Lake Water Quality 2023

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Overview

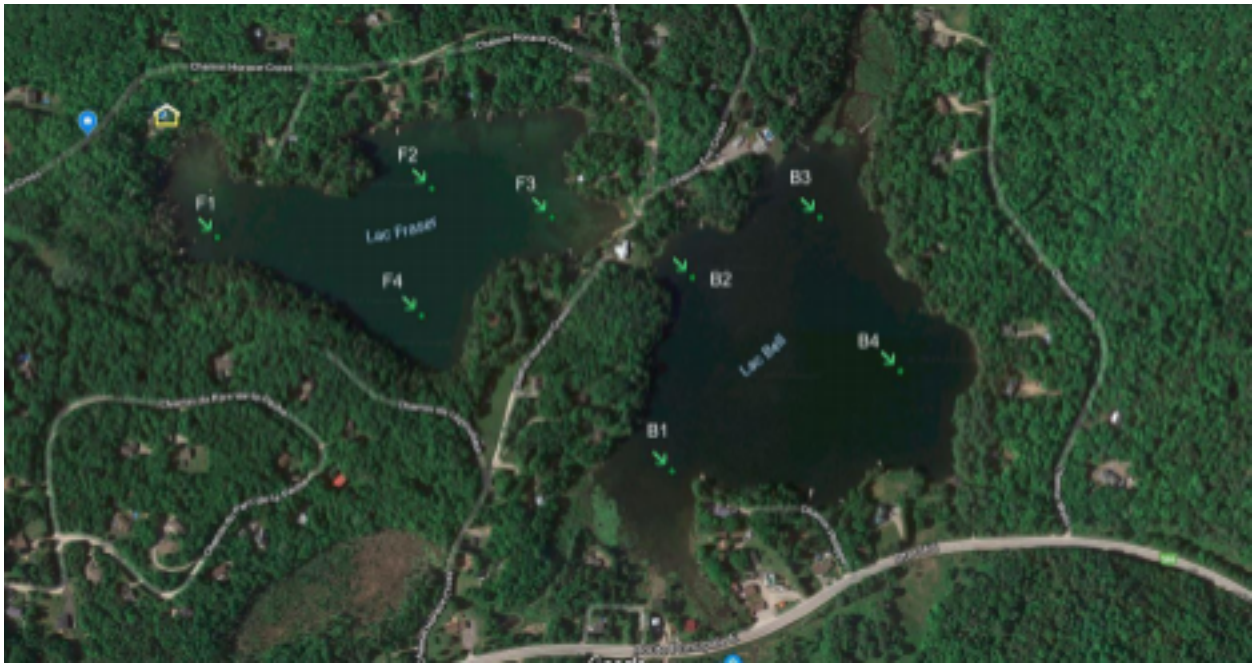
Lake water was surveyed and tested on 17-Aug-2023 and covered a number of parameters similar to previous year's study. This year, it was decided to test four locations in each lake (similar to previous years as last year's two locations were deemed to be insufficient). Again, both Fraser and Bell lakes were tested for E-coli and total Phosphorus. Again, a measurement for turbidity (clarity) was taken using a "Secchi Disk" where possible.

Also, a visual inspection of the shoreline of both lakes was made in order to identify any presence of invasive plant growth in our lakes as well as to gain some better understanding of existing aquatic plants. The results of this investigation are available in a separate document.

Method

Water sample bottles were obtained from Micro-B lab in Hull on 16-Aug-2023 and water was sampled between 10:30 and 11:30 am on the following day (as usual, I needed to select a warm, sunny day with little wind and with no precipitation having occurred for three days prior). Sample bottles were kept in a cooler along with ice packs until delivery, about an hour after sampling. Four sampling locations were chosen for each lake in the approximate same locations chosen in previous years. The locations are shown below:

Sampling locations



In addition, a Secchi disk was used to evaluate the relative turbidity (clarity) of the water which is often used to establish the amount of algae (among other things) present in the water column. It's important to note that this device only gives an approximate value of turbidity and is best used when comparing results from year to year. The disk (20cm dia, pictured below) has a weight attached and is lowered on a graduated string until it is observed to disappear. This value is noted as a depth (in meters). Some locations were too shallow and the disk would get into the muck before it would otherwise have disappeared. These values were not recorded.

