

CHOCORUA LAKE

2022 SAMPLING HIGHLIGHTS

Station 1 South

Tamworth, NH



Extension

Water quality data displayed in Tables 1 and 2 are surface water measurements, with the exception of the dissolved oxygen data that are collected near the lake bottom. Summary statistics are provided for bi-weekly samples collected between May 20 and October 5, 2022.

Blue = Oligotrophic

Yellow = Mesotrophic

Red = Eutrophic

Gray = No Data

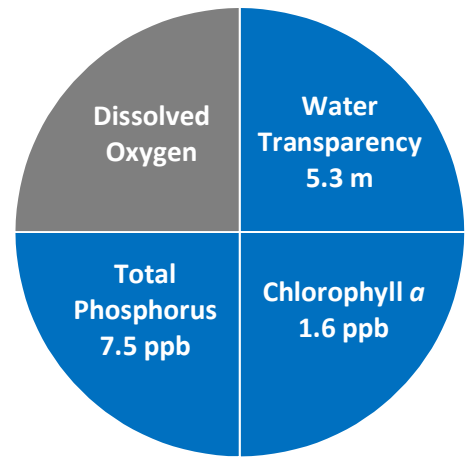


Figure 1. Chocorua Lake Water Quality (2022)

Table 1. 2022 Chocorua Lake Seasonal Averages and NH DES Aquatic Life Nutrient Criteria¹

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Chocorua Lake Average (range)	Chocorua Lake Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	5.3 meters (3.6 – 6.3)	Oligotrophic
Chlorophyll <i>a</i> ¹ (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	1.6 ppb (0.8 – 2.5)	Oligotrophic
Total Phosphorus ¹ (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	4.9 ppb (3.9 – 5.6) *	Oligotrophic
Dissolved Oxygen (ppm)	5.0 – 7.0	2.0 – 5.0	<2.0	Not assessed	Not assessed

* an unusually high total phosphorus concentration of 55.1 ppb was omitted from the statistical summary above as it disproportionately skewed the summary statistics.

Table 2. 2022 Chocorua Lake Seasonal Average Accessory Water Quality Measurements

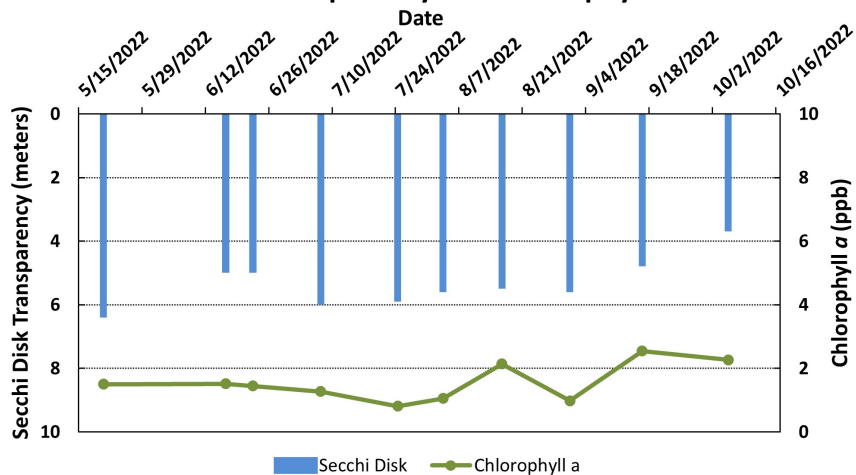
Parameter	Assessment Criteria					Chocorua Lake Average (range)	Chocorua Lake Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	22.2 color units (range: 16.6 – 30.1)	Lightly tea colored
Alkalinity (ppm)	< 0.0 acidified	0.1 – 2.0 extremely vulnerable	2.1 – 10 moderately vulnerable	10.1 – 25.0 low vulnerability	> 25.0 not vulnerable	4.0 ppm (range: 3.0 – 5.0)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			7.0 standard units (range: 6.7 – 7.2)	Optimum range for fish growth and reproduction
Specific Conductivity (μ S/cm)	< 50 μ S/cm Characteristic of minimally impacted NH lakes		50-100 μ S/cm Lakes with some human influence	> 100 μ S/cm Characteristic of lakes experiencing human disturbances		42.9 μ S/cm (range: 40.6 – 44.6)	Characteristic of minimally impacted NH lakes

