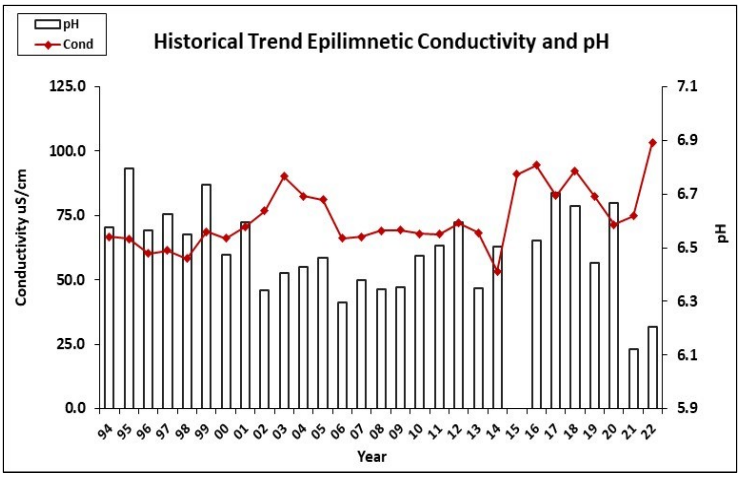
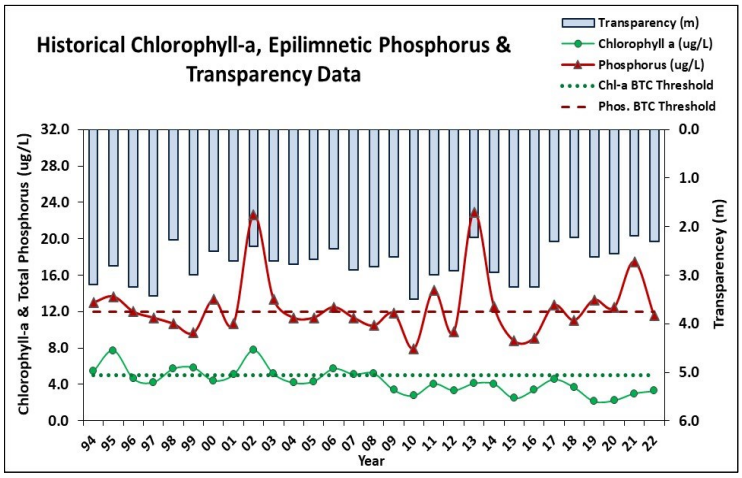
Volunteer Lake Assessment Program Individual Lake Reports
Contoocook Lake, Jaffrey
2022 Data Summary

Recommended Actions: Great job sampling in 2022! Lake quality is representative of mesotrophic, or average, conditions and the improving chlorophyll levels are encouraging. However, lake phosphorus levels tend to fluctuate above the threshold for mesotrophic lakes and transparency has remained below average since 2017. In contrast with record rainfall amounts in 2021, drought conditions in 2022 helped to improve in-lake phosphorus levels. This highlights the importance of managing storm-water runoff and erosion within the watershed. Consider development of a watershed management plan to help identify and quantify nutrient (phosphorus) loads and make recommendations on ways to reduce loading to the lake. Encourage property owners to be certified LakeSmart through NH LAKES lake-friendly living program and to utilize the NH Homeowner's Guide to Stormwater Management to reduce stormwater runoff from shorefront properties. Walsh Inlet experienced elevated phospho-rus levels in 2022. Keep an eye on this station in 2023 for activity in the sub-watershed that could influence nutrient levels. En-courage local road agents and private winter maintenance companies to obtain Green SnowPro Certification to help address the increasing conductivity levels. Keep up the great work!

Historical Water Quality Trend Analysis

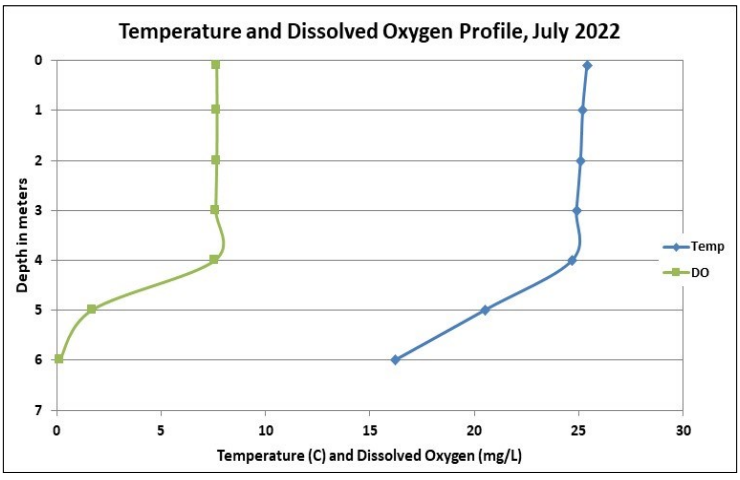
Parameter	Trend	Parameter	Trend
Conductivity	Worsening	**Chlorophyll-a**	Improving
pH (epilimnion)	Stable	**Transparency**	Stable
		Phosphorus (epilimnion)	Stable

