

Tamarack Lake (10-0010) Minnehaha Creek Watershed District

Tamarack Lake is located in the City of Victoria (Carver County). The lake has a surface area of 24 acres. It has a maximum depth of approximately 20 m (66 ft). Approximately 41 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	24.1	19.0	33.0	B
CLA ($\mu\text{g/l}$)	9.7	3.4	21.0	A
Secchi (m)	2.8	1.8	4.3	B
TKN (mg/l)	1.21	0.96	1.40	
Lake Grade				B

The lake received a lake grade of B for 2008, which is similar to the B lake grades received in 2001, 2002, and 2007. The lake has received varying lake grades over the past 9 years of CAMP monitoring, varying in the C and B grades. Continued monitoring is suggested to continue to build the water quality database for increasing the ability to detect potential trends in water quality.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.3 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 1.0 ("beautiful").

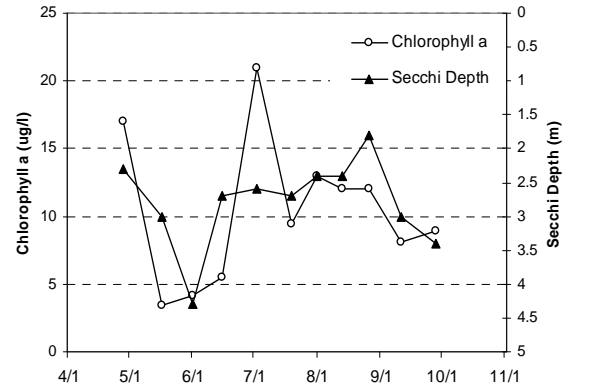
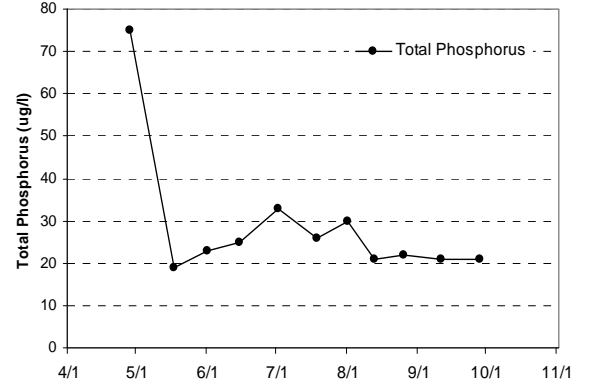
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Tamarack Lake
Victoria, Carver Co.

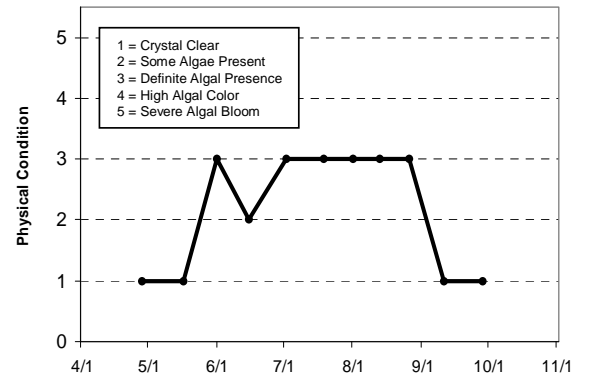
Lake ID: 100010
WD: Minnehaha Creek
Volunteer: Mike Schouldice

● 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	4.4				17	75		2.3	1	1
5/17	16				3.4	19		3	1	1
6/1	21				4.1	23		4.3	3	1
6/15	21				5.5	25		2.7	2	1
7/2	22				21	33		2.6	3	1
7/19	27				9.4	26		2.7	3	1
8/1	27				13	30		2.4	3	1
8/13	22				12	21		2.4	3	1
8/26	22				12	22		1.8	3	1
9/11	17				8.1	21		3	1	1
9/28	18				8.9	21		3.4	1	1



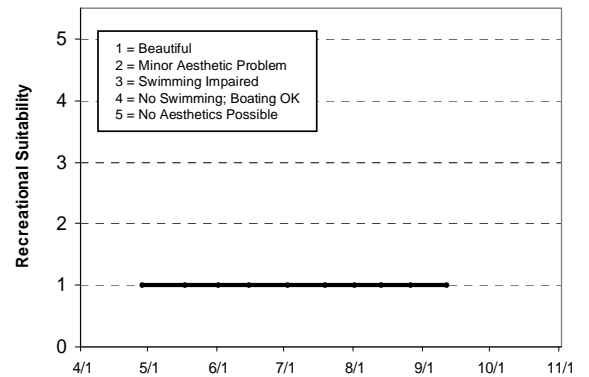
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Terrapin Lake (82-0031) *Marine on St. Croix Watershed Management Organization*

Terrapin Lake is located in May Township (Washington County). It has a surface area of 86 acres and a maximum depth of 4.6 m (15 ft). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

The lake was monitored 7 times in 2008. On each sampling day the lake was monitored for Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
Secchi (m)	3.3	2.7	3.8	A

The lake received a Secchi grade of A for 2008, which is consistent with the historical water quality database. No lake grade was given for the lake this year because total phosphorus and chlorophyll-a were not monitored.

There are insufficient data to determine potential trends in water quality because of the limited quantity of data in the database. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

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

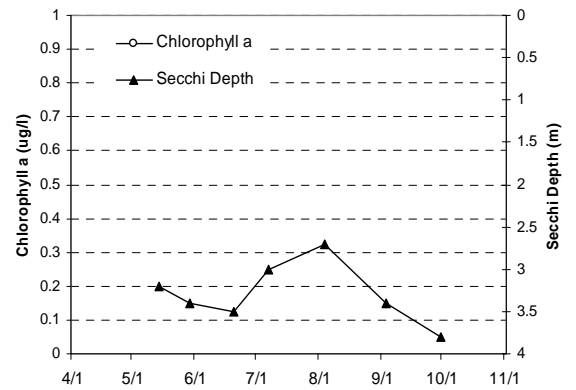
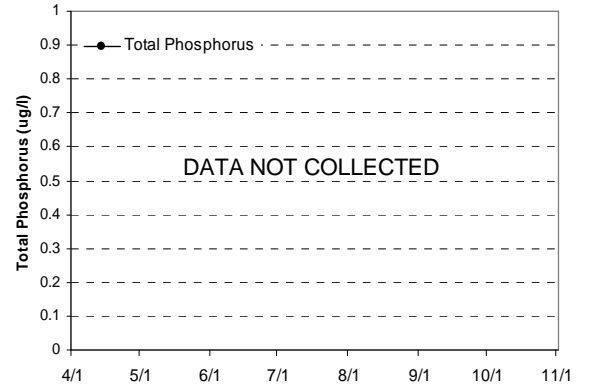
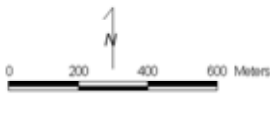
The Fisheries Section of the Minnesota Department of Natural Resources (MNDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MNDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Terrapin Lake
May Twp., Washington Co.

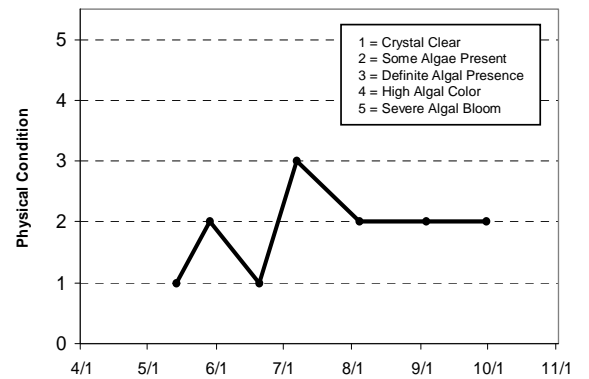
LAKE ID: 820031
WD: Carnelian-Marine-St. Croix
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/14	14.2	13.7	9.51	1.68				3.2	1	1
5/29	18	16.8	9.18	0.76				3.4	2	1
6/20	23.5	19.2	9.79	0.23				3.5	1	2
7/7	26	23	9.45	0.56				3	3	2
8/4	25	21	5.41	0.2				2.7	2	3
9/3	21.8	20.8	4.63	0.2				3.4	2	2
9/30	17.6	17.8	4.45	3.8				3.8	2	2



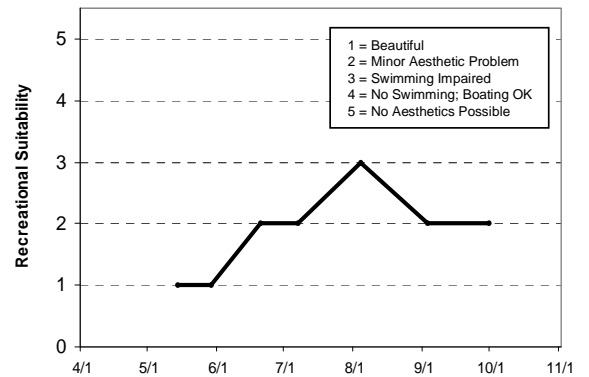
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Turtle Lake (82-0036) Carnelian - Marine Watershed District

Turtle Lake is located in May Township (Washington County). The lake has a surface area of 44 acres, and has a maximum and mean depth of 2.4 m (7.9 ft) and 1.2 m (3.9 ft), respectively. It has an approximate volume of 172 ac-ft. The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake's watershed area is approximately 699 acres. The lake has 16:1 watershed-to-lake area ratio. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 7 times in 2008. On each sampling day the lake was monitored for Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

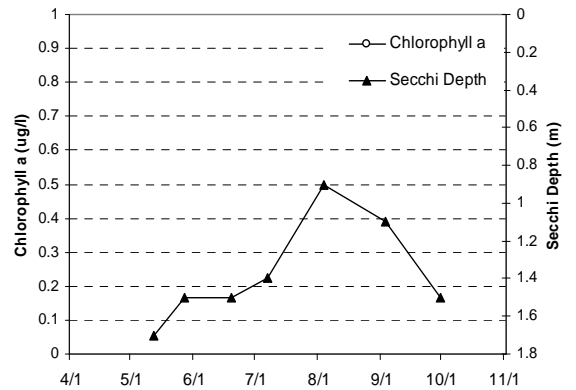
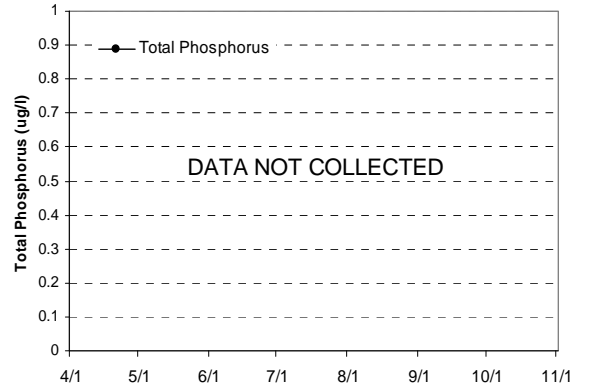
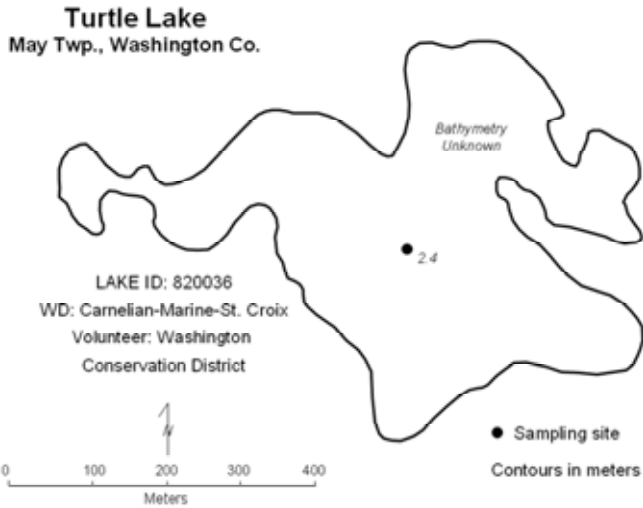
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
Secchi (m)	1.4	0.9	1.7	C

The lake received a Secchi grade of C for 2008, which is consistent with the historical water quality database for the monitoring years since 1999. No lake grade was given for the lake this year because total phosphorus (TP) and chlorophyll-a (CLA) were not monitored.

A review of the historical water quality database shows that lake grades and individual parameter grades (particularly chlorophyll-a and Secchi depth grades) seem to have improved during the period from 1991-2008. However, a lake grade has not been able to be determined since 2003. To better understand the lake's water quality and where it may be heading, continued monitoring is suggested particularly for adding the two other trophic indicator parameters, TP and CLA, so as to determine an up to date lake grade.

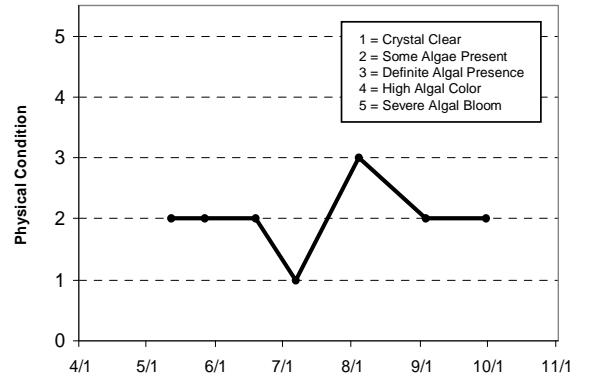
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.0 ("some algae present"). The average recreational suitability ranking was 2.9 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/12	13.6	13.5	7.3	7.14				1.7	2	2
5/27	16.2	15.7	6.76	6.78				1.5	2	3
6/19	24	21	8.84	0.98				1.5	2	4
7/7	26.2	23.3	9.58	0.33				1.4	1	2
8/4	26.1	23.2	10.33	0.32				0.9	3	4
9/3	20.2	19.7	7.3	0.38				1.1	2	3
9/30	15.3	15.6	6.83	1.58				1.5	2	2



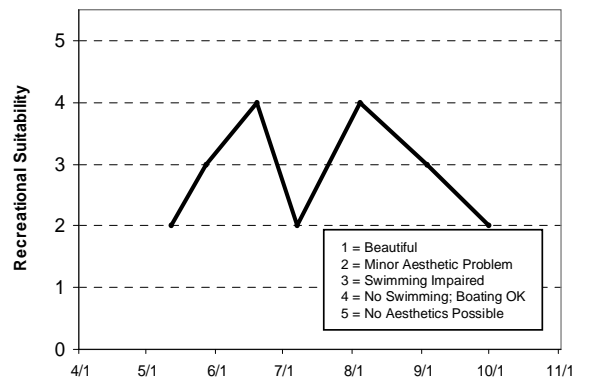
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Twin Lake [Burnsville] (19-0028) Black Dog Watershed Management Commission

Twin Lake is an 11-acre lake located in the City of Burnsville (Dakota County). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The lake has been designated by the MN DNR as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	38.5	17.0	141.0	C
CLA (µg/l)	10.8	4.5	23.0	B
Secchi (m)	2.0	1.3	2.5	C
TKN (mg/l)	1.30	0.56	1.80	
			Lake Grade	C

The lake received a lake grade of C for 2008. The lake grades received in the past have varied in the B and C range. Crushed corn meal was added as a carbon amendment in year 2006 to try to decrease algal concentrations. Since 2005 CLA grades have varied widely from an A in 2005, to a C in 2006, back to an A in 2007, and then to a B in 2008. The water clarity grades have remained a C since 2001.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.7 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 4.1 (between 4- "no swimming/boating ok" and 5- "no aesthetics possible").

