

# CHALK POND

## 2021 SAMPLING HIGHLIGHTS

### Station 1 Deep

New Durham, NH



**Blue** = Excellent = Oligotrophic

**Yellow** = Fair = Mesotrophic

**Red** = Poor = Eutrophic

**Gray** = No Data

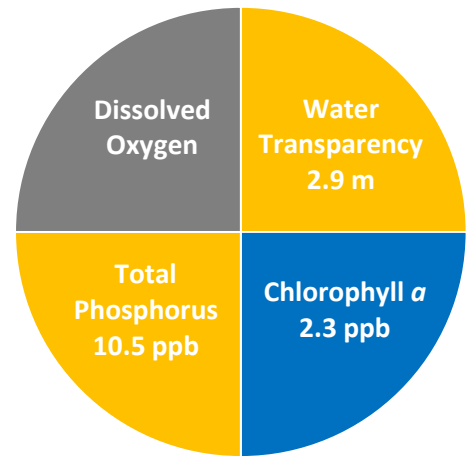


Figure 1. Chalk Pond Water Quality (2021)

Station 1 Deep (Figure 7) was used as a reference point to represent the overall Chalk Pond water quality. With the exception of the dissolved oxygen measurements, that are collected near the lake bottom, the water quality data displayed in Tables 1, 2 and 3 are surface water measurements.

Table 1. 2021 Chalk Pond Seasonal Averages and NH DES Aquatic Life Nutrient Criteria<sup>1</sup>

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Chalk Pond Average (range)	Chalk Pond Classification
Water Clarity (meters)	> 4.0	2.5 - 4.0	< 2.5	2.9 meters (2.7 – 3.0) *	Mesotrophic
Chlorophyll a <sup>1</sup> (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	2.3 ppb (1.8 – 2.9)	Oligotrophic
Total Phosphorus <sup>1</sup> (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	10.5 ppb (8.4 – 11.7)	Mesotrophic
Dissolved Oxygen (mg/L)	5.0 – 7.0	2.0 – 5.0	<2.0	No Data **	Not Assessed

\* Secchi disk consistently rested on the lake bottom before disappearing and thus likely underestimates the water clarity.

\*\*Chalk Pond did not develop a deep water layer that is the basis for the dissolved oxygen classification criteria.

Table 2. 2021 Chalk Pond Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Chalk Pond Average (range)	Chalk Pond Classification
	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored		
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	13.8 color units (range: 12.0 – 17.1)	Slightly colored
Alkalinity (mg/L)	< 0.0 acidified	0.1 – 2.0 extremely vulnerable	2.1 – 10 moderately vulnerable	10.1 – 25.0 low vulnerability	> 25.0 not vulnerable	7.4 mg/L (range: 7.0 – 7.8)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			6.6 standard units (range: 6.2 – 7.1)	Optimal range for fish growth and reproduction
Specific Conductivity (uS/cm)	< 50 uS/cm Characteristic of minimally impacted NH lakes		50-100 uS/cm Lakes with some human influence	> 100 uS/cm Characteristic of lakes experiencing human disturbances		51.0 uS/cm (range: 47.9 – 53.4)	Characteristic of lakes with some human influence

