

2008 Otter Lake Water Quality Report

Introduction:

OLLA was fortunate this year to have assistance from the water quality technicians of Rideau Valley Conservation Authority. The data reported is a combination of results from OLLA volunteers and the RVCA. As OLLA accumulates more years of data, it becomes easier to detect undesirable trends. In the recent past, attention has been focussed on basic water quality indicators such as Phosphorus levels and water clarity (Secchi depth). As this data builds, OLLA can afford to test less often, and direct some attention to other environmental indicators such as heavy metals and hydrology.

Nutrients:

The two key indicators of nutrient load in the lake are Phosphorus and Nitrogen. You will recognize these two as typical nutrients listed on the fertilizer bag that you buy for the lawn and garden. 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.

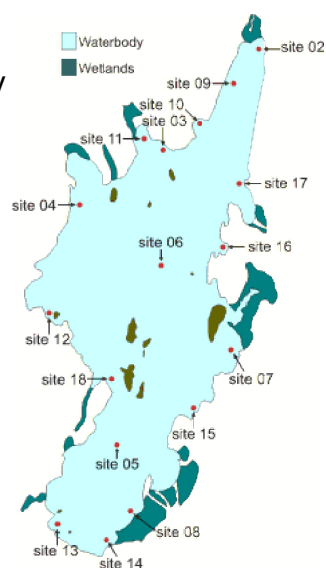
In 2008, both Phosphorus and Nitrogen are within levels for the classification of Otter Lake as oligotrophic.....meaning it is typical of clear, deep water bodies. This is a good thing. A question arose due to a discrepancy of OLLA Phosphorus samples (tested at Caduceon Labs) compared to RVCA samples (tested at a different lab). The OLLA samples were much higher even for those samples drawn on the same day. Further tests will be done comparing labs in 2009.

Phosphorus is the limiting factor in further growth of algae, meaning that algae growth will occur in greater amounts as more Phosphorus is added to the lake. Keep the septic system well maintained, maintain good growth of shrubs and trees near the shoreline, and don't use fertilizers and powdered dish soap. This will ensure that minimal amounts of nutrients get into the water.

Bacteria:

Bacteria detected in the lake can be an indication of septic pollution. E.coli is considered the best indicator of human waste pollution. This species is from the Coliform family of bacteria that usually occur in soil. 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 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.

The 2008 average of 4 E.coli and 171 total Coliform bacteria is generally acceptable. The highest readings were at OLLA 7 which is near the boat ramp and subject to an inflow of water from upland wetlands. OLLA 14 was second highest and is at Moonlight Bay campground. This site has produced higher than average readings over the last few years. Recently some researchers have postulated that a reading of 10 on a consistent basis is cause for concern and may be



showing the effects of human activity as opposed to background readings that may be the result of wildlife.

WATER QUALITY DATA 2008									
Location	Date	Phos ug./litre	Nitrogen ug./litre	Oxygen mg./litre	E. coli cts/100 ml	Fecal Bac cts/100 ml	Total Coliform cts/100 ml	Lead mg./litre	Sodium mg./litre
OLLA2	Apr-21	10			2				
	Jul-14	8 (12)	390	9.5	2	2	30		5.9
	Sep-30	8	390	8.6	2				6.6
OLLA4	Jul-14	7 (14)	380	11.5	2		20		5.9
	Aug-25				2		194		
	Sep-30	9	390		2				6.4
OLLA5 30 m depth	May-22	8	390	10.5					5.6
	Jul-14	9	400	8.5					5.8
	Sep-30	8	450	3.1					6.5
OLLA6 30 m depth	May-22	6	430	11					5.8
	Jul-14	9	430	8.4					5.9
	Aug-25							<0.00002	
	Sep-30	8	380	5					6.7
OLLA7	Jul-14	7 (21)	400	12	12	12	90		6.1
	Aug-25	4			1		>400		
	Sep-30	7	410		2				6.8
OLLA9	Aug-25				1		188		
OLLA11	Jul-14	8 (14)	410	8.5	2	2	40		5.8
	Aug-25				1		>400		
	Sep-30	7	380		2				6.6
OLLA12	Jul-14	6	400		4				5.9
	Sep-30	7	430		2				6.5
OLLA13	Aug-20								
OLLA14	May-27			11.5					
	Jul-14	11		9.5	6	10	100		
	Aug-25				2		>400		
OLLA15	Jul-14								6.1
	Aug-25				1		252	0.00019	
OLLA16	Jul-14	8 (16)	400		2	2	40		5.8
	Sep-30	8	390		2				6.6
OLLA17	Jul-09	17			2	4	40		
	Aug-25				1		170		
OLLA18	Jul-14	7 (18)	380	11.5	26	2	20		5.9
	Aug-25				1		224		
	Sep-30	8	380	9.5	2				6.7
Average		7.76	400	9.3	3.7	4	171		6.2

Heavy Metal:

Last year we screened for Mercury and found it to be low. This year samples were tested for lead and it too was found to be extremely low. In some areas of the province, heavy metal contamination has been associated with industrial air pollution fallout from the previous century. As soil is eroded and acid rain becomes a factor, heavy metals are leached into the water. These initial results indicate that there are no concerns in Otter Lake.

