



# Winter Monitoring Report

## Lakes Environmental Association

2025



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# LEA's Winter Lake Monitoring

## Introduction

For decades, Lakes Environmental Association (LEA) has watched over the water quality of lakes in the greater Bridgton area by measuring conditions and collecting water samples from late spring through early fall. Wintertime was mostly ignored due to challenging work conditions and the long-held perception that lakes are dormant during the cold, ice-covered period. More recently, the scientific community has challenged that perception through a growing number of studies that highlight the importance of evaluating winter-time lake conditions and linking those to overall lake health.

Climate change plays a large role in the increased interest in winter lake conditions. Long-term records of lake freeze and break-up dates show that ice cover periods have decreased significantly for many places. Less time with ice cover has and will lead to a reduction or loss of cultural and recreational activities. The impact on water quality throughout the year from a reduction or loss of ice cover is not as well known. So, to fill that void, researchers have increased efforts to study lakes during the winter and improve basic understanding of winter conditions and how those might link to open water periods.

LEA has joined in that effort to make wintertime field work a more regular part of lake monitoring. Our staff began detailed winter field work in 2018 with nine trips to a total of four of our service-area lakes. The total trip number doubled in the next year with six lakes visited. We made 13 trips with 7 different lakes in 2020, 29 trips/11 lakes in 2021, 32 trips/13 lakes in 2022, 26 trips/13 lakes in 2023, and 26 trips/15 lakes in 2024. In 2025, we made 26 trips with 13 different lakes.

This report summarizes data gathered during the winter 2025 field season. Partial support for this work was provided by the Five Kezars Watershed Association, Hancock & Sand Ponds Association, the Keoka Lake Association, the Keyes Pond Environmental Protection Association, the McWain Pond Association, the Moose Pond Association, the Peabody Pond Association, the Trickey Pond Environmental Protection Association, and the Woods Pond Association. Thanks also go to Rebecca Gould and Bill Buckley, Ann and Dan Lasman, Lakeside Pines, Bob Mercier, Marilyn Smith, Camp Tapawingo, and Chip Wendler for providing lake access.



## Methods

We made two visits each to Back Pond, Hancock Pond, Highland Lake, Keoka Lake, Keyes Pond, Long Lake (north basin), McWain Pond, Middle Pond, Moose Pond (main basin), Peabody Pond, Sand Pond, Trickey Pond, and Woods Pond. For each lake visit, we traveled by foot over the ice to the deep site and used an ice auger to drill a hole. Holes were widened by drilling an extra hole and using an ice saw in order to accommodate larger gear. We used a homemade gauge to measure ice thickness, snow depth, and water level in the hole. We also captured video



*Jake with ice auger (left) and Morgan expanding ice hole with saw(right).*

footage of the ice and under-ice conditions for each lake using a GoPro camera. Staff involved in these trips included Maggie Welch, Jake Linley, Ben Peierls, and Morgan Cross.



*Ice gauge in use (left) and as seen under water (right).*

We measured light levels above and at several depths below the ice using a LI-COR LI-192 underwater quantum sensor. During these measurements, we covered the hole with three layers of window screening to keep sunlight from passing straight through and affecting the under-ice readings. The attenuation of light due to ice was calculated as the percent of surface light that reaches the water just under the ice layer. Water clarity below ice was measured during each visit using a Secchi disk lowered through the hole and viewed with our standard slanted-glass viewing scope.



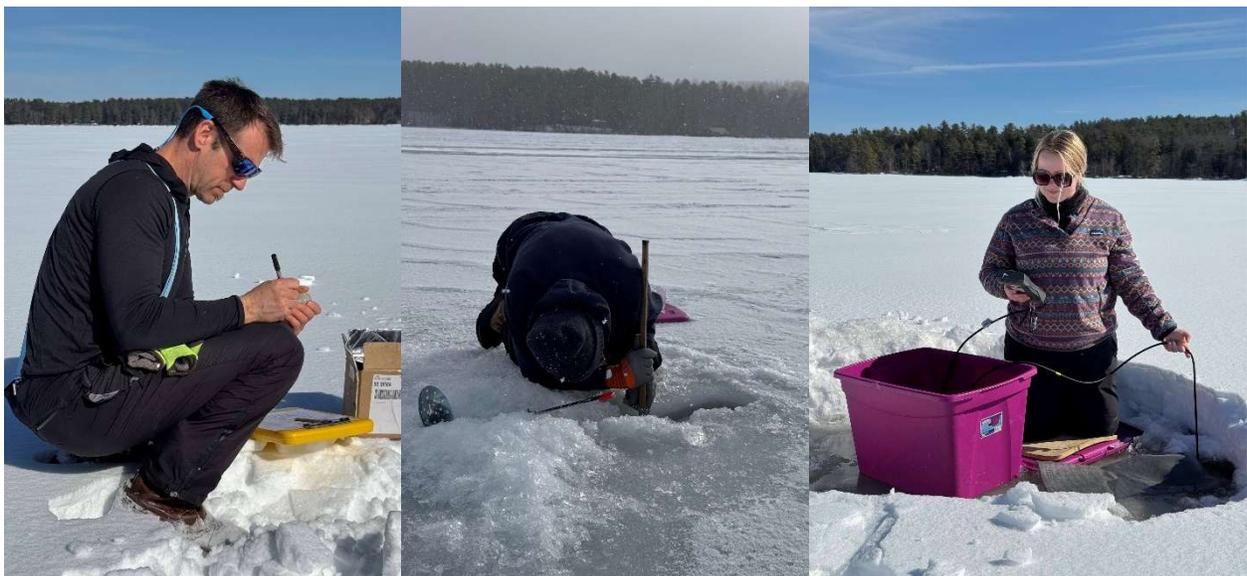
*Jake measuring light under the snow and ice.*

We used a calibrated YSI EXO2 multiparameter sonde connected to a handheld data logger to measure depth profiles of temperature, dissolved oxygen, and chlorophyll fluorescence; the sonde also measures conductivity, pH, and turbidity, but these data are not included in this report. Sonde depth was converted to and reported as depth below ice. Measurements were recorded every 0.5 or 1 meter to the bottom (determined by feel or when turbidity levels rose an order of magnitude).

Water samples were collected using flexible tubing (known as a core tube), which integrates water from the ice to 10 m depth (or to 1 m above the bottom in shallow lakes). These samples were analyzed for total phosphorus using a SEAL segmented flow analyzer, for chlorophyll-a by chemical extraction and fluorescence, and for algae using a Yokogawa Fluid Imaging Technologies FlowCam, a flow imaging microscope that captures images of algae for counting and identification.



*Morgan collecting water sample with core tube and Ben using the sonde (left), Maggie using the sonde (middle), and measuring Secchi depth (right)*



*Jake labeling sample containers (left), Ben measuring ice thickness (middle), and Morgan measuring light (right)*

## Overall Results

Ice cover is the dominant feature of LEA service area lakes during winter. Variation in ice cover timing, duration, and characteristics (known as ice phenology) is driven by local weather conditions. Slightly below-normal temperatures in December and January meant ice-in happened in late December, and we were able to begin field trips in the middle of January. Measured **ice thickness** ranged from 32.4 to 50.2 cm (12.8–19.8 in; Fig. 1), with the minimum recorded on Back Pond and the maximum recorded on Hancock Pond. This year's maximum ice thickness was in the middle of the range of past maxima (35–75 cm during 2018–2024). Ice thickness varied by at most 13.3 cm (5.2 in) between visits and increased between times except for Woods Pond. The ice on this shallow lake could have started melting and thinning by the March visit, but there was also a frozen slush layer that may have confounded the February ice thickness measurement. We observed that the ice layers were often dominated by clear (or black) ice, and had less white ice or slush layers than previous years. Most lakes were ice free by early to mid-April.

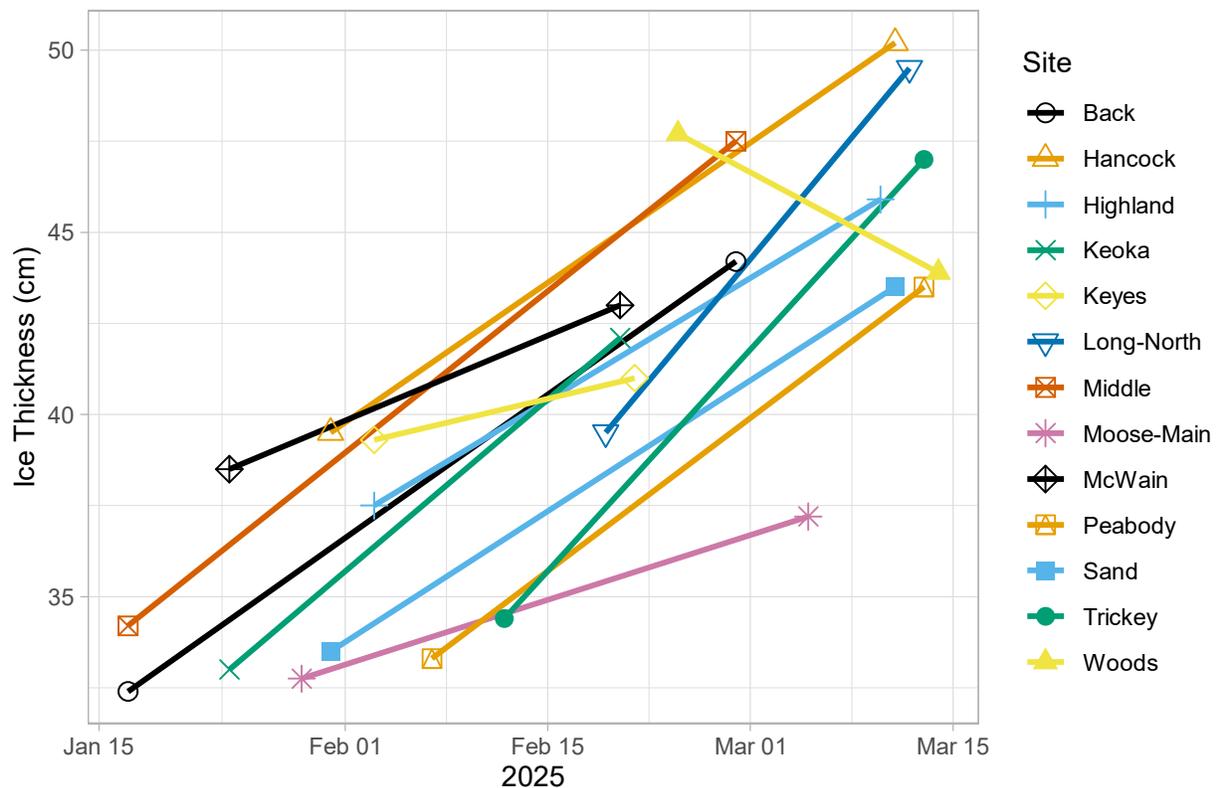


Figure 1. Ice thickness in cm versus date for lakes visited in winter 2025; lines to aid visualization only.

