TOWNHOUSE POND

2016 SAMPLING HIGHLIGHTS

Milton, NH

Please refer to the Milton Three Ponds Annual Report (2016) for additional information

Blue = Excellent = Oligotrophic

Yellow = Fair = Mesotrophic

Red = Poor = Eutrophic

Gray = No Data

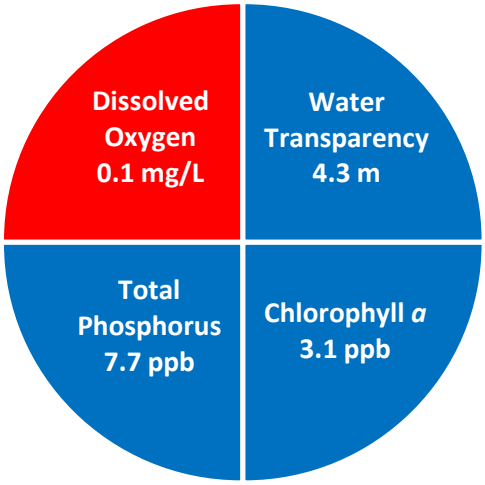


Figure 1. Townhouse Pond Water Quality (2016)

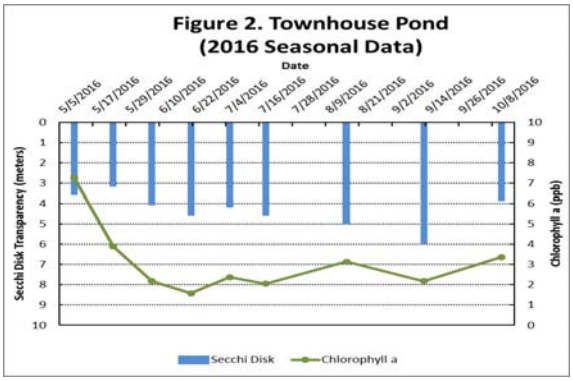
Table 1. 2016 Townhouse Pond Seasonal Averages and NHDES Trophic Level Classification Criteria

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Townhouse Pond Average (range)	Townhouse Pond Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	**4.3** meters (3.1 – 5.9)	Oligotrophic
Chlorophyll *a* (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	**3.1** ppb (1.6 – 7.3)	Oligotrophic
Total Phosphorus (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	**7.7** ppb (4.9 – 12.5)	Oligotrophic
Dissolved Oxygen (mg/L)	5.0 – 7.0	2.0 – 5.0	<2.0	**0.1** mg/L (0.1 – 0.1)	Eutrophic

*Dissolved oxygen concentrations measured on August 16, 2016 between 10.0 and 13.0 meters in the bottom water layer

Table 2. 2016 Townhouse Pond Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Townhouse Pond Average (range)	Townhouse Pond Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	21.4 color units (range: 15.5 – 27.7)	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	8.6 mg/L (range: 7.2 – 9.5)	Moderately vulnerable
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 (range: 7.2 – 7.4)	Optimal range for fish growth and reproduction
Specific Conductivity (uS/cm)	< 50 uS/cm Minimally impacted		50-100 uS/cm Some human influence	> 100 uS/cm Experiencing human disturbances		107.1 *u*S/cm (range: 107.3 – 107.4)	Experiencing human disturbances



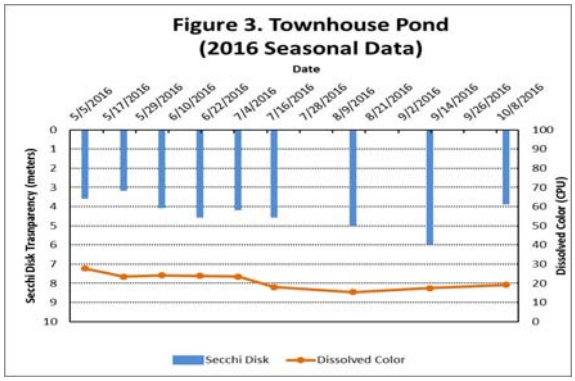


Figure 2 and 3. Seasonal Secchi disk transparency, chlorophyll *a* changes and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll *a* and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in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

