LWCA FINAL WATER QUALITY REPORT 2025

TO: LWCA BOARD AND MEMBERS

FROM: JARED BELL & CLAIRE VANDERVOORT

SUBJECT: WATER QUALITY BOARD REPORT

DIRECTOR UPDATE

Jared Bell has graciously stepped into the role of Director of Water Quality for the LWCA. Jared assisted with 2024 sampling and was officially handed the reins to complete field data collection and sampling for the 2025 season. While the transition of course came with a few bumps in the road while we both figured things out, largely through phone calls and texts - bravo to Jared for completing the 2025 season, and he has been off to a great start for 2026. I will remain available to assist Jared with data analysis and report writing.

- Claire

SAMPLING UPDATE

Dissolved oxygen and temperature sampling have been completed for the months of June and August. Due to weather conditions, sampling at Otter Lake was not completed for the month of August.

Chemistry sampling was completed on October 13th and sent to Caduceon Labs for via mail for testing in Kingston. As we all likely have experienced, there were significant shipping delays. This unfortunately caused the e.coli and total coliform samples to expire, and they were unable to be accurate tested by the lab. While this is unfortunate, it is the reality of field work, and these things are beyond our control. **If there are any interested parties in assisting with shuttling samples to Kingston, we would greatly appreciate the assistance! Please reach out to the LWCA via email.**

A graph outlining year over year chemistry data can be found in Appendix F, with raw results in Appendix G.

Additionally, our contributions to the Lake Partner Program are live and can be viewed here. Please search "Weslemkoon" to view 2023 and 2024 data. This sampling was completed again for 2025 and will be released at a later date.

2025 SAMPLING RESULTS; DISSOLVED OXYGEN AND TEMPERATURE

Detailed graphs outlining the dissolved oxygen and temperature readings for June and August of 2025 can be found in Appendices A through E. The graphs have bands of colour to indicate the suitability of the water temperature for lake trout. Pink indicates the zone from which lake trout would be excluded because of high temperature (>23 ^{o}C). Fish may make short forays into warmer water to feed, but need to spend most of their time in cooler water. Blue indicates the zone where the water temperature is in the preferred range for lake trout (<13 ^{o}C). Grey shading indicates a water layer from which lake trout would be excluded because of low dissolved oxygen (<6 mg/L DO, the bottom of the range set by PWQO). Thus, the plain blue zone has both preferred temperature and dissolved oxygen, and is the "sweet spot" for lake trout.

There continues to be a stable band of dissolved oxygen ranging between 7 to 9 mg/L of dissolved oxygen within the 20 to ~30 metre depths across all sampled sites within the early summer season. As usual, during the lake summer (September), dissolved oxygen levels decrease slightly with the overall warming of the lake. The shallower sites (Otter Lake and Lighthouse) typically see lower dissolved oxygen levels than that seen in the deeper sites (Elmardon, Black Duck and Snake Point). That being said, there is still adequate dissolved oxygen for various fish species within Lake Weslemkoon.

2025 SAMPLING RESULTS; CHEMISTRY

21 samples were collected from various locations ranging from the North end to the South end of Weslemkoon on October 10th, 2025. These samples were sent to Caduceon Labs in Kingston for testing of phosphorous, nitrogen, total coliforms and e.coli. As mentioned earlier, shipping delays resulted in expired samples so there is unfortunately no results for both e.coli and total coliforms. The year over year results can be seen in Appendix F, while raw results can be viewed in Appendix G.

Phosphorous levels have remained relatively stable over recent years, with a stable trend again this year. The ranges set by the Provincial Water Quality Objectives (PWQO) for phosphorous are 0.01-0.02 mg/L (10-20 ug/L), the average for this year was 0.01, so Weslemkoon is within the Provincial standard (Appendix G). The results for nitrogen levels within Weslemkoon saw a slight upward trend this year. There is no official PWQO standard for nitrogen levels in Ontario, but waters not influenced by organic inputs typically range from 0.1 to 0.5 mg/L. Of all 21 sampled sites, the average value was 0.3 which falls within the expected range of 0.1 to 0.5 mg/L.

While we unfortunately have no results for e.coli and total coliforms, we can make an educated assumption given previous year's results that e.coli were likely well below the PWQO range of 100 cfu (colony forming units) per 100 mL of sample. 2024's results were 2 cfu/100 mL, and 2023 saw slightly higher results at 22 cfu/100 mL. **This is your annual reminder that we have the responsibility to maintain septic tanks, through certified inspections and pump outs, and clean up after pets if we want to continue to enjoy our lake for years to come.**

Again, no results for total coliforms but instead will provide a reminder that total coliforms are bacteria that are found naturally in an environment through soil, surface water and animals. Total coliforms are not always bacteria that can make an individual sick, instead e.coli, a fecal coliform is used to determine sanitary conditions of a waterbody. Since e.coli is used to determine sanitary conditions, PWQO recommends against using total coliforms as a sanitary measure, but indicates 1000 cfu/100 mL is acceptable in freshwater systems. In 2024, the average of total coliforms was 8 cfu/100mL, well below the acceptable range.

