

SUNSET LAKE

2017 SAMPLING HIGHLIGHTS

Station – 1 Deep

Hampstead, NH



Water quality data displayed in Tables 1, 2 and 3 are surface water measurements with the exception of the dissolved oxygen data that were collected near the lake bottom.

Blue = Excellent = Oligotrophic
Yellow = Fair = Mesotrophic
Red = Poor = Eutrophic
Gray = No Data

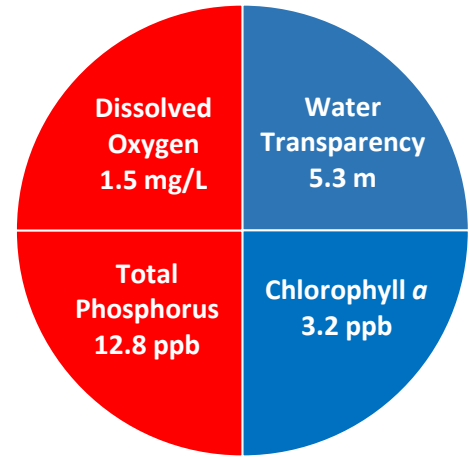


Figure 1. Sunset Lake Water Quality (2017)

Table 1. 2017 Sunset Lake Seasonal Averages and NH DES Aquatic Life Nutrient Criteria¹

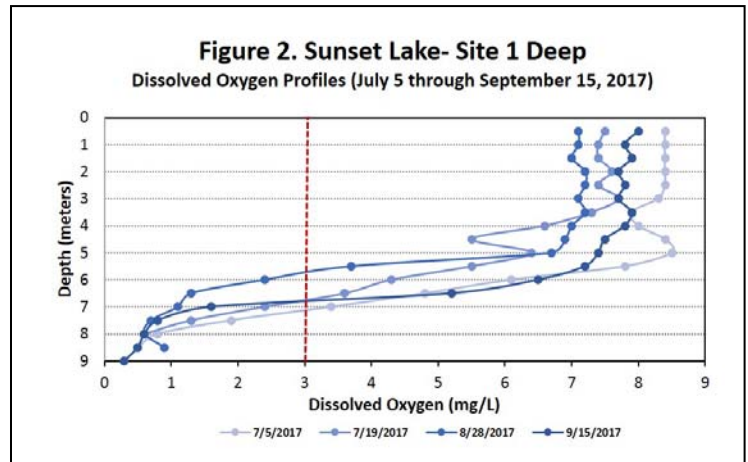
Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Sunset Lake Average (range)	Sunset Lake Classification
Water Clarity (meters)	> 4.0 – 7.0	2.5 - 4.0	< 2.5	5.3 meters (3.0 – 7.5)	Oligotrophic
Chlorophyll a ¹ (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	3.2 ppb (2.1 – 5.1)	Oligotrophic
Total Phosphorus ¹ (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	12.8 ppb (Single Value)	Eutrophic
Dissolved Oxygen (mg/L)	5.0 – 7.0	2.0 – 5.0	<2.0	1.5 mg/L (0.5 – 3.7)	Eutrophic

* Dissolved oxygen concentrations were measured between 5.5 and 8.5 meters, in the layer of rapidly decreasing temperatures, on August 28, 2017.

Table 2. 2017 Sunset Lake Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Sunset Lake 1 Deep Average (range)	Sunset Lake 1 Deep 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	16.8 color units (Single value)	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	19.9 mg/L (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			7.7 standard units (range: 7.6 – 7.7)	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		299.5 uS/cm (range: 299.4 – 299.6)	Experiencing human influences

Figure 2. Site 1 Deep dissolved oxygen profiles were collected between July 5 and September 15, 2017. The vertical red line indicates the oxygen concentration commonly considered the threshold for successful growth and reproduction of warm water fish such as bass and perch. Notice the low oxygen concentrations near the lake bottom.

