



# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

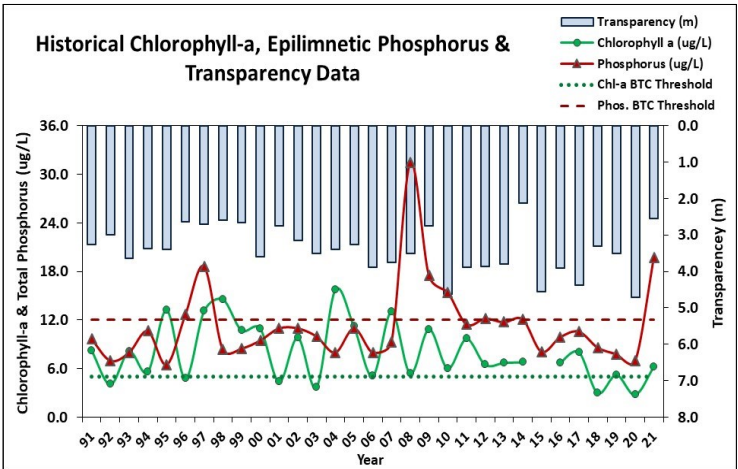
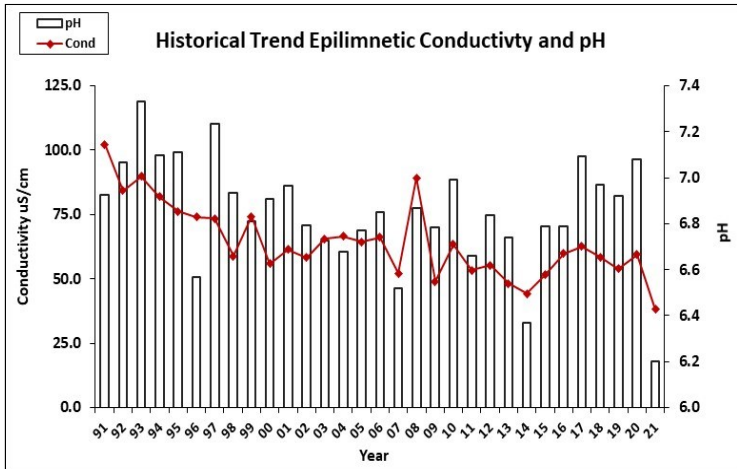
## FOREST LAKE, WINCHESTER

### 2021 DATA SUMMARY

**RECOMMENDED ACTIONS:** Great job sampling in 2021! Lake quality has generally improved in recent years with lake nutrient (phosphorus) levels and algal (chlorophyll) growth remaining within a low range and less than the thresholds for mesotrophic lakes resulting in improved lake clarity (transparency). However, flooding rains and record high water levels in July of 2021 resulted in elevated in-lake nutrient levels that fueled excess algal growth and decreased water clarity. Tributary water quality was improved two weeks after the flooding event likely due to dilution from rainfall, however was likely worse at the time of the event. This highlights the importance of managing stormwater runoff and erosion from shorefront properties and within the watershed. NHDES' [NH Homeowner's Guide to Stormwater Management](#) and [Soak Up the Rain NH](#) are great resources. Minimize stormwater runoff and erosion of dirt/gravel roads and Maine DEP's [Camp Road website](#) is a great resource. Consider hiring a consultant to evaluate the watershed for sites susceptible to runoff and erosion and make recommendations on best practices to improve the sites. Continue watershed education and outreach efforts and encourage shoreline property owners to be certified [LakeSmart](#) through NH LAKES lake-friendly living program. Conductivity levels have improved and pH levels are slowly starting to recover following a period of decline. These trends are encouraging and we hope to see them continue. Keep up the great work!