CONSIDERATIONS FOR COTTAGERS

I know these are repeated in this report year after year, but they remain relevant so here are some things to consider to help protect the water quality of Lake Weslemkoon:

According to FOCA, in recreational lakes that do not have a large point source of phosphorus (e.g., sewage treatment plant), **domestic waste from septic systems is the largest human source of phosphorus. The concentrations of phosphorus in septic wastewaters are roughly 200-300 times higher than the concentrations needed to stimulate significant algal growth in lakes!** Therefore, as cottage owners, we have a shared responsibility to maintain the health of our lakes by limiting the inputs of phosphorus. Below are some ways that you can help reduce the effects of shoreline development on water quality:

1) Maintain a properly functioning septic system. Have your septic system pumped every 3-5 years to remove the build-up of solids and scum, and take this opportunity to have the system inspected by a qualified individual for any required maintenance. If you are converting a cottage into a permanent

dwelling be sure to check the capacity of your septic system. Exceeding the capacity of your septic could result in the remobilization of phosphorus in the soil.

2) Implement septic inspections. Arrange for an inspector to come inspect your current septic system to ensure it is operating properly.

3) Reduce your water use at the cottage. Excessive water use is the most common cause of septic failure. Cut down on the amount of water entering your septic by installing low flow toilets and showerheads, and taking laundry home to wash.

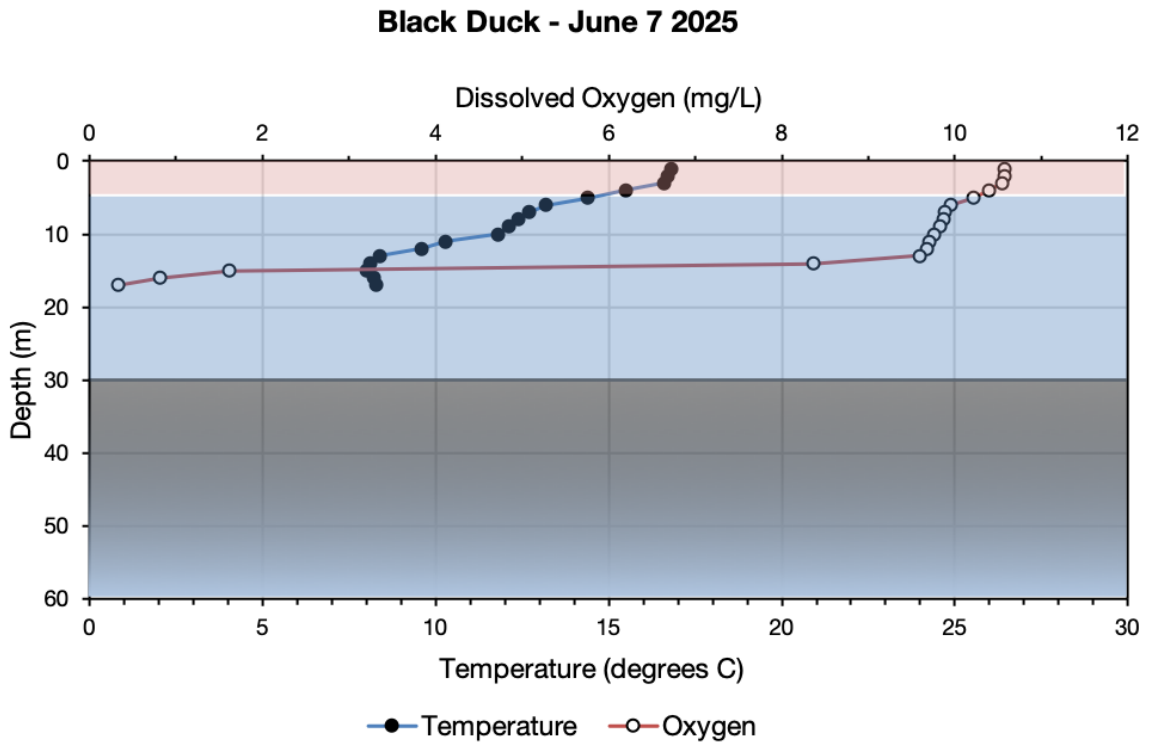
4) **Naturalize your shorelines** (e.g., vegetated buffer strips, wetlands) to help control soil erosion and the runoff of nutrients to the lake and nearby rivers and streams. Aim to keep natural areas natural!

