St. Croix Lake [Whole Lake] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix is divided into four distinct pools: Bayport Pool, Troy Beach Pool, Black Bass Pool, and Kinnickinnic Pool. There were six monitoring sites amongst the four pools in 2009. The results will be discussed for the entire lake, as well as individually for each of the six sites.

Lake St. Croix (approximately 8,600 acres) is considered by the MDNR to extend from Stillwater, Minnesota to Prescott, Wisconsin, a distance of approximately 23 miles. Morphometry information of each of the pools is shown in the table below.

Lake St. Croix Morphometry

Pool Name	*Length (miles)*	*Area (ac)*	*Volume (ac-ft)*	*Mean depth range (dry vs. wet years) (meters)*
Bayport Pool	6.0	2,800	62,500	6.2-7.3
Troy Beach Pool	6.0	3,100	107,800	9.9-11.0
Black Bass Pool	7.0	1,300	59,600	12.9-14.0
Kinnickinnic Pool	5.0	1,400	46,274	9.2-10.3

(USGS 2002)

The MN DNR has designated the lake as being infested with Eurasion water milfoil (*Myriophyllum spicatum*) and Zebra mussels (*Dreissena spp.*).

The year 2009 was the fifth year in which any of the Lake St. Croix sites have been formally involved in CAMP. Prior to 2005, a citizen-monitoring program conducted by the St. Croix Basin Team produced water quality data for the following sites during the 1999 – 2002 period: Bayport Pool- Site 2; Troy Beach Pool-Site 3; Troy Beach Pool-Site 5; and Black Bass Pool-Site 6. Kinnickinnic Pool-Site 7 was monitored during the 2000-2001. All data are available in STORET.

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

2009 summer (May-September) whole lake data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	28	2.0	68	B
CLA (µg/l)	23	5.0	87	C
Secchi (m)	1.8	0.6	3.4	C
TKN (mg/l)	0.70	0.37	1.50	
			Lake Grade	C

The whole lake received a lake grade of C for 2009, which is consistent with the lake's historical database.

Lake water quality grades based on the whole lakes summer means

Year	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*
Total Phosphorus	D	D	C	C			C	C	C	C	B
Chlorophyll a	B	C	C	C			B	B	C	B	C
Secchi Depth	C	C	C	C			C	C	C	C	C
Overall	**C**	**C**	**C**	**C**			**C**	**C**	**C**	**C**	**C**

Source: Metropolitan Council and STORET data

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

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

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

St. Croix Lake [Bayport Pool-Site 1] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Bayport Pool-Site 1] was monitored 8 times in 2009. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

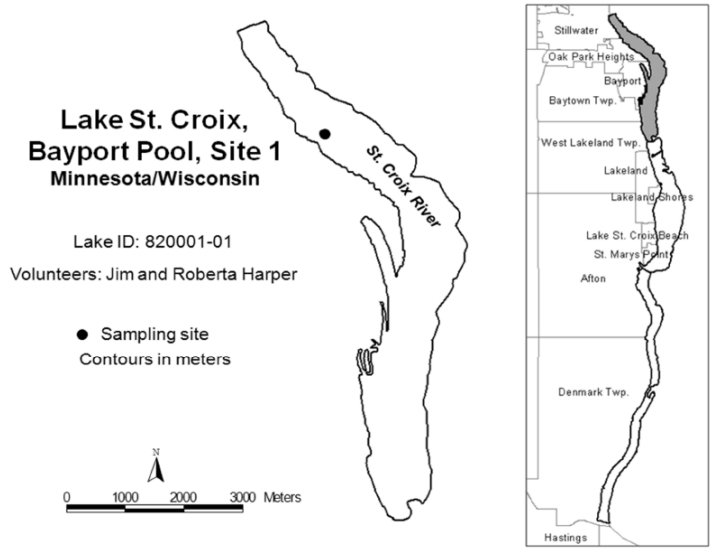
2009 summer (May-September) data summary

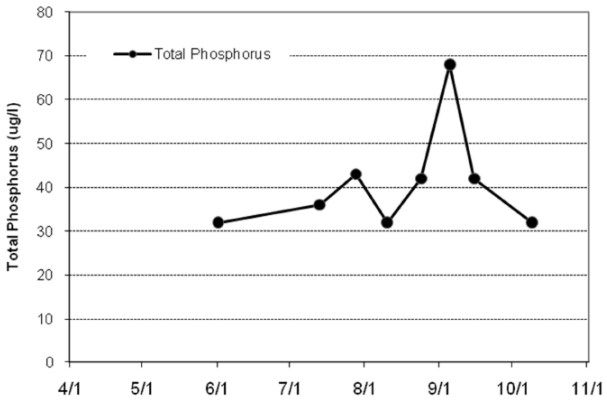
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	42.0	32.0	68.0	C
CLA (µg/l)	35	5.0	87	C
Secchi (m)	1.5	0.8	3.0	C
TKN (mg/l)	0.85	0.61	1.50	
			Lake Grade	C

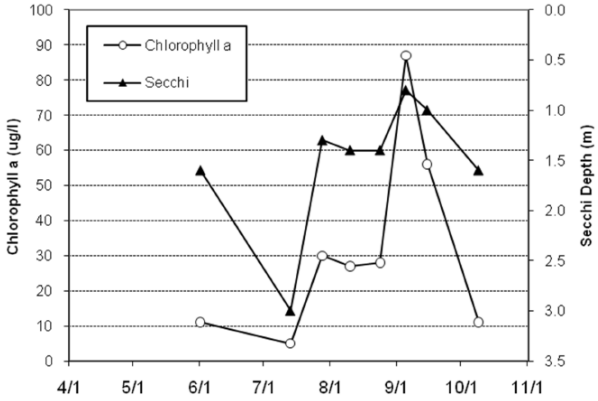
The pool received a lake grade of C for 2009, which is the first year the lake site was enrolled in the CAMP. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

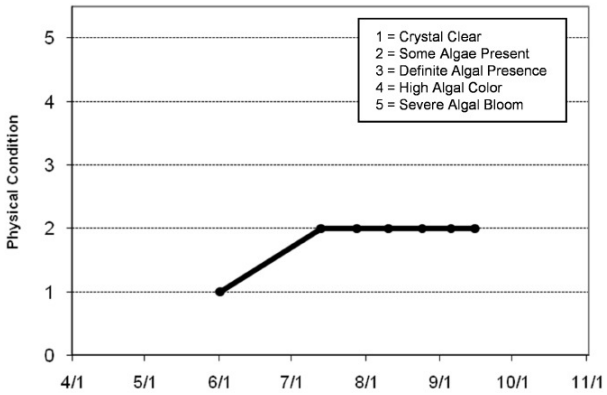






2009 Data

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
6/1/09	21.0				11	32		1.6	1	1
7/13/09	24.3				5.0	36		3.0	2	1
7/28/09	23.8				30	43		1.3	2	2
8/10/09	25.4				27	32		1.4	2	2
8/24/09	23.3				28	42		1.4	2	2
9/5/09	24.3				87	68		0.8	2	2
9/15/09	25.1				56	42		1.0	2	2
10/9/09	11.2				11	32		1.6		



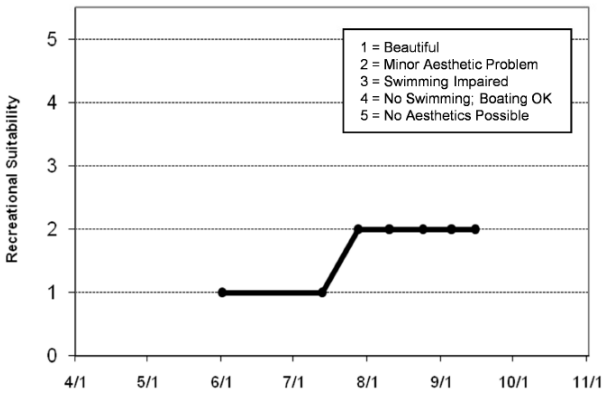
Lake Water Quality Grades Based on Summertime Averages

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						C
Lake Grade						**C**

Source: Metropolitan Council and STORET data



St. Croix Lake [Bayport Pool-Site 2] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Bayport Pool-Site 2] was monitored 12 times in 2009. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

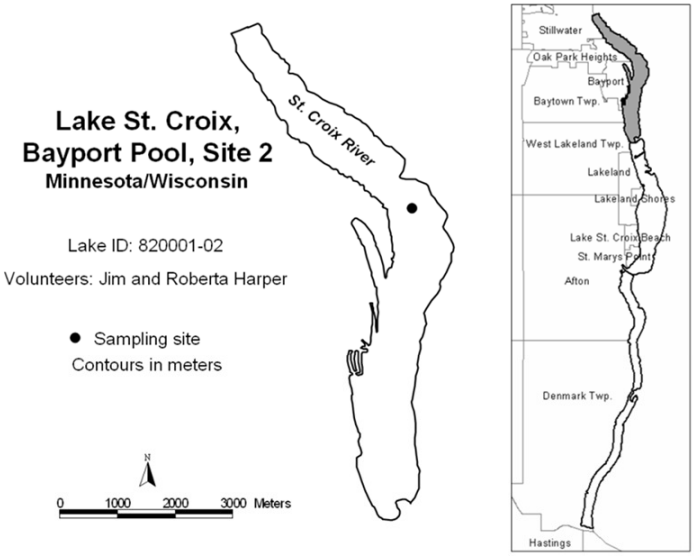
2009 summer (May-September) data summary

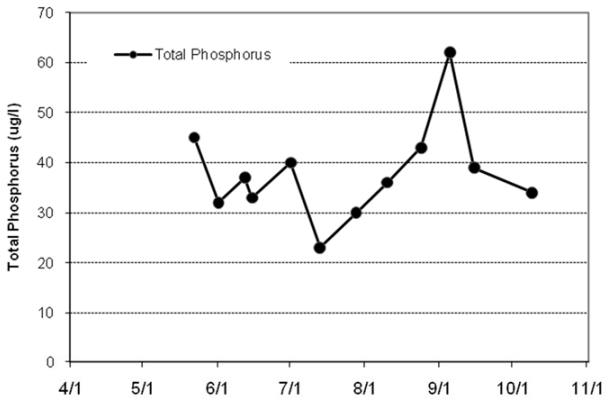
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	38.0	23.0	62.0	C
CLA (µg/l)	21	6.9	46	C
Secchi (m)	1.8	1.0	2.6	C
TKN (mg/l)	0.74	0.50	1.10	
			Lake Grade	C

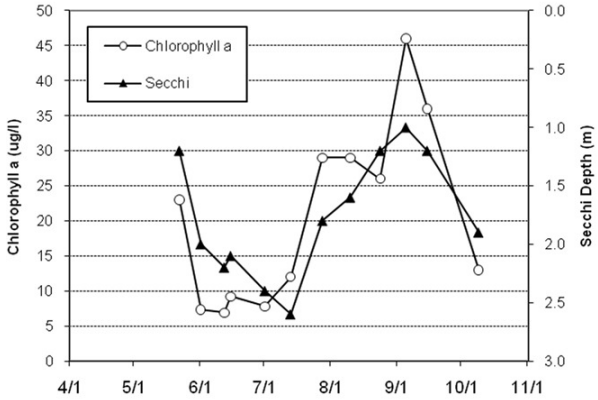
The pool received a lake grade of C for 2009, which is similar to lake grades received in the past. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

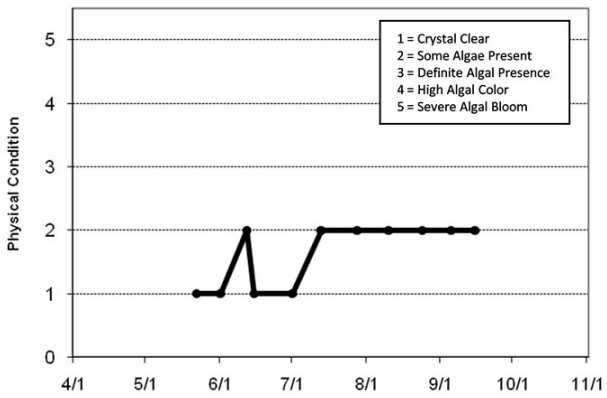
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

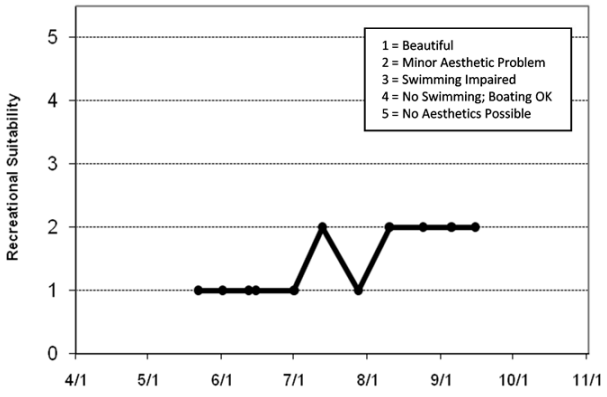
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.