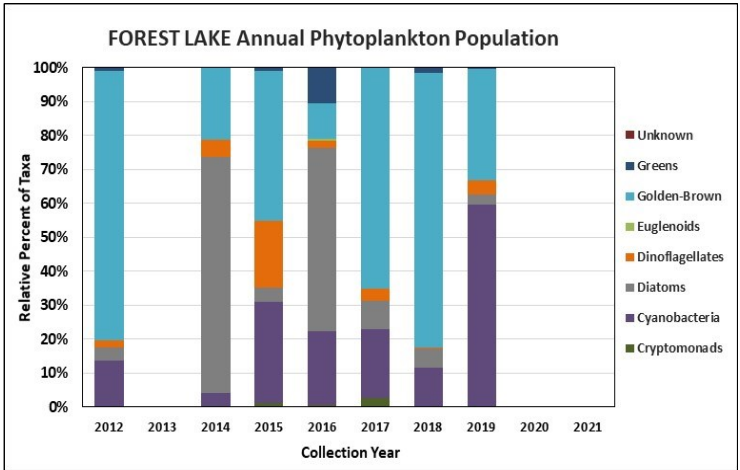
### HISTORICAL WATER QUALITY TREND ANALYSIS

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



### DISSOLVED OXYGEN AND PHYTOPLANKTON

(Note: Information may not be collected annually)





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### 2021 DATA SUMMARY

#### OBSERVATIONS (Refer to Table 1 and Historical Deep Spot Data Graphics)

- ◆ **CHLOROPHYLL-A:** Chlorophyll level was moderate in June and increased to an elevated level in August. Average chlorophyll level increased from 2020 and was greater than the state median and the threshold for mesotrophic 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), Campground Inlet, NE Branch, and Outlet conductivity and chloride levels were low and approximately equal to the state medians. Historical trend analysis indicates significantly decreasing (improving) epilimnetic conductivity levels since monitoring began. Sandy Point Inlet conductivity level was very low. Dump Branch conductivity level was greater than the state median, yet less than a level of concern, and historical analysis indicates decreasing conductivity levels since monitoring began.
- ◆ **COLOR:** Apparent color measured in the epilimnion indicates the water was moderately tea colored, or brown in June, and highly tea colored, or dark brown in August following flooding and record rainfall amounts.
- ◆ **E. COLI:** Campground Culvert E. coli level was low and much less than the state standard of 406 cts/100 mL.
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was slightly elevated in June and increased to an elevated level in August. Average epilimnetic phosphorus level increased greatly from 2020 and was much greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates stable, yet variable, epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus level was moderate in June and slightly elevated in August. Hypolimnetic phosphorus level was within a moderate range and remained stable from June to August. Campground Inlet, Outlet and Sandy Point Inlet phosphorus levels fluctuated within a low range for those stations. Dump Branch phosphorus levels were the lowest measured since monitoring began. NE Branch phosphorus levels fluctuated within a moderate range. Test Sites 2, 4, 6 and 8 phosphorus levels fluctuated within a low range for those stations following a significant storm event in June.
- ◆ **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was below average (worse) in June and decreased (worsened) further in August following flooding and record rainfall amounts. Historical trend analysis indicates significantly increasing (improving) NVS transparency since monitoring began.
- ◆ **TURBIDITY:** Epilimnetic, Metalimnetic and Outlet turbidity levels fluctuated within a low range and were slightly higher in August. Hypolimnetic turbidity level was elevated in June and data note colored water and organics. Campground Inlet turbidity level was slightly elevated in August. Dump Branch and NE Branch turbidity levels were within a low range for those stations. Sandy Beach Inlet turbidity was low.
- ◆ **pH:** Deep spot pH levels fluctuated between desirable 6.5-8.0 units and slightly acidic and less than desirable range. Historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began. Campground Inlet, Dump Branch and Sandy Point Inlet pH levels were slightly acidic. NE Branch and Outlet pH levels were approximately equal to the low end of the desirable range.

Station Name	Table 1. 2021 Average Water Quality Data for FOREST LAKE - WINCHESTER										
	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	6.2	6.26	7	80	38.2		20	2.55	3.00	1.08	6.20
Metalimnion					48.9		14			0.98	6.14
Hypolimnion					44.8		23			3.68	6.24
Campground Culvert						28					
Campground Inlet			9		48.4		20			1.60	5.93
Dump Branch					79.9		8			2.24	6.02
NE Branch			5		36.1		24			1.28	6.44
NE Branch 2							22				
Outlet			7		37.8		11			0.86	6.50
Sandy Point Inlet					18.9		9			0.38	6.23
Test 2							19				
Test 4							16				
Test 6							7				
Test 8							19				

#### 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)