



VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

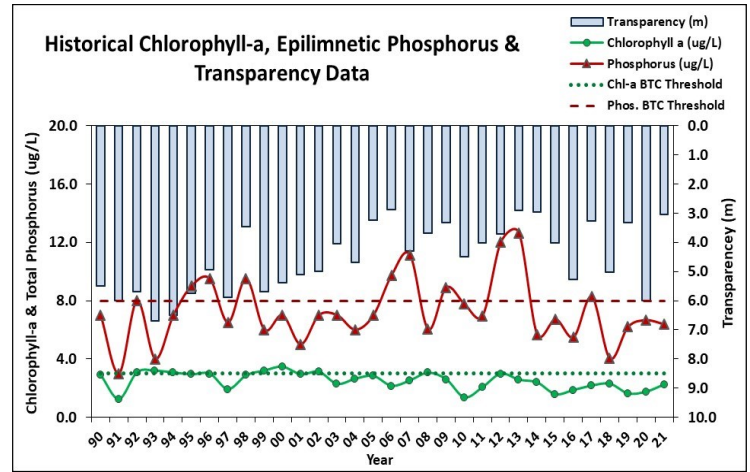
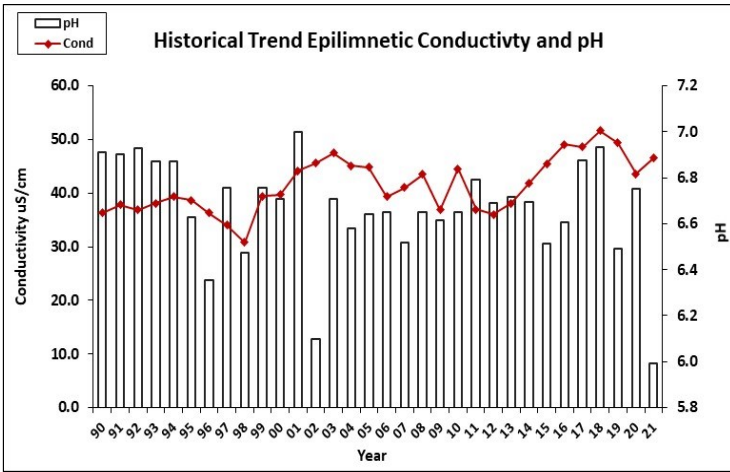
BROAD BAY, OSSIPEE

2021 DATA SUMMARY

RECOMMENDED ACTIONS: Great job sampling in 2021! The improving algal (chlorophyll) growth is encouraging and both phosphorus and chlorophyll levels have remained below the threshold for oligotrophic lakes in recent years. However, phytoplankton monitoring reveals cyanobacteria are becoming more dominant in the lake. The increased frequency and intensity of significant storm events, as experienced in 2021, combined with warmer water temperatures, longer growing seasons due to earlier ice out and later ice in, and potential internal load of nutrients from bottom sediments under anoxic conditions highlights the importance of targeted watershed management efforts aimed at reducing nutrient loading. Observe the lake for any signs of cyanobacteria in late summer/fall and notify NHDES' [Harmful Algal Bloom Program](#) if observed. In contrast to drought conditions in 2020, the record summer rainfall amounts and flushing of waters rich in dissolved organic matter that impart a tea, or brown, color to the water likely resulted in poor water clarity in 2021. In response to increased conductivity levels, GMCG launched the Salt Responsibly initiative in 2022, great job! Continue efforts to implement the watershed management plan and reduce stormwater runoff and erosion throughout the watershed. Encourage shoreline property owners to be certified [LakeSmart](#) through NH LAKES lake-friendly living program. Keep up the great work!