A common method for assessing lake condition is to collect depth-specific physical, chemical, and biological measurements, which we do with our sonde. The resulting measurements (or **profiles**) gave us a snapshot of lake stability and mixing, oxygenation, and algal biomass throughout the whole water column at specific points in time. Here is a summary of the three sonde parameters that we include in this report:

**Temperature:** The most significant feature captured in these profiles is the inverse temperature stratification typical of ice-covered lakes. Water is most dense at 4 °C (39.2 °F),

so in winter the warmest water is at the bottom and the coldest water is at the surface (ice-water interface), opposite of the summer pattern. Temperature typically increased rapidly with depth within the first meter or so (a **stratified layer**), and then increased more slowly to the bottom (**stable** conditions). Sometimes there was little or no change in temperature with depth (a **mixed layer**). Water that is heated by the sun through the ice sinks and is replaced in what is called convective mixing. Heat stored in the sediments over the summer can also increase water temperature, especially at the bottom.

**Dissolved Oxygen (DO):** Microbial respiration and other oxygen-consuming processes do occur despite the cold temperatures. As a result, DO typically decreased with increasing depth and time, much like in summer. Near-ice DO concentrations were mostly near saturation, driven by oxygen produced from algal photosynthesis. Only Back Pond and Middle Pond had **hypoxic** (DO of 2 mg/L or less) deep waters, and both were essentially **anoxic** (complete absence of DO) at the bottom. Hypoxic bottom waters are stressful or lethal habitat for fish and other animals and can promote phosphorus release from the sediment.

**Chlorophyll:** Chlorophyll fluorescence profiles represent the vertical distribution of algae, an important part of lake food webs and an indicator of lake trophic status (i.e., how green a lake is). Chlorophyll fluorescence is a relative measure of chlorophyll pigment concentration, which is itself a proxy for algal biomass. The chlorophyll profiles varied in shape and magnitude, but often showed a peak in fluorescence within a few meters of the ice-water interface and sometimes directly under the ice, especially when snow cover reduced light availability. Chlorophyll fluorescence tended to decrease as the winter progressed. Occasional peaks near the bottom were probably sediment-associated dead or dying cells. Variation of chlorophyll with depth can be explained by light and nutrient availability, differences in algal species present, and grazing on algae by zooplankton (tiny animals), which we often observed in abundance in the under-ice videos. Regardless of the controlling factors, the chlorophyll profiles confirmed the presence of an active algal community in winter.

Another key feature of winter-time lake conditions is low **light**. Sunlight controls water temperature and provides energy for photosynthesis by algae. When lakes are covered by ice or ice and snow, light is blocked from reaching the water below. Our measurements with the light meter demonstrated that light just beneath the ice layer varied from about 2 to 42% of surface irradiance (Fig. 2), with snow cover and the amount of white ice (frozen slush and snow) as strong factors reducing the amount of light reaching the water below. Considering that lake photic zones (where algae have enough light to grow) are usually defined as the layer extending down to where light is 1% of surface irradiance, it is easy to understand how algal growth could be limited to very shallow layers in winter.



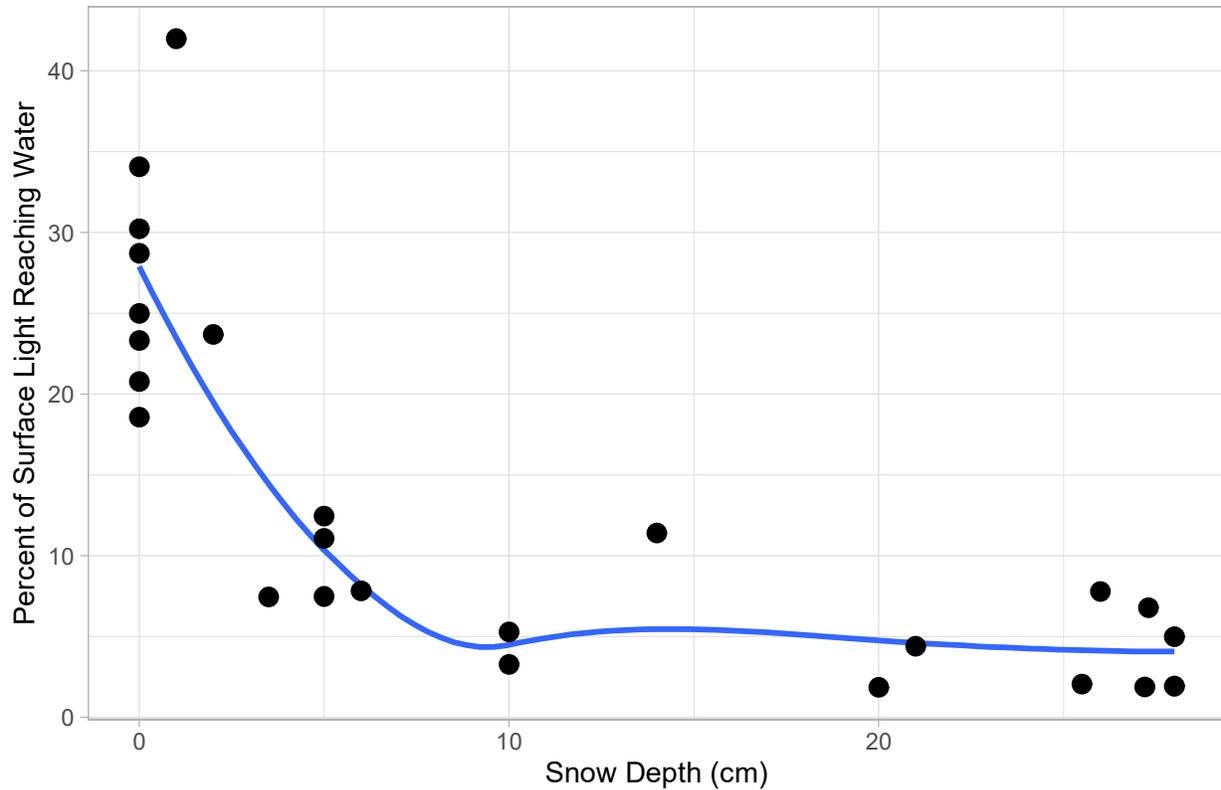


Figure 2. Percent of surface sunlight reaching lake water below the ice as a function snow depth. Blue line is a smoothed fit through the data.

In addition to ice and snow, **water clarity** plays a role in controlling light availability in winter and is an important water quality indicator. This was our fourth year reporting on water clarity measurements made through lake ice using a Secchi disk. The winter 2025 Secchi depth readings generally were within the summer long-term range for each lake. No value was below the long-term minimum, but readings from Hancock Pond and Highland Lake were greater than their respective long-term maxima. Winter water clarity ranged from 3.8 to 12.8 m, which is within the moderate (3.1–7.0 m), high (7.1–10 m), and very high (> 10 m) categories.

Total **phosphorus** (TP) is another important indicator of water quality, where values greater than 12 parts per billion (ppb) indicates an excess of nutrients that may fuel algae growth. Winter 2025 TP concentrations fell well within the summer long-term range for each lake and ranged from 3.8 to 9.3 ppb, which is within the low (< 5.1 ppb) and moderate (5.1–12 ppb) categories. These measurements were made on an integrated water sample from the upper 10 m (or less) of each lake, but nutrients can build up in bottom waters if conditions permit. We did not collect samples to evaluate this, but in winter 2021 we did measure TP concentrations >20 ppb in deep, anoxic lake samples.

**Chlorophyll-a** is another key water quality indicator that we measured on winter lake samples. More accurate than the sonde chlorophyll fluorescence (labeled as “chlorophyll” in the following figures), chlorophyll-a concentrations are the most direct measure of how productive, or “green”, a lake is. Winter 2025 lake chlorophyll-a measurements ranged from 0.4 to 11.4 ppb, which is within the low (< 2.1 ppb), moderate (2.1–7.0 ppb), and high (7.1–12 ppb) categories. Most samples were close to or below the summer long-term average concentration for each lake.

However, samples from Keoka Lake, Keyes Pond, and Peabody Pond were above average. In the case of one sample from Keoka, the chlorophyll-a concentration (11.4 ppb) was the highest winter concentration measured so far.