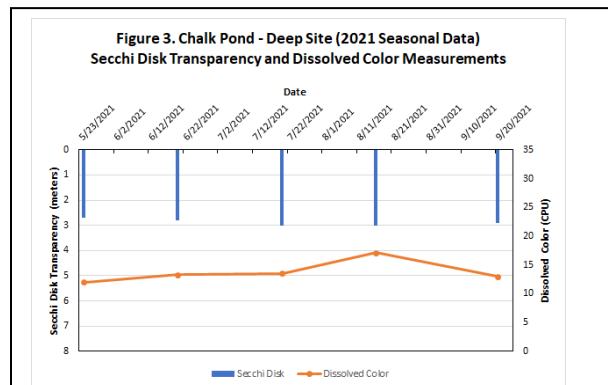
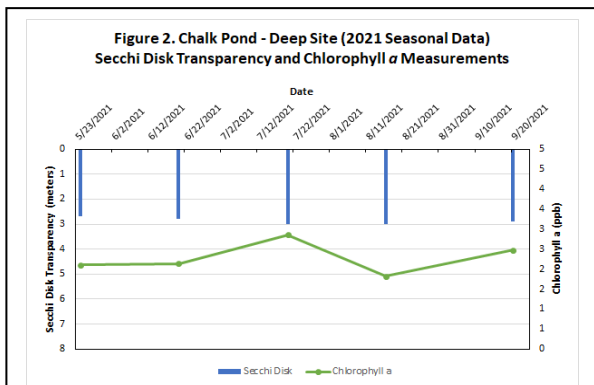
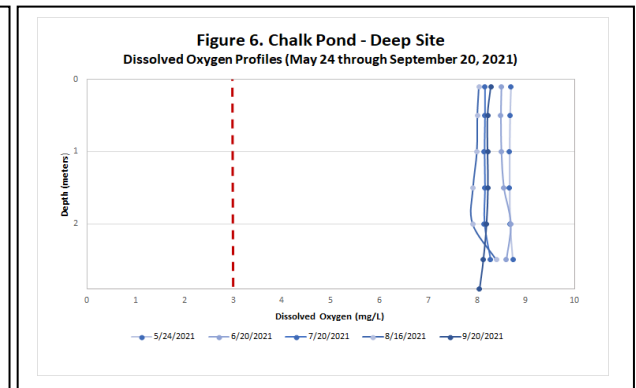
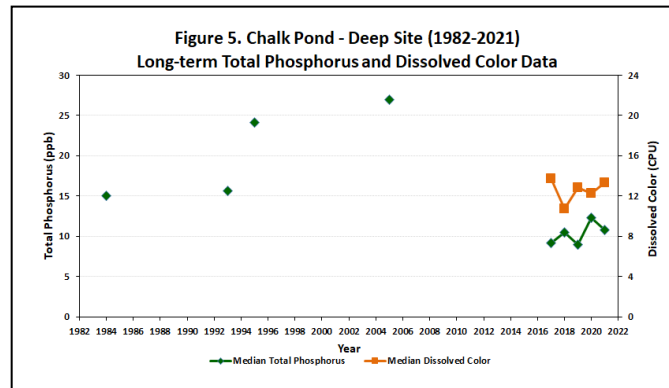
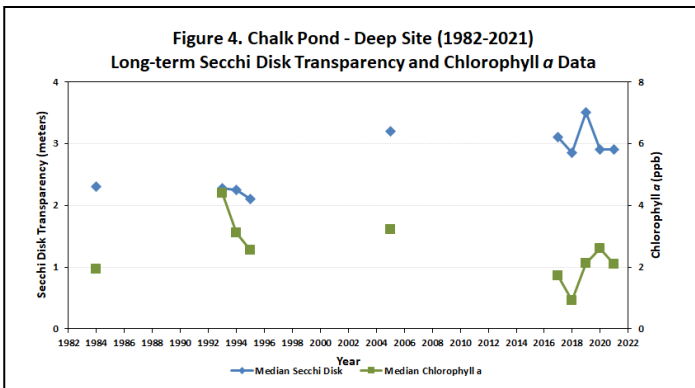


Figure 2 and 3. Seasonal Secchi disk transparency, chlorophyll a changes and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll a and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll a and/or color concentrations. Note: the Secchi Disk measurements consistently reached the lake bottom before disappearing from view and likely underestimate the Chalk Pond water transparency.

