2023 VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
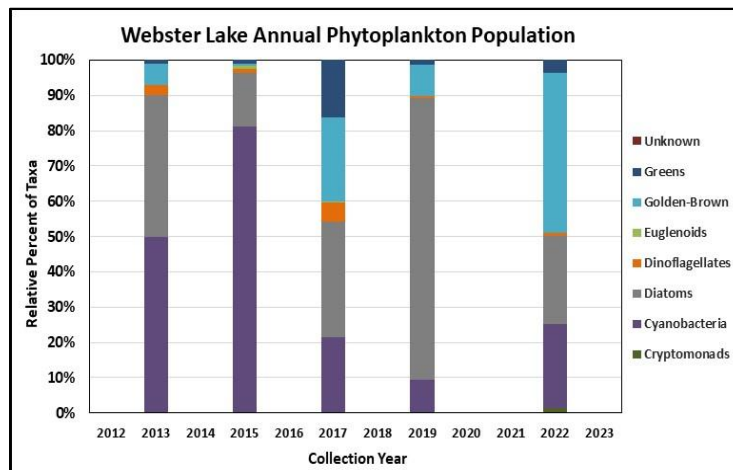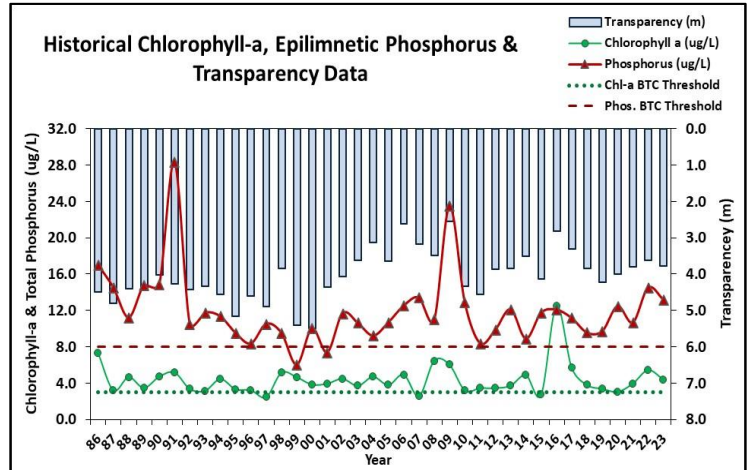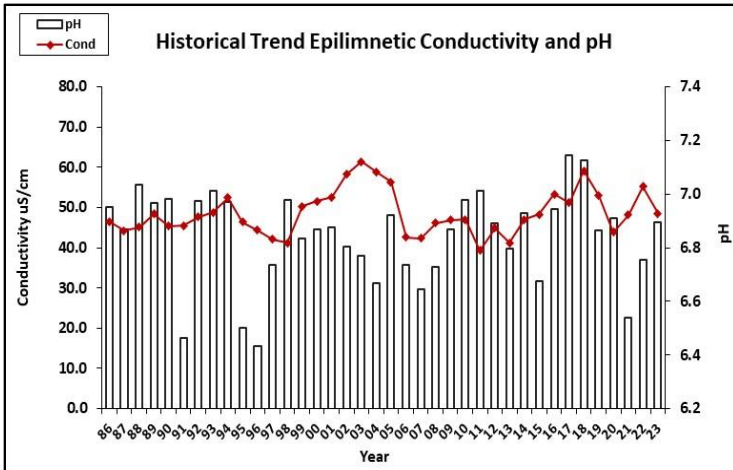## WEBSTER LAKE, FRANKLIN

Recommended Actions: Great job sampling in 2023! Lake nutrient (phosphorus) levels were elevated on several sampling events, but particularly in June when a cyanobacteria bloom was occurring and again in August and September due to an internal load of phosphorus from bottom sediments. Significant rainfall in July generally helped to flush nutrients out of the system resulting in improved quality. However, the internal load of phosphorus resulted in another cyanobacteria alert issued in September. Fluctuating climate conditions with extended periods of dry weather and droughts, high intensity rain events, shorter periods of ice cover, and changes in winter precipitation types and volume will result in more variable water quality and lake conditions in the future. This highlights the importance of watershed management activities aimed at reducing nutrient loading to the lake. Managing stormwater runoff and erosion, maintaining septic systems, planting vegetative buffers, limiting fertilizer use, as well as following responsible boating practices to reduce lake bottom and shoreline erosion can help buffer future climate impacts. Continue to maintain flow in the Outlet channel to help flush nutrients out of the pond. Encourage shoreline property owners to be certified LakeSmart through NH LAKES' lake-friendly. Keep up the great work!

