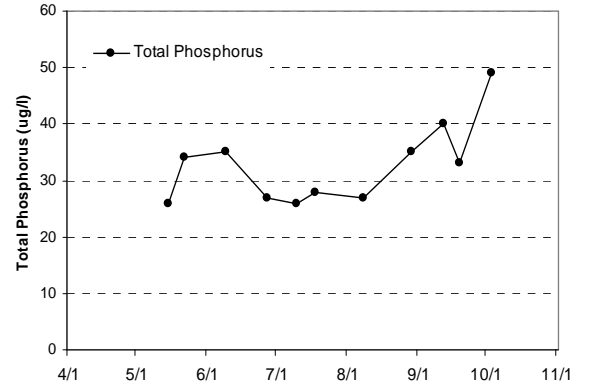
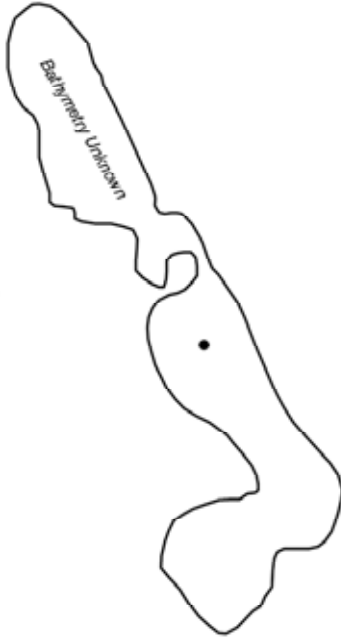
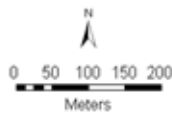
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 2.0 for physical condition ("some algae present"), and 3.5 for recreational suitability (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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

LeMay Lake
Mendota Heights,
Dakota Co.

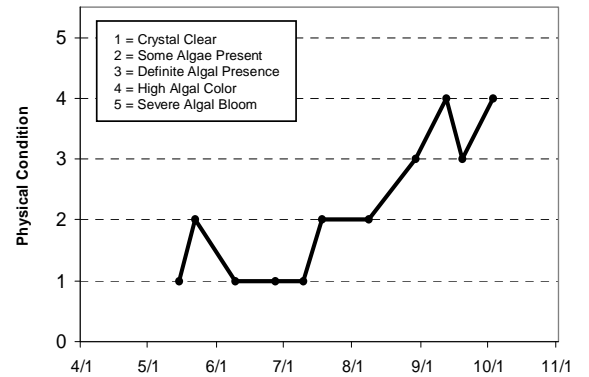
Lake ID: 190082
WMO: Gun Club Lake
Volunteer: City of Mendota Heights

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/15	19.4				2.6	26		2	1	1
5/22	20.4				4.4	34		2.1	2	3
6/9	23				5.3	35		2	1	3
6/27	26.7				2.2	27		2.3	1	4
7/10	25.8				4.3	26		2.3	1	4
7/18	29.3				4.7	28		1.9	2	4
8/8	26.8				6.2	27		1.5	2	4
8/29	24.3				15	35		1.3	3	4
9/12	21.1				14	40		1	4	4
9/19	21.8				11	33		1.1	3	4
10/3	17.4				13	49		0.8	4	3



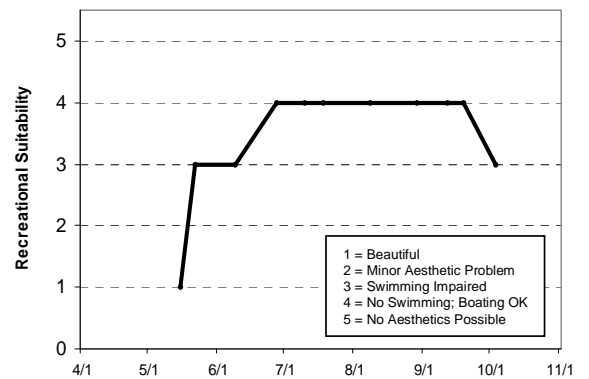
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Lily Lake (82-0023) City of Stillwater

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

A search for water quality data through STORET files resulted in a moderate amount of data. While 1995-2007 are the only years for which nutrient data are available, Secchi transparencies were collected through the MPCA's Citizen Lake Monitoring Program in 1985, and 1987-1992.

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

2008 summer (May-September) data summary

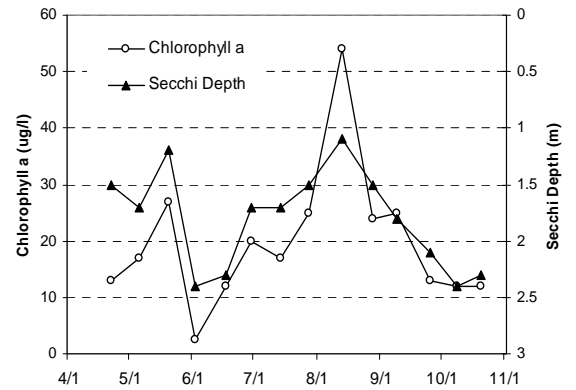
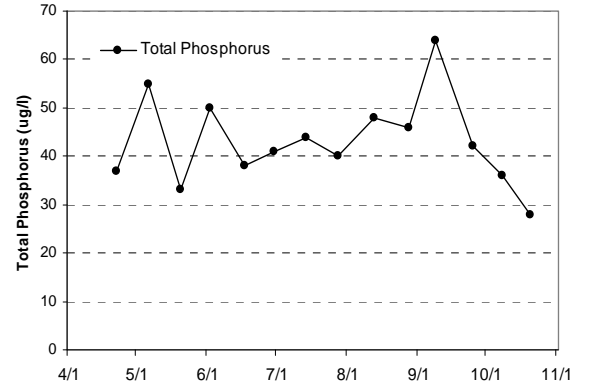
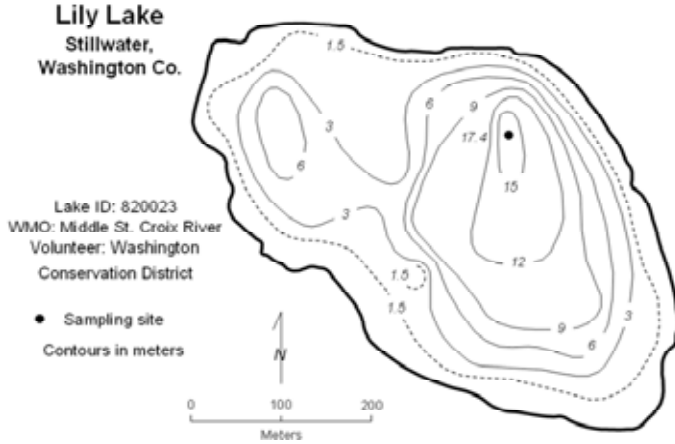
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	45.5	33.0	64.0	C
CLA (µg/l)	21.5	2.6	54.0	C
Secchi (m)	1.7	1.1	2.4	C
TKN (mg/l)	1.85	1.60	2.20	
			Lake Grade	C

The lake received a lake grade of C for 2008, which is similar to the lake grades it has received in previous years. On the basis of the historical water quality database, the lake appears represented by a lake grade of C. However, there appears to be more variation in the historical CLA and water clarity grades. But the historical TP grades have been a constant C grade for the past 14 years. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 2.6 for physical condition (between 2- "some algae present" and 3- "definite algae present"), and 2.9 for recreational suitability (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

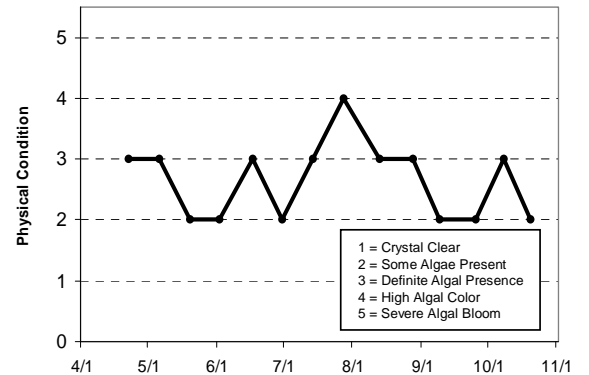
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	7.2	3.3	11.48	2.43	13	37		1.5	3	3
5/6	13.8	3.4	11.73	1.41	17	55		1.7	3	4
5/20	15.5	3.5	11.41	0.27	27	33	201	1.2	2	3
6/2	20.6	3.6	6.82	0.18	2.6	50	204	2.4	2	3
6/17	21.1	3.7	8.36	0.24	12	38	334	2.3	3	2
6/30	24	3.8	8.63	0.81	20	41	396	1.7	2	3
7/14	24.3	3.8	7.35	0.52	17	44	375	1.7	3	3
7/28	26.4	3.9	9.4	0.42	25	40	422	1.5	4	3
8/13	24.9	4.1	7.82	0.34	54	48	733	1.1	3	3
8/28	22.5	4.1	4.65	0.22	24	46	891	1.5	3	2
9/9	20	4.1	6.47	0.26	25	64	821	1.8	2	3
9/25	19.7	4.3	6.65	0.26	13	42	844	2.1	2	3
10/8	15.7	4.3	6.75	0.28	12	36	838	2.4	3	3
10/20	13	4.5	7.15	0.37	12	28	805	2.3	2	3



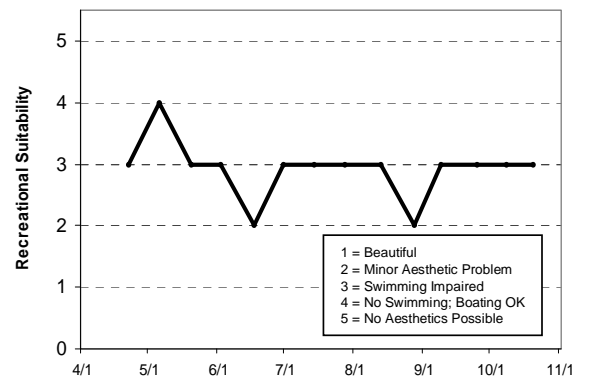
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Linwood Lake (2-0026) Anoka County Parks

Linwood Lake is located in Linwood Township (Anoka County). The lake is considered a “Priority Lake” by the Metropolitan Council because of its high regional recreation value. The lake has a surface area of 559 acres, and a maximum depth of 13 m (42 feet). Approximately 85 percent of the surface area of the lake is considered littoral zone, which is the 0-15 feet depth zone of the lake where the majority of aquatic plants are located.

The year 2008 was the first year the lake was monitored via the CAMP. A search for water quality data through STORET files resulted in an appreciable amount of data. Metropolitan Council staff monitored the lake occasionally in the 1980s and 1990s. Additional data were collected by the MPCA’s volunteer lake monitoring program and Anoka County.