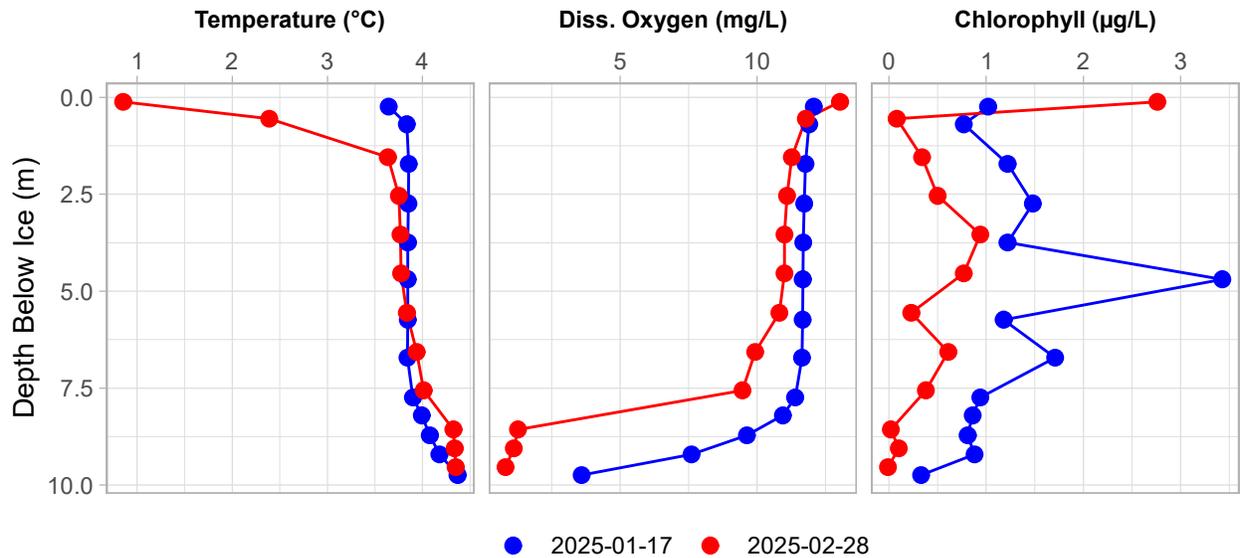
We used our FlowCam analyzer to characterize the taxa (e.g., class, genus, or species) that make up the lake **algae** community in winter. Example images captured by the analyzer are shown and include members of several taxonomic groups, including chlorophytes (e.g., greens), chrysophytes (e.g., golden browns), cryptomonads, cyanobacteria, diatoms, and dinoflagellates. Several of these taxa are capable of deriving nutrition from organic matter and microbial prey in addition to photosynthesis, which makes sense in the light-limited conditions of winter. In general, all the samples showed the presence of a typical mixed algae community at low densities.

Specific lake profiles and water quality indicator results start on the following pages. The winter sampling trips allowed us to capture typical under-ice conditions and some of the changes that happened during the season when we visited more than once. We will continue to examine the data for changes over time and connections between ice-covered and open-water lake conditions. Eventually, we hope to be able to forecast lake water quality changes, if any, as ice cover continues to decrease or disappear altogether due to climate change.



## Back Pond

- Fifth year of winter monitoring.
- Water temperature showed stratified and mixed (no change with depth) layers, with a deepening of the upper stratified layer as the main difference between visits.
- Dissolved oxygen decreased with depth and time, mostly in the deeper waters, which were hypoxic by the second visit.
- Low to moderate chlorophyll fluorescence, with the maximum changing from 5 m deep in January to just under the ice in February.
- Secchi, TP, and chlorophyll-a were all within summer long-term ranges.



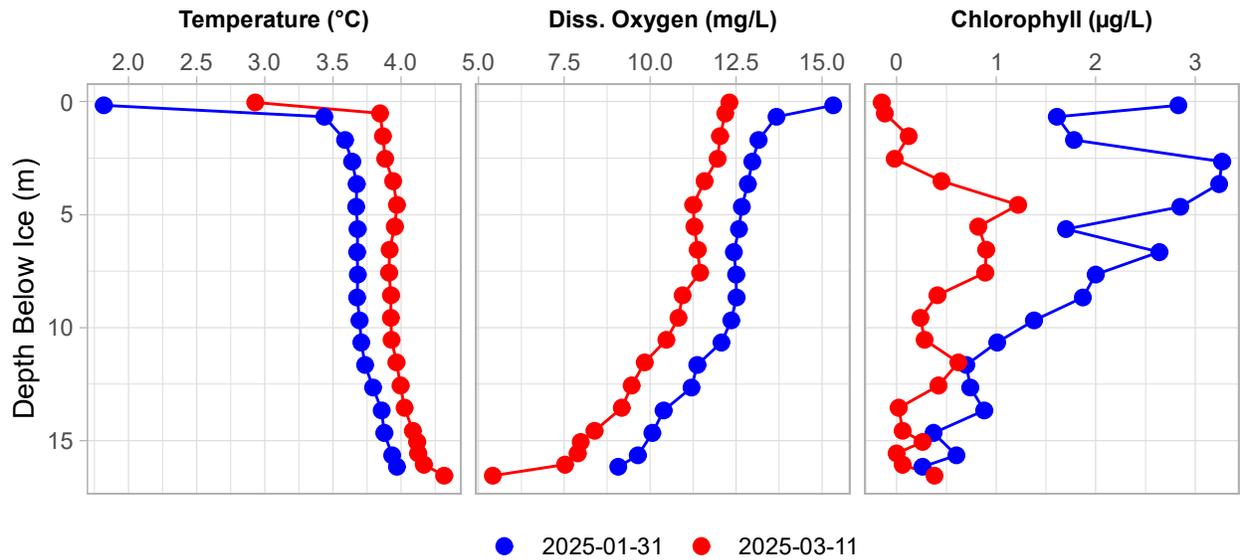
Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-01-17	7.55	8.4	2.2
2025-02-28	6.80	3.8	1.4
Summer 1996–2024 Average (Min–Max)	6.51 (4.35–8.74)	6.1 (3.0–16)	2.1 (0.90–5.2)



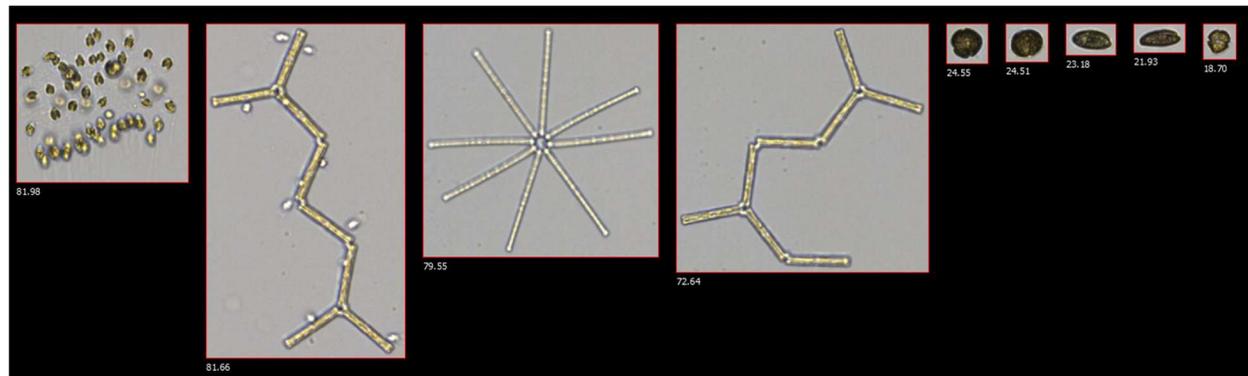
Example FlowCam images captured during runs of Back Pond samples. Numbers indicate diameter in micrometers. Observed taxa include chrysophytes, cryptomonads, and diatoms.

## Hancock Pond

- Fifth year of winter monitoring.
- Water temperature showed a mixed (no change with depth) layer below a thin stratified layer, with little change between visits other than overall temperature increase.
- Dissolved oxygen decreased with depth and time, but did not reach hypoxic levels.
- Low to moderate chlorophyll fluorescence decreased with time and peak values shifted from the upper 5 m deep in January to deeper in March (negative values were due to an incorrect calibration offset).
- Secchi, TP, and chlorophyll-a values were relatively normal and all within summer long-term ranges.



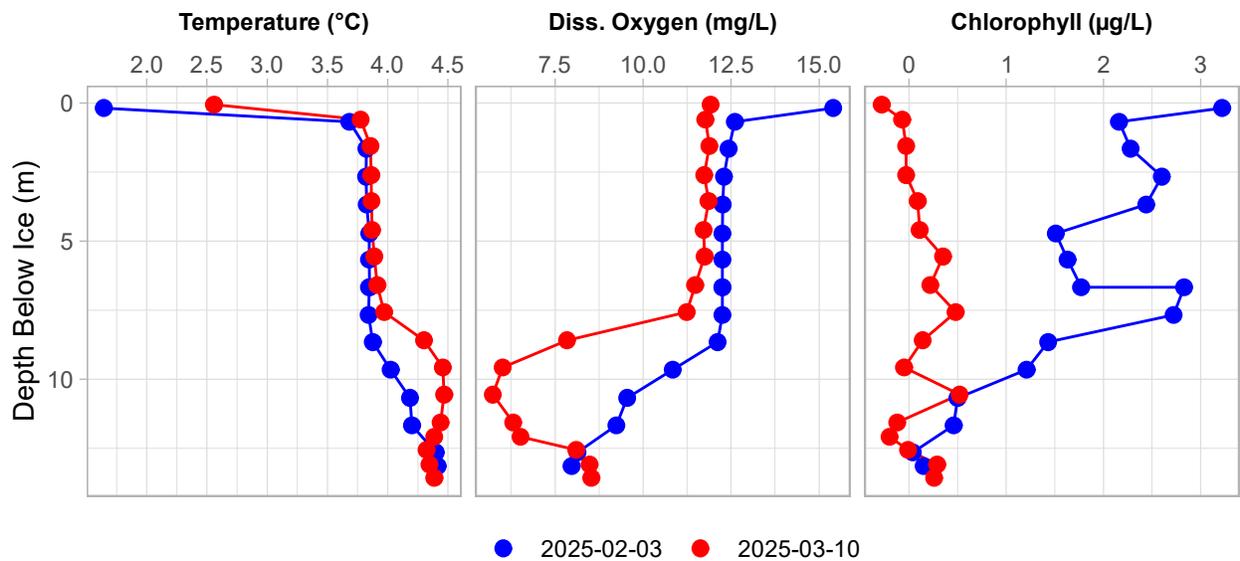
Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-01-31	6.37	5.3	2.8
2025-03-11	9.09	4.6	0.9
Summer 1996–2024 Average (Min–Max)	7.04 (4.60–8.95)	5.7 (3.0–14)	2.8 (1.0–6.0)



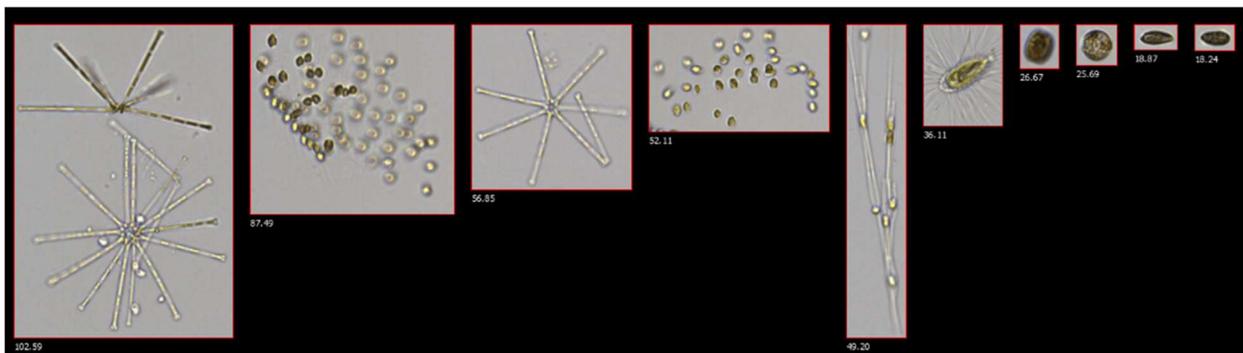
Example FlowCam images captured during runs of the Hancock Pond sample. Numbers indicate diameter in micrometers. Observed taxa include chrysophytes, cryptomonads, diatoms, and dinoflagellates.

