

LAKE WENTWORTH

2018 SAMPLING HIGHLIGHTS

Station – 2 Triggs

Wolfeboro, NH



This report provides a water quality overview for data collected in Lake Wentworth, Site 2 Triggs, between 1984 and 2018. Water quality data displayed in Tables 1, 2 and 3 are surface water measurements with the exception of the dissolved oxygen data that summarize conditions near the lake bottom.

Blue = Excellent =
Oligotrophic

Yellow = Fair =
Mesotrophic

Red = Poor = Eutrophic

Gray = No Data

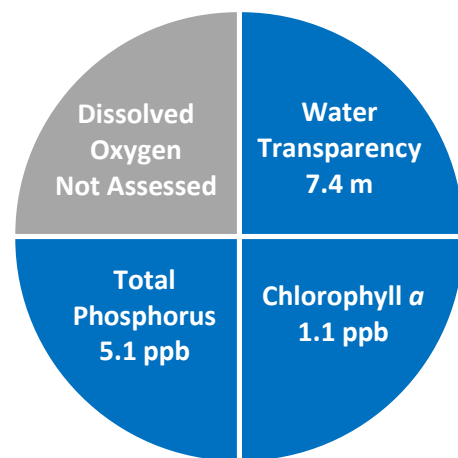


Figure 1. Lake Wentworth Water Quality (2018)

Table 1. 2018 Lake Wentworth Seasonal Averages and NH DES Aquatic Life Nutrient Criteria¹

| Parameter | Oligotrophic "Excellent" | Mesotrophic "Fair" | Eutrophic "Poor" | Lake Wentworth, Site 2 Triggs Average (range) | Site 2 Triggs Classification |
|--|-----------------------------|-----------------------|---------------------|--|---------------------------------|
| Water Clarity (meters) | 4.0 – 7.0 | 2.5 - 4.0 | < 2.5 | 7.4 meters (6.8 – 7.8) | Oligotrophic |
| Chlorophyll <i>a</i> ¹ (ppb) | < 3.3 | > 3.3 – 5.0 | > 5.0 – 11.0 | 1.1 ppb (0.6 – 1.7) | Oligotrophic |
| Total Phosphorus ¹ (ppb) | < 8.0 | > 8.0 – 12.0 | > 12.0 – 28.0 | 5.1 ppb (4.7 – 5.4) | Oligotrophic |
| Dissolved Oxygen (mg/l) | 5.0 – 7.0 | 2.0 – 5.0 | <2.0 | Not Assessed | Not Assessed |

- Site 2 Triggs did not develop a deep cold water layer needed to assess dissolved oxygen concentrations.

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

| Parameter | Assessment Criteria | | | | | Lake Wentworth, Site 2 Triggs Average (range) | Site 2 Triggs Classification |
|---|---|--------------------------------------|---|---|-----------------------------|--|---|
| 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 (9.9 – 19.6) | Slightly 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 | 7.2 mg/L (6.3 – 7.7) | Moderately vulnerable |
| pH (std units) | < 5.5 suboptimal for successful growth and reproduction | | 6.5 – 9.0 optimal range for fish growth and reproduction | | | 7.3 standard units (single value) | Optimal range for fish growth and reproduction |
| Specific Conductivity (μ S/cm) | < 50 μ S/cm Characteristic of minimally impacted NH lakes | | 50-100 μ S/cm Lakes with some human influence | > 100 μ S/cm Characteristic of lakes experiencing human disturbances | | 70.7 μ S/cm (single value) | Characteristic of lakes with some human influence |

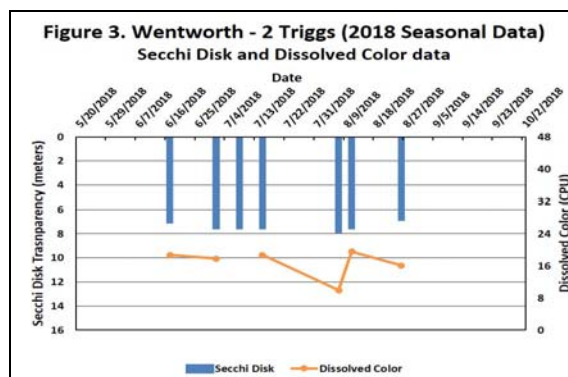
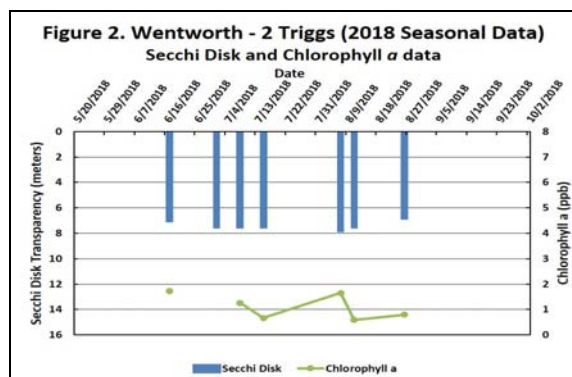


Figure 2 and 3. Seasonal Secchi Disk transparency, chlorophyll *a* changes and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll *a* and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in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

LONG-TERM TRENDS – SITE 2 TRIGGS

WATER CLARITY: The Lake Wentworth water clarity measurements, measured as Secchi Disk transparency, display a trend of decreasing water transparency between 1985 and 2018 (Figure 4).