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

2008 summer (May-September) data summary

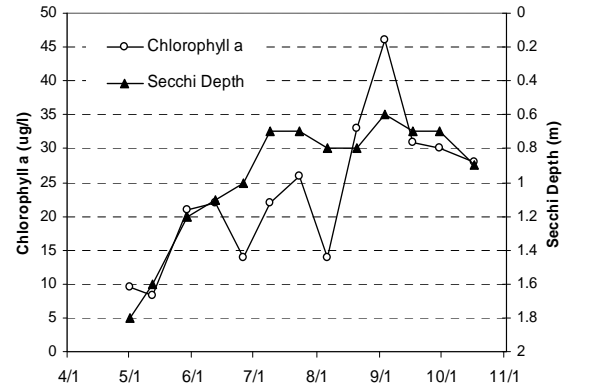
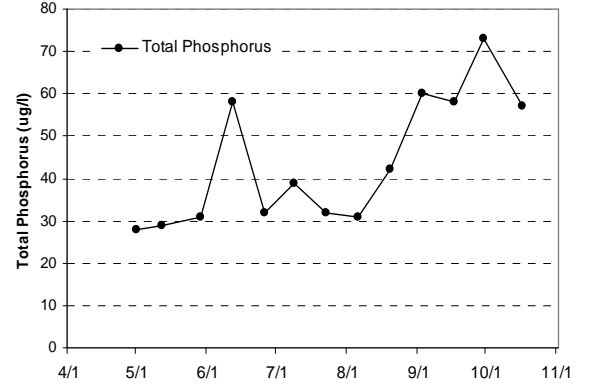
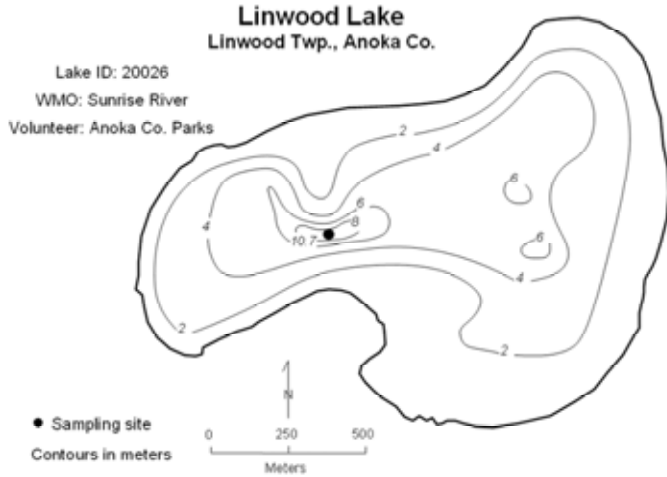
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	42.8	28.0	73.0	C
CLA (µg/l)	23.1	8.3	46.0	C
Secchi (m)	1.0	0.6	1.8	D
TKN (mg/l)	1.40	0.78	2.40	
			Lake Grade	C

The lake received a lake grade of C for 2008, which is similar to the lake grades it has received in previous years. On the basis of the historical water quality database, the lake appears represented by a lake grade of C. Similarly, the historical TP grades have been a C grade since 1983. However, there appears to be more variation in the historical water clarity grades as it has been a C or D for a given year. A trend analysis conducted by the MPCA on the lake’s Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

The volunteer’s perceptions of the physical and recreational conditions of the lake are shown on the next page (ranked on a scale of 1 to 5). The average user perception rankings were 2.7 for physical condition (between 2- “some algae present” and 3- “definite algae present”), and 1.9 for recreational suitability (between 1- “beautiful” and 2- “minor aesthetic problem”).

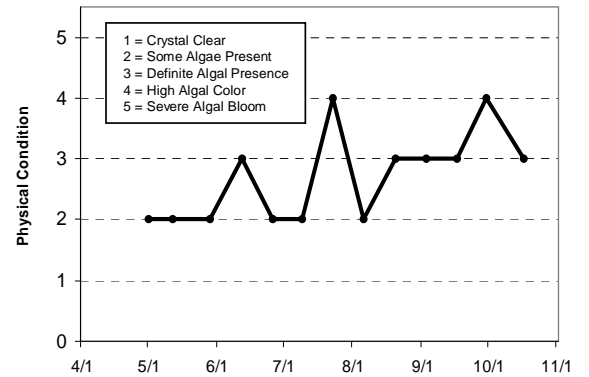
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/1	8.5				9.5	28		1.8	2	
5/12	12.9				8.3	29		1.6	2	
5/29	17.3				21	31		1.2	2	1
6/12	19.8				22	58		1.1	3	2
6/26	26.2				14	32		1	2	1
7/9	25.2				22	39		0.7	2	2
7/23	26.4				26	32		0.7	4	3
8/6	26.1				14	31		0.8	2	2
8/20	25.5				33	42		0.8	3	2
9/3	21.4				46	60		0.6	3	
9/17	17.5				31	58		0.7	3	
9/30	16.3				30	73		0.7	4	
10/17	11.7				28	57		0.9	3	



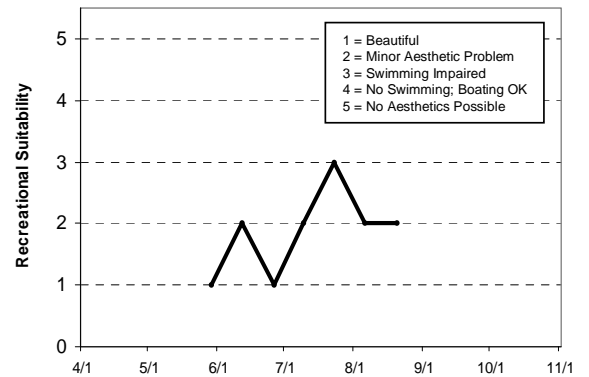
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Little Carnelian Lake is located in Stillwater Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity. The lake has a surface area of 162 acres, and has a shoreline length of 1.7 miles. It has a mean and maximum depth of 10.7 m (35 feet) and 21.3 m (70 feet), respectively. The mean depth of the lake and its surface area translate to an approximate lake volume of 5,686 ac-ft. The lake does not have a public access. The lake’s watershed has an area of 565 acres which translates to a watershed-to-lake area ratio of 3.5:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

This was the eighth year of CAMP monitoring in Little Carnelian Lake. A search of the STORET nationwide water quality database for data on the lake revealed a moderate database throughout the 1990’s with nutrient data available in 1991-1996 and 1998-2007.

The lake was monitored 7 times between early May and mid October. On each sampling day the lake was monitored for Secchi transparency and dissolved oxygen as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)				
CLA (µg/l)				
Secchi (m)	5.6	2.1	7.9	A
TKN (mg/l)				
Lake Grade				

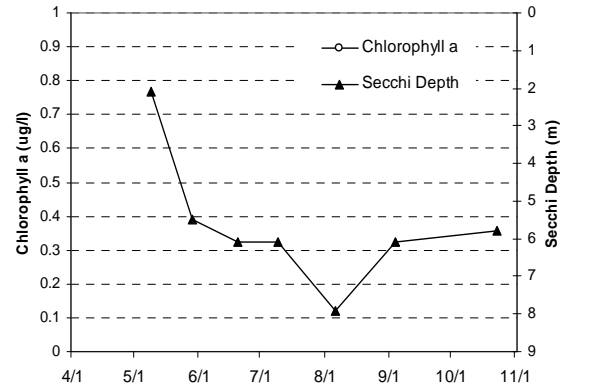
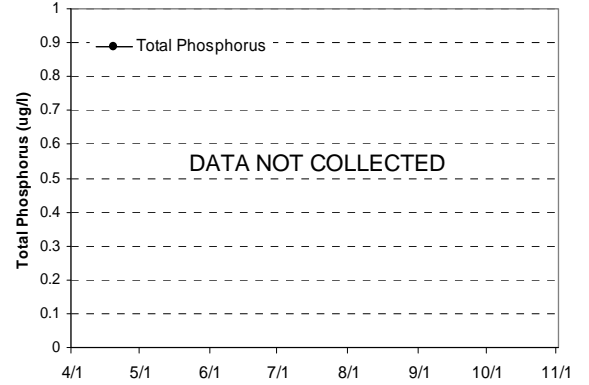
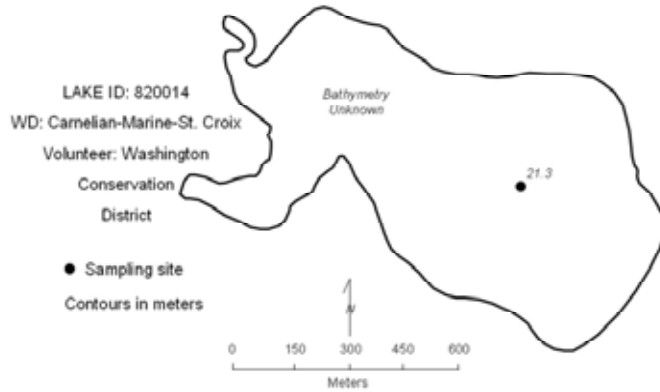
Similar to all past years of CAMP monitoring, the lake received a water clarity grade of A. TP and CLA were not monitored in 2008 so a lake grade cannot be determined. The historical water quality database indicates that the lake’s water quality is well represented by a lake grade of A. A trend analysis conducted by the MPCA on the lake’s Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

The volunteer’s perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.6 (between 2- “some algae present” and 3- “definite algae present”). The average recreational suitability ranking was 2.9 (between 2- “minor aesthetic problem” and 3- “swimming slightly impaired”).

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

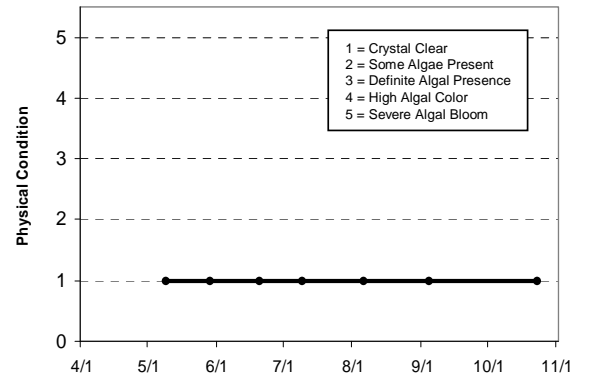
If you notice any errors in the lake’s data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Little Carnelian Lake
Stillwater Twp., Washington Co.



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/9	12.2	5.4	12.55	0.66				2.1	1	1
5/29	16.6	5.7	9.57	0.26				5.5	1	1
6/20	21.9	6	8.81	0.2				6.1	1	1
7/9	24.8	6.1	7.91	0.37				6.1	1	1
8/6	26	6.3	7.26	0.24				7.9	1	1
9/4	22.5	6.3	7.37	0.19				6.1	1	1
10/23	12.7	6.9	8.87	0.41				5.8	1	1



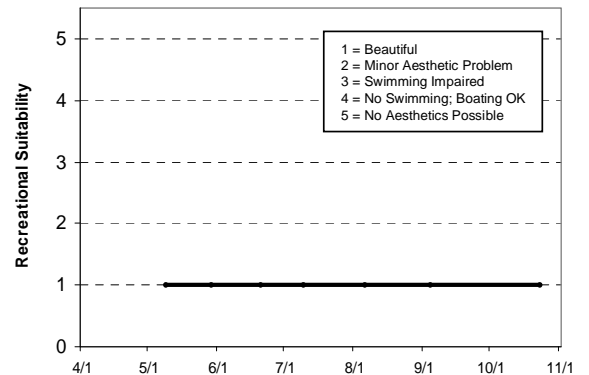
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Little Comfort Lake is located near the City of Wyoming (Chisago County). The lake has a maximum depth of 17.0 m (56 feet). Approximately 44 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

This was the third year that Little Comfort Lake has been involved in CAMP. A search through the STORET nationwide water quality database for data on the lake provided additional data for 1994.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	35.0	20.0	101.0	C
CLA ($\mu\text{g/l}$)	11.1	6.0	15.0	B
Secchi (m)	1.7	1.3	2.0	C
TKN (mg/l)	1.04	0.64	1.90	
			Lake Grade	C

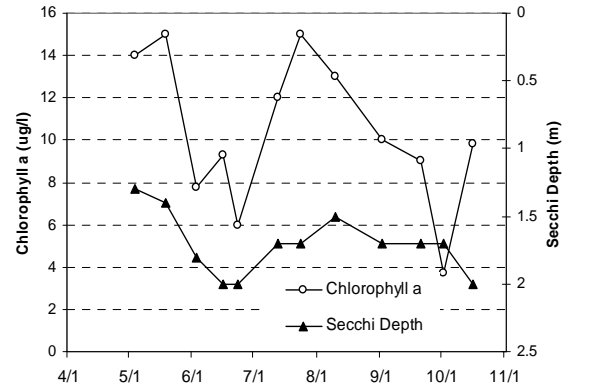
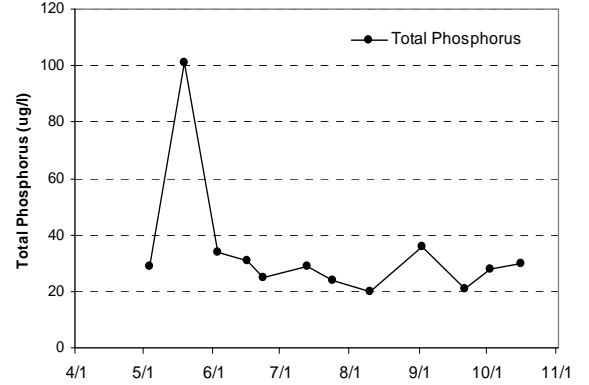
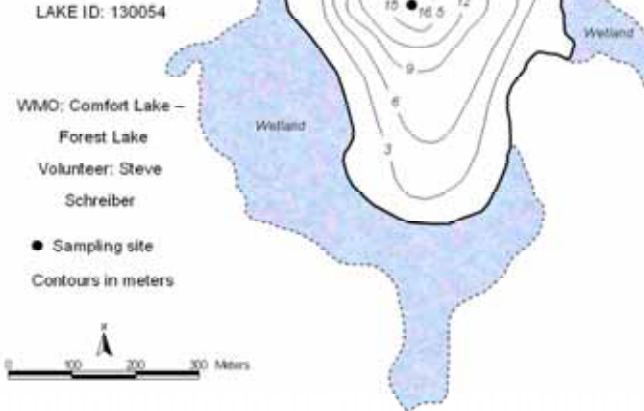
The lake received a lake grade of C for 2008. It also received C grades in 1994 and 2006.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.0 ("some algae present"). The average recreational suitability ranking was 1.9 (between 1- "beautiful" and 2- "minor aesthetic problem").

