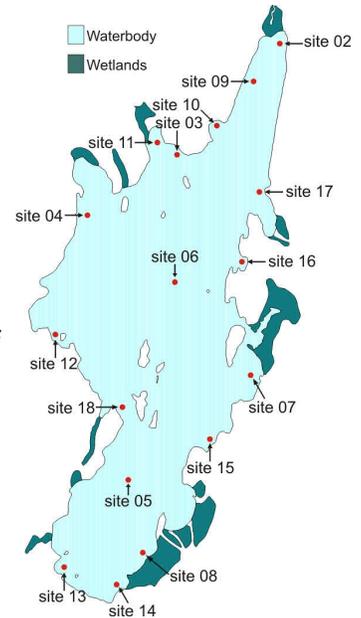


## Otter Lake Water Quality Report - 2009

### Introduction

Water quality testing is an important diagnostic tool to help residents of Otter Lake determine the health of the lake. By systematic testing and monitoring over time, it is possible to evaluate if water quality is improving or declining. By selective testing at strategic sites water quality indicators can help determine the source or cause of contamination. As in previous years OLLA was once again fortunate to have the assistance of the Rideau Valley Conservation Authority (RVCA) in testing the water quality of Otter Lake. Thanks are due to Patrick Larson, Sarah MacLeod and their qualified team of technologists. RVCA tests at least 3 times per year at some of the same sites as OLLA along with some of their own. OLLA also routinely tests 3 times per year usually at different sites. The combined results gives us a good indication of the overall state of health of the lake. The map on the left shows the OLLA test sites. These sites have been chosen to be representative of the whole lake. Sites 05 and 06 represent the 2 deepest water sites. Sites 04, 07, 08, 11 and 18 are sites where there are known inflows from streams and wetlands into the lake. Other sites are in shallow bays where there is an increased tendency for weed and algae growth. OLLA does not test at all of the sites each year, more often we test at select representative sites usually between May and October.



### Nutrients

The two key indicators of nutrient load in the lake are phosphorus and nitrogen. These are both principal ingredients of fertilizers. When these two are present in excessive quantities in surface water, they stimulate algae and aquatic plant growth, just as they would stimulate grass or flowers in the garden. Controlling these nutrients is essential to maintaining a lake that is relatively free of objectionable levels of algae, including reducing the risk of blue-green algae blooms which can be toxic to humans, pets, and wildlife. Levels of nitrogen and phosphorous also determine the trophic status of a lake. Phosphorus is the limiting factor in the growth of algae, meaning that algae growth will occur in greater amounts as more phosphorus is added to the lake. Phosphorus levels below 5 µg/L are typical of oligotrophic lakes that generally are clear and deep with few nutrients. Oligotrophic lakes are typically found in the northern regions of Ontario. Phosphorous levels above 20 µg/L are typical of eutrophic lakes that are laden with nutrients which stimulate algae and plant growth. Mesotrophic lakes are in between these two extremes and are typical of the lakes found in our region. Otter Lake generally exhibits the characteristics of a mesotrophic lake although the deep bathymetry of the central and southern areas of the lake is more typical of an oligotrophic lake.

### Bacteria

All lakes will contain some bacteria, they are naturally present and will be found in the faeces of the wildlife (fish, waterfowl, beavers, etc).that inhabit the lake. High levels of bacteria, particularly coliform bacteria that usually occur in soil and E. Coli can be an indication of septic pollution. E.coli is considered the best indicator of human waste pollution. The presence of E.coli usually means there are other pathogens in the water as well. Provincial guidelines

indicate repeated readings of over 100 cts/100 ml of E. Coli is dangerous for recreational use of the water. E.coli at any level is unacceptable for drinking water therefore treatment is highly recommended for those that draw water from the lake for drinking purposes

## Results for 2009

The table below indicates the results of all the water quality testing done in 2009 (both by OLLA and RVCA). E. coli was generally low or not detectable at most sites tested. The exception being site 07 (close to where Barker's Creek flows into the lake) The higher value at 07 may have resulted from excessive runoff from Barkers Creek due to heavy rainfall. The phosphorous levels were a little higher than last year at several sites tested, but this may again have been due to agricultural runoff resulting from heavy rainfall. The very high reading at 05 (a deep water site) in May by RVCA did not repeat in later tests at this same site and was therefore probably the result of contamination of the sample. The average phosphorous level of 13.3 µg/L would indicate the lake is mesotrophic however if the high May reading is discounted, the low E. coli counts, and the average Secchi disk readings of almost 7 meters (a measurement of water clarity) indicates that the lake is oligotrophic as it was in 2008.