Comparison of Water Quality Indicators 1976-2008					
	Phosphorus	Nitrogen	Secchi Depth	E.Coli	Trophic Status
	ug/litre	ug/litre	meters	per 100 ml	
1975	7.5		3.8		
1996	8.1		3.5		Oligotrophic
2003	9.1	440	5.1		
2004	10.1		5.1		
2005	13.9	290	6.6		Mesotrophic
2006	10.5	390	7.3	2	
2007	9.5	380	7.2	2	
2008	7.8	400	7.2	4	Oligotrophic
OTTER LAKE AVG	9.6	380	6.5	3	
BASS LAKE AVG	12	427	4.2	32	Mesotrophic
Notes:	Oligotrophic status is associated with deep, cold lakes supporting Trout.				
	Mesotrophic status is more productive, warmer, and supporting fish like Bass and Perch.				

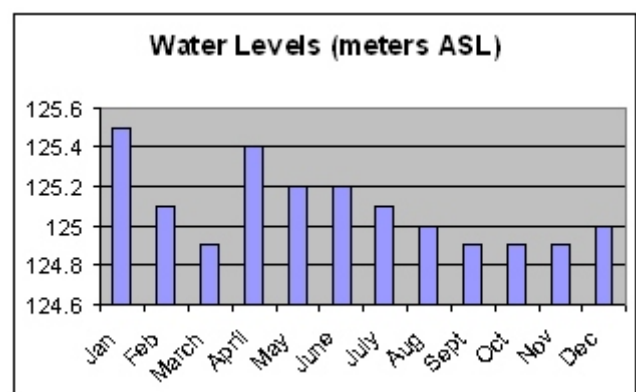
Sodium:

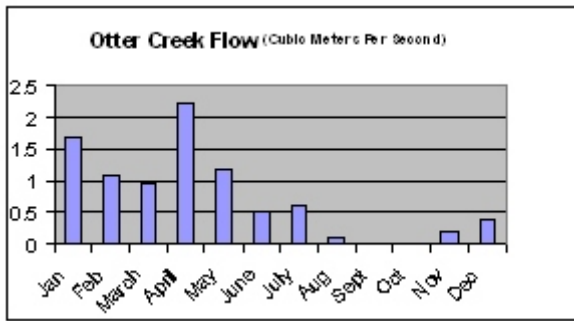
Levels in Otter Lake are slightly higher than the provincial average. The highest readings were detected at OLLA 7 (closest site to highway 15) which may indicate that road salt washing into the lake with spring runoff, is a factor. Above is a water quality chart of data collected over several years which indicates how the status of the lake has changed over the years. A comparison to similar data for Bass Lake is also included.

Water Levels and Flow:

Inspection of the water level and more importantly, the water flow readings, demonstrate the effects of high precipitation during the winter and above average precipitation in April. Higher water levels were experienced throughout the Rideau watershed during this period.

Roads O9 and O10 flooded at the peak of





the water levels in February and April. Prompted by complaints from lake residents, RVCA engaged a trapper to trim the beaver dam that existed at location # 1 of Otter Creek about 300 m downstream from Otter Lake Road. This position is significant in that it is a natural rock ridge that measures about 12 inches higher than the bottom of the culvert under Otter Lake Road. Beavers tend to build at location #1 and the presence or absence of a dam can affect water levels in the lake by as much as 12-18 inches. Dams

further downstream at positions # 2 and 3 have less affect on water levels and those further downstream have no affect. This is because dams further downstream are at a topographical level below the rock ridge at position #1 and the culvert bottom so there is no influence.

Some creekside landowners between the lake and Kelly's Road requested assistance from the RVCA as some land was flooded. RVCA reports that approximately 30 beavers were removed in this area of the creek. Some have estimated that 300 beavers can be found along the total length.

The lake survey indicates that a minority of lake residents are sensitive to high or low levels. The majority find the range acceptable. RVCA has advised that there is a horizon on their participation in beaver management in the creek. OLLA does not have the mandate or legal right to participate in beaver management. Individuals also do not have the legal right to remove dams without a licence. For more information please visit the OLLA website.

Submitted by:
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 April, 2009