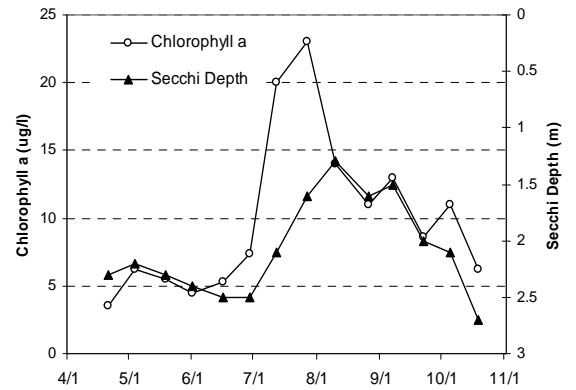
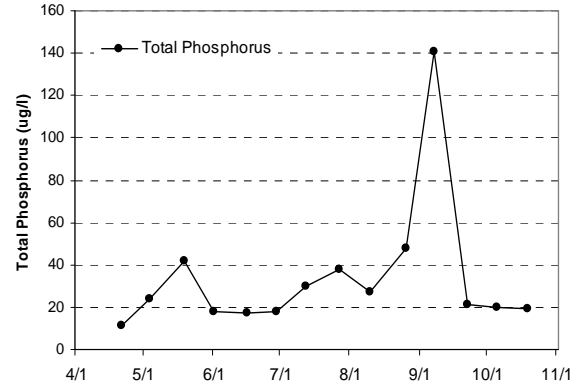
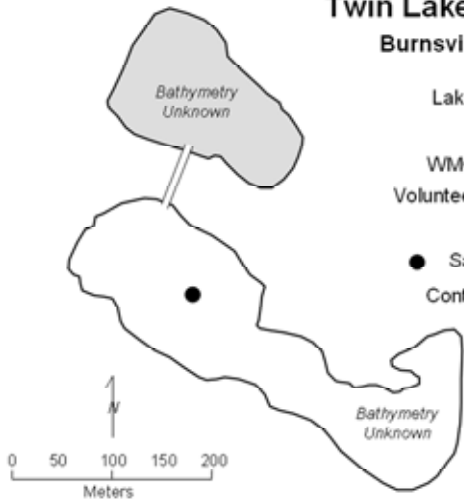
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Twin Lake (South Basin) Burnsville, Dakota Co.

Lake ID: 190028

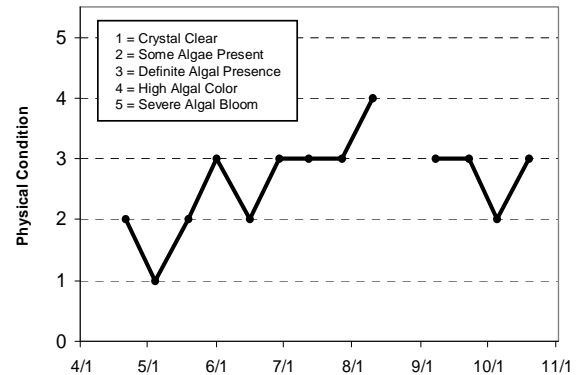
WMO: Black Dog
Volunteer: Dan Freeman

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	13				3.5	11		2.3	2	4
5/4	13				6.2	24		2.2	1	4
5/19	17.1				5.5	42		2.3	2	4
6/1	20.6				4.5	18		2.4	3	4
6/16	21				5.3	17		2.5	2	4
6/29	24.9				7.4	18		2.5	3	4
7/12	26.6				20	30		2.1	3	4
7/27	26.5				23	38		1.6	3	4
8/10	26.5				14	27		1.3	4	4
8/26	23.2				11	48		1.6	5	
9/7	19				13	141		1.5	3	4
9/22	21.2				8.6	21		2	3	4
10/5	15				11	20		2.1	2	4
10/19	13.9				6.2	19		2.7	3	4



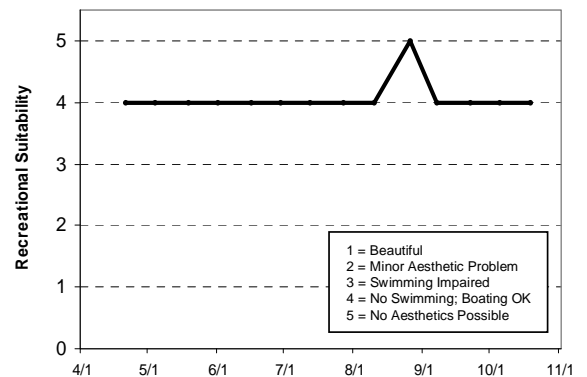
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Twin Lake [upper basin] (27-0042-01) Shingle Creek Watershed Management Commission

The upper basin of Twin Lake is located in the City of Brooklyn Park (Hennepin County). It has a maximum depth of 2.4 m (8 ft) and a mean depth of 0.9 m (3 ft). The entire surface area of the basin is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The basin does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

Twin Lake consists of 3 basins: upper, middle, and lower. The lake has a surface area of approximately 215 acres. Approximately 80 percent of the lake's surface area is considered littoral zone.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	129.2	74.0	252.0	D
CLA ($\mu\text{g/l}$)	93.6	11.0	180.0	F
Secchi (m)	0.6	0.2	1.2	F
TKN (mg/l)	2.58	2.10	3.20	
			Lake Grade	F

The basin received a lake grade of F for 2008, which is consistent with most lake grades from the previous 13 years. The basin received D lake grades in 1991, 1993, and 1998. On the basis of the historical water quality database, the water quality of this basin has fluctuated between lake grades D and F, but with only F lake grades being received over the past decade. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

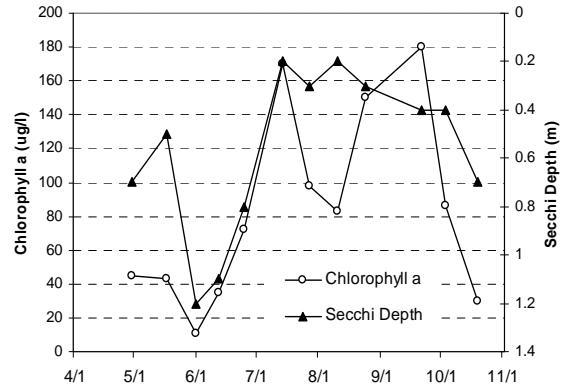
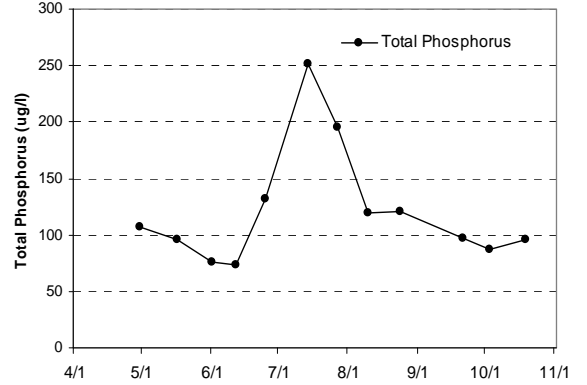
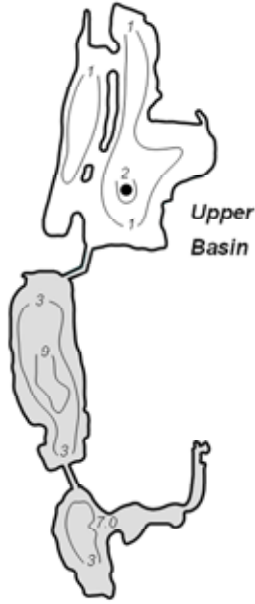
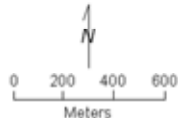
The volunteer's perceptions of the physical and recreational conditions of the basin are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.3 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.1 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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

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

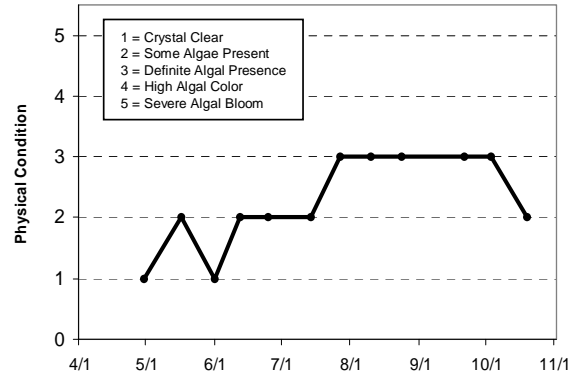
**Twin Lake, Upper Basin,
Brooklyn Center, Hennepin Co.**

Lake ID: 270042-01
WMO: Shingle Creek
Volunteer: Kris Mann
● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/30	10				45	107		0.7	1	1
5/17	20				43	96		0.5	2	2
6/1	25.7				11	76		1.2	1	1
6/12	23.8				35	74		1.1	2	1
6/25	30.3				72	132		0.8	2	2
7/14	28.5				170	252		0.2	2	3
7/27	29.2				98	196		0.3	3	2
8/10	29.5				83	119		0.2	3	2
8/24	27.4				150	121		0.3	3	3
9/21	24.8				180	97		0.4	3	3
10/3	20.3				86	87		0.4	3	3
10/19	23.2				30	96		0.7	2	2



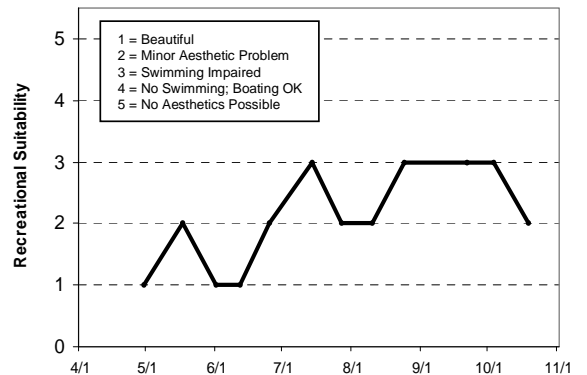
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Twin Lake [middle basin] (27-0042-02) Shingle Creek Watershed Management Commission

The middle basin of Twin Lake is located in the City of Crystal (Hennepin County). It has a maximum depth of 14 m (46 ft) and a mean depth of 4.9 m (16 ft). Twin Lake consists of 3 basins: upper, middle, and lower. The lake has a surface area of approximately 215 acres. Approximately 80 percent of the lake's surface area is considered littoral zone.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	44.1	22.0	96.0	C
CLA ($\mu\text{g/l}$)	17.7	2.1	37.0	B
Secchi (m)	1.9	0.9	4.9	C
TKN (mg/l)	1.55	1.10	1.80	
			<i>Lake Grade</i>	C

The basin received a lake grade of C for 2008, which is consistent with the lake grades received over the past decade. The basin has received B and D lake grades in the past. Since 1985 the annual lake grades have varied between B to D but have been consistently C over the past decade. Continued monitoring is suggested to determine if the lake grades of the past decade indicate that the water quality of the basin is stabilizing at a C lake grade.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.5 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 3.9 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

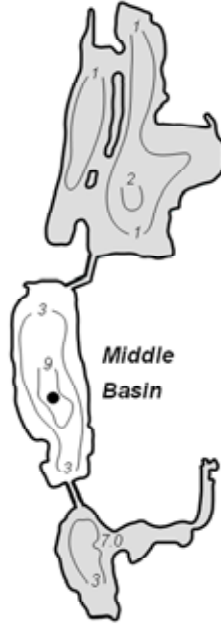
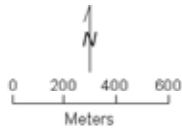
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

**Twin Lake, Middle Basin,
Crystal, Hennepin Co.**

Lake ID: 270042-02
WMO: Shingle Creek
Volunteer: Janet Moore

● Sampling site
Contours in meters



Twin Lake [St. Louis Park] (27-0656) City of St. Louis Park

Twin Lake is a small shallow lake located within the city of St. Louis Park (Hennepin County). Bathymetric information is unknown for the lake.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	131.2	38.0	208.0	D
CLA (µg/l)	71.1	13.0	230.0	D
Secchi (m)	0.5	0.3	0.9	F
TKN (mg/l)	2.22	0.96	3.50	
Lake Grade				D

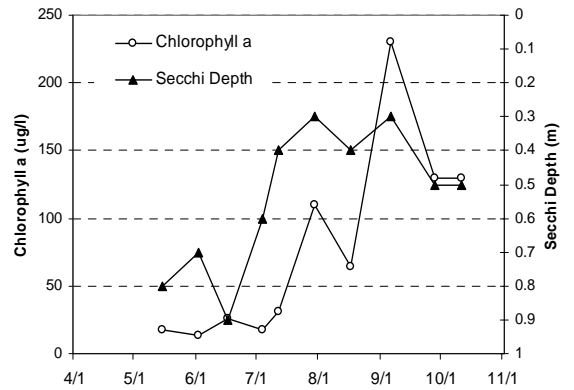
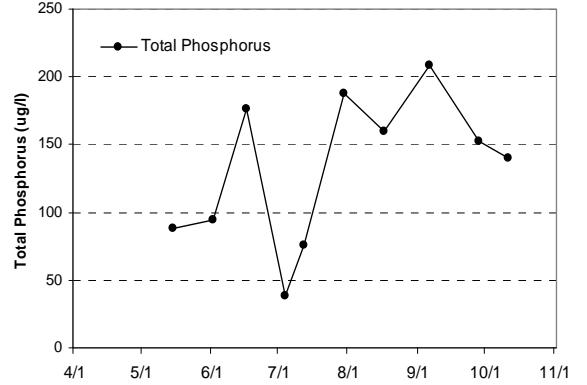
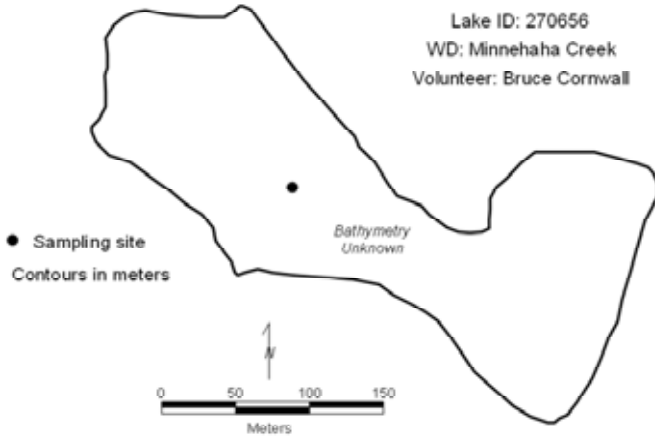
The lake received a lake grade of D for 2008, which is an improvement over last year's F lake grade. Water clarity (Secchi) remains poor with a grade of F. The chlorophyll-a grade has digressed from a B grade in 2002, to C grades in 2003, 2005, and 2006, and then to D grades in 2007 and 2008. Furthermore, water clarity grades in 2002-2004 were Ds, but since then water clarity grades digressed to Fs. These observations seem to indicate that the water quality for Twin Lake has degraded since 2002. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.9 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 4.0 ("no swimming/boating ok").

