



# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

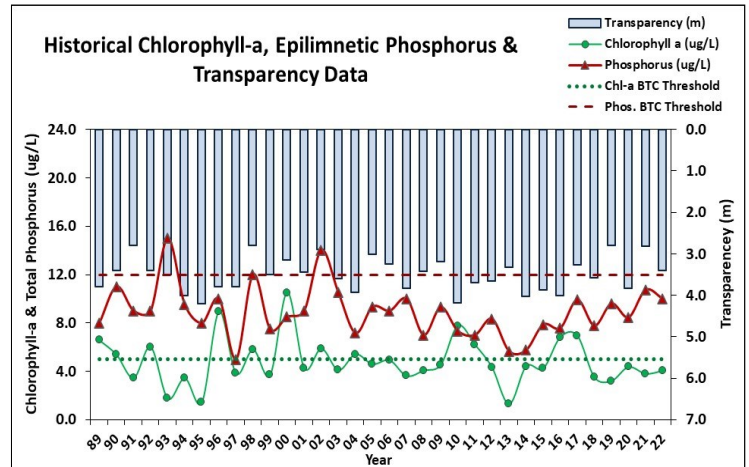
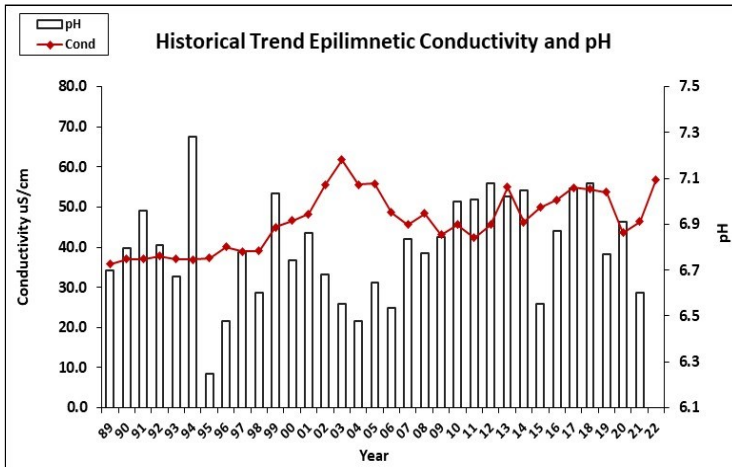
## WHITE OAK POND, HOLDERNESS

### 2022 DATA SUMMARY

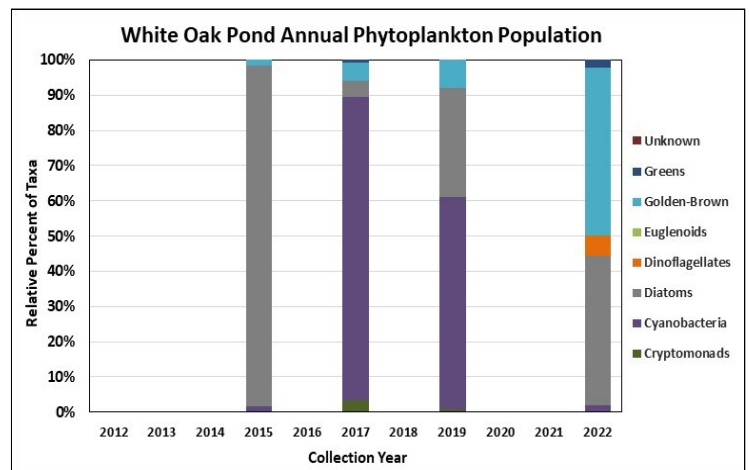
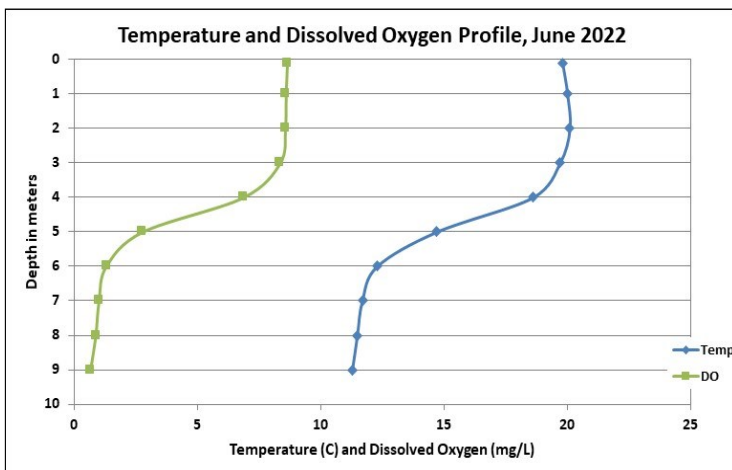
**RECOMMENDED ACTIONS:** Great job sampling in 2022! Pond quality is generally representative of mesotrophic, or average, conditions however chlorophyll levels tend to fluctuate above the threshold for mesotrophic lakes and cyanobacteria blooms have surfaced in the late summer/early fall. The pond experienced another cyanobacteria advisory in October of 2022 that lasted until November. This suggests an internal load of phosphorus from bottom sediments might be fueling the cyanobacteria growth particularly during/after fall turnover as these nutrients become mixed throughout the water column and are readily available for cyanobacteria uptake. An internal load of nutrients, the increased intensity of storm events, increased frequency of summer drought conditions, 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 (epilimnion)	Stable