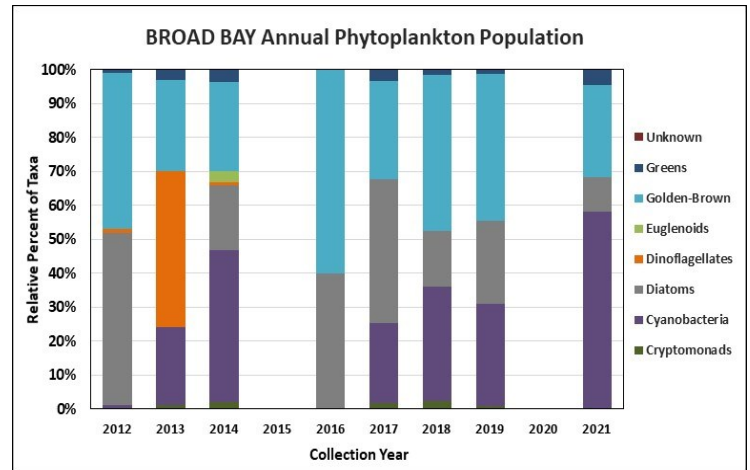
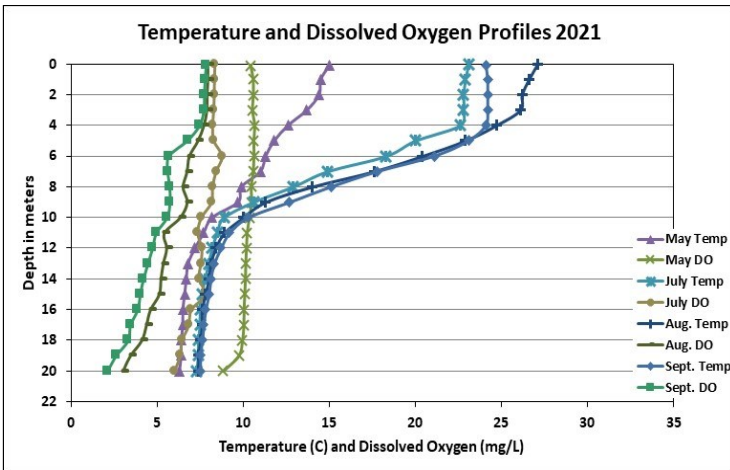
HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Parameter	Trend
Conductivity	Worsening	Chlorophyll-a	Improving
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 May, increased slightly through July, and decreased in September. Average chlorophyll level increased slightly from 2020 but remained less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates significantly decreasing (improving) chlorophyll levels since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) conductivity and chloride levels remained slightly greater than the state medians, yet were less than a level of concern. However, historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.
- **COLOR:** Epilimnetic color data indicate the water was borderline light to moderately tea colored, or light brown to brown, and was darkest in May, August and September following spring snowmelt and significant summer rainfall.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was slightly elevated in May, decreased to low levels through July, increased slightly in August, and decreased in September. Average epilimnetic phosphorus level decreased slightly from 2020 and was less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus levels fluctuated within a low range. Hypolimnetic phosphorus level was slightly elevated in May and September and the turbidity of the September sample was also slightly elevated.
- **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was below average (worse) in May, increased (improved) slightly in June but remained below average, decreased slightly in July, and then increased to within an average range in September. Average NVS transparency decreased (worsened) in 2020 and was slightly lower than the state median. Historical trend analysis indicates significantly decreasing (worsening) NVS transparency since monitoring began. Viewscope transparency (VS) was generally much higher (better) than NVS transparency and likely a better measure of actual conditions.
- **TURBIDITY:** Epilimnetic turbidity level was slightly elevated in June and high water levels were noted. Metalimnetic turbidity levels fluctuated within a low and average range for that station. Hypolimnetic turbidity level was slightly elevated in September.
- **PH:** Epilimnetic, Metalimnetic and Hypolimnetic pH levels fluctuated within a slightly acidic range and were less than desirable 6.5-8.0 units. Historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began.

Station Name	Table 1. 2021 Average Water Quality Data for BROAD BAY - FREEDOM									
	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	5.7	2.24	10	44	46.5	6	3.04	3.74	0.58	5.99
Metalimnion					45.1	7			0.63	6.13
Hypolimnion					44.9	8			0.98	5.96

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)