Strategies to stabilize and improve water quality

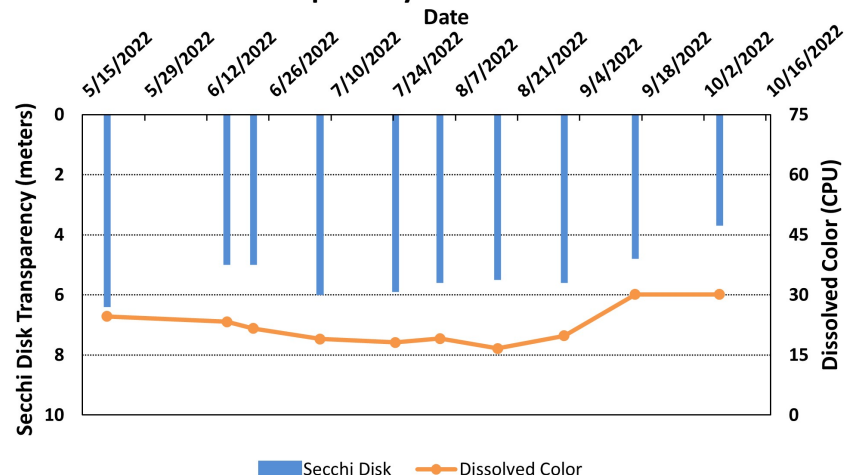
Implement Best Management Practices (BMPs) within the Chocorua Lake watershed to minimize the adverse impacts of polluted runoff and erosion into Chocorua Lake. Refer to "Landscaping at the Water's Edge: An Ecological Approach" and "New Hampshire Homeowner's Guide to Stormwater Management: Do-It-Yourself Stormwater Solutions for Your Home" for more information on how to reduce nutrient loading caused by overland run-off. NH Lakes also provides a series of resources aimed at educating residents and protecting our lakes and ponds.

- 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>
- <https://nhlakes.org/lakesmart-resource-library/>

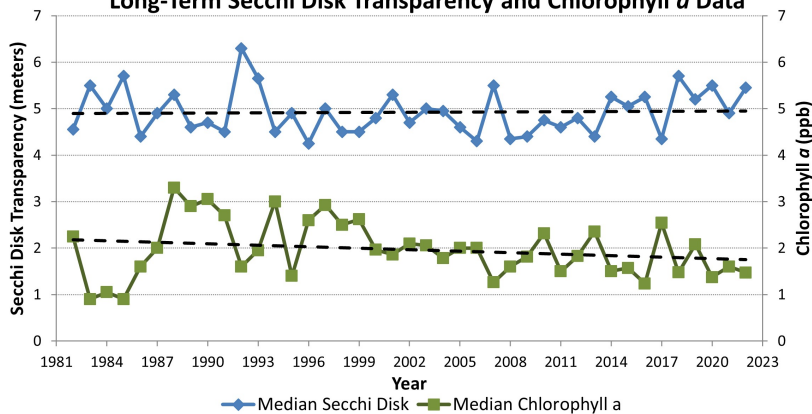
**Figure 2. Chocorua Lake (2022 Seasonal Data)
Secchi Disk Transparency and Chlorophyll *a* Data**



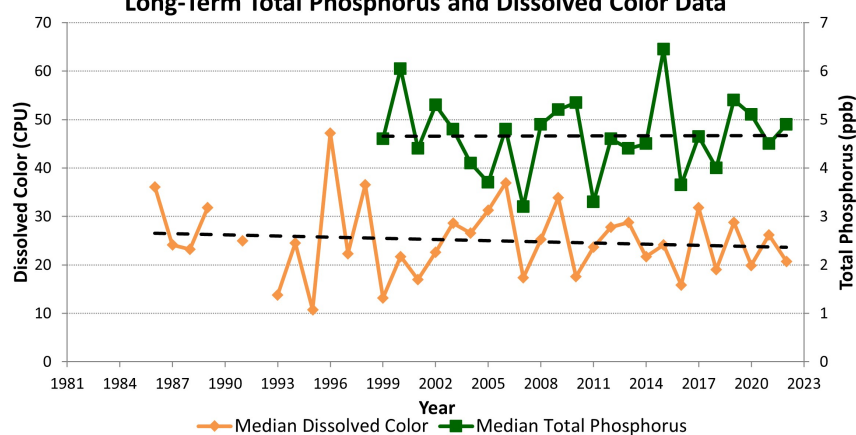
**Figure 3. Chocorua Lake (2022 Seasonal Data)
Secchi Disk Transparency and Dissolved Color Data**