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

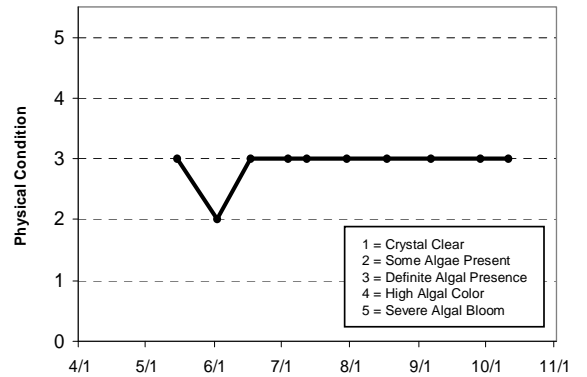
Twin Lake St. Louis Park, Hennepin Co.

Lake ID: 270656
WD: Minnehaha Creek
Volunteer: Bruce Cornwall



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
5/15	21				18	88		0.8	3	4
6/2	22.7				13	94		0.7	2	4
6/17	23.1				26	176		0.9	3	4
7/4	24.5				18	38		0.6	3	4
7/12	24.3				31	76		0.4	3	4
7/30	29.6				110	188		0.3	3	4
8/17	27.4				64	160		0.4	3	4
9/6	20.6				230	208		0.3	3	4
9/28	18.5				130	153		0.5	3	4
10/11	15.3				130	140		0.5	3	4



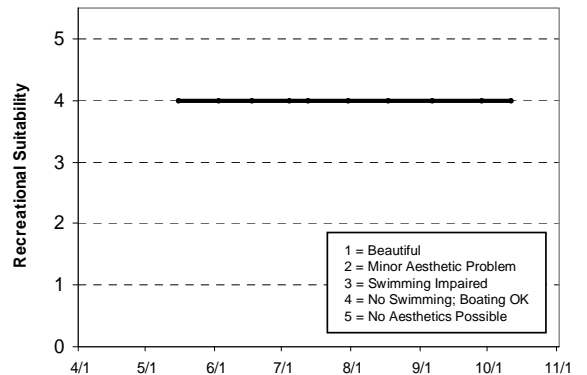
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Twin Lake [south basin] (82-0048) Washington Conservation District

Twin Lake is located in May Township (Washington County). The south basin has a maximum depth of 10 m (33 ft). Other bathymetric information is unknown for this lake. The lake's inflow receives water from Square Lake.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	17.3	11.0	46.0	A
CLA (µg/l)	4.6	2.2	9.6	A
Secchi (m)	5.0	3.8	7.0	A
TKN (mg/l)	0.68	0.45	1.30	
			<i>Lake Grade</i>	A

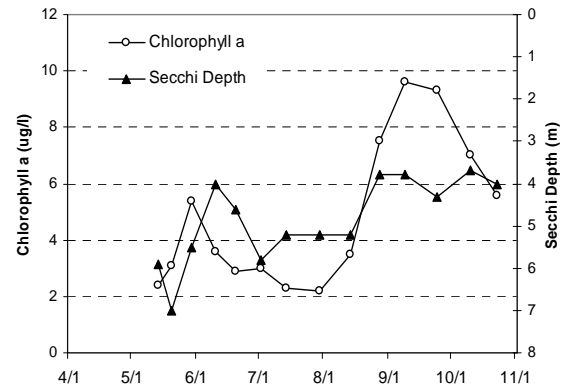
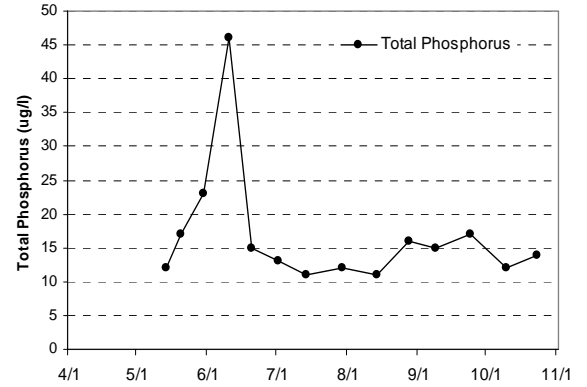
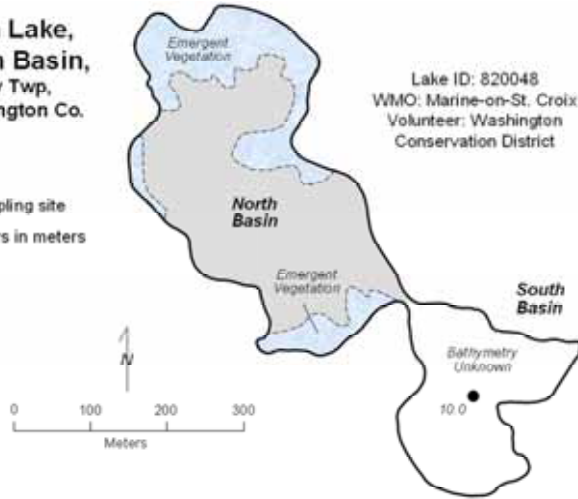
The lake received a lake grade of A for 2008, which is consistent with the other two historical lake grades in the water quality database (1997, 1998). A search for historical monitoring data through STORET, the national water quality database, revealed only the historical CAMP data collected in 1997 and 1998.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 1.4 (between 1- "crystal clear" and 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 1.4 (1- "beautiful" and 2- "minor aesthetic problem").

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

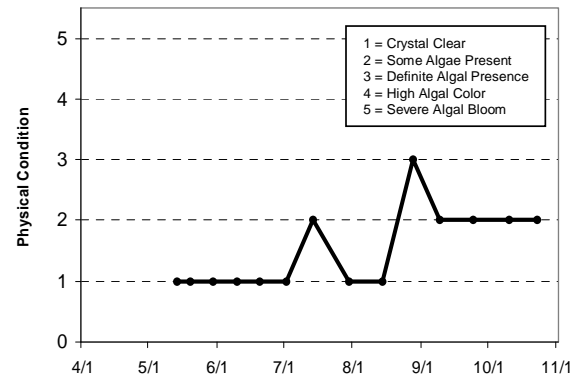
**Twin Lake,
South Basin,
May Twp.,
Washington Co.**

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/13								5.9	1	1
5/14	13.6	5.7	9.84	0.38	2.4	12		7	1	1
5/20	15.4	5.9	9.32	0.27	3.1	17		5.5	1	1
5/30	17.2	6.3	9.12	0.19	5.4	23		4	1	2
6/10	20.7	6.8	8.35	0.26	3.6	46		4.6	1	1
6/20	24	7	8.01	0.25	2.9	15		5.8	1	1
7/2	25	8	8.29	0.56	3	13		5.2	2	2
7/14	26.3	8.8	7.47	0.48	2.3	11		5.2	1	1
7/30	28.2	9.4	7.97	0.25	2.2	12		3.8	3	2
8/14	24.9	9.4	7.07	1.02	3.5	11		4.3	2	2
8/28	23.6	9.4	6.11	0.26	7.5	16		3.7	2	1
9/9	22	10.3	7.7	0.28	9.6	15		4	2	1
9/24	21.3	11	8.32	0.25	9.3	17				
10/10	15.3	10.5	7.18	0.33	7	12				
10/23	12.2	10.2	7.73	0.47	5.6	14				



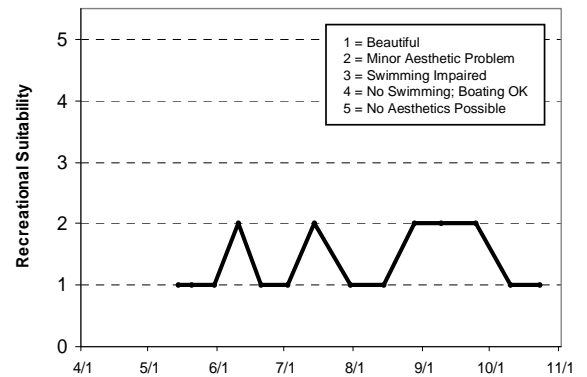
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Valentine Lake (62-0071) Rice Creek Watershed District

Valentine Lake is located within the City of Arden Hills in Ramsey County. The lake has a surface area of 60-acres and a maximum and mean depth of 4.0 m (13.1 feet) and 1.5 m (4.9 feet), respectively. The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The volume of the lake is approximately 300 ac-ft. The drainage area of the lake is approximately 2,237 acres. Therefore, the watershed-to-lake area ratio is 37:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	65.2	33.0	89.0	C
CLA (µg/l)	16.8	5.4	71.0	B
Secchi (m)	1.8	0.8	3.2	C
TKN (mg/l)	1.67	1.10	2.00	
			Lake Grade	C

The lake received a lake grade of C for 2008, which is consistent with the historical water quality database. The TP grade returned to a C from last year's D grade. On the basis of the historical database, the lake appears to be represented by a lake grade of C. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

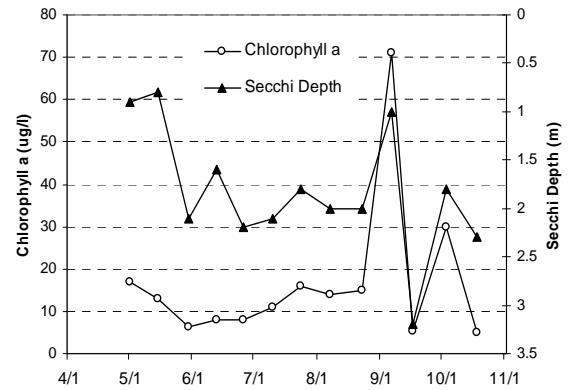
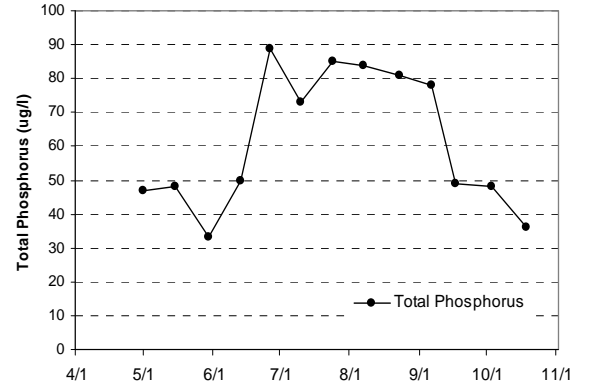
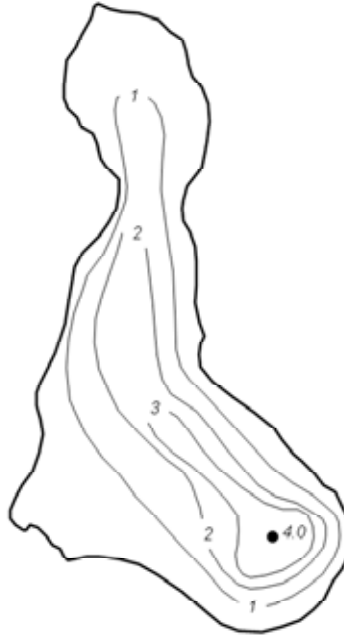
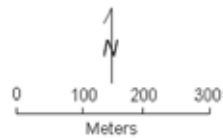
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.0 ("some algae present"). The average recreational suitability ranking was 2.5 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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

Valentine Lake
Arden Hills, Ramsey Co.