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
5/22/09	21.6				23	45		1.2	1	1
6/1/09	25.1				7.3	32		2.0	1	1
6/12/09	23.4				6.9	37		2.2	2	1
6/15/09	22.8				9.2	33		2.1	1	1
7/1/09	23.1				7.8	40		2.4	1	1
7/13/09	25.8				12	23		2.6	2	2
7/28/09	24.6				29	30		1.8	2	1
8/10/09	26.5				29	36		1.6	2	2
8/24/09	24.4				26	43		1.2	2	2
9/5/09	27.6				46	62		1.0	2	2
9/15/09	26.9				36	39		1.2	2	2
10/9/09	17.4				13	34		1.9		

Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data

St. Croix Lake [Troy Beach Pool-Site 3] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Troy Beach Pool-Site 3] was monitored 11 times in 2009. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as 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)	30.0	17.0	64.0	B
CLA (µg/l)	22	10	46	C
Secchi (m)	1.7	1.0	2.6	C
TKN (mg/l)	0.56	0.37	0.87	
			Lake Grade	C

The site received a lake grade of C for 2009, which is consistent with its historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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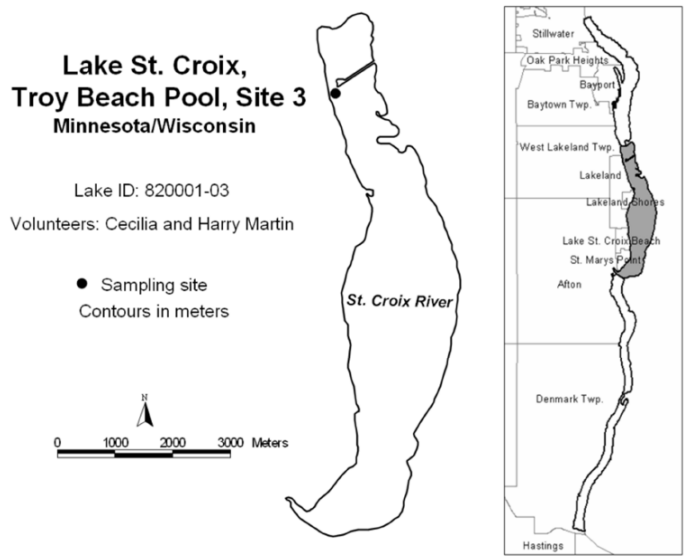
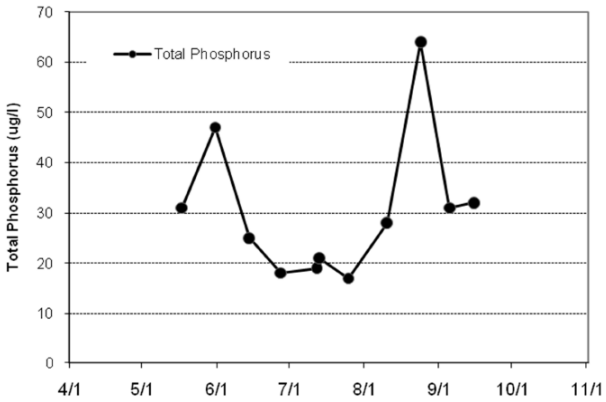
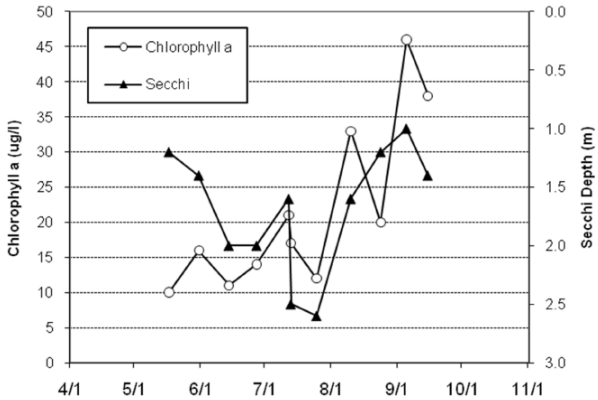
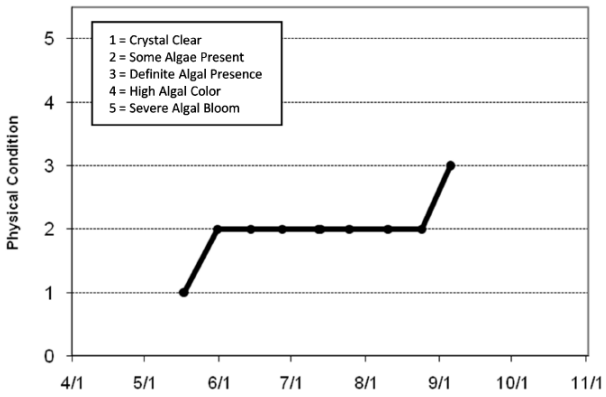






2009 Data

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
5/17/09	16.7				10	31		1.2	1	1
5/31/09	19.3				16	47		1.4	2	1
6/14/09	20.5				11	25		2.0	2	1
6/27/09	25.3				14	18		2.0	2	2
7/12/09	25.4				21	19		1.6	2	2
7/13/09	24.7				17	21		2.5	2	2
7/25/09	22.7				12	17		2.6	2	2
8/10/09	26.5				33	28		1.6	2	2
8/24/09	20.8				20	64		1.2	2	3
9/5/09	21.5				46	31		1.0	3	4
9/15/09	24				38	32		1.4		

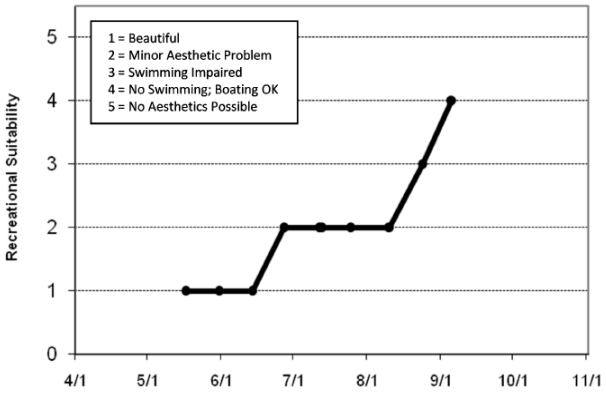


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

St. Croix Lake [Troy Beach Pool-Site 5] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Troy Beach Pool-Site 5] was monitored 13 times in 2009. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as 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)	25.0	14.0	44.0	B
CLA (µg/l)	24	5.9	54	C
Secchi (m)	1.8	0.6	3.4	C
TKN (mg/l)	0.70	0.48	1.20	
			Lake Grade	C

The site received a lake grade of C, which is consistent with its historical water quality database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

Lake St. Croix, Troy Beach Pool, Site 5

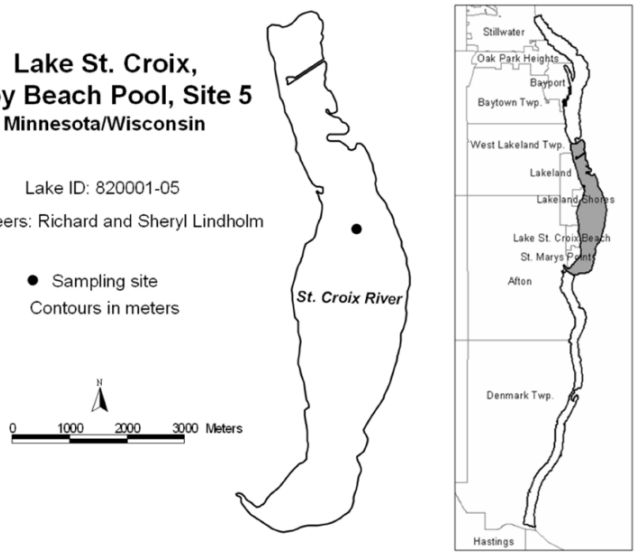
Minnesota/Wisconsin

Lake ID: 820001-05

Volunteers: Richard and Sheryl Lindholm

● 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
5/31/09	19.4				5.9	27		1.0	2	
6/14/09	22.1				9.5	21		2.6	3	2
6/28/09	25.4				8.7	14		3.4	2	2
7/13/09	24.9				20	21		2.6	2	2
7/19/09	23.2				17	16		2.2	3	3
7/25/09	23.3				18	15		2.4	2	2
8/9/09	24.4				21	24		2.0	3	3
8/11/09	26.3				25	20		1.8	2	2
8/22/09	23.6				28	37		1.2	3	3
9/6/09	23.6				54	44		0.6	3	3
9/15/09	24.8				37	25		1.3		
9/20/09	23.9				42	40		1.0	2	2
10/9/09	15.7				16	54		2.0		

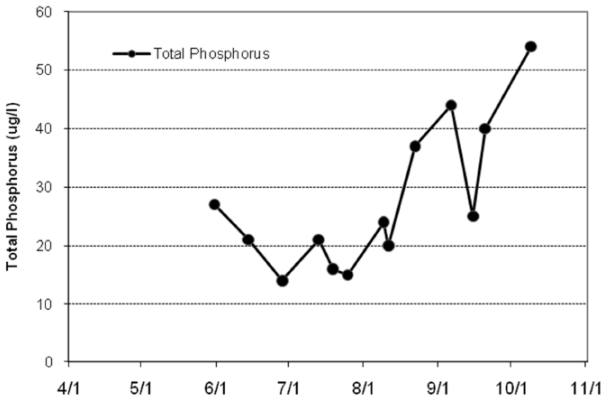
Lake Water Quality Grades Based on Summertime Averages

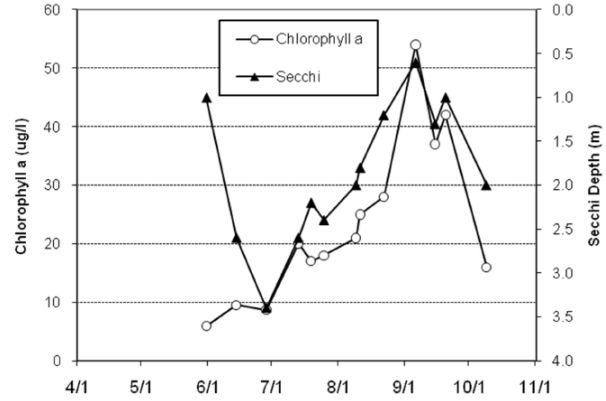
Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total Phosphorus												
Chlorophyll a												
Secchi Depth												
Lake Grade												

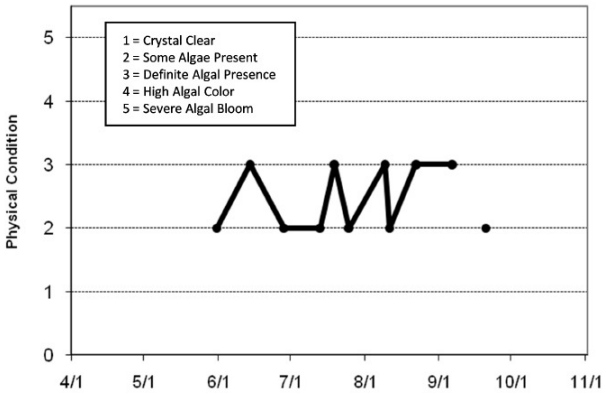
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Phosphorus								D	D	C	C	
Chlorophyll a								B	C	C	C	
Secchi Depth								C	C	C	C	
Lake Grade								**C**	**C**	**C**	**C**	

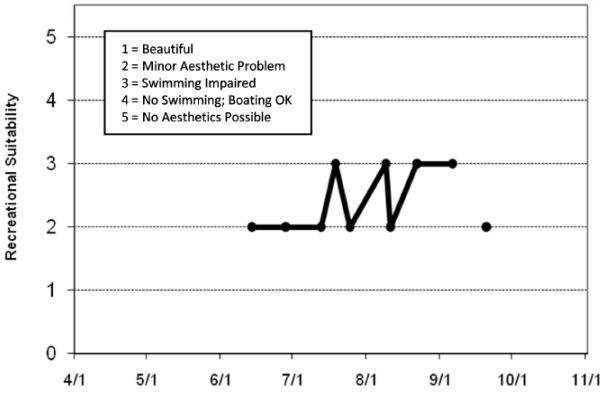
Year	2004	2005	2006	2007	2008	2009
Total Phosphorus		C	C	C	C	B
Chlorophyll a		C	B	C	B	C
Secchi Depth		C	C	C	C	C
Lake Grade		**C**	**C**	**C**	**C**	**C**

Source: Metropolitan Council and STORET data









St. Croix Lake [Black Bass Pool-Site 6] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Black Bass Pool-Site 6] was monitored 14 times in 2009. On each sampling day the lake was monitored for TP, CLA, TKN, and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data and graphs appear on the next page.