## Highland Lake

- Seventh year of winter monitoring.
- Water temperature showed a combination of stratified layers separated by a mixed (no change with depth) layer and a deep, warm mixed layer that formed in March.
- Dissolved oxygen remained above hypoxic levels and decreased with time and depth below about 7 to 8 m; the surface peak in February may have been from photosynthesis and the noticeable sag in March may have been from organic matter decomposition.
- Low to moderate chlorophyll fluorescence decreased with depth in February and decreased with time to extremely low in March (negative values were due to an incorrect calibration offset).
- Secchi, TP, and chlorophyll-a values were within summer long-term ranges, except for a very high Secchi depth and very low chlorophyll-a concentration in March.



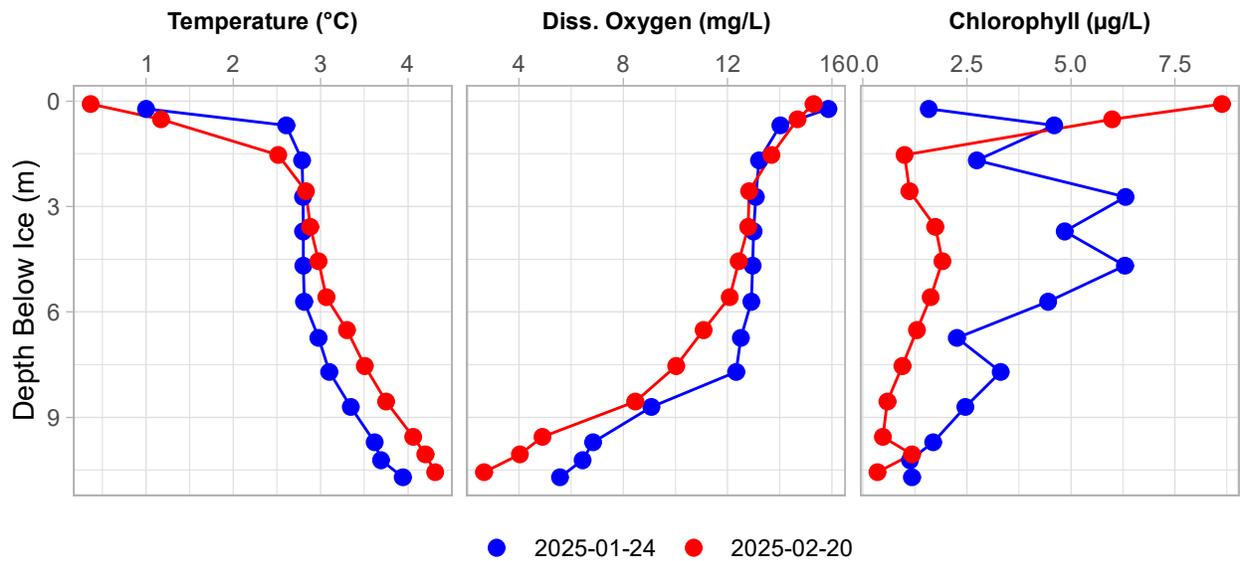
Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-02-03	6.13	4.4	2.1
2025-03-10	10.35	4.1	0.5
Summer 1996–2024 Average (Min–Max)	6.83 (4.80–9.40)	6.5 (3.0–20)	2.8 (1.0–10)



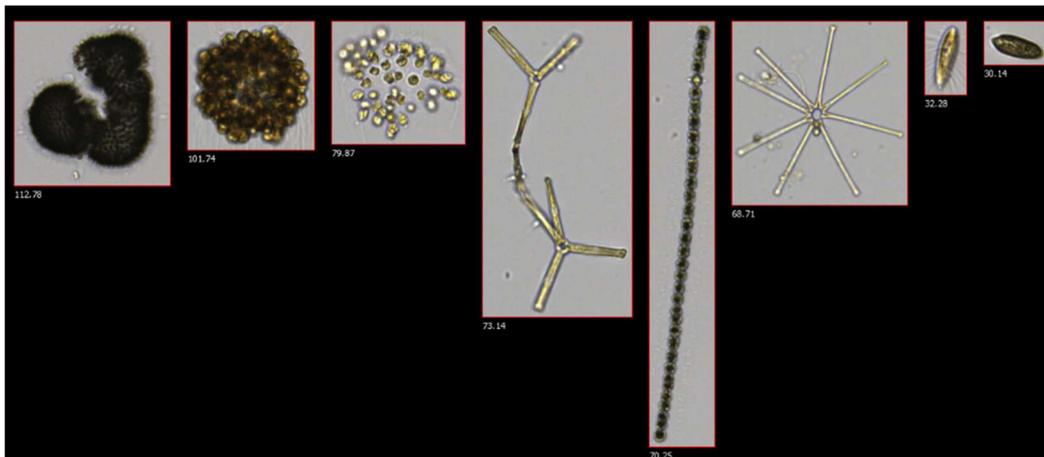
Example FlowCam images captured during runs of Highland Lake samples. Numbers indicate diameter in micrometers. Observed taxa chrysophytes, cryptomonads, and diatoms.

## Keoka Lake

- Seventh year of winter monitoring.
- Water temperature showed a stratified layer above a mixed layer (no change with depth, 1.5-6 m), which shifted to stable and warmer conditions at depth in February.
- Dissolved oxygen decreased with time and depth to just above hypoxic in February.
- Chlorophyll fluorescence switched from moderate and variable concentrations throughout much of the water column in January to a thin, shallow layer with high concentrations in February.
- Chlorophyll-a and TP were elevated in February, but overall, Secchi, TP, and chlorophyll-a values were within summer long-term ranges. High chlorophyll-a concentrations were the likely cause of the below-average Secchi depths.



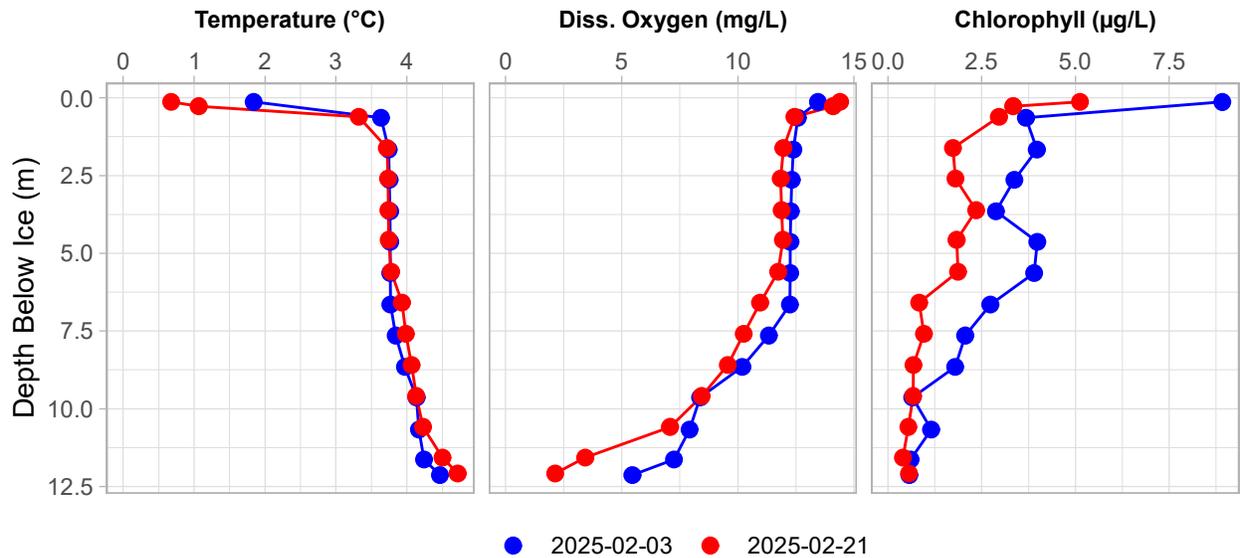
Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-01-24	4.63	7.8	5.9
2025-02-20	3.8	9.3	11.4
Summer 1996–2024 Average (Min–Max)	6.00 (3.50–8.20)	7.6 (3.0–16)	3.7 (0.90–13)



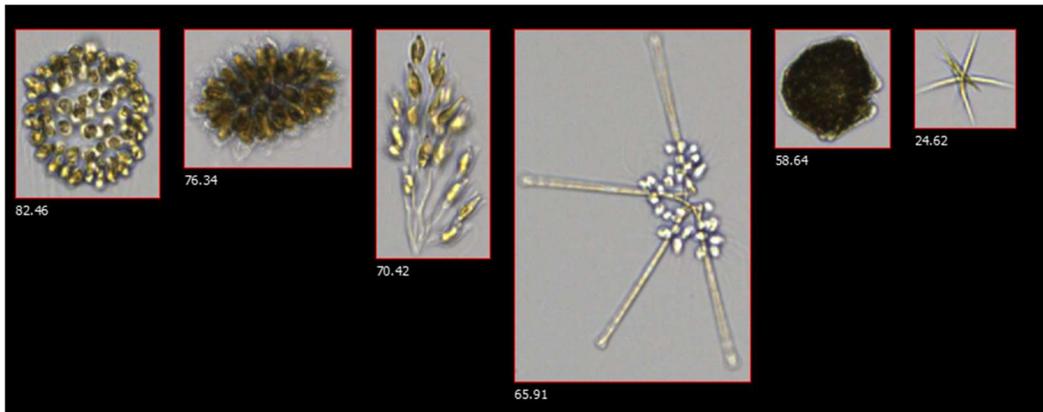
Example FlowCam images captured during runs of Keoka Lake samples. Numbers indicate diameter in micrometers. Observed taxa include chrysophytes, cryptomonads, cyanobacteria, and diatoms.

