Hay Lake (82-0065) *Carnelian - Marine - St. Croix Watershed District*

Hay lake is located in City of Scandia (Washington County). The lake has a surface area of 33 acres, and a maximum depth of 6.1 m (20 feet).

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	60.2	47.0	76.0	C
CLA (µg/l)	23.3	8.5	44.0	C
Secchi (m)	1.8	1.5	2.1	C
TKN (mg/l)	1.26	0.94	1.60	
			Lake Grade	C

The lake received a lake grade of C for 2009, which continues the improved water quality in comparison to the water quality during the late 1990s and early 2000s. The year 2008 was the second year in a row that all of the individual water quality parameters received C grades, which is better than all other past years of monitoring. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

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

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

Hay Lake

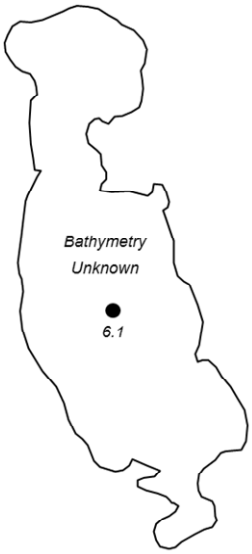
Scandia,
Washington Co.

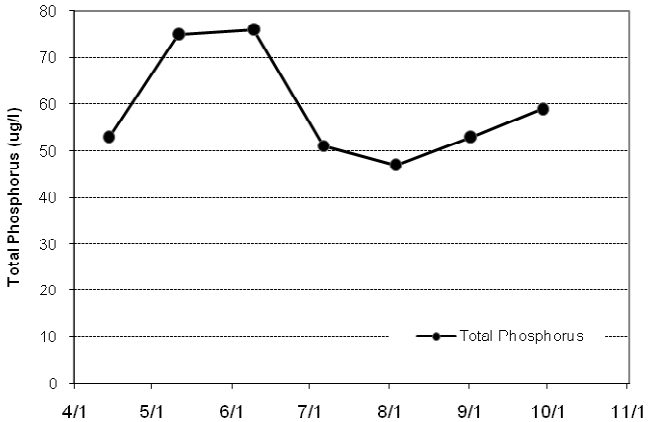
LAKE ID: 820065-00
WD: Carnelian-Marine-St. Croix
Volunteer: Washington Conservation District

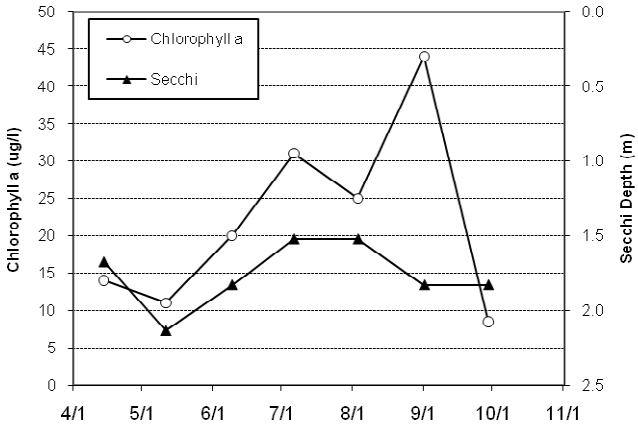
● Sampling site
Contours in meters

N

0 200 400
Meters

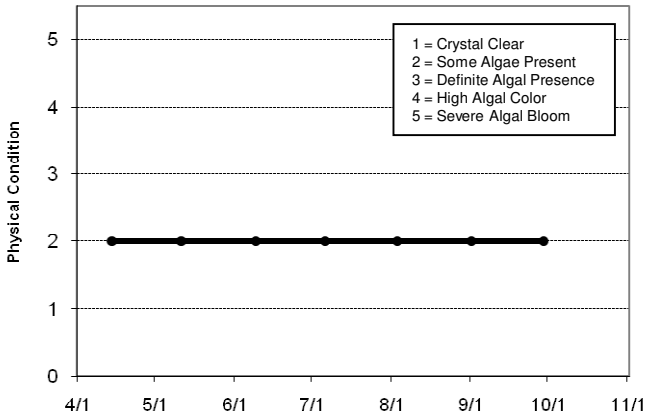






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	11.2	10.4	9.79	9.5	14	53		1.7	2	1
5/11	16.7	14.8	8.99	0.4	11	75		2.1	2	2
6/9	16.5	15.8	7.22	0.09	20	76		1.8	2	2
7/6	24.8	20.9	9.93	0.14	31	51		1.5	2	3
8/3	21.9	20.9	7.11	0.13	25	47		1.5	2	3
9/1	19	18.8	6.58	6.94	44	53		1.8	2	2
9/29	14	13.9	7.03	0.54	8.5	59		1.8	2	2



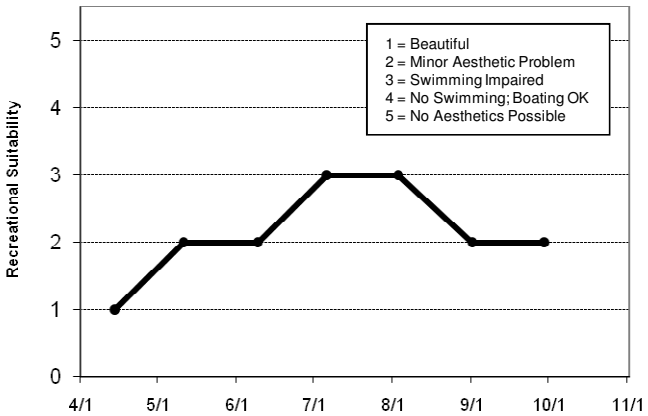
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Hazeltine Lake is located in the City of Chaska (Carver County). The lake has a surface area of 236 acres and a maximum depth of 2.0 m (6.5 ft).

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

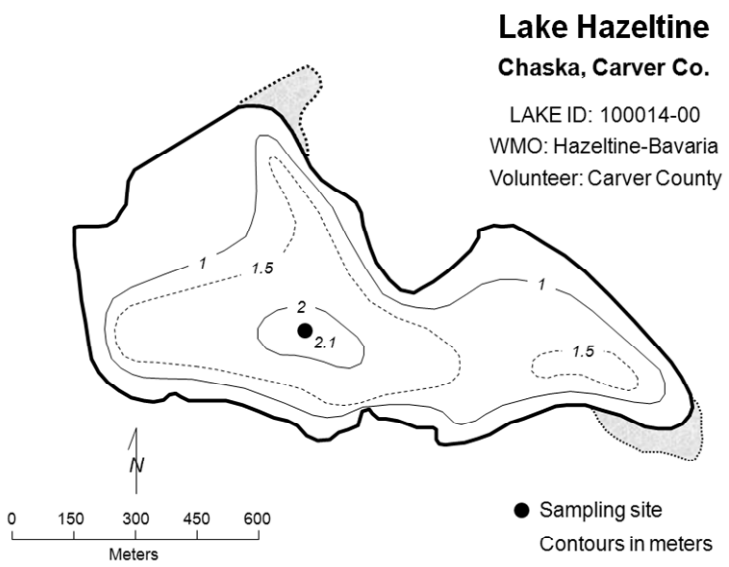
2009 summer (May-September) data summary

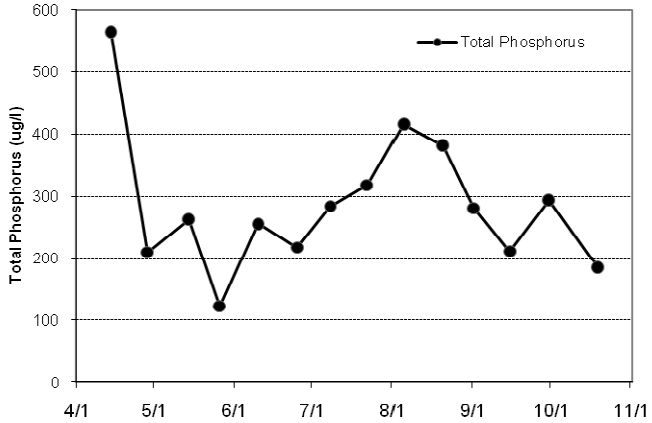
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	276.9	122.0	416.0	F
CLA (µg/l)	286.9	27.0	660.0	F
Secchi (m)	0.3	0.2	0.5	F
TKN (mg/l)	5.41	1.90	7.50	
			Lake Grade	F

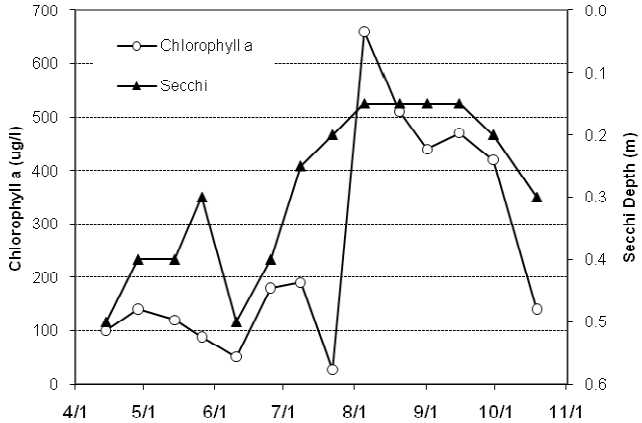
The lake received a lake grade of F for 2009, which is consistent with its historical database. Continued monitoring is suggested to continue to build the water quality database for this lake.

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

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

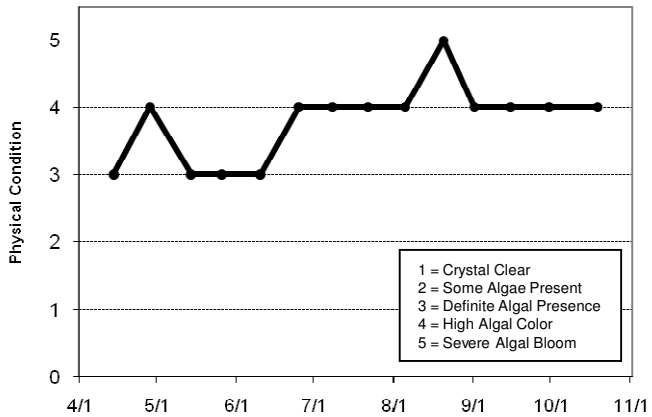






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	11.39		12.83		100	564		0.5	3	3
4/28	11.22		13.7		140	210		0.4	4	3
5/14	14.63		9.61		120	263		0.4	3	4
5/26	19.81		6.3		88	122		0.3	3	4
6/10	15.95		5.82		51	256		0.5	3	4
6/25	26.84		13.85		180	218		0.4	4	4
7/8	24.33		12.3		190	284		0.3	4	5
7/22	21.79		15.24		27	318		0.2	4	4
8/5	23.32		13.67		660	416		0.2	4	5
8/20	21.23		7.29		510	382		0.2	5	5
9/1	20.56		11.8		440	281		0.2	4	4
9/15	23.3		18.7		470	212		0.2	4	5
9/30	12.8		8.99		420	294		0.2	4	4
10/19	8.05		8.74		140	185		0.3	4	4



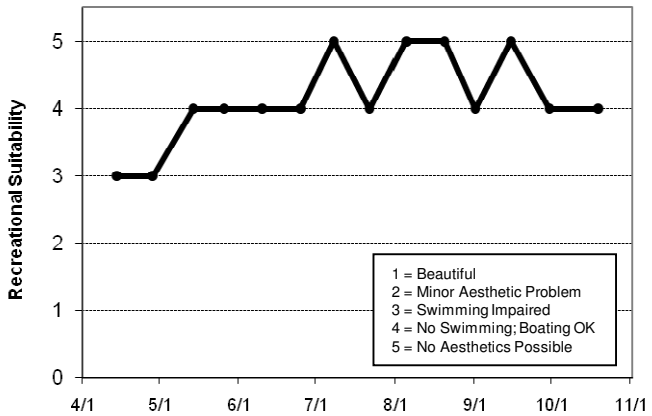
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Heims Lake (13-0056) *Comfort Lake - Forest Lake Watershed District*

Heims Lake is located in Wyoming Township (Chisago County). There are known bathymetric data available for this lake. This was the first year this lake was part of the CAMP.

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	41.4	24.0	82.0	C
CLA (µg/l)	16.9	3.0	82.0	B
Secchi (m)	0.5	0.4	0.6	F
TKN (mg/l)	1.61	1.00	2.10	
			Lake Grade	C

The lake received a lake grade of C for 2009. Continued monitoring is suggested build the baseline water quality database for this lake.

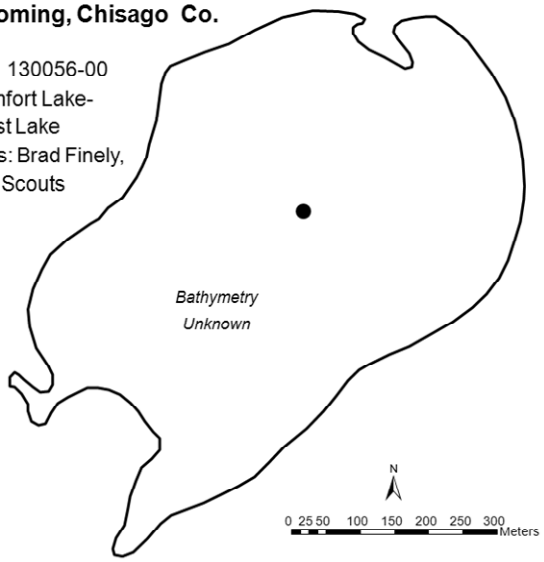
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

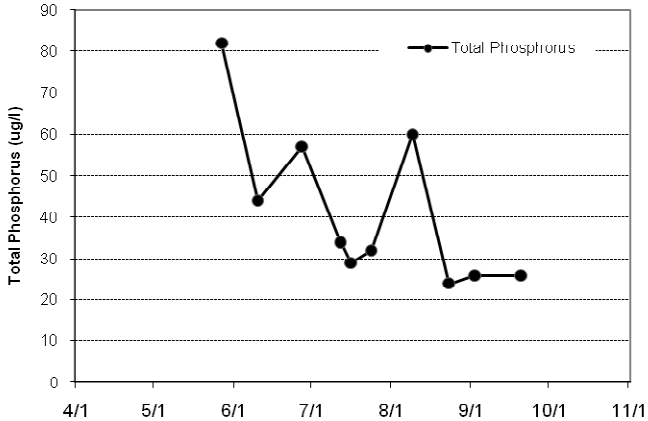
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

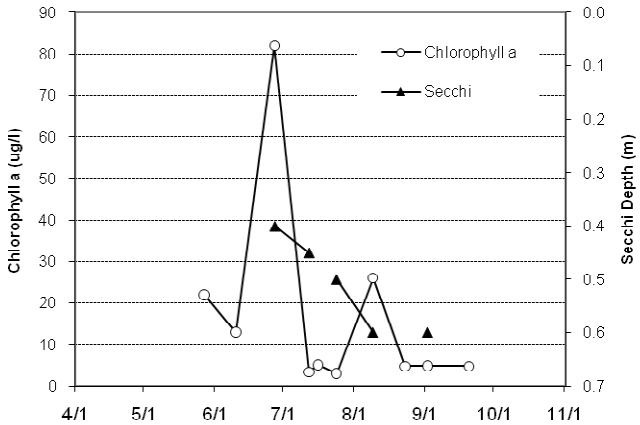
Heims Lake

City of Wyoming, Chisago Co.

LAKE ID: 130056-00
WD: Comfort Lake-Forest Lake
Volunteers: Brad Finely, Boy Scouts

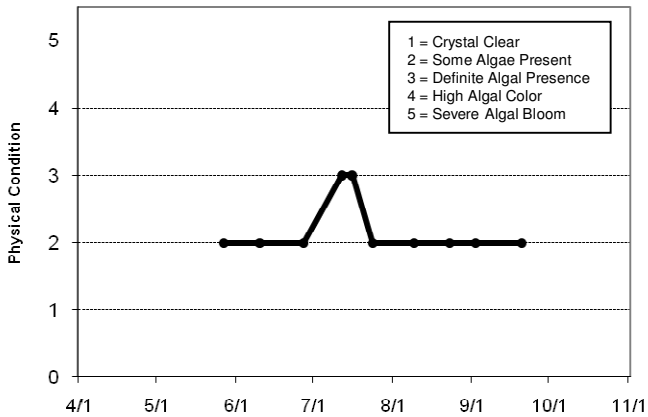






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/27					22	82			2	5
6/10	21				13	44			2	5
6/27	21				82	57		0.4	2	5
7/12	21				3.4	34		0.5	3	5
7/16	20				5.1	29			3	5
7/24	24				3	32		0.5	2	4
8/9	25				26	60		0.6	2	4
8/23	25.8				4.8	24			2	4
9/2	21.9				4.9	26		0.6	2	5
9/20	21.4				4.8	26			2	4



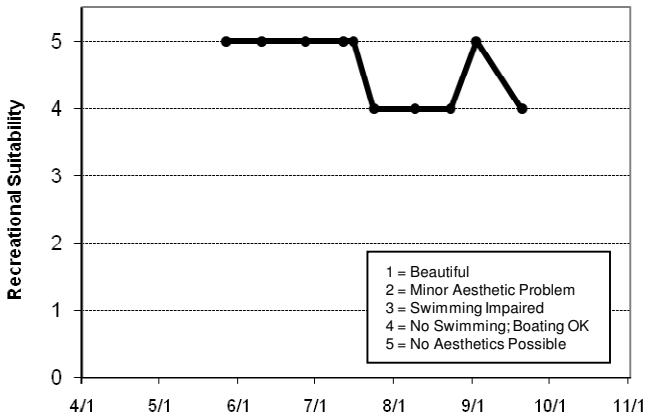
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

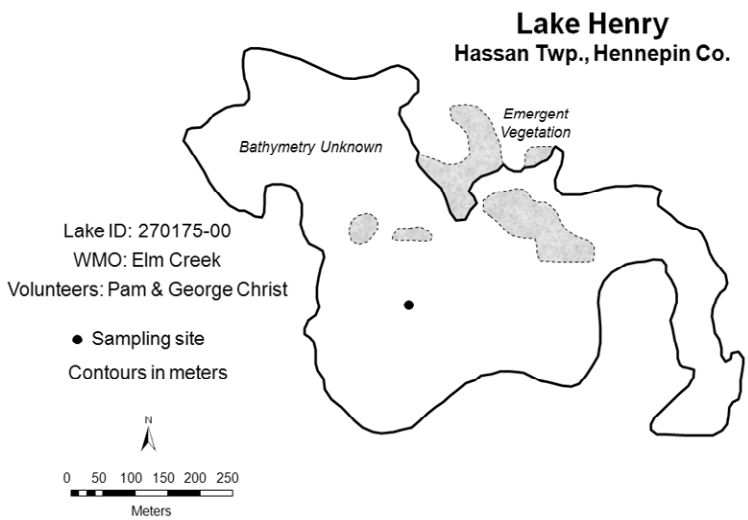
2009 summer (May-September) data summary

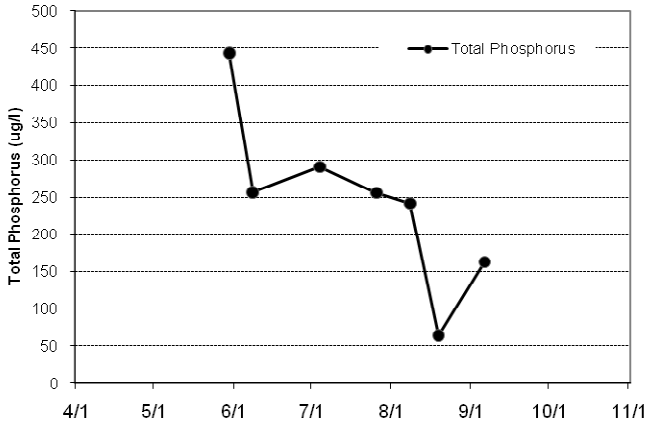
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	245.0	64.0	443.0	F
CLA (µg/l)	80.6	16.0	130.0	F
Secchi (m)	0.4	0.3	0.7	F
TKN (mg/l)	2.54	1.90	3.30	
			Lake Grade	F

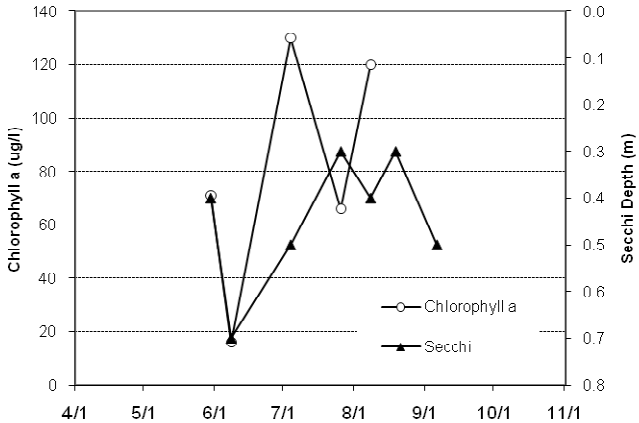
The lake received a lake grade of F for 2009 which is the worst grade the lake has received according to its historical water quality database. Additional years of data are needed to determine trends in water quality.

