Station 1 South Dam was used as a reference point to represent the overall Mendums Pond water quality.

Table 1. 2015 Mendums Pond 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>Mendums Pond Average (range)</th>
<th>Mendums Pond 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>4.8 meters (2.9 – 5.9)</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>2.1 ppb (0.9 – 3.0)</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>8.9 ppb (4.5 – 16.9)</td>
<td>Mesotrophic</td>
</tr>
</tbody>
</table>

Table 2. 2015 Mendums Pond Seasonal Average Accessory Water Quality Measurements

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Assessment Criteria</th>
<th>Mendums Pond Average (range)</th>
<th>Mendums Pond Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color (color units)</td>
<td>&lt; 10 uncolored 10 - 20 slightly colored 20 - 40 Lightly tea colored 40-80 tea colored &gt; 80 highly colored</td>
<td>39.4 color units (25.1 – 61.3)</td>
<td>Lightly tea colored</td>
</tr>
<tr>
<td>Alkalinity (mg/L)</td>
<td>&lt; 0.0 acidified 0.1 - 2.0 extremely vulnerable 2.1 - 10 moderately vulnerable 10.1 - 25.0 low vulnerability &gt; 25.0 not vulnerable</td>
<td>1.6 mg/L (1.3 – 1.7)</td>
<td>Extremely vulnerable</td>
</tr>
</tbody>
</table>

Figure 1. Mendums Pond Water Quality (2015)

Figure 2. Mendums Pond - Site 1 South Dam 2015 Secchi Disk Transparency and Chlorophyll a Data

Figure 3. Mendums Pond - Site 1 South Dam 2015 Secchi Disk Transparency and Dissolved Color Data

Table 2 and 3. Seasonal Secchi disk transparency, chlorophyll a changes and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll a and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll a and/or color concentrations.
LONG-TERM TRENDS

WATER CLARITY: The Mendums Pond water clarity measurements, measured as Secchi Disk transparency, display a trend of increasing water clarity (Figure 4). The water clarity has increased by approximately 40 centimeters (Figure 4).

CHLOROPHYLL: The Mendums Pond chlorophyll a concentrations, a measure of microscopic plant life within the lake, display a trend of increasing concentrations (Figure 4). The chlorophyll a concentration has increased approximately 0.4 parts per billion (Figure 4).

TOTAL PHOSPHORUS: Phosphorus is the nutrient most responsible for microscopic plant growth. The Mendums Pond total phosphorus concentrations display a trend of increasing concentrations (Figure 5).

COLOR: The Mendums Pond color data, the result of naturally occurring “tea” color substances from the breakdown of soils and plant materials, display a trend of increasing concentrations (Figure 5).

Recommendations


Figures 4 and 5. Long-term changes in the Mendums Pond water clarity (Secchi Disk depth), chlorophyll a, water color and total phosphorus concentrations measured between 1987 and 2015. 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 annual Mendums Pond South Dam (dark shading) and West Mid (light shading) water clarity and chlorophyll a concentrations. The inter-site comparison data provide a general sense of the variability between the two long-term Mendums Pond sampling locations.
Figure 7. Mendums Pond
Barrington, NH
2015 Deep water sampling sites and seasonal average water clarity

Surface Area = 265 acres
Average Depth = 21 feet
Maximum Depth = 52 feet

Site 2 West Mid
Secchi Disk Transparency = 15.4 feet

Site 1 South Dam
Secchi Disk Transparency = 15.7 feet

Aerial Orthophoto Source: NH GRANIT
Site locations GPSed by the UNH Center for Freshwater Biology