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	19.0	2.0	37.0	A
CLA (µg/l)	19.8	6.0	36	B
Secchi (m)	1.9	1.2	2.4	C
TKN (mg/l)	0.69	0.38	0.92	
			Lake Grade	B

The site received a lake grade of B for 2009, which is highest lake grade received by this lake site according to its historical water quality database. The driver of this improvement was a decrease in the summer-time mean TP concentration in comparison to previous years' TP concentrations. This year's TP grade was an A, which is in contrast to the C grades received in the past. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

Lake St. Croix, Black Bass Pool, Site 6

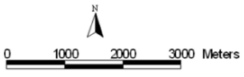
Minnesota/Wisconsin

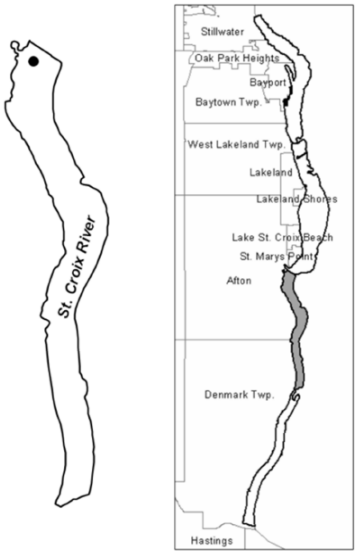
Lake ID: 820001-06

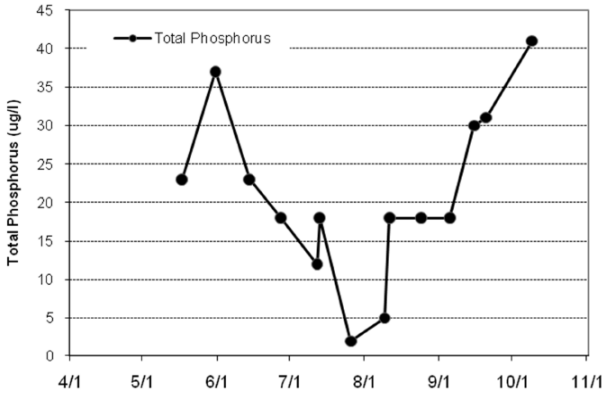
Volunteer: Rick Meierotto

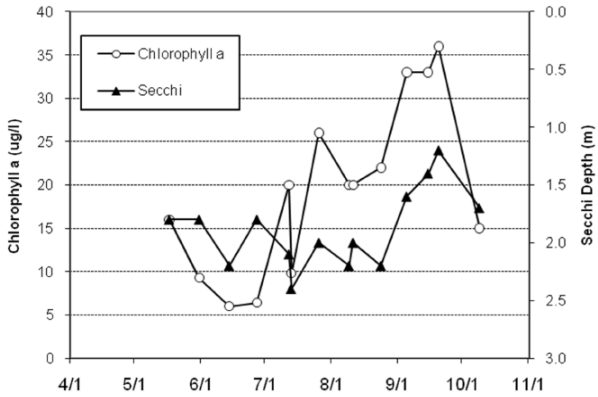
● Sampling site

Contours in meters



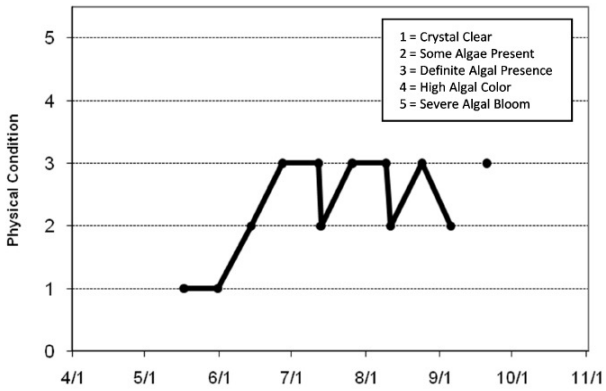






2009 Data

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
5/17/09	16.4				16	23		1.8	1	1
5/31/09	19.5				9.3	37		1.8	1	2
6/14/09	20.9				6	23		2.2	2	2
6/27/09	26.4				6.4	18		1.8	3	3
7/12/09	23.7				20	12		2.1	3	3
7/13/09	25.9				9.8	18		2.4	2	2
7/26/09	23.2				26	2		2.0	3	3
8/9/09	25.6				20	5		2.2	3	3
8/11/09	26.4				20	18		2.0	2	2
8/24/09	22.9				22	18		2.2	3	2
9/5/09	21.6				33	18		1.6	2	2
9/15/09	26.1				33	30		1.4		
9/20/09	23.2				36	31		1.2	3	3
10/9/09	16.2				15	41		1.7		



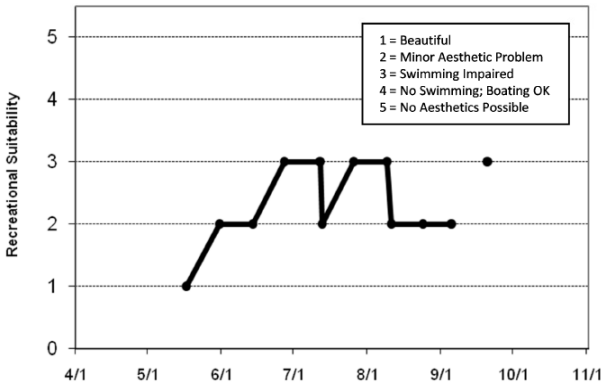
Lake Water Quality Grades Based on Summertime Averages

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

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

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

Source: Metropolitan Council and STORET data



St. Croix Lake [Kinnickinnic Pool-Site 7] (82-0001) *St. Croix Basin Planning Team*

Lake St. Croix [Kinnickinnic Pool-Site 7] was monitored 11 times in 2009. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as 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)	20.0	14.0	28.0	A
CLA (µg/l)	18	5.0	28	B
Secchi (m)	2.1	1.6	3.0	C
TKN (mg/l)	0.70	0.57	1.10	
			Lake Grade	B

The site received a lake grade of B and a TP grade of A for 2009. The TP grade this year was the highest grade received for this lake site according to its historical water quality database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

Lake St. Croix, Kinnickinnic Pool, Site 7

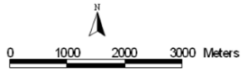
Minnesota/Wisconsin

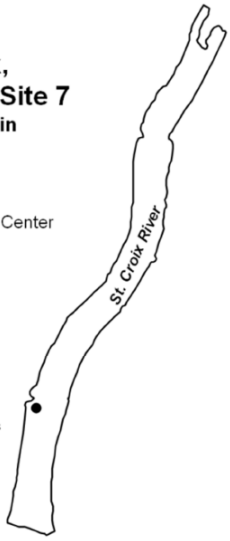
Lake ID: 820001-07

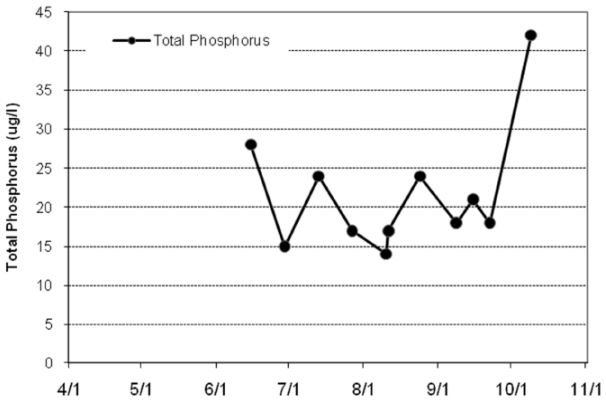
Volunteer: Carpenter Nature Center

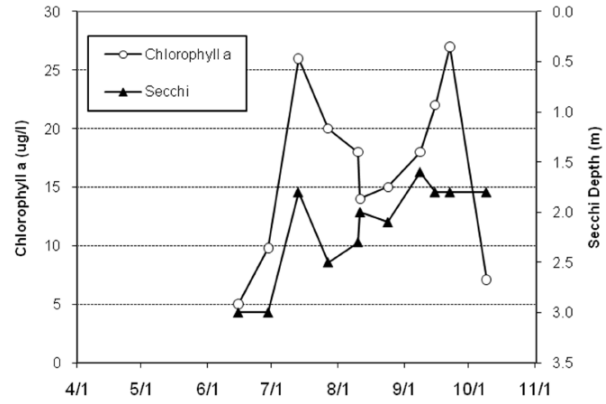
● Sampling site

Contours in meters



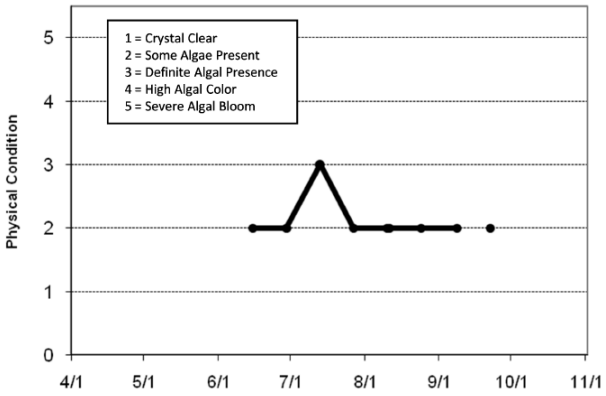






2009 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	**(ºC)**	**(ºC)**	**(mg/L)**	**(mg/L)**	**(µg/L)**	**(µg/L)**	**(µg/L)**	**(m)**	**PC**	**RS**
6/15/09	21.4				5	28		3.0	2	1
6/29/09	24.4				9.8	15		3.0	2	2
7/13/09	26.1				26	24		1.8	3	2
7/27/09	24.1				20	17		2.5	2	2
8/10/09	24.9				18	14		2.3	2	2
8/11/09	27.7				14	17		2.0	2	2
8/24/09	23.8				15	24		2.1	2	2
9/8/09	24.3				18	18		1.6	2	2
9/15/09	25.9				22	21		1.8		
9/22/09	22.4				27	18		1.8	2	2
10/9/09	16.9				7.1	42		1.8		

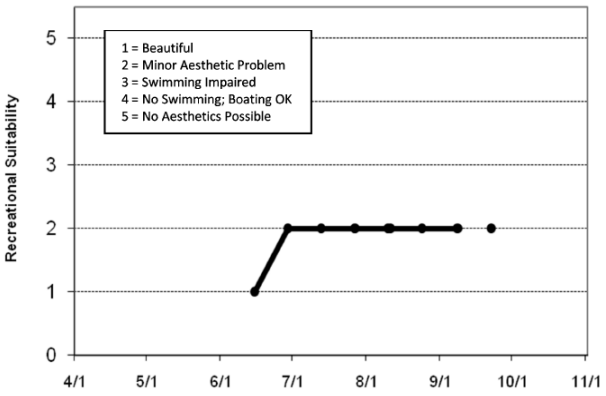


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

St. Joe Lake (10-0011) C*ity of Chanhassen*

St. Joe Lake is a 14-acre lake located within the City of Chanhassen (Carver County). It has a maximum depth of 15.9 m (52 ft).

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	38.0	11.0	123.0	C
CLA (µg/l)	3.6	2.9	4.8	A
Secchi (m)	3.3	2.8	4.0	A
TKN (mg/l)	0.89	0.85	0.98	
			Lake Grade	B

The lake received a lake grade of B for 2009, which is consistent with its historical water quality database. The lake has varied in the A to B lake grade range. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

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

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

St. Joe's Lake

Chanhassen, Carver Co.

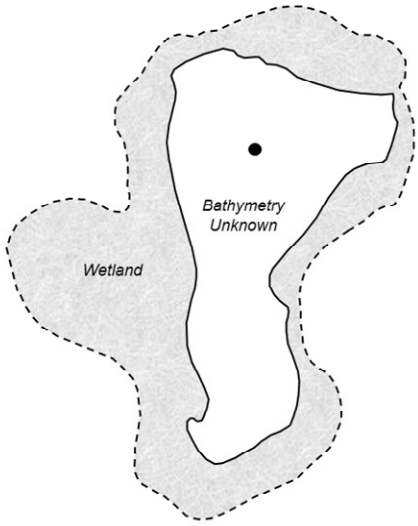
LAKE ID: 100011-00

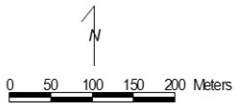
WD: Minnehaha Creek

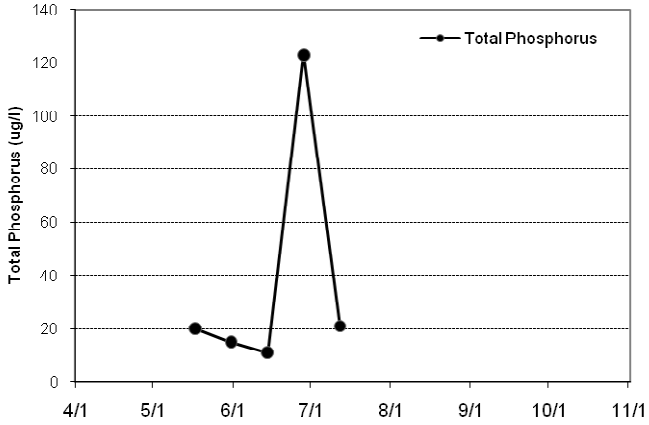
Volunteers: Sue Morgan and Linda Scott

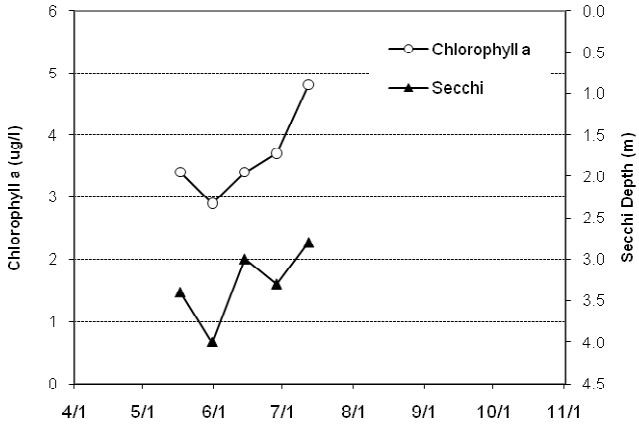
● Sampling site

Contours in meters



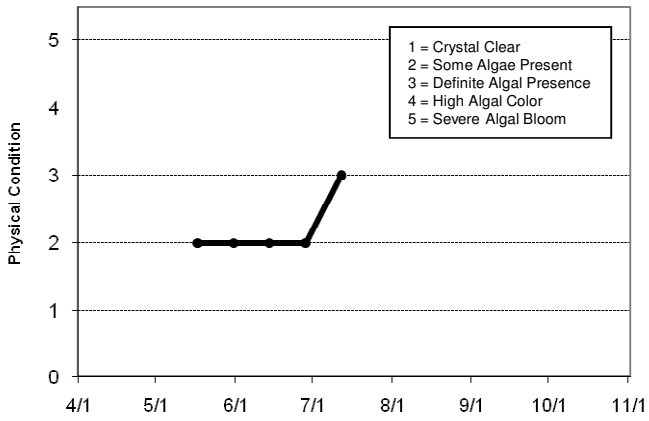






2009 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(ºC)	(ºC)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
5/17	15.4				3.4	20		3.4	2	1
5/31	20.3				2.9	15		4.0	2	1
6/14	24.4				3.4	11		3.0	2	1
6/28	24.5				3.7	123		3.3	2	1
7/12	24.7				4.8	21		2.8	3	