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

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

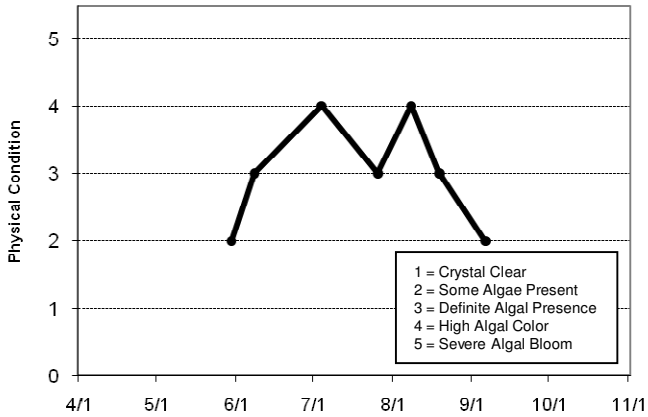






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/30	20.1				71	443		0.4	2	5
6/8	23.3				16	257		0.7	3	5
7/4	25.4				130	291		0.5	4	5
7/26	25.3				66	256		0.3	3	5
8/8	26.3				120	242		0.4	4	5
8/19	21.4					64		0.3	3	5
9/6						162		0.5	2	5



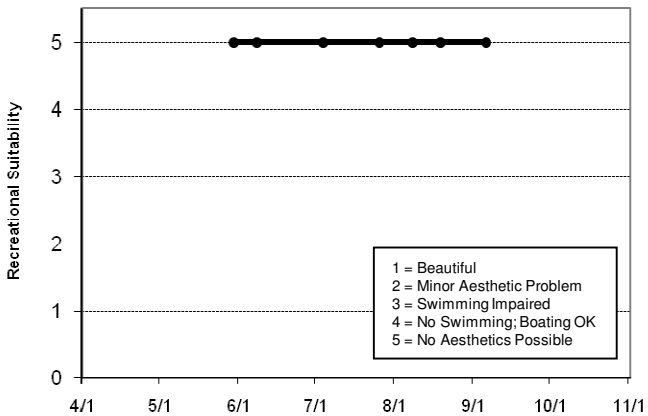
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

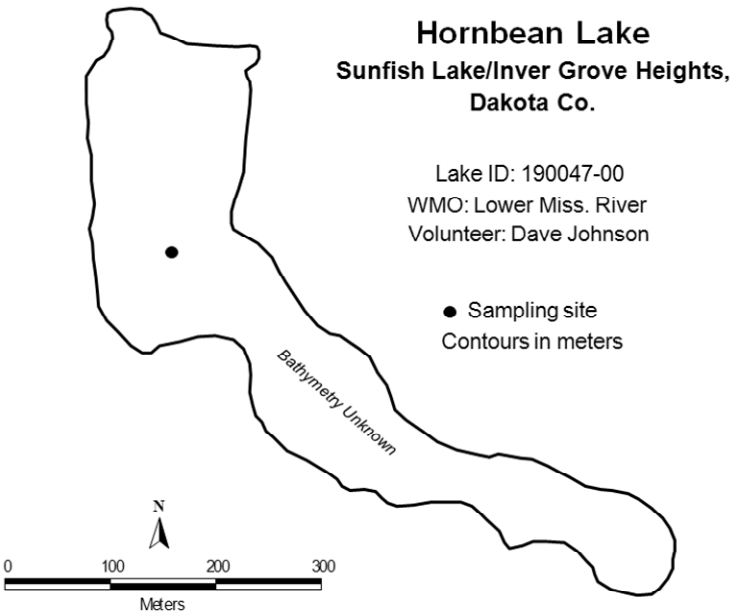
2009 summer (May-September) data summary

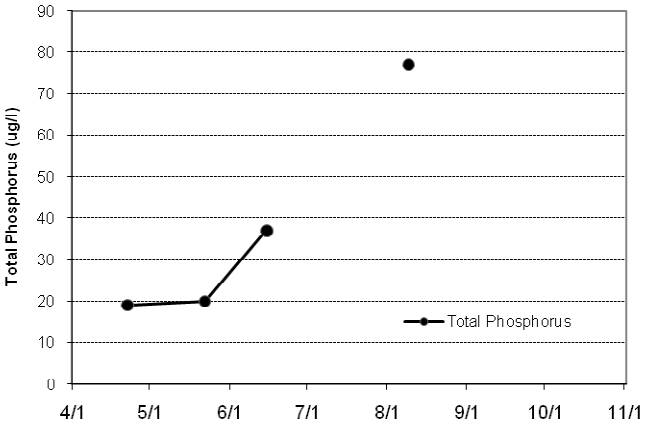
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	44.7	20.0	77.0	N/A
CLA (µg/l)	20.2	4.5	36.0	N/A
Secchi (m)	1.7	0.8	2.7	N/A
TKN (mg/l)	1.49	0.96	1.80	
			Lake Grade	N/A

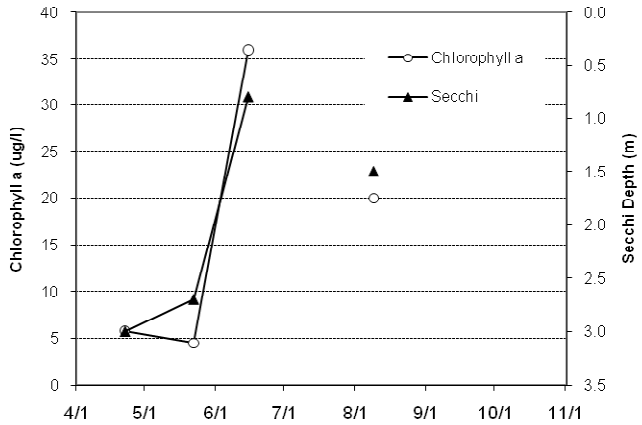
There was an insufficient quantity of data to calculate grades for the lake in 2009. At least 5 monitoring events during the summer-time period (May – September) are needed. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

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

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

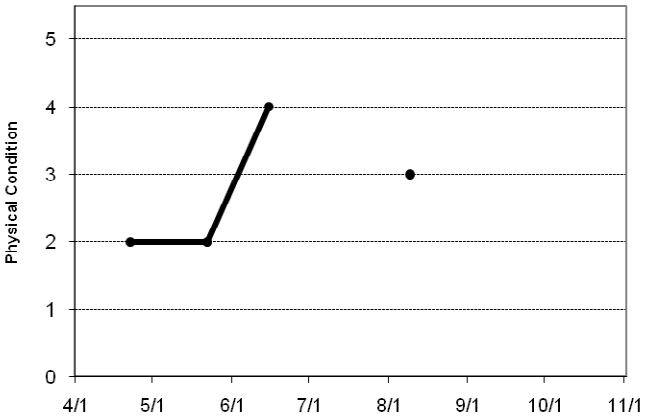






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	13.2				5.8	19		3.0	2	2
5/22	21.3				4.5	20		2.7	2	2
6/15	24.8				36	37		0.8	4	3
8/9	25.1				20	77		1.5	3	3



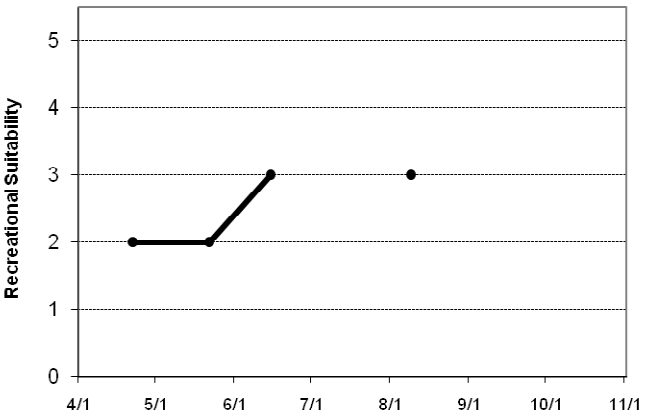
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	25.6	16.0	42.0	B
CLA (µg/l)	4.5	2.7	10.0	A
Secchi (m)	2.3	2.0	3.2	B*
TKN (mg/l)	0.69	0.55	0.88	
			Lake Grade	B

* see discussion below

The lake's 2009 lake water quality grade was a B, which was similar to last year's lake grade. However, the water clarity was better than the Secchi depth data would suggest since most of the measurements were made with the Secchi disk visible on the lake bottom. Therefore the Secchi depth mean and grade given above underestimate the actual water clarity. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

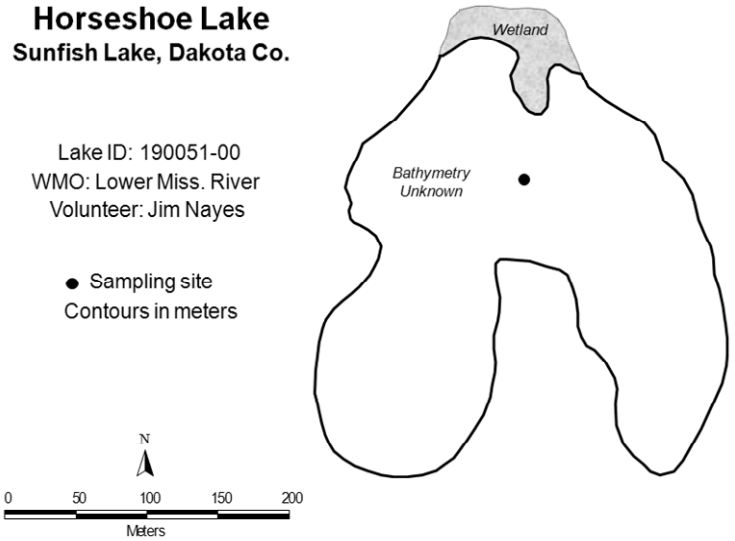
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

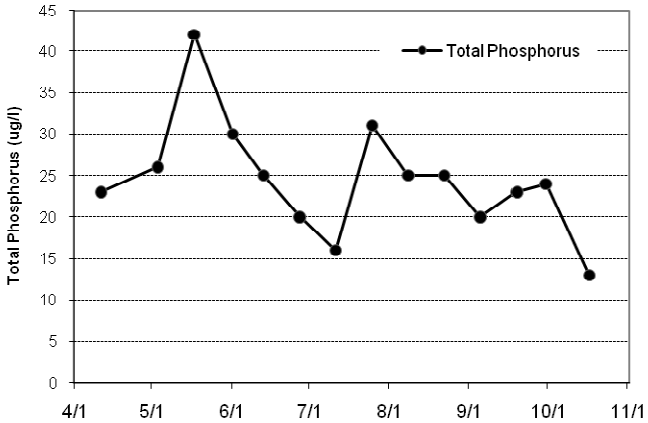
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

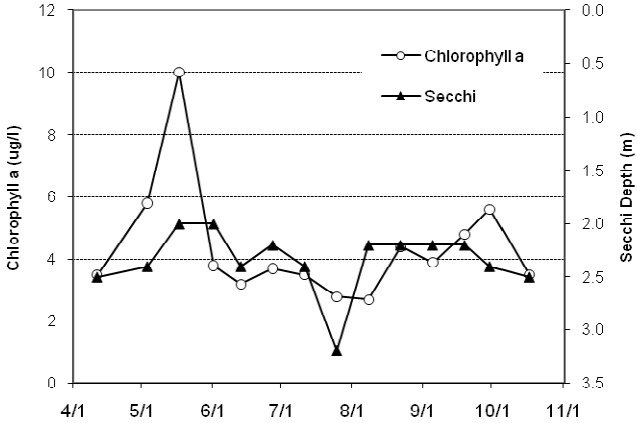
Horseshoe Lake
Sunfish Lake, Dakota Co.

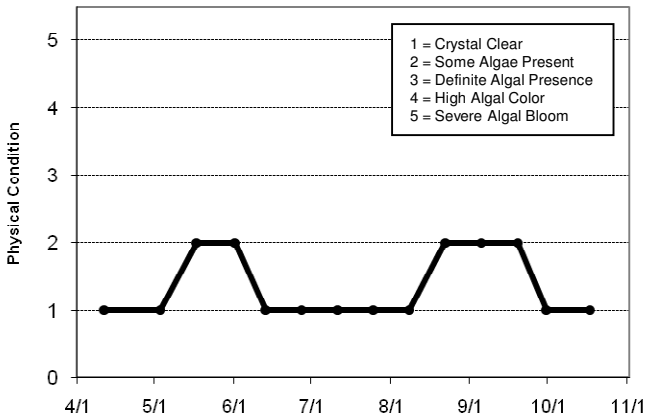
Lake ID: 190051-00
WMO: Lower Miss. River
Volunteer: Jim Nayes

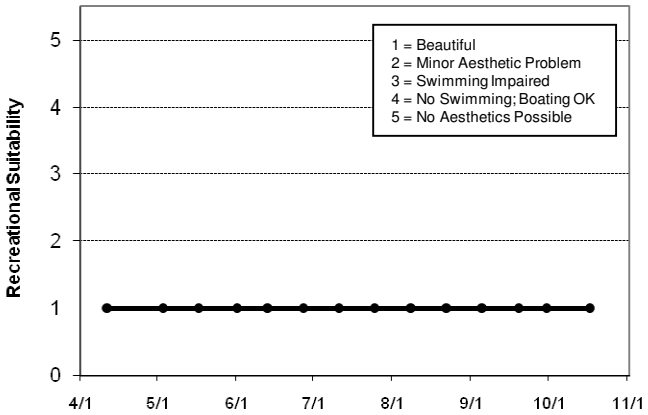
● Sampling site
Contours in meters











2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/11	10.3				3.5	23		2.5	1	1
5/3	16.7				5.8	26		2.4	1	1
5/17	18.7				10	42		2.0	2	1
6/1	20.4				3.8	30		2.0	2	1
6/13	18.6				3.2	25		2.4	1	1
6/27	27.6				3.7	20		2.2	1	1
7/11	25.2				3.5	16		2.4	1	1
7/25	24.5				2.8	31		3.2	1	1
8/8	24				2.7	25		2.2	1	1
8/22	22				4.4	25		2.2	2	1
9/5	24.4				3.9	20		2.2	2	1
9/19	23.7				4.8	23		2.2	2	1
9/30	14.7				5.6	24		2.4	1	1
10/17	8.1				3.5	13		2.5	1	1

Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data

Horseshoe Lake [site 2] (82-0074) *Washington Conservation District*

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

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

2009 summer (May-September) data summary

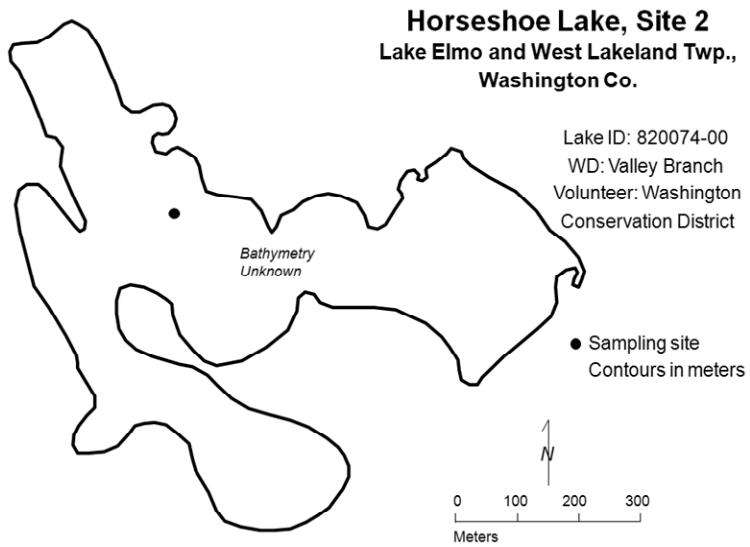
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	50.4	39.0	66.0	C
CLA (µg/l)	21.2	13.0	28.0	C
Secchi (m)	1.1	0.8	1.5	D
TKN (mg/l)	1.54	1.30	1.90	
			Lake Grade	C

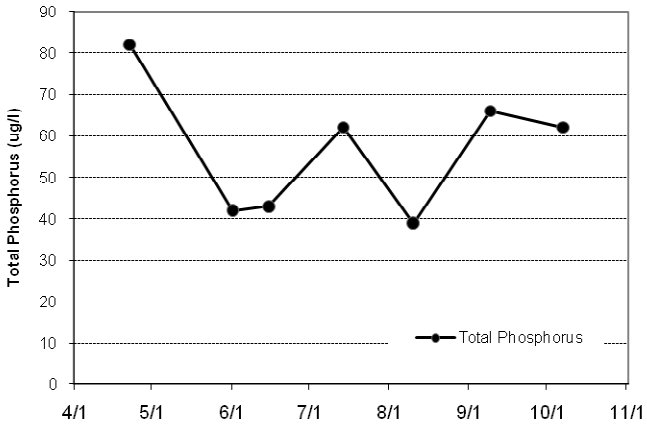
The lake site received a lake grade of C for 2009. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

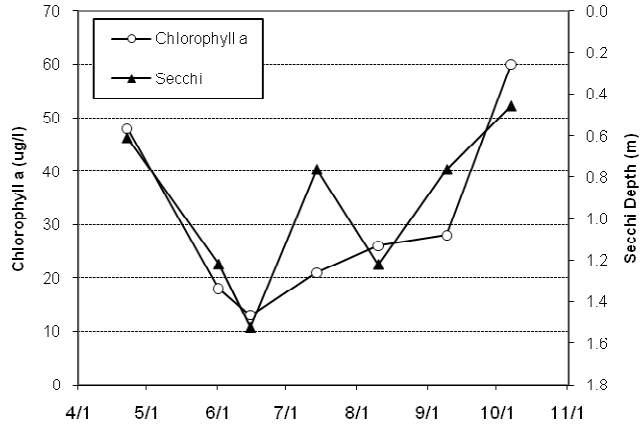
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

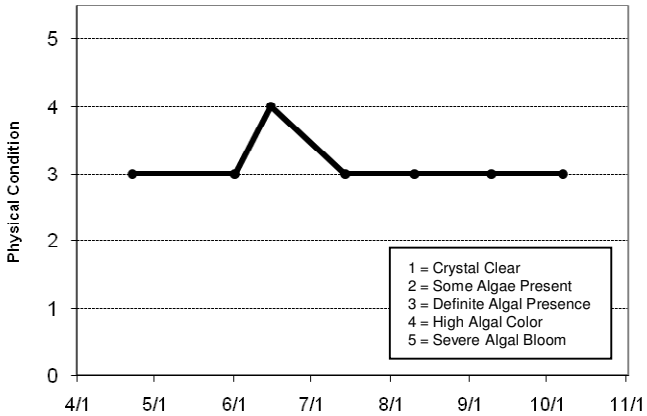






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	11.2	11	10.82	0.13	48	82	109	0.6	3	4
6/1	19.8	19.5	10.73	0.11	18	42	47	1.2	3	4
6/15	22.5	17.8	10.55	0.05	13	43	89	1.5	4	4
7/14	24.3	23.3	8.99	0.09	21	62	76	0.8	3	4
8/10	24.7	22.8	9.37	0.12	26	39	70	1.2	3	4
9/9	22.3	22	9.74	0.12	28	66	65	0.8	3	4
10/7	10.3	10.7	10.96	0.12	60	62	66	0.5	3	4



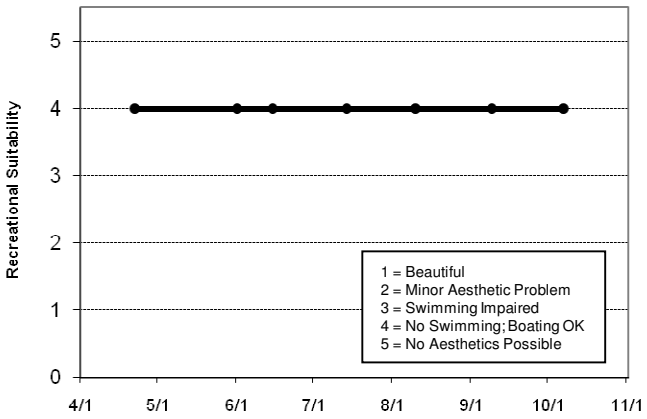
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2009 summer (May-September) data summary

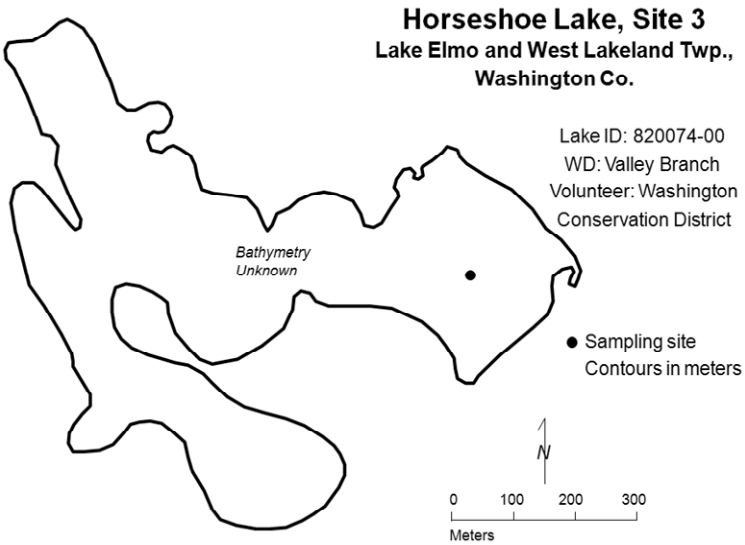
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	55.8	40.0	68.0	C
CLA (µg/l)	18.6	11.0	29.0	B
Secchi (m)	1.2	0.9	1.7	C
TKN (mg/l)	1.52	1.30	1.80	
			Lake Grade	C

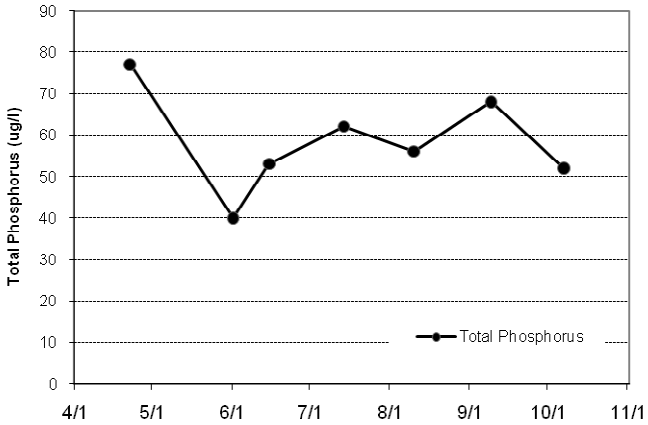
The lake site received a lake grade of C for 2009. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

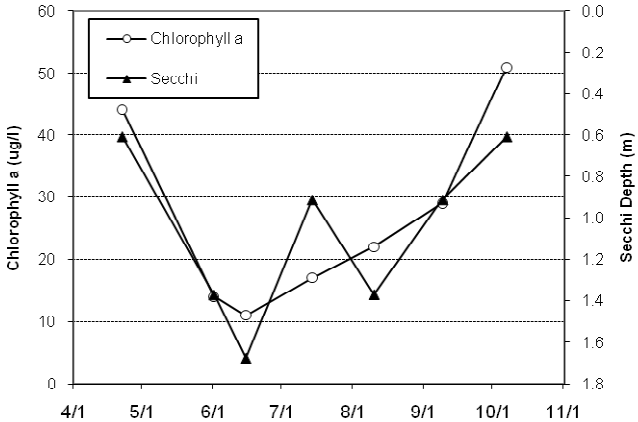
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

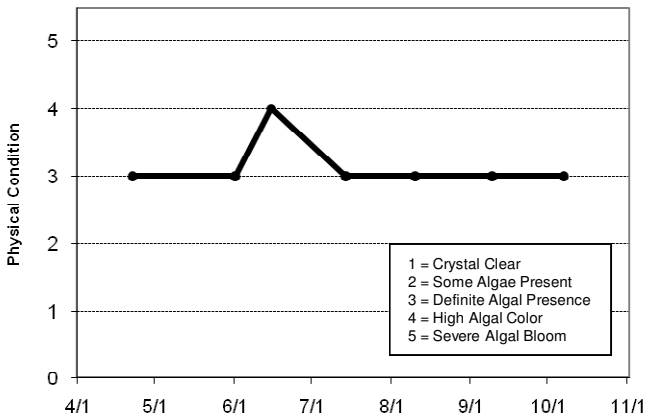






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	11.1	10.7	11.46	0.15	44	77	83	0.6	3	4
6/1	20.1	19.2	10.8	6.75	14	40	43	1.4	3	4
6/15	22.5	17.7	10.22	0.06	11	53	53	1.7	4	2
7/14	24.3	23.3	8.57	0.31	17	62	63	0.9	3	4
8/10	25.1	22.8	8.08	0.09	22	56	54	1.4	3	4
9/9	21.9	20.9	10.05	0.11	29	68	43	0.9	3	4
10/7	10.6	11.2	10.61	0.13	51	52	59	0.6	3	4



