

Citizen-Assisted Monitoring Program (CAMP)

Cedar Island Lake. 2006 was the fourth year that Cedar Island Lake has been enrolled in CAMP (the lake was involved in CAMP in 1995, 2001, and 2003). The 80-acre lake is located within the City of Maple Grove and has an 800-acre immediate watershed. The lake and watershed areas translate to a watershed-to-lake area ratio of 8:1. (The larger the ratio the greater the potential stress on the lake from surface runoff.)

The maximum and mean depths of the lake are 2.1 and 1.4 m (seven and 4.5 feet), respectively. The mean depth and surface translates to an approximate lake volume of 360 ac-ft and it would take approximately 0.5 years to replenish itself. Because of the shallowness of the lake, 100% of the lake’s area is considered littoral (the 0-15 foot depth area dominated by aquatic vegetation) and it does not maintain a thermocline (a density gradient owed to changing water temperatures throughout the lake’s water column).

2006 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	214.4	169.0	294.0	F
CLA (µg/l)	111.7	25.0	270.0	F
Secchi (m)	0.4	0.4	0.4	F
TKN (mg/l)	5.69	4.30	7.20	
			<i>Overall Grade</i>	F

Cedar Island Lake was monitored nine times from early-July to mid-October, 2006. The lake’s 2006 overall water quality grade is identical to that recorded in 1995 and 2003, and worse than that of 2001 (D). The 2006 summer means are the some of the worst recorded to date.

A search for water quality data through Council, MPCA, and STORET files resulted in a minimal amount of data. 1984, 1995, 2001, 2003, and 2006 are the only years for which nutrient data are available. Using Secchi transparency data collected through CAMP to supplement the four years of nutrient data, it becomes apparent that the lake’s water quality through the 1990’s has remained somewhat constant. The recently poor water quality, especially shown as a dramatic decrease in 2006 and 2003 as compared to 2001, however, should be a reason for concern. To better understand the lake’s water quality and where it may be heading, additional years of data collection are needed.

A recent MPCA conducted trend analysis on the lake’s Secchi transparency data revealed a statistically significant decrease in recent water clarity.

During each monitoring event, the volunteers’ opinion of the lake condition was ranked on a 1-to-5 scale. The average score for physical condition was 3.3 (between 3- “definite algae present” and 4- “high algal color”), and 3.0 for recreational suitability (3- “swimming slightly impaired”).

Magda Lake is a 15-acre lake located within City of Brooklyn Park. There is very little known morphological data available for the lake. 2006 marks the fourth year that Magda Lake has been involved in CAMP. CAMP data for 1999-2000, 2003 and now 2006, are the only years for which data



on the lake are known. 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 lake was monitored 12 times between mid-April and early-October, 2006. The lake's overall grade for 2006 is the same as that recorded in 2003 (F) worse than those recorded in 1999 or 2000 (overall grade of a D).

2006 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	154.7	82.0	268.0	F
CLA (µg/l)	106.1	18.0	240.0	F
Secchi (m)	0.4	0.2	0.8	F
TKN (mg/l)	2.99	1.50	4.90	
			<i>Overall Grade</i>	F

As mentioned in the previous reports, there is a lack of water quality data available for Magda Lake. Therefore it is not possible to determine any long-term or short-term trends. To better understand the lake's water quality and where it may be heading, additional years of data collection are needed.

The average user perception rankings were 3.7 for physical condition (between 3- "definite algae present" and 4- "high algal color"), and 3.8 for recreational suitability (between 3- "swimming slightly impaired" and 4- "no swimming - boating ok").

Success Lake. 2006 marks the third year of CAMP monitoring in Success Lake in Brooklyn Park. The lake was also monitored in 1996 and 2003. The lake was monitored 11 times between mid-May and mid-October, 2006. On each monitoring event, the lake was monitored for TP, CLA, TKN, Secchi transparency, as well as the lake's perceived physical condition and recreational suitability

The overall 2006 lake quality grade of C was determined from the individual parameter grades. Because 1996 and 2003 are the only years of available data, no long- or short-term trends can be determined. To better understand the quality of the lake and what direction it may be heading, more years of data collection are needed.

2006 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	87.4	42.0	226.0	D
CLA (µg/l)	16.4	4.3	33.0	B
Secchi (m)	1.0	0.7	1.4	D
TKN (mg/l)	1.34	0.98	2.40	
			<i>Overall Grade</i>	C

2006 Annual Report

The mean perceived physical condition of the north basin of Success Lake was 2.5 (between 2- “some algae present” and 3- “definite algae present”), while the mean recreational suitability was 3.0 (3- “swimming impaired”).

Upper Basin, Twin Lake. 2006 was the sixth year that the upper basin of Twin Lake, which is located in the City of Crystal, was monitored as part of CAMP. The lake has also been monitored by Council staff in the past. As part of the volunteer monitoring program, the upper basin of Twin Lake was sampled 13 times from late-April to mid-October, 2006.