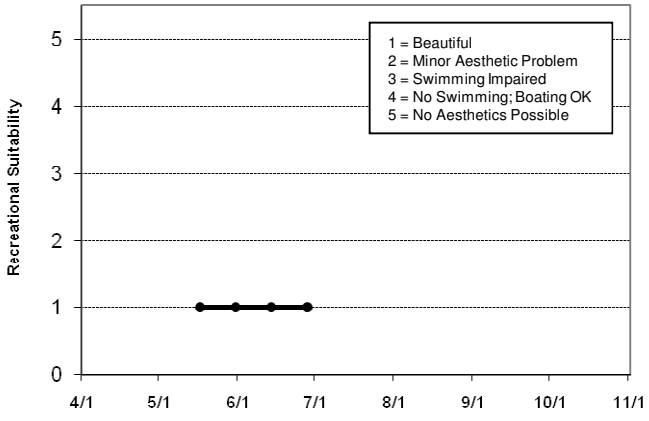


Lake Water Quality Grades Based on Summertime Averages

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			C		B							
Lake Grade												

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



Source: Metropolitan Council and STORET data

Staples Lake (82-0028) *Carnelian - Marine - St. Croix Watershed District*

Staples Lake is a 24-acre lake located within May Township (Washington County). The maximum and mean depths of the lake are 4.3 m (14 feet) and 2.1 m (6.9 ft), respectively. The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column.

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
Secchi (m)	2.6	2.4	3.0	B

The lake received a Secchi depth grade of B for 2009, which is consistent with the historical database.

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

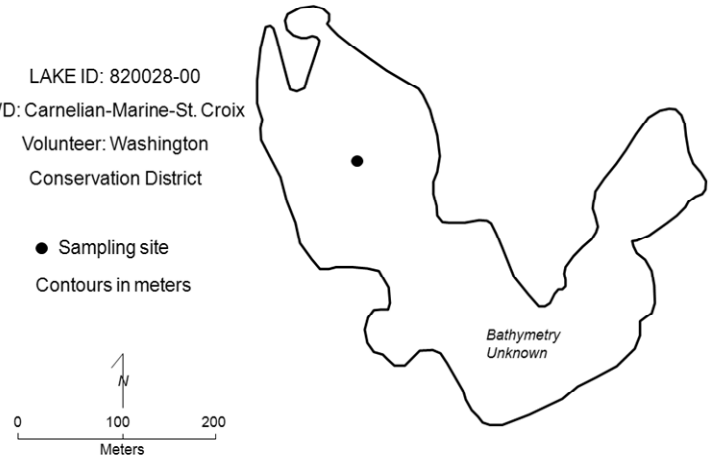
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

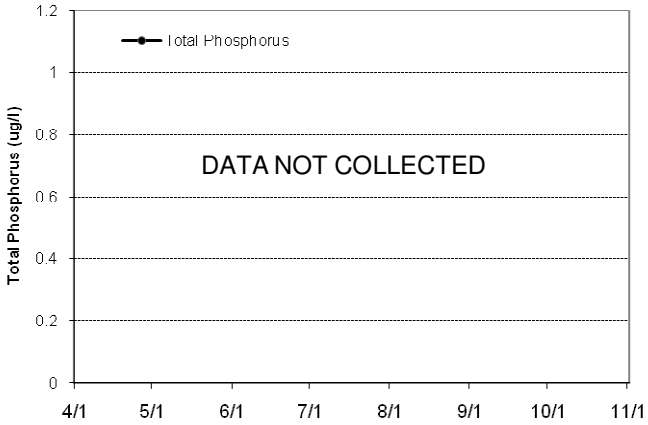
Staples Lake

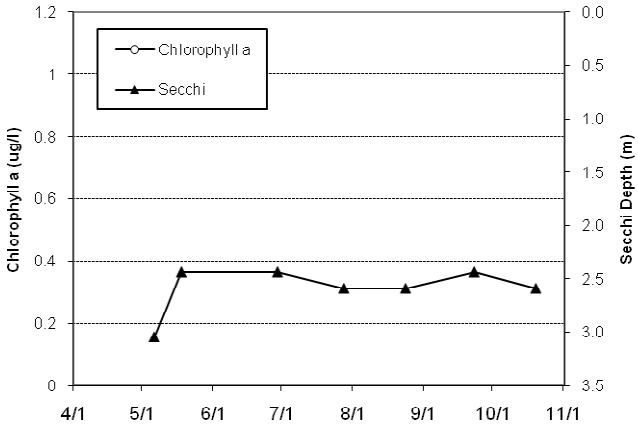
May Twp., Washington Co.

LAKE ID: 820028-00
WD: Carnelian-Marine-St. Croix
Volunteer: Washington
Conservation District

● Sampling site
Contours in meters

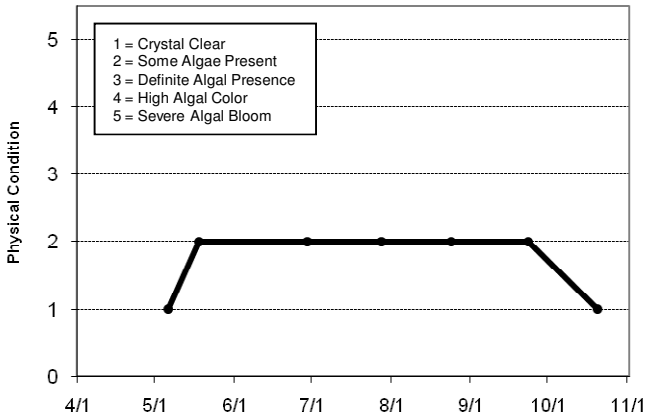






2009 Data

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
5/6	17	12.9	9.63	0.06				3.0	1	1
5/18	16	15.5	9.52	7.4				2.4	2	3
6/29	23.5	20.9	6.52	0.19				2.4	2	1
7/28	23	21.2	7.26	0.25				2.6	2	2
8/24	22.1	20.6	7.4	0.53				2.6	2	2
9/23	21.7	20.9	5.84	0.23				2.4	2	3
10/20	8.7	8.4	10.67	3.23				2.6	1	2

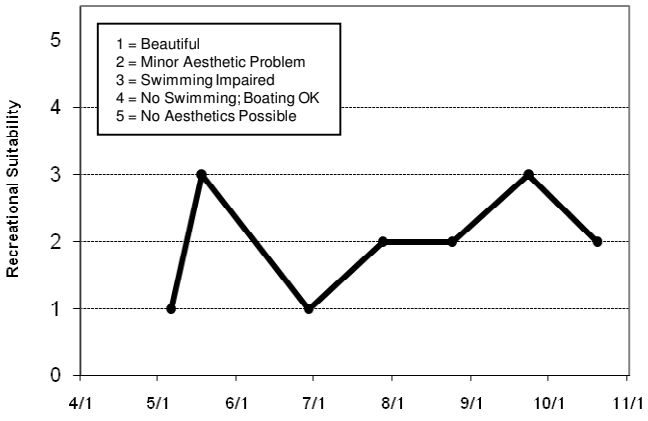


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

Sunfish Lake [Sunfish Lake] (19-0050) *City of Sunfish Lake*

Sunfish Lake is located in the City of Sunfish Lake (Dakota County). The lake has a surface area of 49 acres and a maximum depth of 9.8 m (32 ft).

During each sampling event the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), and total kjeldahl nitrogen (TKN), and Secchi transparency, as well as the lake's perceived physical condition and recreational suitability.

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	24.6	12.0	36.0	B
CLA (µg/l)	13.3	1.6	43.0	B
Secchi (m)	2.6	1.1	5.5	B
TKN (mg/l)	0.78	0.58	1.00	
			Lake Grade	B

The lake received a lake grade of B for 2009, which is the best lake grade yet received in its limited monitoring history. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

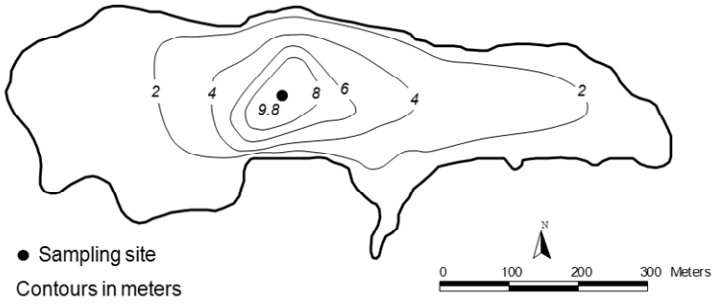
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

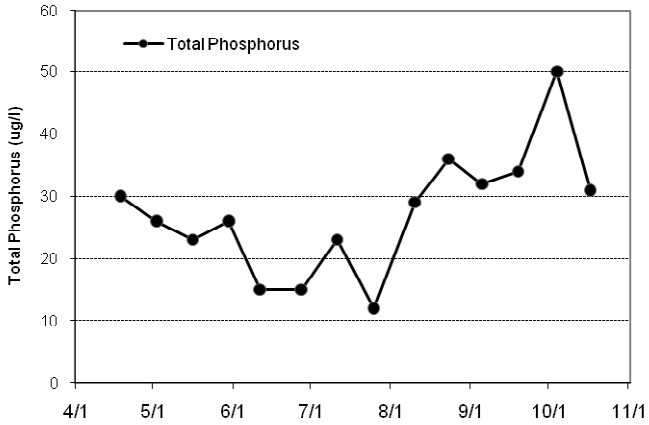
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

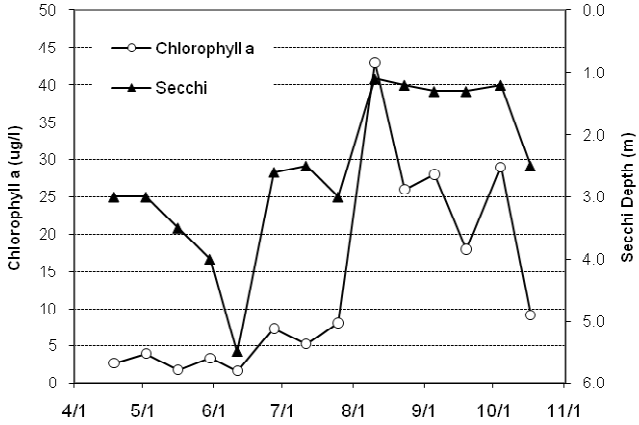
Sunfish Lake

Sunfish Lake, Dakota Co.

