



# 2023 VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

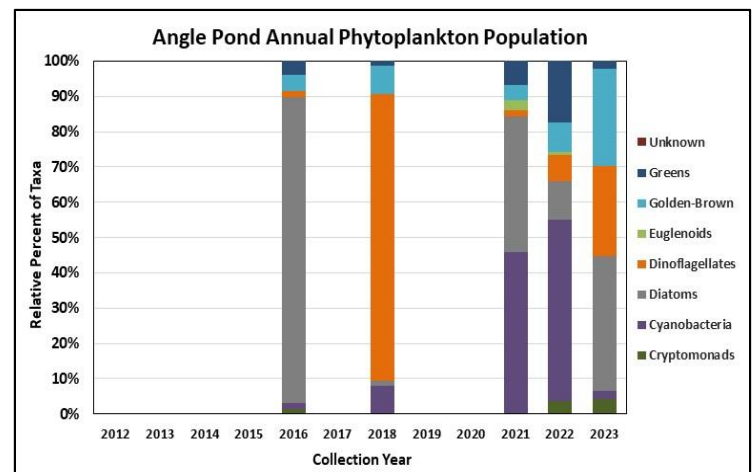
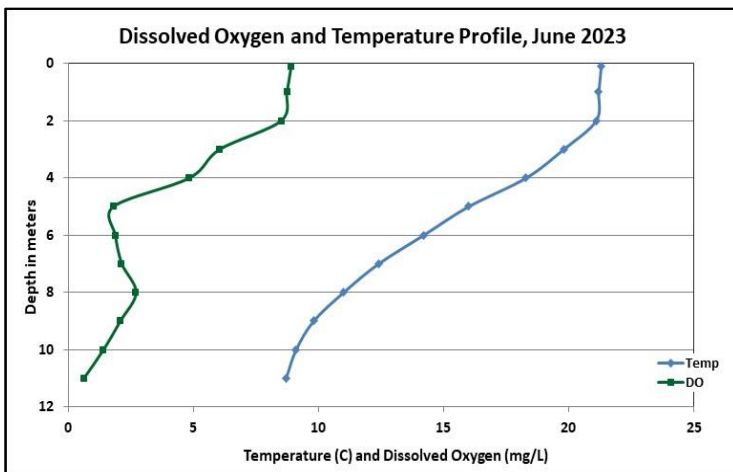
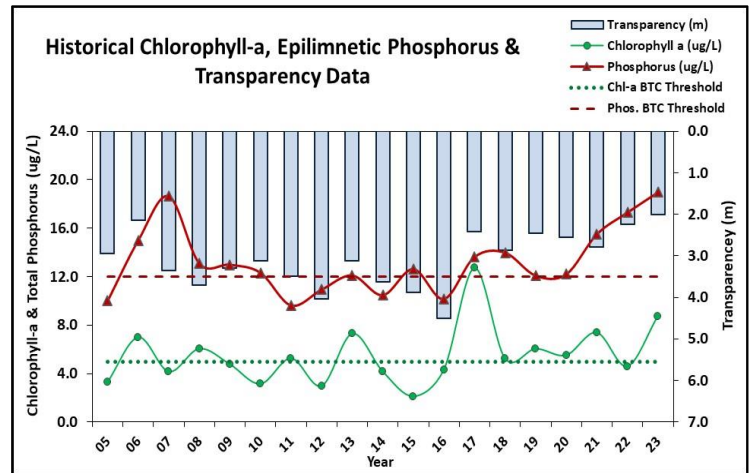
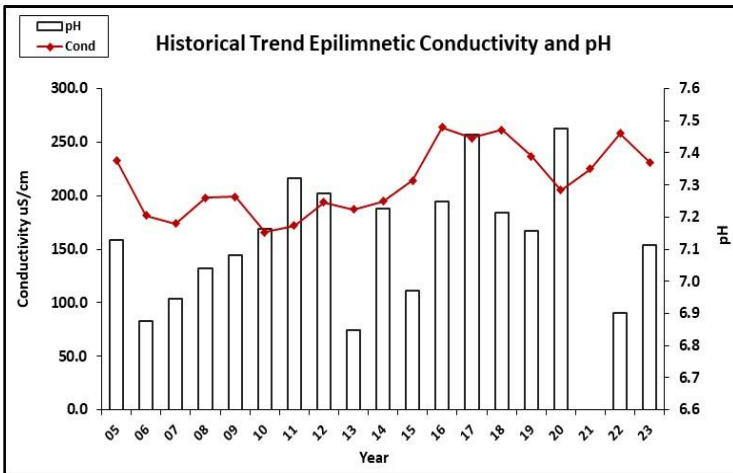
## ANGLE POND, SANDOWN