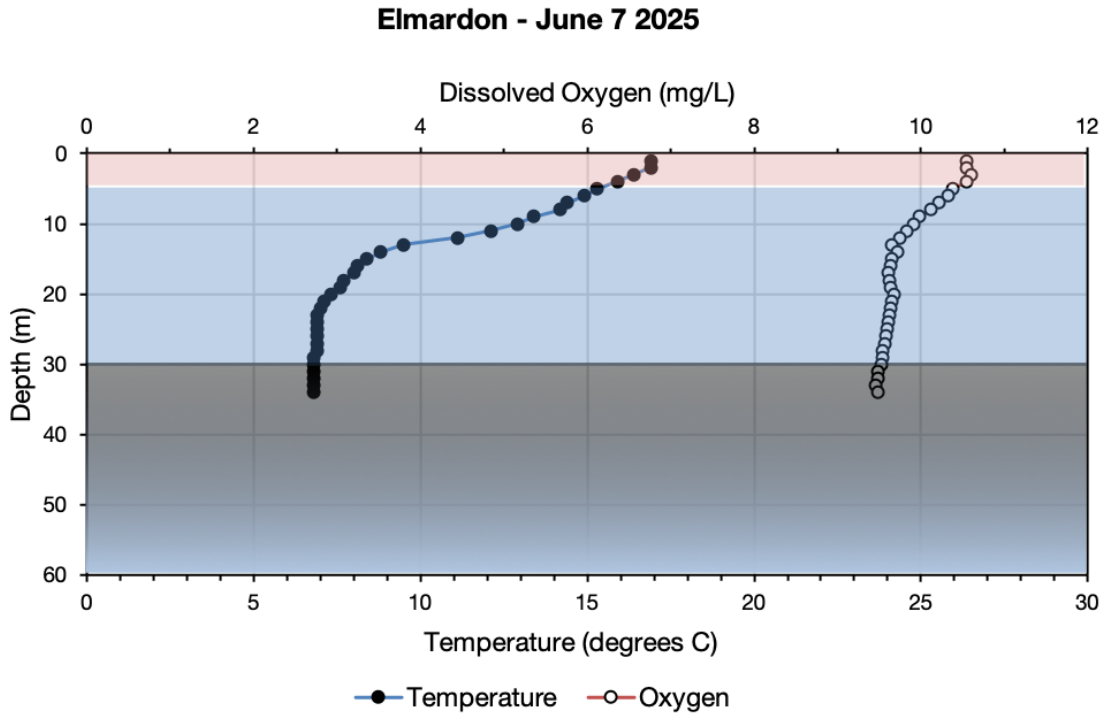
5) Limit the amount of impervious surfaces, including roofs, parking areas, and patios, to reduce runoff to nearby waterbodies.

As always, the guidelines referenced through this report are pulled directly from the Provincial Water Quality Objectives which can be found at the Ontario Government webpage, linked here for ease of access.

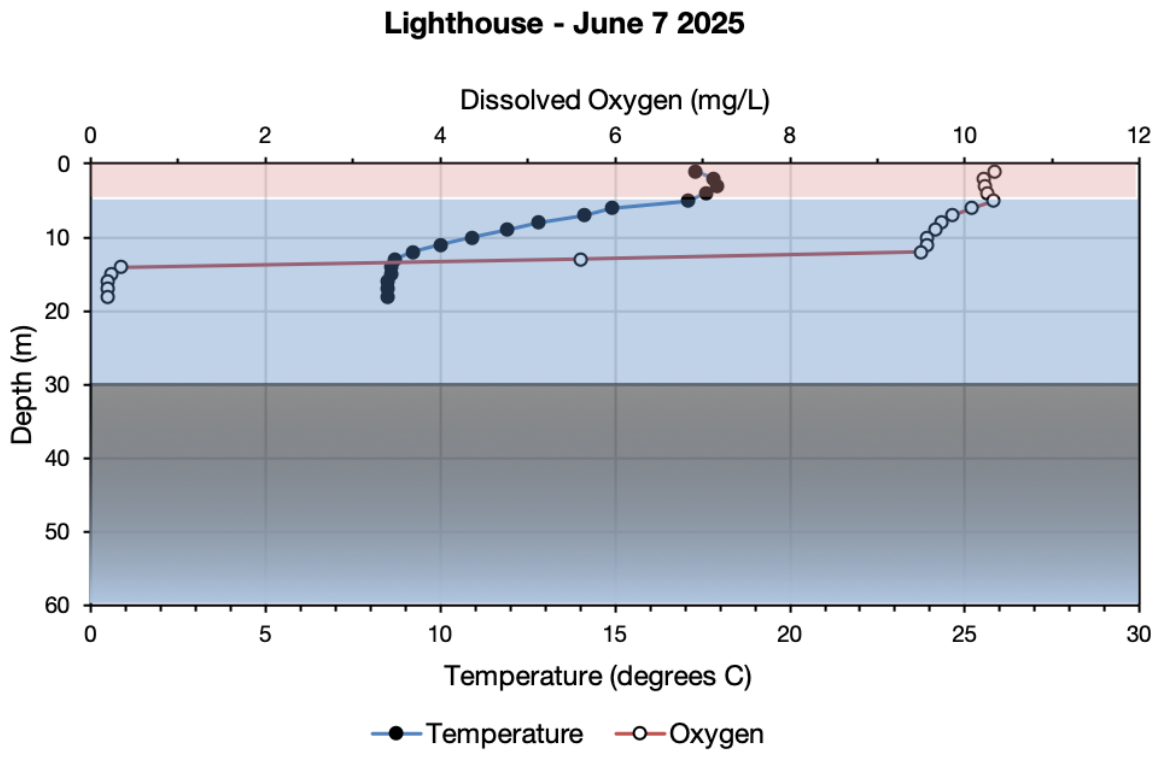
All the best,
Claire Vandervoort & Jared Bell

