FROM OUR WATER QUALITY DIRECTOR | Great test results

By Gord Moore

Well, 2021 is now behind us and the results from the water testing for last season have been received from the Rideau Valley Conservation Authority (RVCA). If you recall, testing was substantially reduced in 2020 because of COVID-19, and the RVCA were only able to complete one round of testing in July of that year. Those results were published in the 2021 Wolfe Lake magazine. Last year I was instructed by the RVCA on how to do the testing myself, as social distancing on a boat would have been difficult. As a result, I was able to push the number of testing times back up to near normal. Besides providing training as to what testing was required and how to do it, Haley Matschke of the RVCA dropped off the necessary equipment on the morning of each test and returned in the afternoon to pick up everything including the water samples. Many thanks to Haley for all her help!

WOLFE LAKE | WATER QUALITY | 2021

SAMPLE DATE	SITE	CALCIUM mg/L Ca	DISSOLVED ORGANIC CARBON mg/L DOC	E. COLI (CFU/100mL)	TOTAL PHOSPHORUS mg/L TP	TOTAL NITROGEN mg/L TKN	SECCHI DEPTH m SD
2021-05-27	DP1				0.005	0.3	6.5
2021-07-12	DP1		4.8		0.002	0.31	5.75
2021-09-09	DP1	26			0.002	0.11	5.5
2021-10-28	DP1				0.012	0.28	6
2021-05-27	DP3				0.008	0.4	7.5
2021-07-12	DP3		4.7		0.002	0.3	5.75
2021-09-09	DP3	16.5			0.008	0.43	6
2021-10-28	DP3				0.011	0.29	5
SHORELINE SAMPLES							
2021-07-12	D			0	0.003	0.31	
2021-09-09	D			0	0.002	0.4	
2021-07-12	I			0	0.003	0.34	
2021-09-09	I			1	0.009	0.43	
2021-07-12	J			0	0.002	0.31	
2021-09-09	J			0	0.007	0.49	
2021-07-12	K			0	0.004	0.31	
2021-09-09	K			0	0.002	0.39	

WATER QUALITY GUIDELINES AND RECOMMENDATIONS

Type	Guideline Source	Guideline
Total Phosphorus (TP)	Provincial Water Quality Objective (PWQO) - Lakes	<0.020mg/L
TKN - Nitrogen	Secondary Indicator, Ministry of the Environment Recomended Guideline	<0.500mg/L
E.Coli	Provincial Water Quality Objective (PWQO)	<100 CFU/100mL

Overall, the results were excellent! Total phosphorous (TP) levels came in well below the Provincial water quality objective. Total nitrogen levels (TKN) all fell within acceptable norms under the Ministry of the Environment's recommended guidelines. Testing for signs of E. coli, which is performed primarily at locations D, I, J, K (shallow-water locations) came in at 0 CFU, whereas the acceptable provincial water quality objective is 100 CFU or less. The reason for testing shallow-water locations only, according to the RVCA, is that E. coli is generally not a concern in open water, hence, deep-water sampling is unnecessary. Calcium and carbon levels are tested for other reasons. Thank you to the RVCA for providing the following clarification:

Calcium and Carbon are tested more for lake classification and long-term trends and are not nutrients that need to be mitigated. As a result, there are no specific guidelines for these nutrients.

Calcium

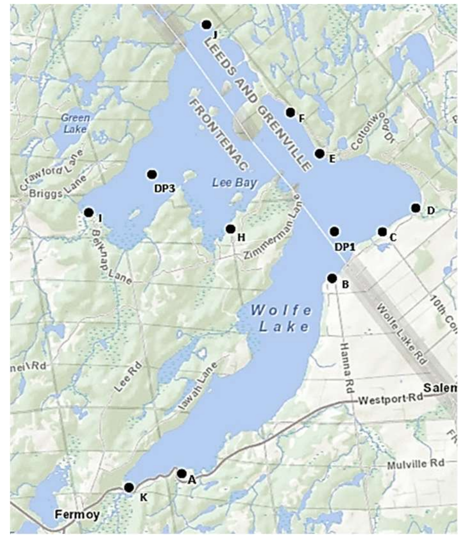
Calcium levels can be used as an indicator for susceptibility of a water system to Zebra mussel populations. Calcium is also a nutrient required by many species existing within the water column. Some studies have suggested that zebra mussel populations are more likely to be sustained when calcium concentrations are >20mg/L, however they have also been detected in lakes with lower values. Calcium is also suggested to play a significant role in the buffering capacity of a lake. The RVCA is currently continuing to monitor for calcium as some watersheds towards the Muskoka's have found that calcium concentrations are declining, which may subsequently influence biological conditions within the lake. As a result, the continued collection of calcium samples will allow the RVCA to have a long-term dataset and continue to monitor our systems for any potential changes in our watersheds

Carbon

Dissolved Organic Carbon (DOC) – Carbon plays a significant role in the nutrient uptake and cycling in a lake. RVCA continues to collect DOC samples in an effort to understand any long-term changes. This can also help the RVCA identify a lake's sensitivity and/or productivity in relation to nutrient loading.

Nutrient levels were all below maximum guidelines, which is great news! Oxygenation levels at the deep-water locations were consistent throughout the season, apart from the sampling completed at the end of October, when the results showed slightly lower levels at greater depths. The RVCA has informed me that this is not unusual for the time of year, given that the lake was demonstrating signs of mixing in advance of the winter months and the ice cover period. As a result, they were not concerned at this time.

Secchi depth reading is a measure of the clarity and/or turbidity of the water. This can be affected by such factors as the colour of the water, algae and other suspended sediments in the water. Secchi depths over the last few years have been fairly stable. There was a time, when we were dealing with zebra mussels, that the transparency extended deeper, possibly because the zebra mussels were feeding on micro-organisms closer to the surface and thus causing increased clarity. Since the zebra mussel infestation is more or less under control for the moment, water clarity has returned to normal levels for our lake.



Finally, I have included a map of Wolfe Lake showing all the testing locations so you can see where the readings from last year's summary were taken.

I wish you all a great summer!