**Figure 4. Chocorua Lake- Site 1 South (1982-2022)
Long-Term Secchi Disk Transparency and Chlorophyll *a* Data**



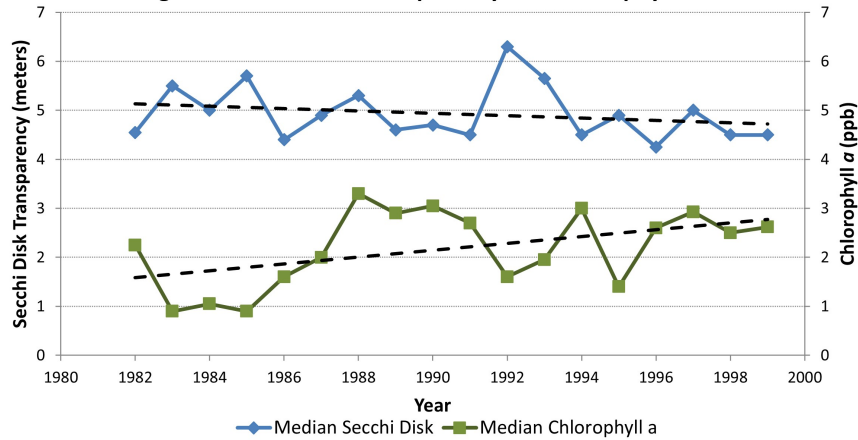
**Figure 5. Chocorua Lake - Site 1 South (1986-2022)
Long-Term Total Phosphorus and Dissolved Color Data**



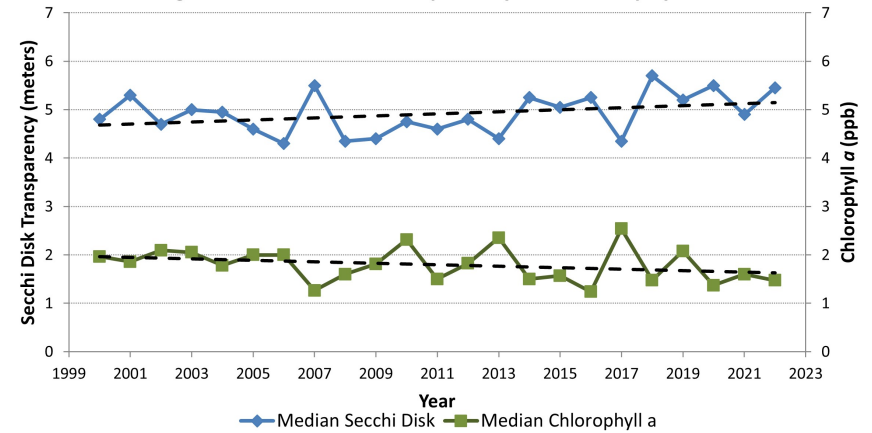
Figures 2 and 3. Seasonal comparison of Chocorua Lake water transparency (Secchi Disk depth), chlorophyll *a* and dissolved color for 2022. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

Figures 4 and 5. Annual median Chocorua Lake water transparency, chlorophyll *a*, dissolved color and total phosphorus concentrations measured between 1982 and 2022, through the New Hampshire Lakes Lay Monitoring Program. The long-term data provide insight into the water quality fluctuations, among years, that have been documented in Chocorua Lake. The dashed trend lines are included for each water quality parameter.

