



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

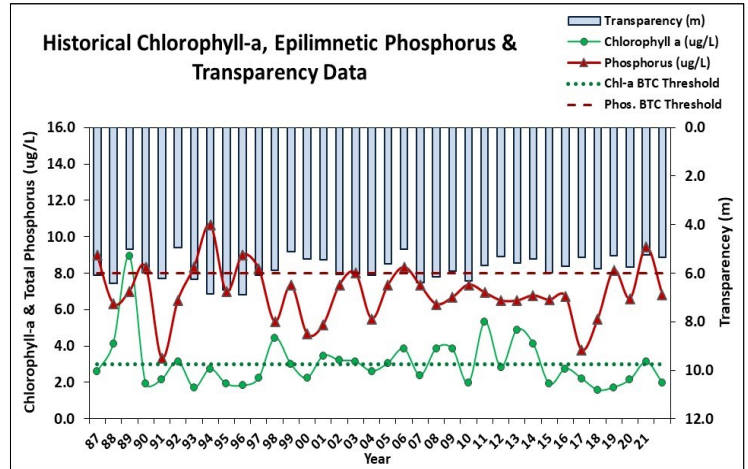
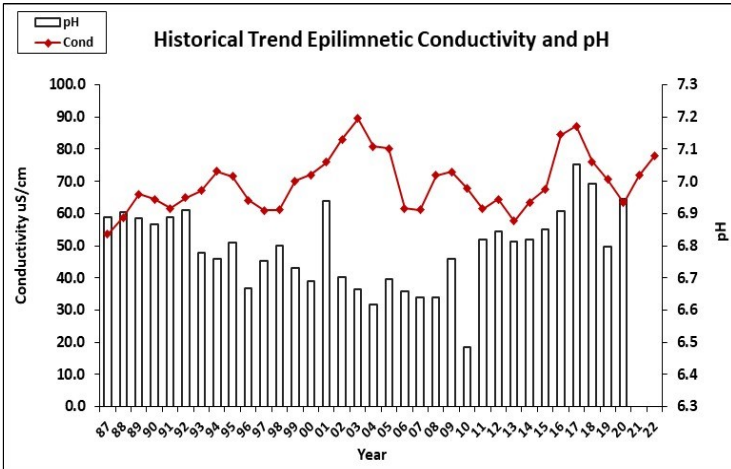
DEERING LAKE, DEERING

2022 DATA SUMMARY

RECOMMENDED ACTIONS: Great job sampling in 2022! Lake phosphorus and chlorophyll levels returned to a low range in 2022 following the spike in 2021 which is a positive sign. Great job collecting monthly dissolved oxygen and temperature profiles! This will help to better understand thermal stratification and presence/extent of anoxia in the Hypolimnion. Remember to adjust deep spot sample depths to collect a sample in the middle of each thermal layer identified through the temperature profile. 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](#). Zowski Inlet experienced elevated phosphorus levels following a storm event in July and efforts should be made to investigate the sub-watershed for areas of stormwater runoff and erosion and evaluate potential remediation strategies. Elevated chloride levels in Main and Morotta Inlets suggests negative impacts from winter road salt. 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 owner's 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/sand during winter months. Keep up the great work!

