



2024 VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

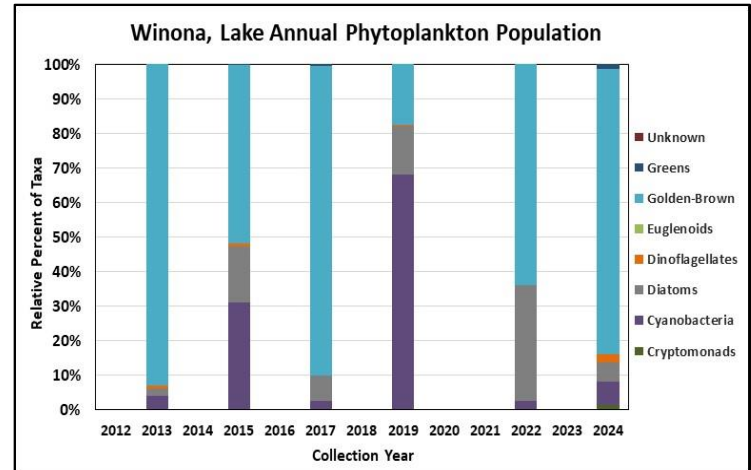
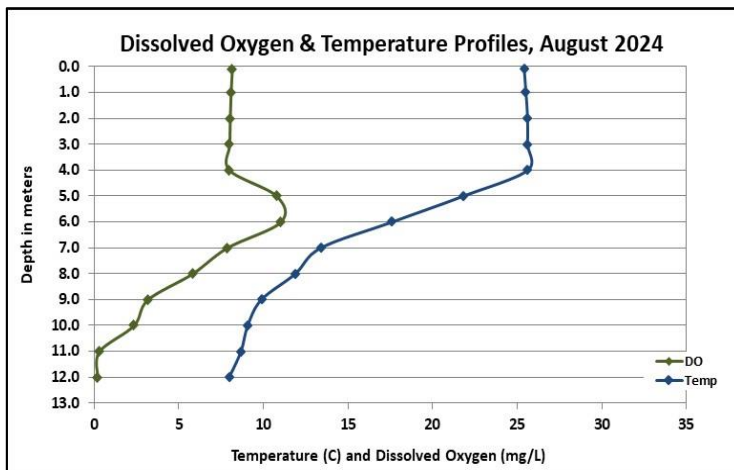
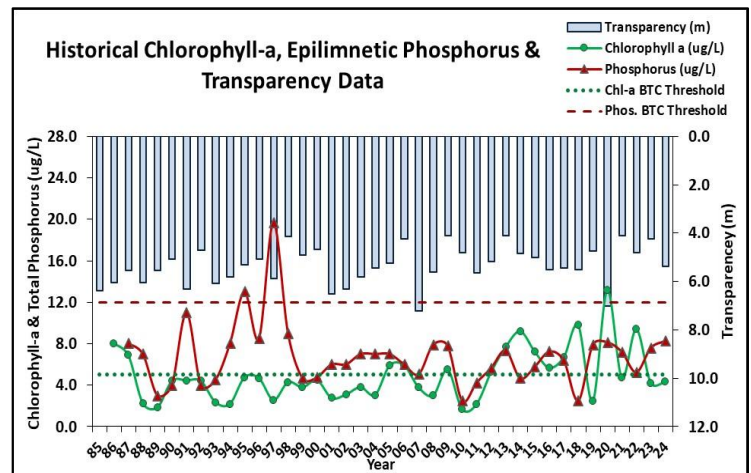
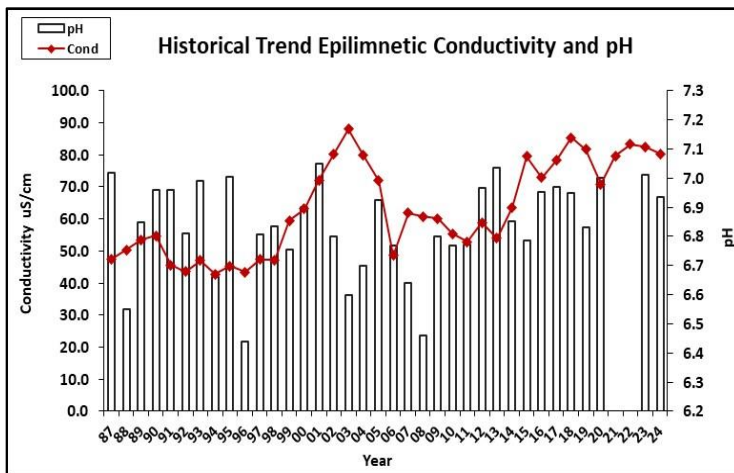
LAKE WINONA, NEW HAMPTON