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

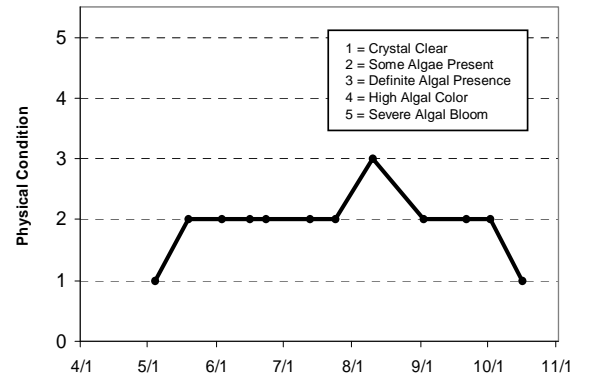
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Little Comfort Lake
Wyoming Twp., Chisago Co.



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	9.1				14	29		1.3	1	1
5/19	9.8				15	101		1.4	2	1
6/3	18.9				7.8	34		1.8	2	2
6/16	21.6				9.3	31		2	2	2
6/23	22.4				6	25		2	2	2
7/13	26.8				12	29		1.7	2	2
7/24	27.7				15	24		1.7	2	2
8/10	25.6				13	20		1.5	3	2
9/2	19.9				10	36		1.7	2	3
9/21	17.8				9	21		1.7	2	2
10/2	16.3				3.7	28		1.7	2	2
10/16	13.2				9.8	30		2	1	1



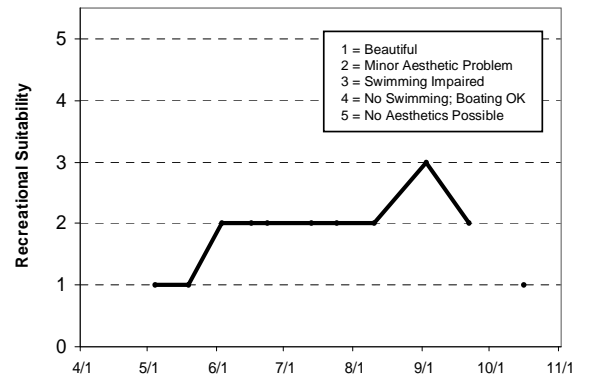
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Little Johanna Lake (62-0058) Rice Creek Watershed District

Little Johanna Lake is located on the boundary between the Cities of Arden Hills and Roseville (Ramsey County). The lake has a surface area of 18 acres and a maximum depth of 12.0 m (39 feet). The littoral area is approximately 67 percent of the surface area. The littoral area overlies the 0-15 feet depth zone, and it is the location of the majority of the lake's aquatic plants.

A search through the STORET nationwide water quality database for historical data revealed just the historical CAMP data.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	44.6	24.0	78.0	C
CLA ($\mu\text{g/l}$)	13.2	4.1	32.0	B
Secchi (m)	1.5	0.7	2.3	C
TKN (mg/l)	1.71	0.76	3.00	
			Lake Grade	C

The lake received a lake grade of C for 2008, which is similar to the historical lake grades. The lake appears well represented by a lake grade of C. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.3 (2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.6 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

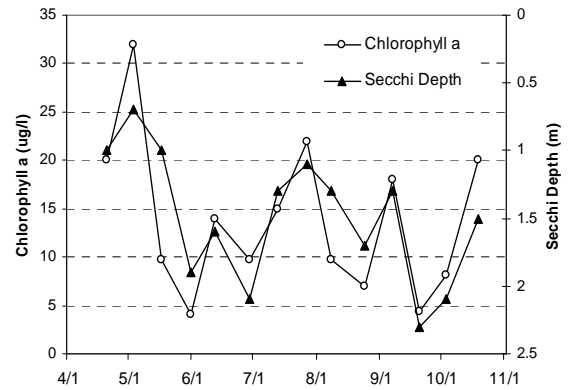
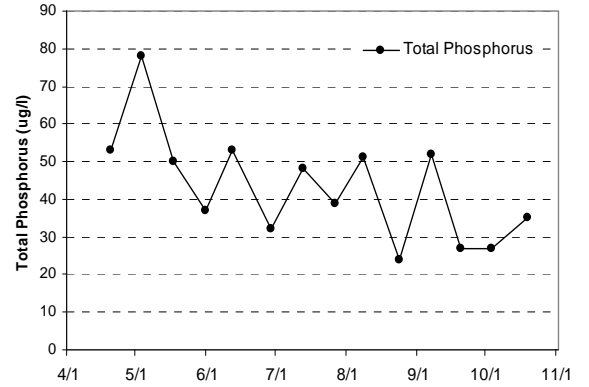
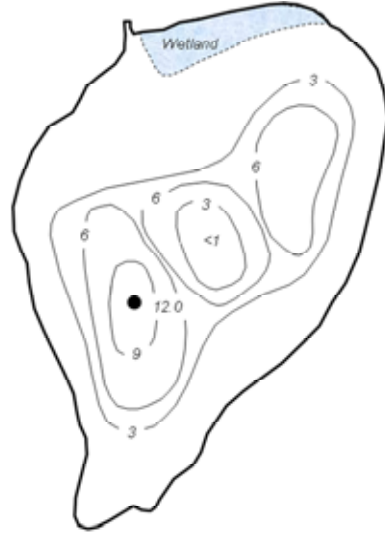
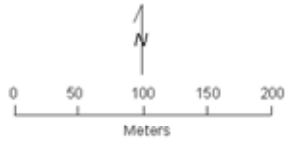
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Little Johanna Lake
Arden Hills/Roseville,
Ramsey Co.

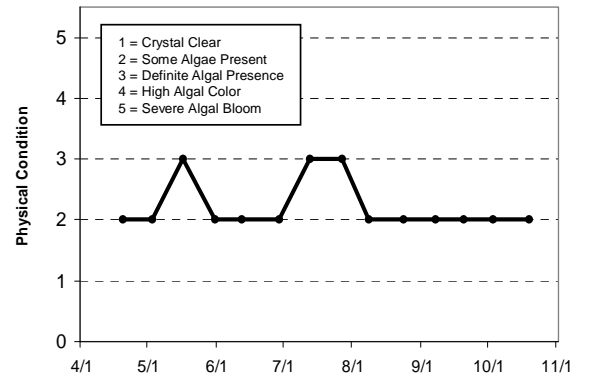
Lake ID: 620058
WD: Rice Creek
Volunteer: Fred Fox

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/20	12.1				20	53		1	2	2
5/3	10.6				32	78		0.7	2	2
5/17	19.2				9.8	50		1	3	3
5/31	18.1				4.1	37		1.9	2	2
6/12	22				14	53		1.6	2	3
6/29	25.1				9.8	32		2.1	2	3
7/13	24.5				15	48		1.3	3	3
7/27	26.1				22	39		1.1	3	3
8/8	26.1				9.7	51		1.3	2	3
8/24	24.9				6.9	24		1.7	2	3
9/7	20.1				18	52		1.3	2	2
9/20	22.3				4.4	27		2.3	2	2
10/3	16.8				8.1	27		2.1	2	2
10/19	12.6				20	35		1.5	2	2



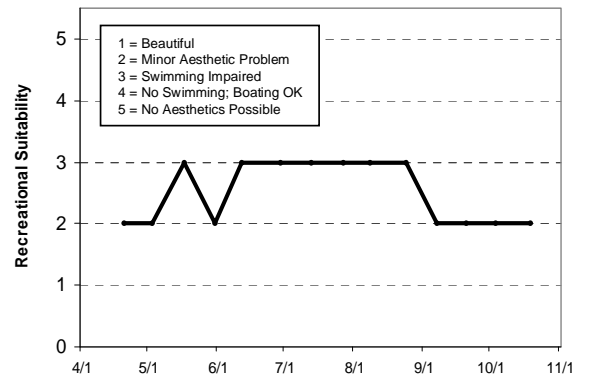
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Lochness Lake (2-0585) Rice Creek Watershed District

Lochness Lake is located in the City of Blaine (Anoka County). It has a surface area of 5.3 acres. There is little known morphological data available for the lake other than it has a maximum depth of 4.9 m (16 ft). Because of the shallowness of the lake, the entire area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. Also the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

A search for historical water quality data via STORET, the nationwide water quality database, provided the historical CAMP data only. The lake was monitored 11 times between mid April and mid October. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	30.0	18.0	90.0	B
CLA ($\mu\text{g/l}$)	6.8	2.8	12.0	A
Secchi (m)	2.6	2.0	3.0	B
TKN (mg/l)	1.61	1.20	1.90	
			Lake Grade	B

The lake received a lake grade of B for 2008, which is a reduction in water quality compared to last year's lake grade of A. Continued monitoring is suggested to build a historical water quality database for determining water quality trends.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions is ranked on a scale of 1 to 5. The average physical condition ranking was 2.3 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 4.0 ("no swimming/boating ok").

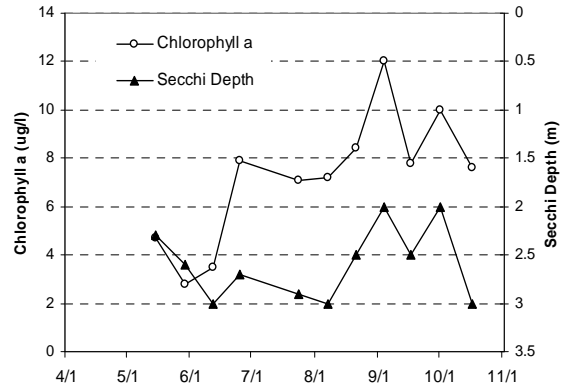
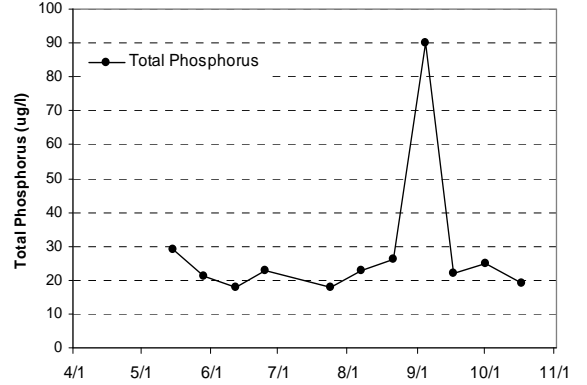
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake in 2005. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Lochness Lake Blaine, Anoka Co.

