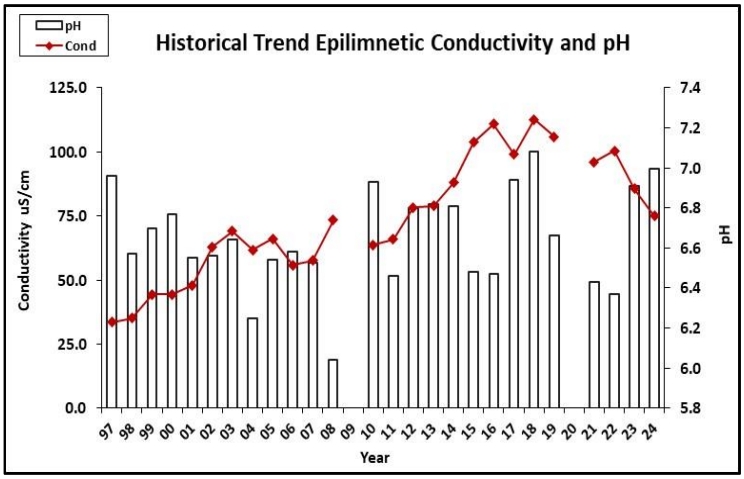
2024 VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
SUNRISE LAKE, MIDDLETON

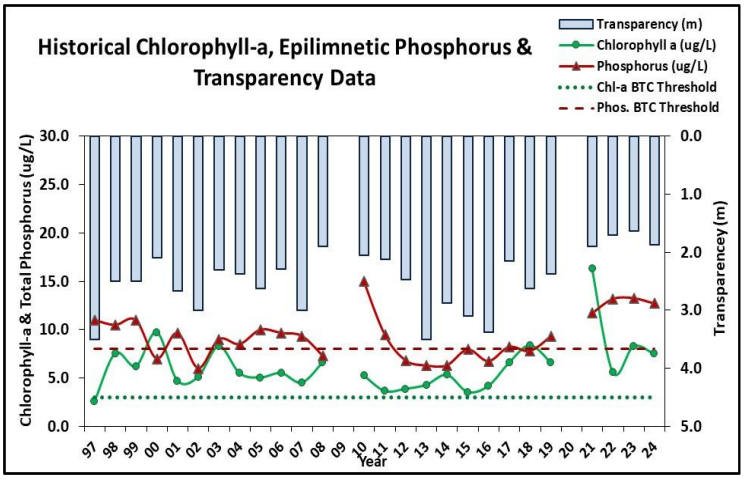
RECOMMENDED ACTIONS: Great job monitoring water quality in 2024! Phosphorus levels remained within an elevated range for the lake in 2024 resulting in elevated algal and Cyanobacteria growth. A Cyanobacteria warning was issued in September for the presence of surface scums. Overall lake turbidity and clarity was poor in August and September potentially reflecting algal/Cyanobacteria growth, impacts from motorized watercraft and re-suspension of sediments, and/or stormwater runoff. This highlights the importance of managing phosphorus (nutrient) loads within the watershed through stormwater management, septic system management, fertilizer use, shoreline stabilization, erosion controls at beach areas, and education of property owners. Also important is educating boaters on best practices when boating in shallow waters. NHDES' fact sheet WMB-25 Impacts of Motorized Craft on New Hampshire's Waterbodies is a great resource. Great job developing a watershed management plan! Implement plan recommendations at priority sites to reduce nutrient loading to the lake. Maintain a monthly sampling program moving forward to better assess nutrient loads, and seasonal and annual variations in water quality. Contact the VLAP Coordinator in the spring for a sampling refresher. Keep up the great work!

