

# Lake Steward Report - 2021

## General Comments

Overall, 2021 was a good year for Otter Lake. While there were a number of days with higher than average temperatures and periods of lack of precipitation, the lake maintained its overall healthy state. Otter Lake did not experience any blue-green algae blooms, unlike our neighbouring Bass Lake. While blue-green algae blooms appear naturally, climate change and nutrient loads caused by human activities increase the possibility of blue-green algae blooms and we must always be mindful of what impact we are imposing on Otter Lake. A blue-green algae bloom, even if it is not of a toxic variety, can have unpleasant and potentially harmful and economic effects.

As part of OLLA's Lake Trout Spawning Project, oxygen levels and water temperatures have received greater scrutiny in 2021, with an encouraging determination that Otter Lake appears to be able to support the re-introduction of Lake Trout. Once our study of this data, as well as potential spawning and habitat is complete, we will approach the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNR) to request that Otter Lake be added to their Lake Trout stocking program.

With respect to our loon population, it was disappointing that Otter Lake only saw the successful hatching/rearing of one baby loon in 2021. This could be due to any number of factors, one of which could be water level fluctuation during nesting season (May 15-June 1 typically). OLLA volunteers will be building two floating loon nests to be installed in 2022 to hopefully assist with ensuring long-term positive results.

## Results of Water Quality Testing in 2021

The Covid-19 pandemic continued to present challenges for both OLLA and RVCA in 2021 in respect of collecting and testing water samples. Consequently, OLLA did not sample any of its sites in 2021 and RVCA conducting a reduced sampling and testing program of surface water but Otter Lake was included. The results of RVCA water testing in 2021 are shown in the table below.

Water Quality Data - 2021																			
RVCA ID	OLLA ID	Total Coliform (cfu/100 ml)			E. Coli (cfu/100 ml)			Total Kjeldahl nitrogen (µg/l)				Total Phosphorous (µg/l)				Secchi Disk (meters)			
		Jun	Jul	Aug	Jun	Jul	Aug	May	Jun	Aug	Oct	May	Jun	Aug	Oct	May	Jun	Aug	Oct
RVL-26C	OLLA 03				1		0		380	390			4	13					
RVL-26DP1	OLLA 05A							400	370	490	380	8	2	10	10	6.0	8.5	5.5	3.0
RVL-26DP3	OLLA 06							400	410	480	350	9	2	10	4	6.0	6.0	3.0	3.5
RVL-26B	OLLA 09				0		10		400	480			4	11					
RVL-26F	OLLA 18				0		4		380	400			2	10					
<b>Average</b>					<b>2.50</b>			<b>407.86</b>				<b>7.07</b>				<b>5.19</b>			
<b>Std. Error</b>					<b>3.99</b>			<b>43.71</b>				<b>3.87</b>				<b>1.91</b>			
<b>Water Quality Recommendations</b>					<b>&lt;100</b>			<b>&lt;500</b>				<b>&lt;20</b>							
<b>Oligotrophic</b>								<b>310 - 1160</b>				<b>3 - 18</b>				<b>5.4 - 28</b>			
<b>Mesotrophic</b>								<b>360 - 1400</b>				<b>11 - 96</b>				<b>1.5 - 8.1</b>			
<b>Eutrophic</b>								<b>390 - 6100</b>				<b>16 - 390</b>				<b>0.8 - 7.0</b>			

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The results indicate that the trend that has been seen for the past five years remains the same. Low levels of *E. Coli* were detected at some sites tested. These low values do NOT present a health hazard for swimming since in Ontario' public beaches are closed only when *E. Coli* levels exceed 100 cfu/100ml.

Total Kjeldahl Nitrogen (TKN) levels were in the acceptable range of between 200 - 500 µg/L, very similar to previous years. As for Total Phosphorous (TP), none of the sites tested had values greater than 13 µg/L, below the Provincial Water Quality Objective (PWQO) – Lakes of less than 20 ug/L.

Secchi depth readings were again between 3 and 8 meters indicating that the lake remains very clear and there were few algae blooms last summer despite the very hot weather we experienced in August.