CHLOROPHYLL: The Lake Wentworth chlorophyll *a* concentrations, a measure of microscopic plant life within the lake, display a relatively stable trend between 1985 and 2018 (Figure 4).

TOTAL PHOSPHORUS: Phosphorus is the nutrient most responsible for microscopic plant growth. The Lake Wentworth total phosphorus concentrations display relatively stable trend between 1986 and 2018 (Figure 5).

COLOR: The Lake Wentworth color data, the result of naturally occurring “tea” color substances from the breakdown of soils and plant materials, display a relatively stable trend between 1987 and 2018 (Figure 5).

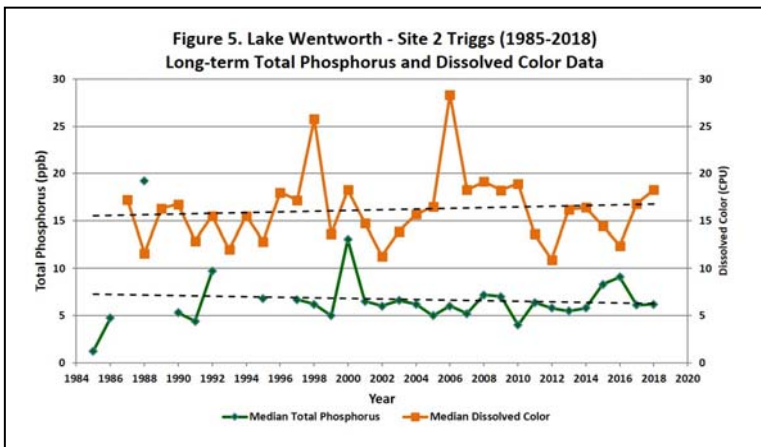
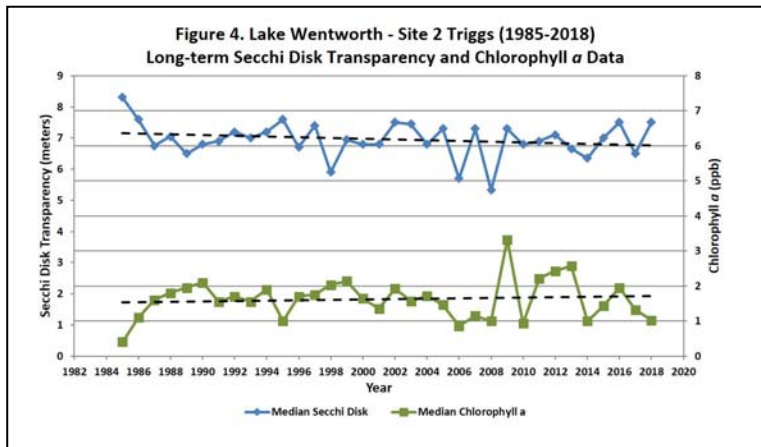


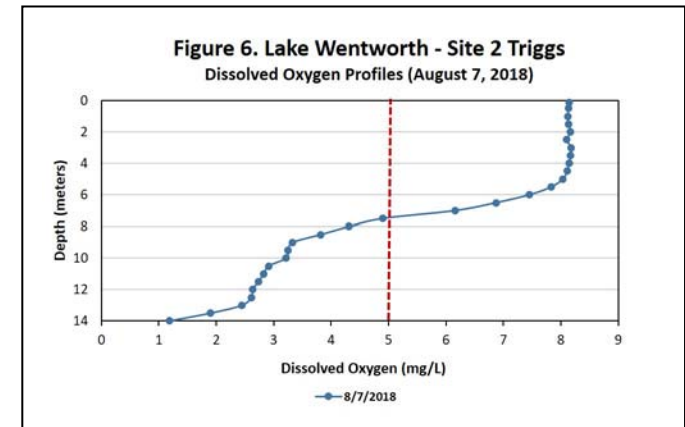
Table 3. Lake Wentworth and Crescent Lake, Site 6 Center, Seasonal Average Water Quality Inter-site Comparison (2018)

| Sampling Station | Average (range) Secchi Disk Depth (meters) | Average (range) Total Phosphorus (ppb) | Average (range) Chlorophyll <i>a</i> (ppb) | Average (range) Dissolved Color (CPU) |
|------------------|--|--|--|---------------------------------------|
| Crescent Lake | * 5.2 m (4.0 – 6.1) | 7.5 ppb (6.8 – 8.1) | 1.6 ppb (1.1 – 2.5) | 18.6 CPU (13.4 – 24.1) |
| 1 Fuller | 6.7 m (5.5 – 7.9) | 5.3 ppb (3.7 – 7.4) | 1.3 ppb (0.8 – 2.1) | 14.2 CPU (9.0 – 21.6) |
| 2 Triggs | 7.4 m (6.8 – 7.8) | 5.1 ppb (4.7 – 5.4) | 1.1 ppb (0.6 – 1.7) | 16.8 CPU (9.9 – 19.6) |
| 12 Governors | 6.8 m (6.3 – 8.3) | 5.4 ppb (4.9 – 5.8) | 1.2 ppb (0.8 – 1.8) | 11.3 CPU (9.0 – 13.5) |

* indicates the Secchi disk occasionally reached the lake bottom before disappearing from view.