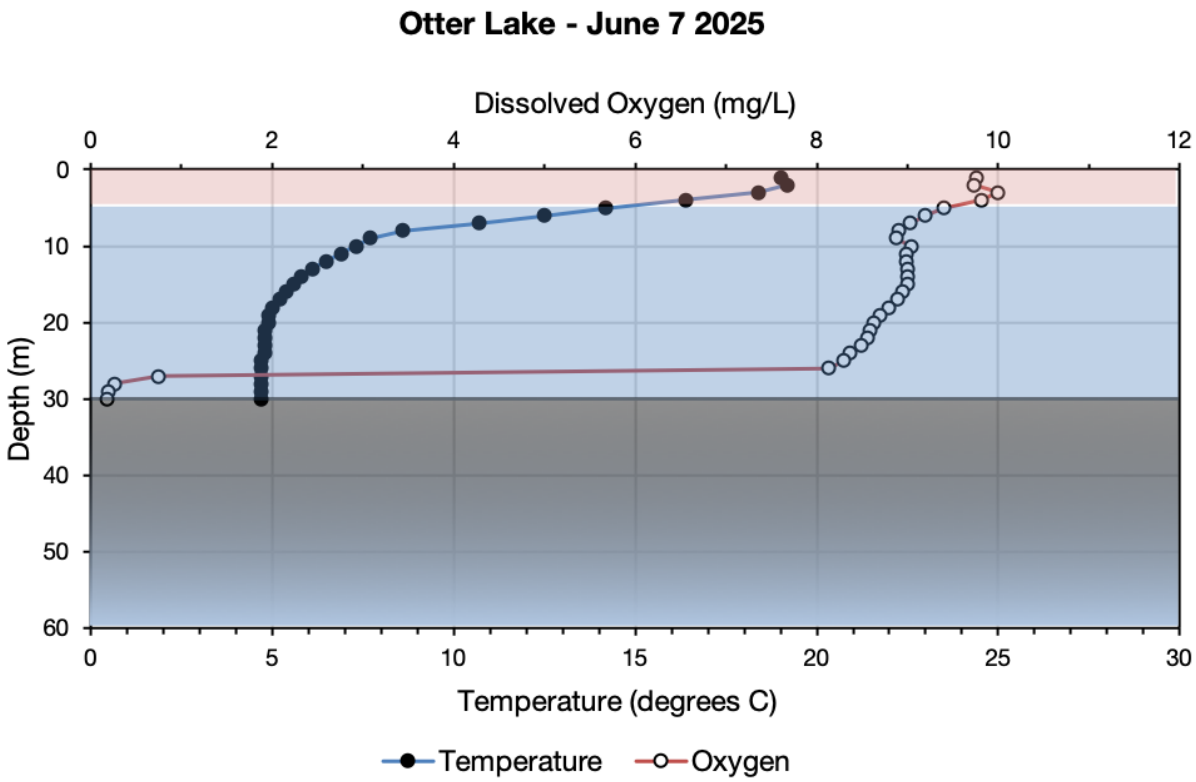
Appendix A


Black Duck - June 7 2025
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
Depth (m)
0
10
20
30
40
50
60
0
5
10
15
20
25
30
Temperature (degrees C)
Temperature
Oxygen