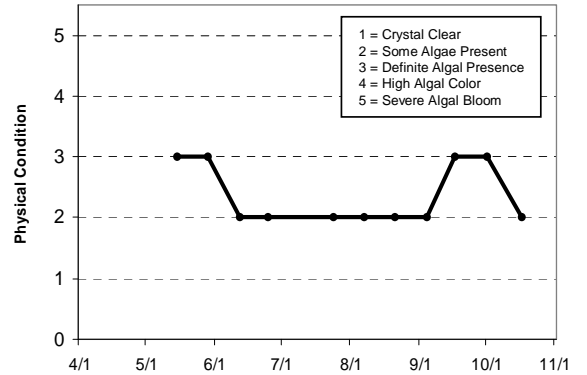
Lake ID: 20585
WD: Rice Creek
Volunteers: Jim & Tricia Hafner

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/15	15.8				4.7	29		2.3	3	4
5/29	18.3				2.8	21		2.6	3	4
6/12	19.6				3.5	18		3	2	4
6/25	24.6				7.9	23		2.7	2	4
7/24	25.9				7.1	18		2.9	2	4
8/7	25.7				7.2	23		3	2	4
8/21	25.9				8.4	26		2.5	2	4
9/4	21.6				12	90		2	2	4
9/17	18.7				7.8	22		2.5	3	4
10/1	17.1				10	25		2	3	4
10/17	12.7				7.6	19		3	2	4



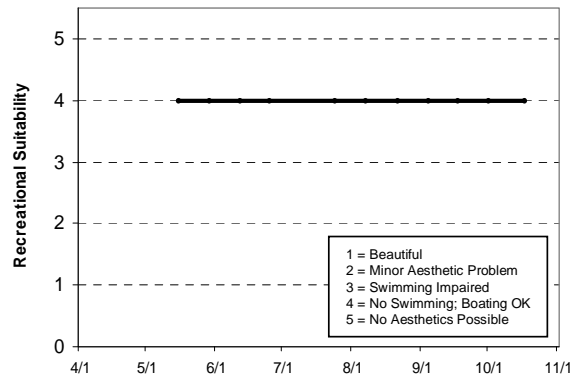
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Long Lake [Apple Valley] (19-0022) *City of Apple Valley*

Long Lake, which has a surface area of roughly 36 acres, is located within the City of Apple Valley (Dakota County). The maximum depth of the lake is approximately 3.5 m (10 feet). There are no other known morphological data available for the lake. Because the lake is relatively shallow, it does not develop and maintain a thermocline, which is a density gradient owed to changing water temperatures throughout the water column. The entire lake is considered littoral zone, which is the shallow (0-15 feet) zone dominated by aquatic plants.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	260.4	82.0	492.0	F
CLA ($\mu\text{g/l}$)	211.2	23.0	520.0	F
Secchi (m)	0.4	0.2	0.7	F
TKN (mg/l)	4.12	1.20	7.10	
			Lake Grade	F

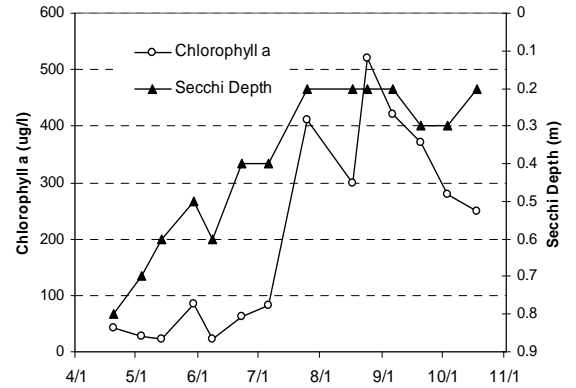
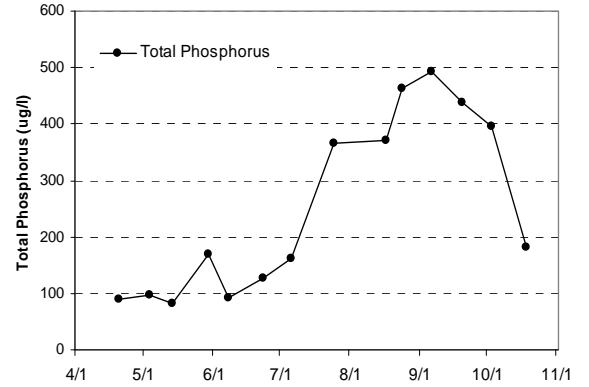
The lake received a lake grade of F for 2008, which is similar to those recorded in 2002-2007, and worse than the lake grade of D recorded in 1997. On the basis of the lake's historical water quality database, the water quality of the lake appears represented by a lake grade of F.

Throughout the course of the study, the volunteers ranked their perceptions of the lake's physical and recreational condition on a 1-to-5 scale. These user perception rankings are shown on the lake's information sheet on the following page. The mean physical condition ranking was 2.9 (between 2- "some algae present" and 3- "definite algae present"), while the mean recreational suitability was 3.8 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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

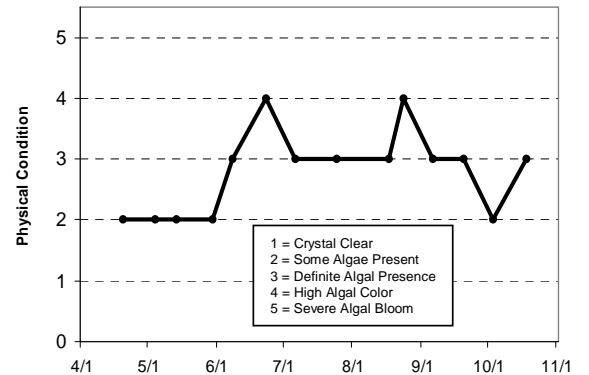
Long Lake
Apple Valley, Dakota Co.

Lake ID: 190022
WMO: Dakota County
Volunteers: Christy McGlocklin & Al Kettlekamp



2008 Data

DATE	Surf 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	9.2				42	90		0.8	2	4
5/4	13.9				28	98		0.7	2	2
5/14	17.8				23	82		0.6	2	2
5/30	20.2				84	170		0.5	2	2
6/8	22.4				23	93		0.6	3	4
6/23	28				63	127		0.4	4	5
7/6	30.5				82	162		0.4	3	5
7/25	27.2				410	367		0.2	3	4
8/17	26.2				300	372		0.2	3	4
8/24	24				520	464		0.2	4	4
9/6	18.7				420	492		0.2	3	4
9/20	21.5				370	437		0.3	3	4
10/3	17				280	396		0.3	2	4
10/18	11.4				250	182		0.2	3	4



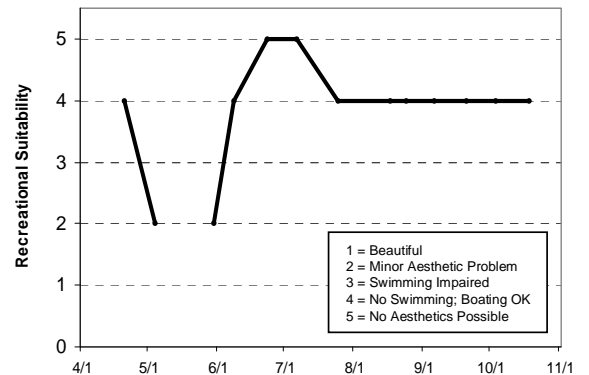
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Long Lake [Mahtomedi] (82-0130) Rice Creek Watershed District

Long Lake is located within the City of Mahtomedi (Washington County). It has a surface area of 48 acres and a maximum depth of 7.7 m (25 feet). Approximately 92 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

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

A search through the STORET nationwide water quality database for historic data on the lake revealed just the historical CAMP data.

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

2008 summer (May-September) data summary

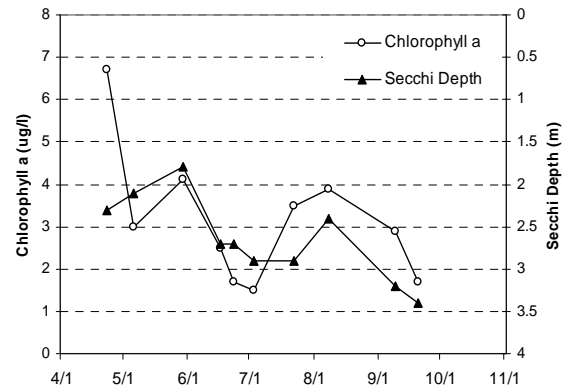
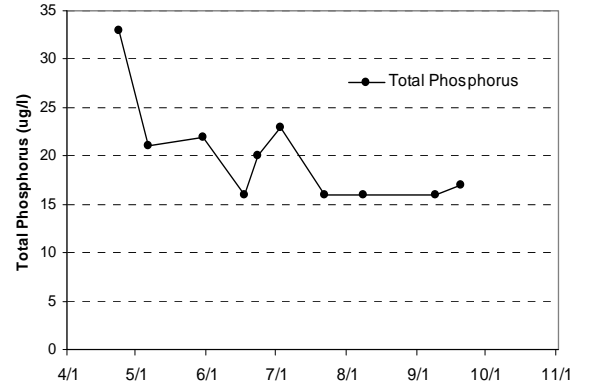
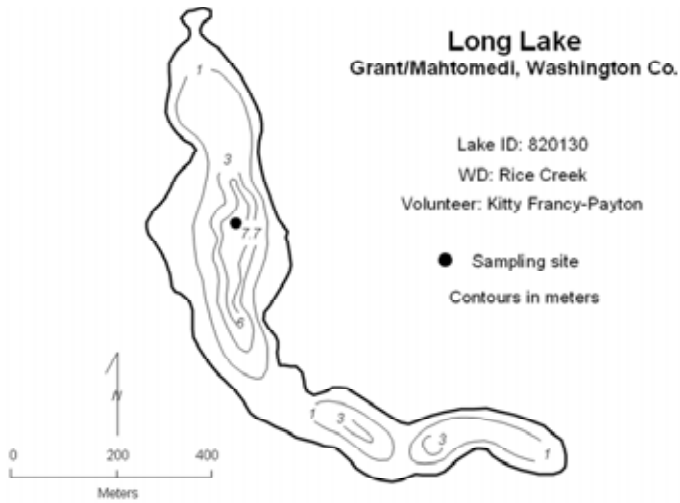
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	18.6	16.0	23.0	A
CLA (µg/l)	2.8	1.5	4.1	A
Secchi (m)	2.7	1.8	3.4	B
TKN (mg/l)	0.58	0.31	0.73	
Lake Grade				A

The lake received a lake grade of A for 2008, which is similar to the lake grade received in 2004, and it is an improvement over lake grades of the past 3 years. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). To better understand the lake's water quality and where it may be heading, additional years of data collection are needed to continue to build the water quality database.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions is ranked on a scale of 1 to 5. The average physical condition ranking was 2.2 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.4 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

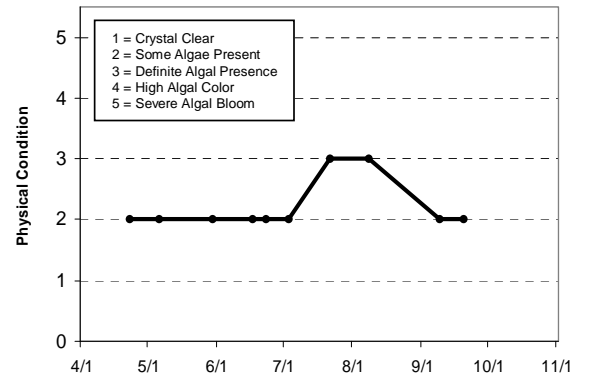
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake in 2005. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/23	9.2				6.7	33		2.3	2	2
5/6	14.9				3	21		2.1	2	3
5/30	17.2				4.1	22		1.8	2	2
6/17	21.1				2.5	16		2.7	2	2
6/23	23.5				1.7	20		2.7	2	2
7/3	18.2				1.5	23		2.9	2	2
7/22	26.1				3.5	16		2.9	3	3
8/8	25.7				3.9	16		2.4	3	3
9/9	19.3				2.9	16		3.2	2	3
9/20	20.4				1.7	17		3.4	2	2



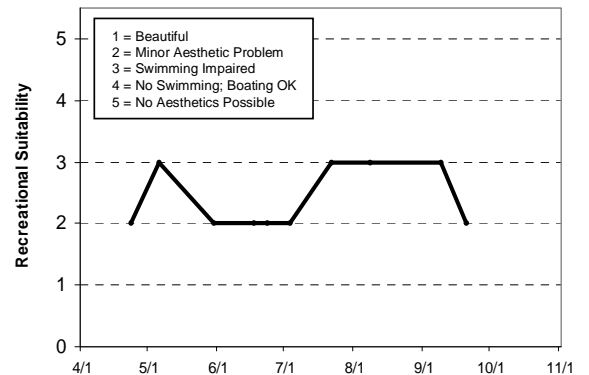
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Long Lake [May Township] (82-0030) *Marine on St. Croix WMO*

Long Lake is located in May Township (Washington County). It has a surface area of 88 acres. The maximum depth is 3.7 m (12 feet). There is no other morphological data available for the lake. The entire lake area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The lake does not maintain a thermocline which is a density gradient caused by changing water temperatures throughout the lake's water column.

