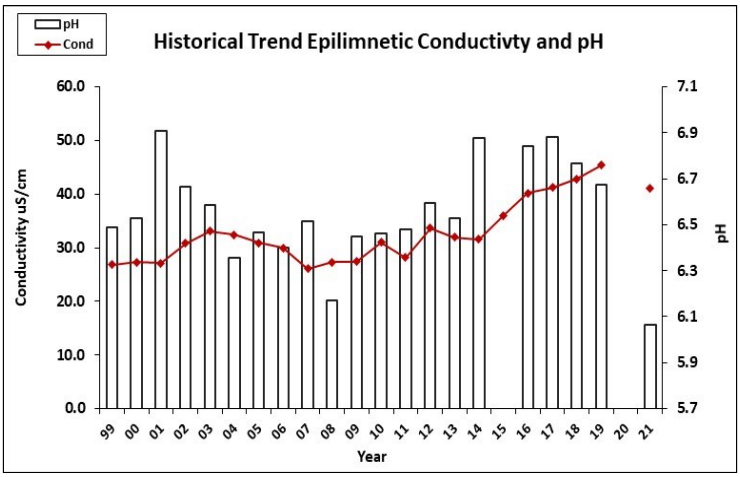
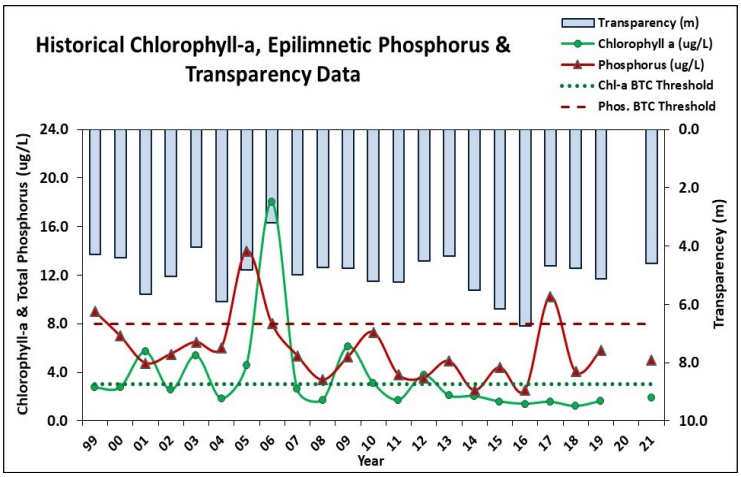
Volunteer Lake Assessment Program Individual Lake Reports
Lower Beech Pond, Tuftonboro
2021 Data Summary

Recommended Actions: Pond quality remained representative of oligotrophic, or high quality, conditions. Epilimnetic phosphorus levels and algal growth (chlorophyll) appear to be decreasing and have generally stabilized at a lower level since 2012. We hope to see this continue! Record summer rainfall amounts and associated stormwater runoff and flushing of wetland systems likely contributed to the elevated nutrient (phosphorus) and turbidity levels measured in the Metalimnion. The increased frequency and intensity of significant storm events highlights the importance of managing stormwater runoff and erosion, particularly from shorefront properties. Educate property owners on ways to reduce stormwater runoff and to stabilize steep slopes. NHDES' NH Homeowner's Guide to Stormwater Management and UNH Cooperative Extension's Landscaping at the Water's Edge are great resourced. Encourage property owners to be certified LakeSmart through NH LAKES lake-friendly living program. Consider development of a watershed management plant to protect high quality waters. NHDES Watershed Assistance Program provides grant funds for watershed management plan development. Keep up the great work!

Historical Water Quality Trend Analysis

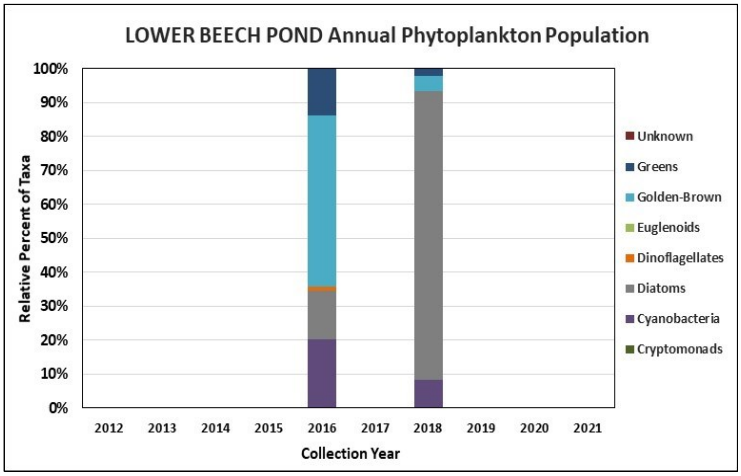
Parameter	Trend	Parameter	Trend
Conductivity	Worsening	**Chlorophyll-a**	Stable
pH (epilimnion)	Stable	**Transparency**	Stable
		Phosphorus (epilimnion)	Stable





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 within a low range in June, decreased in July, and then increased to a moderate level in August. Average chlorophyll level remained stable with 2019 and was less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates stable, yet variable, chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), Inlet, and Outlet conductivity levels remained low and approximately equal to the state median. Epilimnetic chloride level was also within a low range and slightly greater than the state median. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began.
- **Color:** Epilimnetic color data indicates the water was borderline clear to lightly tea colored, or light brown, and remained fairly stable from June through August.
- **E. coli:** First and Second Beach E. coli levels were low and much less than the state standard for public beaches. Inlet and Outlet E. coli levels were also low and much less than the state standard for surface waters.
- **Total Phosphorus:** Epilimnetic phosphorus level fluctuated within a low range and was lowest in July following significant monthly rainfall amounts. Average epilimnetic phosphorus level remained stable with 2019 and was less than the state median and 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 July and August following record rainfall amounts. Hypolimnetic phosphorus level fluctuated within an elevated range and was lowest in July. Inlet and Outlet phosphorus levels were within a very low range.
- **Transparency:** Transparency measured without the viewscope (NVS) was within an average range for the pond in June, decreased (worsened) in July, and then increased (improved) slightly in August. Average NVS transparency decreased slightly from 2019 but remained higher (better) than the state median. Historical trend analysis indicates relatively stable NVS transparency since monitoring began. Viewscope (VS) transparency was much higher (better) than NVS transparency and likely a better measure of actual conditions.
- **Turbidity:** Epilimnetic turbidity levels fluctuated within a low range and decreased as the summer progressed. Metalimnetic turbidity level was slightly elevated in June and elevated in July following significant rainfall amounts and associated stormwater runoff. Hypolimnetic turbidity levels fluctuated within a low range for that station. Inlet and Outlet turbidity levels also fluctuated within a low range.
- **pH:** Epilimnetic pH level fluctuated within a slightly acidic range, was less than desirable range 6.5-8.0 units, and was more acidic than previously measured likely due to record summer rainfall amounts. Metalimnetic, Inlet and Outlet pH levels fluctuated around the low end of the desirable range. Hypolimnetic pH levels was slightly acidic and less than desirable.

Station Name	Table 1. 2021 Average Water Quality Data for LOWER BEECH POND - TUFTONBORO										
	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	1.88	10	27	41.1		5	4.58	6.58	0.56	6.07
Metalimnion					42.9		11			2.48	6.45
Hypolimnion					43.5		15			1.21	5.70
First Beach						1					
Inlet					41.6	2	3			0.31	6.52
Outlet					41.8	1	3			0.31	6.46
Second Beach						3					

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)