## Keyes Pond

- Fifth year of winter monitoring.
- Water temperature showed stratified and mixed (no change with depth) layers and little change between visits.
- Dissolved oxygen decreased with time and depth to just above hypoxic in February.
- Chlorophyll fluorescence decreased with time and depth, starting with moderate to high concentrations in shallow waters.
- Secchi, TP, and chlorophyll-a values were all within summer long-term ranges, but Secchi depths were below the long-term average.



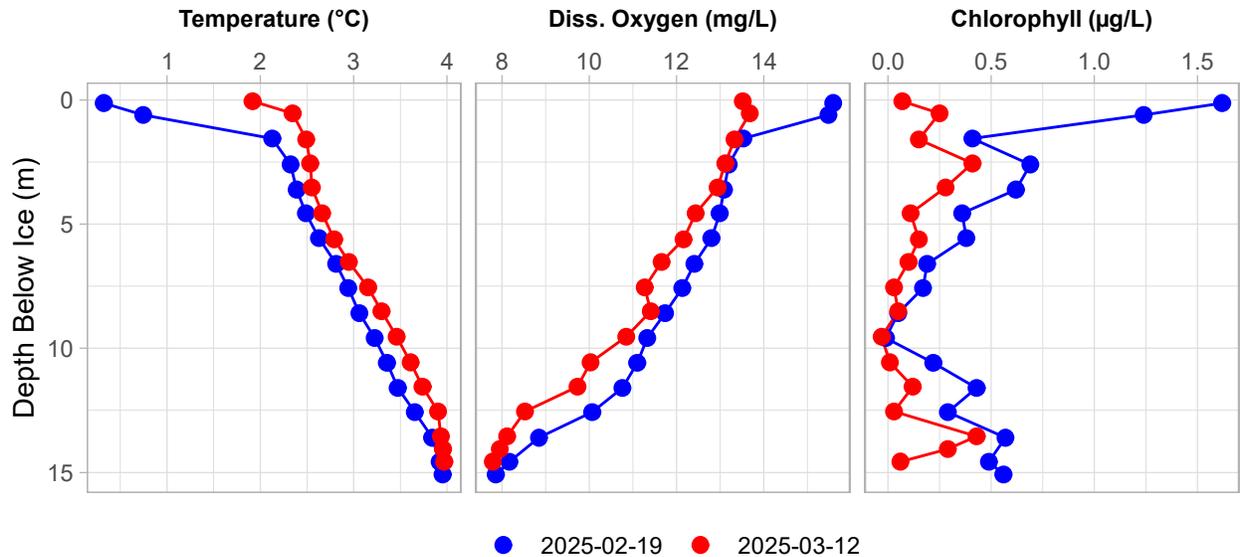
Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-02-03	4.80	7.9	5.3
2025-02-21	5.32	7.0	2.9
Summer 1996–2024 Average (Min–Max)	6.17 (3.20–8.11)	7.2 (3.0–12)	3.3 (1.0–11)



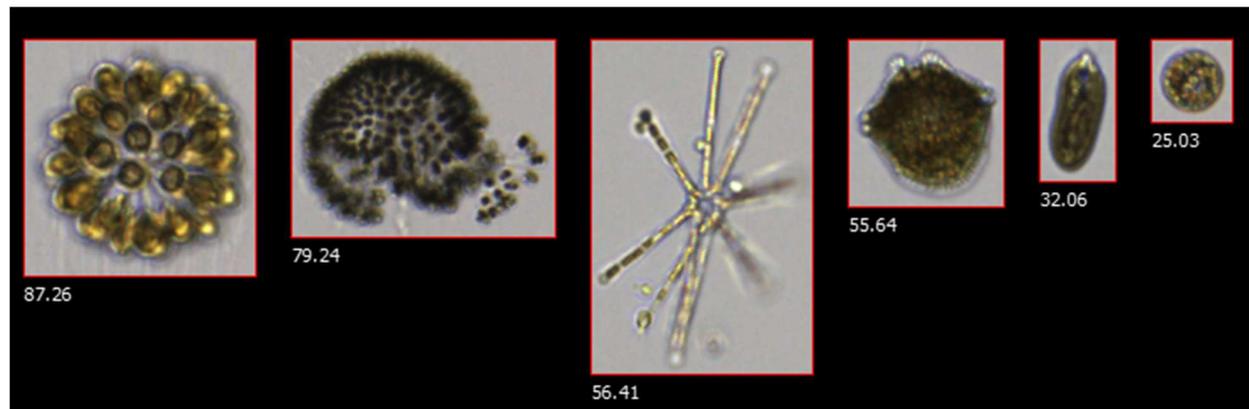
Example FlowCam images captured during runs of Keyes Pond samples. Numbers indicate diameter in micrometers. Observed taxa include chlorophytes, chrysophytes, diatoms, and dinoflagellates.

## Long Lake-North Basin

- Fourth year of winter monitoring.
- Water temperature showed stratified and stable conditions with slight warming between visits.
- Dissolved oxygen decreased with time and depth, but remained above hypoxic levels.
- Chlorophyll fluorescence was low and variable, with a near-surface peak in February.
- Secchi, and TP values were all within summer long-term ranges and not far from long-term averages, but chlorophyll-a was below the long-term minimum.



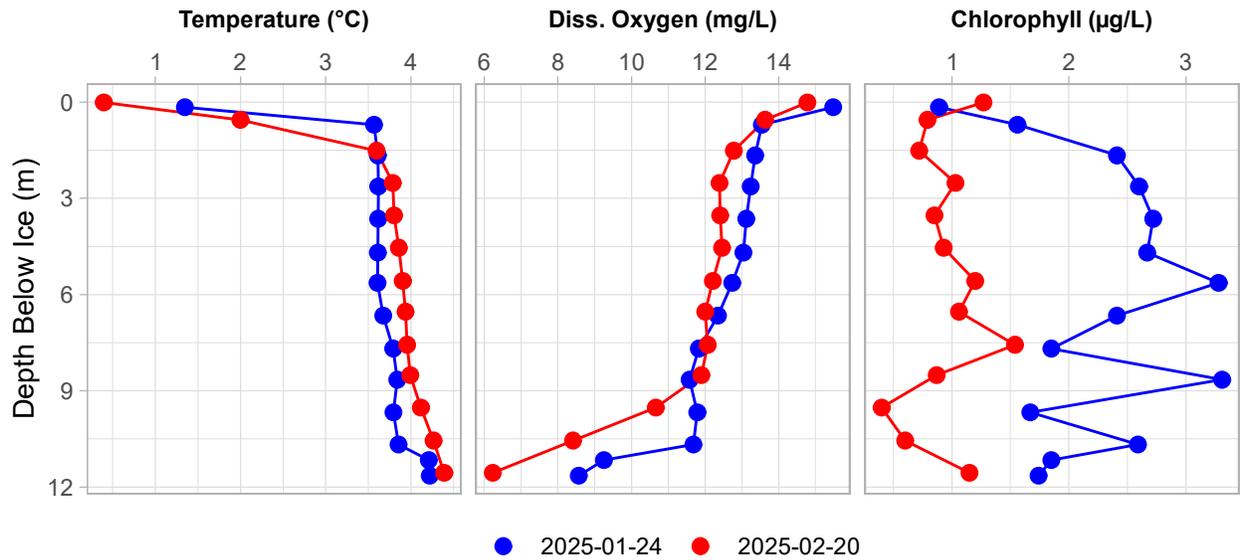
Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-02-19	5.62	7.9	0.7
2025-03-12	7.79	6.4	0.4
Summer 1996–2024 Average (Min–Max)	6.13 (4.00–8.62)	7.3 (3.0–19)	3.0 (1.0–8.7)



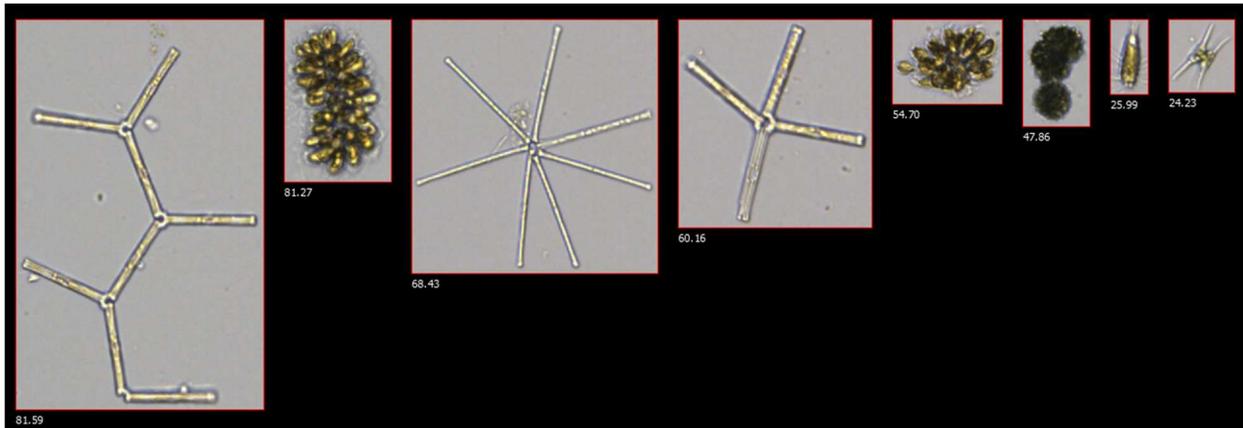
Example FlowCam images captured during runs of the Long Lake sample. Numbers indicate diameter in micrometers. Observed taxa include chrysophytes, cryptomonads, cyanobacteria, diatoms, and dinoflagellates.