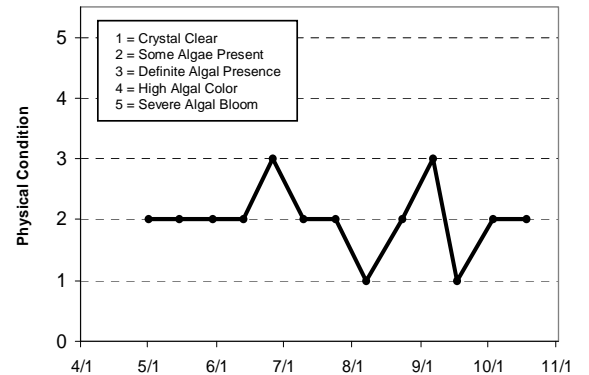
Lake ID: 620071
WD: Rice Creek
Volunteer: Bob Kistler

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/1	11.2				17	47		0.9	2	1
5/15	17.6				13	48		0.8	2	1
5/30	17.6				6.3	33		2.1	2	4
6/13	20.9				7.9	50		1.6	2	4
6/26	26.1				7.9	89		2.2	3	4
7/10	25.4				11	73		2.1	2	4
7/24	25.5				16	85		1.8	2	4
8/7	26.5				14	84		2	1	4
8/23	24.1				15	81		2	2	4
9/6	20.5				71	78		1	3	4
9/17	19.6				5.4	49		3.2	1	4
10/3	16.4				30	48		1.8	2	4
10/18	12.6				4.9	36		2.3	2	4



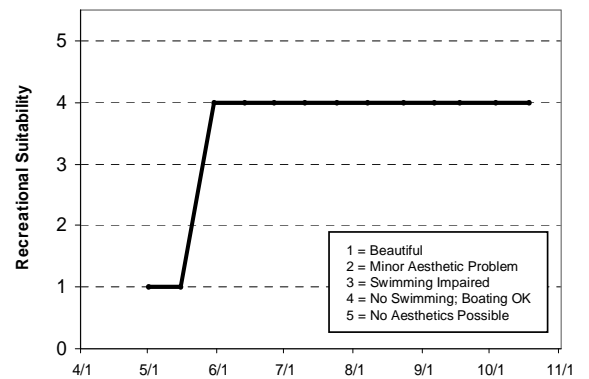
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Valley Lake (19-0348) City of Lakeville

Valley Lake is located in the City of Lakeville (Dakota County). The surface area of the lake is 8 acres, and it has a maximum depth of 3.2 m (10 ft). Because of the shallowness of the lake, the entire lake is considered littoral zone, which is 0 – 15 feet depth zone dominated by aquatic vegetation. The majority of the land within the lake's 117-acre watershed is parkland or single-family residential homes. The watershed-to-lake size ratio is 8:1. The greater the ratio, the greater the potential stress on the lake from surface runoff. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

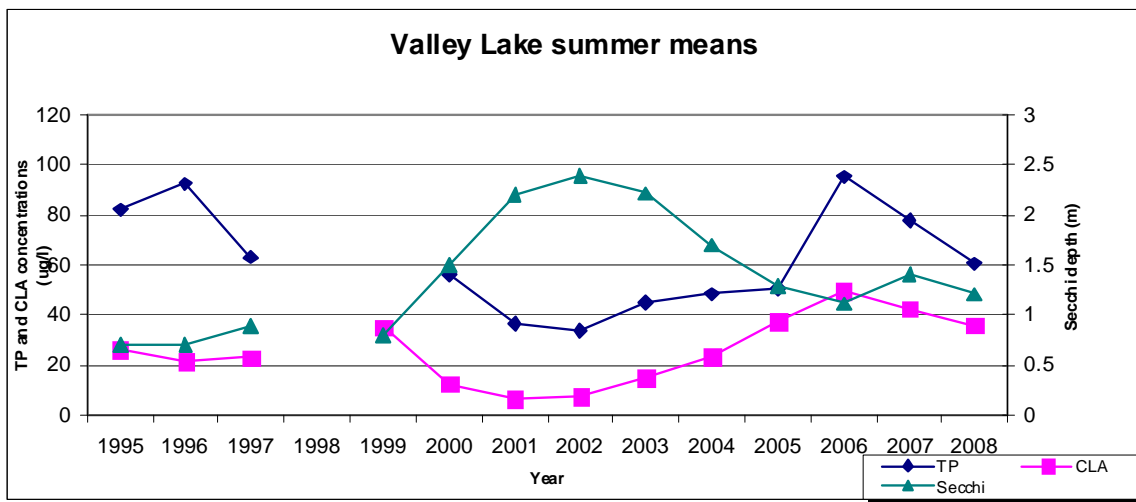
The lake has been involved in a project where barley straw or crushed corn was added to the lake in an attempt to inhibit algal populations. Barley straw has been used for algal control in the United Kingdom for many years but the controlling mechanism has not been known. Therefore, the Valley Lake project was an attempt to answer two questions; 1) the success of the barley straw treatment in Valley Lake; and 2) to clarify the controlling mechanism. CAMP data was used to evaluate the effectiveness of the carbon amendments. The 2006 Metropolitan Council lake study report (METC 2007) included a synopsis of the carbon amendment study. More detailed discussion of the study can be found in McComas and Stuckert (2007).

A search through the STORET nationwide water quality database revealed no water quality data on the lake other than the 1995 CAMP data. The lake was monitored 13 times between late April and mid October. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	60.6	48.0	86.0	C
CLA (µg/l)	36.0	11.0	96.0	C
Secchi (m)	1.2	0.6	2.2	C
TKN (mg/l)	1.33	0.74	2.10	
Lake Grade				C

The lake received a lake grade of C for 2008, which is similar to previous years' lake grades. The individual water quality parameter grades were similar to those observed during the 2004 and 2005 monitoring seasons. The following figure shows an improvement in summer time means for the three water quality parameters from 1999 to 2002, and then a continued decline from 2002 through 2006. TP and CLA appear to be improving since 2006, but water clarity appears stagnant over the same time period. It appears that recent summer time means are returning to similar values observed in the mid-1990's. Furthermore, a trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).



The volunteer(s) ranked their perception of the lake’s physical and recreational conditions on a 1-to-5 scale as shown on the attached information sheet. The summertime mean recorded physical condition was 2.5 (between 2- “some algae present” and 3- “definite algae present”). The mean suitability for recreation ranking was 2.7 (between 2- “minor aesthetic problem” and 3- “swimming slightly impaired”).

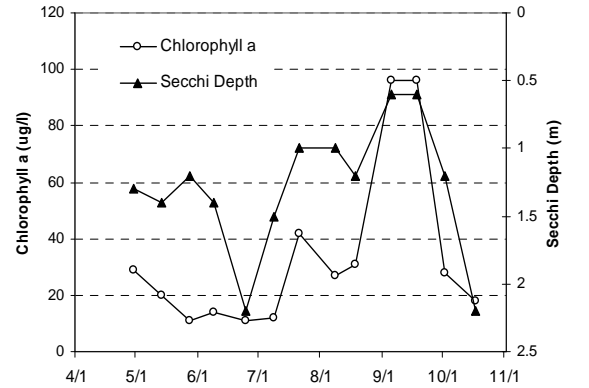
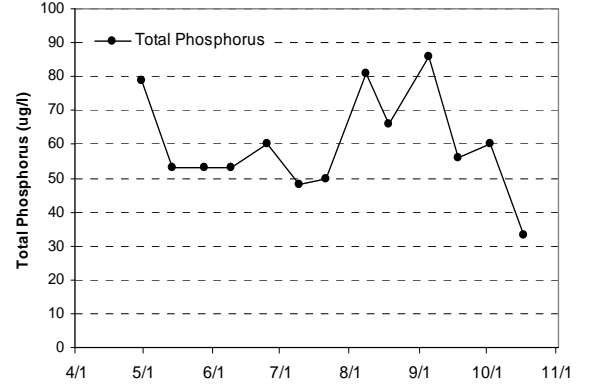
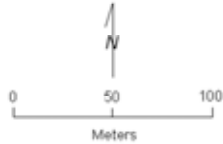
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Valley Lake
Lakeville, Dakota Co.

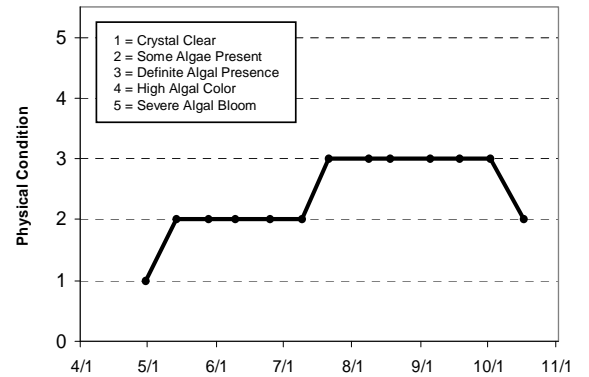
Lake ID: 190348
WMO: Dakota County
Volunteer: City of Lakeville

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/30	10				29	79		1.3	1	1
5/14	14				20	53		1.4	2	1
5/28	18				11	53		1.2	2	2
6/9	21				14	53		1.4	2	3
6/25	25				11	60		2.2	2	2
7/9	26				12	48		1.5	2	3
7/21	28				42	50		1	3	3
8/8	27				27	81		1	3	3
8/18	25.9				31	66		1.2	3	2
9/5	21				96	86		0.6	3	4
9/18	19				96	56		0.6	3	4
10/2	14				28	60		1.2	3	3
10/17	11				18	33		2.2	2	3



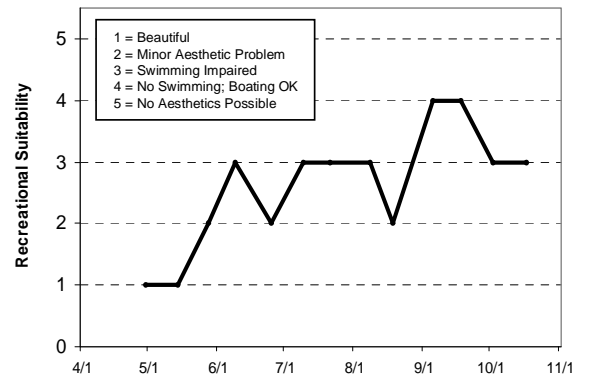
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Waconia Lake (10-0059) Carver County Environmental Services

Lake Waconia is located near the City of Waconia (Carver County). It is considered a Priority Lake by the Metropolitan Council for its high regional recreation value. The lake is one of the largest bodies of water in the region. It has a surface area of approximately 3,000 acres (6.8 miles in circumference), and mean and maximum depths of 4.0 and 11.3 m (13.1 and 47.1 feet), respectively. The lake has an approximate volume of 38,632 ac-ft (resulting in a retention time of about 10 years) and an approximate watershed-to-lake size ratio of 4:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

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

Lake Waconia has been involved in CAMP since 1994 (and monitored by Council staff in 2004). In 2008, the lake was monitored 13 times between early May and mid October. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	43.3	19.0	96.0	C
CLA (µg/l)	23.2	4.9	74.0	C
Secchi (m)	2.5	1.0	4.5	B
TKN (mg/l)	1.10	0.51	1.60	
			<i>Lake Grade</i>	C

The lake received a lake grade of C for 2008, which is consistent with the historical database. The lake grades fluctuate from year to year, but generally the lake receives either a B or C lake grade. The lake has experienced this pattern since 1980. Nutrient water quality data is available for 1980, 1981, 1985, 1990, and 1994-2008 (all as a part of the Council's lake monitoring programs). Additionally, Secchi transparencies have been collected through the MPCA's Citizen Lake Monitoring Program since 1974. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

The volunteer's perceptions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale during each monitoring event. The rankings are shown on the information sheet on the next page. The mean physical condition ranking was 2.2 (between 2- "some algae present" and 3- "definite algae present"), and the mean recreational suitability ranking was 2.0 (2- "minor aesthetic problem").

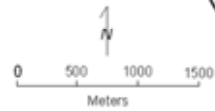
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Lake Waconia
Laketown Twp./Waconia Twp.,
Carver Co.

Lake ID: 100059
WMO: Carver Creek
Volunteer: Carver County

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/1	6.98		11.29		5.9	25		3	2	3
5/13	11.22		10.89		8	25		2.6	2	2
5/27	15.52		7.89		5.5	19		3.5	2	1
6/10	19.12		8.35		4.9	19		2.5	2	2
6/24	22.43		10.95		4.9	39		4.5	2	2
7/9	24.31		8.61		10	26		3	2	2
7/22	24.18		7.71		16	29.5		1.7	2	2
8/4	24.95		6.41		52	44.5		1.1	2	2
8/18	25.88		12.52		74	90		1.2	3	2
9/2	22.85		7.76		69	96		1	3	3
9/15	17.88		5.4		19	81		2.6	2	2
9/30	17.94		4.84		8.6	26		3.8	2	1
10/16	13.41		6.47		4.3	26		4	1	1

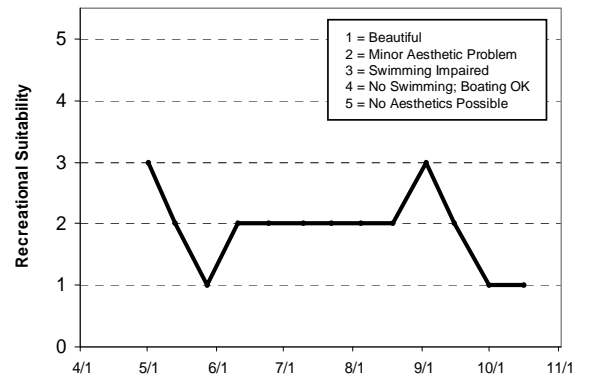
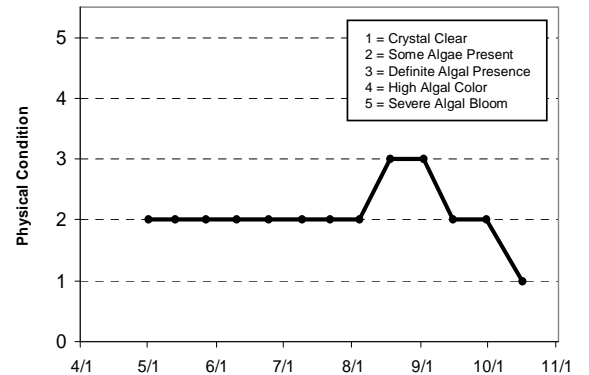
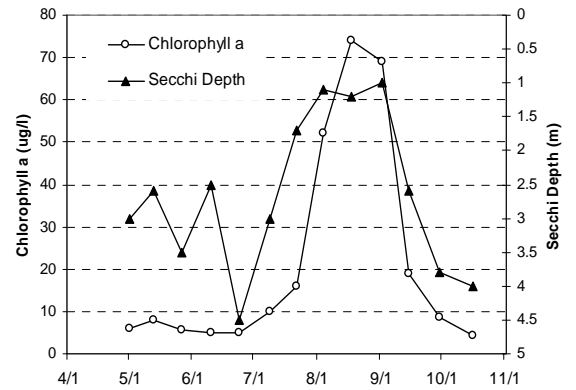
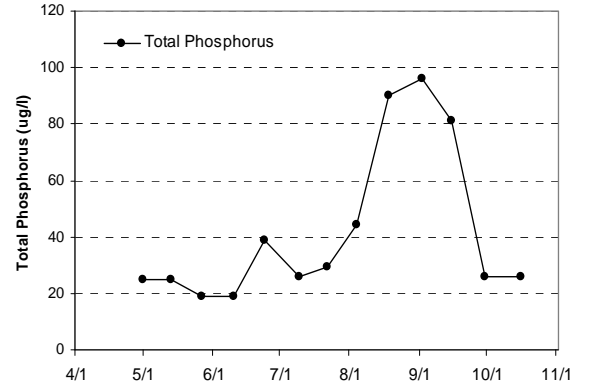
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Weber Pond (82-0119) Valley Branch Watershed District

Weber Pond is located in the City of Mahtomedi (Washington County). It has a surface area of 7.5 acres and a maximum depth of 2.0 m (6.5 ft). Other bathymetric information for the pond is unknown. The entire area of the pond is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the pond does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The pond's watershed area is approximately 141 acres. The watershed to pond area ratio is 19:1. The greater the ratio, the greater the potential stress on the pond from surface runoff.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	37.3	30.0	51.0	
CLA (µg/l)	6.2	4.7	8.7	A
Secchi (m)	1.0	0.3	1.5	D
TKN (mg/l)	1.53	1.20	2.00	
			<i>Lake Grade</i>	

The lake did not receive a lake grade for 2008, because there were an insufficient number of samples for TP. At least 5 samples spread throughout the summer-time period are required to calculate a grade.

