



2023 VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

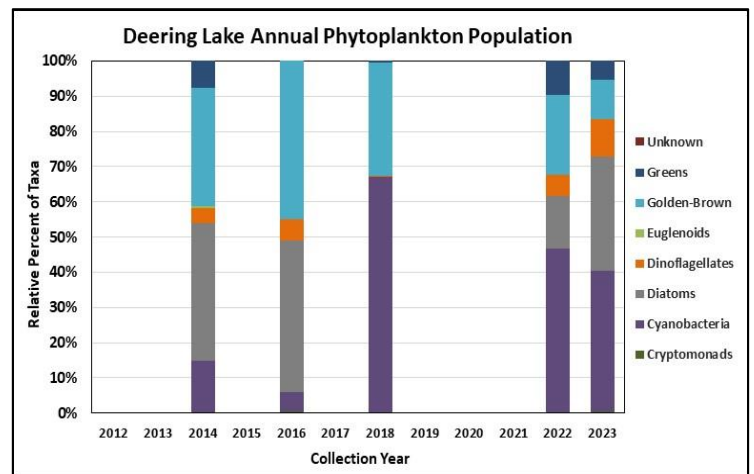
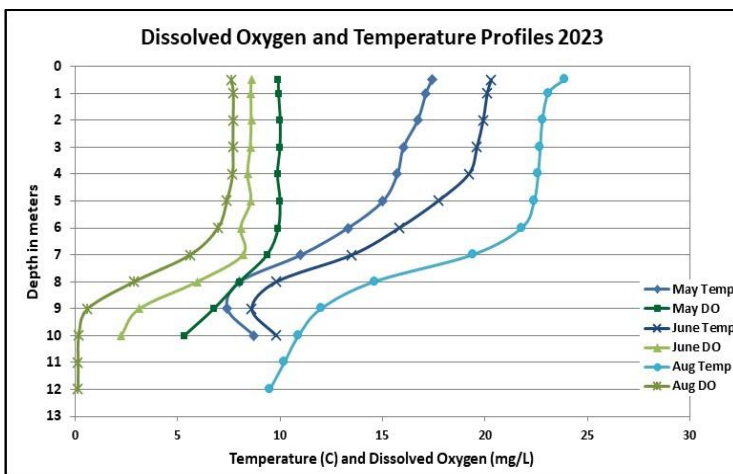
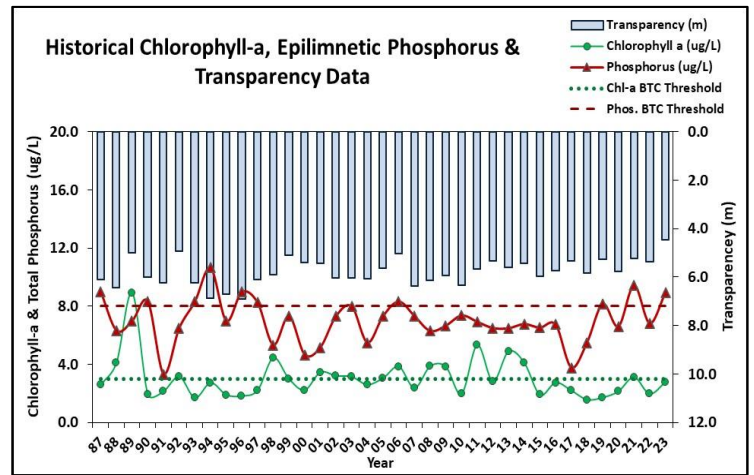
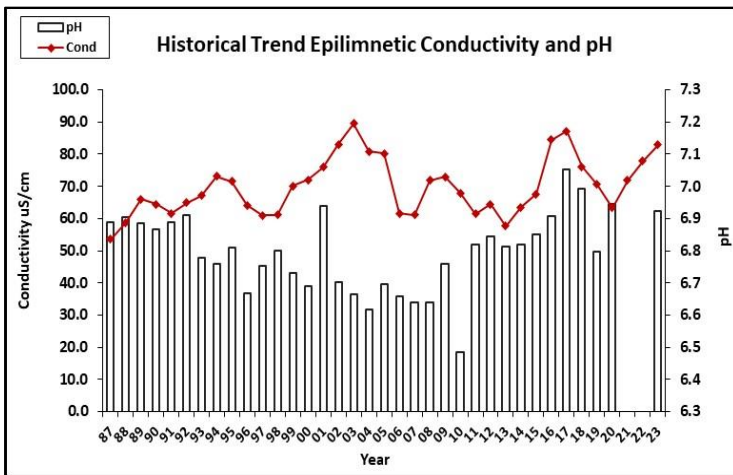
DEERING LAKE, DEERING

Recommended Actions: Great job sampling in 2023! Lake phosphorus levels increased in 2023 and water clarity was poor likely due to the excessive summer rainfall amounts, similar to that experienced in 2021. This highlights the importance of managing stormwater runoff from lake and watershed properties. Great job collecting monthly dissolved oxygen and temperature profiles! Phytoplankton data suggest [Cyanobacteria](#) are becoming more dominant in the lake and highlights the importance of minimizing nutrient (phosphorus) loading from the watershed. Keep an eye on the lake for any signs of Cyanobacteria blooms or surface scums and alert NHDES' [Harmful Algal Bloom Program](#). Campbell Cove Inlet experienced elevated phosphorus levels following a storm event in August. Continue monitoring this new location and monitor any logging activities in the sub-watershed for areas of stormwater runoff and erosion. Encourage winter maintenance companies to obtain NH Salt Applicator License through the [Green SnowPro Certification](#) Program. Encourage the town to conduct spring cleaning of roadside ditches and catch-basins to remove sand/salt that accumulated over winter. Educate shorefront property owners on becoming certified [LakeSmart](#) through NH LAKES' lake-friendly living program. Watershed management efforts should focus on [managing stormwater runoff](#), [dirt/gravel road stabilization](#), and reduced application of [road salt](#) and sand during winter months. Keep up the great work!