## McWain Pond

- Fifth year of winter monitoring.
- Water temperature showed stratified and mixed (no change with depth) layers, changing to more stable and slightly warmer conditions by the second visit.
- Dissolved oxygen decreased with time and depth, but remained above hypoxic levels.
- Chlorophyll fluorescence started as moderate and variable with depth, changing to low by the February visit.
- Secchi, TP, and chlorophyll-a values were all within summer long-term ranges and near or below long-term averages, except for the second Secchi depth value, which was deeper than the long-term average.



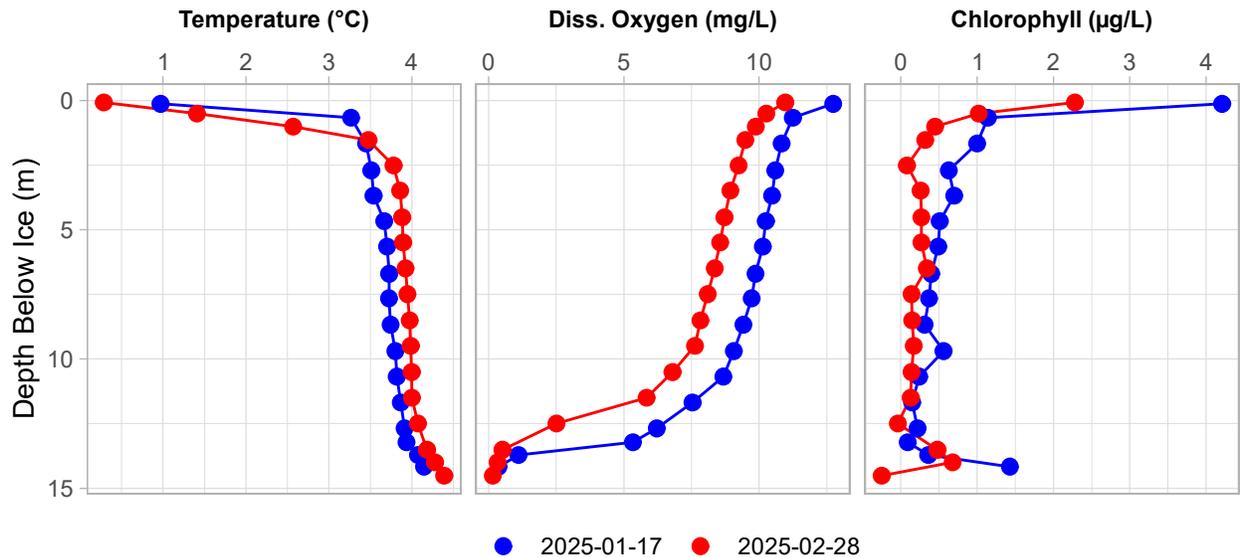
Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-01-24	5.93	6.2	2.3
2025-02-20	6.62	6.2	1.3
Summer 1996–2024 Average (Min–Max)	5.97 (3.40–7.90)	7.1 (1.0–19)	2.9 (1.0–6.0)



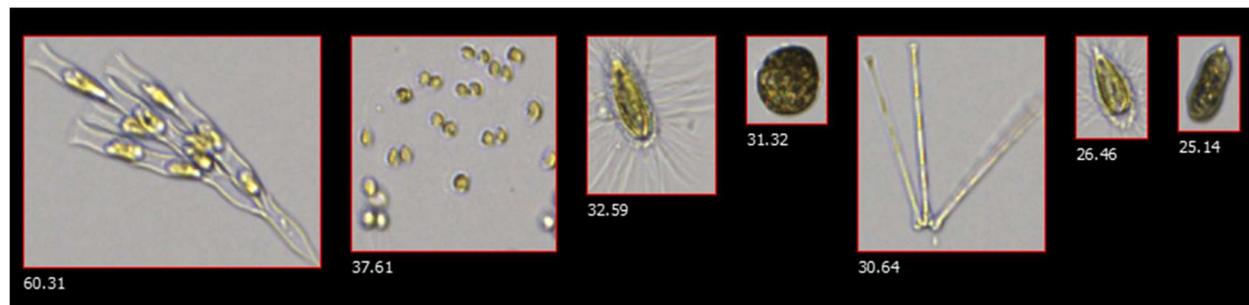
Example FlowCam images captured during runs of McWain Pond samples. Numbers indicate diameter in micrometers. Observed taxa include chlorophytes, chrysophytes, and diatoms.

## Middle Pond

- Fifth year of winter monitoring.
- Water temperature showed both stratified and mixed (no change with depth) layers, with only slightly warmer conditions by the second visit.
- Dissolved oxygen decreased with time and depth, and bottom waters were close to anoxic during both visits.
- Chlorophyll fluorescence was low and variable, except for higher concentrations near the ice-water interface.
- Secchi, TP, and chlorophyll-a values were all within summer long-term ranges and near or below long-term averages.



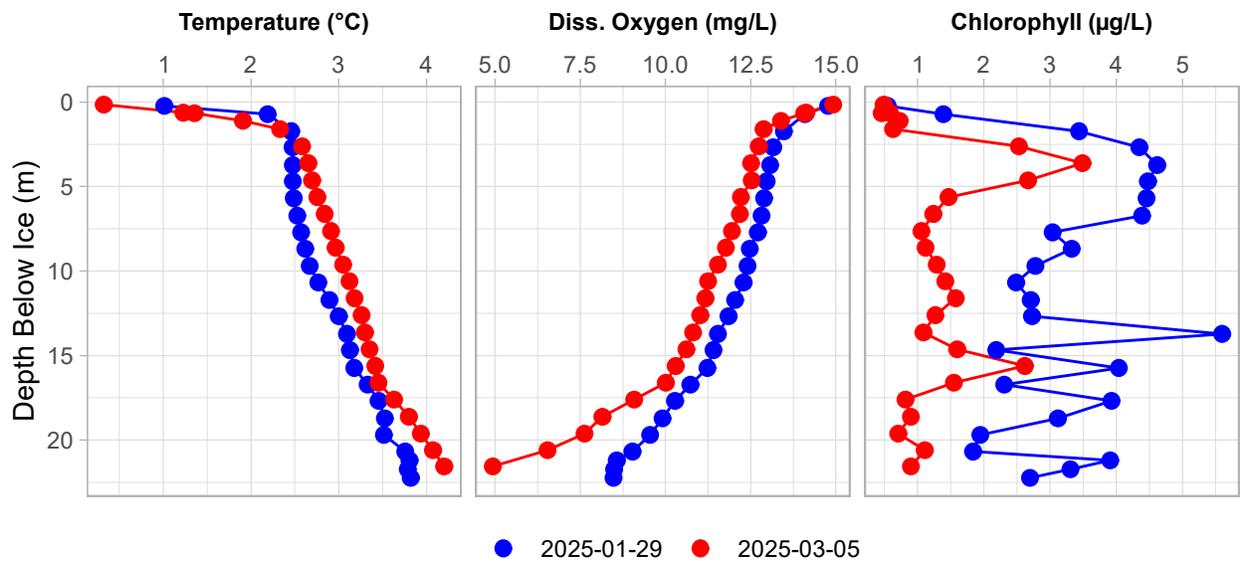
Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-01-17	4.69	7.5	1.2
2025-02-28	4.77	6.3	1.0
Summer 1996–2024 Average (Min–Max)	5.39 (2.00–7.79)	7.5 (3.0–19)	3.4 (1.0–15)



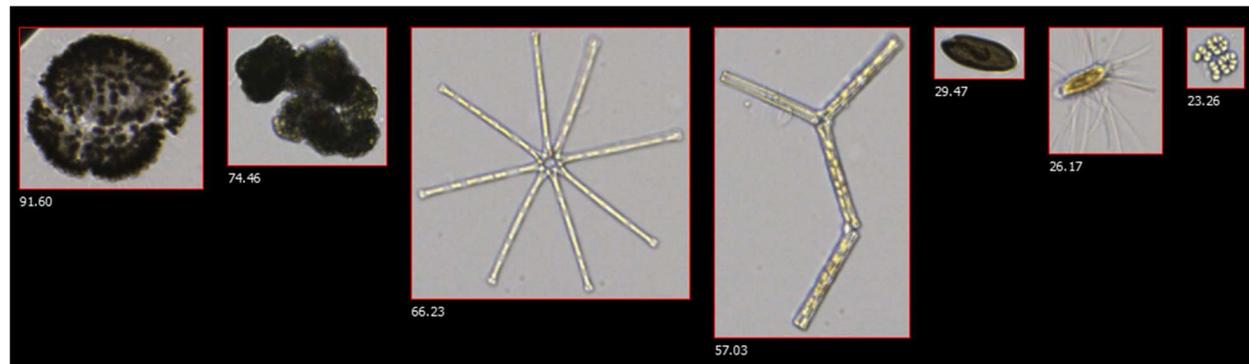
Example FlowCam images captured during runs of Middle Pond samples. Numbers indicate diameter in micrometers. Observed taxa include chrysophytes, cryptomonads, diatoms, and dinoflagellates.

## Moose Pond-Main Basin

- Fifth year of winter monitoring.
- Water temperature showed stratified and stable conditions, except for a mixed layer (no change with depth) between 1 and 6 m in January and slightly warmer conditions by March.
- Dissolved oxygen decreased with time and depth, and bottom waters remained above hypoxic levels.
- Chlorophyll fluorescence started at moderate levels, had a broad peak between 2 and 7 m, and were highly variable in deep water in January; in March, concentrations were lower, though peaks were still evident.
- Secchi, TP, and chlorophyll-a values were all within summer long-term ranges and near or below long-term averages.



