

# CRYSTAL LAKE

## 2018 SAMPLING HIGHLIGHTS

### Station – 1 Deep

Enfield, NH



**Blue** = Excellent = Oligotrophic

**Yellow** = Fair = Mesotrophic

**Red** = Poor = Eutrophic

**Gray** = No Data

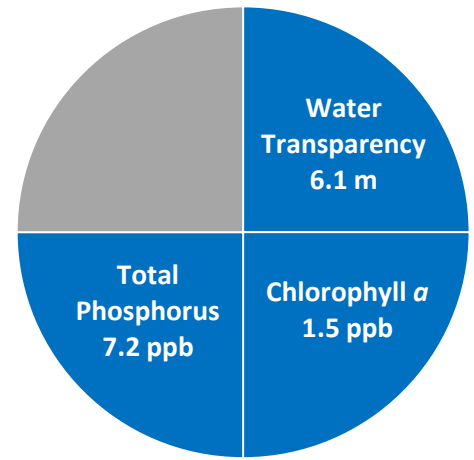


Figure 1. Crystal Lake Water Quality (2018)

Station 1 Deep was used as a reference point to represent the overall Crystal Lake water quality. Water quality data displayed in Tables 1 and 2 are surface water measurements.

Table 1. 2018 Crystal Lake Seasonal Averages and NH DES Aquatic Life Nutrient Criteria<sup>1</sup>

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Crystal Lake Average (range)	Crystal Lake Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	6.1 meters (5.0 – 7.3)	Oligotrophic
Chlorophyll <i>a</i> <sup>1</sup> (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	1.5 ppb (0.9 – 2.2)	Oligotrophic
Total Phosphorus <sup>1</sup> (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	7.2 ppb (6.4 – 7.7)	Oligotrophic

Table 2. 2018 Crystal Lake Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Crystal Lake Average (range)	Crystal 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: 15.4 – 28.0)	Lightly tea 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	8.2 mg/L (range: 7.8 – 8.8)	Moderately vulnerable

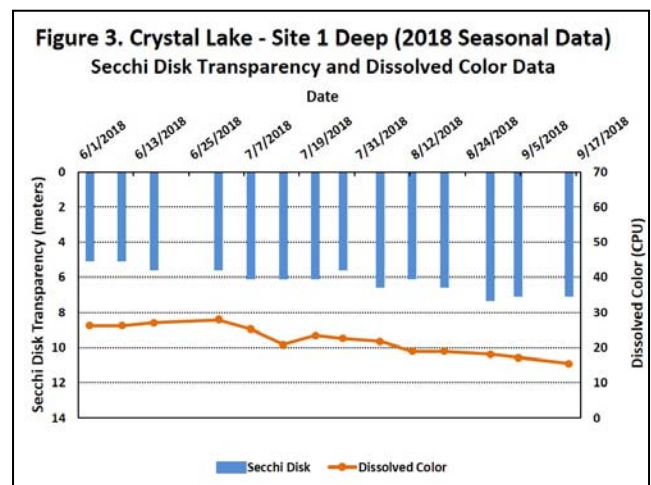
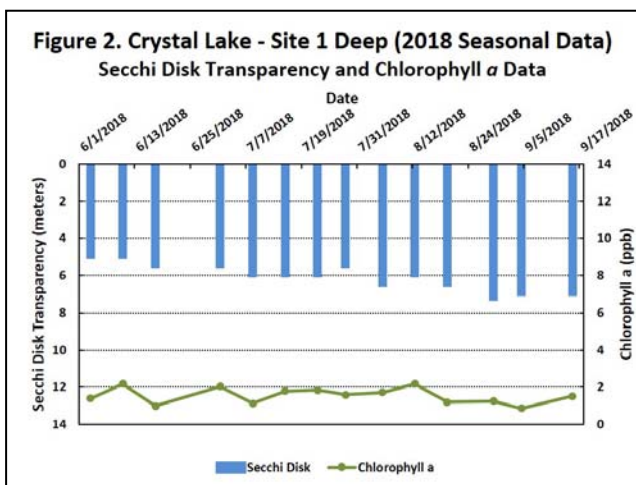


Figure 2 and 3. Seasonal Secchi disk transparency, chlorophyll *a* concentrations and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll *a* concentrations and dissolved color concentrations. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