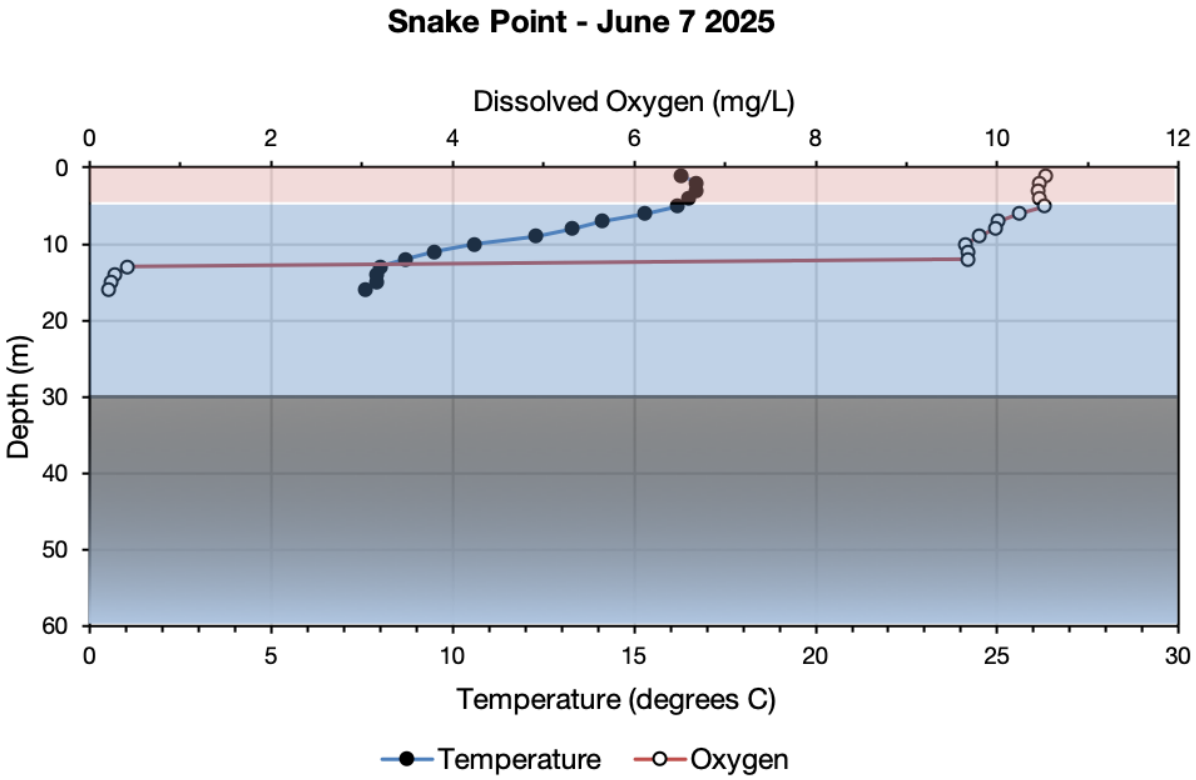

Elmardon - June 7 2025
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
Depth (m)
0
10
20
30
40
50
60
0
5
10
15
20
25
30
Temperature (degrees C)
Temperature
Oxygen

Appendix B

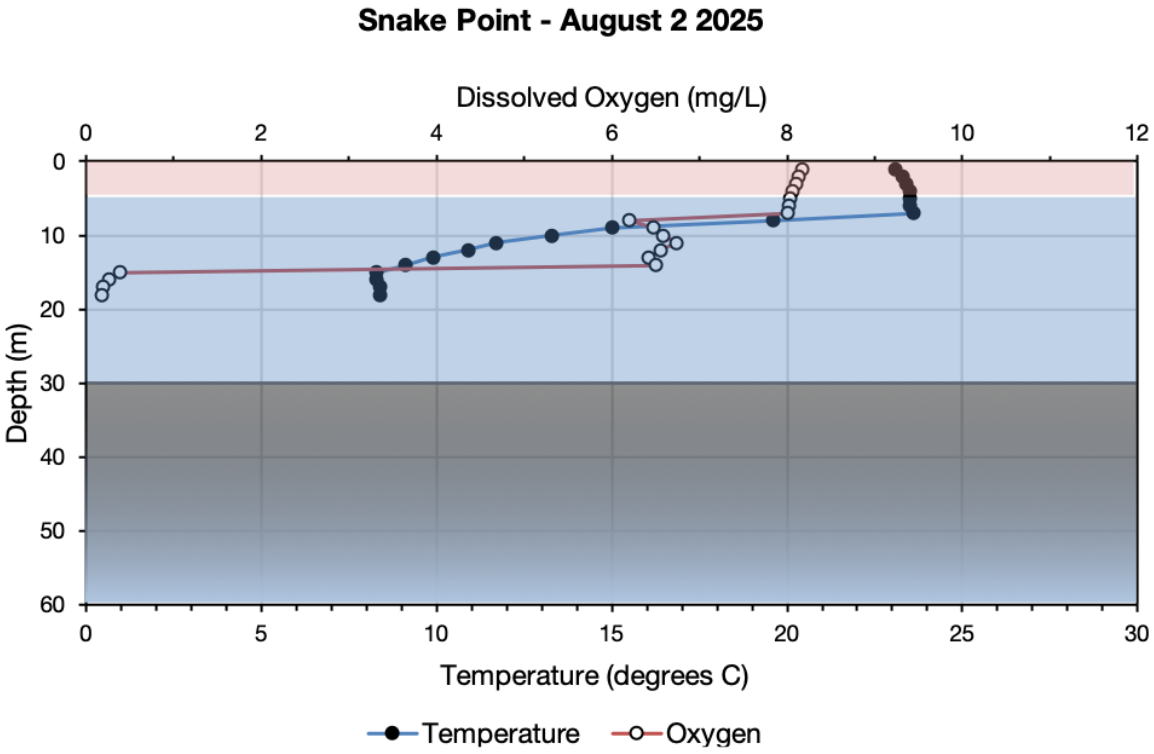

Lighthouse - June 7 2025
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
Depth (m)
0
10
20
30
40
50
60
0
5
10
15
20
25
30
Temperature (degrees C)
Temperature
Oxygen