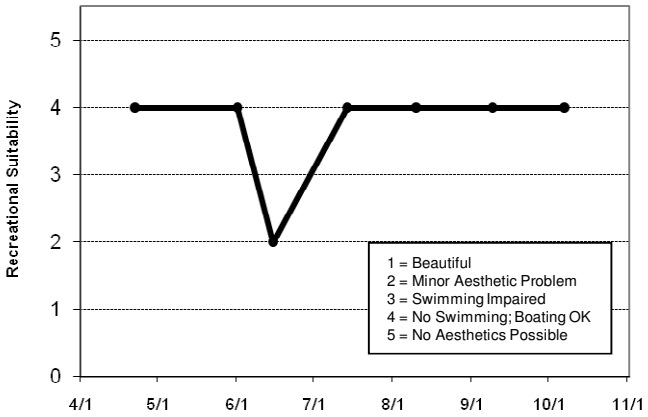
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2009 summer (May-September) data summary

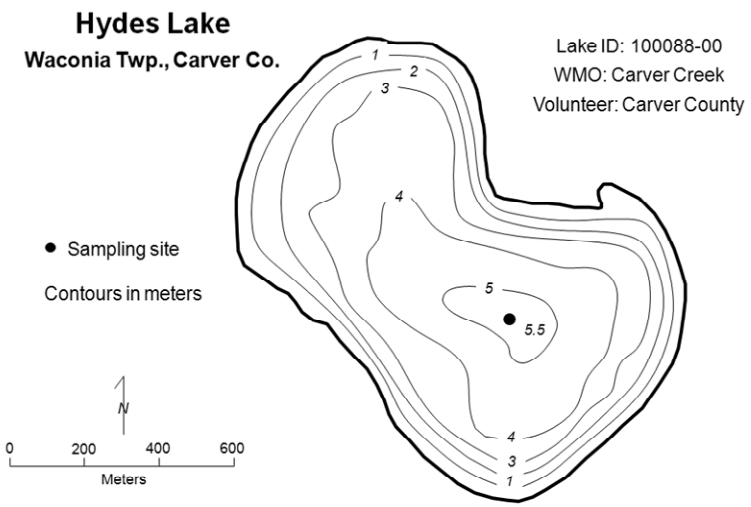
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	185.5	91.0	278.0	F
CLA (µg/l)	39.0	4.8	100.0	C
Secchi (m)	1.7	0.8	3.3	C
TKN (mg/l)	2.15	1.50	3.00	
			Lake Grade	D

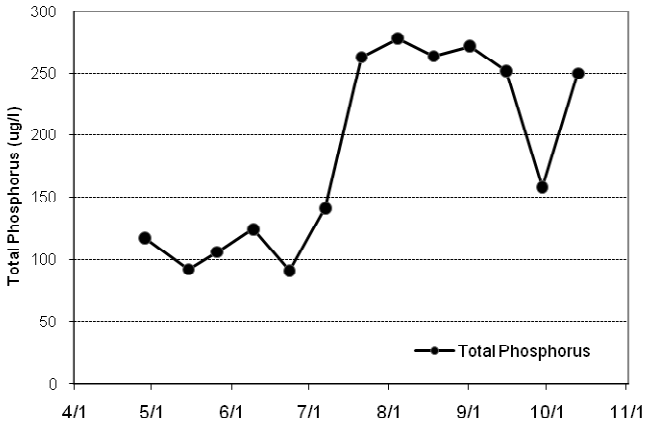
The lake received a lake grade of D for 2009, which is consistent with its historical database. The water quality of 2009 appears to be an improvement over that observed in 2008. Additional monitoring is suggested to build the database for use in determining trends in the lake's water quality.

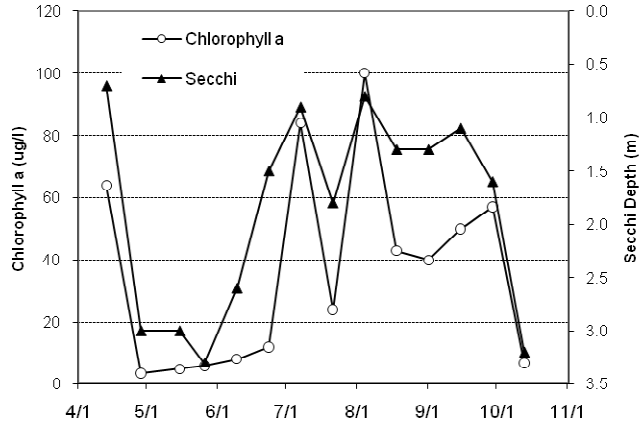
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

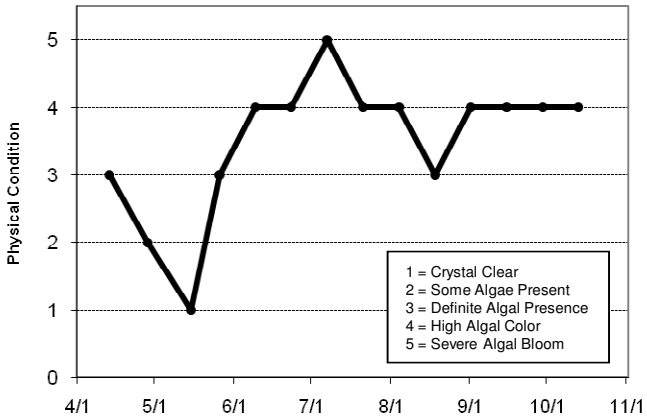






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	7.71		10.3		64			0.7	3	3
4/28	11.81		9.13		3.4	117		3.0	2	2
5/15	15.27		9.22		4.8	92		3.0	1	1
5/26	18.57		9.64		5.9	106		3.3	3	3
6/9	16.73		7.36		8.1	124		2.6	4	4
6/23	26.27		10.78		12	91		1.5	4	4
7/7	25.11		18.1		84	141		0.9	5	5
7/21	22.2		8.55		24	263		1.8	4	4
8/4	23.24		12.33		100	278		0.8	4	5
8/18	23.59		7.22		43	264		1.3	3	3
9/1	20.81		8.81		40	272		1.3	4	4
9/15	22.95		12.8		50	252		1.1	4	4
9/29	17.13		8.92		57	158		1.6	4	4
10/13	8.65		10.34		6.8	250		3.2	4	4

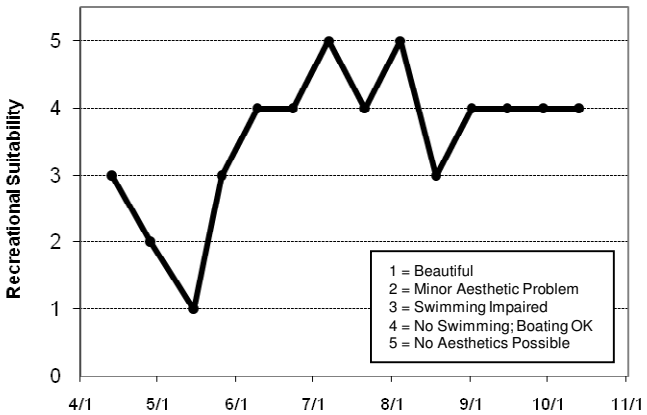


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

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

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

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	28.5	20.0	43.0	B
CLA (µg/l)	10.9	5.2	18.0	B
Secchi (m)	1.1	0.7	1.4	D
TKN (mg/l)	1.03	0.94	1.10	
			Lake Grade	C

The lake received a lake grade of B for 2008, which is consistent with its historical database. The annual lake grades have varied among B's and C's. Continued monitoring is suggested to continue to build the water quality database for determining if the lake is experiencing trends in its water quality.

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

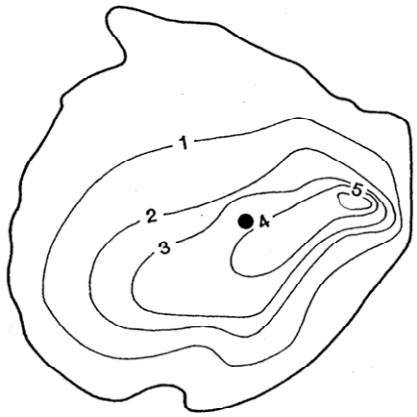
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

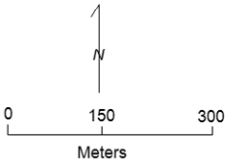
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

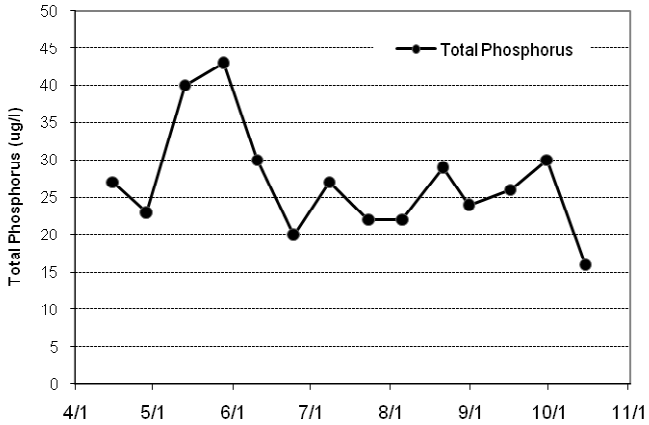
Island Lake
Linwood Twp., Anoka Co.

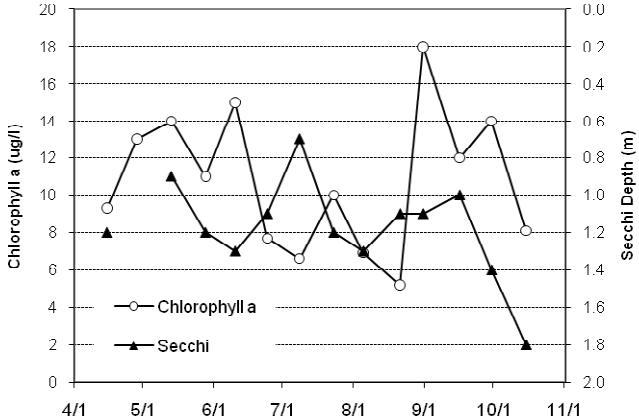
Lake ID: 20022-00
WMO: Sunrise River
Volunteer: Andy Nelson

● Sampling site
Contours in meters



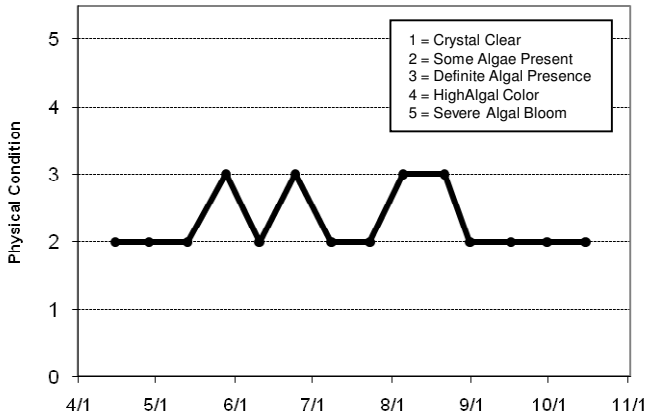






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	11.4				9.3	27		1.2	2	2
4/28	13.2				13	23			2	2
5/13	17.6				14	40		0.9	2	2
5/28	17.8				11	43		1.2	3	
6/10	16.8				15	30		1.3	2	3
6/24	28.1				7.7	20		1.1	3	3
7/8	23.7				6.6	27		0.7	2	2
7/23	23.4				10	22		1.2	2	2
8/5	23.1				6.9	22		1.3	3	2
8/21	20.8				5.2	29		1.1	3	2
8/31	20.4				18	24		1.1	2	2
9/16	23				12	26		1.0	2	2
9/30	14.4				14	30		1.4	2	
10/15	6.3				8.1	16		1.8	2	2



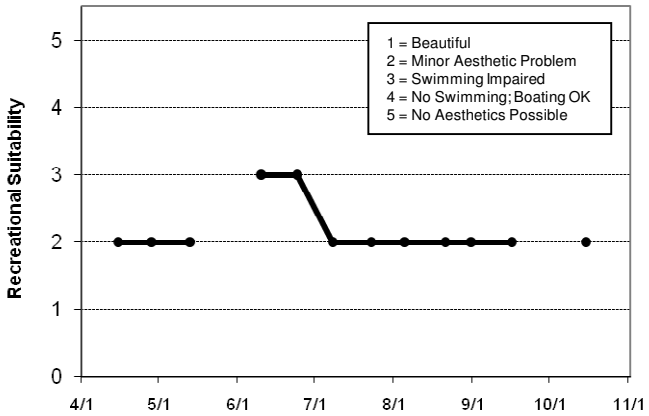
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	14.2	9.0	25.0	A
CLA (µg/l)	3.8	1.6	5.4	A
Secchi (m)	4.5	3.7	5.7	A
TKN (mg/l)	0.59	0.43	0.71	
			Lake Grade	A

The lake received a lake grade of A for 2009, which is consistent with lake grades received since the year 2000.

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

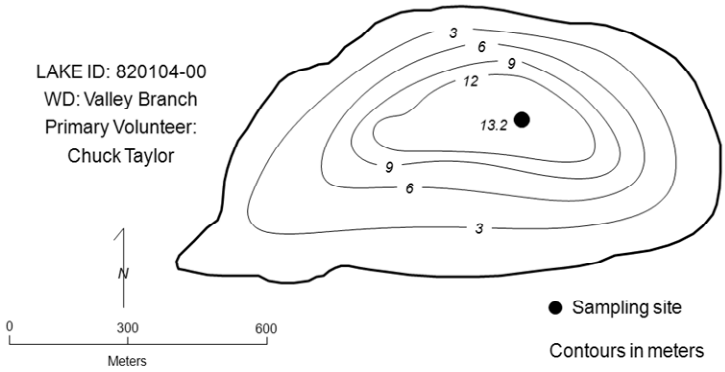
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

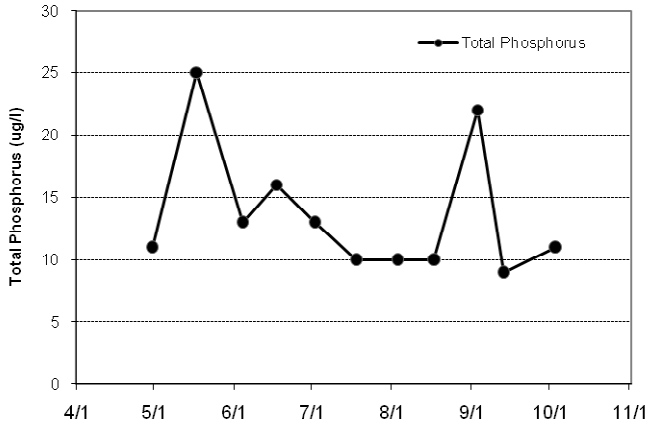
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

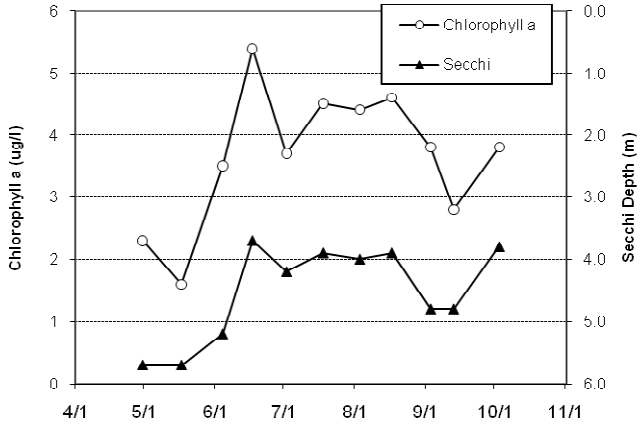
Lake Jane

Lake Elmo, Washington Co.

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

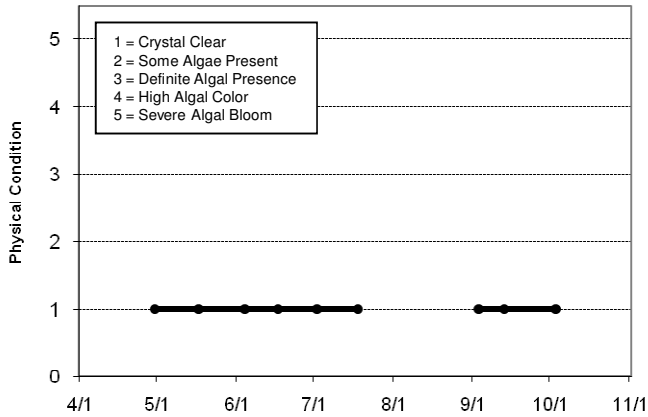






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	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	12.4				2.3	11		5.7	1	
5/17	15.6				1.6	25		5.7	1	
6/4	20.2				3.5	13		5.2	1	
6/17	21.4				5.4	16		3.7	1	
7/2	21.4				3.7	13		4.2	1	1
7/18	20.9				4.5	10		3.9	1	1
8/3	22.8				4.4	10		4.0		
8/17	24.9				4.6	10		3.9		
9/3	21.6				3.8	22		4.8	1	
9/13	24.5				2.8	9		4.8	1	
10/3	14.4				3.8	11		3.8	1	



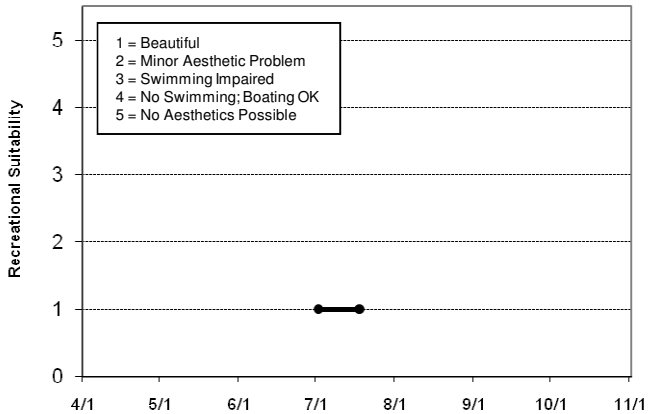
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



Jellum's Bay [Site-1] (82-0052-02) *Carnelian - Marine - St. Croix Watershed District*

Jellum's Bay is located in City of Scandia in Washington County. It has a surface area of 72 acres. The maximum depth of the lake is 4.9 m (16 feet). Therefore the majority of the surface area of the lake is considered littoral zone, which is the 0-15 feet depth zone that is dominated by aquatic vegetation. The lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the lake's water column.

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	53.2	28.0	72.0	C
CLA (µg/l)	8.7	4.8	14.0	A
Secchi (m)	2.7	2.1	3.5	B
TKN (mg/l)	1.18	0.88	1.50	
			Lake Grade	B

The lake received a lake grade of B for 2009, which is highest grade it has received according to its historical database. This continues an apparent trend of improving water quality since 2007. There was a notable improvement in the mean summer-time CLA concentration in 2009. With this year's continued improvement in water quality, further monitoring is suggested to determine if the recent improvements are indication of an improving trend over the D lake grades received between 1996 and 2006.

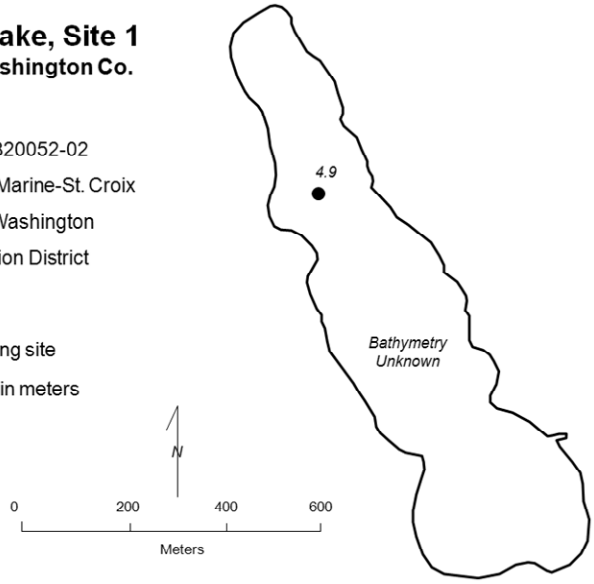
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

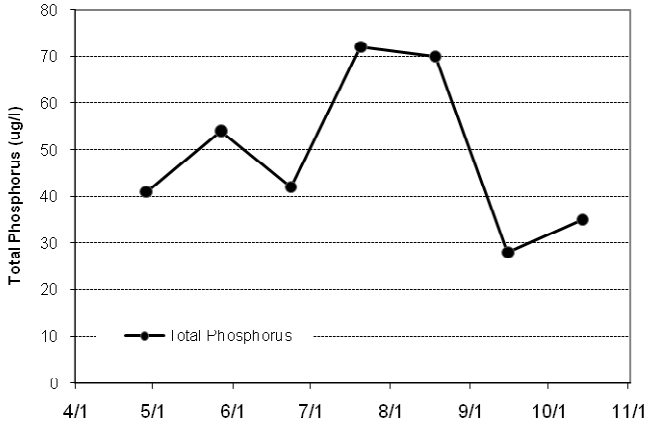
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

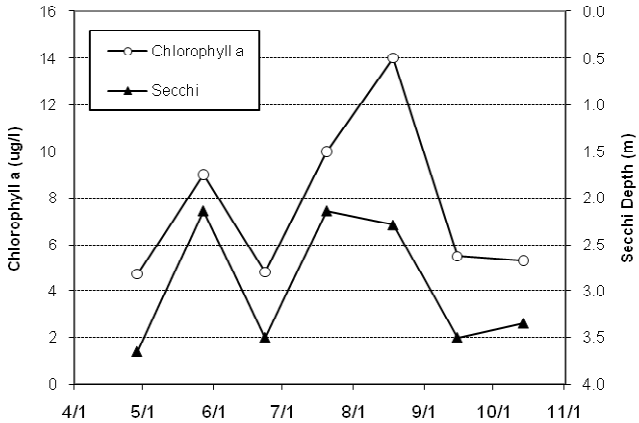
Jellum's Lake, Site 1
Scandia, Washington Co.

