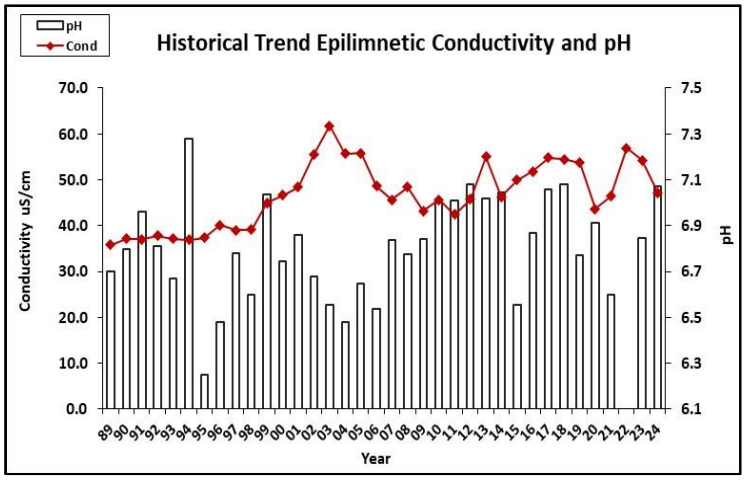
2024 VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
WHITE OAK POND, HOLDERNESS

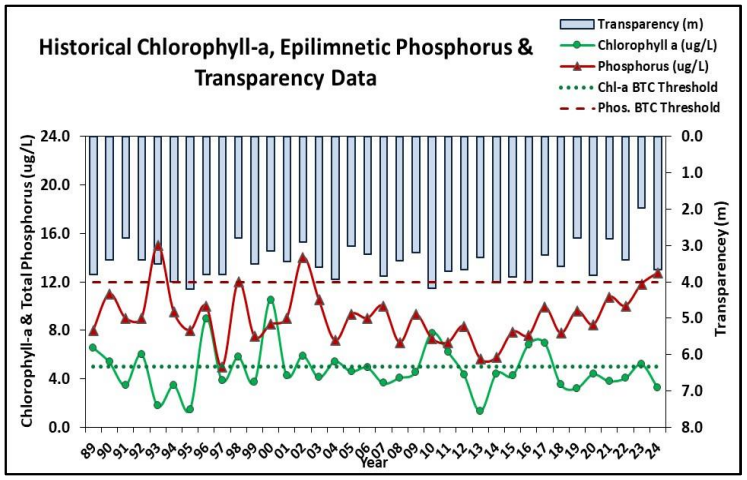
RECOMMENDED ACTIONS: Great job monitoring water quality in 2024! Pond quality is generally representative of mesotrophic, or average, conditions however chlorophyll levels tend to fluctuate above the threshold for mesotrophic lakes, and epilimnetic phosphorus levels have steadily increased since 2014. Cyanobacteria bloomed in September and October resulting in a lake warning. Internal nutrient loads, the increased intensity of storm events, increased frequency of summer drought conditions, longer growing seasons, and warmer water temperatures are likely contributing to the increased occurrence of cyanobacteria blooms. This highlights the importance of minimizing external sources of nutrient loading from the watershed. Great job moving forward with the development of a watershed management plan to identify and quantify nutrient loading to the pond and make recommendations on implementing best practices to reduce stormwater runoff. Encourage shoreline property owners to become certified LakeSmart through NH LAKES' lake-friendly living program. Consider adding a late summer sampling event to assess water column nutrient loads and chlorophyll levels. Keep up the great work!