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

2008 summer (May-September) data summary

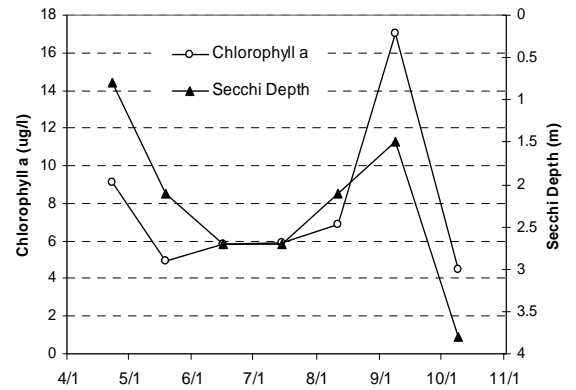
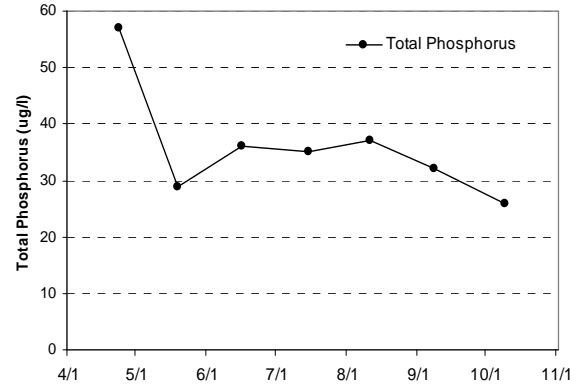
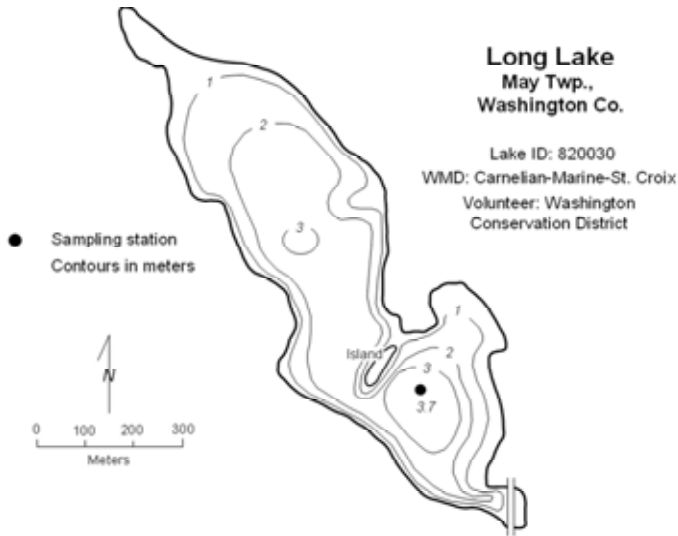
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	33.8	29.0	37.0	C
CLA (µg/l)	8.1	4.9	17.0	A
Secchi (m)	2.2	1.5	2.7	B
TKN (mg/l)	0.91	0.68	1.20	
			Lake Grade	B

The lake received a lake grade of B for 2008, which is consistent with the lake grades the lake has received over the past eight years. The lake's water quality is representative of a C+/B lake grade for the past decade. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions is ranked on a scale of 1 to 5. The average physical condition ranking was 2.2 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.8 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

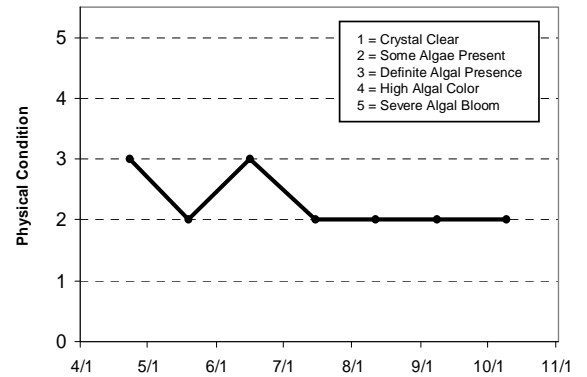
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/23	9.5	7.1	8.81	1.04	9.1	57		0.8	3	3
5/19	16.2	0	8.28	0	4.9	29		2.1	2	3
6/16	21	18.1	8.36	0.38	5.8	36	56	2.7	3	2
7/15	23.7	21.4	7.26	0.23	5.9	35	37	2.7	2	3
8/11	24.7	20.5	5	0.19	6.9	37	158	2.1	2	3
9/8	19.4	18.8	2.2	0.17	17	32	35	1.5	2	3
10/9	13.6	13.6	6.85	0.48	4.5	26	25	3.8	2	2



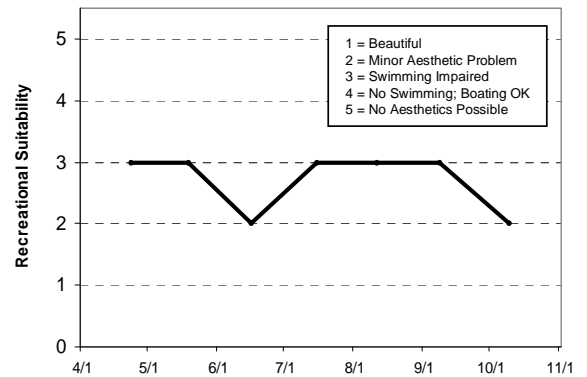
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Long Lake [Pine Springs] (82-0118) Valley Branch Watershed District

Long Lake is located in Pine Springs Township (Washington County). It has a surface area of 62 acres. The mean and maximum depths of the lake are 3.6 m (12 feet) and 10.4 m (34 feet), respectively. Approximately 55 percent of the lake's surface area is considered littoral zone which is the 0-15 feet depth zone of aquatic vegetation dominance. The lake's size and mean depth translate into a lake volume of 744 ac-ft. The lake's surface area and watershed area of 2,060 acres translates to a 33:1 watershed-to-lake area ratio. Generally the larger the ratio, the greater the potential stress on the lake from surface runoff.

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

The lake has been monitored in the past by Council staff (most recently in 2003). This was the sixth year that the lake has been monitored via the CAMP. A search for water quality data on Long Lake uncovered a very small database. The only other years of water quality data other than CAMP data were 1984, 1993, and 2003.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	24.9	15.0	59.0	B
CLA ($\mu\text{g/l}$)	8.2	3.2	14.0	A
Secchi (m)	2.7	1.7	3.5	B
TKN (mg/l)	1.17	0.51	1.80	
			<i>Lake Grade</i>	B

The lake received a lake grade of B for 2008. The annual lake grades appear to vary between B and C. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions is ranked on a scale of 1 to 5. The average physical condition ranking was 2.6 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.8 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

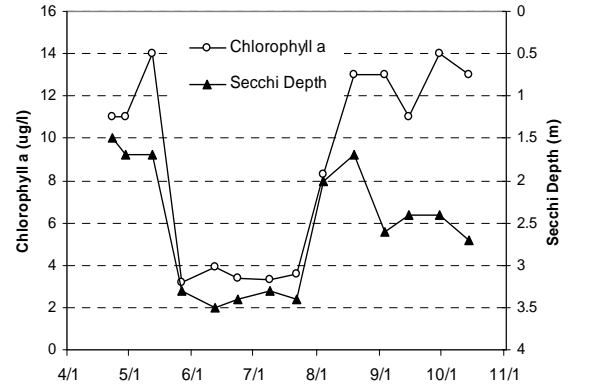
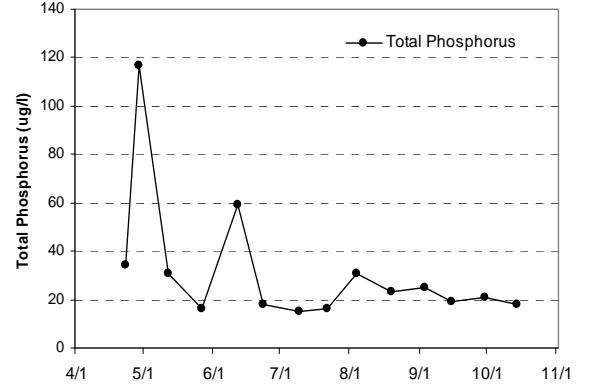
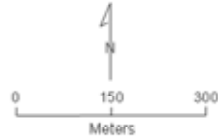
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Long Lake
Pine Springs, Washington Co.

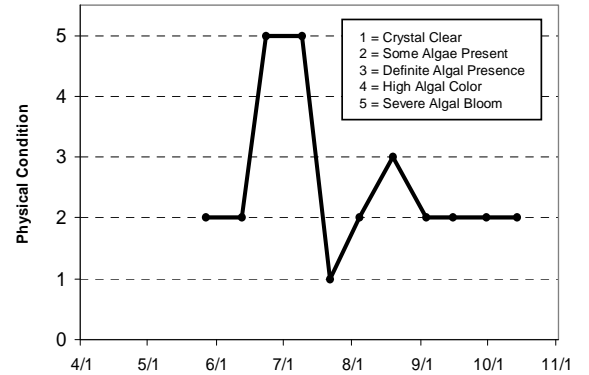
Lake ID: 820118
WD: Valley Branch
Volunteer: Bill Feely

● Sampling station
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/23	9.1				11	34		1.5		
4/29	8.4				11	117		1.7		
5/12	12.8				14	31		1.7		
5/27	17.7				3.2	16		3.3	2	2
6/12	20.4				3.9	59		3.5	2	3
6/23	25.1				3.4	18		3.4	5	4
7/9	24.7				3.3	15		3.3	5	4
7/22	25.6				3.6	16		3.4	1	2
8/4	26.8				8.3	31		2	2	3
8/19	25.3				13	23		1.7	3	3
9/3	22.5				13	25		2.6	2	3
9/15	20				11	19		2.4	2	2
9/30	18				14	21		2.4	2	2
10/14	14.7				13	18		2.7	2	1



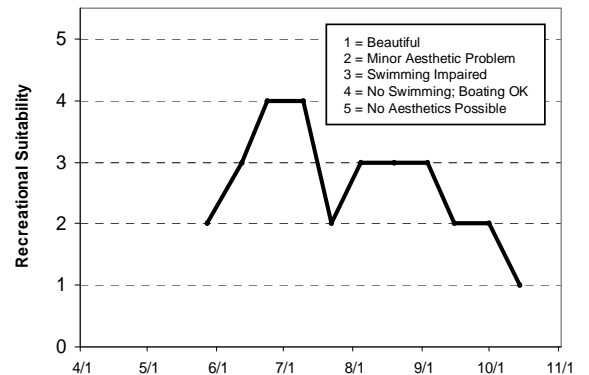
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Long Lake [Stillwater] (82-0021) Browns Creek Watershed District

Long Lake is located on the western boundary of the City of Stillwater (Washington County). It has a surface area of 96 acres, and its maximum depth is 6.7 m (22 feet). Approximately 95 percent of the surface area is considered littoral zone, which is the 0-15 feet depth zone dominated by aquatic vegetation.

This was the eleventh year that Long Lake has been involved in CAMP (1995-1996 and 1998-2008). Additionally, Secchi transparencies collected through the MPCA's Citizen Lake Monitoring Program are available for 1987, 1989, and 1991-1994.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	51.5	37.0	64.0	C
CLA (µg/l)	19.1	6.8	47.0	B
Secchi (m)	1.6	0.9	2.7	C
TKN (mg/l)	1.98	1.60	2.50	
			Lake Grade	C

The lake received a lake grade of C for 2008. On the basis of the historical water quality database, the lake's annual water clarity grades, prior to the C recorded in 2004, have been near constant Fs. The year 2008 was the first year that the lake received a B grade for CLA. This year's lake grade of C continues the improving trend since 2004. However, a recent MPCA conducted trend analysis on the lake's Secchi transparency data, revealed no statistically significant trends in recent water clarity (MPCA 2008).

