



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

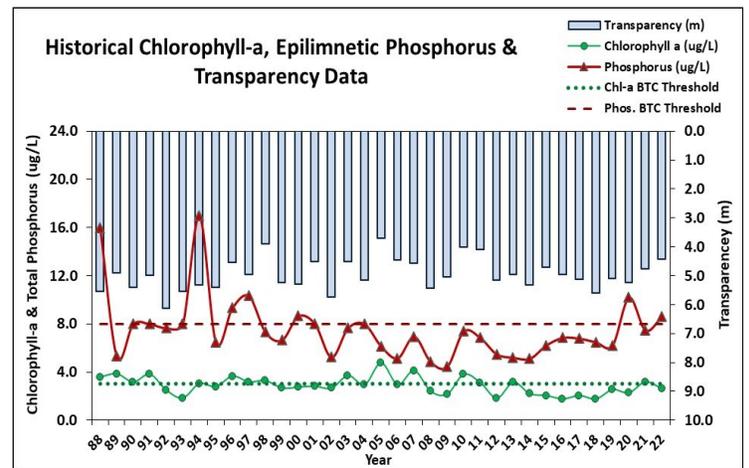
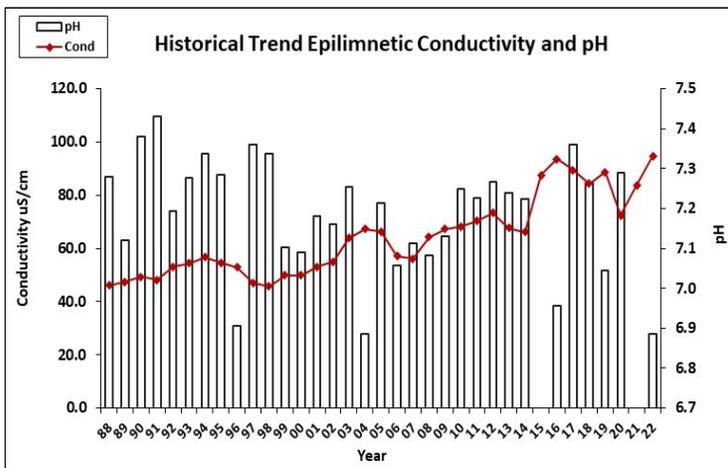
RUST POND, WOLFEBORO

2022 DATA SUMMARY

RECOMMENDED ACTIONS: Great job sampling in 2022! Pond quality is representative of oligotrophic, or high quality, conditions and the improving water quality trends are encouraging. However, sample depths in recent years were modified to be more representative of deep spot thermal layer conditions and suggest that a deep layer of algae/cyanobacteria are present in Metalimnetic waters taking advantage of low light conditions and nutrient availability from Hypolimnetic waters. Hypolimnetic phosphorus data suggest nutrient release from bottom sediments under anoxic conditions in late summer which tends to fuel cyanobacteria growth in our oligotrophic systems. Keep an eye on the pond in late summer for any signs of cyanobacteria surface scums/blooms and [notify NHDES' Harmful Algal Bloom Program](#) if observed. The varying climate conditions in recent years highlights the delicate balance of the lake system and impacts to water quality with changing periods of ice cover, earlier ice out, droughts, water level fluctuations, nutrient flushing or retainment, and flashier storm events and runoff. It is important to minimize nutrient loading to the pond by controlling stormwater runoff, [maintaining septic systems](#), minimizing erosion of shoreline, and maintaining vegetative buffers. [NH LAKES](#) and [NHDES](#) have educational and outreach materials to educate homeowners. Encourage shorefront property owners to be certified [LakeSmart](#) through NH LAKES' lake-friendly living program. North End Inlet water quality has become increasingly variable due to beaver activity. Consult an environmental engineer to discuss solutions to this issue if the association is concerned. Educate local winter maintenance companies on the [Green SnowPro Certification](#) program and encourage local businesses to utilize companies that have obtained this certification. Keep up the great work!