The water clarity grade of D does not correlate well with the chlorophyll-a grade of A. A possible explanation may be that the water clarity may be affected by higher levels of total suspended solids from surface runoff from storm sewers and the surrounding suburban watershed. It is possible for higher suspend solids loadings to decrease water clarity which would decrease light penetration thereby inhibiting algal growth.

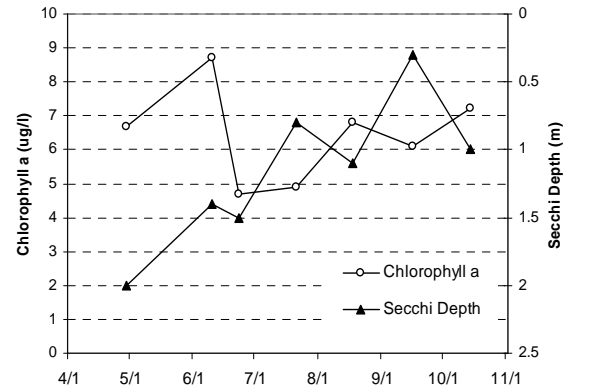
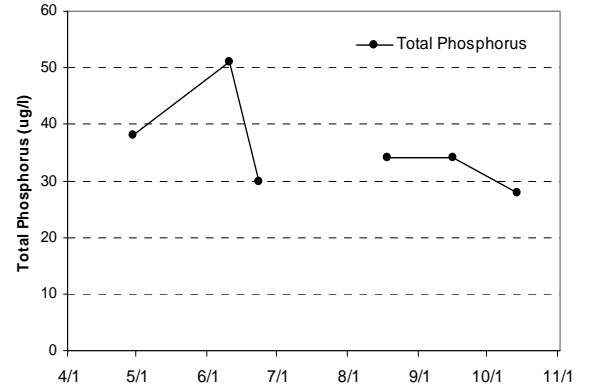
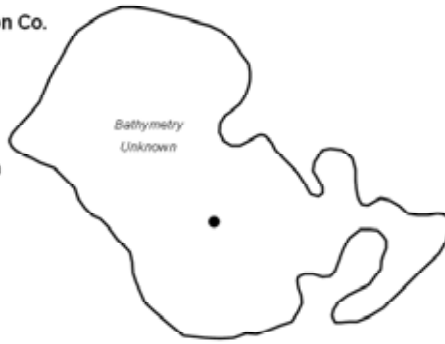
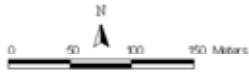
The volunteer's perceptions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale during each monitoring event. The rankings are shown on the information sheet on the next page. The mean physical condition ranking was 2.8 (between 2- "some algae present" and 3- "definite algae present"), and the mean recreational suitability ranking was 4.0 ("no swimming/boating ok").

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

Weber Pond
Mahtomedi, Washington Co.

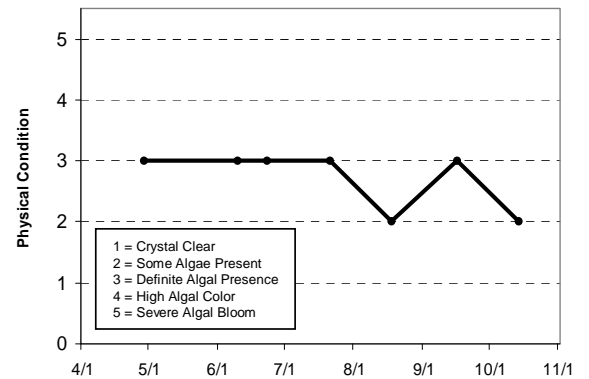
Lake ID: 820119
WD: Valley Branch
Volunteer: Washington
Conserv. Dist.

● Sampling site
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/29	8.7	7.7	11.45	1.36	6.7	38		2	3	4
6/10	20.6	16.6	11.22	0.32	8.7	51		1.4	3	4
6/23	25.9	20.6	13.9	0.78	4.7	30		1.5	3	4
7/21	28.1	24.2	9.23	0.41	4.9			0.8	3	4
8/18	27.3	21.5	9.98	0.2	6.8	34		1.1	2	4
9/16	20	16	12.73	0.49	6.1	34		0.3	3	4
10/14	13.9	13.8	10.15	1.86	7.2	28		1	2	4



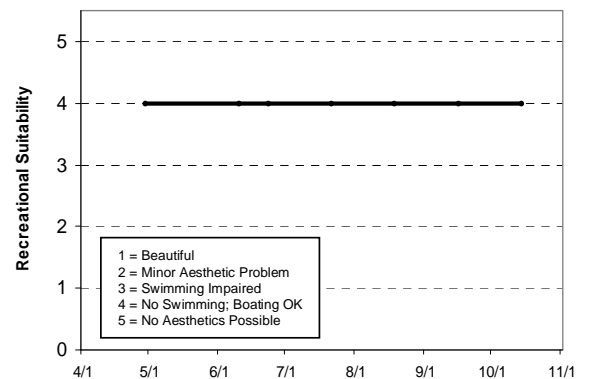
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



West Boot Lake (82-0044) Carnelian - Marine Watershed District

West Boot Lake is located in May Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity. The 110-acre lake has a mean and maximum depth of 5.9 m (19 feet) and 11.9 m (39 feet), respectively. The mean depth of the lake and its surface area translate to an approximate lake volume of 2,090 ac-ft. Approximately 56 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The lake's 209-acre immediate watershed translates to a 2:1 watershed-to-lake area ratio. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The lake was monitored 7 times in 2008. On each sampling day the lake was monitored for Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
Secchi (m)	4.5	3.8	5.3	A

A lake grade was not given this year because total phosphorus and chlorophyll-a were not collected in 2008. The Secchi depth grade of A for 2008 is consistent with the A grades received since 1999. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed a statistically significant improving trend in water clarity (MPCA 2008).

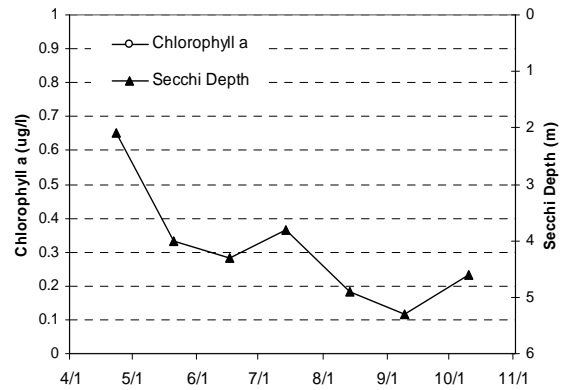
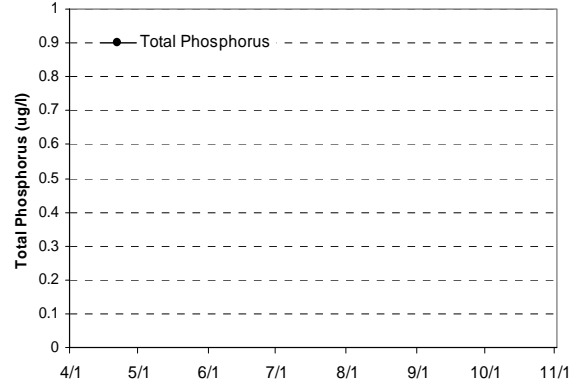
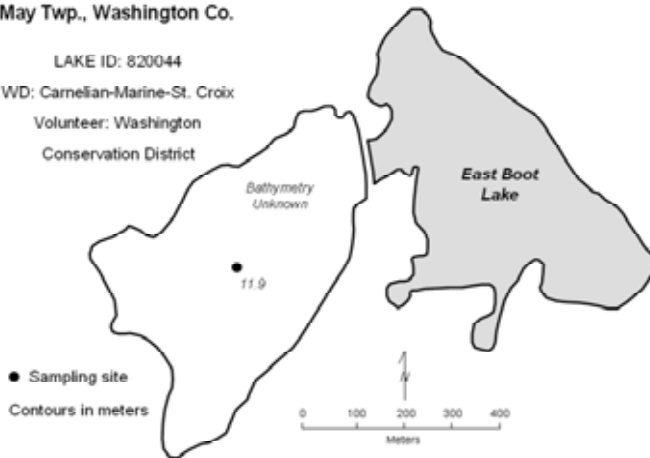
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.2 (between 2- "some algae present" and 3- "definite algae present"). The average recreational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

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

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

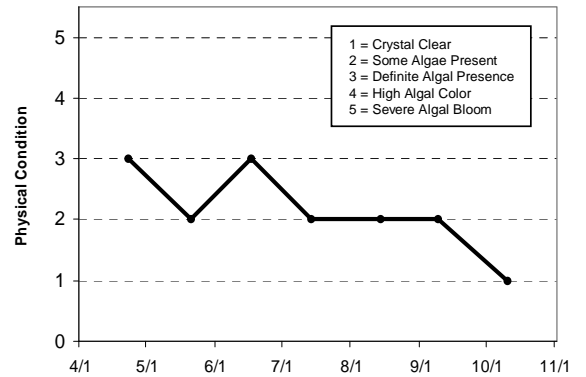
West Boot Lake
May Twp., Washington Co.

LAKE ID: 820044
WD: Carnelian-Marine-St. Croix
Volunteer: Washington
Conservation District



2008 Data

DATE	Surf 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	9.4	4.5	10.48	1.05				2.1	3	2
5/21	16.5	4.6	8.88	0.24				4	2	3
6/17	22.2	4.6	9	0.28				4.3	3	2
7/14	25.8	4.7	7.13	0.45				3.8	2	2
8/14	23.9	4.9	5.06	0.49				4.9	2	2
9/9	20.1	5	6.86	0.27				5.3	2	2
10/10	14	5.3	7.36	0.32				4.6	1	1



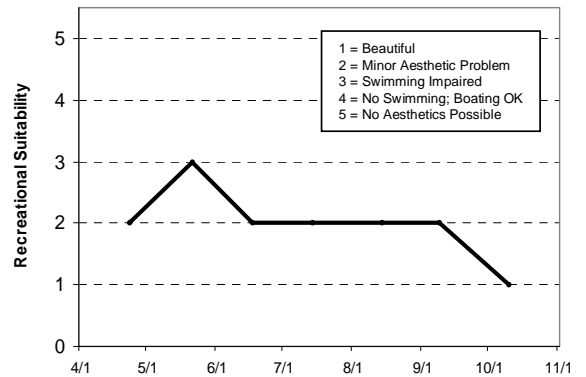
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008
Total Phosphorus	A	A	A	B	
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



West Lakeland Storage Site [north basin] (82-0119) Valley Branch Watershed District

The West Lakeland Storage Site is located in West Lakeland Township (Washington County). The storage site consists of three basins: north, middle, and south. The north basin has a maximum depth of 5.8 m (19 ft). Other bathymetric information for the basin is unknown. Most of the area of the basin is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance.

A search through STORET, the nation-wide water quality database, showed that the north basin was monitored for nutrients and Secchi depth for two days in 2000.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	48.8	28.0	90.0	C
CLA (µg/l)	15.2	6.8	40.0	B
Secchi (m)	2.1	0.9	3.2	C
TKN (mg/l)	1.70	1.30	2.40	
			Lake Grade	C

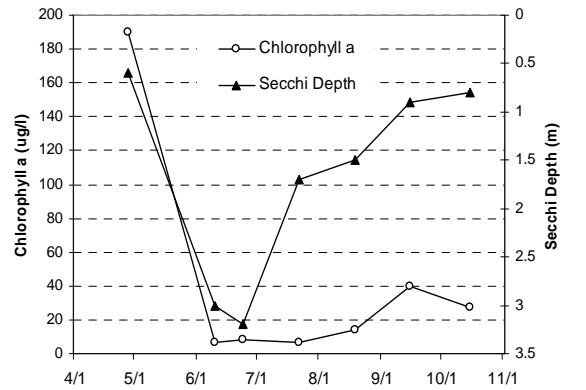
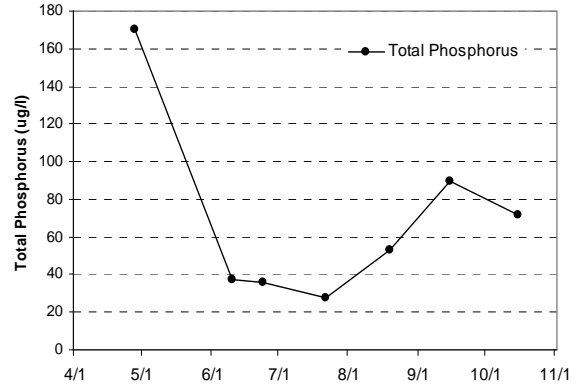
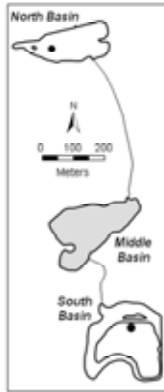
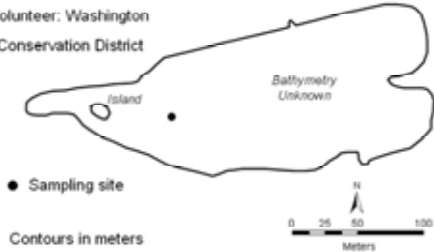
The north basin received a lake grade of C for 2008. Additional years of monitoring are needed to build the water quality database for this water body.

The volunteer's perceptions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale during each monitoring event. The rankings are shown on the information sheet on the next page. The mean physical condition ranking was 2.6 (between 2- "some algae present" and 3- "definite algae present"), and the mean recreational suitability ranking was 3.2 (between 3- "swimming impaired" and 4- "no swimming/boating ok").

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

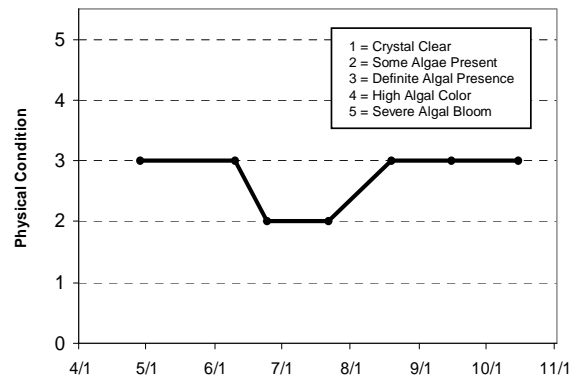
**West Lakeland Storage Site
(North Basin)**
West Lakeland Twp., Washington Co.