**Table 3. New Durham Ponds inter-comparison (2021 Data)**

Lake	Average (range) Secchi Disk Transparency (meters)	Average (range) Chlorophyll <i>a</i> (ppb)	Average (range) Total Phosphorus (ppb)	Average (range) Dissolved Color (CPU)	Average (range) Dissolved Oxygen (mg/l)
Merrymeeting Lake	10.9 meters (range: 8.7 – 13.1)	0.7 ppb (range: 0.4 – 1.0)	4.5 ppb (range: 2.5 – 11.6)	7.7 CPU (range: 3.7 – 13.0)	9.6 mg/l (range: 6.9 – 12.0)
Marsh Pond	2.6 meters (range: 1.7 – 3.8)	13.8 ppb (range: 7.6 – 22.0)	31.3 ppb (range: 22.9 – 37.4)	42.2 CPU (range: 24.1 – 87.8)	1.6 mg/l (range: 0.0 – 4.9)
Jones Pond	2.7 meters (range: 2.0 – 3.5)	8.5 ppb (range: 3.1 – 13.0)	23.1 ppb (range: 16.8 – 31.1)	43.5 CPU (range: 29.9 – 64.5)	1.0 mg/l (range: 0.0 – 3.7)
Downing Pond	2.6 meters (range: 2.1 – 3.0)	6.3 ppb (range: 5.3 – 7.5)	24.2 ppb (range: 16.7 – 30.8)	41.8 CPU (range: 30.7 – 57.0)	-----
Chalk Pond	2.9 meters (range: 2.7 – 3.0)	2.3 ppb (range: 1.8 – 2.9)	10.5 ppb (range: 8.4 – 11.7)	13.8 CPU (range: 12.0 – 17.1)	-----
Marchs Pond	4.5 meters (range: 4.0 – 5.1)	2.5 ppb (range: 0.8 – 3.3)	8.3 ppb (range: 6.7 – 10.3)	11.1 CPU (range: 9.2 – 13.3)	-----
Shaws Pond	3.3 meters (range: 3.3 – 4.4)	3.7 ppb (range: 2.3 – 6.7)	7.4 ppb (range: 5.7 – 10.2)	39.2 CPU (range: 30.5 – 49.6)	6.2 mg/l (range: 4.5 – 8.2)

- Water quality data are reported for a deep reference sampling location in each lake/pond.
- Dissolved oxygen measurements were collected in the summer (mid August) in the bottom water layer (hypolimnion or metalimnion).
- Chalk and Marchs Pond Secchi Disk transparency measurements intermittently reached the lake bottom before disappearing from view and likely underestimate the water transparency.
- ----- Indicates the site is too shallow to form a stable deep water layer (hypolimnion or metalimnion) during the summer months.



Figures 4 and 5. Changes in the Chalk Pond water clarity (Secchi Disk depth), chlorophyll *a*, dissolved color and total phosphorus concentrations measured between 1984 and 2021. **Total phosphorus data are also displayed and are oftentimes correlated with the amount of plant growth.** Long-term trends are based on the analysis of annual median values.

Figure 6. Chalk Pond temperature and dissolved oxygen concentrations collected between May 24 and September 20, 2021.

