

# SUNSET LAKE

## 2022 SAMPLING HIGHLIGHTS

### Station 1 Deep

Hampstead, 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 the samples collected between May 15 and October 15, 2022.

Blue = Oligotrophic

Yellow = Mesotrophic

Red = Eutrophic

Gray = No Data

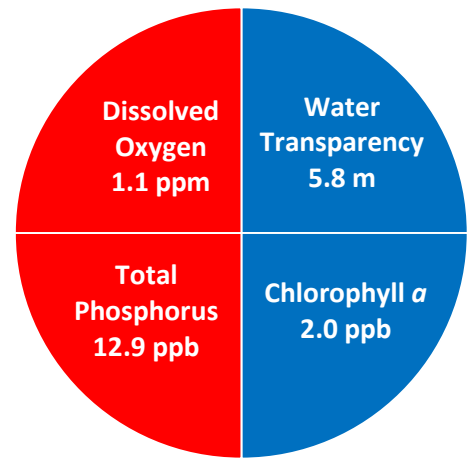


Figure 1. Sunset Lake Water Quality (2022)

Table 1. 2022 Sunset Lake Seasonal Averages and NH DES Aquatic Life Nutrient Criteria<sup>1</sup>

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Sunset Lake Average (range)	Sunset Lake Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	5.8 meters (5.0 – 6.5)	Oligotrophic
Chlorophyll <i>a</i> <sup>1</sup> (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	2.0 ppb (1.3 – 2.7)	Oligotrophic
Total Phosphorus <sup>1</sup> (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	12.9 ppb (10.3 – 14.2)	Eutrophic
Dissolved Oxygen (ppm)	5.0 – 7.0	2.0 – 5.0	<2.0	1.1 ppm (0.0 – 3.6) *	Eutrophic

\* Dissolved oxygen concentrations were measured between 5.5 and 9.8 meters, in the middle and bottom water layers, on August 18, 2022.

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

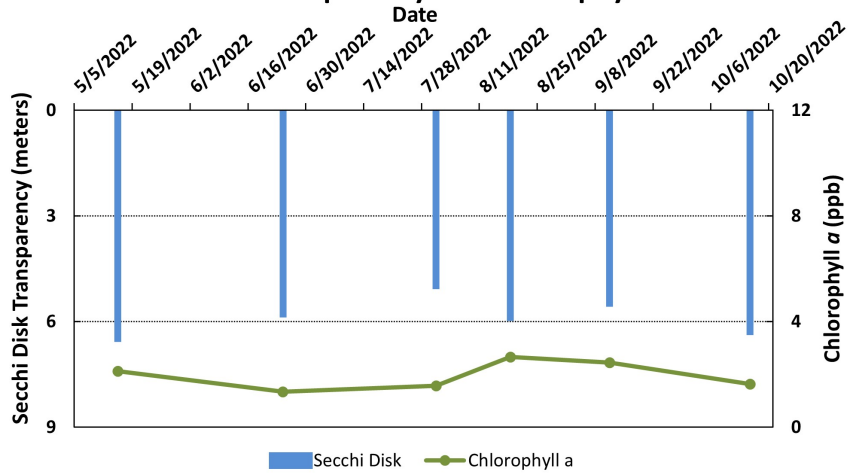
Parameter	Assessment Criteria					Sunset Lake Average (range)	Sunset Lake Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	14.6 color units (11.3 – 19.1)	Slightly colored
Alkalinity (ppm)	< 0.0 acidified	0.1 – 2.0 extremely vulnerable	2.1 – 10 moderately vulnerable	10.1 – 25.0 low vulnerability	> 25.0 not vulnerable	23.6 ppm (single value)	Low vulnerability
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			7.2 standard units (single value)	Optimal range for fish growth and reproduction
Specific Conductivity ( $\mu$ S/cm)	< 50 $\mu$ S/cm Characteristic of minimally impacted NH lakes		50-100 $\mu$ S/cm Lakes with some human influence	> 100 $\mu$ S/cm Characteristic of lakes experiencing human disturbances		291.0 $\mu$ S/cm (single value)	Characteristic of lakes experiencing human disturbances

