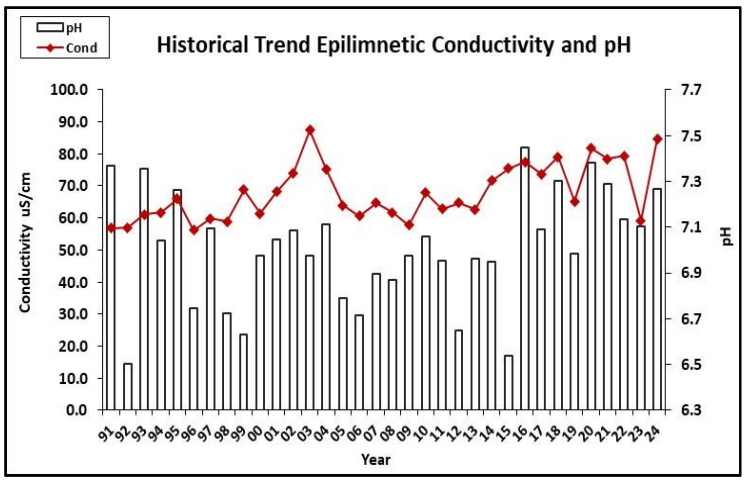
2024 VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
MASCOMA LAKE, ENFIELD

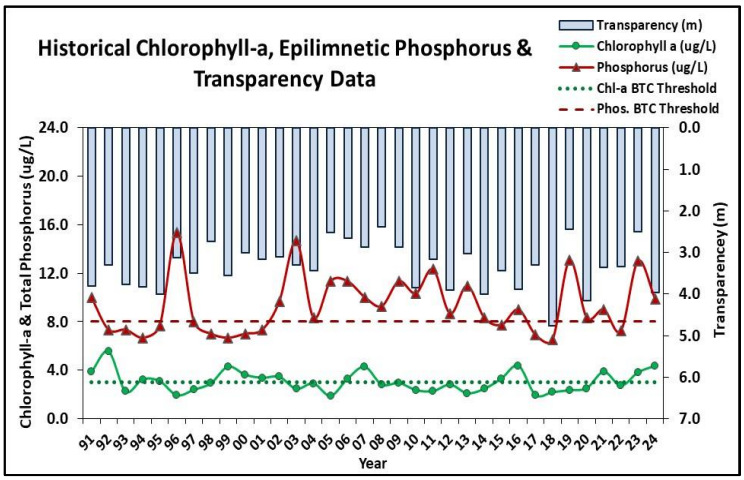
RECOMMENDED ACTIONS: Great job monitoring water quality in 2024! Lake quality is generally representative of oligotrophic, or high quality, conditions. However, lake nutrient levels and algal growth remained elevated and above the thresholds for oligotrophic lakes. The lake continued to experienced cyanobacteria blooms in June and July prompting warnings to be issued. Lake clarity improved in 2024 likely due to the lack of rainfall and associated stormwater runoff. The lake has a history of elevated nutrient (phosphorus) levels and decreased water clarity, particularly following significant storm events. This highlights the importance of managing stormwater runoff within the watershed. Fluctuating climate conditions with increased frequency of summer droughts, high volume storm events, warmer water temperature, shorter periods of ice cover, and earlier ice out can have negative impacts on water quality. Consider partnering with Soak Up the Rain NH to implement stormwater improvement projects along the shoreline. Encourage shorefront property owners to become certified LakeSmart through NH LAKES lake-friendly living program. Educate boaters on best boating practices to prevent bottom sediment and shoreline erosion. Keep up the great work! NHDES' fact sheet WMB-25 Impacts of Motorized Craft on new Hampshire's Waterbodies is a great resource. Keep up the great work!

