Crystal Lake
2016 SAMPLING HIGHLIGHTS
Station – 1 Deep
Enfield, NH

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. 2016 Crystal Lake Seasonal Averages and NH DES Trophic Level Classification Criteria

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Oligotrophic “Excellent”</th>
<th>Mesotrophic “Fair”</th>
<th>Eutrophic “Poor”</th>
<th>Crystal Lake Average (range)</th>
<th>Crystal Lake Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Clarity (meters)</td>
<td>4.0 – 7.0</td>
<td>2.5 - 4.0</td>
<td>&lt; 2.5</td>
<td>6.2 meters (5.0 – 7.5)</td>
<td>Oligotrophic</td>
</tr>
<tr>
<td>Chlorophyll a (ppb)</td>
<td>&lt; 3.3</td>
<td>&gt; 3.3 – 5.0</td>
<td>&gt; 5.0 – 11.0</td>
<td>1.6 ppb (1.1 – 2.5)</td>
<td>Oligotrophic</td>
</tr>
<tr>
<td>Total Phosphorus (ppb)</td>
<td>&lt; 8.0</td>
<td>&gt; 8.0 – 12.0</td>
<td>&gt; 12.0 – 28.0</td>
<td>5.5 ppb (4.5 – 7.4)</td>
<td>Oligotrophic</td>
</tr>
</tbody>
</table>

### Table 2. 2016 Crystal Lake Seasonal Average Accessory Water Quality Measurements

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Assessment Criteria</th>
<th>Crystal Lake Average (range)</th>
<th>Crystal Lake Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color (color units)</td>
<td>&lt; 10 uncolored</td>
<td>10 – 20 slightly colored</td>
<td>17.3 color units (13.2 – 26.5)</td>
</tr>
<tr>
<td>Alkalinity (mg/L)</td>
<td>&lt; 0.0 acidified</td>
<td>0.1 – 2.0 extremely vulnerable</td>
<td>8.7 mg/L (7.8 – 9.2)</td>
</tr>
</tbody>
</table>

Figure 1. Crystal Lake Water Quality (2016)

Figure 2. Crystal Lake - Site 1 Deep (2016 Seasonal Data)
Secchi Disk Transparency and Chlorophyll a Data

Figure 3. Crystal Lake - Site 1 Deep (2016 Seasonal Data)
Secchi Disk Transparency and Dissolved Color Data

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 α 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 α, water color and total phosphorus concentrations measured between 1989 and 2016. 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.

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


Figure 7. Crystal Lake (Enfield, NH)
2016 Deep and nearshore sampling locations
and seasonal average water transparency

Crystal Lake
Average Depth = 21.5 feet
Maximum Depth = 54.5 feet
Surface Area = 404 acres

Outlet

1 Deep
Secchi Disk Transparency = 20.3 feet

Bicknell Brook

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

NH Extension