### Strategies to stabilize and improve water quality

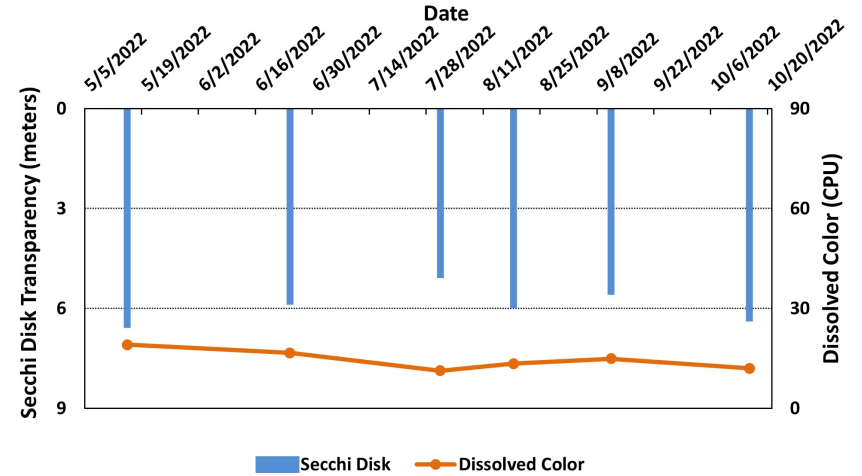
Implement Best Management Practices (BMPs) within the Sunset Lake watershed to minimize the adverse impacts of polluted runoff and erosion into Sunset Lake. Refer to [Landscaping at the Water's Edge: An Ecological Approach](#) and [New Hampshire Homeowner's Guide to Stormwater Management: Do-It-Yourself Stormwater Solutions for Your Home](#) for 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://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/>

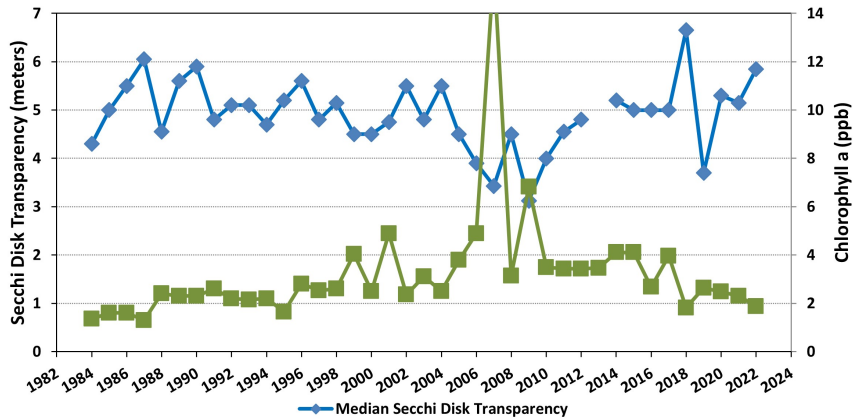
**Figure 2. Sunset Lake (2022 Seasonal Data)  
Secchi Disk Transparency and Chlorophyll *a* Data**



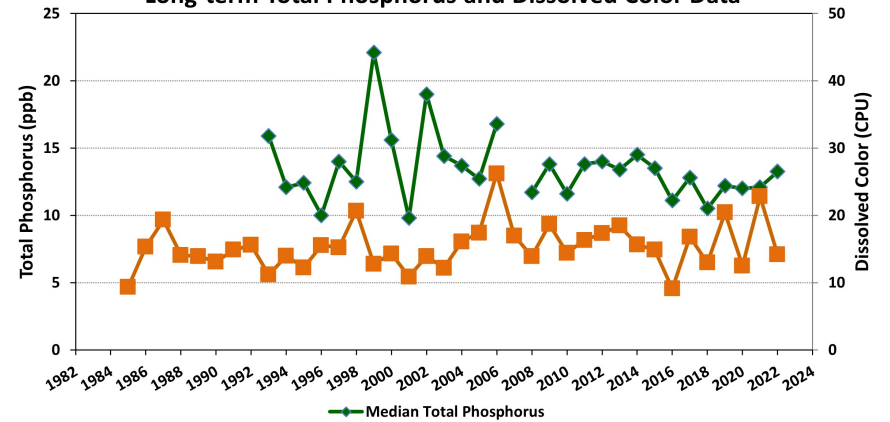
**Figure 3. Sunset Lake (2022 Seasonal Data)  
Secchi Disk Transparency and Dissolved Color Data**



