



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

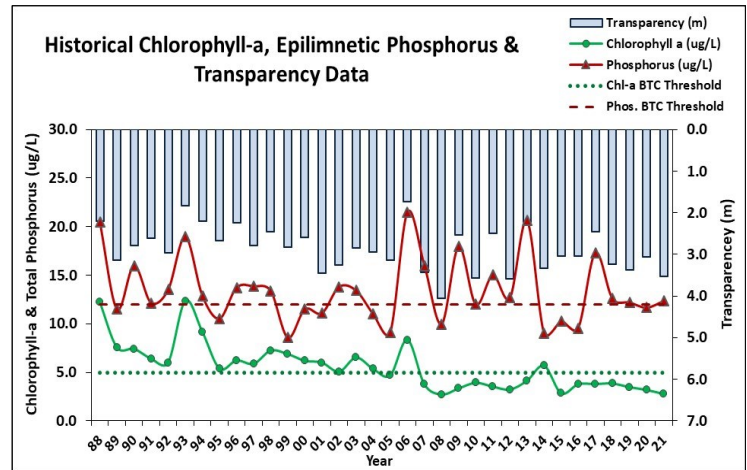
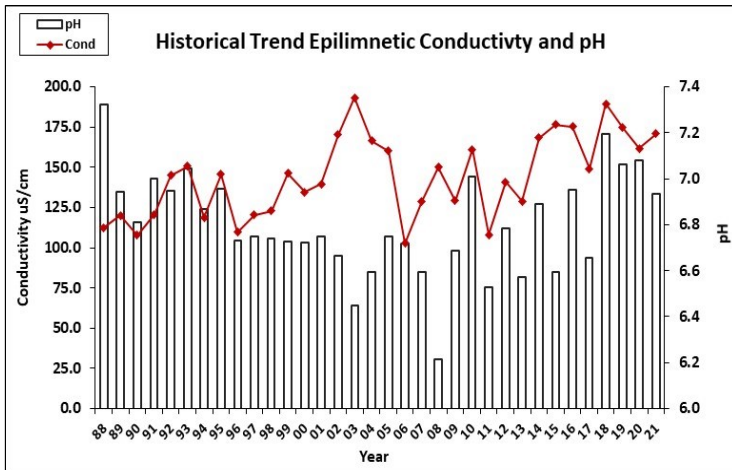
KEZAR LAKE, NORTH SUTTON

2021 DATA SUMMARY

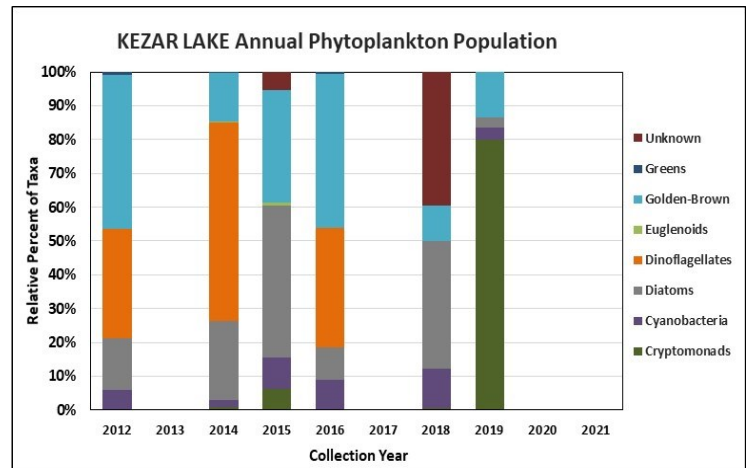
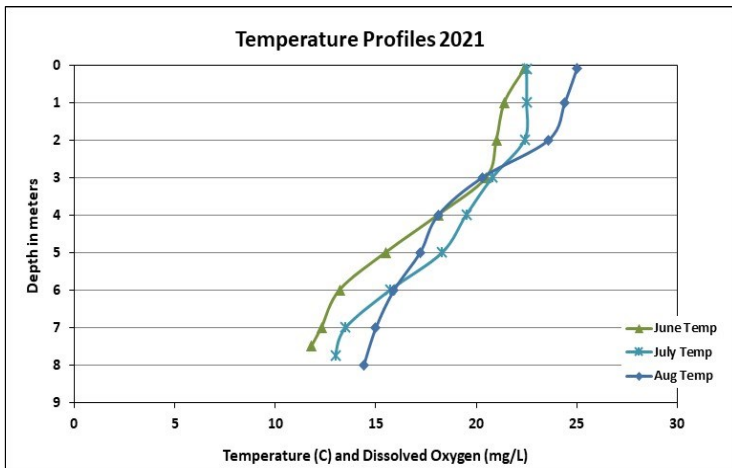
RECOMMENDED ACTIONS: Great job sampling in 2021! Lake nutrient (phosphorus) levels and algal growth (chlorophyll) appear to have stabilized within the thresholds for mesotrophic lakes in recent years and we hope to see this continue. The improving algal growth and water clarity (transparency) are encouraging and lake pH levels appear to be recovering from historical impacts of acid precipitation. Record rainfall in July resulted in the lake becoming a dark tea color, more turbid, less clear, and increased nutrient levels. This is the second year in a row where tropical rainfall has impacted lake quality. This highlights the importance of managing stormwater runoff in the watershed. NHDES' [NH Homeowner's Guide to Stormwater Management](#) is a great resource. Encourage shoreline property owners to obtain [LakeSmart](#) certification through NH LAKES lake-friendly living program. Continue working with Colby Sawyer College students to further study the lake and watershed. Keep up the great work!