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

● Sampling site
Contours in meters

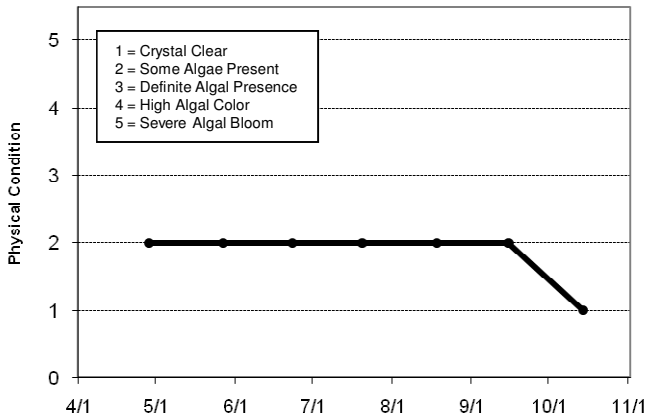






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	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	13.2	12.7	8.87	0.15	4.7	41		3.7	2	2
5/27	18.7	18.7	6.89	0.09	9	54		2.1	2	2
6/23	26.7	17.6	6.65	0.09	4.8	42		3.5	2	2
7/20	21.6	20.8	7.38	0.33	10	72		2.1	2	2
8/18	23.9	22.2	4.68	0.06	14	70		2.3	2	3
9/15	23.1	21.8	7.32	0.11	5.5	28		3.5	2	2
10/14	7.6	7.7	9.3	5.04	5.3	35		3.4	1	1



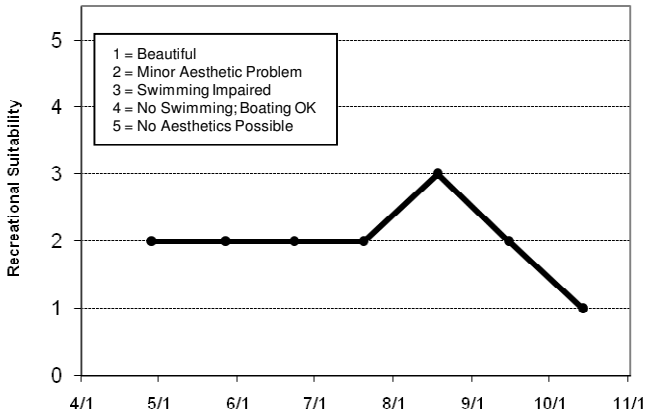
Lake Water Quality Grades Based on Summertime Averages

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

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

Source: Metropolitan Council and STORET data



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

Jonathan Lake is a small lake located in Carver County. There is little known morphological data available for the lake.

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	188.0	106.0	292.0	F
CLA (µg/l)	90.7	9.3	160.0	F
Secchi (m)	0.4	0.2	0.7	F
TKN (mg/l)	2.66	1.40	3.50	
			Overall Grade	F

The lake received a lake grade of F for 2008, which is consistent with its limited database. Additional monitoring is suggested to develop a historical water quality database for this lake.

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

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

Jonathan Lake
Chaska, Carver Co.

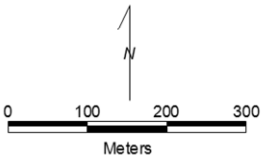
LAKE ID: 100217-00

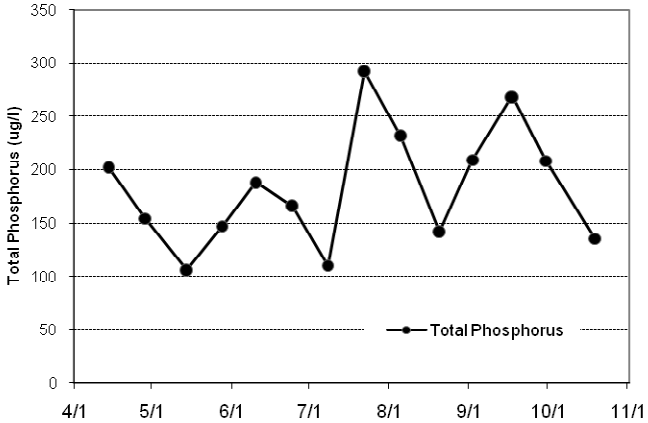
WMO: Hazeltine-Bavaria

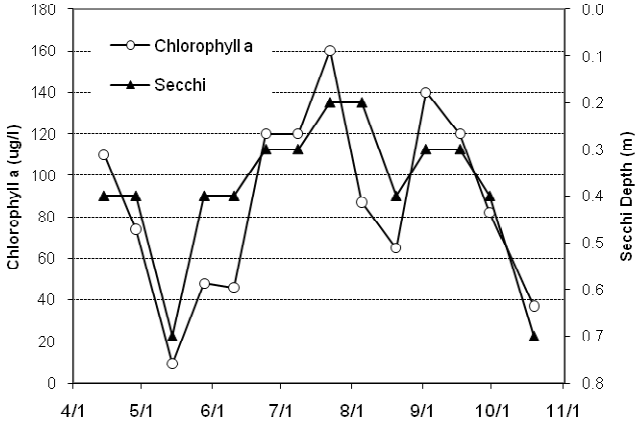
Volunteer: Carver Co.

● Sampling site

Contours in meters

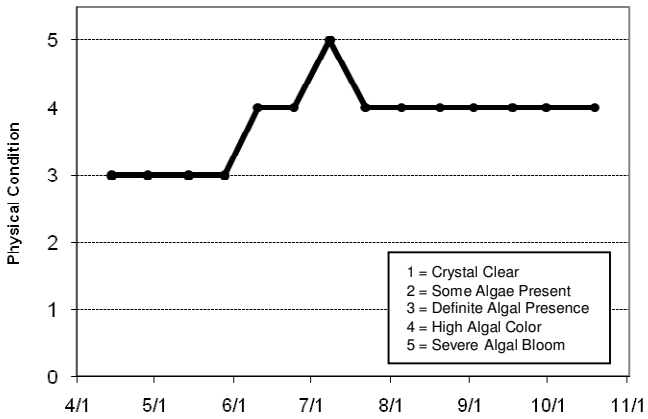






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	11.05		13.2		110	202		0.4	3	3
4/28	11		9.97		74	154		0.4	3	3
5/14	15.34		6.59		9.3	106		0.7	3	4
5/28	17.82		8.7		48	147		0.4	3	4
6/10	16.06		8.32		46	188		0.4	4	4
6/24	26.22		14.57		120	166		0.3	4	5
7/8	24.03		13.22		120	110		0.3	5	5
7/22	21.9		15.55		160	292		0.2	4	4
8/5	23.07		9.58		87	232		0.2	4	5
8/20	21.61		5.61		65	142		0.4	4	5
9/2	20.04		9.51		140	209		0.3	4	4
9/17	23.68		15.07		120	268		0.3	4	4
9/30	14.42		10.26		82	208		0.4	4	4
10/19	8.5		10.5		37	135		0.7	4	4



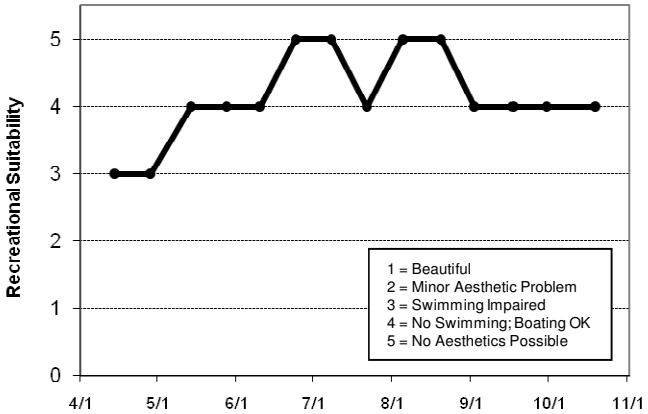
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



July Lake (82-0318) *Browns Creek Watershed District*

July Lake is a small lake located in Washington County. There is little known morphological data available for the lake.

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	120.3	47.0	197.0	N/A
CLA (µg/l)	45.0	14.0	110.0	N/A
Secchi (m)	0.8	0.2	1.2	N/A
TKN (mg/l)	2.30	1.20	3.50	
			Lake Grade	N/A

There was an insufficient quantity of data to calculate grades for the lake in 2009. At least 5 monitoring events during the summer-time period (May – September) are needed.

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

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

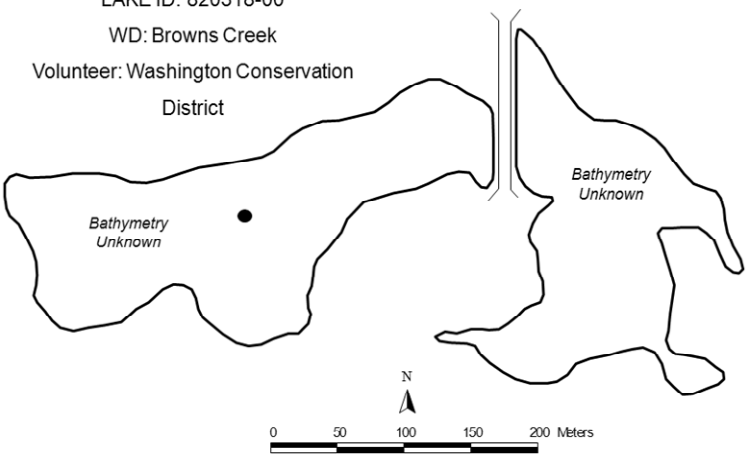
July Lake

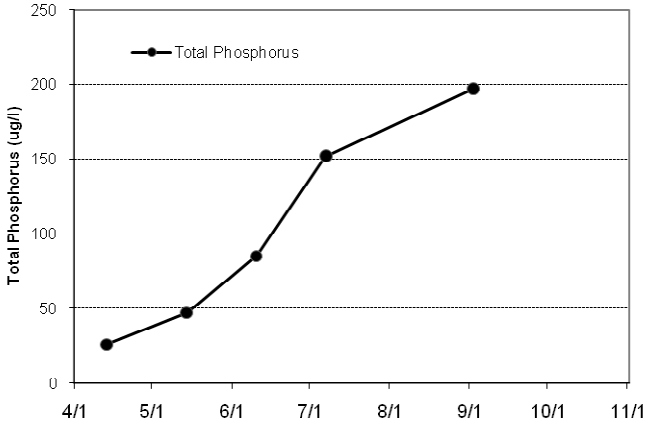
Grant and Hugo, Washington Co.

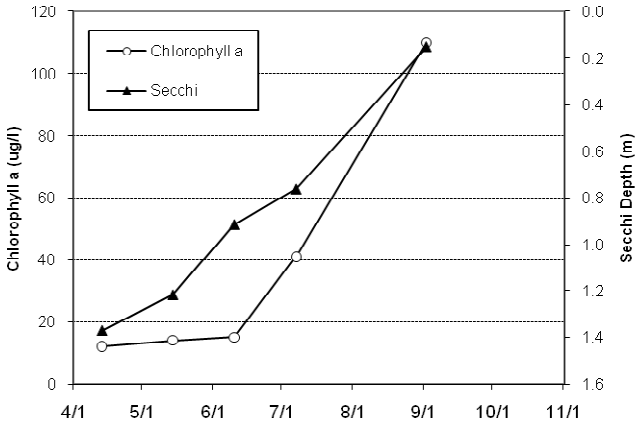
LAKE ID: 820318-00

WD: Browns Creek

Volunteer: Washington Conservation District

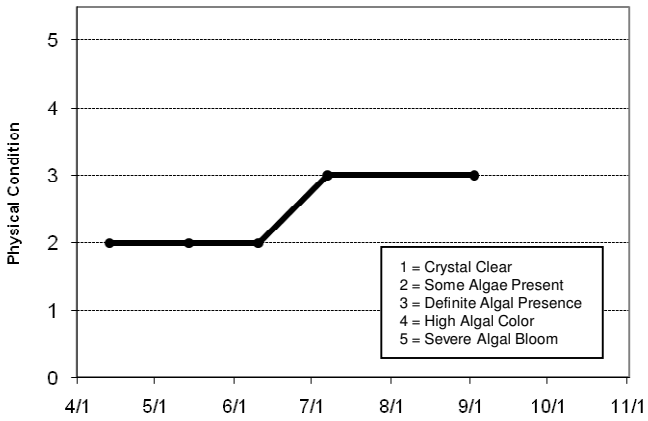






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	11	11.5	12.13	1.38	12	26		1.4	2	2
5/14	13.8	13.6	8.6	8.62	14	47		1.2	2	4
6/10	16.7	15.4	9.76	0.09	15	85		0.9	2	4
7/7	24.5	23.3	7.79	0.31	41	152		0.8	3	4
9/2	18.2		8.48		110	197		0.2	3	4



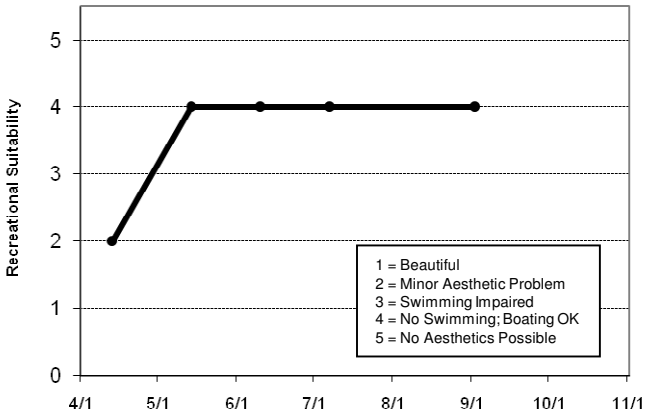
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

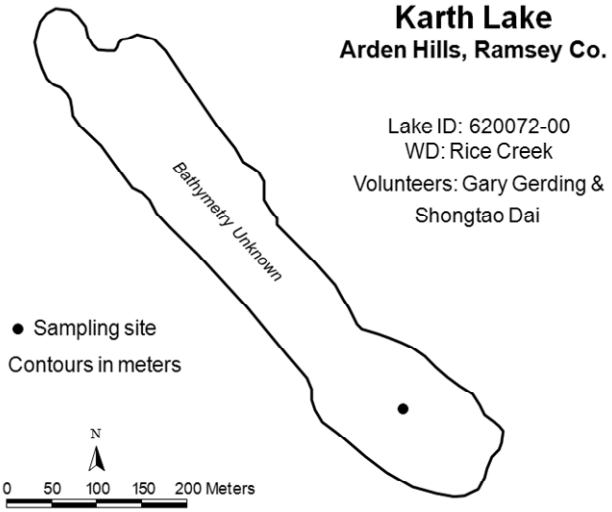
2009 summer (May-September) data summary

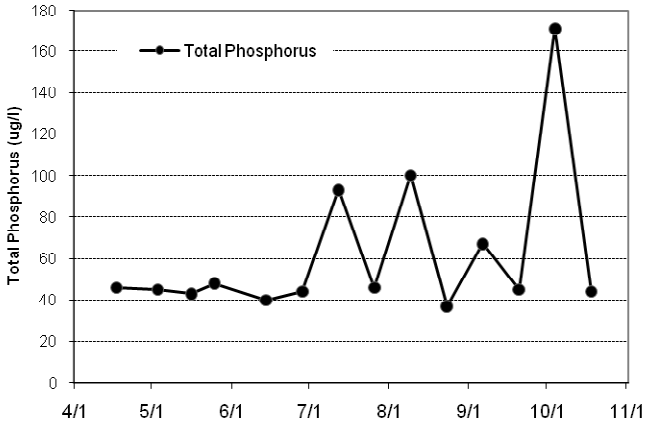
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	55.3	37.0	100.0	C
CLA (µg/l)	32.4	9.3	86.0	C
Secchi (m)	0.9	0.4	1.6	D
TKN (mg/l)	1.56	1.30	2.20	
			Lake Grade	C

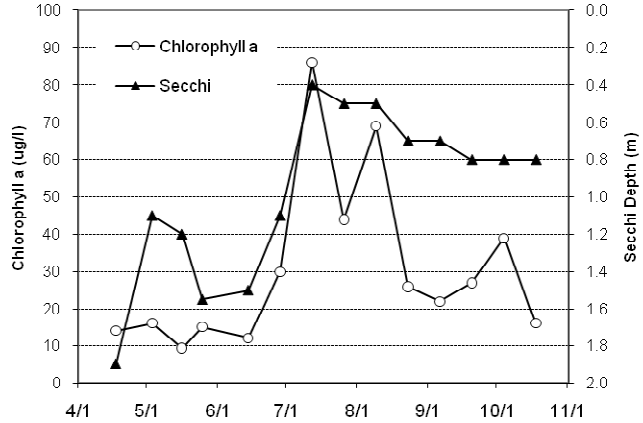
The lake received a lake grade of C for 2009. Further monitoring is suggested to develop a water quality database.

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

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

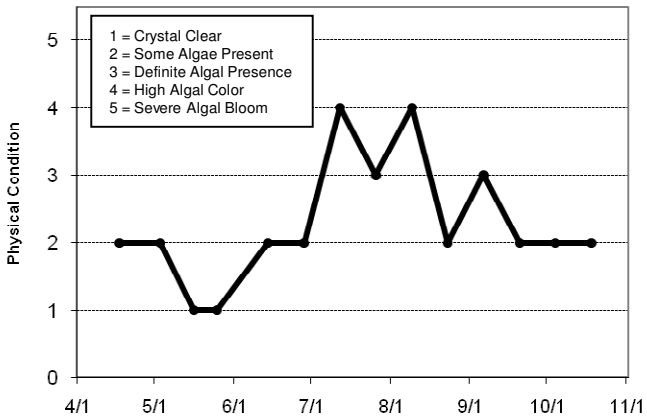






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/17	13.8				14	46		1.9	2	1
5/3	13.6				16	45		1.1	2	2
5/16	15.9				9.3	43		1.2	1	1
5/25	20.6				15	48		1.6	1	1
6/14	21.4				12	40		1.5	2	4
6/28	25				30	44		1.1	2	4
7/12	24				86	93		0.4	4	4
7/26	22.5				44	46		0.5	3	4
8/9	23.9				69	100		0.5	4	4
8/23	22.1				26	37		0.7	2	4
9/6	22.8				22	67		0.7	3	4
9/20	23.1				27	45		0.8	2	4
10/4	14				39	171		0.8	2	4
10/18	9				16	44		0.8	2	4



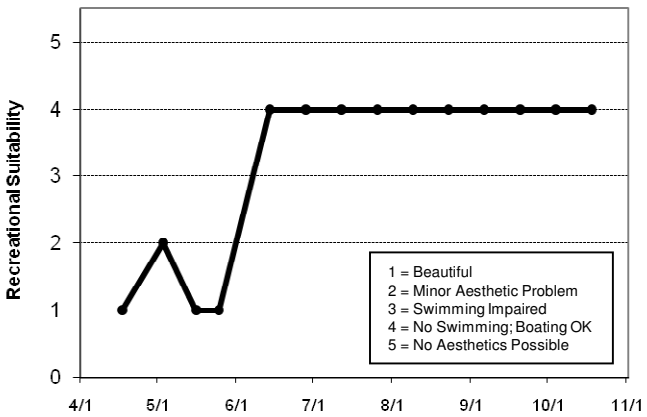
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	96.0	43.0	218.0	D
CLA (µg/l)	112.0	3.2	430.0	F
Secchi (m)	0.7	0.3	1.6	D
TKN (mg/l)	1.95	0.81	4.30	
			Lake Grade	D

The lake received a lake grade of D for 2009. There was a shift towards poorer water quality in 2009. The mean summer-time concentration of TP and CLA both increased compared to recent years. Notably, the lake received a CLA grade of F, which is the first such F since 1996. Water clarity also decreases in 2009, with a mean summer-time depth of just 0.7 m. Continued monitoring is suggested to determine if 2009 was an anamoly or a sign of shifting conditions in the lake or its watershed.

There were two monitoring events when the Secchi disk was visible on the lake bottom. The measurements from these events were excluded from the statistics given in the table above.

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

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

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

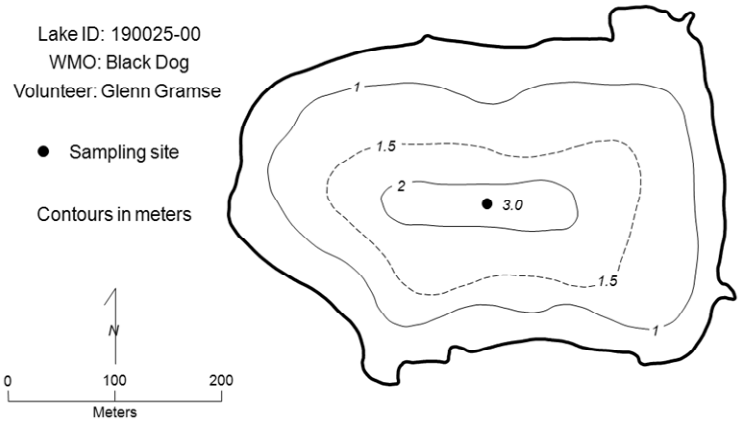
Keller Lake

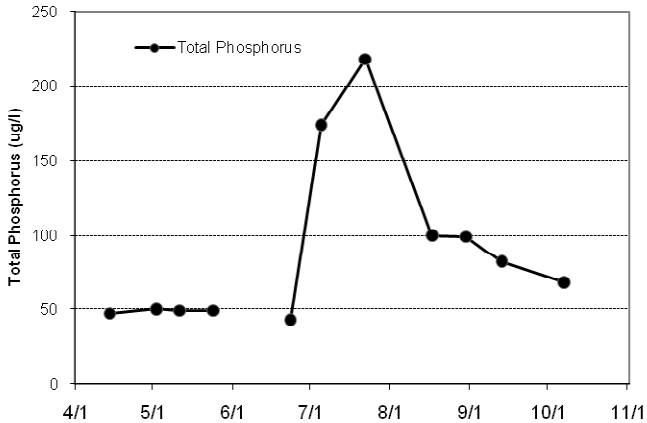
Burnsville, Dakota Co.

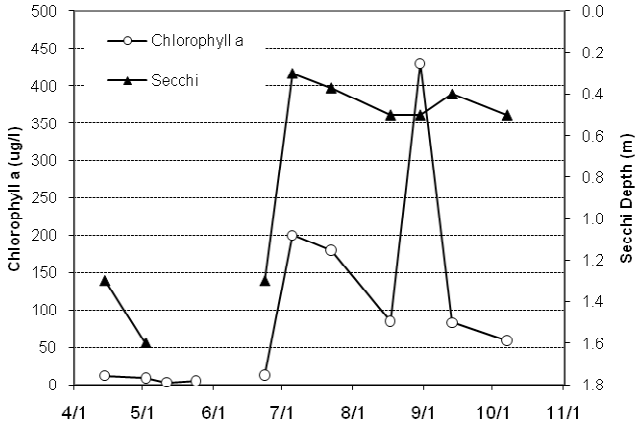
Lake ID: 190025-00
WMO: Black Dog
Volunteer: Glenn Gramse

● Sampling site

Contours in meters



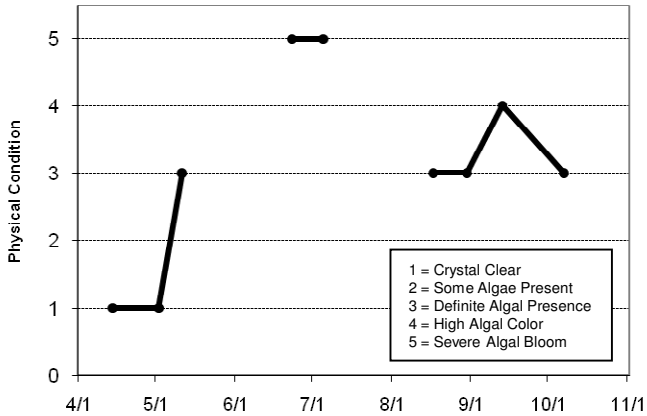




2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/14	14.8				12	47		1.3	1	2
5/2	14.7				8.8	50		1.6	1	1
5/11	17.8				3.2	49		2.0+	3	4
5/24	22.4				4.9	49		1.8+		
6/23	28.8				13	43		1.3	5	5
7/5	25.5				200	174		0.3	5	5
7/22	26.7				180	218		0.4		3
8/17	26.5				85	100		0.5	3	4
8/30	22.7				430	99		0.5	3	4
9/13	27.7				83	82		0.4	4	5
10/7	12				59	68		0.5	3	4

+ Indicates the Secchi Disk was visible on the lake bottom



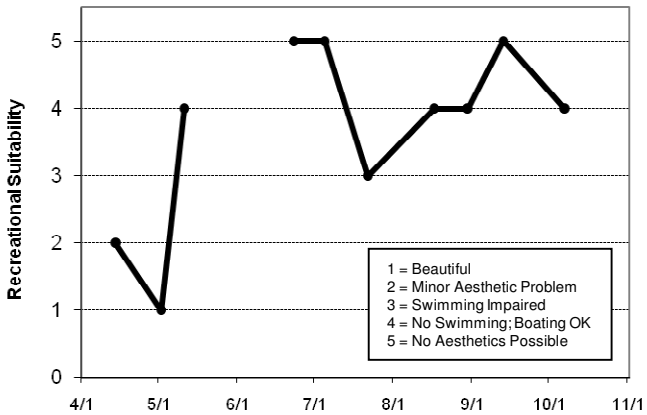
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	16.3	10.0	23.0	A
CLA (µg/l)	5.8	1.3	36.0	A
Secchi (m)	Likely >= 3	2.3	>= 3	A*
TKN (mg/l)	0.62	0.54	0.73	
			Lake Grade	A*

* See discussion below.