Lake ID: 190050-00
WMO: Lower Mississippi River
Volunteer: Dick Bancroft

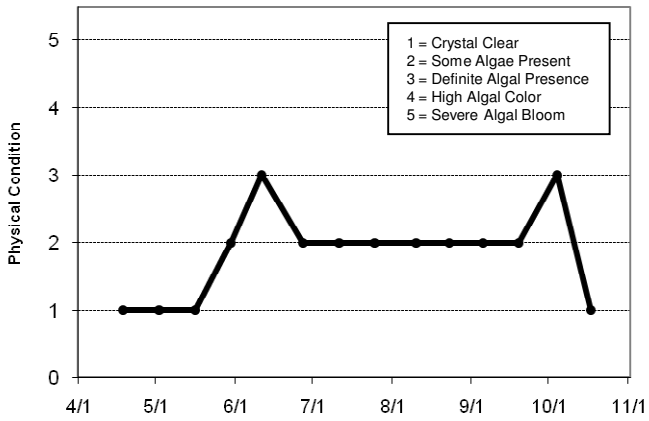






2009 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(ºC)	(ºC)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
4/18	15.2				2.6	30		3.0	1	1
5/2	16.3				3.9	26		3.0	1	1
5/16	15.5				1.7	23		3.5	1	1
5/30	19.8				3.3	26		4.0	2	1
6/11	18.4				1.6	15		5.5	3	3
6/27	26.2				7.3	15		2.6	2	3
7/11	24.6				5.2	23		2.5	2	3
7/25	23.6				8.1	12		3.0	2	1
8/10	24.9				43	29		1.1	2	1
8/23	22.6				26	36		1.2	2	1
9/5	22.7				28	32		1.3	2	1
9/19	24.1				18	34		1.3	2	1
10/4	12.7				29	50		1.2	3	1
10/17	8.6				9.2	31		2.5	1	1

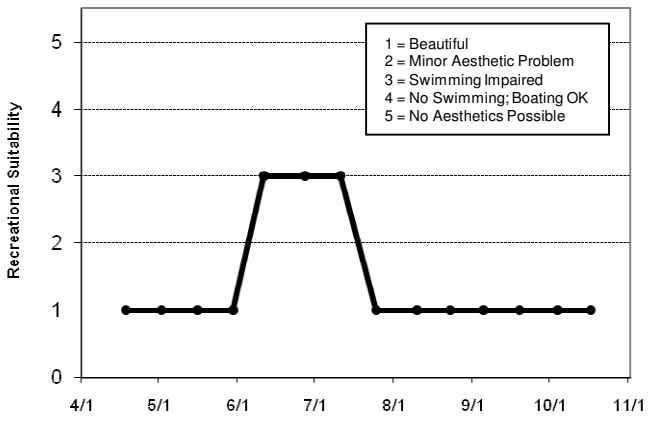


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

Sunnybrook Lake (82-0133) *Valley Branch Watershed District*

Sunnybrook Lake is a 16-acre lake located within Grant Township (Washington County). The maximum and mean depths of the lake are 6.1 and 2.0 m (20.0 and 6.5 feet), respectively. The majority of the lake's area is considered littoral zone (the area of aquatic vegetation dominance). The lake has a 630-acre immediate watershed, which translates to a watershed-to-lake area ratio of 39:1. The larger the ratio the greater the potential stress put on the lake from surface runoff.

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

2009 summer (May-September) data summary

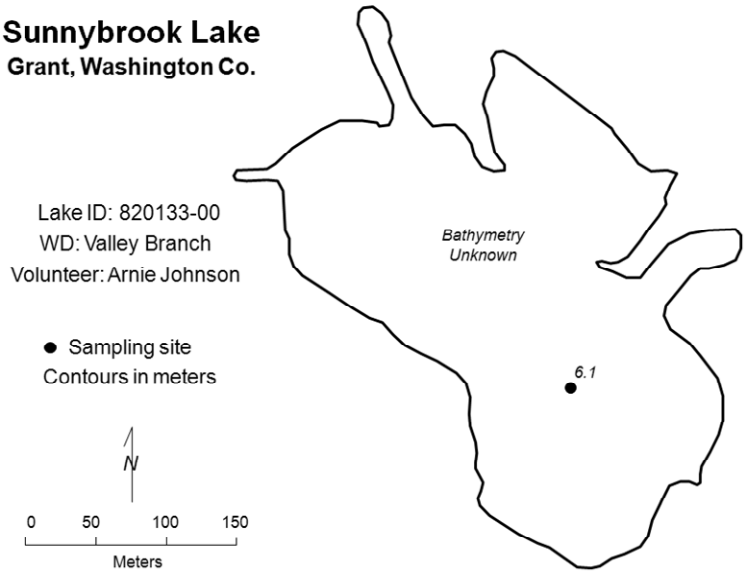
Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	18.0	10.0	23.0	A
CLA (µg/l)	7.1	1.9	19.0	A
Secchi (m)	2.8	1.6	3.9	B
TKN (mg/l)	0.77	0.66	0.88	
			Lake Grade	A

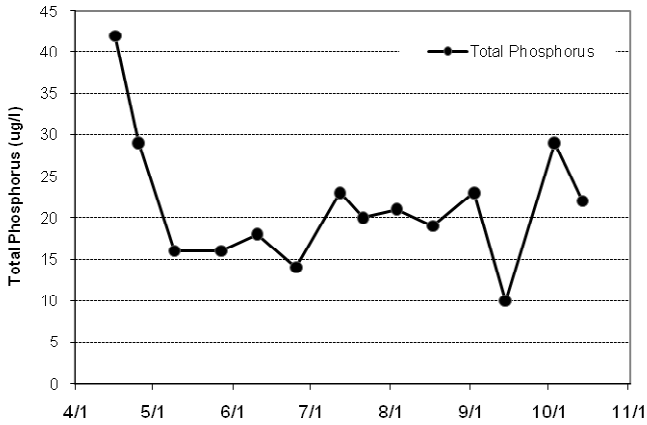
The lake received a lake grade of A for 2009, which is the second time it received such a lake grade. Last year it also received a lake grade of A. The total phosphorus concentrations were generally lower in 2008 and 2009 in comparison to previous years. Additional monitoring is suggeseted to provide data for evaluating potential trends in water quality.

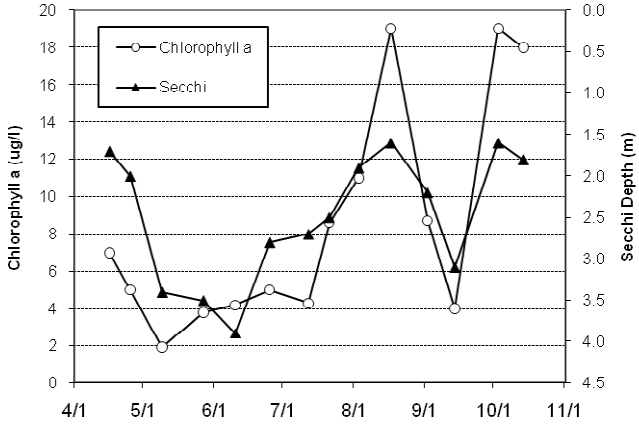
Throughout the monitoring period, the volunteer's opinions of the lake's physical condition and recreational suitability were ranked on a 1-to-5 scale. These user perception rankings are shown on the following page.

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

Sunnybrook Lake
Grant, Washington Co.

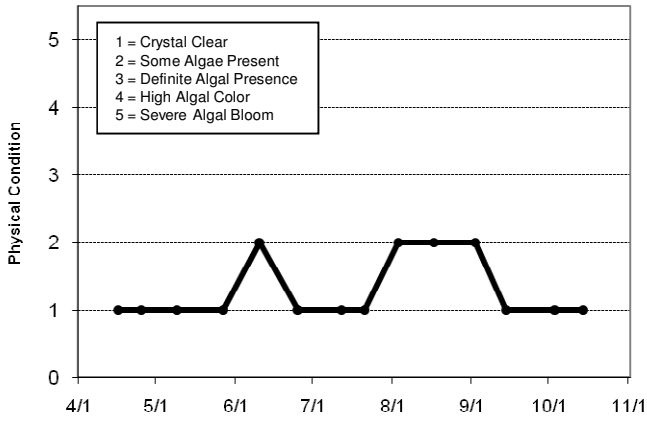






2009 Data

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	13.9				7	42		1.7	1	1
4/25	13.9				5	29		2.0	1	1
5/9	16.2				1.9	16		3.4	1	1
5/27	18.8				3.8	16		3.5	1	1
6/10	17.8				4.2	18		3.9	2	1
6/25	27.3				5	14		2.8	1	1
7/12	24.4				4.3	23		2.7	1	1
7/21	22.1				8.6	20		2.5	1	1
8/3	23.2				11	21		1.9	2	2
8/17	24.7				19	19		1.6	2	2
9/2	21.8				8.7	23		2.2	2	1
9/14	23.8				4	10		3.1	1	1
10/3	13.7				19	29		1.6	1	1
10/14	8.4				18	22		1.8	1	1

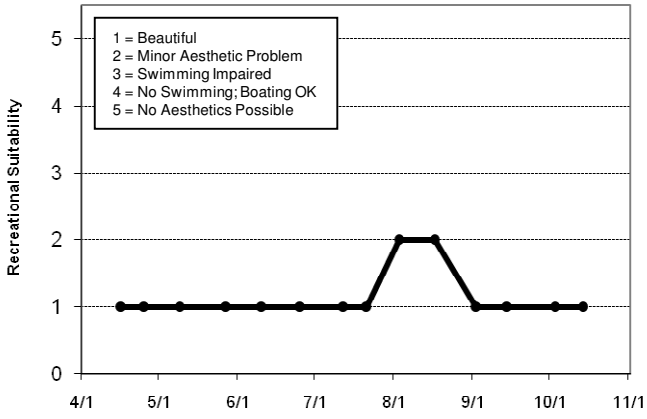


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

Sunset Lake (82-0153) *Rice Creek Watershed District*

Sunset Lake is located in the southern portion of the City of Hugo (Washington County). It has a surface area of 124 acres and a maximum depth of 5.2 m (17 ft). Nearly the entire lake is considered littoral zone, which is the shallow 0 – 15 feet depth zone that is typically dominated by aquatic plants. Since the lake is relatively shallow, it does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

Sunset Lake has been involved in CAMP since 1993. On each sampling day the lake was monitored for total phosphorus (TP), chlorophyll-a (CLA), total kjeldahl nitrogen (TKN), and secchi transparency, as well as the lake's perceived physical condition and recreational suitability. The resulting data are summarized in tables and figures on the following page.

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	16.1	10.0	21.0	A
CLA (µg/l)	3.1	2.3	4.4	A
Secchi (m)	3.0	2.1	3.5	B
TKN (mg/l)	0.76	0.48	1.30	
			Lake Grade	A

The lake received a lake grade of A for 2009, which is consistent with grades received over the past decade. According to the historical water quality database, the water quality of the lake has improved over the past 25 years, as demonstrated by the shift from mostly C lake grades received in the period 1993-1999 to A lake grades in the period 2001-2009. Furthermore, Secchi depths were measured throughout the mid- to late-1980's as part of the MPCA's volunteer program. Secchi grades in the 1980s were in the C to D range.

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

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

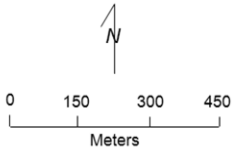
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

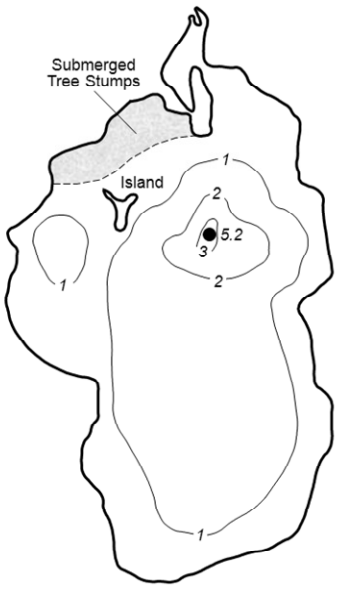
Sunset Lake

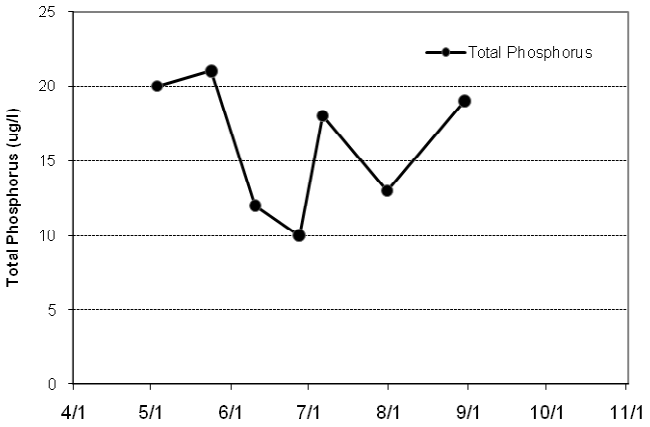
Hugo, Washington Co.