LAKE ID: 820488
WD: Valley Branch
Volunteer: Washington
Conservation District



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	7.7	5.5	15.07	0.11	190	170		0.6	3	4
6/10	21.2	8.3	9.44	0.02	7	37		3	3	2
6/24	25.2	7.9	8.75	0.78	8	36		3.2	2	3
7/22	27.1	9.5	7.3	0.26	6.8	28		1.7	2	3
8/19	25.8	13.8	8.17	0.23	14	53		1.5	3	4
9/15	19.8	15.1	6.65	0.2	40	90		0.9	3	4
10/15	13.8	13.5	6.33	0.21	27	72		0.8	3	4



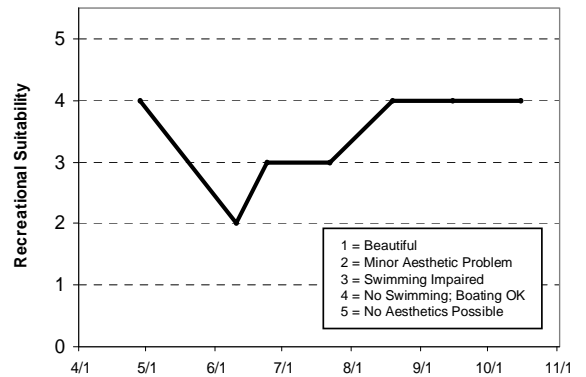
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



West Lakeland Storage Site [south basin] Valley Branch Watershed District

The West Lakeland Storage Site is located in West Lakeland Township (Washington County). The storage site consists of three basins: north, middle, and south. The south basin had a maximum depth of 0.46 m (1.5 ft) in 2008. Other bathymetric information for the basin is unknown. The entire area of the basin is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance.

No other monitoring data is known for this water body. A search through STORET was not possible because the south basin does not have a DNR lake ID number.

The north basin was monitored 3 times in 2008. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total Kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. Depth profiles for temperature and dissolved oxygen were also measured. The resulting data are summarized in tables and figures on the following page.

2008 summer (May-September) data summary

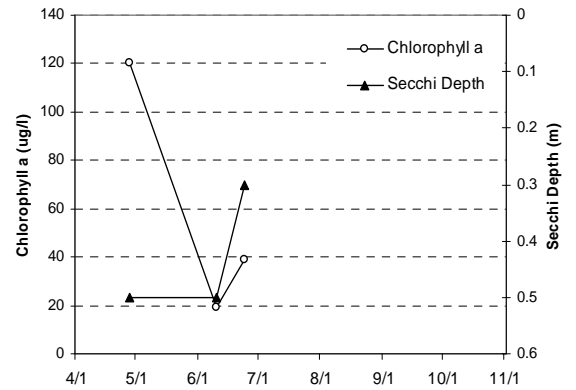
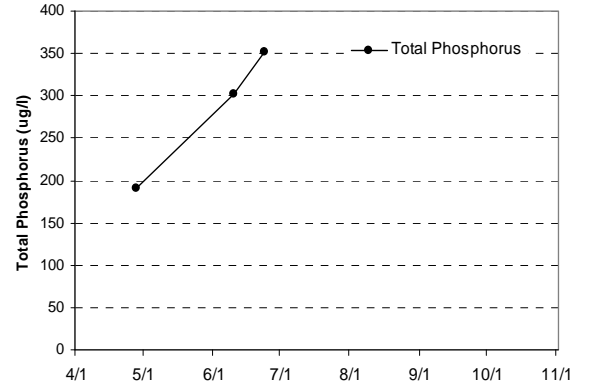
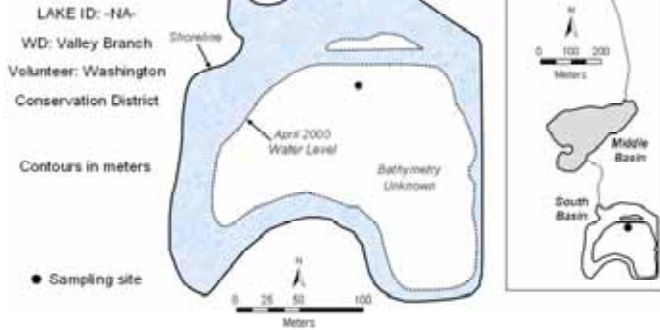
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	327.0	302.0	352.0	
CLA (µg/l)	29.0	19.0	39.0	
Secchi (m)	0.4	0.3	0.5	
TKN (mg/l)	6.60	4.70	8.50	
			<i>Lake Grade</i>	

The south basin did not receive a lake grade and individual parameter grades because there were only 3 monitoring events in 2008. At least 5 monitoring events throughout the summer-time period are required to calculate a grade. Monitoring was discontinued in 2008 because of extremely low water levels.

The volunteer's perceptions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale during each monitoring event. The rankings are shown on the information sheet on the next page. The mean physical condition ranking was 3.0 ("definite algae present"), and the mean recreational suitability ranking was 4.5 (between 4- "no swimming/boating ok" and 5- "no aesthetics possible").

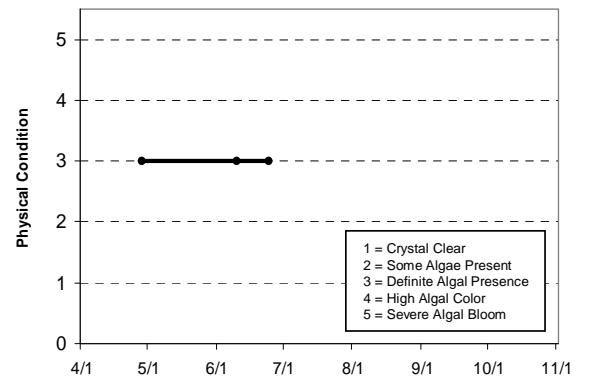
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

**West Lakeland Storage Site
(South Basin)
West Lakeland Twp., Washington Co.**



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/28	6.7		15.31		120	191		0.5	3	4
6/10	22.5		4.31		19	302		0.5	3	5
6/24	29.6	28.6	7.48	1.23	39	352		0.3	3	4



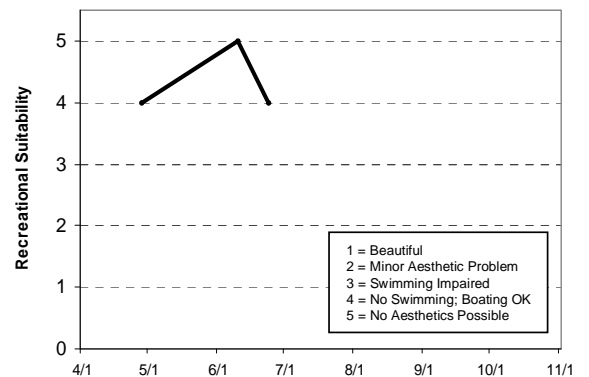
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Westwood Lake (27-0711) Bassett Creek Watershed Management Organization

Westwood Lake is located in the City of St. Louis Park (Hennepin County). The lake has a surface area of 41 acres and a maximum depth of 2.0 m (6.6 ft). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2005 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	29.9	22.0	39.0	B
CLA ($\mu\text{g/l}$)	6.5	2.5	15.0	A
Secchi (m)	1.2	0.6	1.7	D
TKN (mg/l)	1.66	1.30	2.00	
			<i>Lake Grade</i>	B

The lake received a lake grade of B in 2008, which is consistent with the lake grades received in 2000, 2003, and 2004. The lake grades have varied mainly in the Cs and Bs. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008). Continued monitoring is suggested to enhance the ability to detect potential trends in water quality.

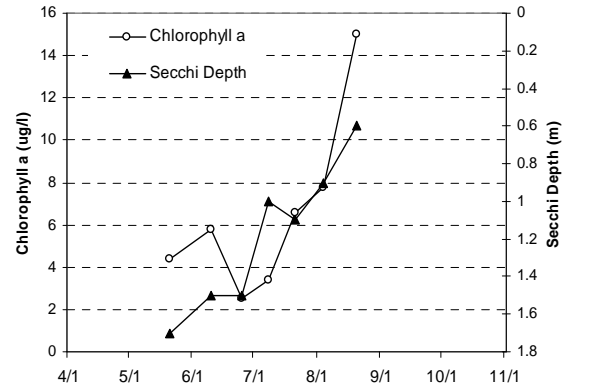
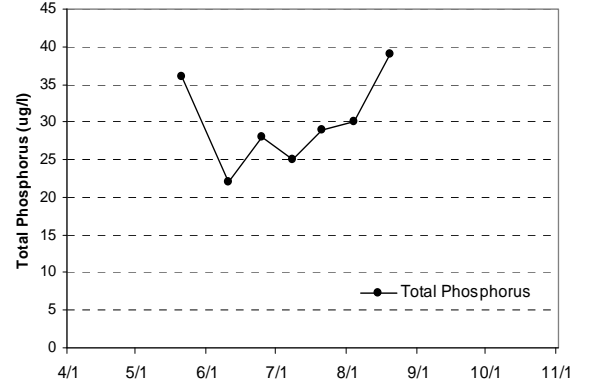
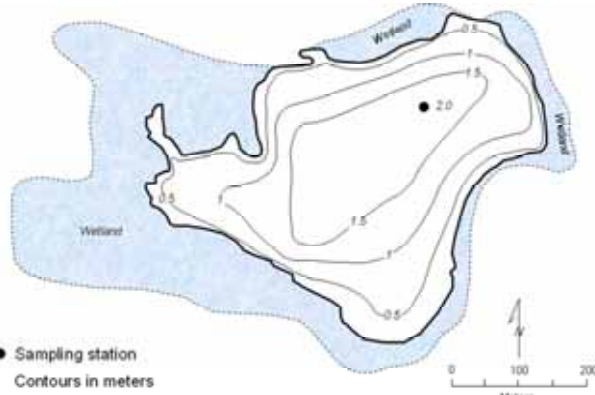
The water clarity grade of D does not correlate well with the CLA grade of A and the TP grade of B. Other years in which a poor correlation between water clarity and CLA grades existed were 2003 and 2004. A possible explanation may be that in certain years the water clarity may be affected by higher levels of total suspended solids from surface runoff from the surrounding urban watershed. It is possible for higher suspended solids loadings to decrease water clarity which would decrease light penetration thereby inhibiting algal growth. Furthermore, the relatively lower TP concentrations could possibly limit the abundance of algae.

Throughout the monitoring period, the volunteers' opinions of the lake's physical and recreational conditions were ranked on a 1-to-5 scale. These user perception rankings are shown on the lake information sheet. The average user perception rankings, on a 1-to-5 scale, were 2.4 for physical condition (between 2- "some algae present" and 3- "definite algal color"), and 3.3 for recreational suitability (between 3- "swimming impaired" and 4- "no swimming/boating ok").

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

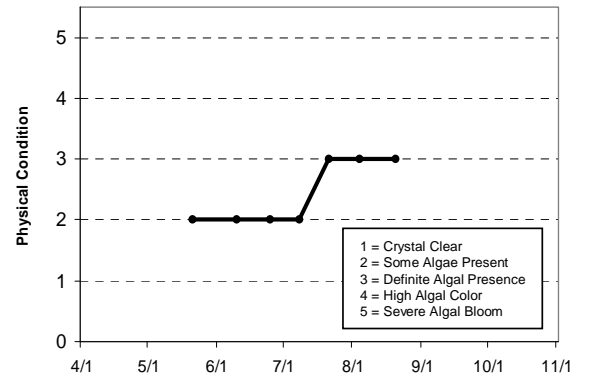
Lake ID: 270711
 WMO: Bassett Creek
 Volunteer: The Westwood Nature Center

**Westwood Lake,
 St. Louis Park, Hennepin Co.**



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/21	17.5				4.4	36		1.7	2	2
6/10	20.4				5.8	22		1.5	2	2
6/25	27.5				2.5	28		1.5	2	4
7/8					3.4	25		1	2	3
7/21	28.4				6.6	29		1.1	3	4
8/4	26.9				7.8	30		0.9	3	4
8/20	25.8				15	39		0.6	3	4



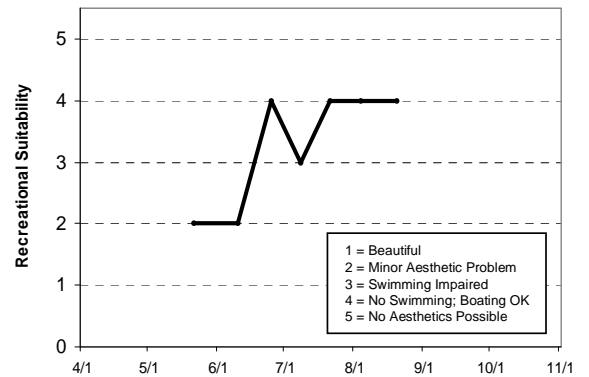
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



White Rock Lake (82-0072) Rice Creek Watershed District

White Rock Lake is a 65-acre lake located in Washington County. There is no other known morphological data for the lake. This was the third year that White Rock Lake has been involved in CAMP. A search through the STORET nationwide water quality database for data on the lake provided just the historical CAMP data.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	78.9	65.0	120.0	D
CLA ($\mu\text{g/l}$)	36.5	11.0	98.0	C
Secchi (m)	0.7	0.5	1.2	D
TKN (mg/l)	2.28	1.50	3.20	
			Lake Grade	D

The lake received a lake grade of D in 2008, which is similar to the previous two years' grades. There is limited water quality data available for White Rock Lake. Therefore, additional years of data are needed to determine potential trends in water quality.

