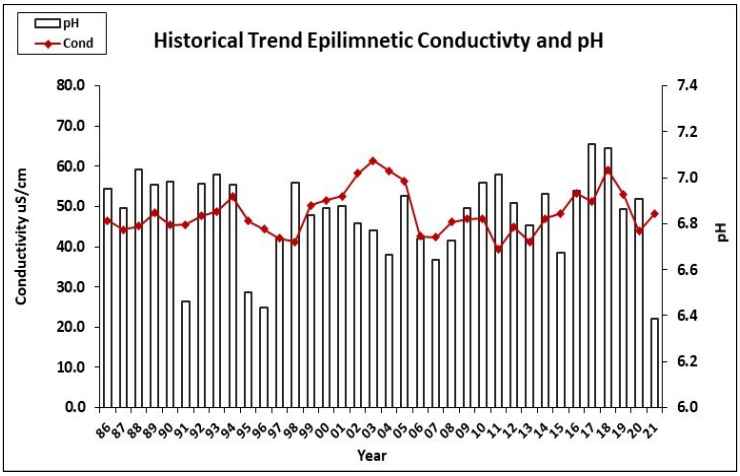
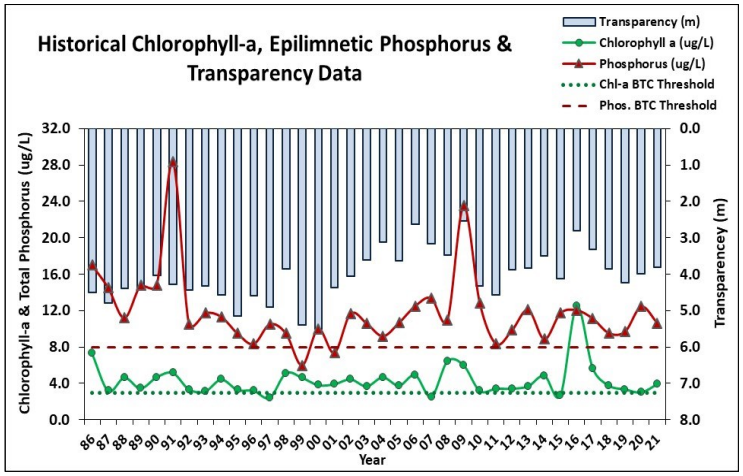
Volunteer Lake Assessment Program Individual Lake Reports
Webster Lake, Franklin
2021 Data Summary

Recommended Actions: Great job sampling in 2021! Lake nutrient (phosphorus) levels remain slightly elevated and greater than the threshold for oligotrophic lakes, however algal growth (chlorophyll) has generally remained equal to the threshold for oligotrophic lakes since 2010, which is encouraging. However, the lake experienced an early season cyanobacteria bloom in June that was likely fueled by excess nutrients retained during the drier spring/early summer. Record rainfall in July helped to flush nutrients out of the system as lake nutrient levels were at lowest levels in July. Nutrient levels increased again by late summer, particularly in Hypolimnetic waters, which usually fuels late season cyanobacteria blooms. Conduct a deep spot sampling event in ***late September/early October*** to evaluate water quality during/following fall turnover events. Contact the VLAP Coordinator for assistance with this sampling. Continue to maintain flow in the Outlet channel to help flush nutrients out of the pond that could fuel cyanobacteria growth. Educate shoreline property owner's on ways to stabilize shorelines to reduce stormwater erosion and runoff, and encourage property owners to be certified LakeSmart through NH LAKES lake-friendly. Keep up the great work!