HISTORICAL WATER QUALITY TREND ANALYSIS

PARAMETER	TREND	PARAMETER	TREND
Conductivity	Worsening	Chlorophyll-a	Stable
pH (epilimnion)	Stable	Transparency	Worsening
Phosphorus (hypolimnion)	Improving	Phosphorus (epilimnion)	Stable

HISTORICAL WATER QUALITY GRAPHICS





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OBSERVATIONS *(Refer to Table 1 and Historical Deep Spot Data Graphics)*

- ◆ **CHLOROPHYLL-A:** Chlorophyll level was low in May, increased to a slightly elevated level in June, and decreased to a low level in August. Average chlorophyll level increased slightly from 2022 but remained less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), Center Inlet, Outlet, and Zowski Inlet conductivity levels were greater than the state medians, yet less than a level of concern. Campbell Cove Inlet conductivity and chloride levels were low. Main Inlet conductivity and chloride levels were slightly elevated and Morotta Inlet conductivity and chloride levels were greatly elevated, however chloride levels did not exceed the state chronic chloride standard. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.
- ◆ **COLOR:** Apparent color measured in the epilimnion indicates the water was clear in May, and darkened slightly to a lightly tea colored, or light brown, range in June and August.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was slightly elevated in June and decreased slightly in August. Average epilimnetic phosphorus level increased slightly from 2022, was less than the state median, and was slightly greater than the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus level fluctuated within a slightly elevated range. Hypolimnetic phosphorus level was elevated in August and the turbidity of the sample was also elevated indicating potential release of phosphorus from bottom sediments under anoxic (no dissolved oxygen) conditions. Campbell Cove Inlet and Main Inlet phosphorus levels were elevated in August and the turbidity of the samples was also slightly elevated following a rain event. Center Inlet, Outlet and Zowski Inlet phosphorus levels fluctuated within a low range. Morotta Inlet phosphorus levels fluctuated within an average range for that station.
- ◆ **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was below average (worse) in May, decreased slightly in June, and increased (improved) slightly in August. Average NVS transparency decreased (worsened) from 2022 but remained higher (better) than the state median. Historical trend analysis indicates significantly decreasing (worsening) NVS transparency since monitoring began. Viewscope (VS) transparency was higher (better) than NVS transparency but also below average.
- ◆ **TURBIDITY:** Epilimnetic turbidity level was slightly elevated in June following a significant rainfall. Metalimnetic turbidity levels were slightly elevated in June and August, and Hypolimnetic turbidity level was elevated in August. Center Inlet, Campbell Cove Inlet, Main Inlet, and Morotta Inlet turbidity levels were elevated in August following a storm event. Outlet and Zowski turbidity levels fluctuated within a low range for those stations.
- ◆ **pH:** Epilimnetic, Metalimnetic and tributary pH levels were within the desirable range 6.5-8.0 units. Hypolimnetic pH was slightly acidic and less than desirable. Historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began.

Table 1. 2023 Average Water Quality Data for DEERING RESERVOIR - DEERING

Station Name	Alk. (mg/L)	Chlor-a (ug/L)	Chloride (mg/L)	Color (pcu)	Cond. (us/cm)	Total P (ug/L)	Trans. (m)		Turb. (ntu)	pH
							NVS	VS		
Epilimnion	6.4	2.78	16	26	82.9	9	4.45	5.50	0.96	6.92
Metalimnion	-	-	-	-	87.2	11	-	-	1.12	6.54
Hypolimnion	-	-	-	-	99.4	15	-	-	6.04	6.38
Campbell Cove Inlet	-	-	2	-	53.8	26	-	-	3.04	7.09
Center Inlet	-	-	12	-	83.0	13	-	-	1.48	6.87
Main Inlet	-	-	25	-	141.6	14	-	-	2.55	6.52
Morotta Inlet	-	-	71	-	223.0	16	-	-	2.72	6.88
Outlet	-	-	14	-	82.7	8	-	-	0.74	6.89
Zowski Inlet	-	-	20	-	118.0	11	-	-	1.23	6.90

NH Median Values

Median values generated from historic lake monitoring data.

Alkalinity: 4.5 mg/L **Chlorophyll-a:** 4.39 ug/L
Conductivity: 42.3 uS/cm **Chloride:** 5 mg/L
Total phosphorus: 11 ug/L **Transparency:** 3.3 m
pH: 6.6

NH Water Quality Standards

Numeric criteria for specific parameters. Water quality violation if exceeded.

Chloride: > 230 mg/L (chronic) **Turbidity:** > 10 NTU above natural
E. coli: > 88 cts/100 mL (beach)
E. coli: > 406 cts/100 mL (surface waters)
pH: between 6.5-8.0 (unless naturally occurring)