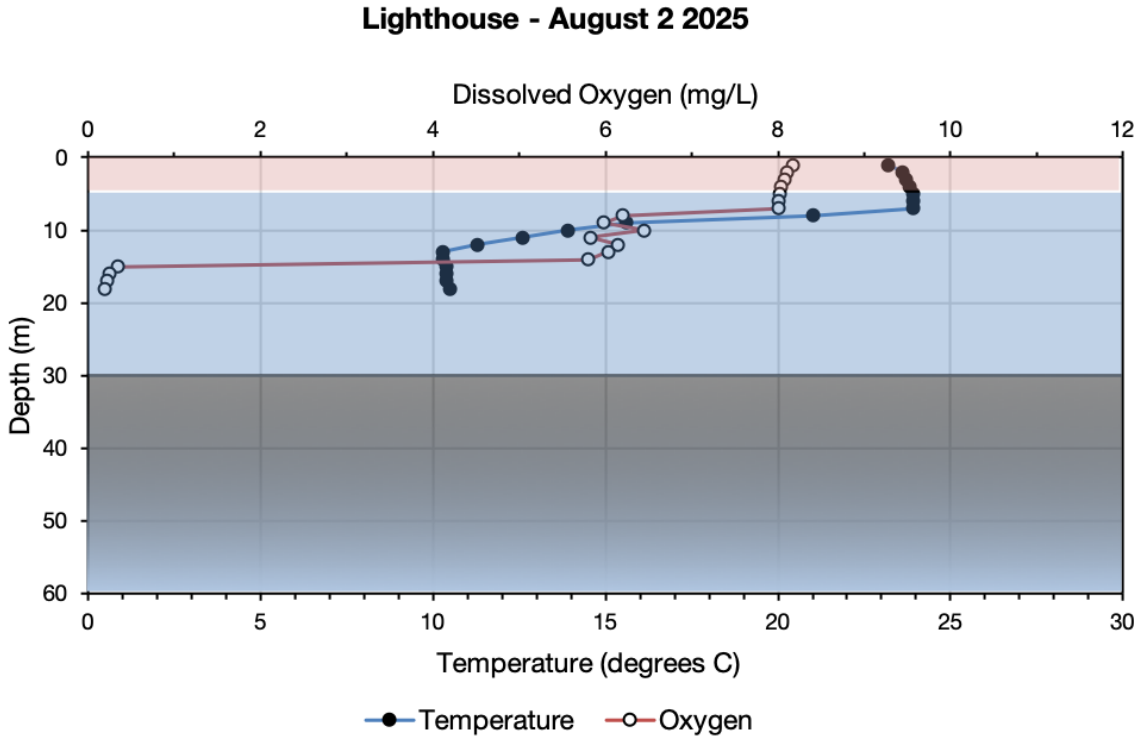

Otter Lake - June 7 2025
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
Depth (m)
0
10
20
30
40
50
60
0
5
10
15
20
25
30
Temperature (degrees C)
Temperature
Oxygen