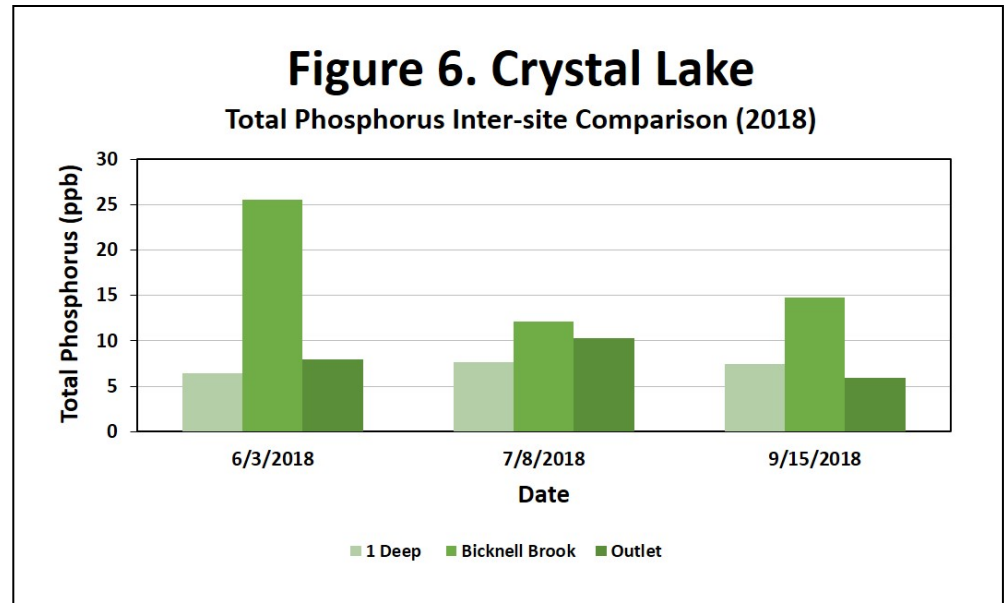
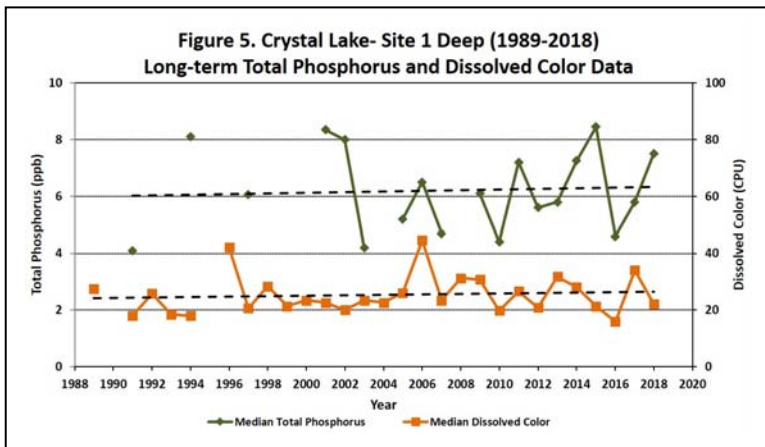
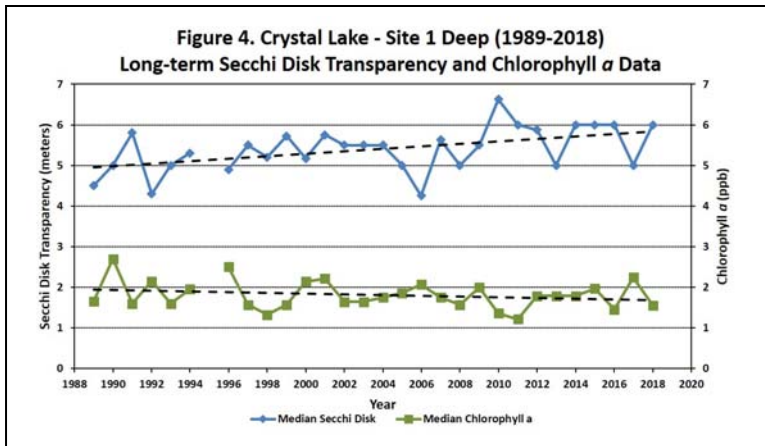
## LONG-TERM TRENDS

**WATER CLARITY:** The Crystal Lake water clarity measurements, measured as Secchi Disk transparency, display a trend of increasing water clarity since 1989 (Figure 4).

**CHLOROPHYLL:** The Crystal Lake chlorophyll *a* concentrations, a measure of microscopic plant life within the lake, display a trend of decreasing concentrations since 1989 (Figure 4).

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

**COLOR:** The Crystal Lake color data, the result of naturally occurring “tea” color substances from the breakdown of soils and plant materials, have oscillated among years while the long-term trend is stable (Figure 5).



Figures 4 and 5. Long-term changes in the Crystal Lake water clarity (Secchi Disk depth), chlorophyll *a*, water color and total phosphorus concentrations measured between 1989 and 2018. **These data illustrate the relationship among plant growth, water color and water clarity. 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.