**Figure 4. Sunset Lake - Site 1 Deep (1984-2022)  
Long-term Secchi Disk Transparency and Chlorophyll *a* Data**



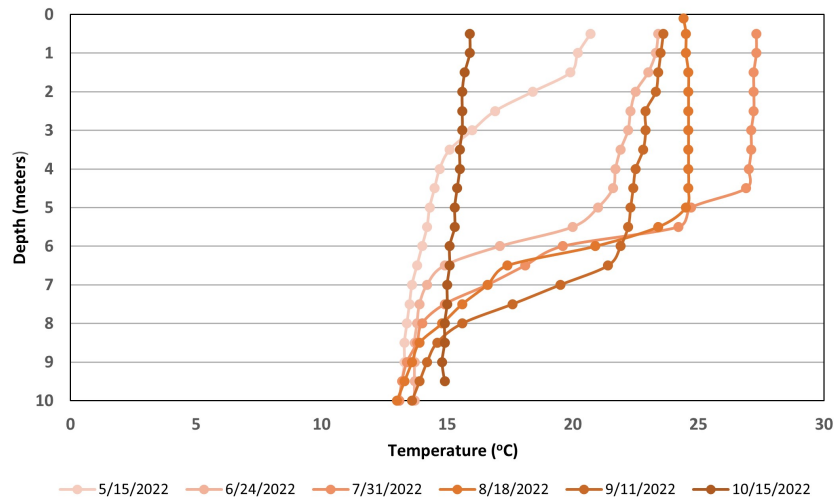
**Figure 5. Sunset Lake - Site 1 Deep (1984-2022)  
Long-term Total Phosphorus and Dissolved Color Data**



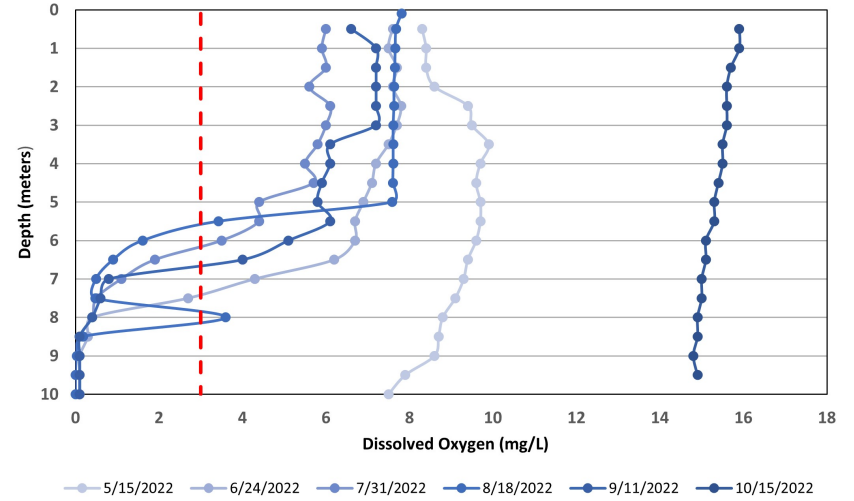
Figures 2 and 3. Seasonal comparison of Sunset Lake, Site 5 Center, water transparency (Secchi Disk depth), chlorophyll *a* and dissolved color for 2022. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

Figures 4 and 5. Annual median Sunset Lake water transparency, chlorophyll *a*, dissolved color and total phosphorus concentrations measured through the New Hampshire Lakes Lay Monitoring Program between 1984 and 2022. The long-term data provide insight into the water quality fluctuations, among years, that have been documented in Sunset Lake.