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions is ranked on a scale of 1 to 5. The average physical condition ranking was 3.0 ("definite algae present"). The average recreational suitability ranking was 3.7 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

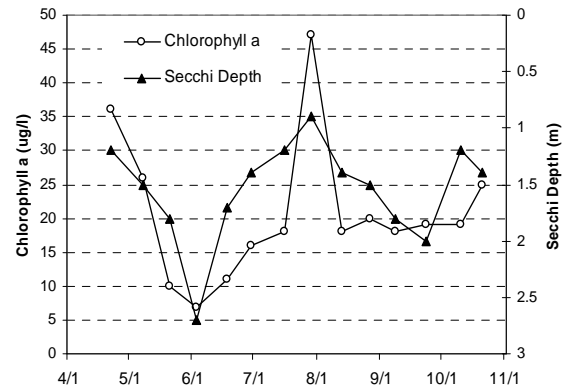
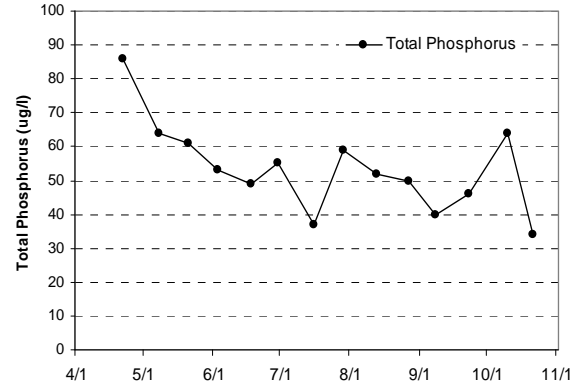
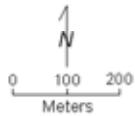
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Long Lake, Stillwater, Washington Co.

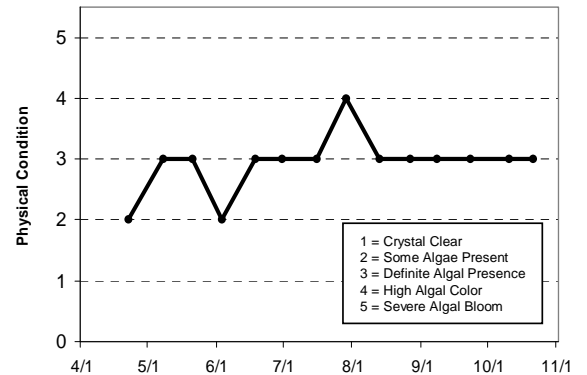
Lake ID: 820021
WD: Browns Creek
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	13.1	4.5	15	2.46	36	86		1.2	2	3
5/8	14.9	4.9	9.87	0.69	26	64		1.5	3	3
5/21	17.1	5.3	8.18	0.29	10	61		1.8	3	3
6/3	19.7	5.8	7.58	0.19	6.8	53		2.7	2	3
6/18	23.2	6.7	9.41	0.3	11	49		1.7	3	4
6/30	24.4	7.1	9.37	0.95	16	55		1.4	3	4
7/16	25.9	7.8	9.04	0.55	18	37		1.2	3	4
7/29	29.1	9.4	11.48	0.31	47	59		0.9	4	4
8/13	26.1	11.3	7.41	0.53	18	52		1.4	3	4
8/27	23.2	9.3	7.88	0.23	20	50		1.5	3	4
9/8	20.4	10.5	7.6	0.26	18	40		1.8	3	4
9/23	20.9	14.7	8.25	0.22	19	46		2	3	4
10/10	14.3	13.7	4.25	0.25	19	64		1.2	3	4
10/21	12.4	11.7	9.35	0.25	25	34		1.4	3	3



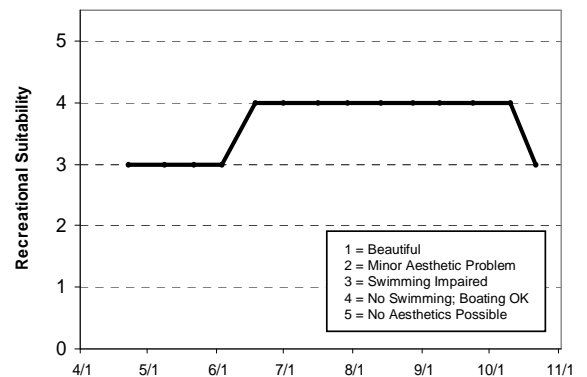
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Long Lake [Washington Co.] (82-0068) Carnelian - Marine Watershed District

Long Lake is located within City of Scandia (Washington County). The lake has a surface area of 35 acres. The maximum and mean depths are 2.1 m (6.9 ft) and 1.1 m (3.6 ft), respectively. The lake’s surface area and mean depth translates to an approximate volume of 126 ac-ft. Because of the shallowness of the lake, the entire surface area is considered littoral zone, which is the area where the majority of the lake’s aquatic plants are located. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The majority of the landuse within the lake’s 381-acre watershed is undeveloped. The watershed-to-lake area ratio is 11:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

A search through the STORET nationwide water quality database revealed data for 1998-1999 and the historical CAMP data. The lake was monitored 8 times between early May and early October. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake’s perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

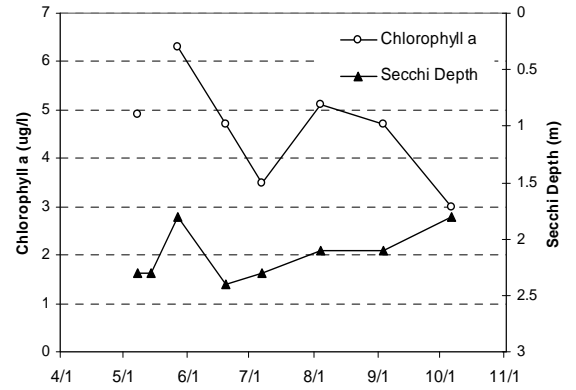
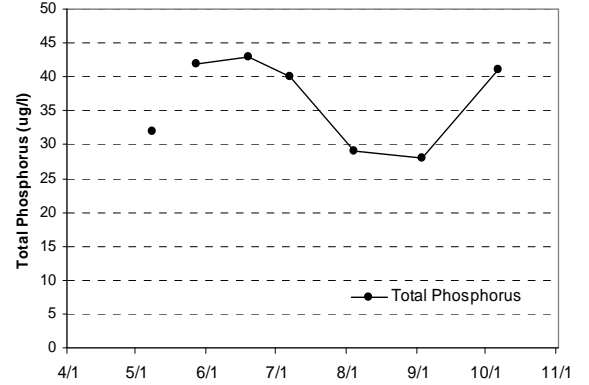
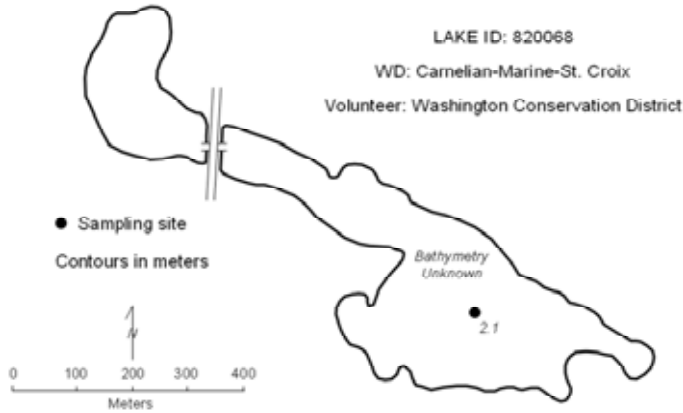
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	35.7	28.0	43.0	C
CLA (µg/l)	4.9	3.5	6.3	A
Secchi (m)	2.2	1.8	2.4	C
TKN (mg/l)	0.90	0.78	1.20	
			Lake Grade	B

The lake received a lake grade of B for 2008, which is the best lake grade the lake has received in all the know years of monitoring for this lake. The lake received F lake grades in the late 1990s and early 2000s. The water quality of the lake has steadily improved since then, especially with respect to water clarity and CLA concentrations. Continued monitoring is suggested to determine if this trend continues.

The volunteer’s perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.1 (2- “some algae present” and 3- “definite algae present”). The average recreational suitability ranking was 2.6 (between 2- “minor aesthetic problem” and 3- “swimming slightly impaired”).

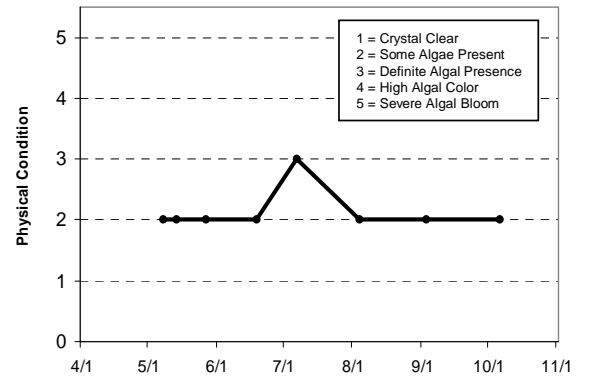
If you notice any errors in the lake’s data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Long Lake Scandia, Washington Co.



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/8	15.4	13.3	9.4	7.28	4.9	32		2.3	2	2
5/14	14.6							2.3	2	3
5/27	17	16.8	7.17	0.21	6.3	42		1.8	2	3
6/19	23.9	21.7	8.67	0.67	4.7	43		2.4	2	3
7/7	26.4	25.5	7.28	4.87	3.5	40		2.3	3	2
8/4	26.2	24.9	5.93	0.18	5.1	29		2.1	2	3
9/3	21.9	22	6.52	5.62	4.7	28		2.1	2	2
10/6	13.1	13.2	11.27	10.42	3	41		1.8	2	2



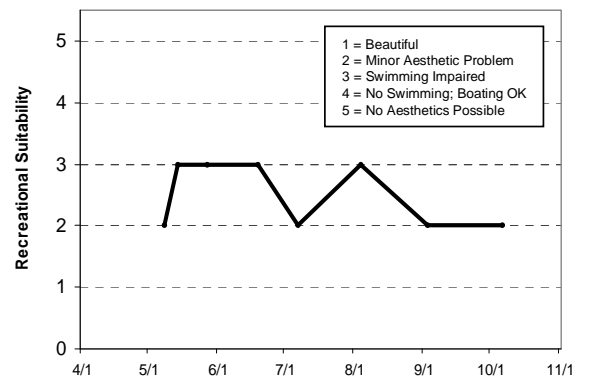
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Loon Lake (82-0015-02) Carnelian - Marine Watershed District

Loon Lake is located in Stillwater Township (Washington County). The surface area of the lake is 64 acres. It has a mean and maximum depth of 2.4 m (eight feet) and 4.9 m (16 feet), respectively. The mean depth of the lake and its surface area translate to an approximate lake volume of 206 ac-ft. Because of the shallowness of the lake, the majority of its area is considered littoral zone, which is the 0-15 feet depth zone dominated by aquatic vegetation. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column. The lake's 407-acre watershed translates to a 6.4:1 watershed-to-lake size ratio. The greater the ratio, the greater the potential stress on the lake from surface runoff.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	149.0	48.0	206.0	D
CLA (µg/l)	137.5	37.0	300.0	F
Secchi (m)	0.4	0.2	0.8	F
TKN (mg/l)	4.42	1.30	6.10	
			Lake Grade	F

The lake received a lake grade of F for 2008, which is similar to previous years' lake grades. On the basis of the historical water quality database, this lake appears represented by a lake grade of F.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 3.9 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.1 (between 4- "no swimming/boating ok" and 5- "no aesthetics possible").

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

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

Loon Lake
Stillwater Twp., Washington Co.