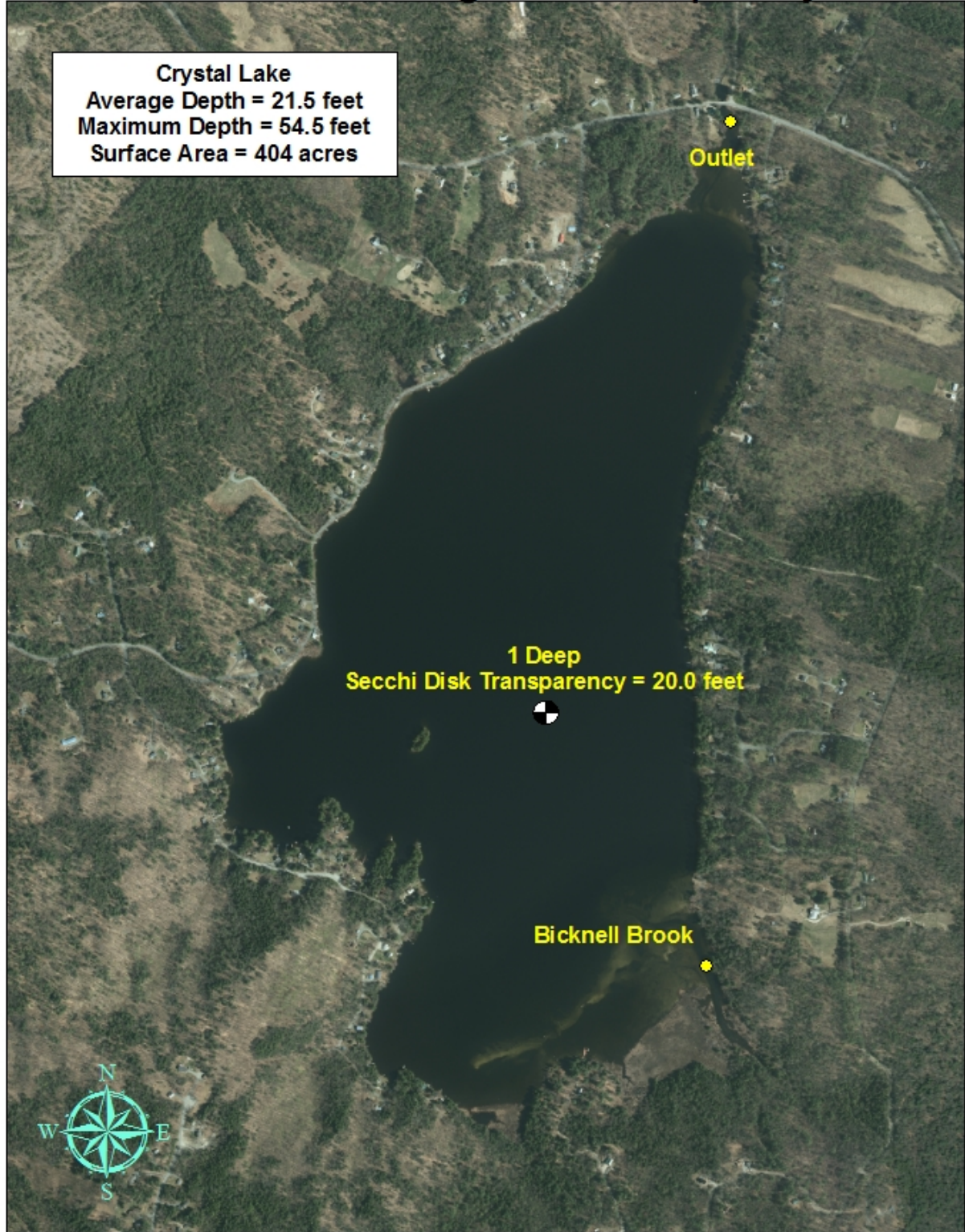
Figure 6. Inter-site comparison of the Crystal Lake Site 1 Deep, Bicknell Brook, and Outlet surface water total phosphorus concentrations. The inter-site comparison data provide insight into the variability among the three Crystal Lake sampling locations.

## Recommendations

Implement Best Management Practices within the Crystal Lake watershed to minimize the adverse impacts of polluted runoff and erosion on Crystal 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.

- [https://extension.unh.edu/resources/files/Resource004159\\_Rep5940.pdf](https://extension.unh.edu/resources/files/Resource004159_Rep5940.pdf)
- <https://www.des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-11-11.pdf>

**Figure 7. Crystal Lake (Enfield, NH)**  
**2018 Deep and nearshore sampling locations**  
**and seasonal average water transparency**



0 0.15 0.3 0.45 0.6 Miles

Aerial Orthophoto Source: NH GRANIT

Site location GPS coordinates collected by the UNH Center for Freshwater Biology



Extension