## Recommendations

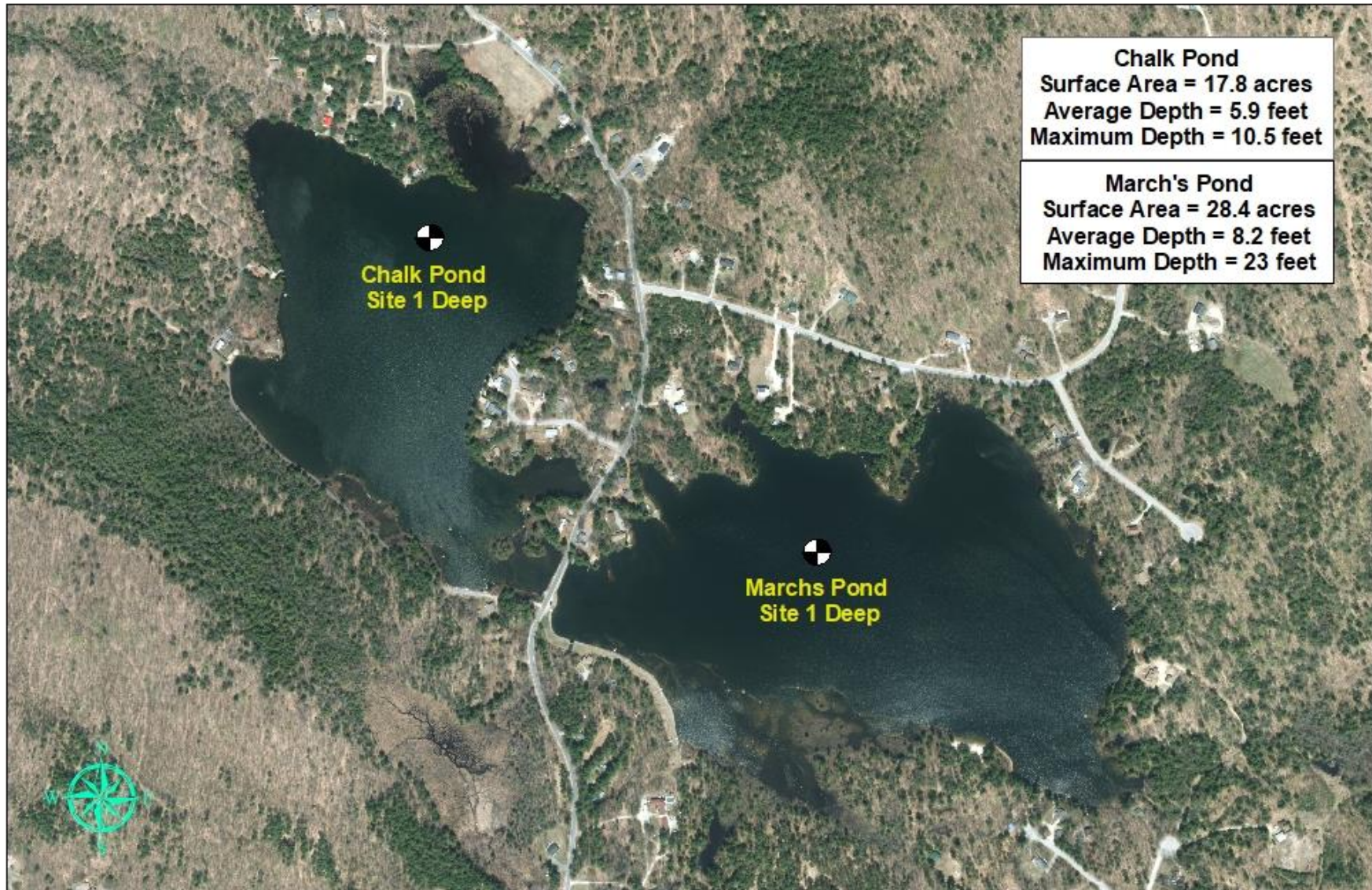
Implement Best Management Practices within the Chalk Pond watershed to minimize the adverse impacts of polluted runoff and erosion into Chalk Pond. Refer to “Landscaping at the Water’s Edge: An Ecological Approach” and “New Hampshire Homeowner’s Guide to Stormwater Management: Do-It-Yourself Stormwater Solutions for Your Home” for more information on how to reduce nutrient loading caused by overland run-off.

- [https://extension.unh.edu/resources/files/Resource004159\\_Rep5940.pdf](https://extension.unh.edu/resources/files/Resource004159_Rep5940.pdf)
- <https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/homeowner-guide-stormwater.pdf>

# Figure 7. Chalk Pond and Marchs Pond

New Durham, NH

2021 Deep water sampling sites



**Chalk Pond**  
Surface Area = 17.8 acres  
Average Depth = 5.9 feet  
Maximum Depth = 10.5 feet

**March's Pond**  
Surface Area = 28.4 acres  
Average Depth = 8.2 feet  
Maximum Depth = 23 feet

**Chalk Pond**  
Site 1 Deep

**Marchs Pond**  
Site 1 Deep

0 0.1 0.2 0.3 0.4 Miles

Aerial Orthophoto Source: NH GRANIT  
GPS Coordinates collected by the UNH Center for Freshwater Biology



Extension