Recommended Actions: Great job monitoring water quality in 2024! Algal growth (chlorophyll-a) has significantly increased in the lake, particularly since 2012. Due to the history of cyanobacteria surface scums, keep an eye on the lake for any unusual signs of algal/cyanobacteria growth and [report](#) to NHDES' [Harmful Algal Bloom Program](#). Phosphorus levels have significantly increased in the Hypolimnion suggesting an organic layer on the lake bottom that depletes dissolved oxygen, resulting in release of phosphorus bound in lake sediments. The increased intensity of storm events and fluctuating climate conditions resulting in shorter periods of ice cover, warmer water temperatures, and longer periods of thermal stratification can impact pond quality over time and accelerate the eutrophication process. This highlights the importance of minimizing stormwater runoff, erosion, sedimentation, and deposition of organic material to the lake from the surrounding watershed. Encourage shoreline property owners to maintain a good vegetative buffer to help reduce stormwater runoff to the lake and minimize shoreline erosion from wave action. NHDES' [NH Homeowner's Guide to Stormwater Management](#) and UNH Cooperative Extension's [Landscaping at the Water's Edge](#) are good resources. Keep up the great work!

HISTORICAL WATER QUALITY TREND ANALYSIS

PARAMETER	TREND	PARAMETER	TREND
Conductivity	Worsening	Chlorophyll-a	Worsening
pH (epilimnion)	Stable	Transparency	Stable
Phosphorus (hypolimnion)	Worsening	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 within a low range in June and increased in August but remained low. Average chlorophyll level decreased from 2023 and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates significantly increasing (worsening) chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), and Outlet conductivity and chloride levels were slightly greater than the state medians, yet not above a level of concern. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. Chutes Cove and Hawkins Pond Inlet conductivity and chloride levels were elevated and greater than the state medians, however chloride levels did not exceed the state chronic chloride standard.
- ◆ **COLOR:** Apparent color measured in the epilimnion indicates the water was lightly tea colored, or light brown, in June and August.
- ◆ **E. COLI:** Chutes Cove and Hawkins Pond Inlet E. coli levels were moderate in August following a significant storm event, but did not exceed state standard for surface waters. Outlet E. coli level was very low. North Inlet E. coli level was elevated in August following a significant storm event and exceeded the state standard for surface waters likely because beaver activity upstream.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was within a low range in June and decreased in August. Average epilimnetic phosphorus level remained stable with 2023 and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates stable, yet variable, epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus level was slightly elevated in June and the turbidity of the sample was also slightly elevated likely due to a layer of algal growth. Hypolimnetic phosphorus level was slightly elevated in August likely due to release of phosphorus from bottom sediments under anoxic (no dissolved oxygen) conditions. Historical trend analysis indicates significantly increasing (worsening) hypolimnetic phosphorus levels since monitoring began. Hawkins Pond Inlet phosphorus levels were within an average range for that station. Chutes Cove and Outlet phosphorus levels were elevated in August following a significant storm event and the turbidity of the samples was also elevated.
- ◆ **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was average in June and increased (improved) in August. Average NVS transparency improved from 2023 and was higher (better) than the state median. Historical trend analysis indicates stable, yet variable, NVS transparency since monitoring began.
- ◆ **TURBIDITY:** Epilimnetic and Hawkins Pond Inlet turbidity levels fluctuated within a low range. Metalimnetic turbidity level was slightly elevated in June due to a layer of algae/cyanobacteria growth. Hypolimnetic turbidity level was slightly elevated in August due to formation and accumulation of organic compounds under anoxic conditions. Chutes Cove and Outlet turbidity levels were elevated in August following a significant storm event.
- ◆ **PH:** Epilimnetic, Metalimnetic, Chutes Cove, Hawkins Pond Inlet, and Outlet pH levels were within the desirable range of 6.5-8.0 units. Historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began. Hypolimnetic pH level was slightly acidic and less than desirable.

Table 1. 2024 Average Water Quality Data for LAKE WINONA - CENTER HARBOR

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	6.6	3.84	18	26	80.4	-	8	5.40	5.82	0.50	6.94
Metalimnion	-	-	-	-	76.4	-	12	-	-	1.20	6.61
Hypolimnion	-	-	-	-	82.9	-	16	-	-	2.37	6.18
Chutes Cove	-	-	29	-	121.8	91	66	-	-	4.18	6.85
Hawkins Pond Inlet	-	-	30	-	108.3	94	19	-	-	0.91	6.93
North Inlet	-	-	-	-	-	613	-	-	-	-	-
Outlet	-	-	19	-	83.1	12	30	-	-	2.12	6.61

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)

