September 26, 2008

Tests of Water in Three Mile Lake

The testing of bacteria content (i.e. total coliform and E. coli), was initiated this year. The testing equipment and sampling procedures were provided by representatives of the Citizens' Environmental Watch (CEW) program. The testing was performed by volunteers and the preliminary results are tabulated below. The final results for 2008 will be available later this year when the CEW gives us their report. ***The results are for information only. Ensuring that water is safe to drink or to swim in is the sole responsibility of the users.***

Volunteer Team: Wendy Bristow, Lloyd Bristow, Dan Leonard, Barb Leonard, Nancy Pundsack, Tim Taylor and Rod Ward. Team Lead: Arnie Pundsack. CEW Coordinator: Amy McLeish.

Executive Summary

The lake was tested every two weeks this summer. The phosphorus, coliform and E. coli levels for each of these eight testing times is shown in the data sheets. It should be noted that the last three test results (12 samples) of phosphorus are not yet available but should be available in October from the CEW staff.

E. coli: The Ontario recreational water quality threshold for E. coli is 100 colony-forming units (cfus)/100ml of water. None of our results exceeded this value. However, the Muskoka Lakes water quality threshold is only 10 cfus/100ml and six of our 34 tests exceeded this value with results ranging between 11 - 30 cfus/100ml. We need clarification for the reason for these different thresholds and we hope that the CEW can enlighten us in their report.

E. coli

Recreational Water Threshold: 100 cfus/100 ml

(cfus = colony forming units)

	TML-1	**TML-2**	**TML-3**	**TML-4**	**TML4**
Sampling Date	***North-West side (beaver dam)***	***North-East side (Bear Trap Bay)***	***South-West side (small islands)***	***South-East side (Echo Bay/boat launch)***	***Duplicate***
5/31/08	11 cfus	<3 cfus	<3 cfus	3 cfus	5 cfus
6/13/08	25	11	30	12	
6/27/08	3	5	<3	<3	
7/11/08	<3	5	<3	3	
7/26/08	3	<3	5	13	
8/10/08	5	8	8	5	
8/12/08	<3	5	<3	<3	
9/4/08	8	19	19	11	5

Coliform: Only one of the coliform results exceeded the Ontario recreational water quality threshold of 1000 cfus/100ml of water. Subsequent testing did not replicate the previous result (2424 cfus/100ml of water) achieved at site TML-1. We were advised that two consecutive high reading are required before the local health authorities are contacted..