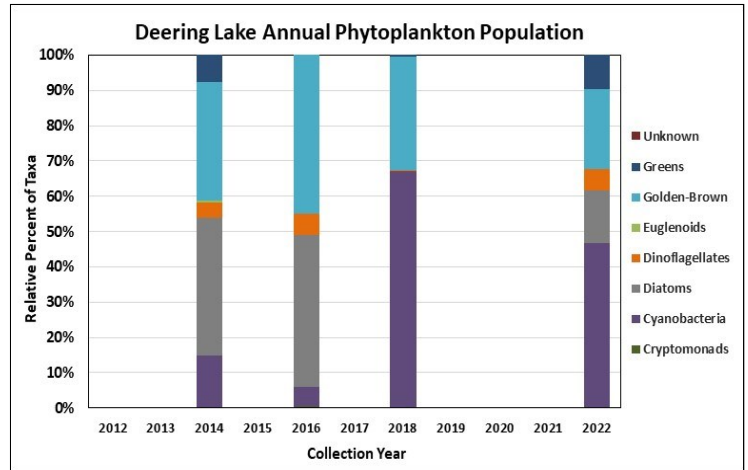
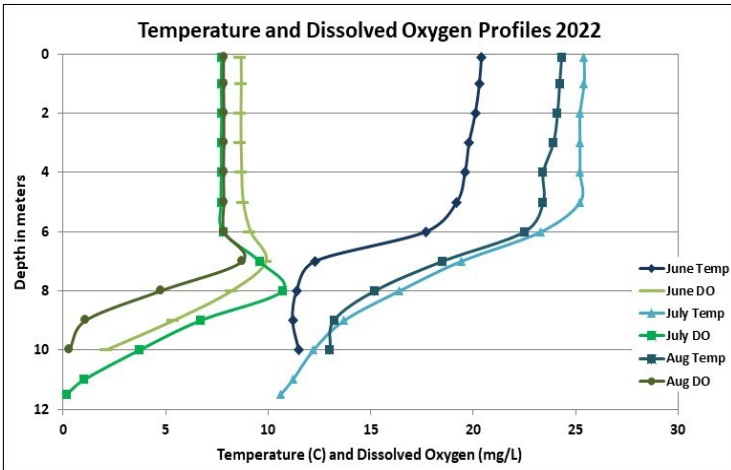
HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Parameter	Trend
Conductivity	Worsening	Chlorophyll-a	Stable
pH (epilimnion)	Stable	Transparency	Worsening
		Phosphorus (epilimnion)	Stable



DISSOLVED OXYGEN AND PHYTOPLANKTON

(Note: Information may not be collected annually)





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

- ◆ **CHLOROPHYLL-A:** Chlorophyll level was within a low range in June and increased slightly through August. Average chlorophyll level decreased from 2021 and was less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates stable, yet variable, chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), Outlet, and Zowski Inlet conductivity levels were greater than the state medians, yet less than a level of concern. Main Inlet conductivity and chloride levels were 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 with little to no tea, or brown, coloring.
- ◆ **E. COLI:** Beach E. coli levels were very low and much less than the state standard for public beaches.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level fluctuated within a low range and was lowest in July and highest in June. Average epilimnetic phosphorus level decreased from 2021 and was less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates stable, yet variable, epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus level was slightly elevated in July potentially due to a layer of algae at that depth. Hypolimnetic phosphorus level was slightly elevated in July and August and the turbidity of the samples was also slightly elevated suggesting potential release of phosphorus from bottom sediments. Main Inlet phosphorus level was slightly elevated in August and the turbidity of the sample was also elevated. Morotta Inlet phosphorus level fluctuated within a low range for that station. Outlet phosphorus levels were low. Zowski phosphorus level was elevated in July following a significant storm event.
- ◆ **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was within an average range in June and increased (improved) slightly as the summer progressed. Average NVS transparency remained stable with 2021 and was higher (better) than the state median. Viewscope (VS) transparency was much higher than NVS transparency and a better measure of actual conditions.
- ◆ **TURBIDITY:** Epilimnetic, Metalimnetic, Outlet, and Zowski Inlet turbidity levels fluctuated within a low range. Hypolimnetic turbidity level was slightly elevated in July and August potentially due to formation and accumulation of organic compounds under anoxic (no dissolved oxygen) conditions. Main Inlet turbidity level was elevated in August likely due to low flow conditions. Morotta Inlet turbidity level was slightly elevated in July following a significant storm event.
- ◆ **pH:** Epilimnetic pH data were invalidated due to a laboratory instrument error and we apologize for the inconvenience. Metalimnetic, Main Inlet, Morotta Inlet, Outlet, and Zowski Inlet pH levels were within the desirable range 6.5-8.0 units. Hypolimnetic pH level was slightly less than desirable. Historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began.

Station Name	Table 1. 2022 Average Water Quality Data for DEERING RESERVOIR - DEERING										
	Alk. (mg/L)	Chlor-a (ug/L)	Chloride (mg/L)	Color (pcu)	Cond. (us/cm)	E. coli (mpn/100 mL)	Total P (ug/L)	Trans. (m)		Turb. (ntu)	pH
								NVS	VS		
Epilimnion	6.6	1.97	16	10	77.8		7	5.36	7.11	0.50	
Metalimnion					79.7		9			0.50	6.90
Hypolimnion					79.8		15			1.74	6.30
Beach						2					
Main Inlet			40		176.6		14			5.58	6.64
Morotta Inlet			109		426.3		11			1.54	6.88
Outlet			16		81.2		8			0.51	6.95
Zowski Inlet			17		104.6		14			0.63	6.99

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 thresholds 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)