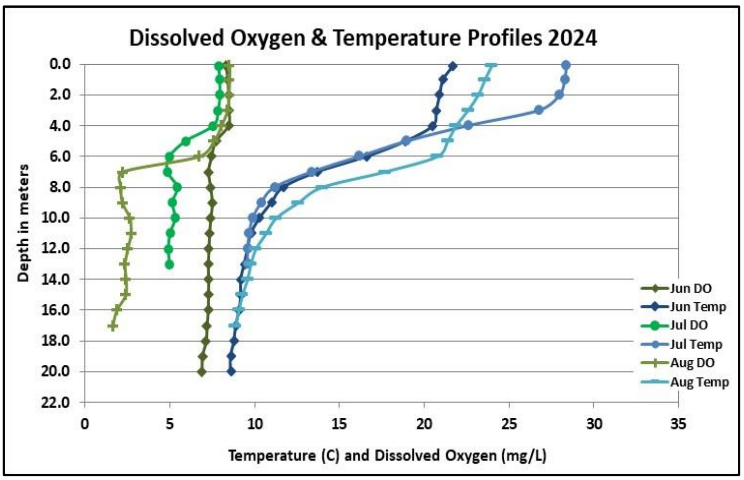
HISTORICAL WATER QUALITY TREND ANALYSIS

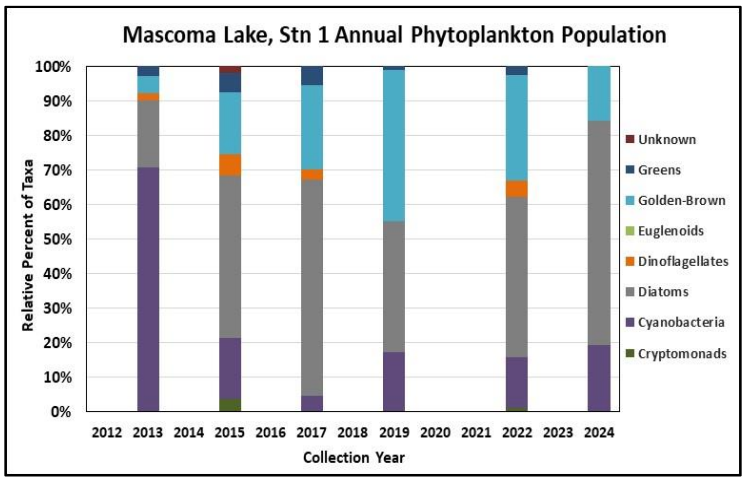
PARAMETER	TREND	PARAMETER	TREND
Conductivity	Worsening	**Chlorophyll-a**	Stable
pH (epilimnion)	Stable	**Transparency**	Stable
Phosphorus (hypolimnion)	Stable	**Phosphorus (epilimnion)**	Stable

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 remained stable in August. Average chlorophyll level increased from 2023, was approximately equal to the state median, and was greater than the threshold for oligotrophic 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), Outlet, Knox River, and Mascoma River conductivity and/or chloride levels remained greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. Browns Bk. and LaSalette #3 conductivity and chloride levels were elevated, yet chloride levels did not approach the state chronic chloride standard. Shaker Bk. conductivity and chloride levels were elevated, and chloride levels approached the state chronic chloride standard.
- **COLOR:** Apparent color measured in the epilimnion indicates the water was moderately colored and remained stable from June through August. Average color indicates the water was two times lighter than that measured in 2023.
- **E. COLI:** Knox River E. coli level was elevated in July following a rain event and likely due to beaver activity. Mascoma River Inlet E. coli level was within a low range.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was slightly elevated in June, decreased to a low level in July, and increased to a slightly elevated level in August. Average epilimnetic phosphorus level decreased from 2023, was less than the state median, but remained greater than the threshold for oligotrophic lakes. Metalimnetic phosphorus levels were slightly elevated. Hypolimnetic phosphorus levels were slightly elevated, particularly in August. Historical trend analysis indicates relatively stable epilimnetic and hypolimnetic phosphorus levels since monitoring began. Browns Brook, Knox River, Mascoma River, Outlet, and Shaker Brook phosphorus levels were within average ranges for these stations. LaSalette #3 phosphorus level was extremely elevated in August and the turbidity of the sample was also extremely elevated. Lab data noted colored water with high levels of organic matter.
- **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was below average (worse) in June due to wave action, increased (improved) to above average conditions in July, and decreased slightly in August but remained high (good). Average NVS transparency improved from 2023 and was higher (better) than the state median. Historical trend analysis indicates relatively stable NVS transparency since monitoring began.
- **TURBIDITY:** Epilimnetic, Metalimnetic, Outlet, and Shaker Brook turbidity levels were within low ranges. Hypolimnetic turbidity levels were within a low range for that station. Knox River, Browns Brook, and Mascoma River turbidity levels were elevated in July and decreased to slightly elevated levels in August. LaSalette #3 turbidity levels were greatly elevated due to organic matter.
- **PH:** Epilimnetic, Metalimnetic, Outlet, Knox River, Mascoma River, and Shaker Brook 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. Hypolimnetic pH levels fluctuated around the low end of the desirable range. LaSalette #3 pH levels exceeded the basic end of the desirable range due to presence of Cyanobacteria.

Table 1. 2024 Average Water Quality Data for MASCOMA LAKE - ENFIELD

Station Name	Alk. (mg/L)	Chlor-a (ug/L)	Chloride (mg/L)	Color (pcu)	Cond. (us/cm)	E. coli (mpn/100 mL)	Total P (ug/L)	Trans. (m)		Turb. (ntu)	pH
								NVS	VS		
Epilimnion	11	4.37	10	45	84.8	-	10	3.96	4.77	0.84	7.27
Metalimnion	-	-	-	-	80.4	-	10	-	-	0.85	6.83
Hypolimnion	-	-	-	-	73.4	-	14	-	-	1.28	6.44
Browns Brook	-	-	35	-	231.1	-	24	-	-	4.02	6.17
Dam Outlet	-	-	14	-	87.3	-	10	-	-	1.02	7.25
Knox River Inlet	-	-	17	-	154.9	436	17	-	-	2.14	7.07
LaSalette #3	-	-	18	-	246.3	-	161	-	-	140	9.35
Mascoma River Inlet	-	-	10	-	98.4	70	18	-	-	4.95	6.96
Shaker Brook	-	-	176	-	991.0	-	22	-	-	0.58	7.23

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)