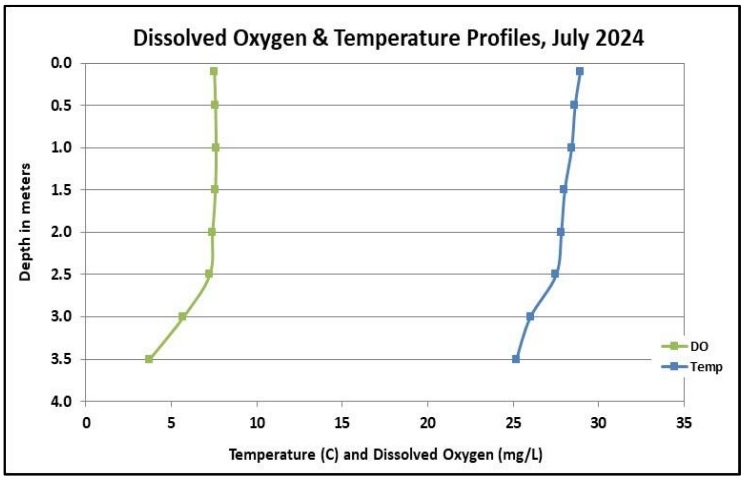
HISTORICAL WATER QUALITY TREND ANALYSIS

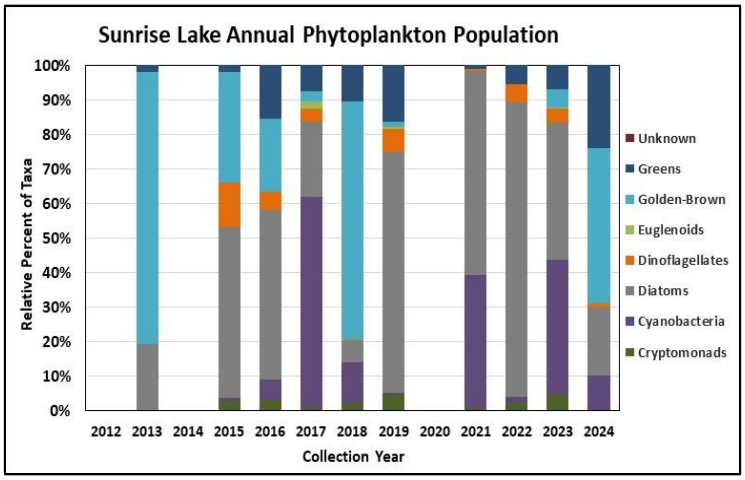
PARAMETER	TREND	PARAMETER	TREND
Conductivity	Worsening	**Chlorophyll-a**	Stable
pH (epilimnion)	Stable	**Transparency**	Stable
Phosphorus (hypolimnion)	Stable	**Phosphorus (epilimnion)**	Stable

HISTORICAL WATER QUALITY GRAPHICS









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

- **CHLOROPHYLL-A:** Chlorophyll level was slightly elevated in June, increased to an elevated level in August and decreased slightly in September but remained elevated. Average chlorophyll level decreased from 2023 but remained greater than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates stable, yet variable, chlorophyll levels since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Hypolimnetic (lower water layer), Bartletts Cove, Hampshire Brook, Shores and Launch, Main Beach, Nicola Beach, Nicola Beach 1, Pinkham Cove, Tanglewood Brook and Beach, and Town Beach conductivity and/or chloride levels remained slightly greater than the state medians, yet less than a level of concern. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.
- **COLOR:** Apparent color measured in the epilimnion indicates the water was moderately tea colored.
- **E. COLI:** Lakelands Assoc. Drainage Ditch E. coli levels were within a low range and much less than the state standard for surface waters.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was slightly elevated in July, increased in August, and decreased slightly in September. Average epilimnetic phosphorus level remained stable with 2023 and was greater than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Hypolimnetic phosphorus level was elevated in July potentially indicating periods of internal loading if stratification occurs. Bartletts Cove phosphorus level was elevated in August potentially due to sediment contamination in the sample. Hampshire Shores and Town Beach phosphorus levels were slightly elevated in August following a storm event. Main Beach and Nicola Beach phosphorus levels were above average in August and September when algal/cyanobacteria growth was elevated. Pinkham Cove and Tanglewood Beach phosphorus levels were elevated in September. Tanglewood Brook phosphorus level was elevated in July.
- **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was average (good) in July, and decreased (worsened) in August and September due to elevated levels of algal growth. Average NVS transparency increased (improved) slightly from 2023 and historical trend analysis indicates relatively stable NVS transparency since monitoring began.
- **TURBIDITY:** All stations experienced elevated turbidity levels particularly in August and September with the exception of Hampshire Brook. A combination of storm events and algal/cyanobacteria growth likely influenced lake turbidity levels.
- **PH:** All stations except the Hypolimnion and Hampshire Brook experienced pH levels within the desirable range of 6.5-8.0 units. Historical trend analysis indicates stable, yet variable, epilimnetic pH levels since monitoring began.

Table 1. 2024 Average Water Quality Data for SUNRISE LAKE - MIDDLETON

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	7.3	7.50	19	65	75.0	-	13	1.88	1.76	2.69	7.00
Hypolimnion	-	-	-	-	65.8	-	18	-	-	3.88	6.34
Bartletts Cove	-	-	20	-	76.1	-	37	-	-	2.61	6.87
Hampshire Brook	-	-	20	-	76.0	-	16	-	-	0.75	6.14
Hampshire Shores	-	-	21	-	81.2	-	17	-	-	3.42	7.00
Hampshire Boat Launch	-	-	-	-	81.6	-	14	-	-	2.92	7.06
Lakelands Assoc DD	-	-	-	-	-	59	-	-	-	-	-
Main Beach	-	-	20	-	75.2	-	11	-	-	2.29	7.10
Nicola Beach	-	-	20	-	76.2	-	11	-	-	2.32	7.16
Nicola Beach 1	-	-	20	-	74.1	-	11	-	-	2.40	7.13
Pinkham Cove	-	-	-	-	76.2	-	17	-	-	2.44	6.80
Tanglewood Beach	-	-	23	-	79.1	-	22	-	-	1.88	6.91
Tanglewood Brook	-	-	20	-	76.8	-	33	-	-	3.37	-
Town Beach	-	-	22	-	81.6	-	14	-	-	2.29	6.88

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)