**Recommended Actions:** Great job sampling in 2023! Pond quality has declined since 2017 with elevated levels of phosphorus and algal growth and decreased water clarity (transparency). The pond experienced another cyanobacteria bloom in June of 2023. Hypolimnetic nutrient levels indicate phosphorus release from bottom sediments that provide an internal load of nutrients that likely fuels excess algal/cyanobacteria growth. This highlights the delicate balance between nutrients, algae and clarity and could be indicative of more permanent changes to water quality which is a concern. Record summer rainfall in 2023 resulted in several Inlets experiencing elevated nutrient and turbidity levels and highlights the importance of managing stormwater runoff to the pond. Due to recent changes in water quality and watershed development, immediate action should be taken to develop and implement a watershed management plan. A [management plan](#) will identify and quantify nutrient loading to the pond, make recommendations on ways to reduce loading, and assist with implementing the recommendations. For more information contact the NHDES [Watershed Assistance Section](#). Elevated conductivity and chloride levels highlight the impacts of road salting within the watershed. Encourage local winter maintenance companies to obtain [Green SnowPro](#) Certification through UNH Technology Transfer Center. Work with the property owner upstream of Sayre Inlet to reduce nutrient and chloride loading to the tributary and pond. 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 elevated in June, decreased to a low level in July, and increased to an elevated level indicative of an algal bloom in August. Average chlorophyll level increased from 2022 and was much greater 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), North Inlet, Outlet, and West Inlet conductivity and chloride levels remained elevated and greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity and chloride levels since monitoring began. East Lane Pipe, Lakeview Ramp, Sayre Inlet, and Smith Inlet conductivity and chloride levels were greatly elevated and chloride levels approaches the state chronic chloride standard at East Lane Pipe.
- ◆ **COLOR:** Apparent color measured in the epilimnion indicates the water was highly tea colored in June and became slightly darker as the summer progressed likely due to excessive rainfall and flushing of systems rich in organic matter.
- ◆ **E. COLI:** Sayre Inlet E. coli level was low and much less than the state standard for surface waters in June.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels fluctuated within an elevated range and were lowest in August and highest in June. Average epilimnetic phosphorus level increased from 2022, was much greater than the state median and the threshold for mesotrophic lakes, and was the highest measured since 2007. Historical trend analysis indicates stable, yet variable, epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus levels were elevated in August and turbidity levels were also slightly elevated likely due to a layer of algae. Hypolimnetic phosphorus levels were slightly elevated in June and increased to a greatly elevated level by August indicating the release of phosphorus from bottom sediments under anoxic (no dissolved oxygen) conditions. East Lane Pipe and Lakeview Ramp phosphorus levels were within an elevated range on each sampling event and during low flows. North Inlet and Outlet phosphorus levels fluctuated within low ranges for those stations. Smith Inlet phosphorus levels were greatly elevated in July and July and the turbidity of the samples was also elevated. Sayre Inlet and West Inlet phosphorus levels were also greatly elevated, and lab data noted highly colored water.
- ◆ **TRANSPARENCY:** Transparency measured with (VS) and without the viewscope (NVS) was below average (worse) in June when algal growth was elevated, increased (improved) slightly in July, and decreased in August likely due to an algal bloom. Average NVS transparency decreased (worsened) slightly from 2022, was lower (worse) than the state median, and was the lowest since monitoring began. Historical trend analysis indicates stable, yet variable, NVS transparency since monitoring began.
- ◆ **TURBIDITY:** Epilimnetic turbidity levels fluctuated within a slightly elevated range. Metalimnetic turbidity level was elevated in August likely due to elevated algal growth. Hypolimnetic turbidity level was slightly elevated in July and August due to the formation of organic compounds as the summer progresses. East Lane Pipe and Lakeview Ramp turbidity levels were slightly elevated during low flow conditions. North Inlet, Outlet and West Inlet turbidity levels were within a low range. Smith Inlet turbidity levels were greatly elevated. Sayre Inlet turbidity levels fluctuated within an elevated yet normal range for that station and lab data noted highly colored water.
- ◆ **PH:** Epilimnetic, Metalimnetic, Hypolimnetic, Lakeview Ramp, Outlet, Sayre Inlet, and West Inlet pH levels were within the desirable range 6.5-8.0 units. Historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began. East Lane Pipe and North Inlet pH levels were slightly less than the desirable range.

Table 1. 2023 Average Water Quality Data for ANGLE POND - SANDOWN

Station Name	Alk. (mg/L)	Chlor-a (ug/L)	Chloride (mg/L)	Color (pcu)	Cond. (us/cm)	E. coli (mpn/100mL)	Total P (ug/L)	Trans. (m)		Turb. (ntu)	pH
								NVS	VS		
Epilimnion	20.9	8.74	58	95	231.3	-	19	2.00	2.33	1.67	7.11
Metalimnion	-	-	-	-	237.3	-	18	-	-	2.06	6.59
Hypolimnion	-	-	-	-	245.2	-	49	-	-	3.14	6.61
East Lane Pipe	-	-	183	-	761.0	-	49	-	-	5.47	6.47
Lakeview Ramp	-	-	96	-	416.0	-	59	-	-	3.44	6.77
North Inlet	-	-	48	-	204.4	-	30	-	-	0.80	6.21
Outlet	-	-	-	-	232.7	-	19	-	-	1.26	7.13
Sayre Inlet	-	-	77	-	316.8	61	140	-	-	6.84	6.68
Smith Inlet	-	-	88	-	379.5	-	129	-	-	23.05	6.92
West Inlet	-	-	40	-	226.0	-	179	-	-	1.29	6.52

#### 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)