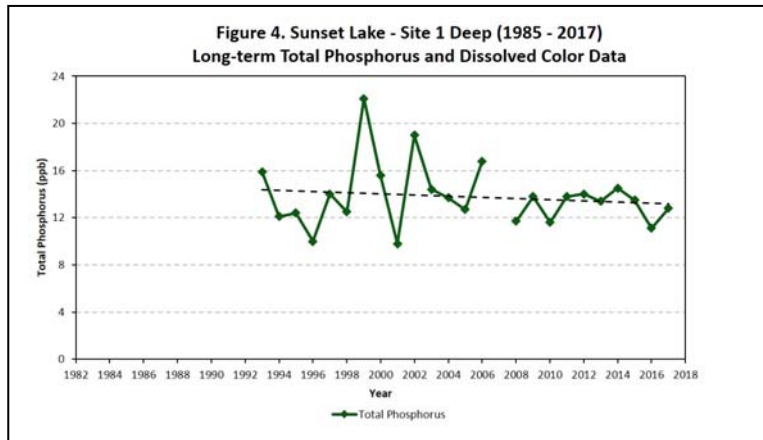
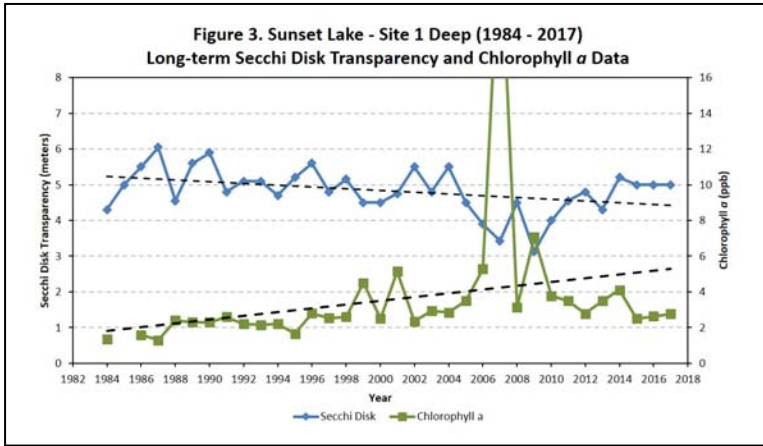


LONG-TERM TRENDS

WATER CLARITY: The Site 1 Deep water clarity measurements, measured as Secchi Disk transparency, display a trend of decreasing water clarity since 1984 (Figure 4). On a positive note, the Secchi Disk transparency has stabilized over the past four years.

CHLOROPHYLL: The Site 1 Deep chlorophyll *a* concentrations, a measure of microscopic plant life within the lake, display a trend of increasing concentrations since 1984 (Figure 4). On a positive note, the chlorophyll *a* concentrations have stabilized over the past three years.

TOTAL PHOSPHORUS: Phosphorus is the nutrient most responsible for microscopic plant growth. The Site 1 Deep total phosphorus concentrations have oscillated among years while the long-term trend is relatively stable (Figure 5).



Recommendations:

Implement Best Management Practices within the Sunset Lake watershed to minimize the adverse impacts of polluted runoff and erosion on 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 more information on how to reduce nutrient loading caused by overland run-off.

- http://extension.unh.edu/resources/files/Resource004159_Rep5940.pdf
- <http://soaknh.org/wp-content/uploads/2016/04/NH-Homeowner-Guide-2016.pdf>

Table 3. Near-shore Sample Site Water Quality Inter-comparison (2017)

Site	Total Phosphorus (ppb)
S-02	9.5
S-03	8.9
S-04	8.9
S-05	9.3
S-06	8.9
S-07	11.1
S-08	10.0
S-09	9.6
S-10	10.8
S-11	9.3
S-12	10.8
S-13	9.9
S-14	9.9
S-15	9.3
S-16	9.1
S-17	10.8
S-18	9.9
S-19	10.2
S-20	9.2
S-21	9.7
S-22	10.5

- Total phosphorus measurements were collected by the CFB on July 5, 2017 around the shoreline of Sunset Lake.