In addition to water quality testing, a visual survey was made of the shoreline of both lakes to identify any areas where Eurasian Water Milfoil might be present as well as identify other water plants found in our lakes. Eurasian Milfoil is an invasive water plant that can potentially overtake all other indigenous water plants and even take over the whole lake. The way that the plant propagates is by simple fracturing of the plants from which new growth will take root from the broken plant matter. It is very difficult to get rid of once it takes hold. For this reason, it is imperative that any new watercraft be thoroughly cleaned before being introduced into our lakes.

Blue-green algae (cyanobacteria) has been a problem in our lakes in the past and continues to be a problem in neighbouring lakes. Low densities of the algae are difficult to detect as they are microscopic but blooms are definitely visible and can be identified as bluish-green (pea soup) masses in the water. It is apparently relatively easy to identify when in such a high concentration. This algae is potentially harmful to humans and pets and swimming is not recommended when present. The main cause of algae growth is nutrient content (mostly phosphorus) in the water from surface runoff of fertilizers or poorly functioning septic systems. Algae growth was thought to be favoured in warm, shallow, slow-moving water but a recent study showed that temperature does not have a significant effect. Any blooms present in our lakes should be noted and other residents alerted.

Test results:

Lab results are attached and summarised here. Also noted are accepted standards for each parameter.

Test Results
(along with results from previous years)

E-Coli UFC/100ml

Loc	2022
Fraser A	4
Fraser B	0
Bell A	0
Bell B	0

Loc	2023	2021	2020	2019
F-1	1	1	3	2
F-2	1	1	3	4
F-3	2	0	3	<2
F-4	0	0	1	<2
B-1	3	0	5	2
B-2	11	1	6	4
B-3	0	1	1	<2
B-4	3	0	3	2

Total Phosphorus (mg/L)

Loc	2022	
Fraser A	0.004	
Fraser B	0.04	retested Oct 4: 0.03
Bell A	0.03	retested Oct4: <0.02
Bell B	0.006	

Loc	2023	2021	2020	2019
F-1	0.29	0.03	0.012	0.047
F-2	1.36	<0.02	0.034	0.010
F-3	<0.02	<0.02	0.007	0.014
F-4	<0.02	<0.02	0.009	0.019
B-1	<0.02	<0.02	0.012	0.010
B-2	<0.02	<0.02	0.011	0.010
B-3	<0.02	<0.02	0.011	0.010
B-4	<0.02	<0.02	0.013	0.012

Secchi Depths (m)

F-1	n/a	2.8	n/a	(n/a)
F-2	3.5	2.8	3.0	(3.2)
F-3	3.8	2.6	4.0	(3.4)
F-4	n/a	2.9	n/a	(n/a)
B-1	n/a	3.7	3.7	(3.2)
B-2	3.5	3.6	4.0	(4.0)
B-3	3.5	3.7	4.0	(4.0)
B-4	n/a	3.8	4.0	(4.3)

Standards

E-Coli: less than 20 is considered "Class A excellent"

Phosphorus: Oligotrophic 0.004 -> 0.01
Mesotrophic 0.01 -> 0.02
Meso-eutrophic 0.02 -> 0.035
Eutrophic 0.035 -> 0.1

Secchi depth Swamps/ponds > 0.5m
Murky lakes > 0.5 – 1m
Typical rivers 1m – 2.5m
Typical lakes 1m – 8m
Very clear lakes 10m – 60m

Secchi depths are within norms for lakes such as ours and consistent with last year's measurements. Entries showing Secchi depths as "**n/a**" indicate that the bottom was reached before a valid depth could be measured.

Also note that the testing locations are approximate and bottom contour varies.

Conclusions

I'm happy to report that our lakes continue to be in good condition. E-coli still doesn't seem to be a problem (except for the reading of **11 at B-2** but that still makes it **Class A Excellent**) and neither are turbidity levels. Phosphorus levels are of slight concern in two areas in Fraser lake but it is unsure if this higher reading comes from a sampling error on my part or the fact that there is not much flow at that end of the lake. In any event, the average level of phosphorus is still quite low but those two spots should be monitored carefully in the future.

Looks like our septic systems continue to function well and that nobody is allowing fertilizer to run off their property into the lakes. We should however continue to be vigilant and report any concerns. Make sure to wash off and disinfect any and every kind of floating device if it has been used on any other body of water than ours. This includes every canoe, kayak, stand-up paddleboard, floating inflatable bouncy castle or rowboat.

This report will be uploaded to our new website as will the test documents from the lab and the aquatic plant report.

Please feel free to contact me if you have any questions or concerns.

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