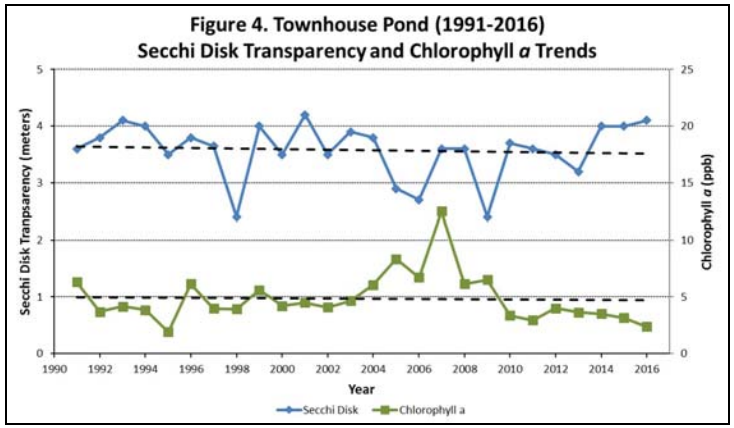
LONG TERM TRENDS

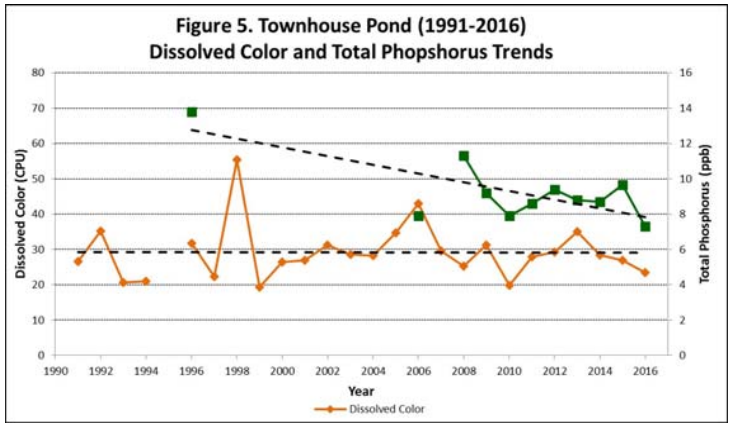
WATER CLARITY: The Townhouse Pond water clarity measurements, measured as Secchi Disk transparency, have oscillated among years while the long-term trend is relatively stable (Figure 4).

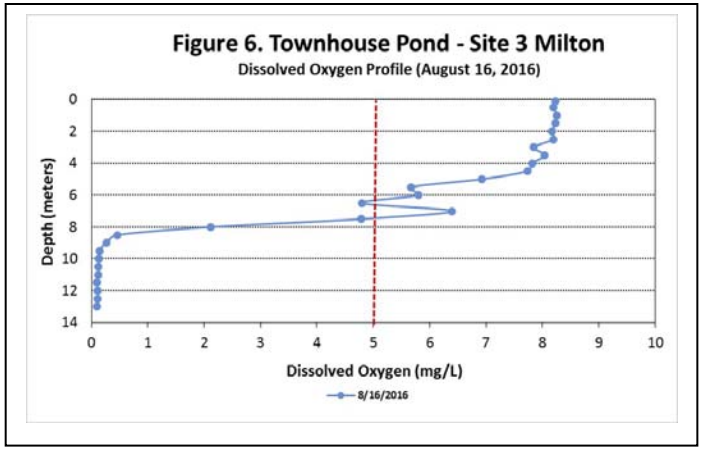
CHLOROPHYLL: The Townhouse Pond chlorophyll *a* concentrations, a measure of microscopic plant life within the lake, have oscillated among years while the long-term trend is relatively stable (Figure 4).

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

COLOR: The Townhouse Pond 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 relatively stable (Figure 5).







Figures 4 and 5. Changes in the Townhouse Pond water clarity (Secchi Disk depth), chlorophyll *a,* dissolved color and total phosphorus concentrations measured between 1991 and 2016. **These data illustrate the relationship between plant growth, natural water color and water clarity. Total phosphorus data are also displayed and are oftentimes correlated with the amount of plant growth.** Trendlines are displayed when ten or more years of data are available.

Figure 6. Townhouse Pond dissolved oxygen profile collected by the **Center for Freshwater Biology** on August 16, 2016. The vertical red line indicates the oxygen concentration commonly considered the threshold for successful growth and reproduction of cold water fish such as trout and salmon. *Notice the low dissolved oxygen concentrations near the lake bottom.*

Recommendations:

Implement Best Management Practices within the Townhouse Pond watershed to minimize the adverse impacts of polluted runoff and erosion into the 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 suggestions that can help 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

Figure 7. Townhouse Pond

Milton, NH

2016 Deep water sampling sites and average water clarity

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