Similar to past years, the Secchi transparency in 2009 would have been greater except that during most monitoring events either the lake's excessive submergent macrophyte growth obscured the secchi disk, or the secchi was visible while resting on the lake bottom. According to the volunteer's judgement, the Secchi depths in these instances would have likely been in excess of 3 meters. Also, the other two water quality parameter received A grades. Therefore, giving a Secchi depth grade of A may be justified.

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

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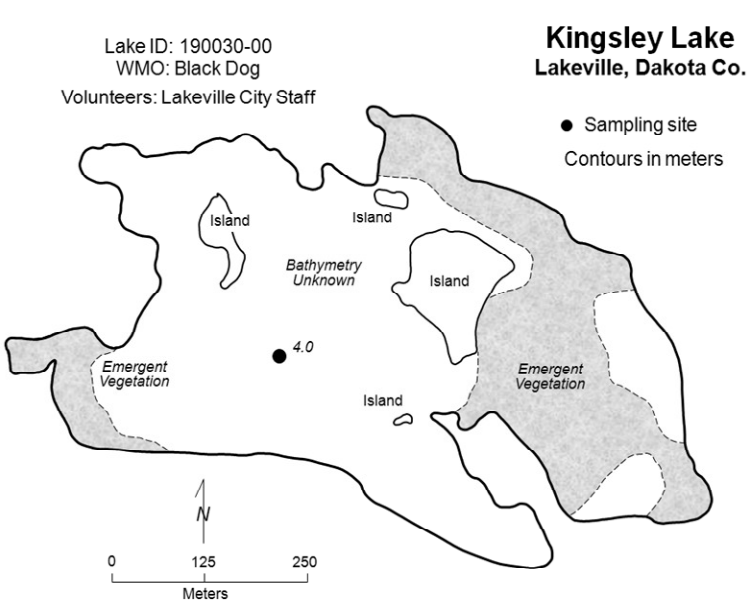
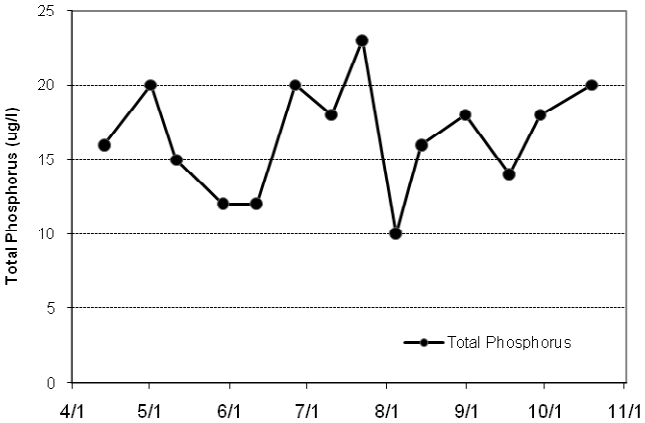
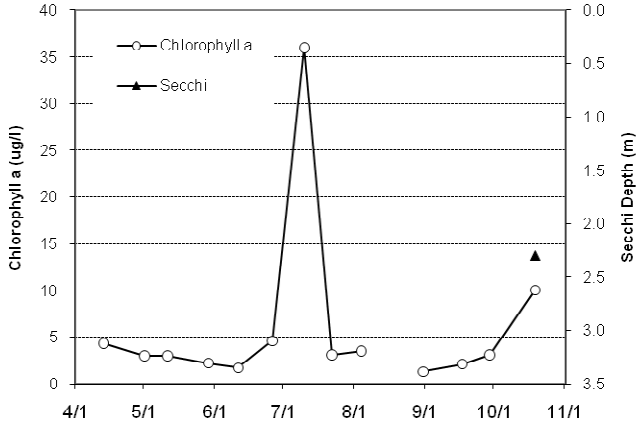
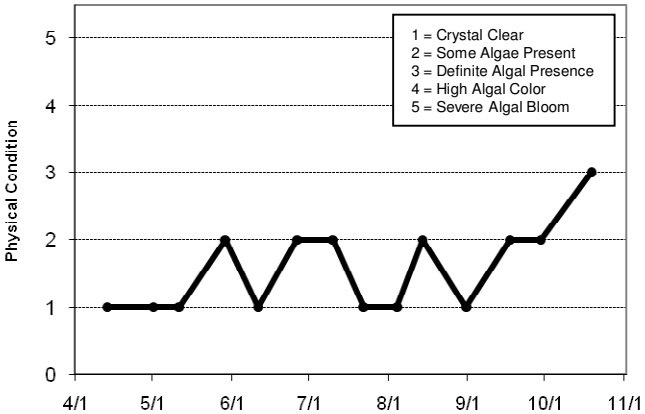
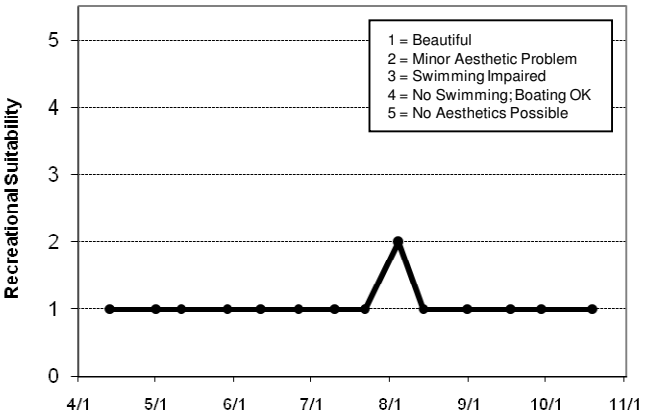










2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	10.9				4.3	16		2.6+	1	1
5/1	15				3	20		3.0+	1	1
5/11	16				3	15		2.8+	1	1
5/29	19.7				2.2	12		2.5+	2	1
6/11	17				1.7	12		3.0+	1	1
6/26	27.1				4.6	20		2.6+	2	1
7/10	25				36	18		3.0+	2	1
7/22	22.4				3.1	23		2.6+	1	1
8/4	23.4				3.5	10		2.5+	1	2
8/14	26					16		2.5+	2	1
8/31	21.4				1.3	18		2.7+	1	1
9/17	23				2.1	14		2.5+	2	1
9/29	16.6				3.1	18		2.3+	2	1
10/19	8.6				10	20		2.3	3	1

+ Indicates the Secchi Disk was visible on the lake bottom

Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data

Kismet Lake (82-0333) *Browns Creek Watershed District*

Kismet Lake is located in Washington County. This relatively small lake has a maximum depth of approximately 3.7 m (12 feet). Because of the shallowness of the lake the whole lake is considered littoral zone, which is the 0 – 15 feet depth zone dominated by aquatic vegetation. TSince the lake is relatively shallow, it does not maintain a thermocline which is a density gradient caused by changing water temperatures throughout the water column.

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

2009 summer (May-September) data summary

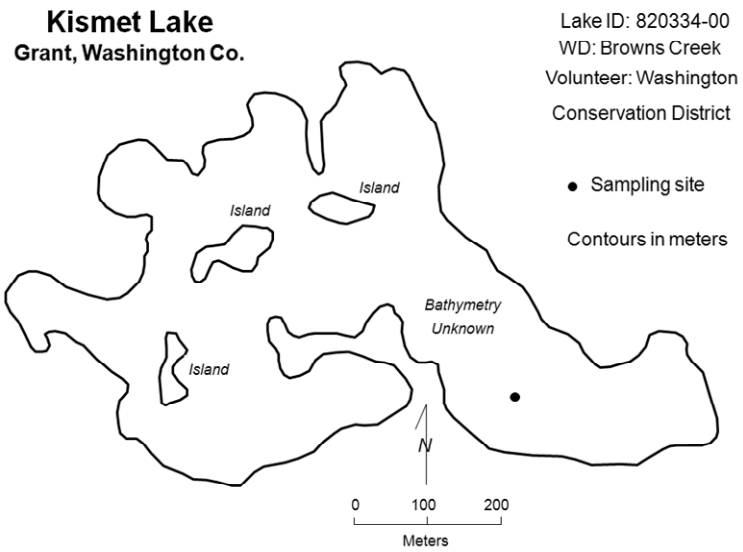
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	33.3	16.0	44.0	C
CLA (µg/l)	7.3	4.4	16.0	A
Secchi (m)	1.0	0.6	1.7	D
TKN (mg/l)	0.94	0.77	1.10	
			Lake Grade	C

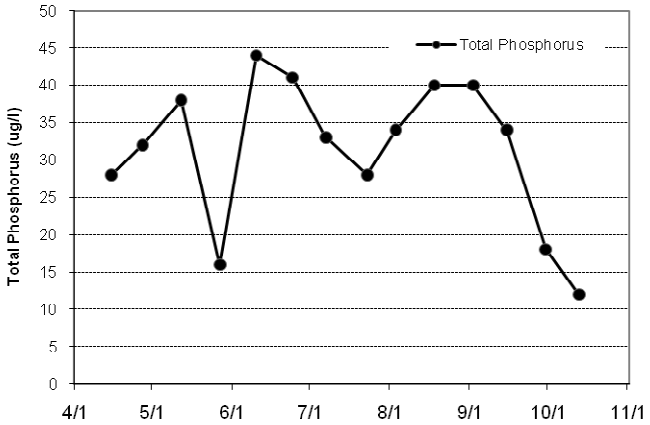
The lake received a lake grade of C for 2009, which is similar to previous years' lake grades. The 2009 CLA grade of A showed a marked decrease in mean summer-time CLA concentration, in comparision to last year's D CLA grade. However the Secchi grade decrease to a D, which is the worst grade received according to the lake's historical database. The incongruency between the CLA grade (A) and the Secchi depth grade (D) points to another factor (or set of factors) besides algal abundance that may be likely influencing water clarity in this lake. For example, the reduced water clarity may be caused by suspended sediment delivered to the lake via its watershed, or resuspension of lake sediment via mixing events.

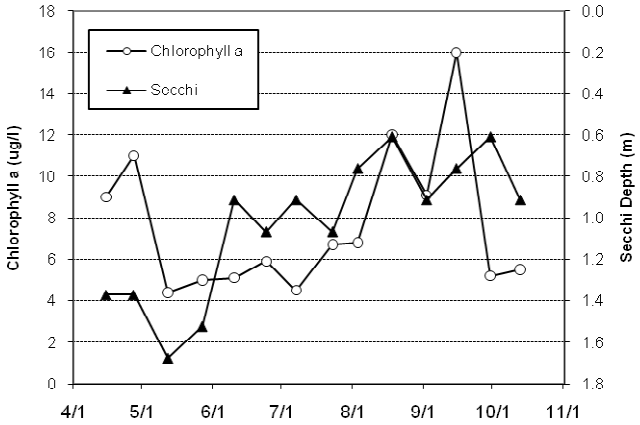
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

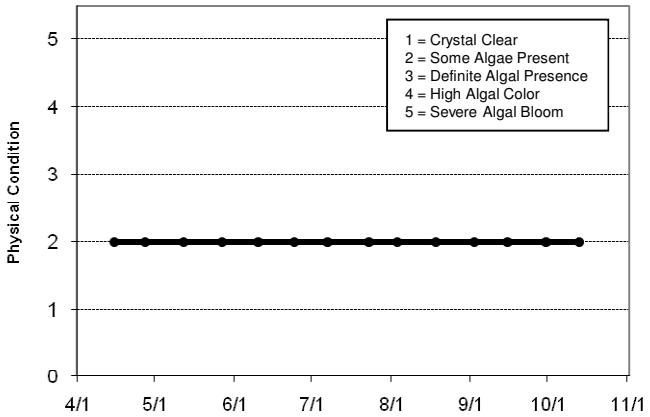
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

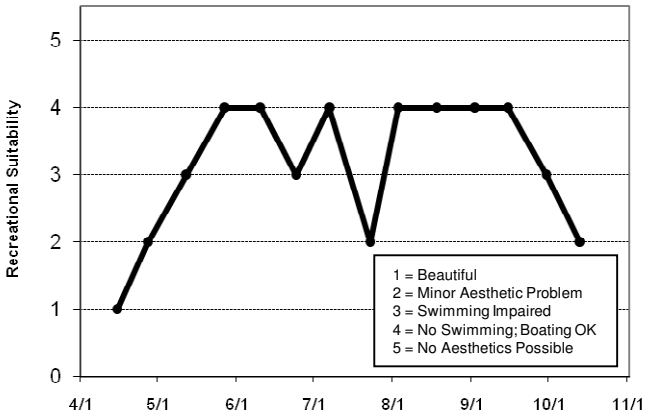
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/15	13	9.7	10.95	3.9	9	28		1.4	2	1
4/27	12	11.1	9.96	1.54	11	32		1.4	2	2
5/12	15.3	13.3	10.57	0.41	4.4	38		1.7	2	3
5/27	18	15.9	8.48	0.11	5	16		1.5	2	4
6/10	15.8	14.4	7.49	0.16	5.1	44		0.9	2	4
6/24	26.6	20.7	4.28	0.09	5.9	41		1.1	2	3
7/7	24.5	17.8	8.05	0.13	4.5	33		0.9	2	4
7/23	22.2	18.4	9.93	0.19	6.7	28		1.1	2	2
8/3	25.7	19.8	9.32	0.26	6.8	34		0.8	2	4
8/18	21.9	21.7	5.28	2.37	12	40		0.6	2	4
9/2	18.7	17.9	7.98	0.09	9.1	40		0.9	2	4
9/15	22	20.6	7.58	0.39	16	34		0.8	2	4
9/30	11.7	11.7	8.18	7.44	5.2	18		0.6	2	3
10/13	6.5	5.4	11.25	8.99	5.5	12		0.9	2	2

Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data

Klawitter Pond (82-0368) *Valley Branch Watershed District*

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

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	149.9	110.0	200.0	D
CLA (µg/l)	61.7	20.0	180.0	D
Secchi (m)	0.4	0.2	0.8	F
TKN (mg/l)	3.24	1.90	4.60	
			Lake Grade	D

The lake received a lake grade of D for 2009, which is similar to previous years' lake grades. Based on the limited water quality database for the lake, it appears to be represented by a lake grade of D. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

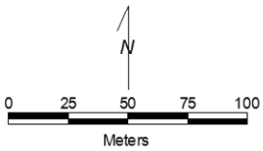
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

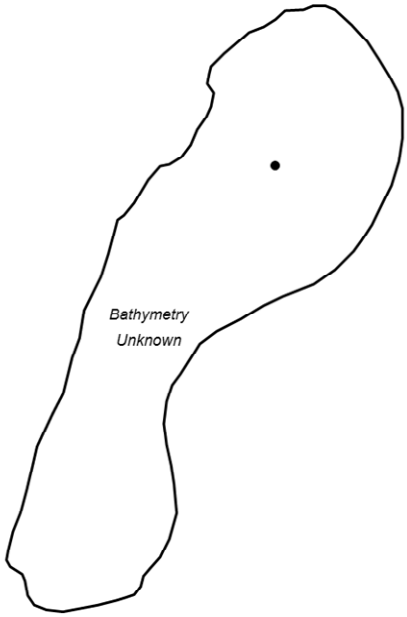
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

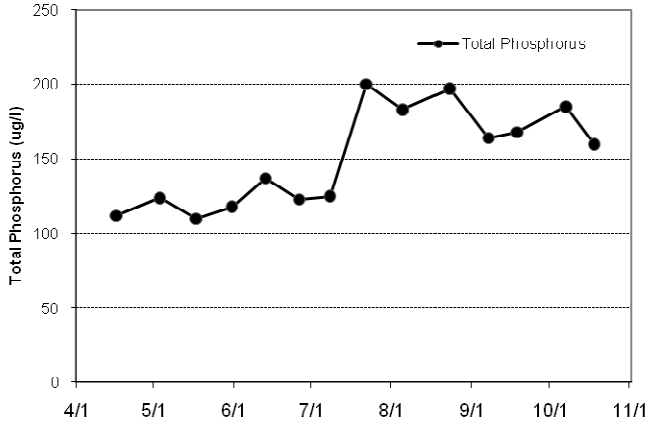
Klawitter Pond
Lake Elmo, Washington Co.

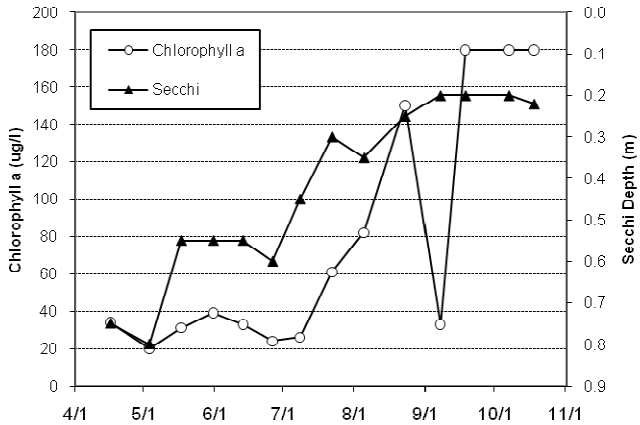
Lake ID: 820368-00
WD: Valley Branch
Volunteers: Bonnie Juran & Pat Barrett

● Sampling site
Contours in meters



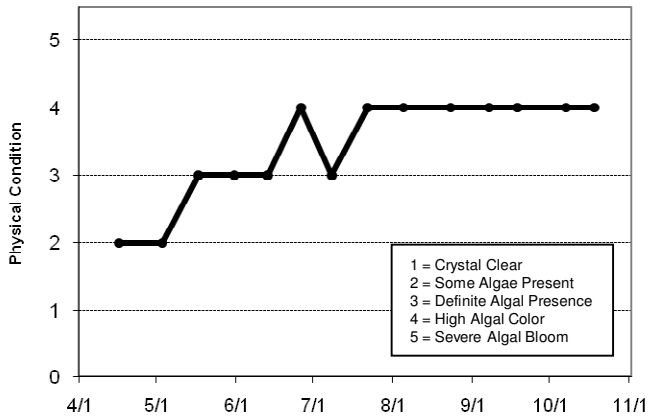






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/16	15				34	112		0.8	2	2
5/3	15.6				20	124		0.8	2	2
5/17	18.4				31	110		0.6	3	2
5/31	22.3				39	118		0.6	3	2
6/13	21.2				33	137		0.6	3	2
6/26	29.4				24	123		0.6	4	3
7/8	25				26	125		0.5	3	3
7/22	22.7				61	200		0.3	4	4
8/5	25.9				82	183		0.4	4	4
8/23	21.9				150	197		0.3	4	4
9/7	22.3				33	164		0.2	4	5
9/18	23.5				180	168		0.2	4	4
10/7	10.8				180	185		0.2	4	4
10/18	7.8				180	160		0.2	4	4

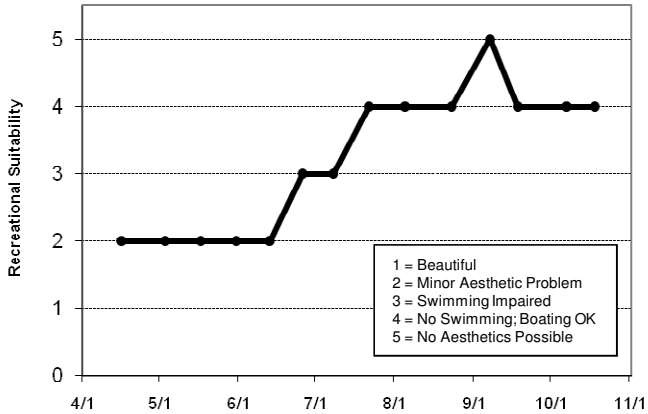


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

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

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

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	696.0	600.0	807.0	F
CLA (µg/l)	265.5	7.5	740.0	F
Secchi (m)	0.4	0.2	0.8	F
TKN (mg/l)	7.54	6.40	8.40	
			Lake Grade	F

The lake received a lake grade of F for 2009, which is similar to last year's grade. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

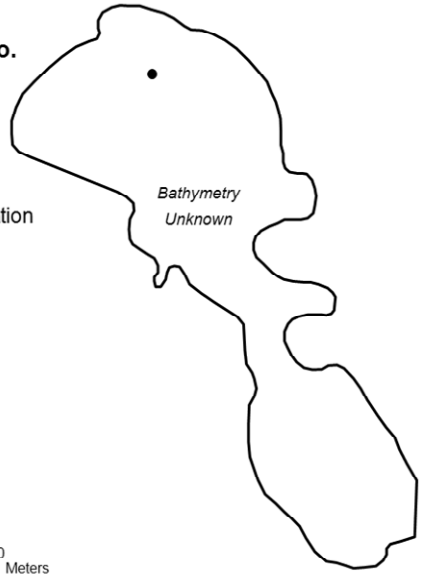
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

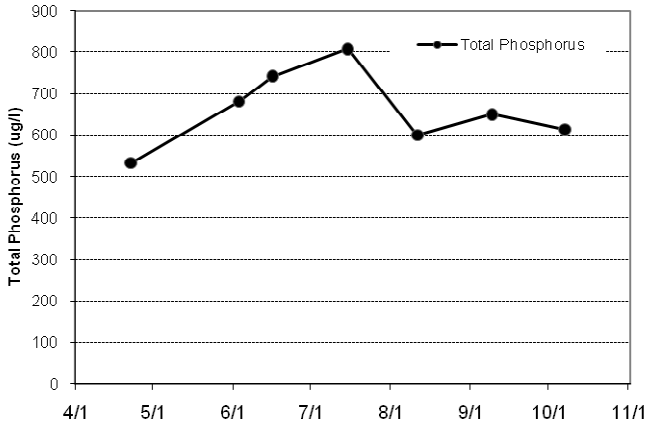
Kramer Pond
Lake Elmo, Washington Co.