#### DISSOLVED OXYGEN AND PHYTOPLANKTON (Note: Information may not be collected annually)





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### 2022 DATA SUMMARY

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

- ◆ **CHLOROPHYLL-A:** Chlorophyll level was within a low range in June and increased to a moderate level in July. Average chlorophyll level increased slightly from 2021 and was slightly less than the state median and the threshold for mesotrophic 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), #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.
- ◆ **COLOR:** Apparent color measured in the epilimnion indicates the water was moderately tea colored, or brown, in June and then gradually became lighter as the summer progressed to within a lightly tea colored, or light brown, range.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was within a low range in June, remained stable in July, and decreased in August. Average epilimnetic phosphorus level decreased slightly from 2021 and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus level fluctuated within a low range. Hypolimnetic phosphorus level was moderate in June and increased to an elevated level as the summer progressed indicating potential internal loading of phosphorus from bottom sediments. #2 Lamb Swamp Inlet phosphorus level was slightly elevated in June but within an average range for the station. #3 Dump Inlet phosphorus level fluctuated within a moderate range. #4 Outlet phosphorus level was elevated in August when water levels were low and lab data noted organic matter, likely cyanobacteria, in the sample. #6 Stone Bridge Inlet phosphorus level was also elevated in August and lab data noted organic matter in the sample. #9 E Holderness Rd. Trib. phosphorus levels fluctuated within an elevated but average range for that station.
- ◆ **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was within an average range for the pond in June and increased (improved) in July. Average NVS transparency increased (improved) from 2021 and was slightly higher (better) than the state median. Viewscope (VS) transparency was higher (better) than NVS transparency, remained stable from June through August, and is likely a better measured of actual conditions.
- ◆ **TURBIDITY:** Epilimnetic, Metalimnetic and #4 Outlet turbidity levels were slightly elevated in August likely due to excess algal or cyanobacteria growth. Hypolimnetic turbidity level was slightly elevated in July and elevated in August potentially due to the formation and accumulation of organic compounds under anoxic conditions. #2 Lamb Swamp Inlet, #3 Dump Inlet, and #6 Stone Bridge Inlet turbidity levels fluctuated within a low range. #9 E Holderness Rd. Trib. turbidity levels were slightly elevated on each sampling event and within an average range for the station.
- ◆ **PH:** Epilimnetic pH data were invalidated due to a laboratory equipment error and we apologize for this inconvenience. Metalimnetic, #3 Dump Inlet, #4 Outlet, #6 Stone Bridge Inlet, and #9 E Holderness Rd. Trib. pH levels were within the desirable range 6.5-8.0 units. Hypolimnetic and #2 Lamb Swamp Inlet pH levels were slightly acidic and less than desirable.

Station Name	Table 1. 2022 Average Water Quality Data for WHITE OAK POND - HOLDERNESS									
	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	4.06	9	43	56.9	10	3.40	3.98	0.80	
Metalimnion					56.9	10			1.61	6.56
Hypolimnion					60.0	19			2.14	6.18
#2 Lamb Swamp Inlet			13		66.0	16			0.55	5.98
#3 Dump Inlet			9		58.0	15			0.56	6.64
#4 Outlet					57.6	14			0.90	6.86
#6 Stone Bridge Inlet			8		54.7	17			0.66	6.87
#9 E Holderness Rd. Trib.			34		163.1	25			2.17	6.75

#### 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)