Appendix C

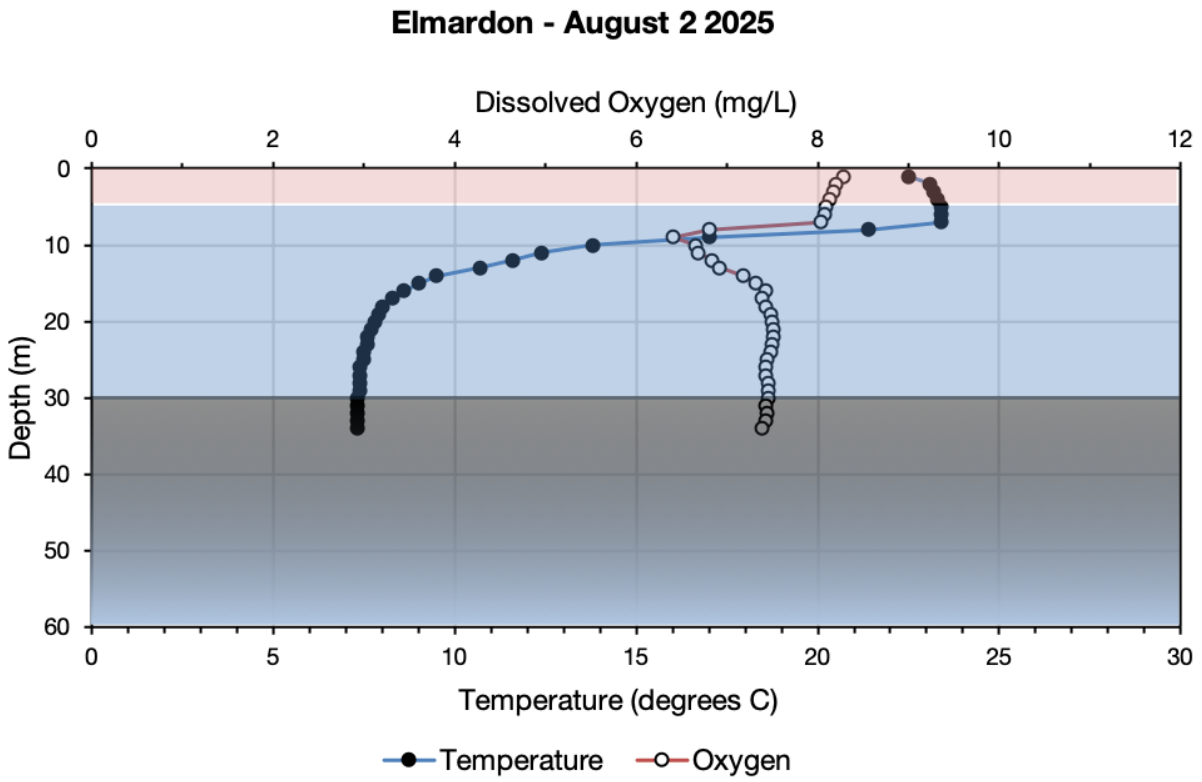

Snake Point - June 7 2025
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
Depth (m)
0
10
20
30
40
50
60
0
5
10
15
20
25
30
Temperature (degrees C)
Temperature
Oxygen

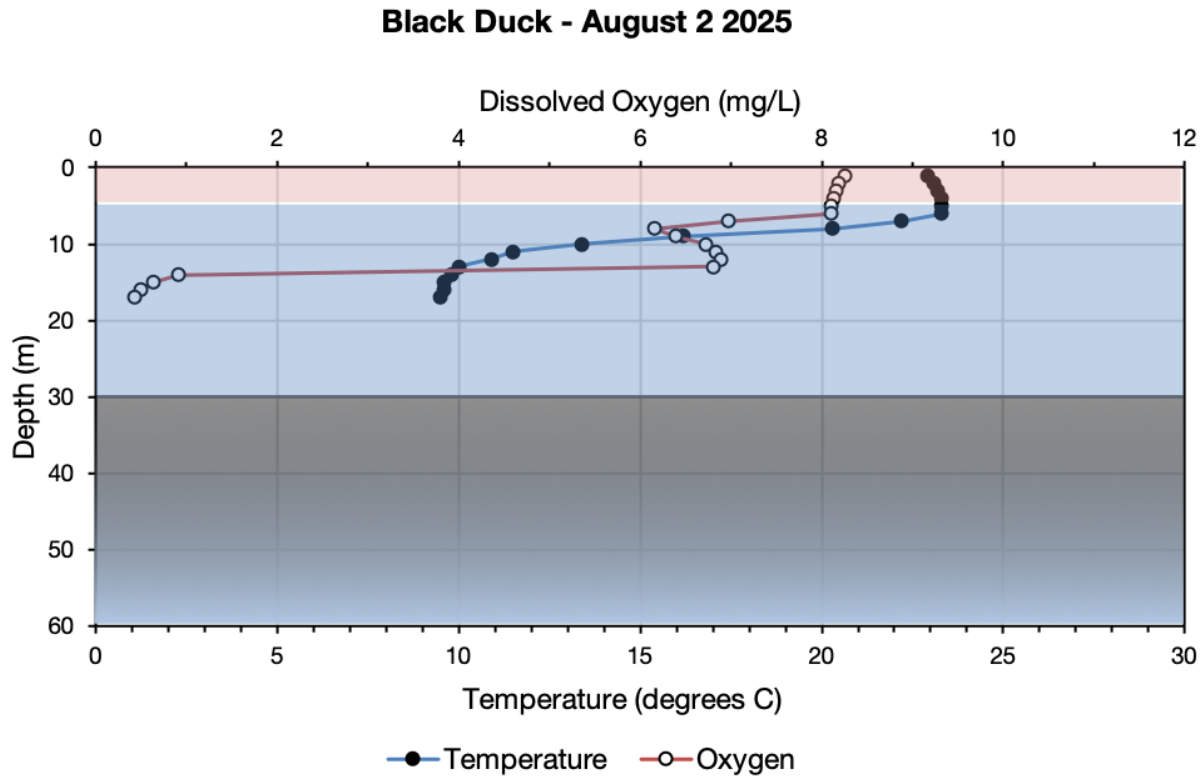
Appendix D


Snake Point - August 2 2025
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
Depth (m)
0
10
20
30
40
50
60
0
5
10
15
20
25
30
Temperature (degrees C)
Temperature
Oxygen