HISTORICAL WATER QUALITY TREND ANALYSIS

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

HISTORICAL WATER QUALITY GRAPHICS

2023 VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
WEBSTER LAKE, FRANKLIN

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

⬥ **CHLOROPHYLL-A:** Chlorophyll level was within a slightly elevated range in June, decreased slightly through August, and remained stable in September. Average chlorophyll level decreased from 2022, 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), and Sucker Brook conductivity and/or chloride levels were slightly greater than the state median, yet less than a level of concern. Historical trend analysis indicates stable epilimnetic conductivity levels since monitoring began. Gagnes Brook, Lake Ave Trib. and Rt. 11 Inlet conductivity and chloride levels remained low and less than the state medians.

⬥ **COLOR:** Apparent color measured in the epilimnion indicates the water was lightly tea colored from June through September.

⬥ **E. COLI:** Gagnes Brook E. coli level was elevated in September. Lake Ave Trib. E. coli levels were slightly elevated in August. Sucker Brook E. coli levels were slightly elevated in July following significant rainfall. All results, while slightly elevated, remained than the state standards for surface waters.

⬥ **TOTAL PHOSPHORUS:** Epilimnetic and Metalimnetic phosphorus levels were elevated in June, epilimnetic phosphorus decreased to a moderate range in July and remained relatively stable through September. Average epilimnetic phosphorus level decreased slightly from 2022 but remained greater than the state median and the threshold for oligotrophic lakes. Metalimnetic phosphorus level was also elevated in August due to a layer of cyanobacteria. Hypolimnetic phosphorus levels were greatly elevated in August and September due to release of phosphorus from bottom sediments under anoxic (low dissolved oxygen) conditions. Historical trend analysis indicates stable, yet variable, epilimnetic and hypolimnetic phosphorus levels since monitoring began. Gagnes Brook and Lake Ave Trib. phosphorus levels were elevated but within an average range for those stations. Rte. 11 Inlet phosphorus levels were elevated in August during low flow conditions. Sucker Brook phosphorus levels were elevated in July following significant rainfall.

⬥ **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was below average (worse) in June when phosphorus levels were elevated and during a cyanobacteria advisory, and increased (improved) gradually through September. Average NVS transparency increased slightly from 2022 and was higher (better) than the state median. Historical trend analysis indicates significant decreasing (worsening) NVS transparency since monitoring began.

⬥ **TURBIDITY:** Epilimnetic turbidity levels fluctuated within a low to moderate range and were highest in June and September when cyanobacteria growth was elevated. Metalimnetic turbidity level was slightly elevated in June and September and was greatly elevated in August indicating a layer of cyanobacteria at that depth. Hypolimnetic turbidity levels increased as the summer progressed due to formation and accumulation of organic compounds under anoxic conditions. Rte. 11 Inlet and Lake Ave Trib. turbidity levels fluctuated within low ranges for those stations. Gagnes Brook turbidity levels were slightly elevated on each sampling event and lab data noted colored water. Sucker Brook turbidity levels were elevated in July following significant rainfall.

⬥ **PH:** Epilimnetic and Sucker Brook pH levels were within the desirable range of 6.5-8.0 units. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Metalimnetic, Hypolimnetic and Rte. 11 Inlet pH levels were approximately equal to the low end of the desirable range. Gagnes Brook and Lake Ave Trib. pH levels were slightly acidic.

Table 1. 2023 Average Water Quality Data for WEBSTER LAKE - FRANKLIN

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) NVS	Trans. (m) VS	Turb. (ntu)	pH
Epilimnion	6.6	4.39	7	31	48.5	-	13	3.78	4.05	0.80	6.90
Metalimnion	-	-	-	-	50.7	-	18	-	-	2.78	6.41
Hypolimnion	-	-	-	-	65.6	-	75	-	-	5.46	6.46
Gagnes Brook	-	-	2	-	26.8	175	30	-	-	3.00	6.21
Lake Ave Trib.	-	-	4	-	32.8	79	34	-	-	1.22	5.96
Rte. 11 Inlet	-	-	2	-	17.7	27	17	-	-	0.32	6.46
Sucker Brook	-	-	7	-	56.2	125	16	-	-	1.29	7.09

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)

NHDES Volunteer Lake Assessment Program (VLAP) | sara.e.steiner@des.nh.gov