Historical Water Quality Trend Analysis

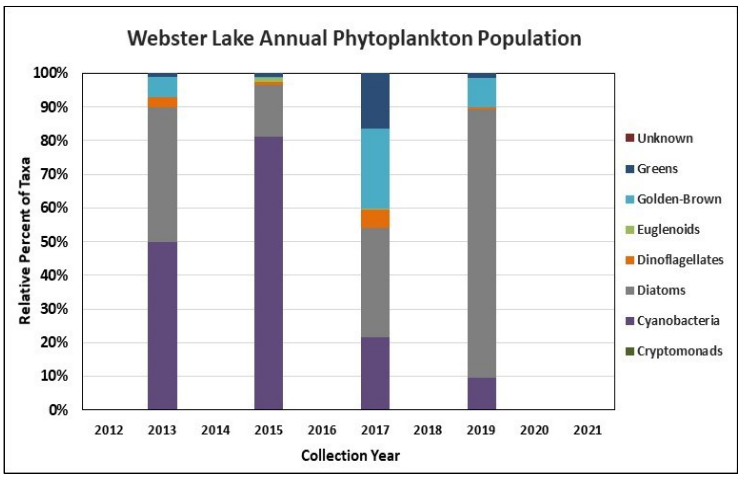
Parameter	Trend	Parameter	Trend
Conductivity	Stable	**Chlorophyll-a**	Stable
pH (epilimnion)	Stable	**Transparency**	Worsening
		Phosphorus (epilimnion)	Stable





Dissolved Oxygen and Phytoplankton

(Note: Information may not be collected annually)



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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, increased slightly in July, and then increased to slightly elevated levels in August and September. Average chlorophyll level increased slightly from 2020, was less than the state median, and was slightly 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 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:** Epilimnetic color data indicates the water was lightly tea colored, or light brown, and was darkest in September.
- **Total Phosphorus:** Epilimnetic phosphorus level fluctuated within a slightly elevated range and was lowest in August and highest in September. Average epilimnetic phosphorus level decreased from 2020, was approximately equal to the state median, and was greater than the threshold for oligotrophic lakes. Historical trend analysis indicates stable, yet variable, epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus level was slightly elevated in June, August and September but was within an average range for this station. Hypolimnetic phosphorus level increased as the summer progressed and was elevated in August and September due to release of phosphorus from bottom sediments under anoxic (no dissolved oxygen) conditions. Gagnes Brook phosphorus levels were elevated during low flow conditions, particularly in August when lab data noted organic matter in the sample. Lake Ave Trib. phosphorus levels were elevated, but within an average range for that station and remained fairly stable from June through September. Lake Ave Trib. B phosphorus level was elevated in August but also within a normal range for the tributary. Rt. 11 Inlet phosphorus levels remained low. Sucker Brook phosphorus level fluctuated within a moderate range and decreased as the summer progressed.
- **Transparency:** Transparency measured without the viewscope (NVS) was below average (worse) in June when cyanobacteria growth was noted, increased (improved) to an average range in July, increased again in August, and then decreased to below average in September when algal growth was also higher. Average NVS transparency decreased slightly from 2020 and was slightly higher (better) than the state median. Historical trend analysis indicates significantly decreasing (worsening) NVS transparency since monitoring began. Viewscope (VS) transparency was slightly higher than NVS transparency and likely a better measure of actual conditions.
- **Turbidity:** Epilimnetic and Metalimnetic turbidity levels were slightly elevated in September when algal growth was elevated. Hypolimnetic turbidity level was slightly elevated in June when lab data noted algae/cyanobacteria in the sample, and elevated in September due to formation and accumulation of organic compounds under anoxic conditions. Gagnes Brook turbidity was elevated in August and September during low flows and lab data note colored water and organic matter in the sample. Lake Ave Trib. turbidity was slightly elevated on each sampling event. Rt. 11 Inlet turbidity level was slightly elevated in August during low flows. Sucker Brook turbidity level fluctuated within a normal range.
- **pH:** Epilimnetic and Metalimnetic pH levels were within the desirable range 6.5-8.0 units in June and July and then became slightly acidic and less than desirable in August and September following significant summer rainfall amounts. Hypolimnetic, Gagnes Brook, Lake Ave Trib., and Rt. 11 Inlet pH levels were slightly acidic and less than desirable. Sucker Brook pH level was within the desirable range.

Station Name	Table 1. 2021 Average Water Quality Data for WEBSTER LAKE - FRANKLIN										
	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	6.8	3.94	8	32	48.1		11	3.80	4.31	0.90	6.39
Metalimnion					48.4		11			1.06	6.58
Hypolimnion					52.6		29			1.81	6.33
Gagnes Brook			3		33.4	62	38			7.84	5.93
Lake Ave Trib.			4		32.7	834	40			2.91	5.74
Lake Ave Trib. B			4		31.0	308	45			1.16	5.36
Rte. 11 Inlet			3		16.4	42	5			0.49	6.14
Sucker Brook			9		58.2	60	14			0.74	6.86

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)