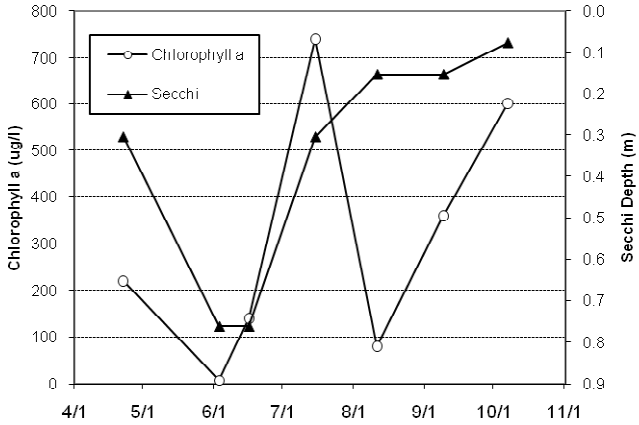
Lake ID: 820117-00
WD: Valley Branch
Volunteer: Washington Conservation District

● Sampling site

Contours in meters

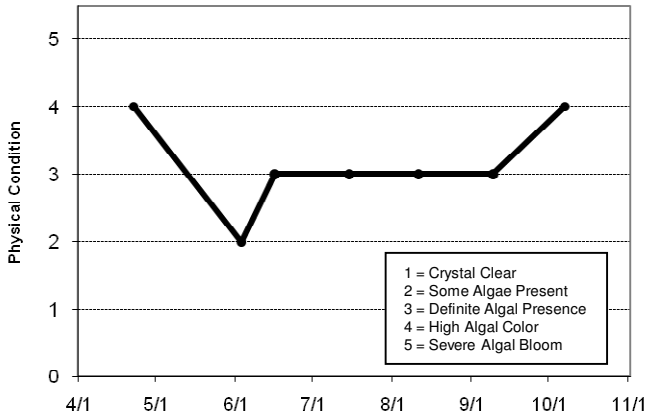






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	10.7		13.06		220	533		0.3	4	4
6/3	18.5		4.76		7.5	681		0.8	2	4
6/16	22.1		8.57		140	742		0.8	3	4
7/15	21		6.09		740	807		0.3	3	4
8/11	24.5		5.19		80	600		0.2	3	4
9/9	21.7		10.14		360	650		0.2	3	4
10/7	8.5		12.43		600	614		0.1	4	4



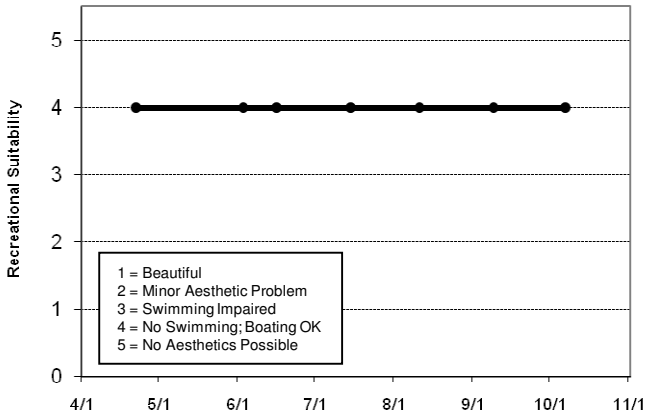
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



La Lake (82-0097) *City of Woodbury*

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

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	124.3	50.0	212.0	D
CLA (µg/l)	34.0	1.5	83.0	C
Secchi (m)	1.7	0.8	>= 3	C*
TKN (mg/l)	1.63	0.90	2.60	
			Lake Grade	C

* See discussion below.

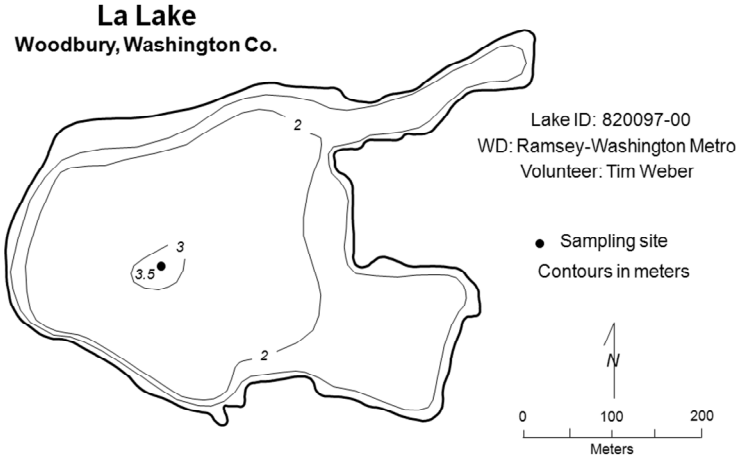
The lake received a lake grade of C for 2009, which is consistent with its historical database. Water quality for the lake has experienced annual variability as indicated by its water quality database. The lake's water quality seems to be represented by lake grades of C or B. Note that the Secchi depth measurements made in April and May 2009 would have been greater except that during these monitoring events the Secchi disk was visible while resting on the lake bottom. The Secchi grade was calculated by assuming that the May measurements were equal to 3.0 meters.

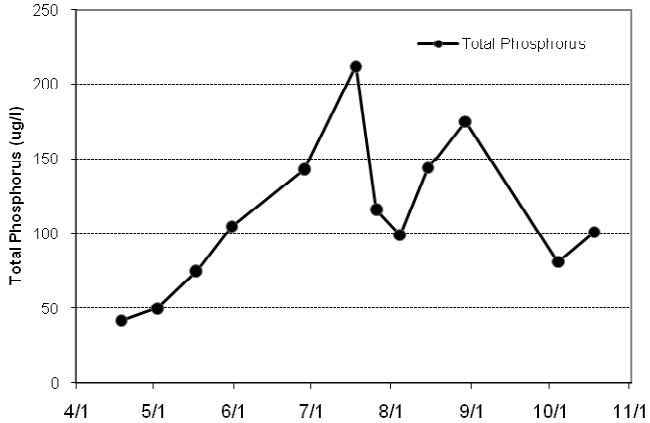
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

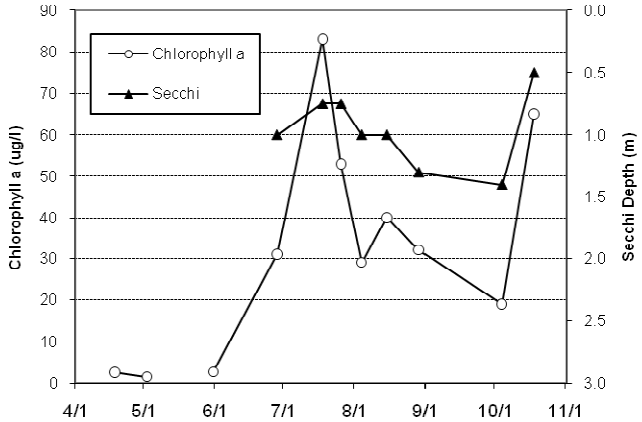
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

La Lake

Woodbury, Washington Co.



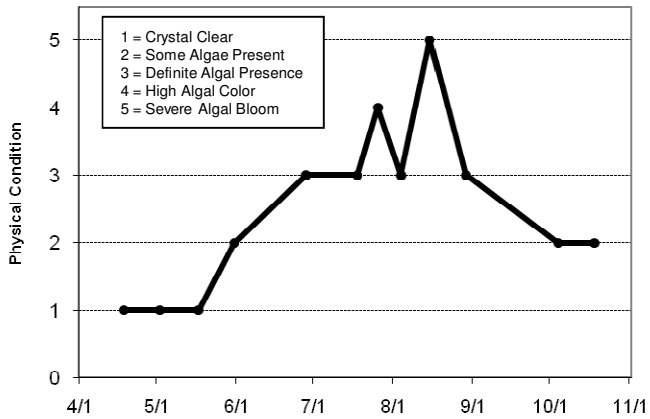




2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/18	16.4				2.5	42		3.0+	1	1
5/2	14.5				1.5	50		3.0+	1	1
5/17	18.2					75		3.0+	1	1
5/31	22.1				2.6	105		3.0+	2	2
6/28	24.7				31	143		1.0	3	3
7/18	24.6				83	212		0.8	3	4
7/26	25.4				53	116		0.8	4	4
8/4	25.7				29	99		1.0	3	4
8/15	25.7				40	144		1.0	5	4
8/29	20.9				32	175		1.3	3	4
10/4	1.6				19	81		1.4	2	2
10/18	8.2				65	101		0.5	2	2

+ Indicates the Secchi Disk was visible on the lake bottom

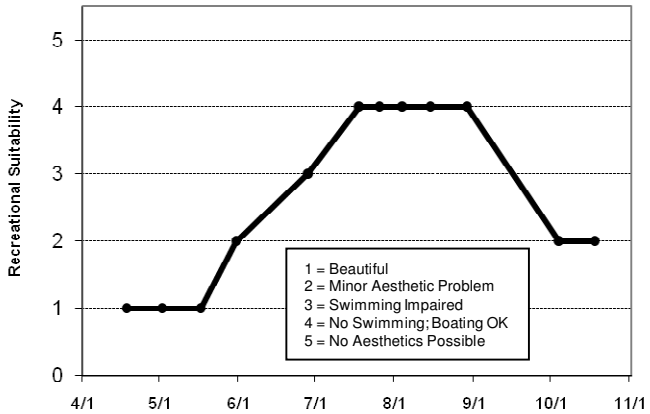


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

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

Lac Lavon is located within the City of Apple Valley (Dakota County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007). The lake is an abandoned gravel pit maintained by groundwater (MDNR 1996). The lake has been designated by the Minnesota DNR as being infested with the aquatic plants Eurasian Water Milfoil (*Myriophyllum spicatum*) and Brittle Naiad (*Najas minor*).

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	12.6	8.0	20.0	A
CLA (µg/l)	4.0	1.5	6.9	A
Secchi (m)	3.8	2.1	5.1	A
TKN (mg/l)	0.77	0.48	1.40	
			Lake Grade	A

The lake received a lake grade of A for 2009, which is a return to better water quality in comparision to last year's B lake grade. The lake appears to be well represented by a lake grade of A on the basis of its historical database.

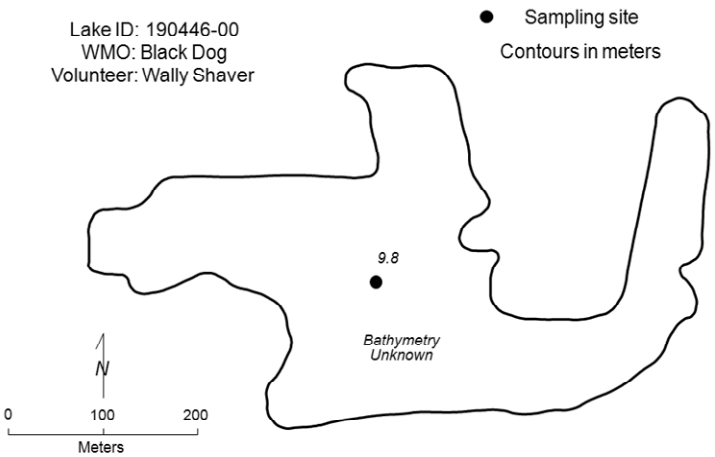
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

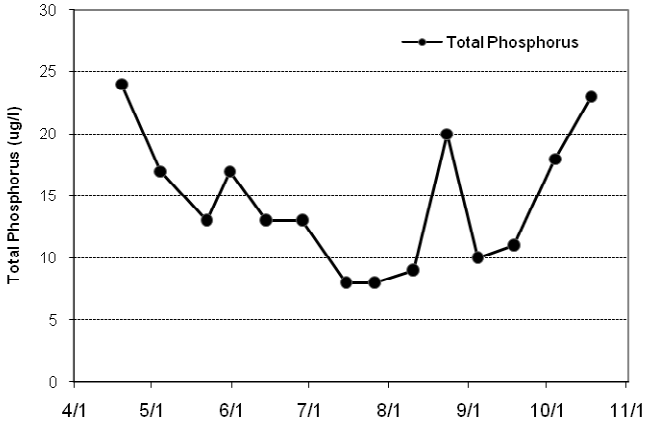
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

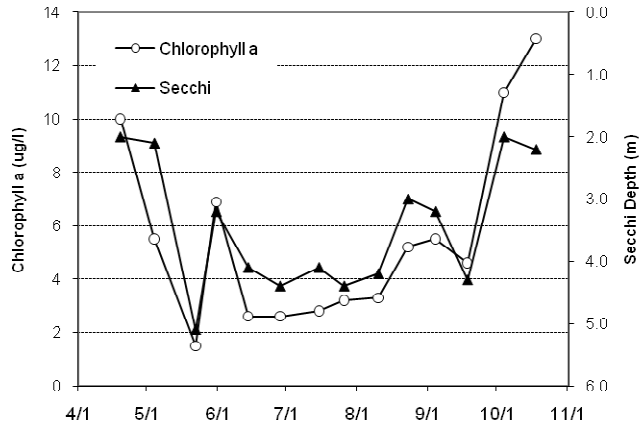
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Lac Lavon

Apple Valley/Burnsville, Dakota Co.

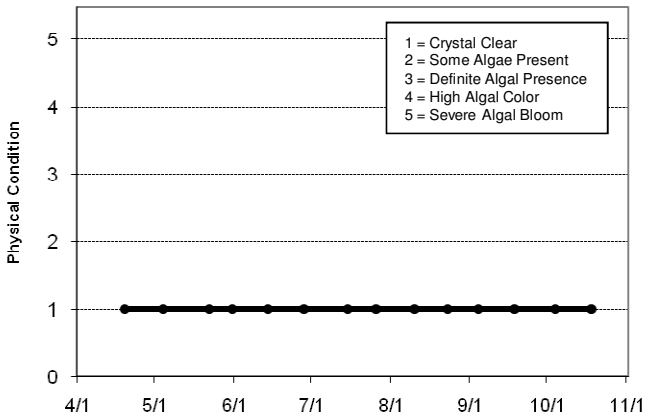






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/19	12.8				10	24		2.0	1	1
5/4	16.1				5.5	17		2.1	1	1
5/22	18.9				1.5	13		5.1	1	1
5/31	20.4				6.9	17		3.2	1	1
6/14	22.4				2.6	13		4.1	1	1
6/28	24.6				2.6	13		4.4	1	1
7/15	24.1				2.8	8		4.1	1	1
7/26	24.1				3.2	8		4.4	1	1
8/10	25.5				3.3	9		4.2	1	1
8/23	23.6				5.2	20		3.0	1	1
9/4	22.1				5.5	10		3.2	1	1
9/18	23.2				4.6	11		4.3	1	1
10/4	15.1				11	18		2.0	1	1
10/18	9.8				13	23		2.2	1	1

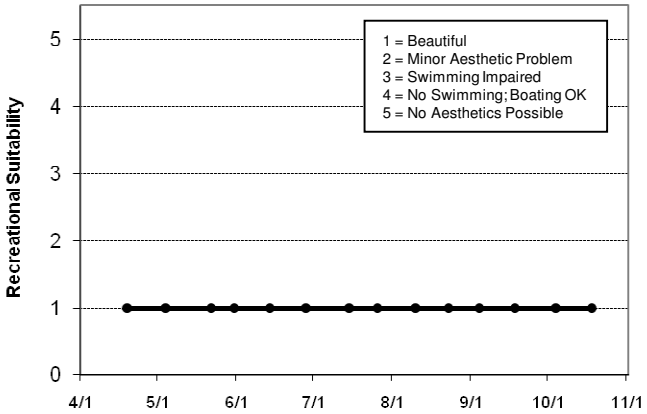


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

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

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

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	50.4	26.0	105.0	C
CLA (µg/l)	6.1	2.7	13.0	A
Secchi (m)	1.0	0.5	1.2	D
TKN (mg/l)	1.16	1.00	1.50	
			Lake Grade	C

The basin received a lake grade of C for 2008, which is similar to past years of lake grades. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

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

Langton Lake, Site 1
Roseville, Ramsey Co.

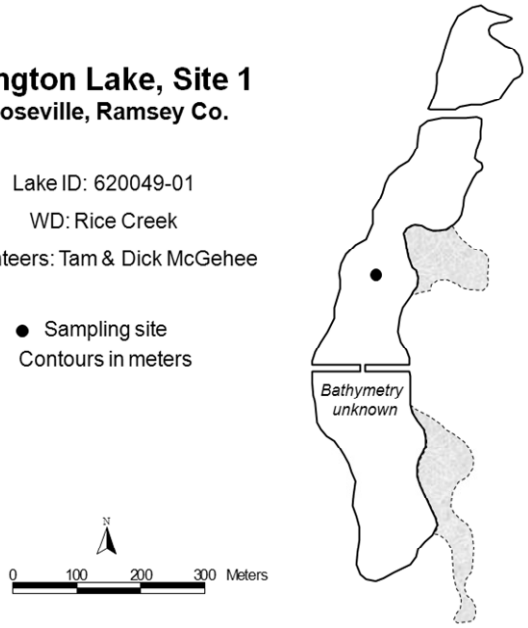
Lake ID: 620049-01

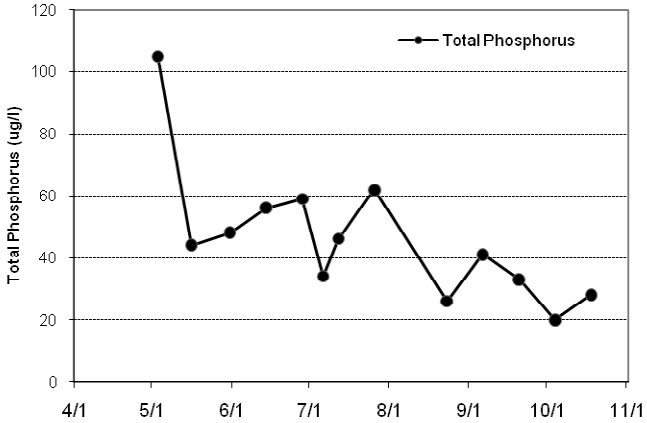
WD: Rice Creek

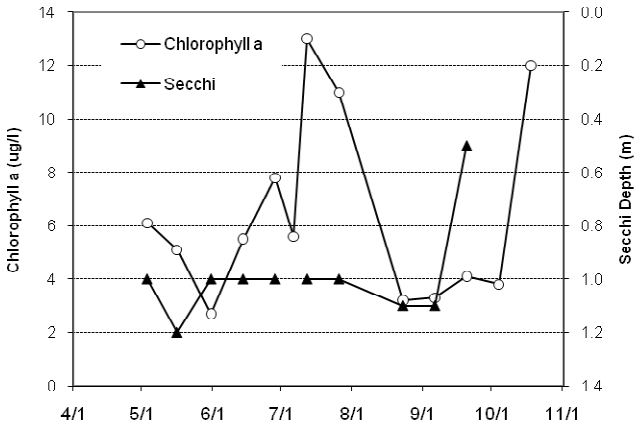
Volunteers: Tam & Dick McGehee

● Sampling site

Contours in meters

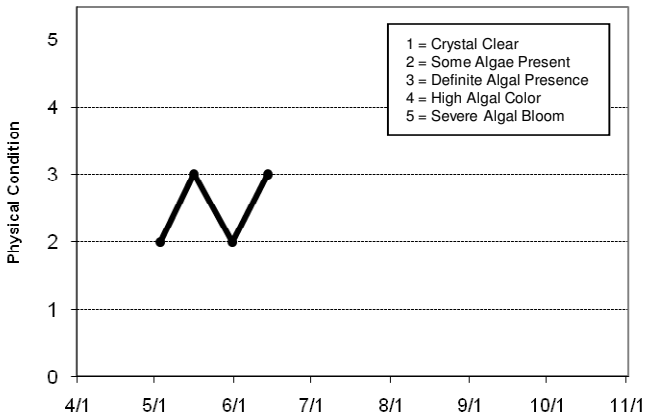






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/3	19.1				6.1	105		1.0	2	
5/16	18.5				5.1	44		1.2	3	
5/31	23.6				2.7	48		1.0	2	
6/14	26.3				5.5	56		1.0	3	
6/28	26.9				7.8	59		1.0		
7/6	25.2				5.6	34				
7/12	26.1				13	46		1.0		
7/26	26.9				11	62		1.0		
8/23	24.3				3.2	26		1.1		
9/6	22.9				3.3	41		1.1		
9/20	23.3				4.1	33		0.5		
10/4	10.7				3.8	20				
10/18	8.5				12	28				



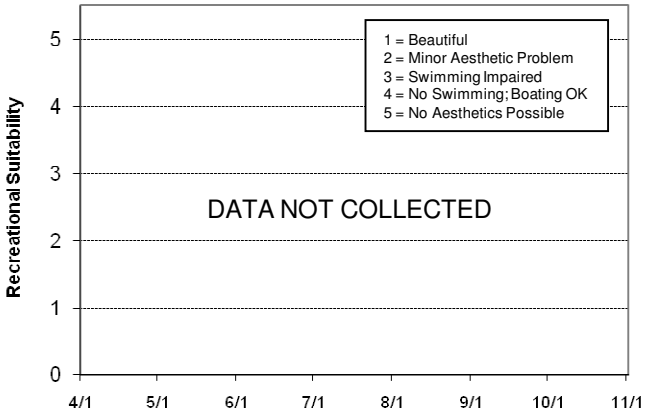
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

An abundance of submerged aquatic vegetation (Curlyleaf pondweed) has been a continuing problem in the lake. Not only is it an aesthetic and recreational problem, but the decaying of plants in late-summer adds to concentrations of phosphorus in the water column.

Barley straw has been added to this lake in the past to study the potential inhibition of algal populations within the lake (McComas and Stuckert 2009a).

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	18.8	12.0	28.0	A
CLA (µg/l)	4.3	1.0	8.9	A
Secchi (m)	3.6	1.7	5.1	A
TKN (mg/l)	0.72	0.56	1.10	
			Lake Grade	A

The lake received a lake grade of A for 2009, including A grades for each of the 3 water quality parameters. The year 2009 saw the best water quality in its historical water quality database.