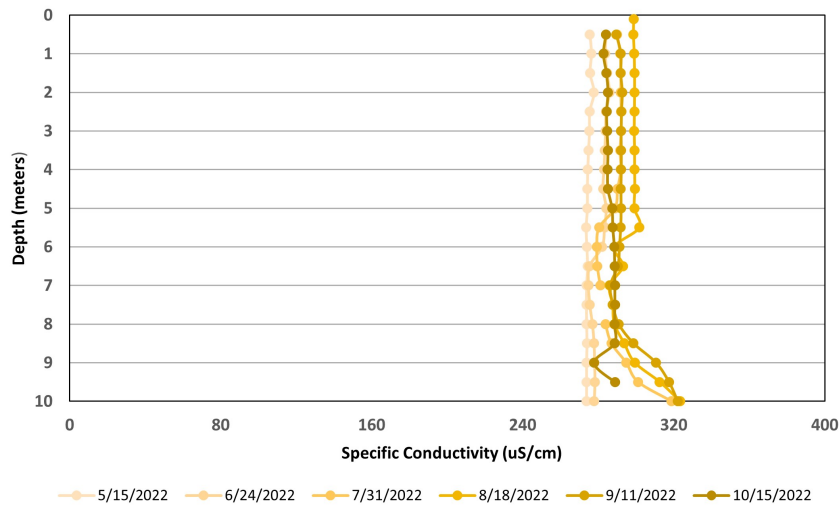
**Figure 6. Sunset Lake - Site 1 Deep**  
Temperature Profiles (May 15 through October 15, 2022)



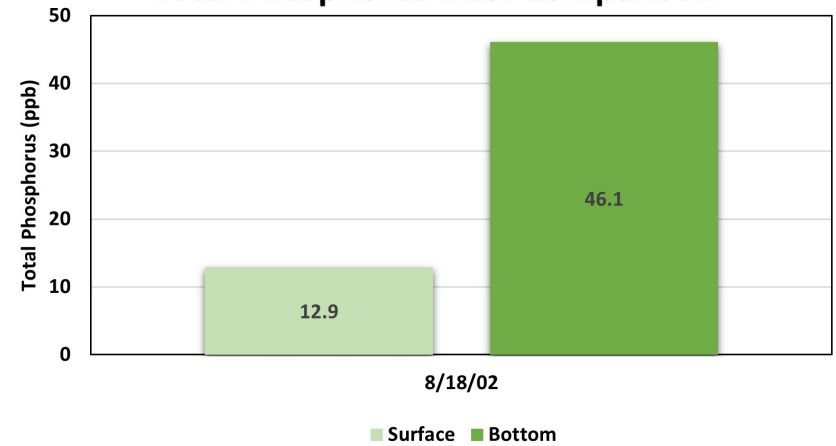
**Figure 7. Sunset Lake - Site 1 Deep**  
Dissolved Oxygen Profiles (May 15 through October 15, 2022)



**Figure 8. Sunset Lake - Site 1 Deep**  
Specific Conductivity Profiles (May 15 through October 15, 2022)



**Figure 9. Sunset Lake - Site 1 Deep**  
Total Phosphorus inter-comparison



Figures 6, 7 and 8. Temperature, dissolved oxygen and specific conductivity profiles displaying the water quality differences, through the water column, in 0.5-meter increments. Notice the decreasing dissolved oxygen concentrations and the increasing specific conductivity levels, near the lake bottom. The dashed vertical red line in Figure 7 displays the dissolved oxygen threshold for the successful growth and reproduction of warm-water fish such as bass and perch.

Figure 9. Total phosphorus comparison between the surface (epilimnion) and bottom water (hypolimnion) zones. Notice the difference between the Sunset Lake surface and deep, bottom water, total phosphorus concentrations.