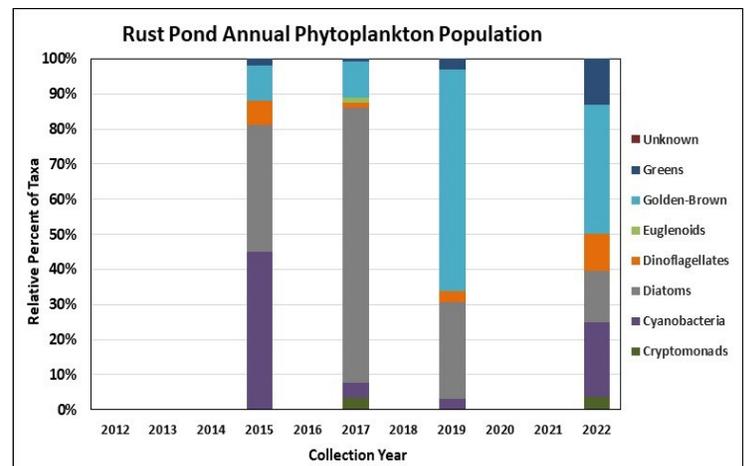
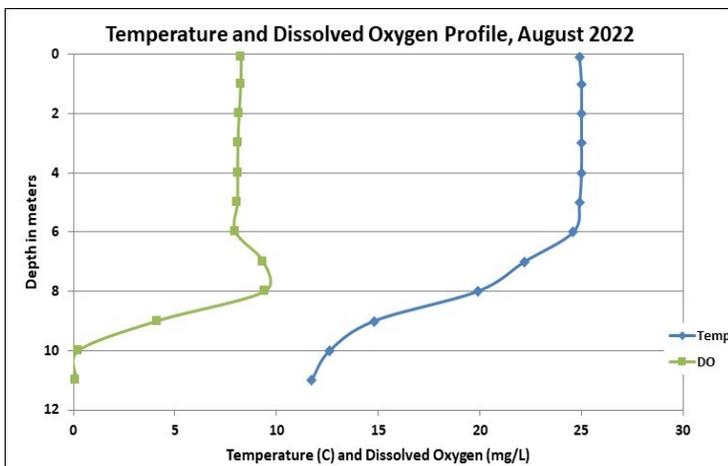
HISTORICAL WATER QUALITY TREND ANALYSIS

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



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 decreased gradually through August. Average chlorophyll level decreased slightly from 2021 and was less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), and Outlet conductivity levels remained slightly greater than the state median. Epilimnetic chloride levels were also slightly greater than the state median yet much less than the state chronic chloride standard. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. Perry Brook and Golf Course conductivity levels were average for NH lakes and chloride levels were approximately equal to the state median. North Inlet conductivity and chloride levels were elevated particularly in July and were much greater than the state medians.
- ◆ **COLOR:** Apparent color measured in the epilimnion indicates the water was lightly tea colored, or light brown, in June, and then lightened to within a clear range in July and August.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was slightly elevated in June, decreased to a low level in July, and remained stable in August. Average epilimnetic phosphorus level increased from 2021, was less than the state median, and was slightly greater than the threshold for oligotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus level was elevated in June and lab data noted light organic matter in the sample which could indicate a layer of algae/cyanobacteria at that depth, and levels decreased to a normal range in July and increased slightly in August. Hypolimnetic phosphorus level was moderate in June and July and elevated in August indicating potential release of phosphorus from bottom sediments under anoxic (low dissolved oxygen) conditions. North End Inlet phosphorus level was greatly elevated in June and July and lab data note sediment in samples. Outlet phosphorus levels fluctuated within a low range. Perry Brook phosphorus level was slightly elevated in July during low flow conditions and the turbidity of the sample was also slightly elevated. Golf Course Outlet phosphorus level was within a low to average range for surface waters in August.
- ◆ **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was below average (worse) in June when deep spot phosphorus, turbidity and chlorophyll levels were higher, increased (improved) in July, and remained stable in August. Average NVS transparency decreased (worsened) slightly from 2021 but remained higher (better) than the state median. Historical trend analysis indicates stable NVS transparency since monitoring began. Viewscope (VS) transparency was also below average in June, was higher (better) than NVS transparency, and a better measure of actual conditions.
- ◆ **TURBIDITY:** Epilimnetic and Metalimnetic turbidity levels were slightly elevated in June and lab data noted organic matter in the Metalimnetic sample indicating a potential layer of algae/cyanobacteria at that depth. Hypolimnetic turbidity level was slightly elevated in August and field data noted colored water indicating the formation and accumulation of organic compounds under anoxic conditions. Golf Course Outlet turbidity level was within a slightly elevated range. North End Inlet turbidity levels were elevated in June and July. Outlet turbidity level fluctuated within a low range. Perry Brook turbidity level was slightly elevated in July during low flows and in August following a storm event.
- ◆ **PH:** Epilimnetic, Metalimnetic, Hypolimnetic, Golf Course Outlet, North End Inlet, Outlet, and Perry Brook pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates stable, yet variable epilimnetic pH levels since monitoring began.

Station Name	Table 1. 2022 Average Water Quality Data for RUST POND - WOLFEBORO									
	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	14.1	2.60	16	20	94.8	9	4.44	5.46	0.59	6.88
Metalimnion					93.9	13			0.76	7.20
Hypolimnion					99.0	17			1.84	6.76
Golf Course Outlet			5		72.4	12			1.24	7.52
North End Inlet			53		222.0	53			2.82	6.79
Outlet					96.3	8			0.49	7.45
Perry Brook			5		66.3	17			1.76	7.39

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)