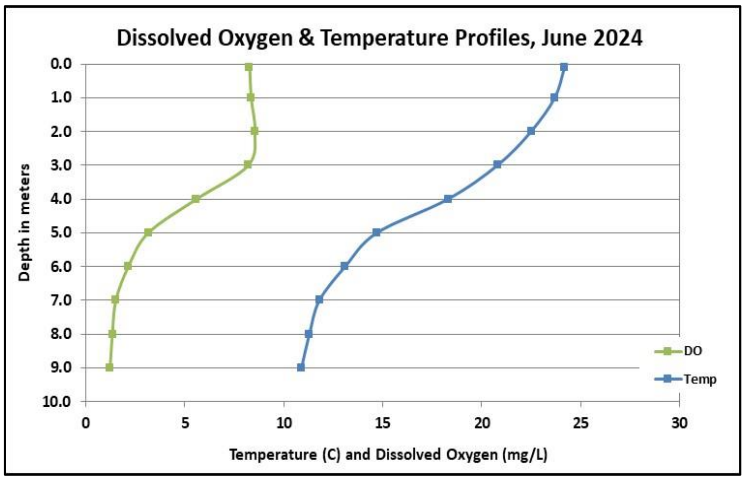
HISTORICAL WATER QUALITY TREND ANALYSIS

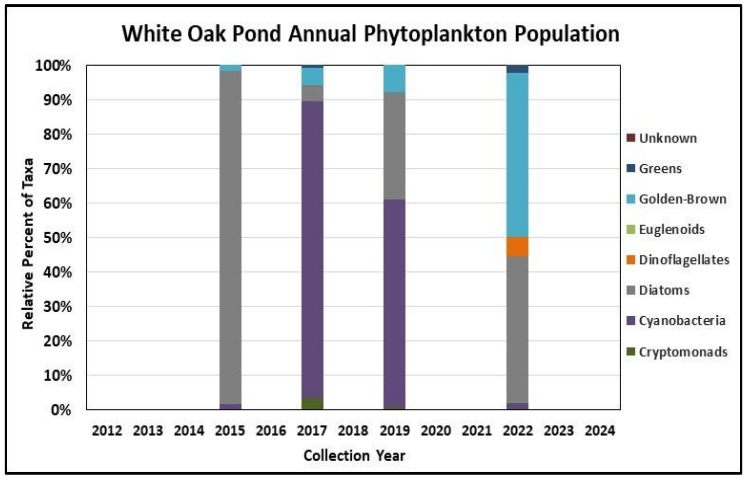
PARAMETER	TREND	PARAMETER	TREND
Conductivity	Worsening	**Chlorophyll-a**	Stable
pH (epilimnion)	Stable	**Transparency**	Stable
Phosphorus (hypolimnion)	Stable	**Phosphorus (epilimnion)**	Stable

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 June, increased to a slightly elevated level in July, and decreased to a low level in August. Average chlorophyll level decreased from 2023 and was less than the state median and the threshold for mesotrophic 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), #11 Cocchiaro, #3 Dump Inlet, #4 Outlet, and #6 Stone Bridge conductivity and/or chloride levels were within a low range and slightly greater than the state medians. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. #9 E Holderness Rd., #3 Dump Trib., and #3T2 conductivity and chloride levels were slightly elevated and greater than the state medians, yet chloride levels were much less than the state chronic chloride standard.
- **COLOR:** Apparent color measured in the epilimnion indicates the water was moderately tea colored, or brown, in June and gradually became lighter as the summer progressed.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was moderate in June, increased to a slightly elevated level in July, and decreased to a moderate level in August. Average epilimnetic phosphorus level increased slightly from 2023 and was greater than the state median and the threshold for mesotrophic lakes. Metalimnetic phosphorus levels were slightly elevated and increased as the summer progressed. Hypolimnetic phosphorus level was greatly elevated in August indicating potential internal load of phosphorus from bottom sediments under anoxic (no dissolved oxygen) conditions. Historical trend analysis indicates relatively stable epilimnetic and hypolimnetic phosphorus levels since monitoring began. #11 Cocchiaro phosphorus level was low. #3 Dump Inlet and #4 Outlet phosphorus levels were elevated in June during stagnant conditions. #3T Dump Trib. phosphorus levels were slightly elevated for that station during low flows. #3T2 phosphorus levels were average. #6 Stone Bridge phosphorus levels were elevated in July. #9 E Holderness Rd. phosphorus levels were within an average range for that station.
- **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was average in June, remained stable in July, and decreased (worsened) slightly in August. Average NVS transparency improved from 2023 and was higher (better) than the state median. Historical trend analysis indicates relatively stable NVS transparency since monitoring began.
- **TURBIDITY:** Epilimnetic and Metalimnetic turbidity levels were slightly elevated in August and lab data noted algal/cyanobacteria growth in the samples. Hypolimnetic turbidity level was elevated in August likely due to formation and accumulation of organic compounds under anoxic conditions. #11 Cocchiaro Trib., #3 Dump Inlet, and #6 Stone Bridge turbidity levels fluctuated within a low range. #3T Dump Trib., #3T2, and #4 Outlet turbidity levels were elevated in June during stagnant conditions. #9 E Holderness Rd. turbidity levels were slightly elevated in June and July.
- **PH:** Epilimnetic and all tributary pH levels were within the desirable range of 6.5-8.0 units. Historical trend analysis indicates stable, yet variable, epilimnetic pH levels since monitoring began. Metalimnetic and Hypolimnetic pH levels were slightly acidic and less than desirable.

Table 1. 2024 Average Water Quality Data for WHITE OAK POND - HOLDERNESS

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	6.9	3.30	11	63	47.1	13	3.67	3.80	0.81	7.07
Metalimnion	-	-	-	-	47.5	16	-	-	1.18	6.35
Hypolimnion	-	-	-	-	50.6	48	-	-	2.02	6.21
#11 Cocchiaro Trib.	-	-	12	-	46.5	8	-	-	0.61	6.93
#3 Dump Inlet	-	-	12	-	47.8	23	-	-	0.91	7.05
#3T Dump Trib.	-	-	43	-	152.0	32	-	-	6.12	6.74
#3T2 Dump Trib. 2	-	-	32	-	114.7	18	-	-	2.54	6.99
#4 Outlet (Dam)	-	-	-	-	47.8	11	-	-	7.46	6.97
#6 Stone Bridge Inlet	-	-	12	-	47.9	19	-	-	1.05	6.97
#9 E Holderness Rd. Trib.	-	-	31	-	121.8	28	-	-	3.62	6.86

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)