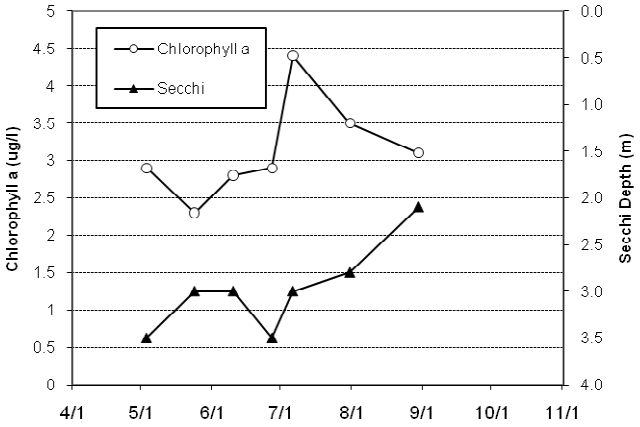
Lake ID: 820153-00
WD: Rice Creek
Volunteer:
Dianne Coderre

● Sampling site
Contours in meters



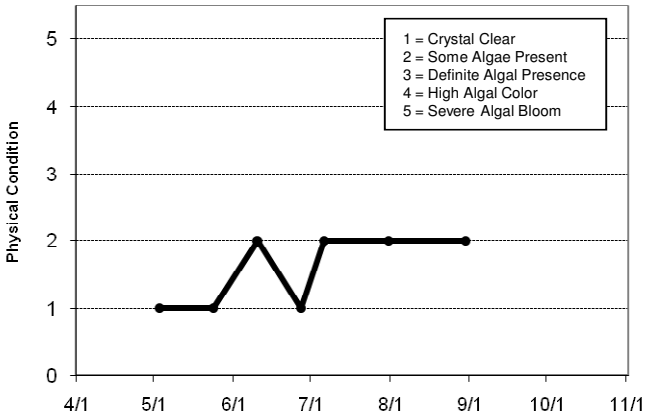






2009 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	(ºC)	(ºC)	(mg/L)	(mg/L)	(µg/L)	(µg/L)	(µg/L)	(m)	PC	RS
5/3	15.5				2.9	20		3.5	1	1
5/24	22.6				2.3	21		3.0	1	
6/10	19.2				2.8	12		3.0	2	
6/27	26.8				2.9	10		3.5	1	
7/6	25.8				4.4	18		3.0	2	4
7/31	24.1				3.5	13		2.8	2	
8/30	22.3				3.1	19		2.1	2	4

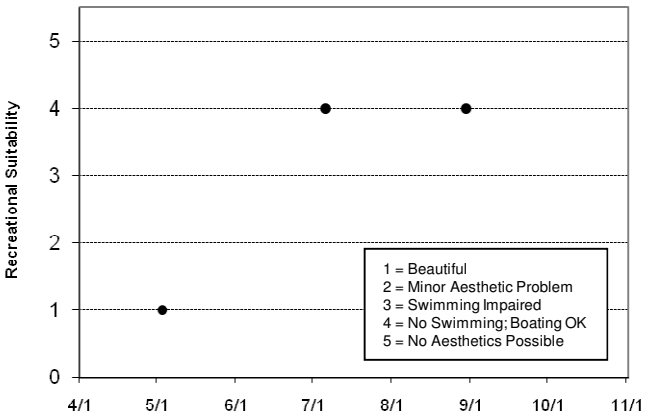


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

Sunset Pond (19-0451) *Black Dog Watershed Management Commission*

Sunset Pond, a 60-acre man-made lake, is located in the City of Burnsville (Dakota County). It has been involved in CAMP since 1994 (with an omission in 1999). The pond has a normal maximum depth of 3.7 m (12 ft). The entire area of the lake is considered littoral zone which is the 0-15 feet depth zone of aquatic plant dominance. Furthermore, the lake does not maintain a thermocline, which is a density gradient caused by changing water temperatures throughout the water column. The pond collects drainage from a portion of the cities of Burnsville's and Savage's stormwater conveyance systems, including outflow from Crystal and Earley lakes. Because the lake was created to detain stormwater, the pond can experience extreme bounce in its water level during runoff conditions. The pond has been designated by the MN DNR as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	62.7	35.0	87.0	C
CLA (µg/l)	9.2	4.1	19.0	A
Secchi (m)	1.9	1.5	2.2	C
TKN (mg/l)	0.93	0.60	1.20	
			Lake Grade	B

The pond received a lake grade of B for 2009. The pond experiences variability in its water quality as demonstrated by the variation in the historical lake grades. The lake typically receives a B or C lake grade. The Secchi grade of C does not correlate well with the CLA grade of A. One possible explanation for this incongruency may be that the water clarity may be affected by higher levels of total suspended solids from surface runoff via the surrounding urbanized watershed. In this scenario, higher loadings of suspended solids could cause a decrease in water clarity which would decrease light penetration, thereby inhibiting algal growth. In other words, the algal population may be light-limited rather than nutrient-limited.

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

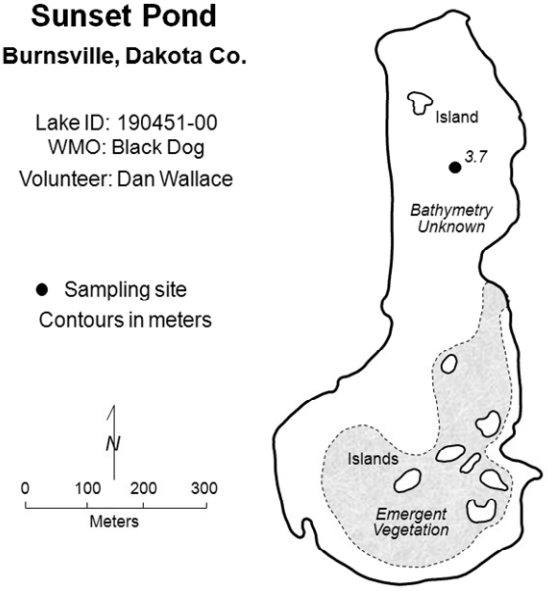
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

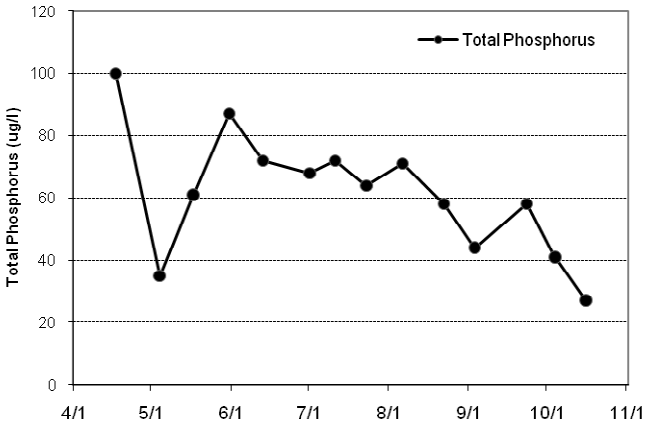
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

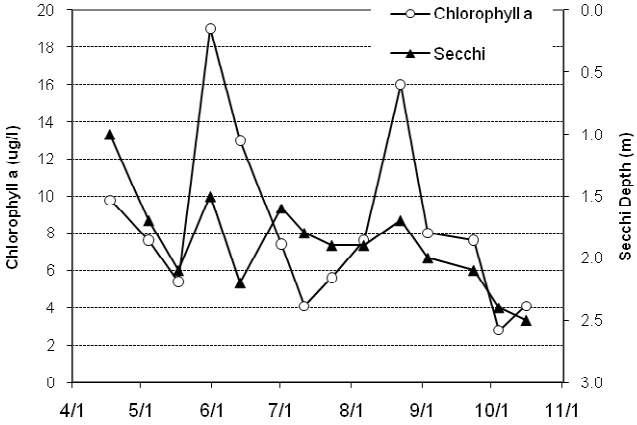
Sunset Pond

Burnsville, Dakota Co.

Lake ID: 190451-00
WMO: Black Dog
Volunteer: Dan Wallace

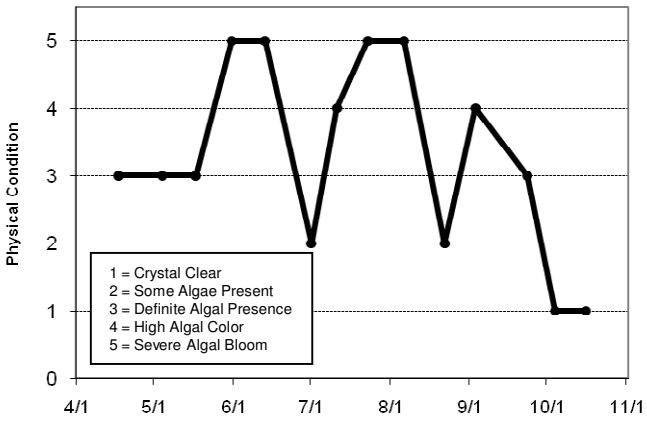






2009 Data

	Surf Tmp	Bot Tmp	Surf DO	Bot DO	CLA	Surf TP	Bot TP	Secchi		
DATE	**(ºC)**	**(ºC)**	**(mg/L)**	**(mg/L)**	**(µg/L)**	**(µg/L)**	**(µg/L)**	**(m)**	**PC**	**RS**
4/17	18.8				9.8	100		1.0	3	2
5/4	15.1				7.6	35		1.7	3	4
5/17	14.4				5.4	61		2.1	3	4
5/31	20				19	87		1.5	5	4
6/13	17.7				13	72		2.2	5	4
7/1	21.3				7.4	68		1.6	2	2
7/11	26.2				4.1	72		1.8	4	4
7/23	25.6				5.6	64		1.9	5	5
8/6	26.2				7.6	71		1.9	5	5
8/22	20.2				16	58		1.7	2	2
9/3	22.4				8	44		2.0	4	4
9/23	22.1				7.6	58		2.1	3	4
10/4	11				2.8	41		2.4	1	2
10/16	6.7				4.1	27		2.5	1	2

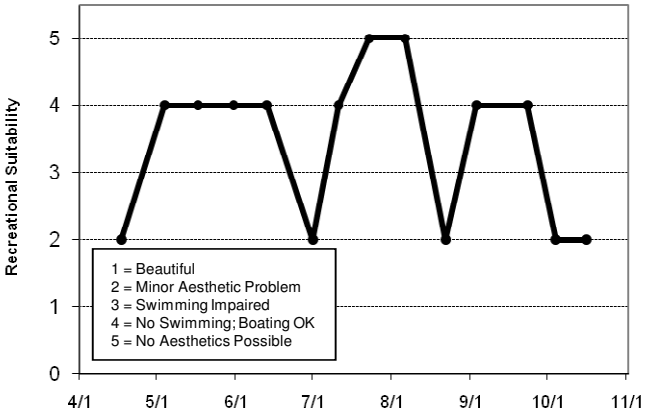


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

Susan Lake (10-0013) *City of Chanhassen*

Susan Lake, located in the City of Chanhassen (Carver County), covers an area of 93 acres and has a maximum depth of 5.2 m (17 feet). Approximately 81 percent of the lake's surface area is considered littoral zone, which is the 0-15 feet depth zone of aquatic plant dominance. The MN DNR has designated the lake as being infested with Eurasian water milfoil (*Myriophyllum spicatum*).

Susan Lake is involved in a study on the common carp (*Cyprinus carpio*), which is an invasive, non-native fish species, originally from central Asia. The study is being lead by Dr. Peter Sorensen of the the University of Minnesota. The purpose of the study is to develop an integrated management plan for the Riley chain-of-lakes (including Susan Lake) so as to improve the water quality of the lake chain. The activity and feeding behavior of the common carp can wreak havoc on the water quality and ecology of lakes by causing a litany of problems including reduced water clarity, decreased abundance of rooted aquatic vegetation, increase in algal populations, resuspension of sediment, increased internal loading of phosphorus, and negative changes in native fish populations. The long-term goal of the study is to develop a carp management strategy that can be applied to other lakes beyond the study lakes. For more information on this project, please refer to Dr. Sorensen's website at: http://fwcb.cfans.umn.edu/sorensen/research/index.html

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	91.2	33.0	180.0	D
CLA (µg/l)	43.2	7.4	76.0	C
Secchi (m)	1.3	0.5	3.0	C
TKN (mg/l)	1.82	1.20	3.40	
			Lake Grade	C

The lake received a lake grade of C for 2009, which is consistent with its limited historical database. Additional years of monitoring are suggested for continuing to build the water quality database so as to better understand the lake's water quality and determine potential water quality trends.