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

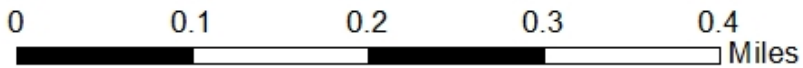
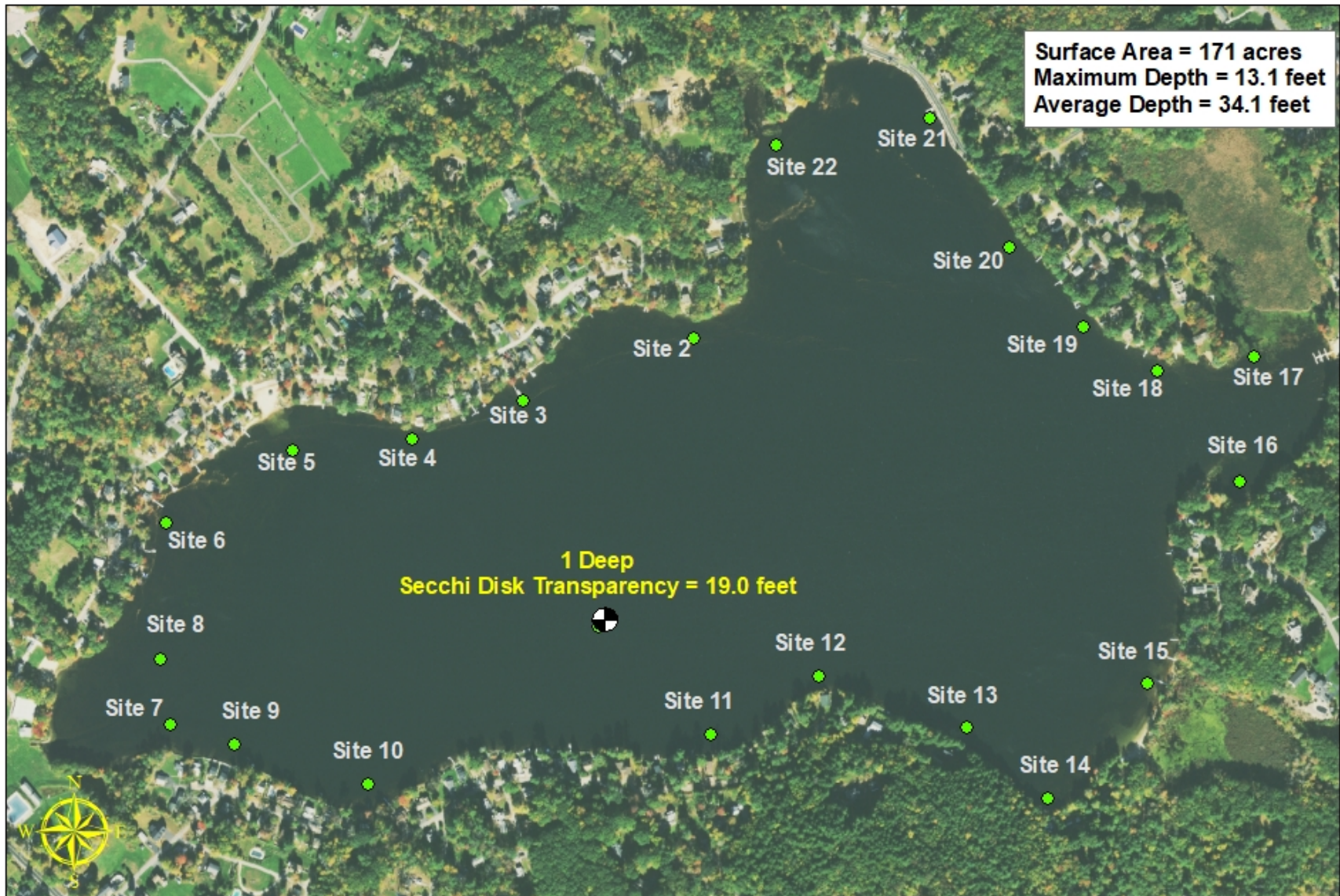
This highlight report provides a general overview of the current and historical conditions of Sunset Lake. The report is intended to provide a simple assessment of the water quality trends. Should you have additional questions about interpreting your water quality results, we would be happy to discuss 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. Lakes that exhibit internal nutrient loading may also exhibit increasing deep water specific conductivity concentrations (a measure of dissolved materials) through the summer months.

# Figure 10. Sunset Lake

Hampstead, NH

2022 Deep water sampling station and seasonal average water clarity



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