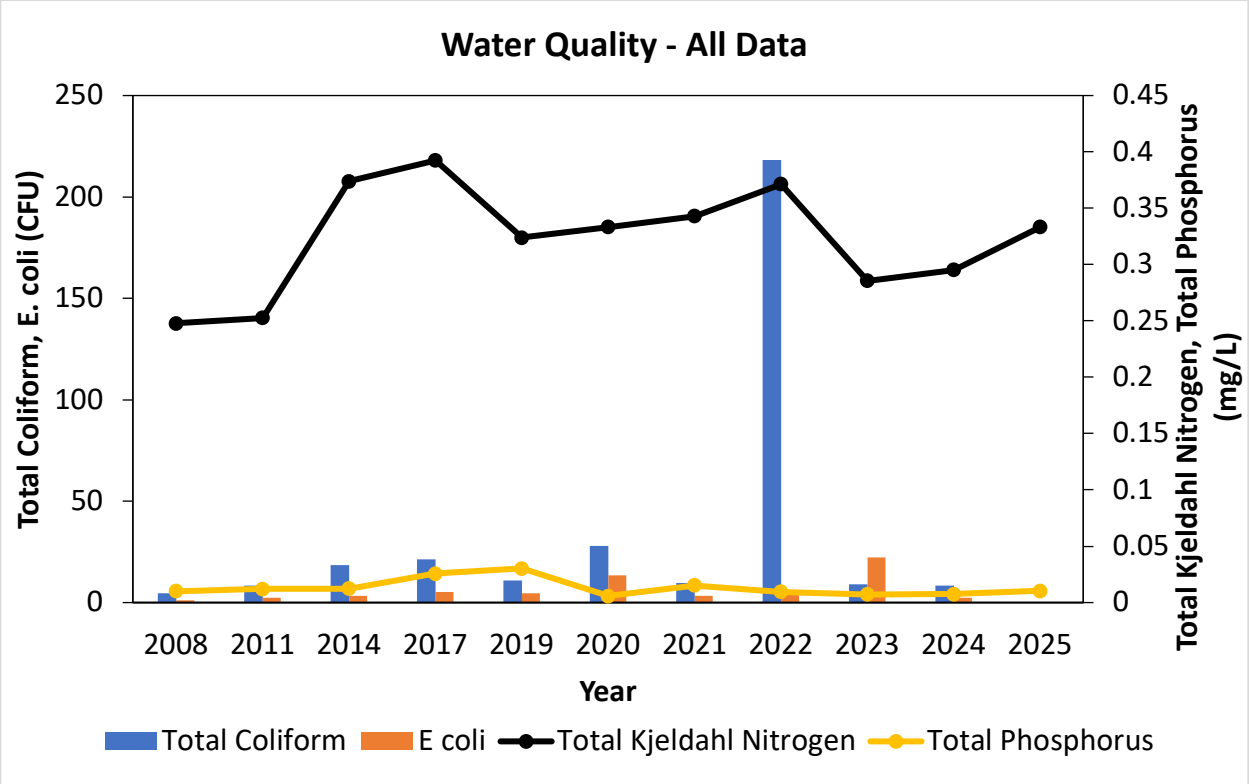

Lighthouse - August 2 2025
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
Depth (m)
0
10
20
30
40
50
60
0
5
10
15
20
25
30
Temperature (degrees C)
Temperature
Oxygen

Appendix E


Elmardon - August 2 2025
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
Depth (m)
0
10
20
30
40
50
60
0
5
10
15
20
25
30
Temperature (degrees C)
Temperature
Oxygen


Black Duck - August 2 2025
Dissolved Oxygen (mg/L)
0
2
4
6
8
10
12
Depth (m)
0
10
20
30
40
50
60
0
5
10
15
20
25
30
Temperature (degrees C)
Temperature
Oxygen

Appendix F. Chemistry Sampling Year over Year Trends



Appendix G. Raw Results from Caduceon Laboratory

Date Collected: October 13, 2025	Total Coliform	E. coli	Total Kjeldahl Nitrogen	Total Phosphorus
Units	cfu/100ml	cfu/100ml	mg/L	mg/L
PWQO Guidelines	**2 ct/100**	**0 ct/100**	**0.02**	**0.02-0.5**
Sample Number	2025	2025	2025	2025
1	Samples expired due to shipping issues	Samples expired due to shipping issues	0.3	0.013
2			0.3	0.012
3			0.3	0.012
4			0.4	0.02
5			0.3	0.002
6			0.3	0.004
7			0.4	0.005
8			0.3	0.003
9			0.3	0.014
10			0.4	0.013
11			0.4	0.007
12			0.3	0.006
13			0.3	0.009
14			0.3	0.011
15			0.4	0.014
16			0.3	0.012
17			0.4	0.017
18			0.3	0.013
19			0.4	0.018
20			0.3	0.014
21			0.3	0.002
Average			**0.333333**	**0.010524**