The entire 212-acre lake has a maximum and mean depth of 14.0 and 2.1 m (46 and 7 feet), respectively. The acreage of each basin is as follows: lower basin = 46 acres, middle basin = 69 acres, and the upper basin = 137 acres. The upper basin itself has a mean and maximum depth of 2.4 m and 0.9 m (8 and 3 feet). The total volume of the whole lake is approximately 1,490 ac-ft (397 ac-ft of which is contained within the upper basin). About 81% of the whole lake’s area is considered littoral (the 0-15 foot depth area dominated by aquatic vegetation). Access to the lake can be obtained at two locations, the southern end of the lake and the lake’s eastern shore.

No statistically significant long-term trend is evident from the lake’s water quality database, in the short-term however, the lake’s quality seems to fluctuate between a low-D and F grade. To better understand the quality of the lake and what direction it may be heading, continued monitoring is suggested.

2006 summer (May-September) data summary

<i>Parameter</i>	<i>Mean</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Grade</i>
TP (µg/l)	199.7	95.0	311.0	F
CLA (µg/l)	90.1	23.0	140.0	F
Secchi (m)	0.4	0.2	0.5	F
TKN (mg/l)	2.28	1.20	3.30	
			<i>Overall Grade</i>	F

The mean physical condition ranking was 2.6 (between 2- “some algae present” and 3- “definite algae present”), while the mean recreational suitability ranking was 2.1 (between 2- “minor aesthetic problem” and 3- “swimming slightly impaired”).

The Fisheries Section of the Minnesota Department of Natural Resources (MDNR) has conducted a fisheries survey on this 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 data or physical information on these lakes, or are aware of any additional or missing information, please contact Kent Johnson of the Metropolitan Council at (651) 602-8117 or kent.johnson@metc.state.mn.us.



Shingle Creek Watershed Management Commission's Lake Monitoring Program

Lake	Last Monitored	Summer Average TP ($\mu\text{G/l}$)	Summer Average CLA ($\mu\text{G/l}$)	Summer Average Secchi (M)	Summer Average TKN (mg/l)
Bass	2005	65.9	48.5	1.4	1.96
Cedar Island	2006	214.4	111.7	0.4	5.69
Crystal	2005	113.5	41.2	0.9	2.48
Eagle	2005	36.2	15.5	2.6	.77
Magda	2006	154.7	106.1	0.4	2.99
Meadow	2005	248.9	68.8	0.5	3.70
Pike	2000	64	29	1.3	
Pomerleau	2003	69.5	62.5	1.5	
Ryan	2003	51.4	8.6	2.6	
Schmidt	2004	39.5	12.1	1.8	
Success	2006	87.4	16.4	1.0	1.34
Lower Twin	2005	42.3	39.0	1.7	1.46
Middle Twin	2005	57.8	14.9	1.8	1.53
Upper Twin	2006	199.7	90.1	0.4	2.28

TP=Total Phosphorus · CLA=Chlorophyll-a · TKN=Total Kjeldahl Nitrogen · 20 cm black and white Secchi disk was used

Volunteers monitor their designated lake sites biweekly from mid-April to mid-October. They note natural and cultural observations and general perceptions of the lakes' condition and suitability for recreation. They take a water transparency reading using a Secchi disk.

CAMP Monitoring History Water Quality Grades

Year	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08
Bass				C			C		C		C		C		C		x	
Cedar Island					F						D		F			F		
Crystal				D			D				D				D		x	
Curtis																		
Eagle	C		B			B	B	B		B		C			B			x
Magda									D	D			F			F		
Meadow						F			F			F			F			x
Palmer																		
Pike						C	C	D		C								x
Pomerleau						C			C		C		D					
Ryan						C		B		D		B	B				x	
Schmidt					C			C		C	C			C				x
Success													C			C		
Twin Lower	D		C			C		C		C			C		C		x	
Twin Middle	D					C	B		C	C			C		C		x	
Twin Upper	D		D			F		D		F		F		F		F		x

Data from each lake's sampling forms and lab analyses are entered into a data management and statistical analysis program called Statistical Analysis System (SAS). Various quality control methods are used throughout the program to ensure that proper sampling and data analysis techniques were used. Suspect data are excluded from the databases or conclusions.

Finally, they collect a surface water sample by submersing and filling a one-gallon jug. After measuring and recording the surface water temperature, volunteers take two samples from the jug -- one each for total phosphorus (TP) and total Kjeldahl nitrogen (TKN). A Chlorophyll-a (CLA) sample taken from the jug is filtered in the field and the filter with its collected planktonic algae is stored along with the other samples until they are delivered to the laboratory. The samples are picked up by Met Council staff within 30 days of each sampling.