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

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

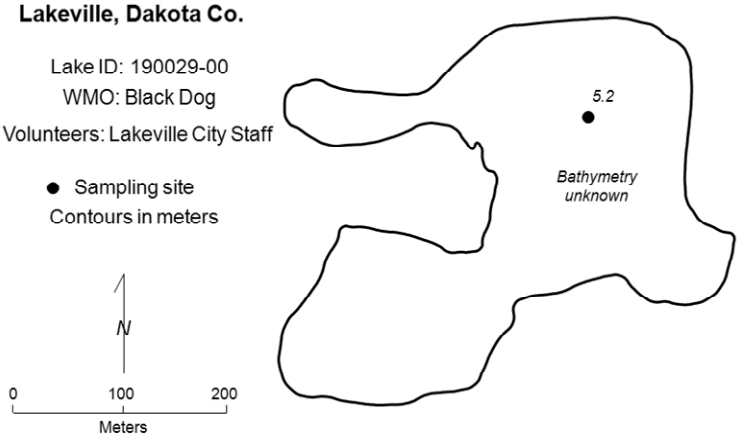
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

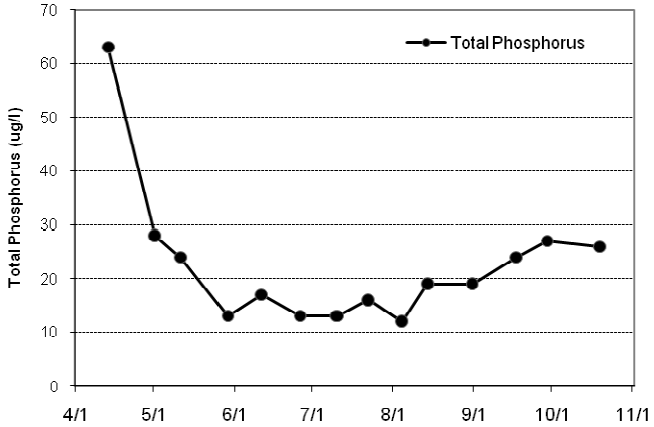
Lee Lake

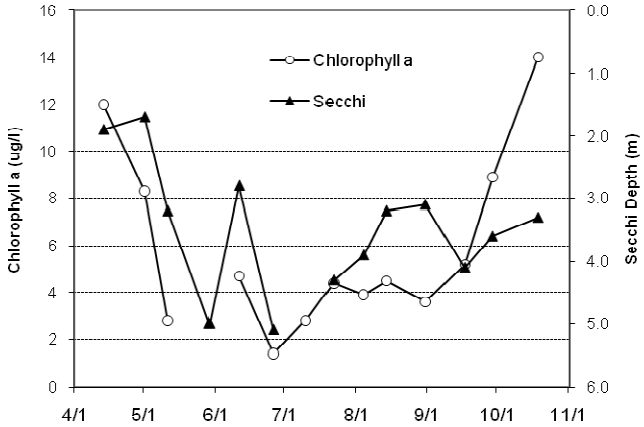
Lakeville, Dakota Co.

Lake ID: 190029-00
WMO: Black Dog
Volunteers: Lakeville City Staff

● Sampling site
Contours in meters

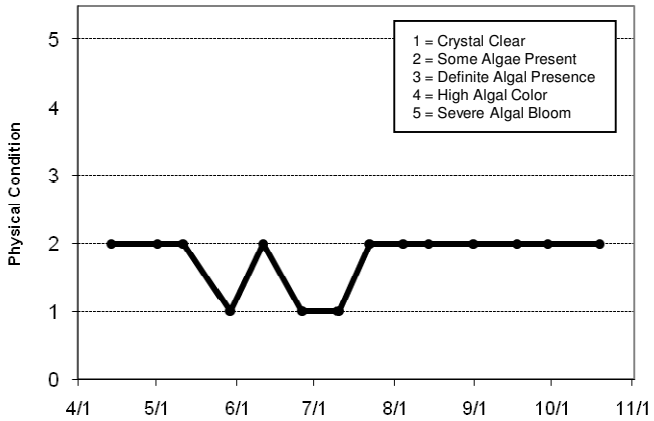






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	11.4				12	63		1.9	2	1
5/1	14				8.3	28		1.7	2	2
5/11	16				2.8	24		3.2	2	1
5/29	20					13		5.0	1	1
6/11	18.9				4.7	17		2.8	2	2
6/26	27				1.4	13		5.1	1	1
7/10	25				2.8	13			1	1
7/22	23.5				4.4	16		4.3	2	1
8/4	24				3.9	12		3.9	2	1
8/14	28.5				4.5	19		3.2	2	1
8/31	23				3.6	19		3.1	2	1
9/17	24				5.2	24		4.1	2	1
9/29	18.7				8.9	27		3.6	2	1
10/19	7.9				14	26		3.3	2	1

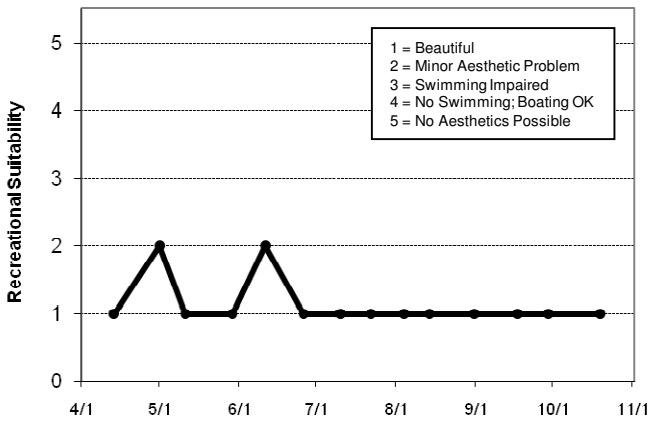


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

Legion Pond (82-0462) *Valley Branch Watershed District*

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

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

2006 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	42.0	42.0	42.0	N/A
CLA (µg/l)	11.0	11.0	11.0	N/A
Secchi (m)	0.3	0.3	0.3	N/A
TKN (mg/l)	1.00	1.00	1.00	
			Overall Grade	N/A

There was an insufficient quantity of data to calculate grades for the lake in 2009. At least 5 monitoring events during the summer-time period (May – September) are needed. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

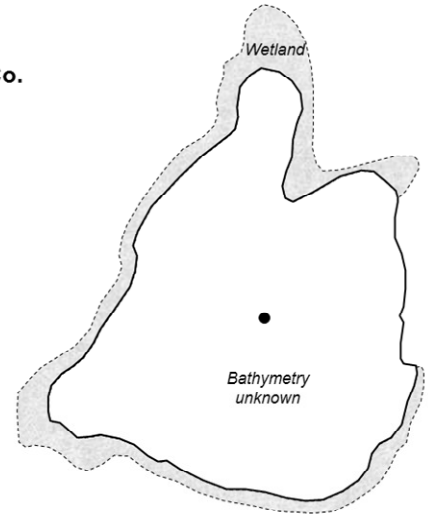
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

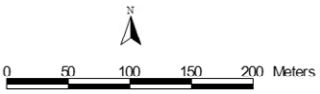
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

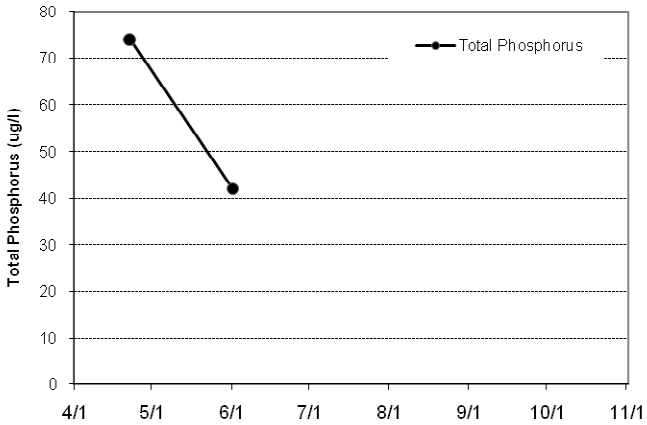
Legion Pond
Lake Elmo, Washington Co.

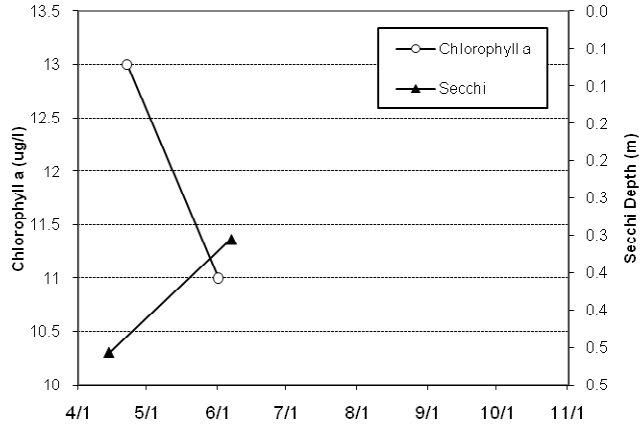
Lake ID: 820462-00
WD: Valley Branch
Volunteer: Washington Conservation District

● Sampling site
Contours in meters



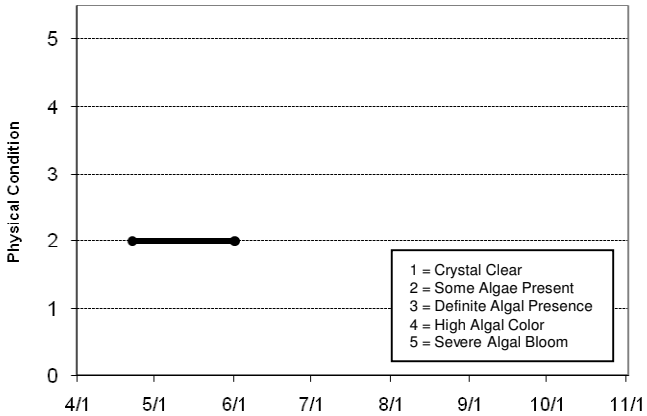






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/22	14.6		11.68		13	74		0.5	2	4
6/1	25.1		9.07		11	42		0.3	2	4



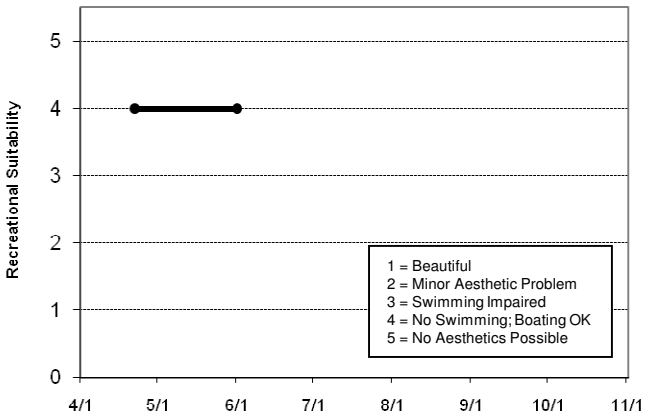
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

LeMay Lake is located in the City of Mendota Heights. It has a surface area of 34 acres and an average depth of 1.6 m (5.1 ft). The maximum depth is 4.0 m (13 ft). The entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	50.6	34.0	66.0	C
CLA (µg/l)	9.8	4.2	21.0	A
Secchi (m)	1.4	0.8	2.9	C
TKN (mg/l)	1.38	1.00	1.90	
			Lake Grade	B

The lake received a lake grade of B for 2009. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

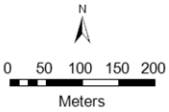
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

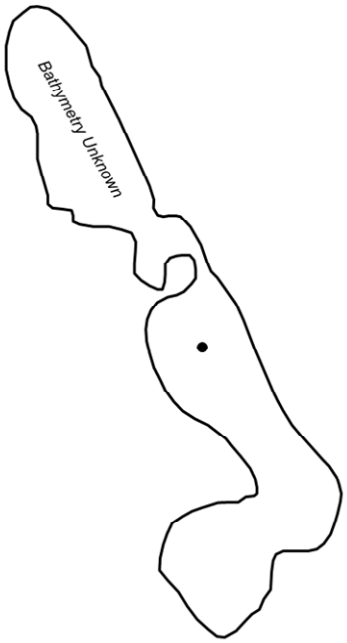
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

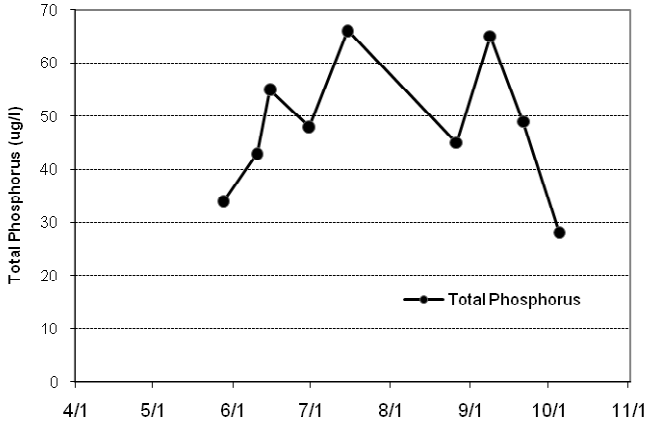
LeMay Lake
Mendota Heights, Dakota Co.

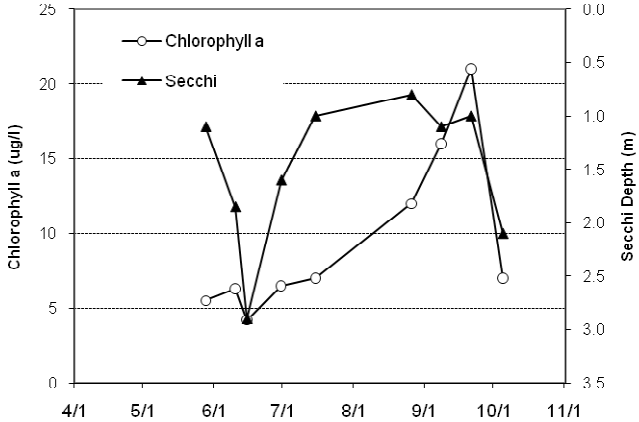
Lake ID: 190082-00
WMO: Gun Club Lake
Volunteers: Mendota Heights City Staff

● Sampling site
Contours in meters



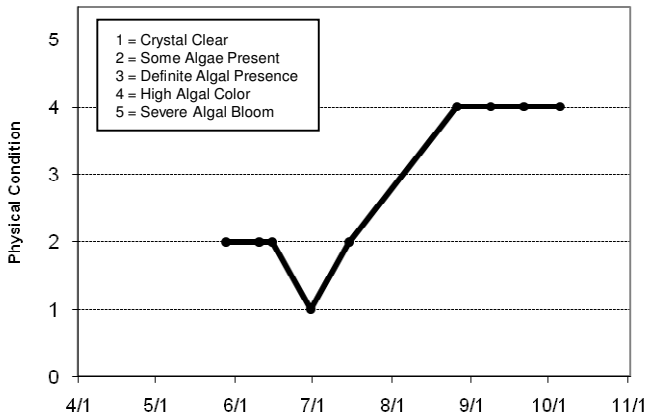






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/28	22.4				5.5	34		1.1	2	2
6/10	18.3				6.3	43		1.9	2	2
6/15	24.1				4.2	55		2.9	2	2
6/30	22.3				6.5	48		1.6	1	2
7/15	23.5				7	66		1.0	2	4
8/26	26.6				12	45		0.8	4	4
9/8	24.7				16	65		1.1	4	4
9/21	21				21	49		1.0	4	5
10/5	13.2				7	28		2.1	4	4



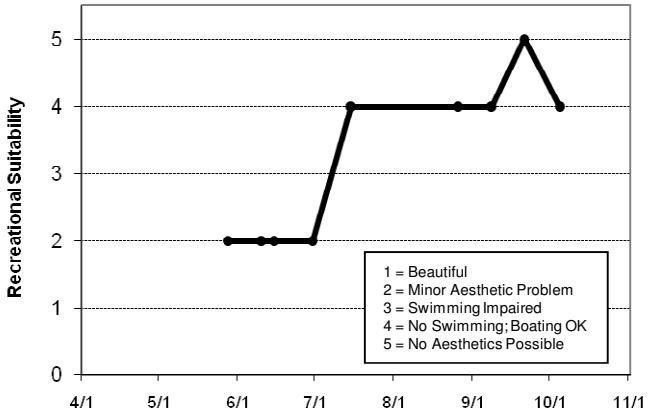
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

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

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

2009 summer (May-September) data summary

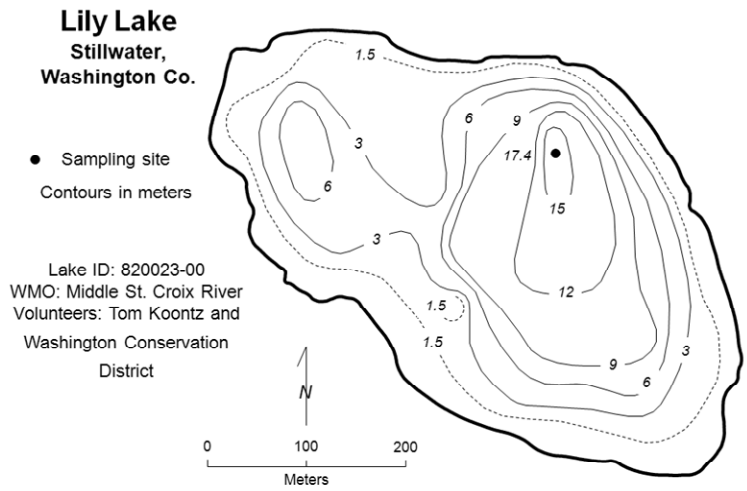
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	28.5	21.0	41.0	B
CLA (µg/l)	7.9	4.0	14.0	A
Secchi (m)	2.7	1.6	4.1	B
TKN (mg/l)	0.93	0.50	1.20	
			Lake Grade	B

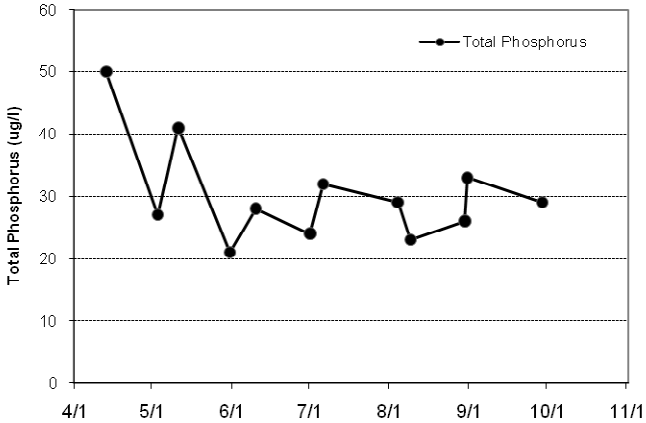
The lake received a lake grade of B for 2009, which is the lake also received in 1995 and 2001. On the basis of the historical water quality database, the lake appears represented by a lake grade of C. However, there appears to be more variation in the historical CLA and Secchi depth grades.

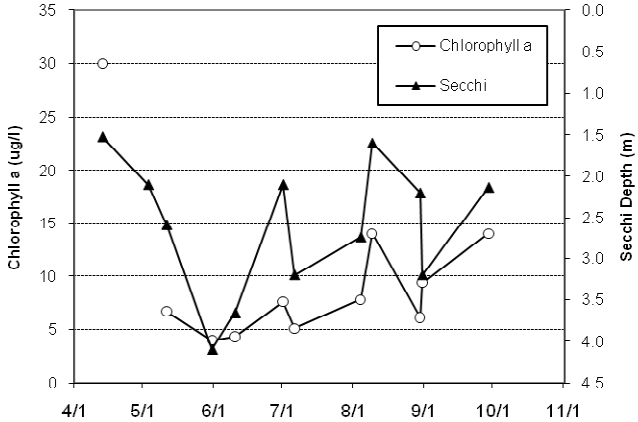
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

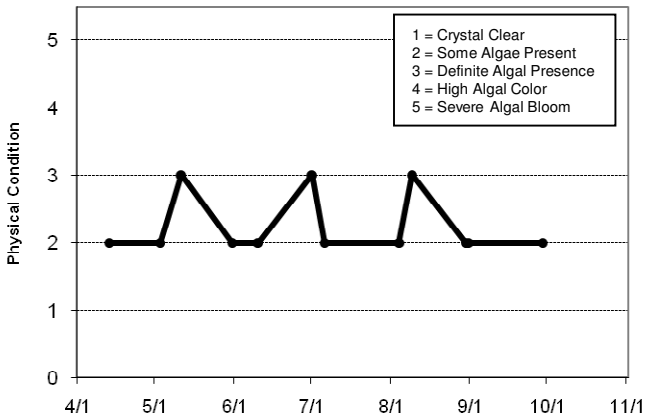
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

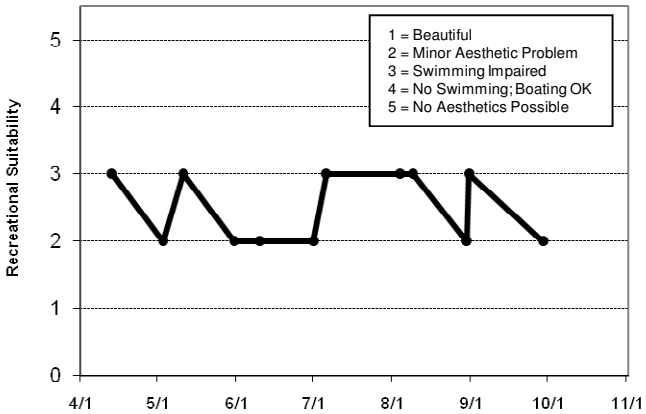
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/13	9.4	3.9	14.52	2.88	30	50	608	1.5	2	3
5/3	13.8					27		2.1	2	2
5/11	15	4.1	9.14	0.03	6.7	41	428	2.6	3	3
5/31	19.4				4	21		4.1	2	2
6/10	17.7	4.2	8.59	0.05	4.3	28	346	3.7	2	2
7/1	21.5				7.6	24		2.1	3	2
7/6	23.4	4.4	8.62	0.05	5.1	32	409	3.2	2	3
8/4	23.4	4.5	8.52	0.05	7.8	29	544	2.7	2	3
8/9	25.8				14	23		1.6	3	3
8/30	22.6				6.1	26		2.2	2	2
8/31	21.3	4.8	5.55	0.03	9.4	33	735	3.2	2	3
9/29	17.5	4.8	5.93	0.03	14	29	627	2.1	2	2

Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data

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

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

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)				
CLA (µg/l)				
Secchi (m)	6.9	5.8	7.9	A
TKN (mg/l)				
			Lake Grade	

Similar to all past years of CAMP monitoring, the lake received a water clarity grade of A. TP and CLA were not monitored in 2008 so a lake grade cannot be determined. The historical water quality database indicates that the lake's water quality is well represented by a lake grade of A.