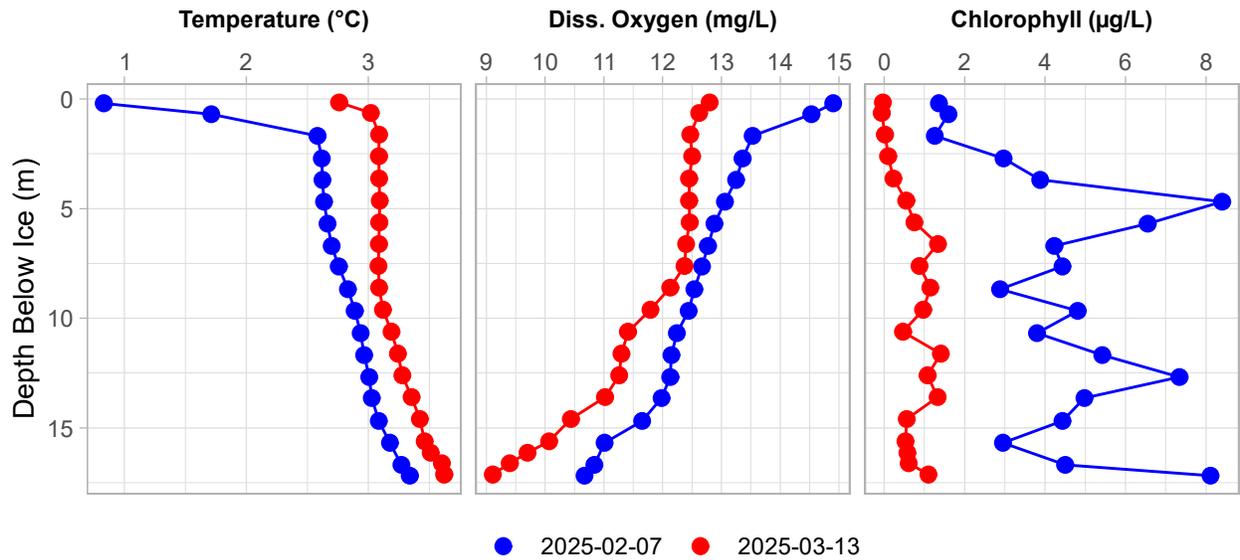
Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-01-29	5.91	5.6	3.1
2025-03-05	5.99	4.8	1.5
Summer 1996–2024 Average (Min–Max)	7.40 (4.52–10.20)	5.7 (3.0–13)	2.8 (1.0–10)



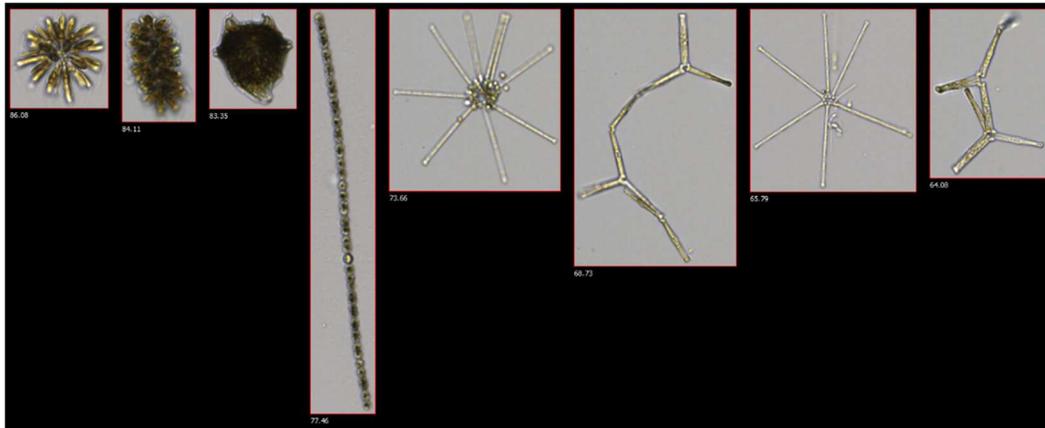
Example FlowCam images captured during runs of Moose Pond samples. Numbers indicate diameter in micrometers. Observed taxa include chlorophytes, chrysophytes, cryptomonads, cyanobacteria, and diatoms.

## Peabody Pond

- Fifth year of winter monitoring.
- Water temperature showed stratified and mixed (no change with depth) layers, with warmer conditions and a deeper mixed layer by March.
- Dissolved oxygen decreased with time and depth, and bottom waters remained above hypoxic levels.
- Chlorophyll fluorescence in February was at moderate to high levels with peaks at about 5 and 12 m, but by March fluorescence decreased to low levels.
- Secchi, TP, and chlorophyll-a values were all within summer long-term ranges and alternated between above and below the long-term averages.



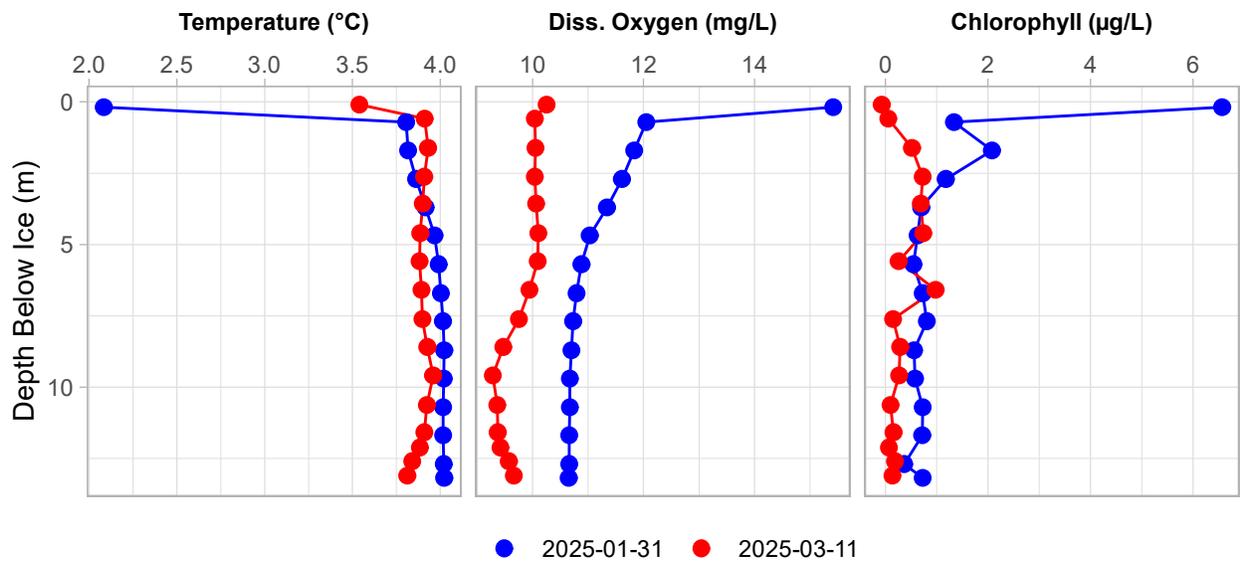
Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-02-07	5.30	7.7	4.1
2025-03-13	8.84	5.3	1.8
Summer 1996–2024 Average (Min–Max)	7.44 (4.60–10.37)	5.6 (2.0–13)	2.6 (0.80–10)



Example FlowCam images captured during runs of Peabody Pond samples. Numbers indicate diameter in micrometers. Observed taxa include chrysophytes, cyanobacteria, diatoms, and dinoflagellates.

## Sand Pond

- Eighth year of winter monitoring.
- Water temperature showed mostly mixed (no change with depth) conditions beneath a thin stratified layer. The unusual slightly cooler deep waters in March could have been caused by incomplete mixing of sun-warmed water to those depths.
- Dissolved oxygen was well above hypoxic levels and decreased with time and only slightly with depth; algal photosynthesis caused supersaturated conditions at the surface in January.
- Chlorophyll fluorescence was mostly low, except for a significant peak in January just under the ice.
- Secchi, TP, and chlorophyll-a values were almost all within summer long-term ranges and were either above (Secchi) or below (TP and chlorophyll-a) the long-term averages.



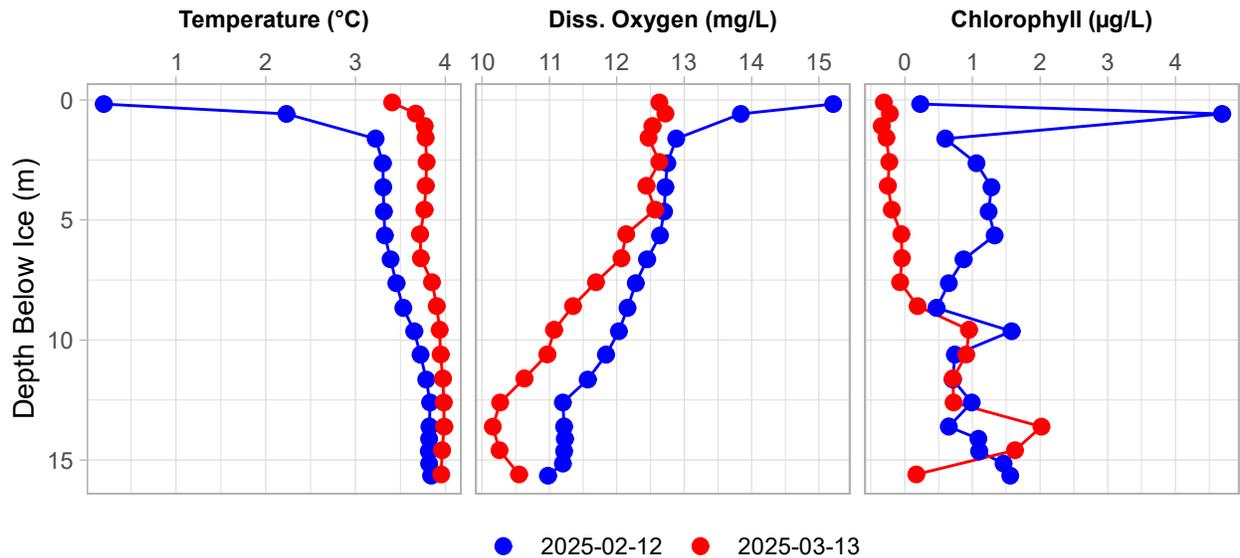
Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-01-31	6.27	7.4	1.9
2025-03-11	7.27	6.8	0.7
Summer 1996–2024 Average (Min–Max)	6.13 (4.00–8.70)	8.3 (5.0–26)	3.5 (1.2–9.0)



Example FlowCam images captured during runs of Sand Pond samples. Numbers indicate diameter in micrometers. Observed taxa include chrysophytes, cryptomonads, diatoms, and dinoflagellates.

