



2023 VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

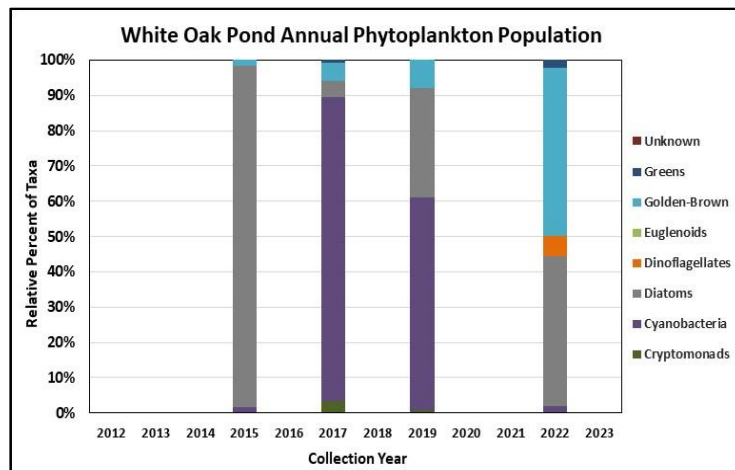
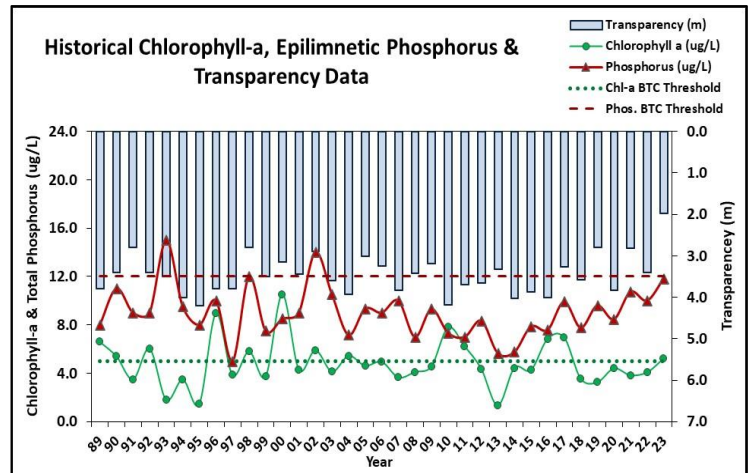
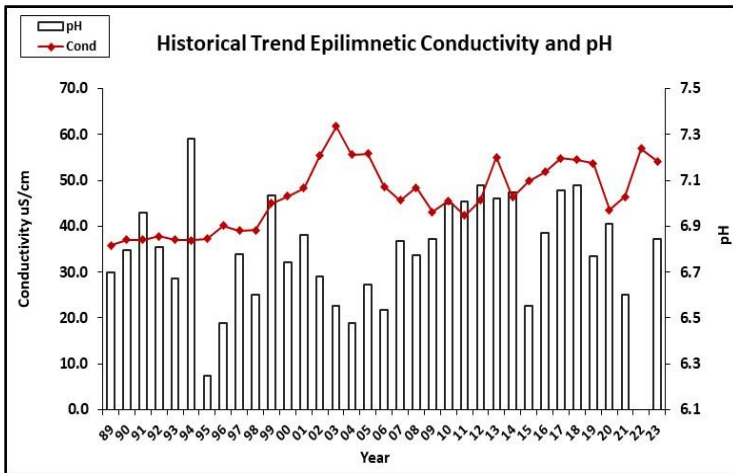
WHITE OAK POND, HOLDERNESS

Recommended Actions: Great job sampling in 2023! Pond quality is generally representative of mesotrophic, or average, conditions however chlorophyll levels tend to fluctuate above the threshold for mesotrophic lakes. Record summer rainfall resulted in higher pond nutrient (phosphorus) levels, higher levels of algal growth, and poor water clarity (transparency), however no cyanobacteria blooms were reported as have happened historically due to an internal load of phosphorus from bottom sediments. An internal load of nutrients, 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. Consider 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. Contact the NHDES [Watershed Assistance Section](#) for more information. 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 moderate in June, decreased in July, and increased to a slightly elevated level in September. Average chlorophyll level increased from 2022 and was slightly greater 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), #2 Lamb Swamp Inlet, #3 Dump Inlet, #4 Outlet, and #6 Stone Bridge Inlet 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. Trib. 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. #3 Dump Trib. conductivity and chloride levels were elevated and much greater than that measured at other stations.
- ◆ **COLOR:** Apparent color measured in the epilimnion indicates the water was moderately tea colored, or brown.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was moderate in June and remained stable in August. Average epilimnetic phosphorus level increased from 2022, was slightly greater than the state median, and was approximately equal to the threshold for mesotrophic lakes. Metalimnetic phosphorus level was elevated in August following significant rainfall. Hypolimnetic phosphorus level was slightly elevated in June and increased in August indicating release 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. #2 Lamb Swamp Inlet phosphorus level was within an average range for that station in June. #3 Dump Inlet and Trib. phosphorus levels were elevated in July and August following significant rainfall. #4 Outlet and #6 Stone Bridge Inlet phosphorus levels were low. #9 E Holderness Rd. Trib. phosphorus levels fluctuated within a low to average range for that station.
- ◆ **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was below average (worse) in June, decreased (worsened) in July, and increased (improved) slightly in August but remained below average. Average NVS transparency decreased by over a meter from 2022 and was the lowest (worst) measured since monitoring began. Historical trend analysis indicates relatively stable NVS transparency since monitoring began.
- ◆ **TURBIDITY:** Epilimnetic and Metalimnetic turbidity levels fluctuated within an average range. Hypolimnetic turbidity level was elevated in August indicating formation and accumulation of organic compounds under anoxic conditions. #2 Lamb Swamp Inlet, #4 Dam Outlet and #6 Stone Bridge Inlet turbidity levels were low. #3 Dump Inlet and Trib. turbidity levels were elevated in August following significant rainfall. #9 E Holderness Rd. Trib. turbidity levels were slightly elevated in July.
- ◆ **pH:** Epilimnetic, #3 Dump Inlet and Trib., #4 Outlet, #6 Stone Bridge Inlet, and #9 E Holderness Rd. Trib. 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, Hypolimnetic and #2 Lamb Swamp Inlet pH levels were slightly acidic.

Table 1. 2023 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	6.8	5.20	7	70	54.2	12	1.97	3.18	1.08	6.84
Metalimnion	-	-	-	-	55.8	14	-	-	1.02	6.28
Hypolimnion	-	-	-	-	65.0	23	-	-	2.64	6.24
#2 Lamb Swamp Inlet	-	-	8	-	60.0	16	-	-	0.27	5.88
#3 Dump Inlet	-	-	7	-	56.1	19	-	-	1.27	6.66
#3 Dump Trib.	-	-	47	-	254.3	27	-	-	2.74	7.01
#4 Outlet (Dam)	-	-	-	-	53.6	9	-	-	0.86	6.87
#6 Stone Bridge Inlet	-	-	7	-	53.1	11	-	-	0.74	6.83
#9 E Holderness Rd Trib.	-	-	17	-	112.6	18	-	-	1.51	6.80

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)