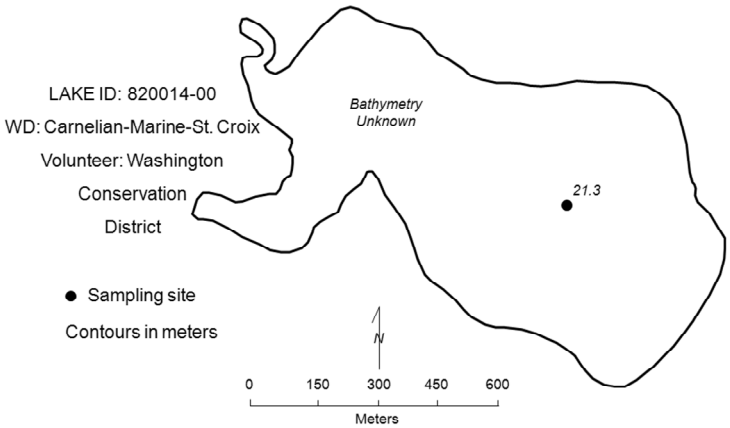
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

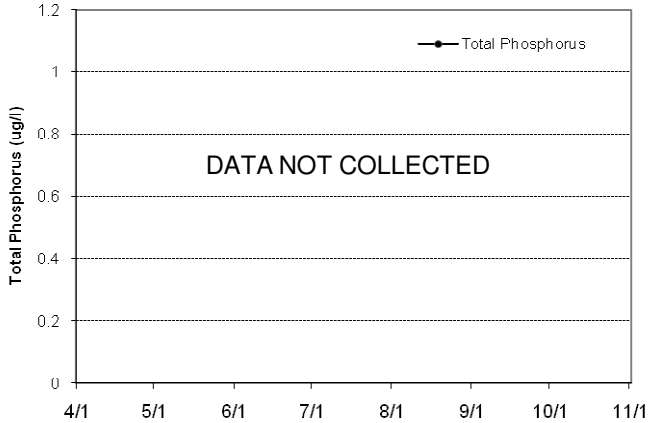
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

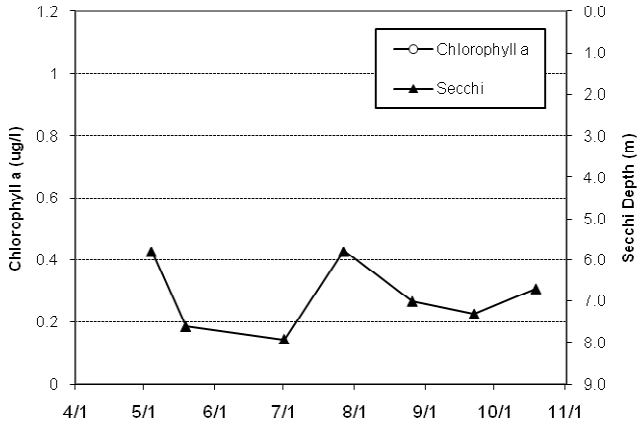
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

Little Carnelian Lake

Stillwater Twp., Washington Co.

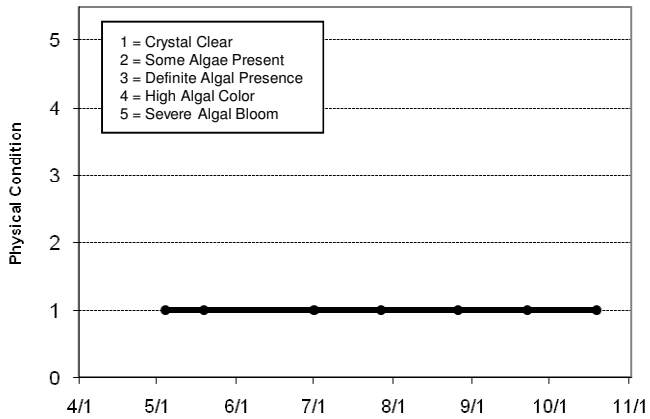






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/4	12.8	5.1	12.19	0.08				5.8	1	1
5/19	15.4	5.4	10.57	0.07				7.6	1	1
7/1	21	5.8	8.68	0.08				7.9	1	1
7/27	23.2	6.3	8.89	0.05				5.8	1	1
8/26	23.5	6.4	8.84	0.06				7.0	1	1
9/22	22.7	6.7	8.52	0.03				7.3	1	3
10/19	11.1	6.5	10.32	0.02				6.7	1	1

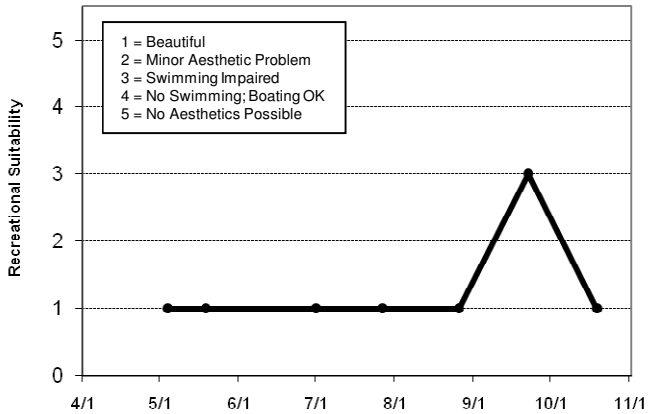


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

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

Little Comfort Lake is located near the City of Wyoming (Chisago County). The lake has a maximum depth of 17.0 m (56 feet).

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

2009 summer (May-September) data summary

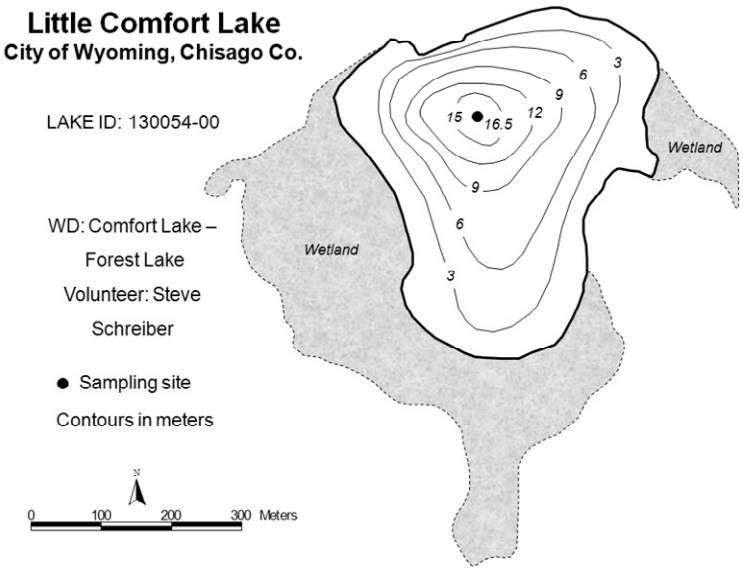
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	20.6	14.0	30.0	A
CLA (µg/l)	8.1	3.5	11.0	A
Secchi (m)	1.9	1.0	3.0	C
TKN (mg/l)	0.82	0.74	0.92	
			Lake Grade	B

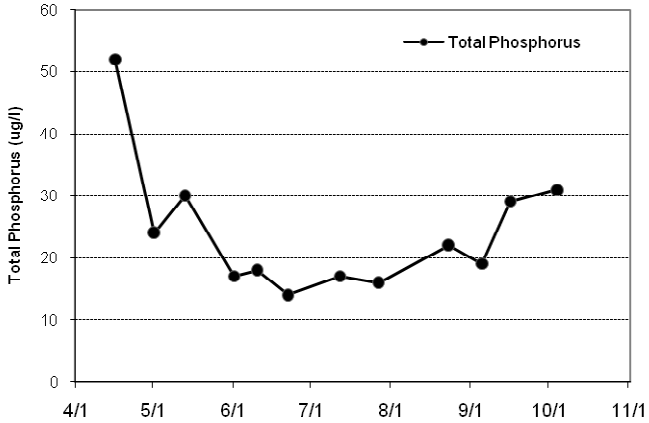
The lake received a lake grade of C for 2009. The TP grade of A was the best grade received for this parameter in the lake's water quality database.

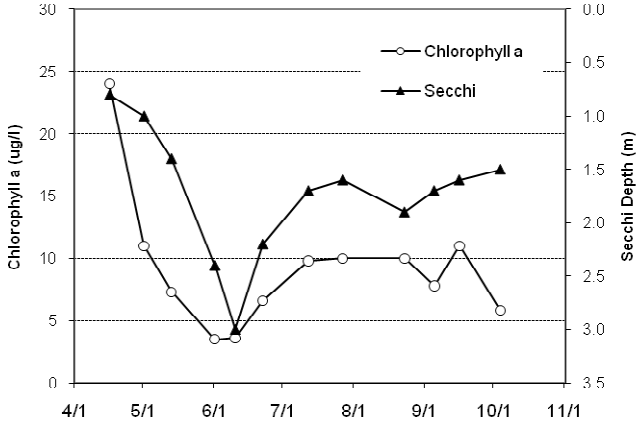
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

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

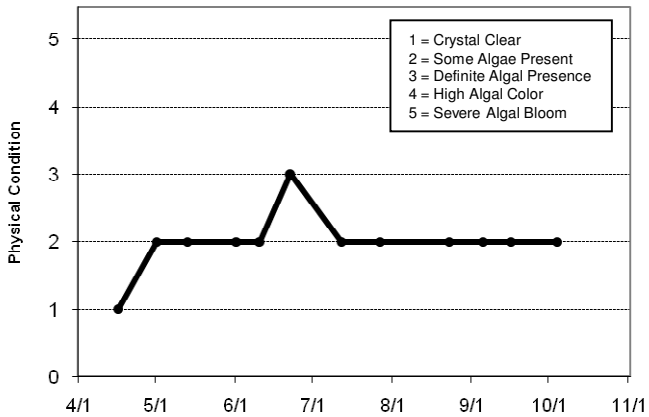






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/16	15.2				24	52		0.8	1	1
5/1	15.6				11	24		1.0	2	2
5/13	16				7.3	30		1.4	2	2
6/1	20.3				3.5	17		2.4	2	2
6/10	22.3				3.6	18		3.0	2	2
6/22	28.1				6.6	14		2.2	3	3
7/12					9.8	17		1.7	2	2
7/27					10	16		1.6	2	3
8/23					10	22		1.9	2	3
9/5	25.6				7.8	19		1.7	2	3
9/16	24				11	29		1.6	2	3
10/4	14.6				5.8	31		1.5	2	3



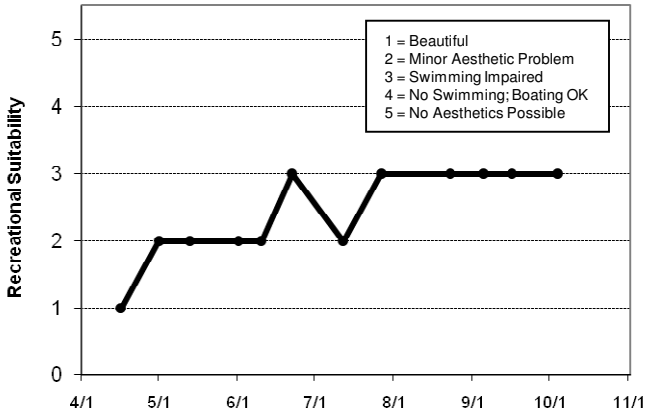
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



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

Little Johanna Lake is located on the boundary between the Cities of Arden Hills and Roseville (Ramsey County). The lake has a surface area of 18 acres and a maximum depth of 12.0 m (39 feet).

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	50.2	18.0	97.0	C
CLA (µg/l)	18.7	1.7	52.0	B
Secchi (m)	1.5	0.7	2.8	C
TKN (mg/l)	1.14	0.65	1.70	
			Lake Grade	C

The lake received a lake grade of C for 2009, which is similar to the historical lake grades. The lake appears well represented by a lake grade of C. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

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

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

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

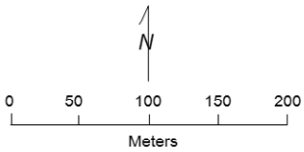
Little Johanna Lake

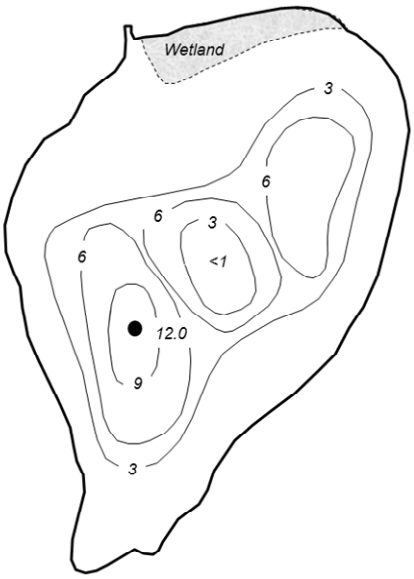
Arden Hills/Roseville, Ramsey Co.

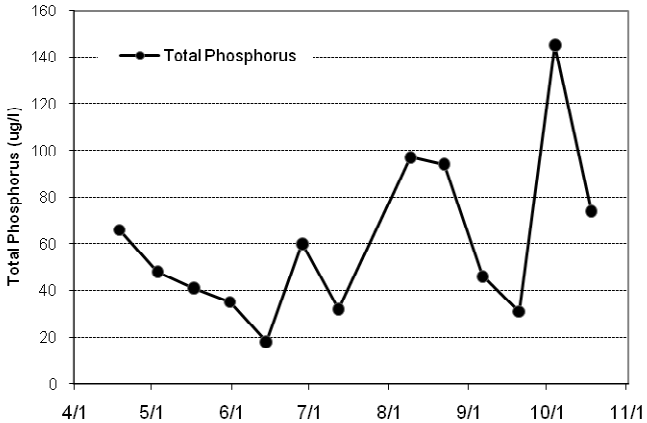
Lake ID: 620058-00
WD: Rice Creek
Volunteer: Fred Fox

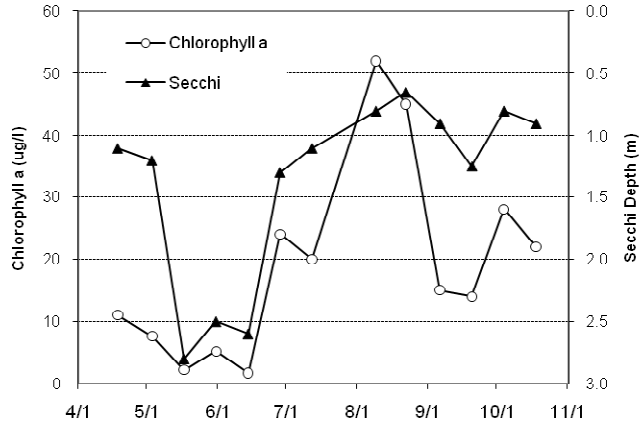
● Sampling site

Contours in meters



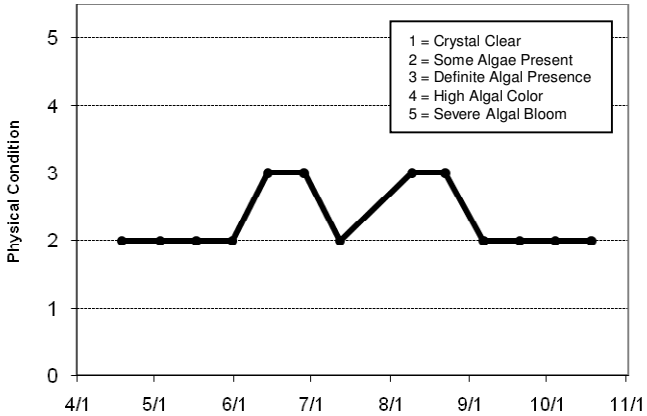






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
4/18	18				11	66		1.1	2	2
5/3	17				7.6	48		1.2	2	3
5/17	17.7				2.2	41		2.8	2	2
5/31	21.1				5.2	35		2.5	2	3
6/14	24.3				1.7	18		2.6	3	3
6/28	25.7				24	60		1.3	3	4
7/12	25.4				20	32		1.1	2	3
8/9	24				52	97		0.8	3	3
8/22	24				45	94		0.7	3	4
9/6	23				15	46		0.9	2	3
9/20	23.4				14	31		1.3	2	3
10/4	12.5				28	145		0.8	2	2
10/18	8.1				22	74		0.9	2	2



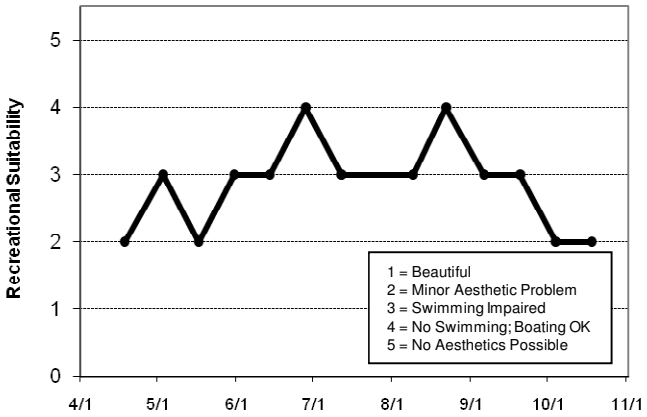
Lake Water Quality Grades Based on Summertime Averages

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

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

Year	2004	2005	2006	2007	2008	2009
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



Little Long Lake (27-0179-01) *Pioneer Sarah Creek Watershed Management Commission*

Little Long Lake is located in the City of Minnetrista (Hennepin County). It has a surface area of 108 acres. It has a maximum depth of 23.2 m (76 ft). The lake is a METC Priority Lake because of its outstanding water clarity (METC 2007). The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*).

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	15.9	4.0	68.0	A
CLA (µg/l)	3.1	1.7	4.2	A
Secchi (m)	4.4	3.0	5.5	A
TKN (mg/l)	0.63	0.43	1.70	
			Lake Grade	A

The lake received a lake grade of A for 2009, which is consistent with its historical water quality database. Additional years of monitoring are suggested for continuing to monitor this outstanding resource.

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

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

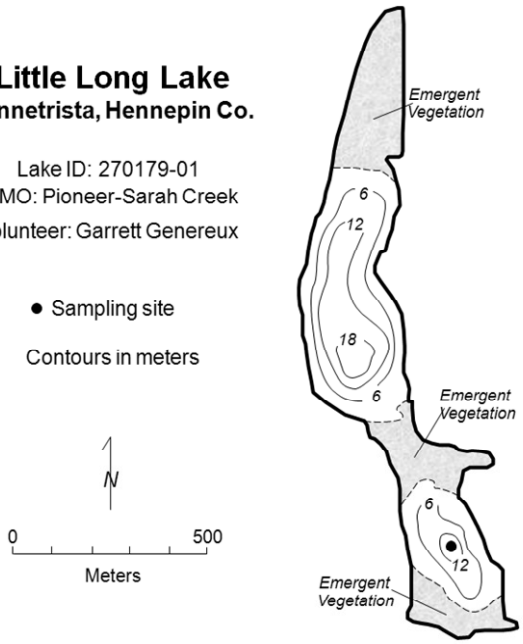
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

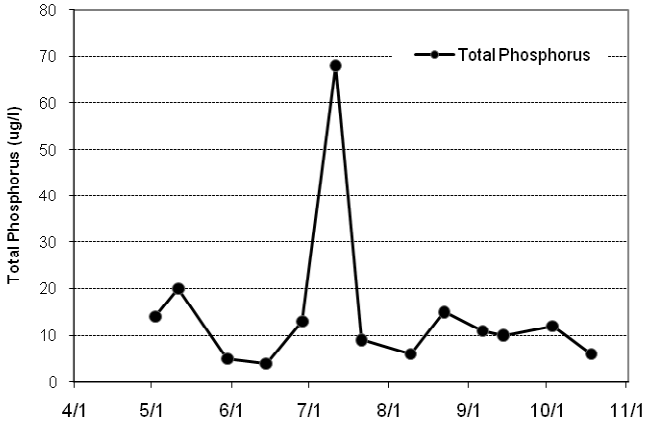
Little Long Lake
Minnetrista, Hennepin Co.

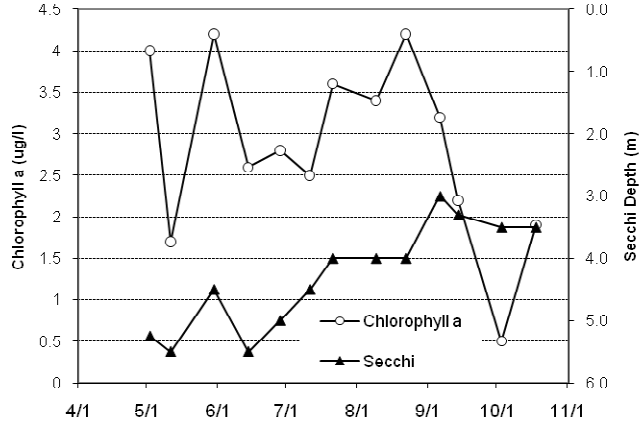
Lake ID: 270179-01
WMO: Pioneer-Sarah Creek
Volunteer: Garrett Genereux

● Sampling site

Contours in meters

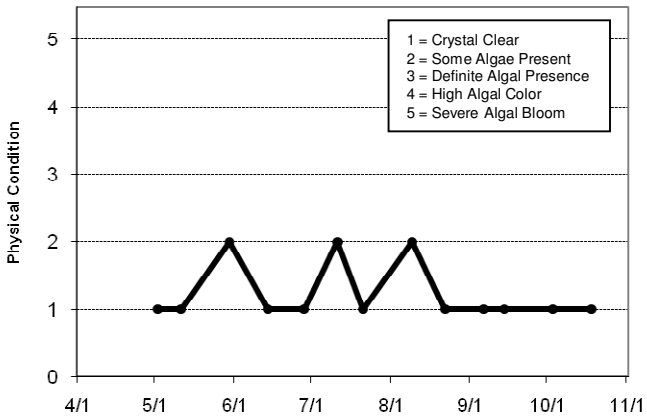






2009 Data

DATE	Surf Tmp (ºC)	Bot Tmp (ºC)	Surf DO (mg/L)	Bot DO (mg/L)	CLA (µg/L)	Surf TP (µg/L)	Bot TP (µg/L)	Secchi (m)	PC	RS
5/2	13.3				4	14		5.3	1	1
5/11	15.7				1.7	20		5.5	1	1
5/30	17.8				4.2	5		4.5	2	1
6/14	23.7				2.6	4		5.5	1	1
6/28	25.5				2.8	13		5.0	1	1
7/11	24.8				2.5	68		4.5	2	1
7/21	22.7				3.6	9		4.0	1	1
8/9	25.5				3.4	6		4.0	2	1
8/22	23.9				4.2	15		4.0	1	1
9/6	22.5				3.2	11		3.0	1	1
9/14	24				2.2	10		3.3	1	1
10/3	15.9				0.5	12		3.5	1	1
10/18	10.9				1.9	6		3.5	1	1

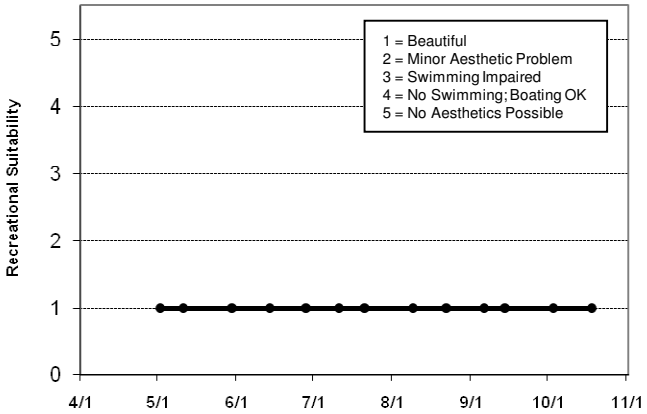


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data