Total Coliform for Recreational Water: Threshold: 1000 cfus/ 100 ml

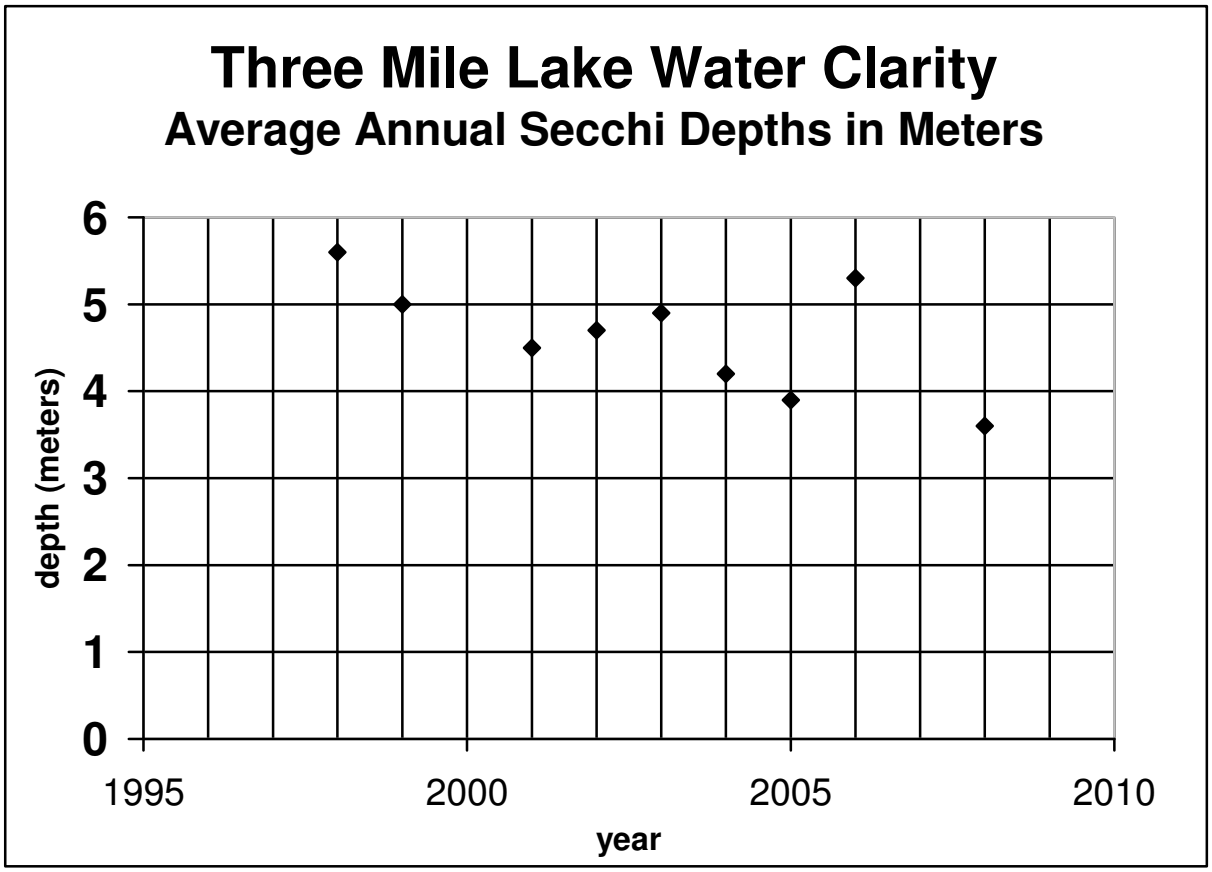
	TML-1	TML-2	TML-3	TML-4	
Sampling Date	***North-West side (beaver dam)***	***North-East side (Bear Trap Bay)***	***South-West side (small islands)***	***South-East side (Echo Bay/boat launch)***	***Duplicate***
5/31/08	146 cfus	200 cfus	52 cfus	22 cfus	534 cfus
6/13/08	72	19	19	3	
6/27/08	8	5	0	19	
7/11/08	98	98	46	49	
7/26/08	375	83	156	114	
8/10/08	2424	339	289	307	
8/12/08	510	858	489	619	
9/04/08	280	177	280	403	559

Phosphorus: The Ontario water quality threshold is 10 µg/L. Of the 20 results we have received so far only two results are above this threshold but they are significantly above the threshold reaching values of 27.1 µg/L and 34.4 µg/L. We need to see the remaining 12 phosphorus results to get a better picture of the phosphorus content of our lake.

Phosphorus

	TML-1	TML-2	TML-3	TML-4
Sampling Date	***North-West side (beaver dam)***	***North-East side (Bear Trap Bay)***	***South-West side (small islands)***	***South-East side (Echo Bay/boat launch)***
5/31/08	8.5	6.6	5.9	8.2
6/13/08	6.8	34.4	6.6	7.3
6/17/08	3.6	4.5	2.4	6.6
7/11/08	5.8	8.5	5.3	27.1
7/26/08	6/1	5/2	8	8/1
8/10/08	tbd	tbd	tbd	Tbd
8/22/08	tbd	tbd	tbd	Tbd
9/4/08	tbd	tbd	tbd	Tbd

Water Clarity: Three Secchi disk measurements were taken in September. The average Secchi depth of 3.6 meters was added to our data from previous years. A quick look at the data might suggest declining water clarity (see summary/discussion section). Visually the water was not very clear all summer.



Summary / Discussion: In general, the test results suggest that our lake is healthy with most of the phosphorus, E. coli, and coliform counts below Ontario recreational lake thresholds.

Recently, Amy McLeish of CEW forwarded a 1971 paper summarizing the "Bacteriological Water Quality of Hodson Lake (Three Mile Lake)" submitted by the Ontario Water Resources Commission. The full report will be added to the TML website. The phosphorus levels at that time were reported to be between 14 and 20 µg/L which is more than we have now. Also the Secchi disk readings were between 4.2-4.3 meters, again on the low side of current measurements (see summary chart covering 1998-2008).

So this begs the question what has changed over the last 37 years? There are a few general observations which do not necessarily show up in test results. For example, there is definitely more weed growth throughout the lake now than there was in 1971. There have been a number of algae blooms over the past 5 years, something which was not occurring in the '70's. And the fish population, along with those of frogs and crayfish, are noticeably lower. There could be any number of reasons for these changes, but we can't ignore these signs.

Run-off into the lake is a concern. Maintaining natural shoreline barriers (i.e. not clear-cutting lots) and maintaining septic systems will be critical to our ability to control the health of Three Mile Lake.