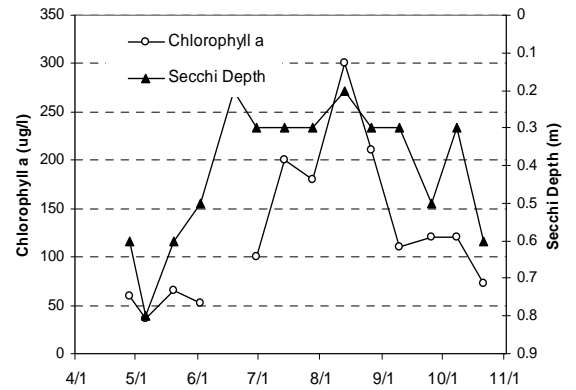
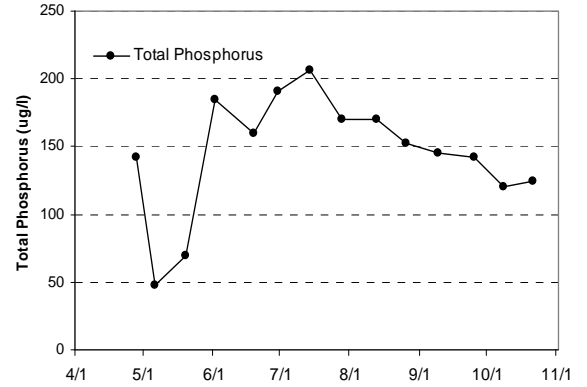
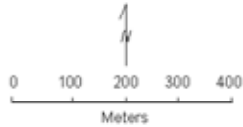
LAKE ID: 820015-02

WD: Carmelian-Marine-St. Croix

Volunteer: Washington Conservation District

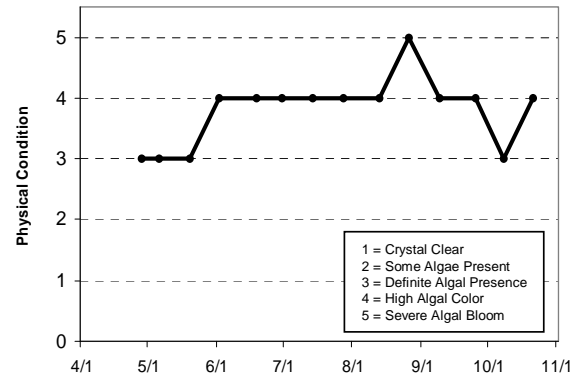
● Sampling site

Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	8.7	8.7	11.1	8.78	59	142		0.6	3	3
5/6	14.2	11.3	11.13	0.56	37	48		0.8	3	4
5/20	15.7	14.9	8.81	6.76	65	70	198	0.6	3	4
6/2	20.3	14.1	9.92	0.12	53	185	108	0.5	4	4
6/19	22.2	16.4	9.42	0.16		160	175	0.2	4	4
6/30	23.3	15.9	5.4	0.47	100	191	222	0.3	4	4
7/14	23.5	17.6	7.79	0.32	200	206	200	0.3	4	4
7/28	25.6	19	7.76	0.24	180	170	186	0.3	4	4
8/13	24.4	23	9.79	0.73	300	170	180	0.2	4	4
8/26	22.3	20.7	4.25	0.19	210	152	151	0.3	5	4
9/9	18.9	18.2	5.06	0.18	110	145	134	0.3	4	4
9/25	19.1	19.1	5.53	0.2	120	142	125	0.5	4	5
10/8	14.3	13.8	7.04	0.32	120	120	127	0.3	3	4
10/21	11.1	11	6.9	0.36	72	124	118	0.6	4	4



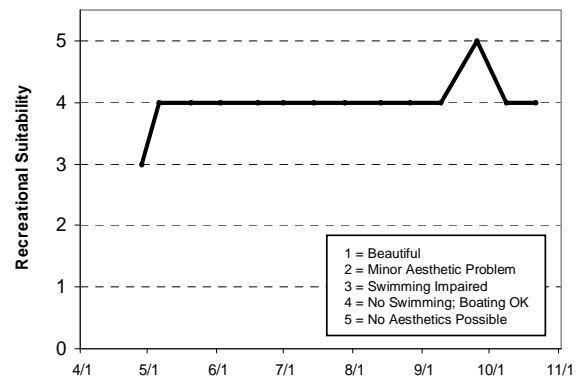
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Lost Lake (82-0134) City of Mahtomedi

Lost Lake is a small lake located in the City of Mahtomedi (Washington County). There is little known morphological data available for the lake.

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

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	40.5	20.0	53.0	C
CLA ($\mu\text{g/l}$)	6.8	1.5	15.0	A
Secchi (m)	1.5	0.9	2.1	C
TKN (mg/l)	1.21	0.60	1.70	
			Lake Grade	B

The lake received a lake grade of B for 2008, which is an improvement over the lake grades of the past two years. The main driver of the improved water quality is the relatively lower CLA concentrations observed in 2008. The CLA grade was an A for 2008, which is a two-grade jump above the previous two years' CLA grades.

The region experienced below normal precipitation for 2008, and the lake water level was well below normal. In fact the volunteer had to end monitoring activities in September because of development of mud flats along shore which prevented access to the water. Therefore, a possible explanation for reduction in CLA may be related to the reduction of surface inflows into the lake. Less inflow could cause a reduction in external TP loading, which could limit algae growth via reduction in TP availability. Indeed, the mean, minimum, and maximum TP concentrations in 2008 were less than those observed in 2006 and 2007.

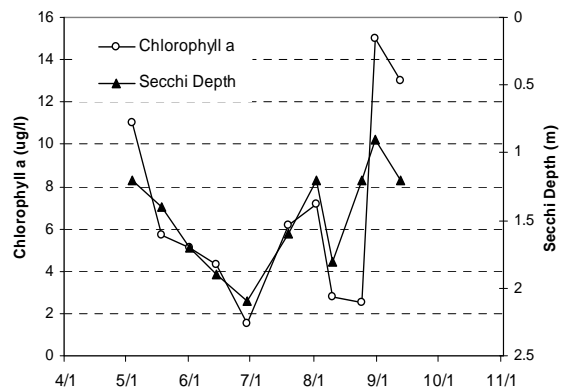
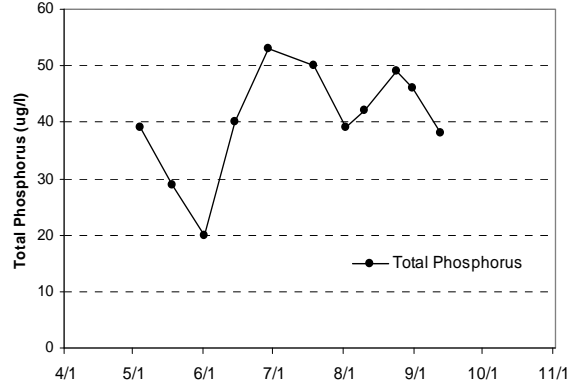
As mentioned earlier, there are no nutrient data available for the lake other than the 2006 – 2008 CAMP data. Additional data are needed to build the water quality database so as to better understand potential water quality trends.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 3.1 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.7 (between 4- "no swimming/boating ok" and 5- "no aesthetics possible").

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

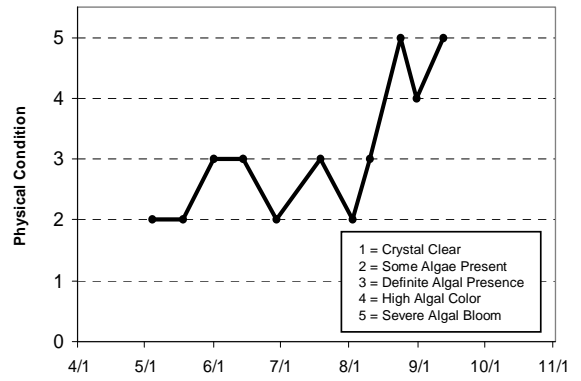
Lost Lake
Mahtomedi, Washington Co.

LAKE ID: 820134
WD: Rice Creek
Volunteer: Martha Popp



2008 Data

DATE	Surf 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	14.1				11	39		1.2	2	4
5/18	18.5				5.7	29		1.4	2	4
6/1	22.9				5.1	20		1.7	3	4
6/14	24.5				4.3	40		1.9	3	5
6/29	25.3				1.5	53		2.1	2	5
7/19	25.1				6.2	50		1.6	3	5
8/2	28.1				7.2	39		1.2	2	5
8/10	26.9				2.8	42		1.8	3	5
8/24	25.3				2.5	49		1.2	5	5
8/31	23.8				15	46		0.9	4	5
9/12	21.4				13	38		1.2	5	5



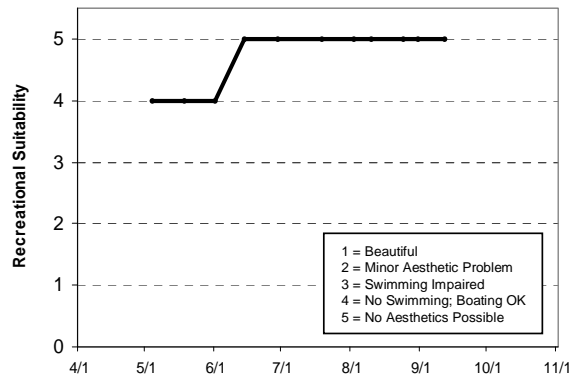
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Lotus Lake (10-0006) City of Chanhassen

Lotus Lake is located within the City of Chanhassen (Carver County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value. It has a surface area of 246 acres and a maximum and mean depth of 8.9 m (29.2 ft) and 4.3 m (14.2 ft.), respectively. The surface area and mean depth translate into a lake volume of 3,500 ac-ft. Approximately 74 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column. The lake's surface area and its 1,033-acre watershed translate into a 4:1 watershed-to-lake area ratio. The greater the ratio, the greater the potential stress on the lake from surface runoff.

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

The lake was monitored previously by Council staff (1985, 1990 and 1999-2000) and the MPCA's volunteer Secchi program (1980, 1988-1991). The year 2008 marks the sixth year the lake has been monitored via the CAMP.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	43.9	23.0	82.0	C
CLA (µg/l)	23.2	4.4	60.0	C
Secchi (m)	1.3	0.8	2.1	C
TKN (mg/l)	1.83	0.98	2.40	
Lake Grade				C

The lake received a lake grade of C for 2008, which is consistent with all previous years' lake grades except for the D lake grade received in 2003. On the basis of the historical water quality database, the water quality of this lake appears represented well by a lake grade of C. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.4 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.4 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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

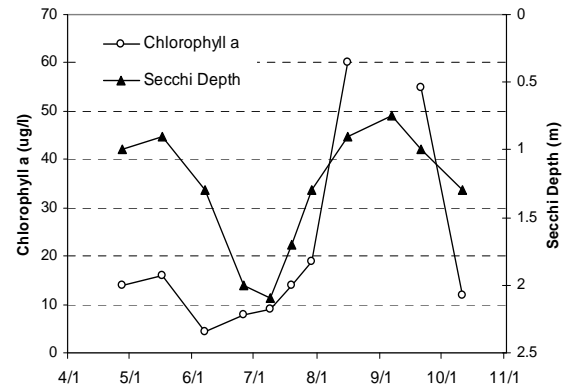
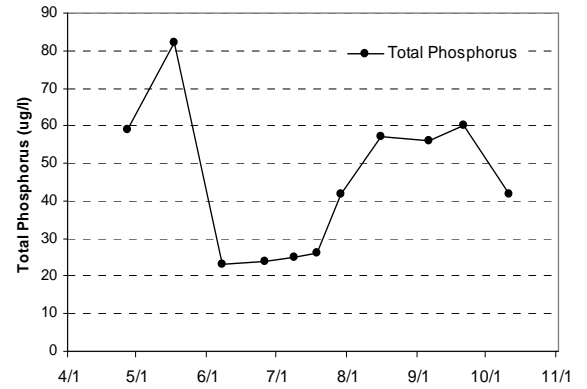
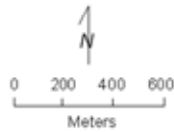
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lotus Lake
Chanhasseen, Carver Co.