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.6 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 2.5 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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

**White Rock Lake,
New Scandia Twp.,
Washington Co.**

Lake ID: 820072
WD: Rice Creek
Volunteer: David Bluhm

● Sampling station
Contours in meters



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/29	10.5				15	56		1.5	1	1
5/18	18.3				12	65		1.2	2	1
5/26	18.2				27	71		1	2	2
6/12	23				68	74		0.7	2	2
6/24	21.6				23	65		0.8	2	2
7/12	25				98	120		0.5	3	3
7/22	27.3				42	90		0.5	3	3
8/5	26.8				28	85		0.5	3	3
8/18	28.5				21	67		0.6	3	3
9/1	24.1				11	75		0.6	3	3
9/18	19.9				35	77		0.6	3	3
10/4	15.6				40	96		0.5	3	3
10/18	12.7				23	65		0.7	2	2

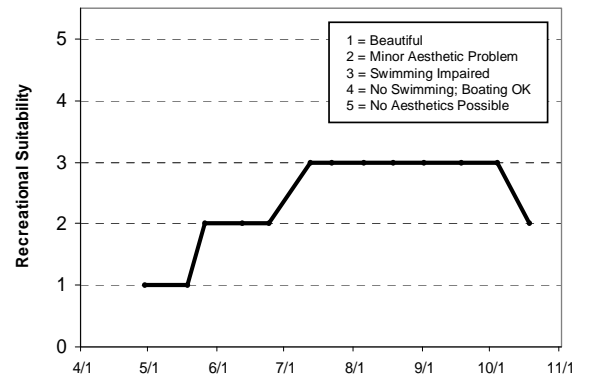
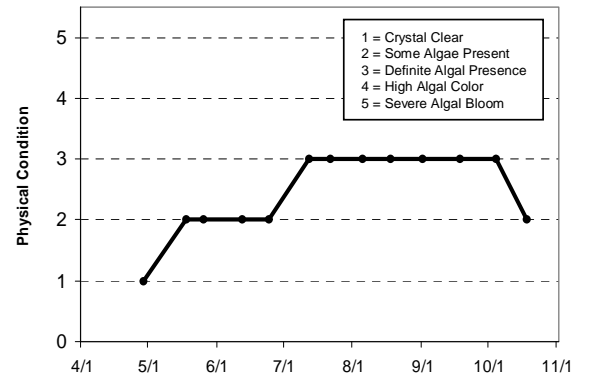
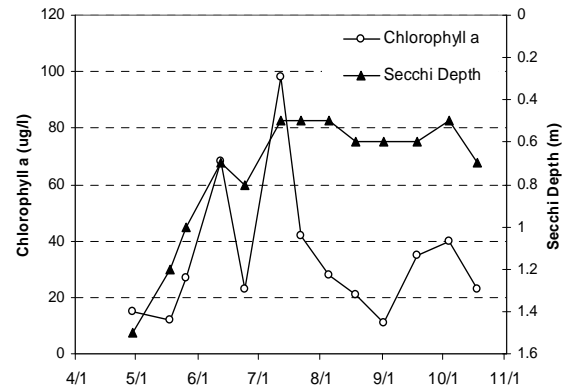
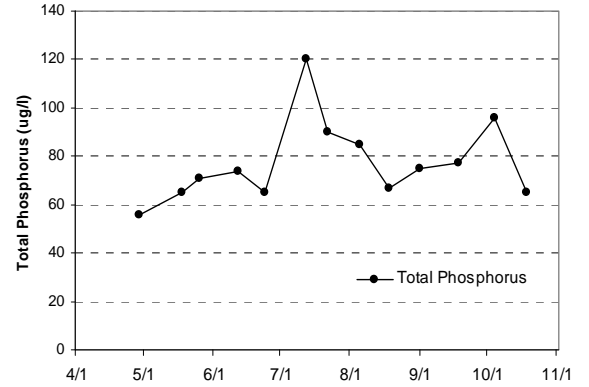
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Wilmes Lake (82-0090) City of Woodbury

Wilmes Lake is located in the City of Woodbury (Washington County). It is classified as a minnow lake that experiences frequent fish kills. The lake has a surface area of 41 acres and a maximum depth of 5.5 m (18 feet). The lake's 2,247-acre watershed translates to a watershed-to-lake area ratio of 55:1. The larger the ratio, the greater the potential stress on the lake quality from surface runoff. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

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

2008 summer (May-September) data summary

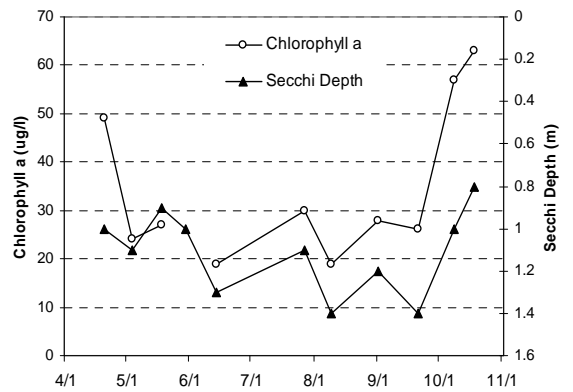
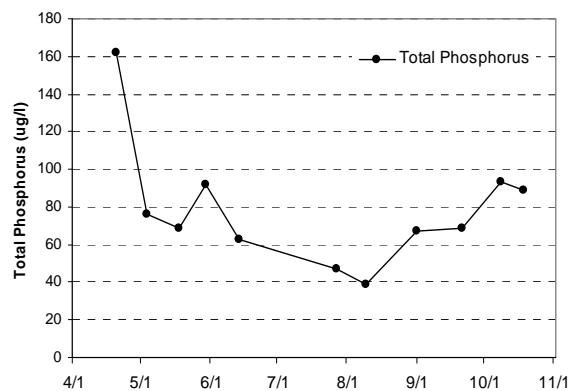
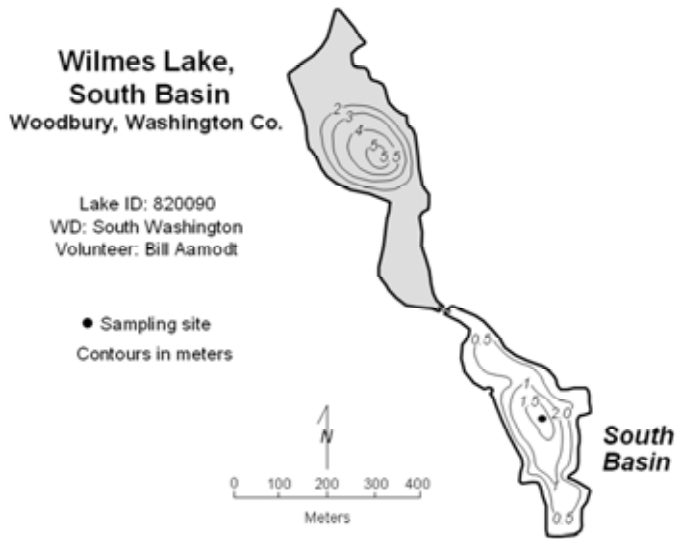
<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	65.3	39.0	92.0	C
CLA ($\mu\text{g/l}$)	24.7	19.0	30.0	C
Secchi (m)	1.2	0.9	1.4	D
TKN (mg/l)	1.80	1.50	2.50	
			<i>Lake Grade</i>	C

The lake received a lake grade of C for 2008, which is consistent with lake grades received in the lake's historical water quality database. The water quality of the lake varies between a lake grade of C and D on the basis of the historical database. A trend analysis conducted by the MPCA on the lake's Secchi transparency data revealed no statistically significant trend in water clarity (MPCA 2008).

The 1994 and 1995 CAMP monitoring was performed in the northern basin of Wilmes Lake, while the 1996-2008 monitoring was performed in the lake's south basin. Comparisons between the 1994-1995 data and the 1996-2006 data should not be made as they are from different basins.

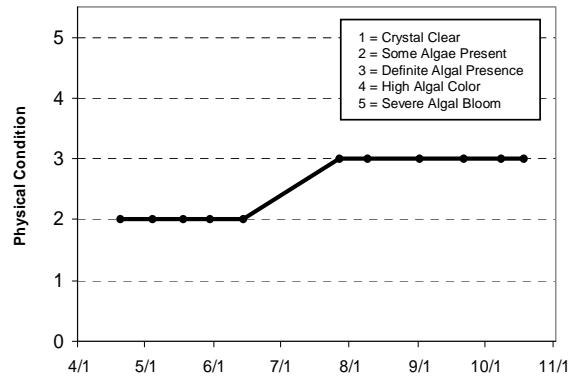
Throughout the monitoring period, the perceived physical condition and recreational suitability of the lake were ranked on a 1-to-5 scale by the volunteer monitors. These user perception rankings are presented in data tables and graphs on the information sheet. The mean physical condition ranking was 2.5 (between 2- "some algae present" and 3- "definite algae present"). The mean recreational suitability ranking was 2.4 (between 2- "minor aesthetic problem" and 3- "swimming slightly impaired").

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



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/20	8.9				49	162		1	2	2
5/4	14.4				24	76		1.1	2	2
5/18	17.6				27	69		0.9	2	2
5/30	18.6					92		1	2	2
6/14	22.5				19	63		1.3	2	2
7/27	26.4				30	47		1.1	3	3
8/9	26.4				19	39		1.4	3	3
9/1	24.1				28	67		1.2	3	2
9/21	21.8				26	69		1.4	3	3
10/8	16.6				57	93		1	3	3
10/18	13.7				63	89		0.8	3	3



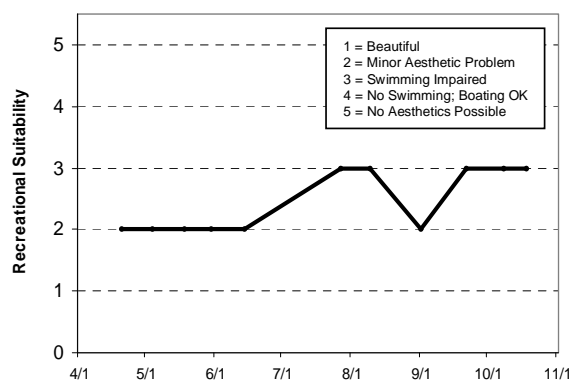
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Wing Lake (27-0091) *Nine Mile Creek Watershed District*

Wing Lake is a small 11-acre lake located within the City of Minnetonka (Hennepin County). There is little known morphological data available for the lake.

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

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

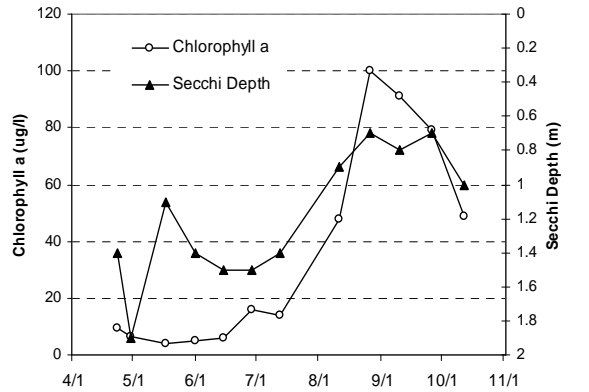
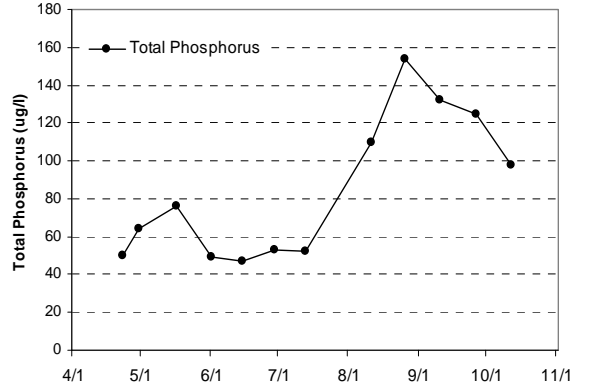
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	88.7	47.0	154.0	D
CLA ($\mu\text{g/l}$)	40.3	4.1	100.0	C
Secchi (m)	1.1	0.7	1.5	D
TKN (mg/l)	1.77	1.30	2.00	
			Lake Grade	D

The lake received a lake grade of D for 2008, which is consistent with the previous two years' of data. The individual parameter grades have remained unchanged for the past 3 years as well. Since only 3 years of data are available, additional years of monitoring are needed to determine potential trends in water quality.

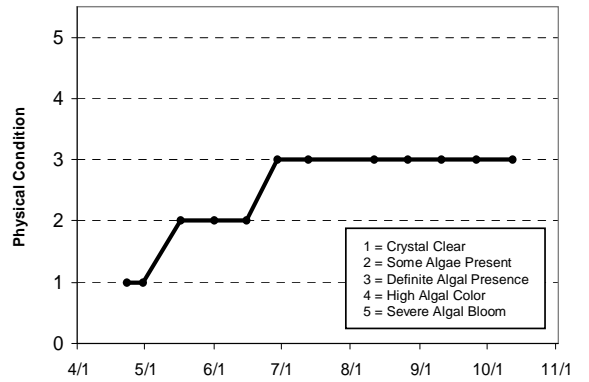
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.7 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 4.8 (between 4- "no swimming/boating ok" and 5- "no aesthetics possible").

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



2008 Data

DATE	Surf 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	15.7				9.6	50		1.4	1	1
4/30	12				6.6	64		1.9	1	1
5/17	19				4.1	76		1.1	2	4
6/1	25				5.2	49		1.4	2	
6/15	24				5.8	47		1.5	2	4
6/29	24				16	53		1.5	3	5
7/13	23				14	52		1.4	3	5
8/11	25				48	110		0.9	3	5
8/26	21				100	154		0.7	3	5
9/10	16.4				91	132		0.8	3	5
9/26	19.6				79	125		0.7	3	5
10/12	16.7				49	98		1	3	5



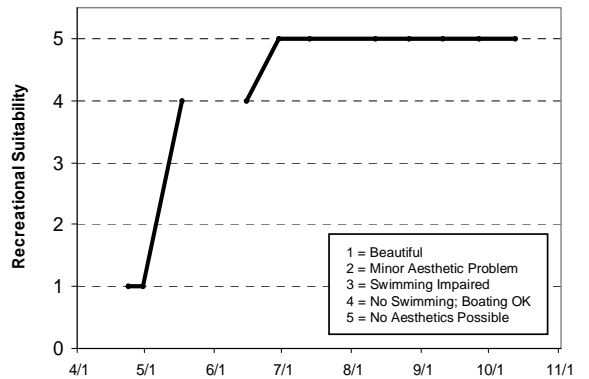
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Winkler Lake (10-0066) Carver County Environmental Services

Winkler Lake is a 129-acre lake located within Benton Township (Carver County). The lake has a 2,758-acre immediate watershed, which translates to a watershed-to-lake area ratio of 21:1 (the larger the ratio the greater the potential stress put on the lake from surface runoff). The lake is the receiving waterbody for the Bongard's wastewater treatment plant.

The DNR has designated the lake as being infested with Eurasian Water Milfoil (*Myriophyllum spicatum*).

A search through the STORET nationwide water quality database provided one additional year of data (1995) besides historical CAMP data.