## Trickey Pond

- Seventh year of winter monitoring.
- Water temperature showed a combination of stratified and mixed (no change with depth) layers with an increase in temperatures over time.
- Dissolved oxygen was well above hypoxic levels and decreased with time and depth; algal photosynthesis may have contributed to peak surface concentrations in February.
- Chlorophyll fluorescence was mostly low, except for a significant peak in February in the upper 1 m (negative values in March were due to an incorrect calibration offset).
- Secchi, TP, and chlorophyll-a values were all within summer long-term ranges and were at or below the long-term averages, except the high Secchi depth value in March.



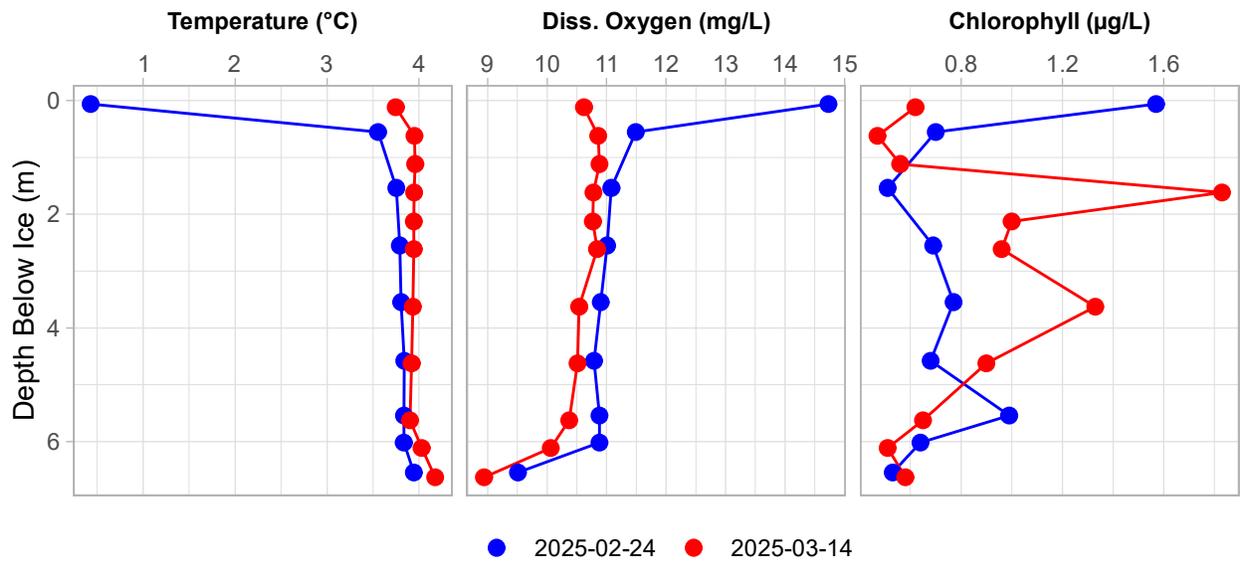
Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-02-12	8.00	5.2	1.8
2025-03-13	12.78	5.0	0.8
Summer 1996–2024 Average (Min–Max)	9.95 (6.40–14.70)	5.2 (2.0–10)	1.8 (0.47–6.7)



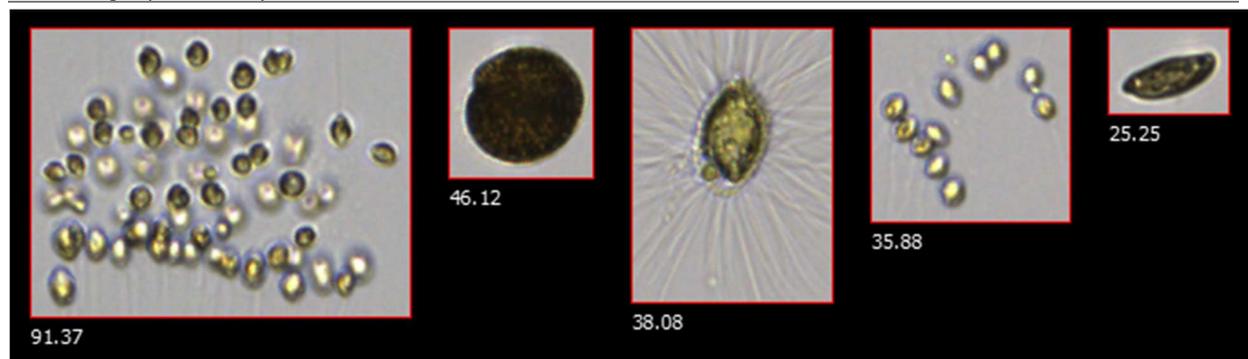
Example FlowCam images captured during runs of Trickey Pond samples. Numbers indicate diameter in micrometers. Observed taxa include chlorophytes, chrysophytes, cyanobacteria, and diatoms.

## Woods Pond

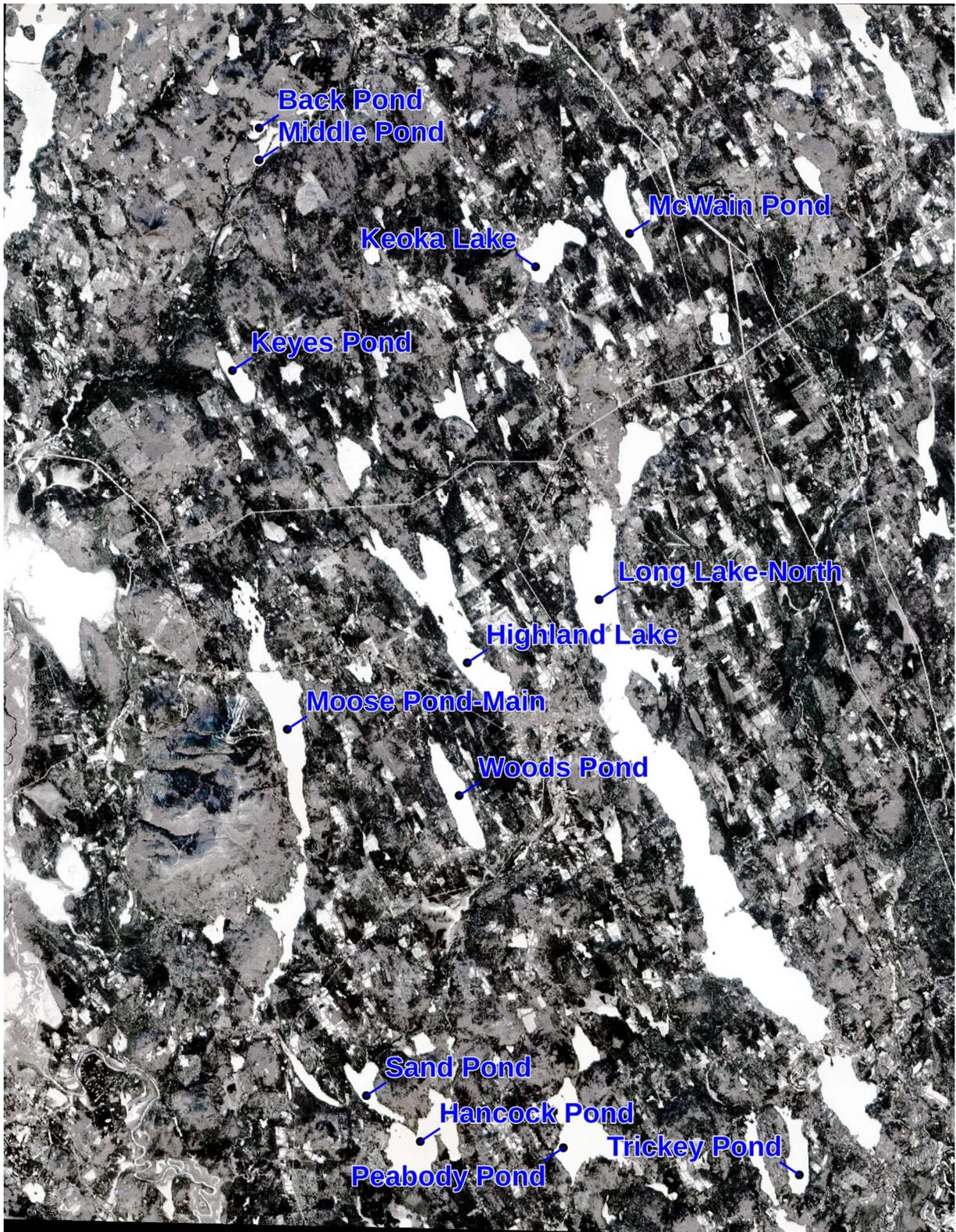
- Sixth year of winter monitoring.
- Water temperature showed mostly mixed (no change with depth) conditions beneath a thin stratified layer and only minor temperature increase over time.
- Dissolved oxygen was well above hypoxic levels and decreased slightly with time and depth; the peak surface concentration in February was mostly due to temperature effects.
- Chlorophyll fluorescence was mostly low and variable, with a peak just under the ice in February and around 2 m in March.
- Secchi and TP values were all within summer long-term ranges, but chlorophyll-a values were lower than the long-term minimum. Chlorophyll-a and TP were below the long-term average concentrations, while Secchi values were above average.



Collection Date	Secchi Depth (m)	Total Phosphorus (ppb)	Chlorophyll-a (ppb)
2025-02-24	5.41	5.9	0.8
2025-03-14	6.25	5.1	0.9
Summer 1996–2024 Average (Min–Max)	4.99 (3.00–7.50)	8.1 (4.0–16)	3.1 (1.0–11)



Example FlowCam images captured during runs of Woods Pond samples. Numbers indicate diameter in micrometers. Observed taxa include chrysophytes, cryptomonads, and dinoflagellates.



*Winter monitoring locations shown on top of Sentinel-2 satellite imagery from 2025-02-05*



Thank you for supporting our work. If you have any questions about this report or its content, or would like to share your thoughts, please contact Ben Peierls: [ben@mainelakes.org](mailto:ben@mainelakes.org)