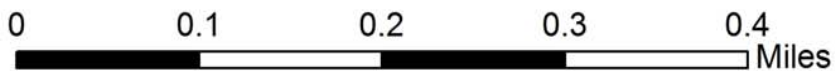
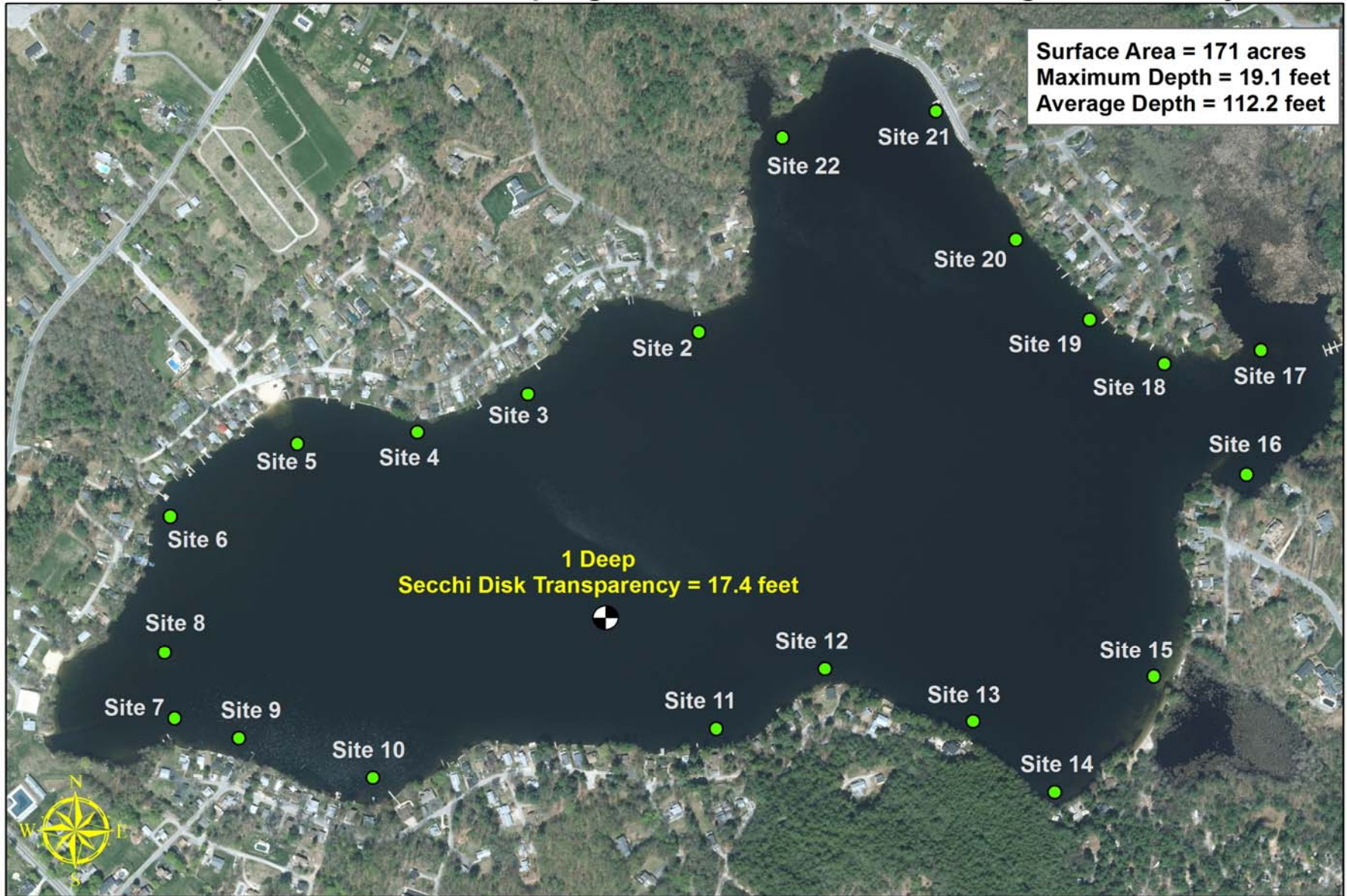
Figures 3 and 4. Changes in the Site 1 Deep water clarity (Secchi Disk depth), chlorophyll *a* and total phosphorus concentrations measured between 1984 and 2017. **These data illustrate the relationship between plant growth and water clarity. Total phosphorus data are also displayed and are oftentimes correlated with the amount of plant growth.** Trendlines are displayed when sufficient data are available.

Table 3. Sunset Lake near-shore total phosphorus measurements collected on July 5, 2017 as part of a shoreline survey. The total phosphorus concentrations were relatively stable among sampling locations during the July 5, 2017 survey.

Figure 5. Sunset Lake

Hampstead, NH

2017 deep and near-shore sampling stations and seasonal average water clarity.



Extension



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