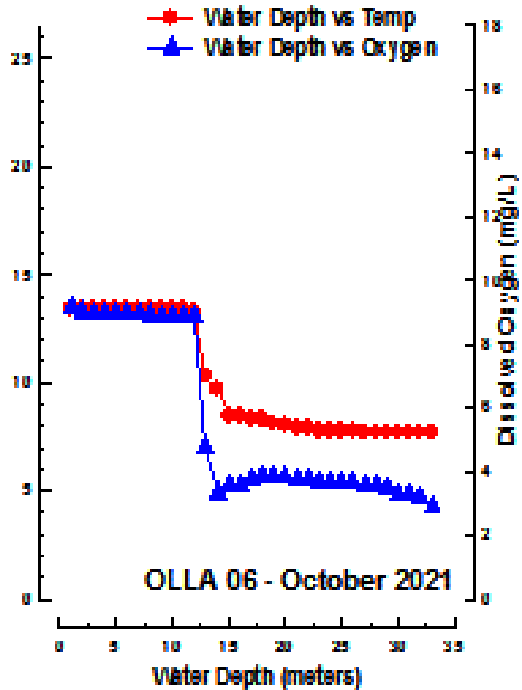
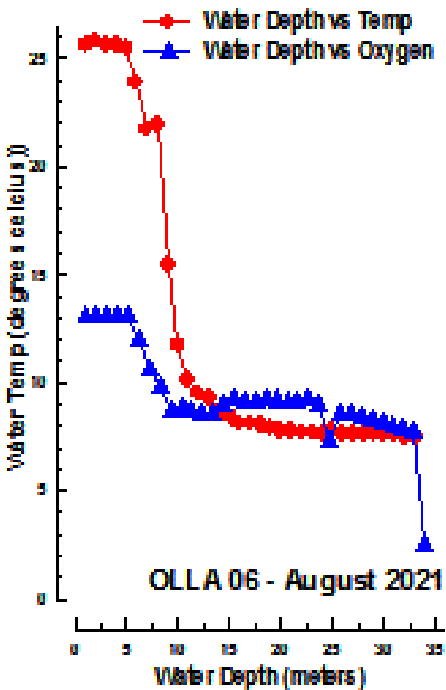
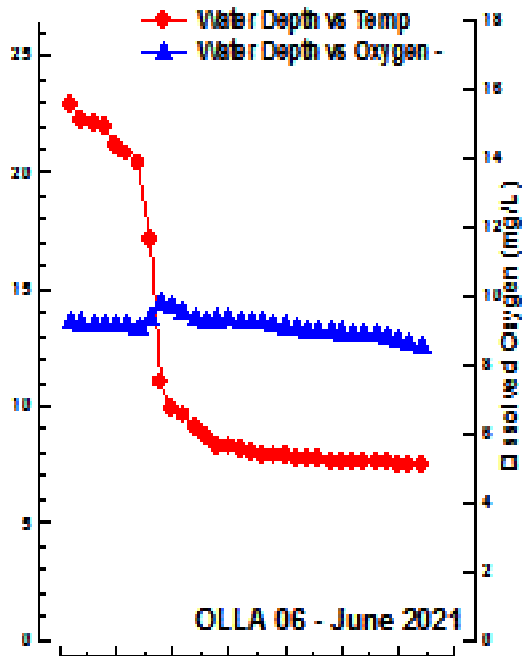
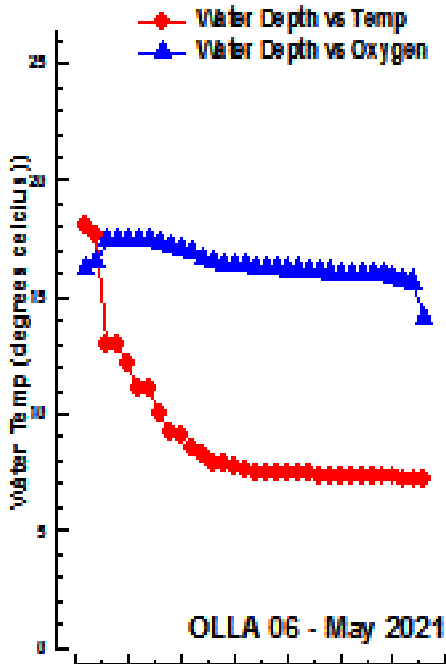
Otter Lake continues to be one of very few lakes in the area that is classified as oligotrophic. The only other lakes classified as oligotrophic are Farren and Wolfe Lake. Most oligotrophic lakes are usually found much further North.

RVCA performed measurements of water temperature and DO in May, June, August and October at two deep water sites OLLA 5A/RVCA DP1 and OLLA O6/RVCA DP2. The results obtained by RVCA in 2021 are shown in the graphs on the next page.

The concentration of dissolved oxygen in lakes is affected by temperature and has well-defined seasonal cycles. Cold water can hold more dissolved oxygen than warm water. The red lines indicate water temperature vs depth showing the rise/fall in temperature, particularly at the surface, while the temperature at deep water levels remains more constant regardless of the month. The blue lines indicate the dissolved oxygen levels vs depth. DO concentrations are high in early Spring but begin to decline over the Summer when the water temperature rises. Trout live in cold water below the hyperlimnion (the depth at which the water temperature drops rapidly). DO concentrations below the hyperlimnion cannot be replenished because of the layer of less dense water above it and cold water fish will not survive well if DO levels fall below 4 mg/L. A further test will be done in February 2022 if the ice is safe enough to venture out on.

*Note: For more technical information on water quality please go to our website <https://otterlake.org/environment/water-observation/>*

# Lake Steward Report – 2021 (cont'd)



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