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Parameter	Trend
Conductivity	Worsening	Chlorophyll-a	Improving
pH (epilimnion)	Stable	Transparency	Improving
		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 July and increased slightly in August but remained low. Average chlorophyll level decreased slightly from 2020 and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since monitoring began.
- ◆ **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Hypolimnetic (lower water layer) and Outlet conductivity and chloride levels remained slightly elevated and greater than the state medians, however chloride levels did not exceed the state chronic chloride standard. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. Birch Brook, Lyon Brook and Penacook Rd. Bridge conductivity and chloride levels remained elevated. Rowe Creek and King Hill Brook conductivity and chloride levels were low and less than the state medians.
- ◆ **COLOR:** Apparent color measured in the epilimnion indicates the water was moderately tea colored, or brown, in July, and highly tea colored, or dark brown in August.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus was moderate in June, decreased to a low level in July, and then increased to a slightly elevated level in August following record rainfall in July. Average epilimnetic phosphorus level remained stable with 2020, was slightly greater than the state median, and was approximately equal to the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Hypolimnetic phosphorus levels fluctuated within a normal range for that station. Birch Brook and Lyon Brook phosphorus levels fluctuated within a moderate range for those stations. Outlet phosphorus level was elevated in June and lab dated noted high levels of organic matter in the sample. Penacook Rd. Bridge phosphorus levels were slightly elevated in June and August during low flows and lab data noted colored water with sediment in the sample. Rowe Creek and King Hill Brook phosphorus levels were low.
- ◆ **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was high (good) in June and then decreased (worsened) as the summer progressed and water color became darker. Average NVS transparency increased (improved) from 2020 and was slightly higher (better) than the state median. Historical trend analysis indicates significantly increasing (improving) NVS transparency since monitoring began.
- ◆ **TURBIDITY:** Epilimnetic turbidity level was elevated in August following record rainfall in July and a rain event prior to sampling. Hypolimnetic turbidity level was elevated in July potentially due to bottom sediment contamination and/or the formation and accumulation of organic compounds under anoxic conditions. Birch Brook, Lyon Brook and Penacook Rd. Bridge turbidity levels were elevated in June and August due to low flow conditions, high flow conditions and varying levels of color and organic matter in samples. Outlet turbidity level was elevated in June due to organic matter.
- ◆ **PH:** Deep spot, Birch Brook, King Hill Brook, Lyon Brook, Outlet and Rowe Creek average pH levels were within the desirable range 6.5-8.0 units, however most stations experienced a drop in pH in July following record rainfall. Penacook Rd. Bridge pH levels fluctuated around the low end of the desirable range. Historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began.

Station Name	Table 1. 2021 Average Water Quality Data for KEZAR LAKE - NORTH SUTTON									
	Alk. (mg/L)	Chlor-a (ug/L)	Chloride (mg/L)	Color (pcu)	Cond. (us/ cm)	Total P (ug/L)	Trans. (m)		Turb. (ntu)	pH
							NVS	VS		
Epilimnion	9.8	2.78	30	75	170.9	12	3.52	3.90	1.36	6.94
Hypolimnion			30		170.1	19			6.02	6.62
Birch Brook			66		307.9	19			3.54	6.69
King Hill Brook			3		24.7	8			1.41	6.93
Lyon Brook at Trussel Ridge			79		385.0	18			1.78	7.17
Outlet			33		169.5	16			2.47	7.05
Penacook Rd. Bridge			51		251.1	27			2.71	6.47
Rowe Creek			3		27.6	8			1.07	6.55

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)