Date	RVCA ID	OLLA ID	Calcium (mg/l )	E. coli (cfu/100 ml)	Dissolved organic carbon (mg/l)	Total Kjeldahl nitrogen (µg/l)	Total Phosphorous (µg/l)	Secchi disk (m)
21-May-09	RVL-26DP1	OLLA 05				640	49	5.5
30-Jun-09	RVL-26DP3	OLLA 06			5.5	430	10	5.5
30-Jun-09	RVL-26B	OLLA 09		2		460	10	
30-Jun-09	RVL-26C	OLLA 03		2		440	9	
30-Jun-09	RVL-26DP1	OLLA 05			5.9	470	10	6.5
5-Jul-09		OLLA 02					4	
5-Jul-09		OLLA 04		0			<2	
5-Jul-09		OLLA 05					14	
5-Jul-09		OLLA 06					8	
5-Jul-09		OLLA 07		7			7	
5-Jul-09		OLLA10		0				
5-Jul-09		OLLA 11					6	
5-Jul-09		OLLA 12					7	
5-Jul-09		OLLA 14		0			10	
5-Jul-09		OLLA 18		0			12	
21-Aug-09	RVL-26DP3	OLLA 06	31			460	11	8.5
21-Aug-09	RVL-26B	OLLA 09	31	2		470	9	
21-Aug-09	RVL-26C	OLLA 03	31	2		430	9	
21-Aug-09	RVL-26F	OLLA 18	31	2		420	8	
21-Aug-09	RVL-26DP1	OLLA 05	31			480	10	7.5
24-Sep-09		OLLA 02				350	10	
24-Sep-09		OLLA 04					<2	
24-Sep-09		OLLA 07				300	20	
24-Sep-09		OLLA 10				400	30	
24-Sep-09		OLLA 11				450	30	
24-Sep-09		OLLA 14				300	20	
8-Oct-09	RVL-26DP3	OLLA 06				440	9	8
8-Oct-09	RVL-26DP1	OLLA 05				440	10	6.25
<b>Average</b>			<b>31</b>	<b>1.7</b>	<b>5.7</b>	<b>434.1</b>	<b>13.3</b>	<b>6.8</b>

## Water Levels

The graph on the right shows the monthly lake level from January 2009 to the present. As reported at the AGM in July, RVCA did not perform any beaver management in the upper reaches of Otter Creek in the spring of 2009, and it would appear that as a result beavers did not return to the Creek. According to Environment Canada we received 130mm of rain in July of 2009, however the lake level remained about the same as it was in June and there was excellent flow in the Creek. However, even though August was considerably hotter and dryer than July, the level remained constant.

This suggested that beavers may have once again returned to the creek. Nevertheless, water levels remained considerably lower than they were at this same time in 2008. September 2009 continued to be fairly dry and the lake level dropped about 3 inches so that the level was about the same as it was in September of 2008. Since we had a fair amount of rain in October and November the lake level rose significantly. There was also minimal flow in Otter Creek again suggesting that beavers were once again active in the upper reaches of Otter Creek. The fact that water levels increased significantly in November and December indicated that this was indeed the case. RVCA performed some beaver management during this time period. Several beaver were removed by the trapper in an attempt to keep the creek open and flowing. Therefore, even though the water level in December, January, February and March of this year has been about as high as it was in May of 2009 there has been excellent water flow in the creek all winter. It looks like the February/March level represented our spring "high" since all the snow was gone by the end of March and the ground dried out quickly. April and May were both relatively mild and fairly dry so the lake level dropped significantly and is now at about the same level it was at this time last year. However, June was a considerably wetter month which is why the water level increased slightly. The lake gained about 6 inches in the last 2 weeks of June.

While there would not have been any significant flooding of low lying property or access roads this spring, all Otter Lake property owners should be aware that RVCA's beaver management program came to an end in December 2009.

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