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

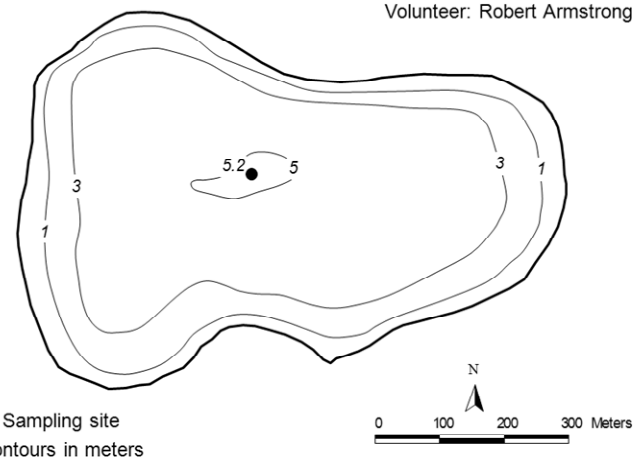
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

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

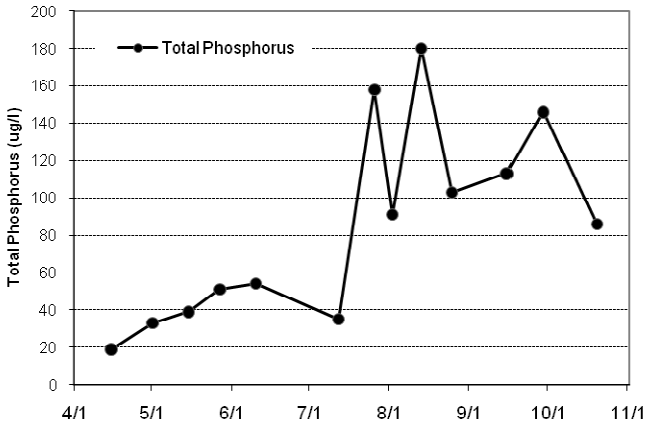
Lake Susan

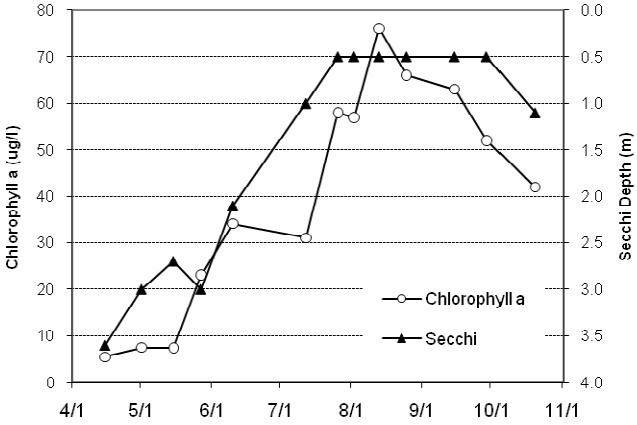
Chanhassen, Carver Co.

Lake ID: 100013-00
WD: Riley-Purgatory-Bluff Creek
Volunteer: Robert Armstrong



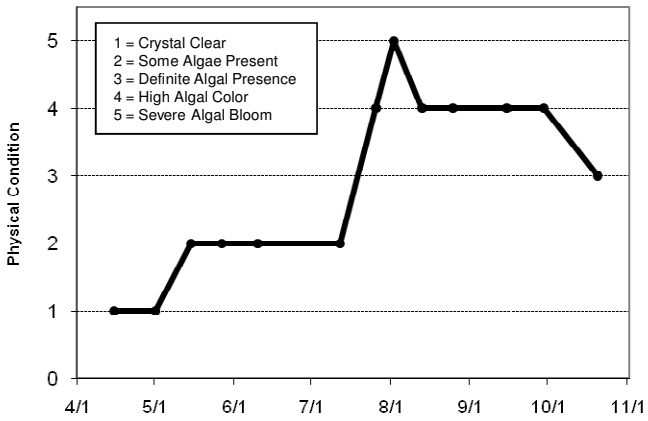
● Sampling site
Contours in meters





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	4.2				5.5	19		3.6	1	1
5/1	7.1				7.5	33		3.0	1	1
5/15	9.5				7.4	39		2.7	2	1
5/27	15				23	51		3.0	2	2
6/10	20.6				34	54		2.1	2	2
7/12	25.9				31	35		1.0	2	2
7/26	22.7				58	158		0.5	4	4
8/2	23.7				57	91		0.5	5	4
8/13	25.6				76	180		0.5	4	4
8/25	22.3				66	103		0.5	4	3
9/15	22.1				63	113		0.5	4	4
9/29	17.2				52	146		0.5	4	4
10/20	9.1				42	86		1.1	3	4

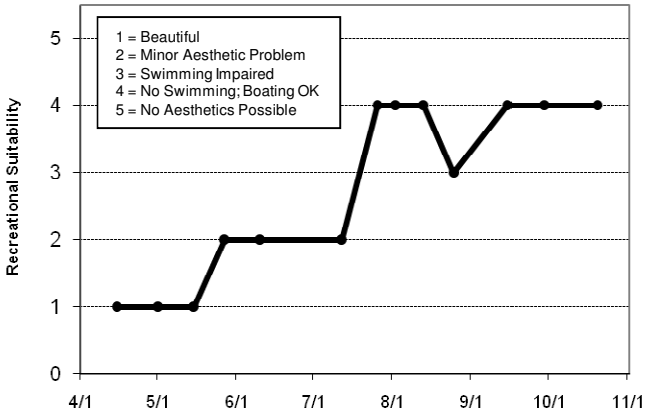


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

Swede Lake (10-0095) *Carver County Environmental Services*

Swede Lake is a 376-acre lake located in Watertown Township (Carver County) with a maximum depth of approximately 4.0 m (13.1 feet). Because of the shallowness of the lake, its entire surface area is considered littoral (the shallow [0-15 foot depth] area dominated by aquatic vegetation). The MN DNR has designated the lake as being infested with Eurasion Water Milfoil (*Myriophyllum spicatum*).

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	391.7	139.0	799.0	F
CLA (µg/l)	158.5	19.0	460.0	F
Secchi (m)	0.4	0.2	0.6	F
TKN (mg/l)	4.92	2.60	7.50	
			Lake Grade	F

The lake received a lake grade of F for 2009. The lake receives typically F lake grades with the occasional D grade. The lake's water quality seems well represented by a lake grade of F with occassional variation.

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

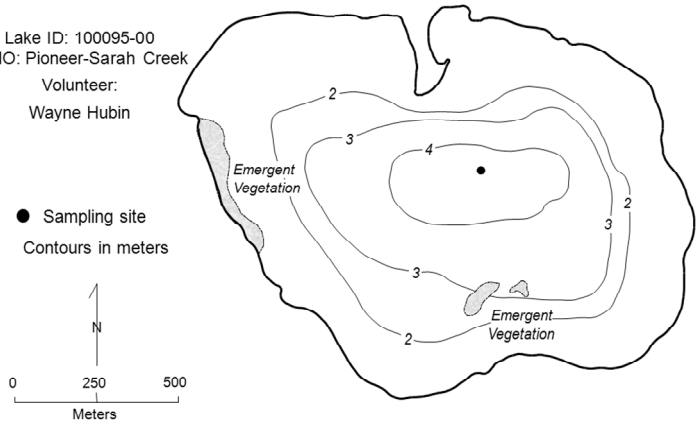
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

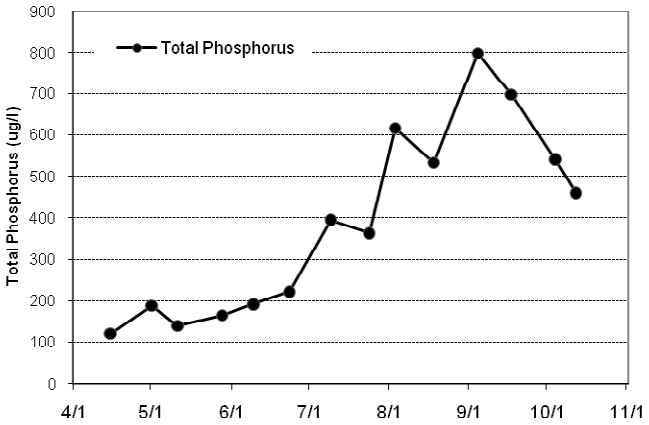
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

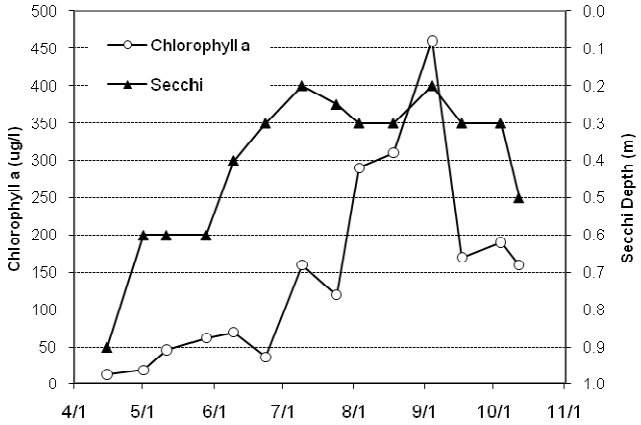
Swede Lake

Watertown Twp., Carver Co.

Lake ID: 100095-00
WMO: Pioneer-Sarah Creek
Volunteer:
Wayne Hubin

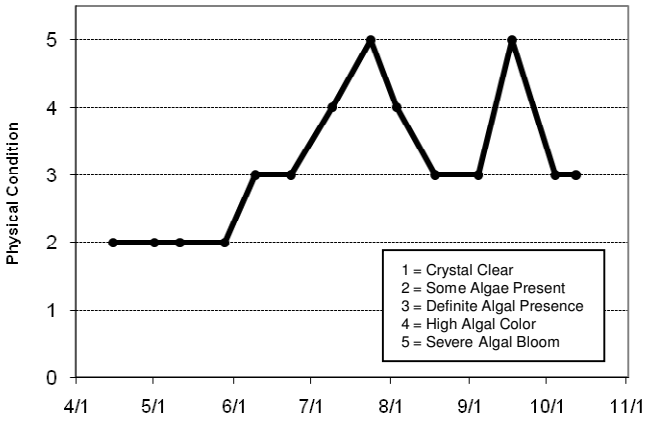






2009 Data

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	14				13	121		0.9	2	4
5/1	13				19	188		0.6	2	4
5/11	16				46	139		0.6	2	4
5/28	22				62	165		0.6	2	4
6/9	20				70	192		0.4	3	4
6/23	27				37	222		0.3	3	4
7/9	24				160	395		0.2	4	4
7/24	25				120	363		0.3	5	4
8/3	24				290	616		0.3	4	4
8/18	23				310	533		0.3	3	4
9/4	24				460	799		0.2	3	4
9/17	30				170	697		0.3	5	5
10/4	13				190	541		0.3	3	4
10/12	10				160	460		0.5	3	4

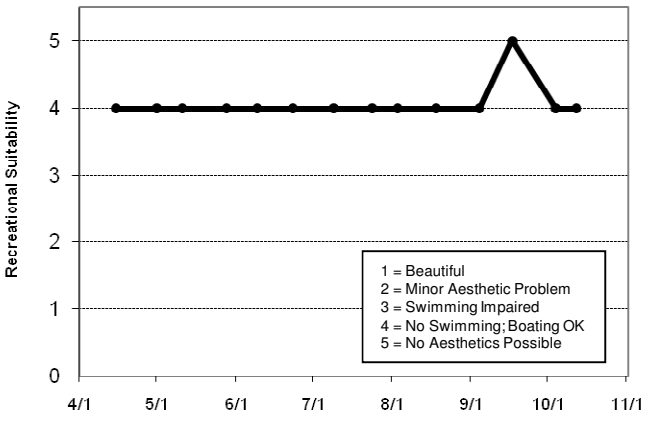


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data

Sweeney Lake (27-0035) *Bassett Creek Watershed Management Organization*

Sweeney Lake is located in the City of Golden Valley (Hennepin County). The lake has a surface area of 66 acres and mean and maximum depths of 3.6 m (12 ft) and 8.0 m (26 ft), respectively. The lake's surface area and a watershed area of 2,400 acres give a large watershed-to-lake area ratio of 36:1. The greater the ratio, the greater the potential stress on the lake from surface runoff.

The Sweeney Lake branch of Bassett Creek flows into the lake on the south end and discharges at the north end over a dam. Sweeny Lake is connected to Twin Lake during periods of high water levels by a channel. The surface elevations of the two lakes are about the same.

The lake has a hypolimnetic aeration system which generally operates year round. The aeration system keeps the lake well mixed, so it does not develop a thermocline when the system is operational. A thermocline is a density gradient caused by changing water temperatures throughout the water column.

The aeration system was turned off during the monitoring seasons of 2007 and 2008 as part of a total maximum daily load (TMDL) study. The TMDL study was initiated in response to the lake being listed as impaired in 2004 by the Minnesota Pollution Control Agency. The impaired listing is due to excessive nutrients.

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	58.3	32.0	182.0	C
CLA (µg/l)	23.9	4.2	75.0	C
Secchi (m)	1.3	0.9	2.5	C
TKN (mg/l)	1.04	0.84	1.80	
			Lake Grade	C

The lake received a lake grade of C for 2009 which is consistent with its historical database. Over the period of the monitoring database, the water quality of the lake seems represented by a lake grade of C. Further monitoring is suggested to continue to build the water quality database for increasing power to detect water quality trends.

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

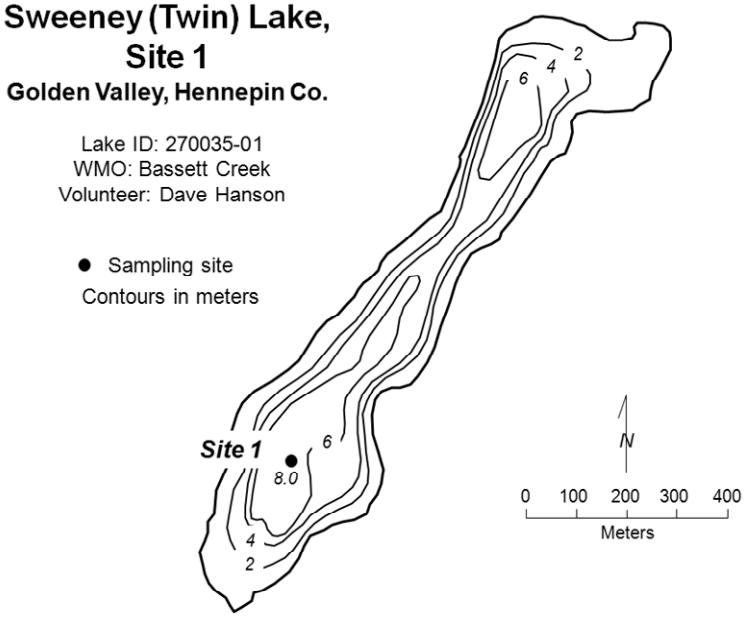
The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on the lake. Information on the survey can be obtained through the MDNR Fisheries Section by calling (651) 259-5831 or by downloading the information off the Internet at http://www.dnr.state.mn.us/lakefind/.