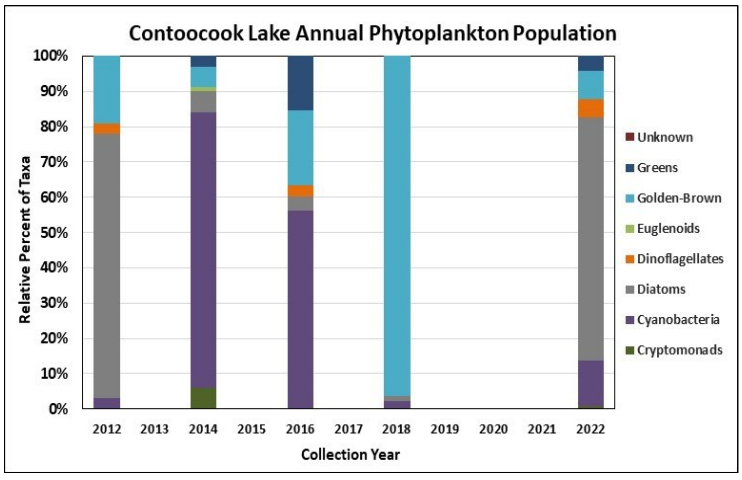




Dissolved Oxygen and Phytoplankton

(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 moderate in June, decreased to a low level in July and remained stable in August. Average chlorophyll level increased slightly from 2021 but remained 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), Cochrane Inlet E and W, Outlet, Jowder Cove Inlet, Squantum Inlet, and Townline Inlet conductivity and/or chloride levels remained slightly elevated for NH surface waters and greater than the state medians, yet chloride levels were less than the state chronic chloride standard. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. Walsh Inlet 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 from June through August.
- **E. coli:** Jowder Cove Inlet and Townline Inlet E. coli levels were low in June and increased in July but remained less than the state standard of 406 cts/100 mL for surface waters.
- **Total Phosphorus:** Epilimnetic phosphorus level was slightly elevated in June, decreased to a low level in July, and increased to a moderate level in August. Average epilimnetic phosphorus level decreased from 2021 and was approximately equal to the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus level since monitoring began. Hypolimnetic phosphorus level was slightly elevated in June and July. Cochrane Inlet E, Outlet, Jowder Cove, and Townline Inlet phosphorus levels fluctuated within a low ranges for those stations. Cochrane Inlet W phosphorus level was slightly elevated but within an average range for the station. Squantum Inlet phosphorus level was elevated but also within an average range for the station. Walsh Inlet phosphorus levels were elevated in June and July and lab data noted colored water.
- **Transparency:** Transparency measured without the viewscope (NVS) was below average (worse) in June and increased (improved) slightly in July. Wave conditions prevented August data collection. Average NVS transparency remained stable with 2021 and was less (worse) than the state median. Viewscope (VS) transparency was higher (better) than NVS transparency and likely a better measure of actual conditions.
- **Turbidity:** Epilimnetic, Hypolimnetic, Cochrane Inlet E and W, Jowder Cove, Outlet, Squantum Inlet, and Townline Inlet turbidity level fluctuated within a low to average range. Walsh Inlet turbidity level was elevated in June and lab data noted colored water conditions.
- **pH:** Epilimnetic and Hypolimnetic pH levels were slightly less than the desirable range 6.5-8.0 units. Historical trend analysis indicates stable, yet variable, epilimnetic pH levels since monitoring began. Cochrane Inlet E and W and Outlet pH levels were slightly acidic. Jowder Cove, Squantum Inlet and Townline Inlet pH levels were approximately equal to the low end of the desirable range.

Station Name	Table 1. 2022 Average Water Quality Data for CONTOOCOOK LAKE - JAFFREY										
	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	3.9	3.28	23	43	103.3		12	2.31	3.20	0.97	6.20
Hypolimnion					101.2		17			1.06	6.28
Cochrane Inlet E			40		176.8		10			1.56	6.01
Cochrane Inlet W			32		138.4		21			0.76	5.22
Dam Outlet					106.3		12			0.52	5.96
Jowder Cove Inlet			41		149.5	153	15			0.65	6.47
Squantum Inlet			31		124.3		79			1.03	6.43
Townline Inlet			24		99.3	107	16			1.03	6.56
Walsh Inlet			3		35.6		38			2.46	6.68

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)