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

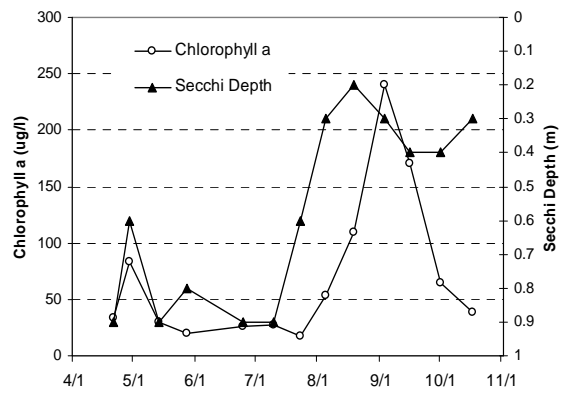
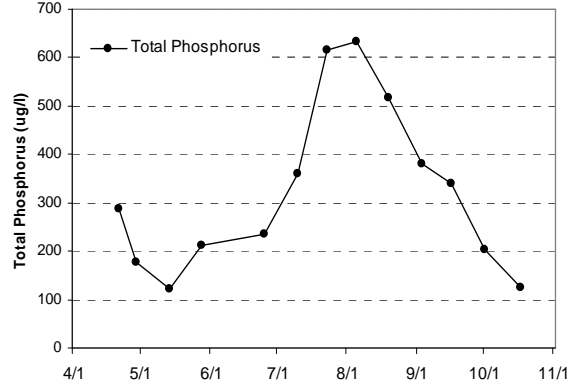
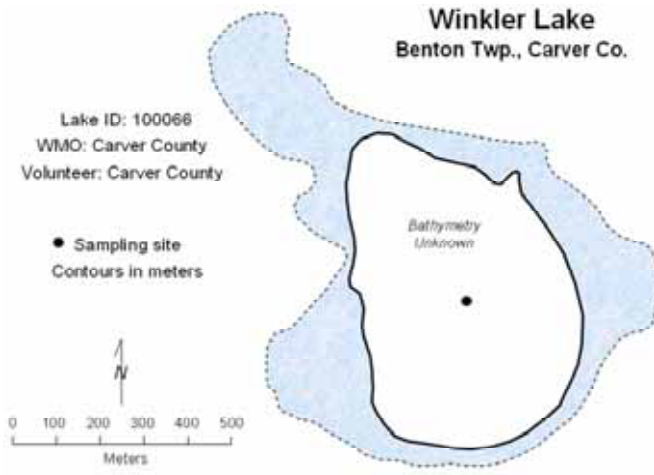
2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	379.6	122.0	633.0	F
CLA (µg/l)	77.2	18.0	240.0	F
Secchi (m)	0.6	0.2	0.9	F
TKN (mg/l)	3.28	1.40	5.20	
			Lake Grade	F

The lake received a lake grade of F for 2008. The lake appears to fluctuate between lake grades of D and F, except that F lake grades are more common. The lake received a lake grade of C in 1995, so to better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

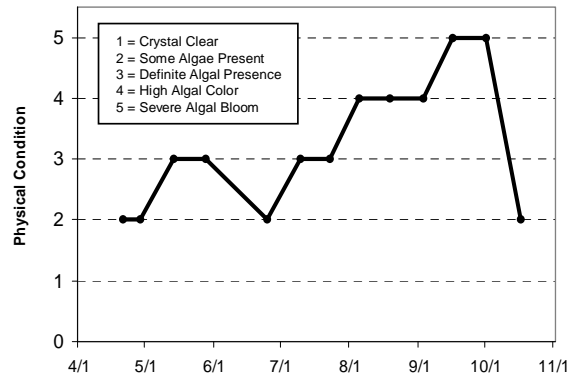
The average user perception rankings, on a 1-to-5 scale, were 3.4 for physical condition (between 3- "definite algae present" and 4- "high algal color") and 4.6 for recreational suitability ranking (between 4- "no swimming - boating ok" and 5- "no aesthetics possible").

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



2008 Data

DATE	Surf Tmp (°C)	Bot Tmp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	11.12		10.7		34	287		0.9	2	4
4/29	4.2		21.8		83	176		0.6	2	4
5/14	12.44		10.56		30	122		0.9	3	4
5/28	16		7.79		20	212		0.8	3	5
6/25	24.48		7.35		26	235		0.9	2	4
7/10	25.87		8.98		27	359		0.9	3	4
7/23	27.26		4.03		18	616		0.6	3	4
8/5	26.74		12.36		54	633		0.3	4	5
8/19	25.69		9.88		110	518		0.2	4	5
9/3	17.84		13.42		240	381		0.3	4	5
9/16	16.61		10.53		170	340		0.4	5	5
10/1	12.86		6.8		65	202		0.4	5	5
10/17	10.47		6.56		38	126		0.3	2	3



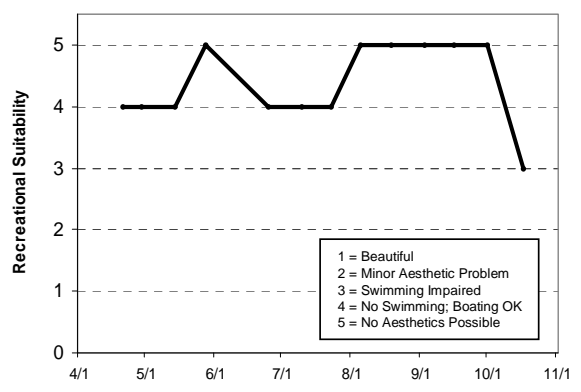
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Wood Lake (19-0024) Black Dog Watershed Management Commission

Wood Lake is located in the City of Burnsville (Dakota County). The lake has a surface area of 9 acres. The maximum depth of the lake is 4.5 m (14.8 feet). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The majority of the land within the lake's 157-acre immediate watershed is urban/developed. The resulting watershed-to-lake area ratio is 17:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	59.7	35.0	109.0	C
CLA ($\mu\text{g/l}$)	14.1	1.8	33.0	B
Secchi (m)	2.1	0.8	5.0	C
TKN (mg/l)	1.81	1.50	2.10	
			Lake Grade	C

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

The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.4 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 3.6 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

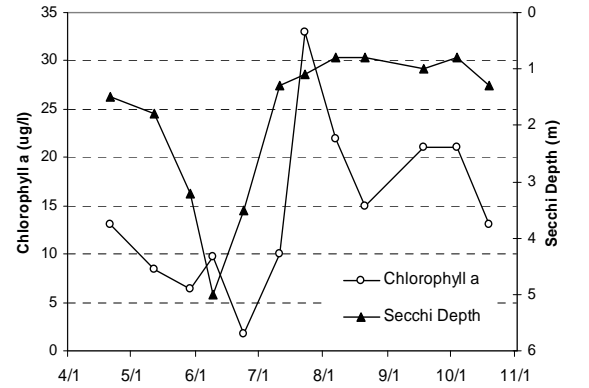
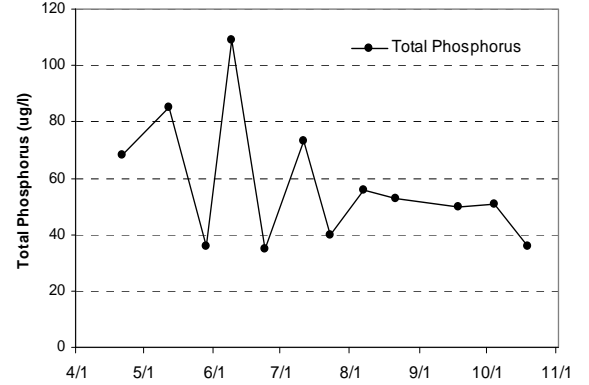
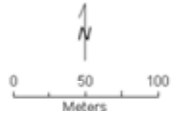
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at <http://www.dnr.state.mn.us/lakefind/>.

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

Wood Lake
Burnsville, Dakota Co.

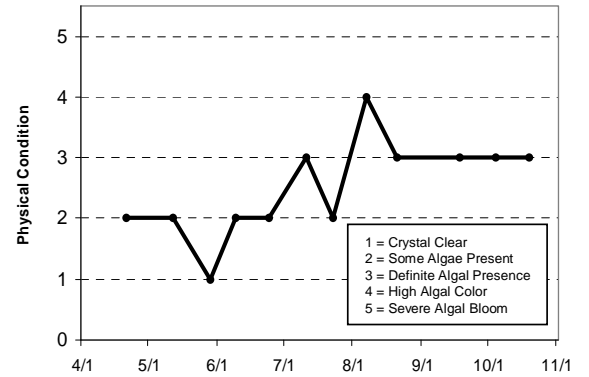
Lake ID: 190024
WMO: Black Dog
Volunteers: David Bess;
Burnsville City Staff

● Sampling site
Contours in meters



2008 Data

DATE	Surf Temp (°C)	Bot Temp (°C)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/21	11.4				13	68		1.5	2	4
5/12	14.8				8.4	85		1.8	2	4
5/29	17.6				6.4	36		3.2	1	4
6/9	21.3				9.7	109		5	2	2
6/24	25				1.8	35		3.5	2	3
7/11	27.2				10	73		1.3	3	3
7/23	27.8				33	40		1.1	2	4
8/7	26.3				22	56		0.8	4	4
8/21	25.7				15	53		0.8	3	4
9/18	20.7				21	50		1	3	4
10/4	17.2				21	51		0.8	3	4
10/19	13.9				13	36		1.3	3	4



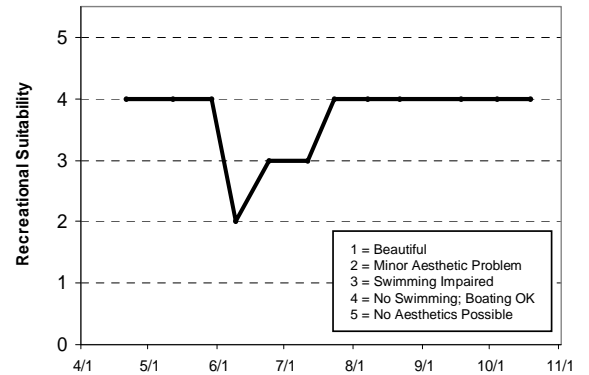
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Woodpile Lake (82-0132) Browns Creek Watershed District

Woodpile Lake is a small 15-acre lake located in Washington County. The maximum depth of the lake is 8.2 m (27 ft). This was the third year that Woodpile Lake has been involved in the CAMP. A search through the STORET nationwide water quality database for data on the lake provided only the historical CAMP data.

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

2008 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP ($\mu\text{g/l}$)	41.8	12.0	68.0	C
CLA ($\mu\text{g/l}$)	20.9	3.5	74.0	C
Secchi (m)	2.0	0.9	3.5	C
TKN (mg/l)	1.27	0.71	2.60	
			<i>Lake Grade</i>	C

The lake received a lake grade of C for 2008, which is similar to the lake grade received in 2006, but worse than the B lake grade received last year. The quantity of data in the water quality database is limited, so additional years of data are needed to determine potential trends in water quality.

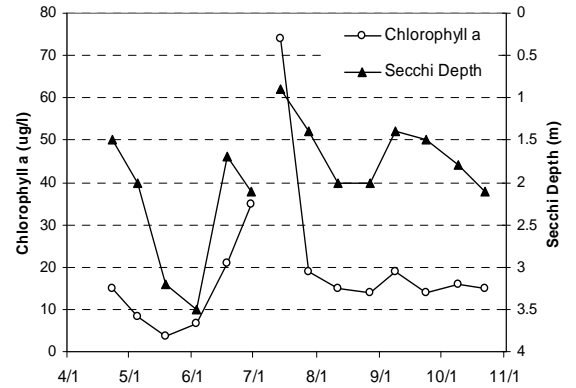
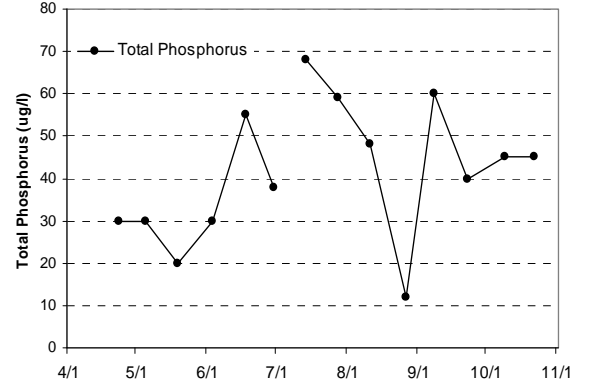
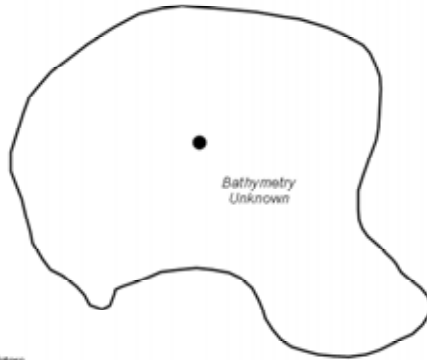
The volunteer's perceptions of the physical and recreational conditions of the lake are shown on the next page. Each of the conditions was ranked on a scale of 1 to 5. The average physical condition ranking was 2.9 (between 2- "some algae present" and 3- "definite algae present"). The average recreational suitability ranking was 3.8 (between 3- "swimming slightly impaired" and 4- "no swimming/boating ok").

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

Woodpile Lake
Grant, Washington Co.

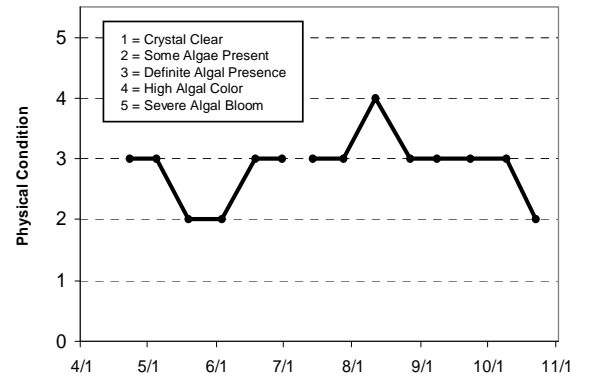
Lake ID: 820132
WD: Browns Creek
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters



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	12.1	5	12.82	1.47	15	30		1.5	3	3
5/5	13.9	5	11.69	0.86	8.3	30		2	3	4
5/19	16.1	5.3	9.71	0.34	3.5	20		3.2	2	3
6/3	19.4	5.8	9.23	0.2	6.6	30		3.5	2	3
6/18	22.1	6.1	11.4	0.26	21	55		1.7	3	4
6/30	25.5	6.3	10.89	0.77	35	38		2.1	3	4
7/8										
7/14	25	7	8.53	0.44	74	68		0.9	3	4
7/28	27.4	6.7	8.66	0.39	19	59		1.4	3	4
8/11	25.5	7	6.88	0.26	15	48		2	4	4
8/27	22.7	7.2	7.31	0.49	14	12		2	3	4
9/8	20.4	7.5	6.67	0.21	19	60		1.4	3	4
9/23	20.5	7.7	8.66	0.35	14	40		1.5	3	4
10/9	14.4	7.9	7.79	0.3	16	45		1.8	3	3
10/22	11.1	8.3	7.78	0.53	15	45		2.1	2	3



Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data