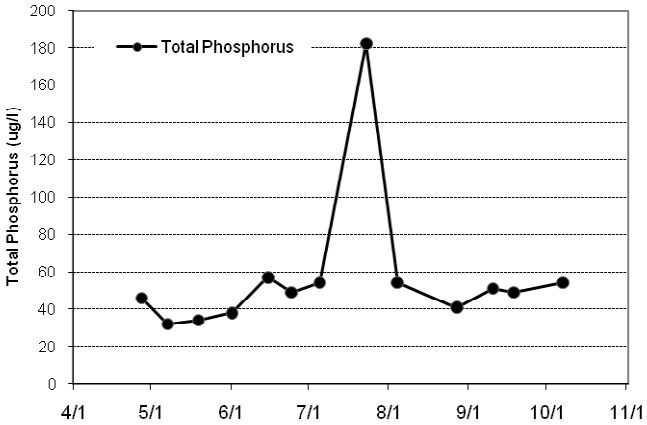
If you notice any errors in the lake's data or physical information, or are aware of any additional or missing information, please contact Brian Johnson of the Metropolitan Council at (651) 602-8743 or brian.johnson@metc.state.mn.us.

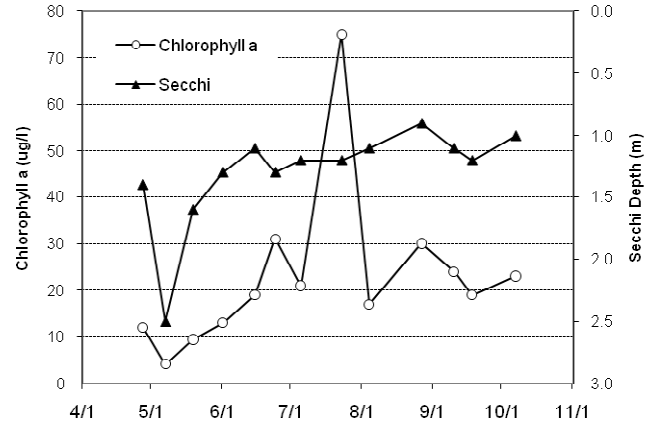
Sweeney (Twin) Lake, Site 1

Golden Valley, Hennepin Co.

Lake ID: 270035-01
WMO: Bassett Creek
Volunteer: Dave Hanson

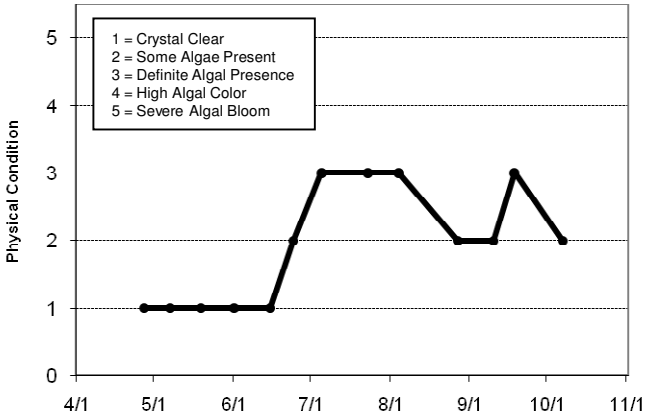






2009 Data

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
4/27	14.7		13.6	11.4	12	46		1.4	1	1
5/7	15.9		9.4	8.1	4.2	32		2.5	1	1
5/19	18	17.5	13.1	13.6	9.5	34		1.6	1	1
6/1	20.3	19.8	11.7	11.09	13	38		1.3	1	1
6/15	21.7	18.3	11.9	6.1	19	57		1.1	1	1
6/24	25.6	22.1	11.37	4.8	31	49		1.3	2	2
7/5	24.8	22.4	10.12	3	21	54		1.2	3	3
7/23	24.9	22.3	11.9	4	75	182		1.2	3	3
8/4	24.9	22.8	10.23	3.3	17	54		1.1	3	3
8/27	24.5	22.3	10.53	3.4	30	41		0.9	2	2
9/10	23.1	22	9	5.3	24	51		1.1	2	2
9/18	24.9	22.4	8.92	5.18	19	49		1.2	3	3
10/7	14	13.3	7.6	7.29	23	54		1.0	2	2

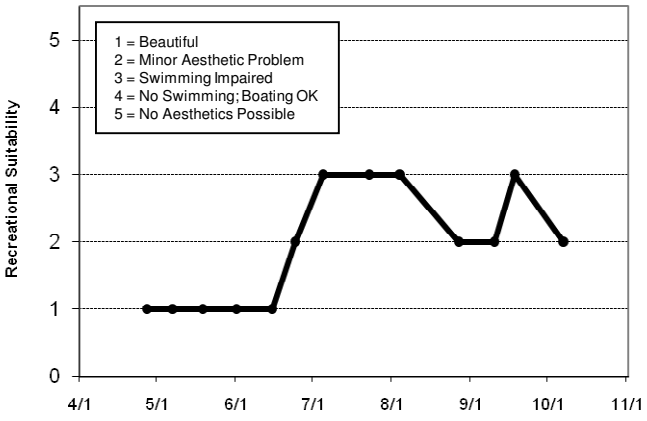


Lake Water Quality Grades Based on Summertime Averages

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total Phosphorus													
Chlorophyll a													
Secchi Depth													
Lake Grade													

Year	1993	1994	1995	1996	1997	1998	1999	2000 Site 1	2000 Site 2	2001 Site 1	2001 Site 2	2002 Site 1	2002 Site 2
Total Phosphorus								C	C	C	C	C	NA
Chlorophyll a								C	C	B	C	B	NA
Secchi Depth								D	D	C	C	C	NA
Lake Grade								**C**	**C**	**C**	**C**	**C**	**NA**

Year	2003 Site 1	2004 Site 1	2005 Site 1	2006 Site 1	2007 Site 1	2008 Site 1	2009 Site 1
Total Phosphorus	C	C	C	D	C	C	C
Chlorophyll a	B	B	C	C	B	B	C
Secchi Depth	C	C	C	D	D	C	C
Lake Grade	**C**	**C**	**C**	**D**	**C**	**C**	**C**



Source: Metropolitan Council and STORET data

Sylvan Lake [Half Breed Lake] (82-0080) *Comfort Lake-Forest Lake Watershed District*

Sylvan Lake (also known as Half Breed Lake) is a 75-acre lake located in Forest Lake Township (Washington County). It is considered a Priority Lake by the Metropolitan Council for its exceptional water clarity (METC 2007).

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

2009 summer (May-September) data summary

Parameter	*Mean*	*Minimum*	*Maximum*	*Grade*
TP (µg/l)	15.3	7.0	23.0	A
CLA (µg/l)	2.7	1.7	3.6	A
Secchi (m)	5.0	4.2	5.5	A
TKN (mg/l)	0.64	0.55	0.81	
			Lake Grade	A

The lake received a lake grade of A for 2009, which is consistent with its historical water quality database. The historic water quality database indicates that the lake has maintained its high quality over the past 20+ years.

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

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

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

Sylvan Lake

(Halfbreed Lake)

Forest Lake/Scandia, Washington Co.

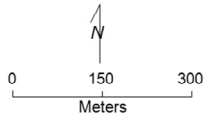
LAKE ID: 820080-00

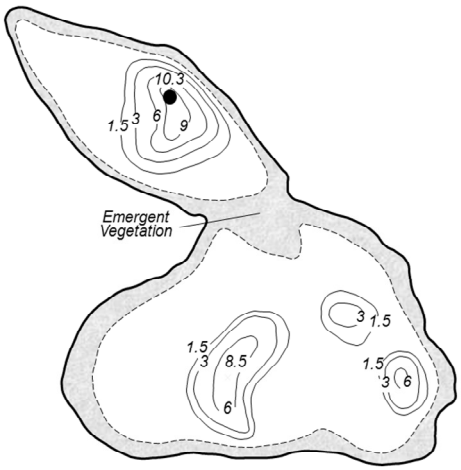
WD: Comfort Lake - Forest Lake

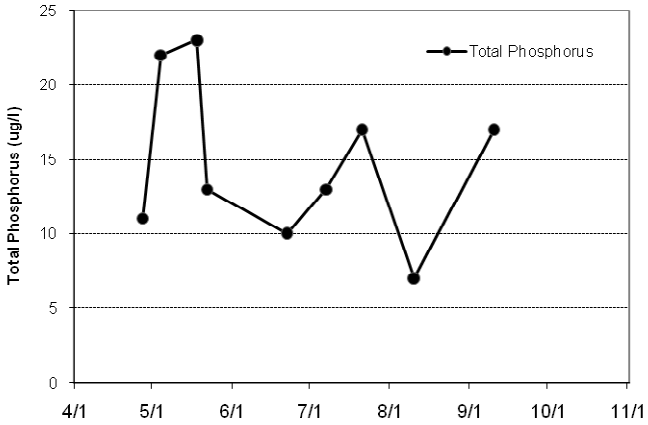
Volunteer: Curt Sparks

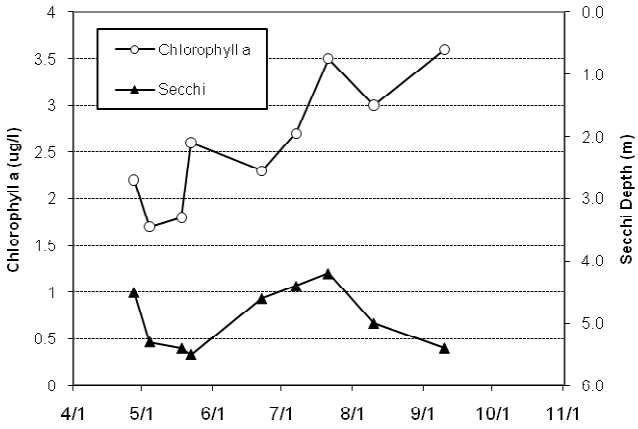
● Sampling station

Contours in meters



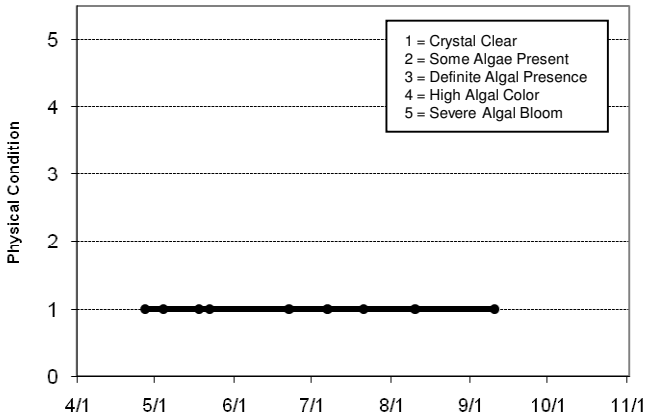






2009 Data

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
4/27	14.2				2.2	11		4.5	1	1
5/4	15.3				1.7	22		5.3	1	1
5/18	15.6				1.8	23		5.4	1	1
5/22	20.2				2.6	13		5.5	1	1
6/22	27.1				2.3	10		4.6	1	1
7/7	26				2.7	13		4.4	1	1
7/21	22.5				3.5	17		4.2	1	1
8/10	24.8				3	7		5.0	1	1
9/10	21.6				3.6	17		5.4	1	1

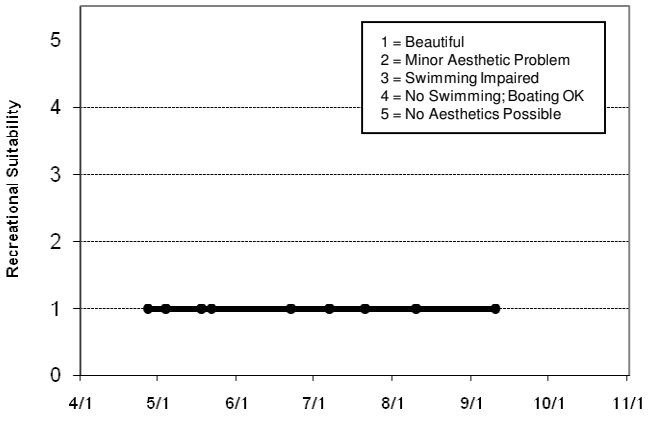


Lake Water Quality Grades Based on Summertime Averages

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

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

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



Source: Metropolitan Council and STORET data