Lake ID: 100006
WD: Riley-Purgatory-Bluff Creek
Volunteer: Shelly Strohmaier

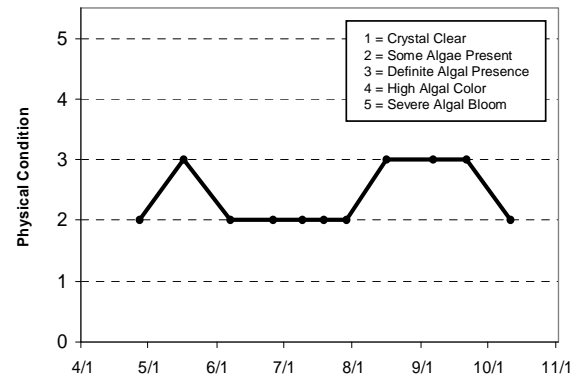
● Sampling site

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
4/27	8.5				14	59		1	2	2
5/17	18.3				16	82		0.9	3	3
6/7	21.2				4.4	23		1.3	2	2
6/26	25.4				7.9	24		2	2	2
7/9	25.1				9	25		2.1	2	2
7/19	26.8				14	26		1.7	2	2
7/29	27.3				19	42		1.3	2	2
8/16	25.3				60	57		0.9	3	3
9/6	21.7					56		0.75	3	3
9/21	20.9				55	60		1	3	3
10/11	18				12	42		1.3	2	2



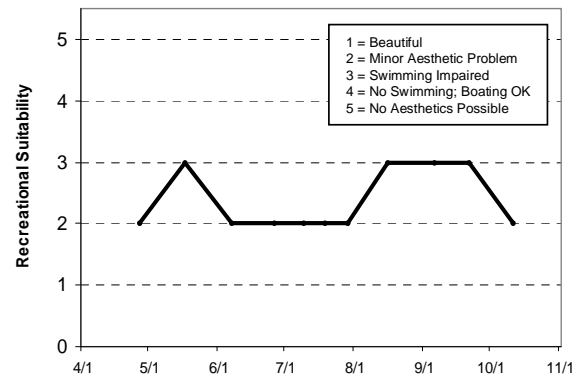
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Louise Lake (82-0025) Carnelian - Marine Watershed District

Louise Lake is located in Stillwater Township (Washington County). The lake has a surface area of a 48 acres. It has a maximum and mean depth of the lake are 3.7 m (12 ft) and 1.8 m (6 ft), respectively. The mean depth of the lake and its surface area translate to a lake volume of 283 ac-ft. Because of the shallowness of the lake, the entire surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

The lake's 616-acre watershed and surface area translates to a watershed-to-lake size ratio of 13:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

A search through the STORET nationwide water quality database for data on the lake provided limited information (1996-2006).

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	145.7	108.0	224.0	D
CLA ($\mu\text{g/l}$)	35.4	13.0	74.0	C
Secchi (m)	0.8	0.5	1.4	D
TKN (mg/l)	2.46	1.90	3.10	
			<i>Lake Grade</i>	D

The lake received a lake grade of D for 2008. The historical water quality database shows that the annual lake grades have varied from Cs to Ds. To better understand the lake's water quality and where it may be heading, more data are needed.

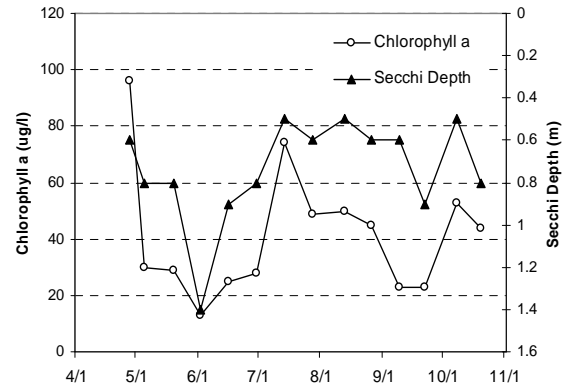
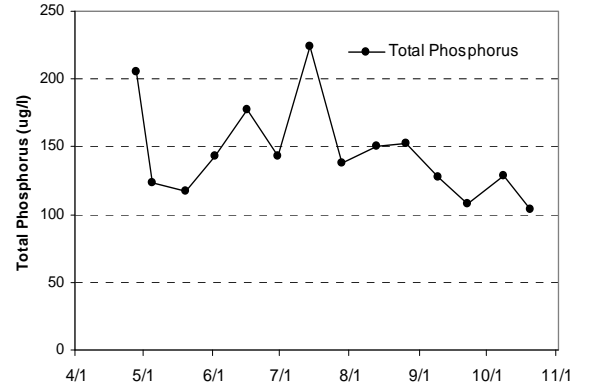
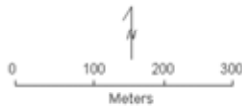
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 3.3 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.0 ("no swimming/boating ok").

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

Lake Louise
Stillwater Twp., Washington Co.

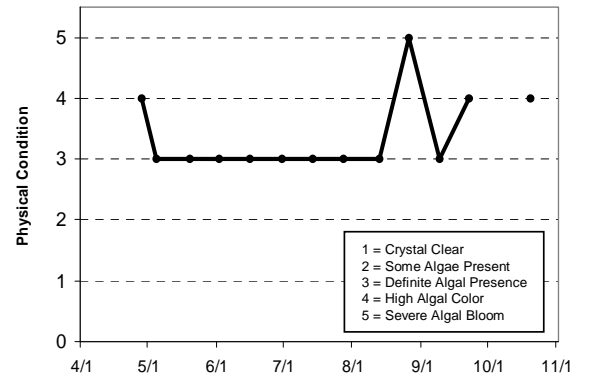
LAKE ID: 820025
WD: Carnelian-Marine-St. Croix
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	7.5	7.5	13.21	13.09	96	205		0.6	4	4
5/5	12.4	11	11.28	0.59	30	123		0.8	3	4
5/20	15.3	14.6	9.02	0.53	29	117	107	0.8	3	4
6/2	20.6	17.6	8.48	2.22	13	143	151	1.4	3	4
6/16	20.6	20.5	9.94	9.57	25	177	165	0.9	3	4
6/30	23	20.8	6.32	0.35	28	143	133	0.8	3	4
7/14	23	21.7	8.68	0.38	74	224	198	0.5	3	4
7/28	26.3	22.5	9.03	0.2	49	138	241	0.6	3	4
8/13	24.1	23	5.8	0.56	50	150	168	0.5	3	4
8/26	22.4	22.4	10.27	5.16	45	152	144	0.6	5	4
9/9	18.2	17.5	9.45	9.02	23	128	108	0.6	3	4
9/22	20.9	19.3	11.36	0.35	23	108	98	0.9	4	4
10/8	13.9	13.7	10.15	0.3	53	129	115	0.5	4	4
10/20	11.4	11.2	9.69	0.39	44	104	124	0.8	4	4



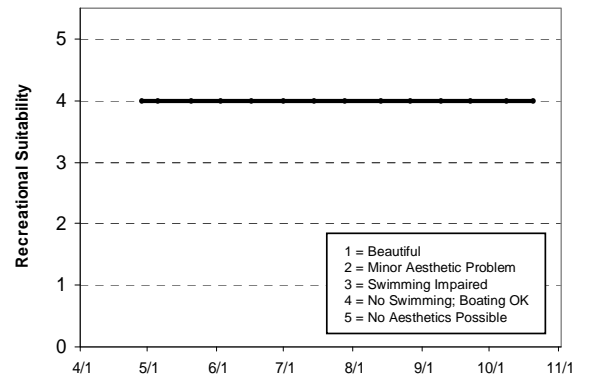
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Lynch Lake (82-0042) Browns Creek Watershed District

Lynch Lake is located in Washington County. It has a surface area of 43 acres. There is little known morphological data available for the lake.

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

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

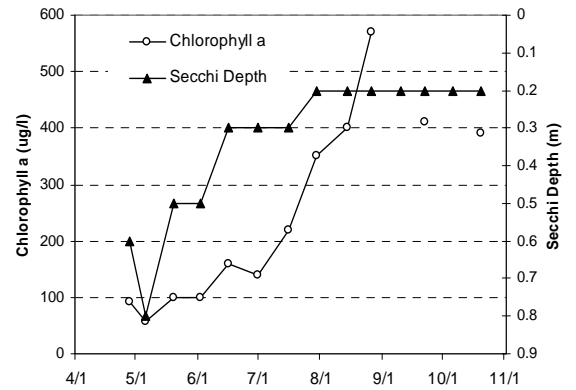
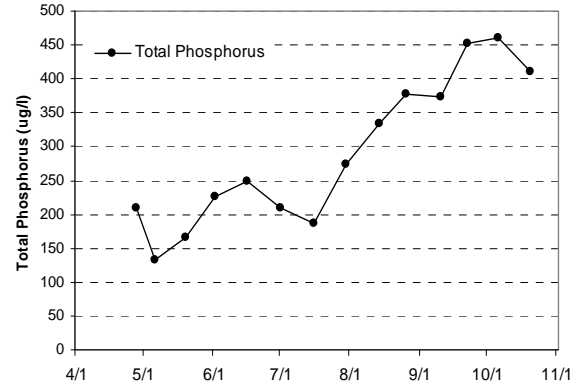
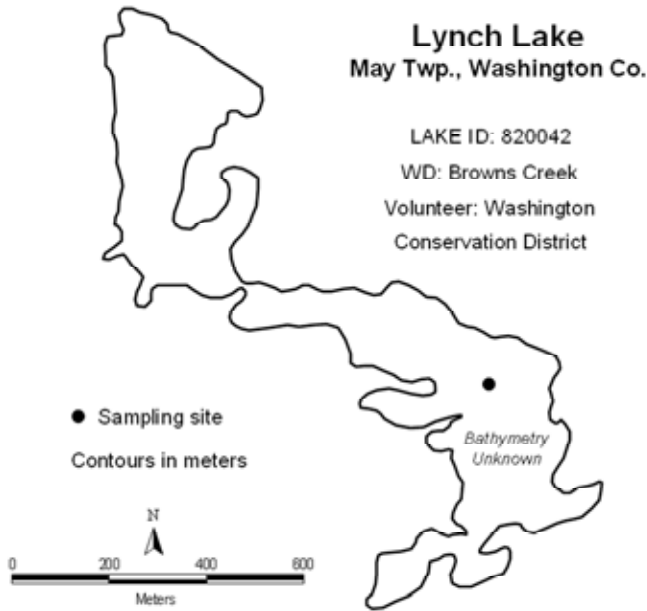
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	270.9	133.0	453.0	F
CLA ($\mu\text{g/l}$)	250.6	57.0	570.0	F
Secchi (m)	0.3	0.2	0.8	F
TKN (mg/l)	6.74	3.20	12.00	
			Lake Grade	F

The lake received a lake grade of F for 2008. The 2007 overall water quality grade was an F. This lake also received F lake grades in 2006 and 2007. To continue to build the water quality database for this lake, additional years of data collection are needed.

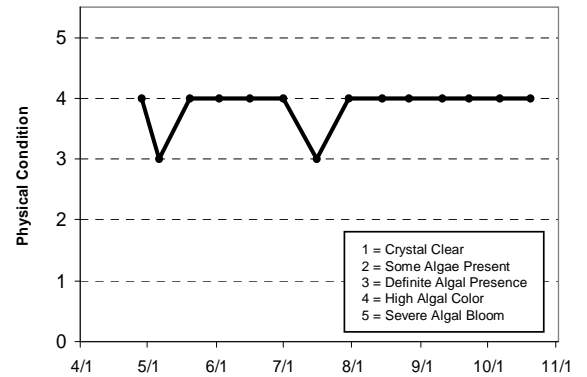
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 3.8 (between 3- "definite algae present" and 4- "high algal color"). The average recreational suitability ranking was 4.1 (between 4- "no swimming/boating ok" and 5- "no aesthetics possible").

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



2008 Data

DATE	Surf 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	7	12.68	12.5	91	210		0.6	4	4
5/6	16	12.8	13.34	0.61	57	133		0.8	3	4
5/20	15.8	15.2	10.94	0.25	99	166		0.5	4	4
6/2	21.5	18.3	10.39	0.17	100	226		0.5	4	4
6/16	21.1	20.7	10.4	9.33	160	248		0.3	4	4
7/1	28.3	21.7	13.84	0.29	140	209		0.3	4	4
7/16	24.7	22.7	7.2	0.92	220	187		0.3	3	4
7/30	26.4	23.7	9.84	0.29	350	273		0.2	4	4
8/14	23.3	22.7	10.72	0.89	400	335		0.2	4	4
8/26	24.3	22.4	13.69	10.35	570	377		0.2	4	4
9/10	17.2	17	8.93	0.2		373		0.2	4	4
9/22	21.2	20.5	11.98	0.3	410	453		0.2	4	5
10/6	12.9	13	14.22	0.44		461		0.2	4	4
10/20	11.6	11.2	11.52	0.42	390	410		0.2	4	4



Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data