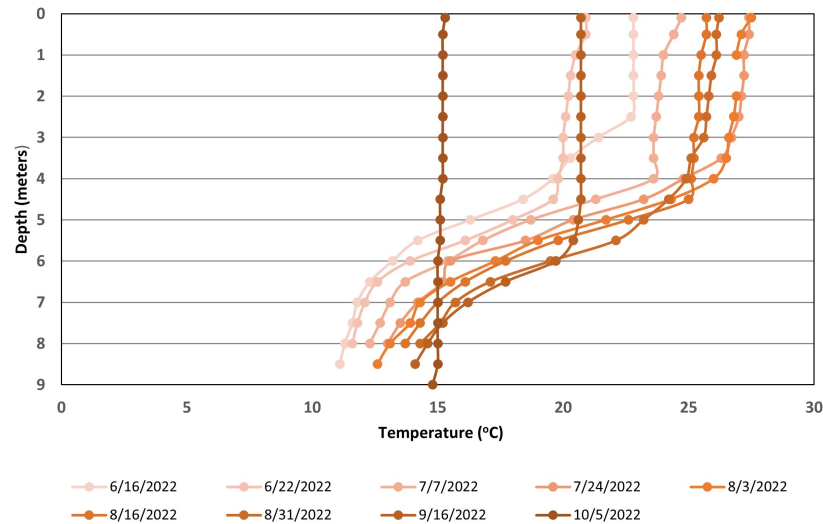
**Figure 6. Chocorua Lake- Site 1 South (Pre-BMPs: 1982-1999)
Long-Term Secchi Disk Transparency and Chlorophyll a Data**



**Figure 7. Chocorua Lake- Site 1 South (Post-BMPs: 2000-2022)
Long-Term Secchi Disk Transparency and Chlorophyll a Data**



**Figure 8. Chocorua Lake - Site 1 South
Temperature Profiles (June 16 through October 5, 2022)**



Figures 6 and 7. Annual median Chocorua Lake water transparency, chlorophyll a , dissolved color and total phosphorus concentrations measured between 1982 and 1999 (Pre-BMP) and 2000 and 2022 (Post-BMP), through the New Hampshire Lakes Lay Monitoring Program. The long-term data provide insight into the water quality fluctuations, among years, that have been documented in Chocorua Lake before and after the implementatin of Best Management Practices (BMPs) along the Route 16 travel corridor. The dashed trend lines are included for each water quality partamater.

Figures 8. Temperature profiles that display the changes in water temperature, through the water column, at 0.5 meter increments. Notice how the water temperatures vary from the surface to the lake bottom during the water summer months.

Data Interpretation: Overview of factors to consider when reviewing the Chocorua Lake data

This highlight report provides a general overview of the current and historical conditions of Chocorua Lake. The report is intended to provide a simple assessment of the water quality trends. Should you have additional questions about interpreting your water quality results, we would be happy to discuss the data with you and/or any concerns you may have. In general, some factors that influence the current and long-term water quality results/trends for our New Hampshire lakes and ponds include:

- **Land-use Patterns** within the watershed (drainage basin) – Research indicates land use patterns have an impact on how much phosphorus (nutrient) is washing into our lakes. In general, more urbanized watersheds have a greater degree of phosphorus runoff than highly forested/vegetated drainage areas.
- **Weather Patterns** – Rainfall and temperature can influence water quality. Wet periods, and overland runoff, tend to be a time when elevated nutrients and other pollutants are transported into our lakes. Temperature can also influence water quality conditions since many aquatic plants and algae tend to respond to changing seasonal conditions. Unusually warm periods are sometimes tied to short-term algal and cyanobacteria blooms.
- **Best Management Practices (BMPs)** – The presence/absence of best management practices can have an interplay on water quality. BMPs are measures that are used to manage nutrients and other pollutants that could otherwise make their way into our lakes. Properties that employ BMPs, designed specifically to remove pollutants of concern (e.g. sediments and phosphorus), are less likely to contribute nutrients and other pollutants into our lakes.
- **Temperature (Thermal) Stratification** – Many lakes become thermally stratified during the summer months and may form three distinct thermal layers: upper water layer (epilimnion), middle lake layer (metalimnion) and bottom cold-water layer (hypolimnion). These thermal zones form a barrier to lake mixing, during the summer months, and can coincide with differences in dissolved oxygen and specific conductivity through the water column.
- **Internal Nutrient Loading** (nutrients that are introduced from the sediments along the lake bottom) – Some of our lakes experience significant internal nutrient loading. Such lakes generally tend to be well stratified and exhibit increasing deep water phosphorus concentrations, relative to surface levels.

Figure 9. Chocorua Lake

Tamworth, NH

2022 Deep sampling site and seasonal average water clarity



Aerial Orthophoto Source: NH GRANIT
Site location GPS coordinates collected by the UNH Center for Freshwater Biology



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