Figures 4 and 5. Changes in the Lake Wentworth water clarity (Secchi Disk depth), chlorophyll *a*, dissolved color and total phosphorus concentrations measured between 1983 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. Lake Wentworth dissolved oxygen profile collected on August 7, 2018. The vertical red line indicates the dissolved oxygen concentration commonly considered the threshold for successful growth and reproduction of cold water fish such trout and salmon. *Notice the decreasing dissolved oxygen concentrations near the lake bottom.*



Recommendations

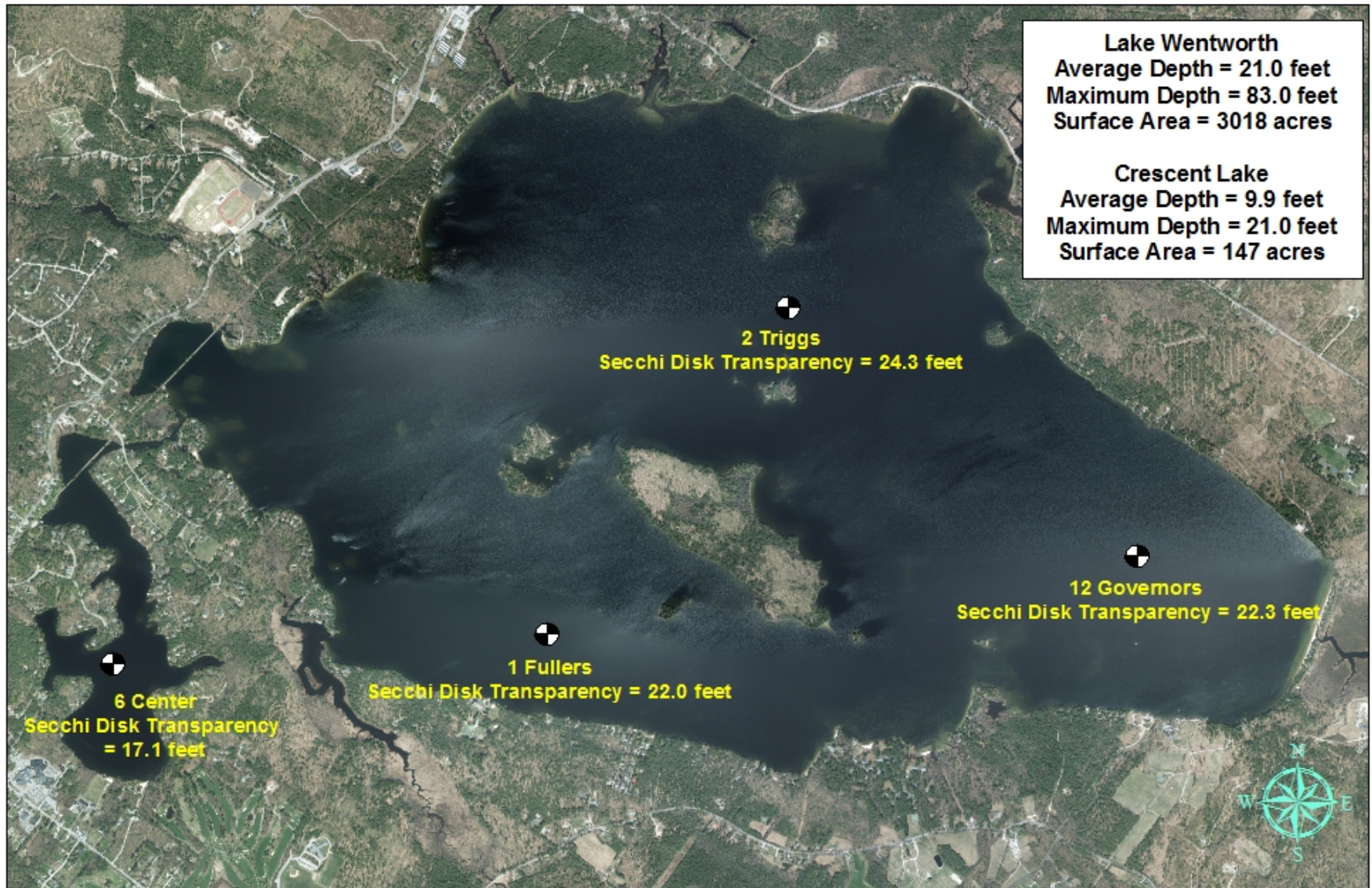
Implement Best Management Practices within the Lake Wentworth watershed to minimize the adverse impacts of polluted runoff and erosion into Lake Wentworth. Refer to “Landscaping at the Water’s Edge: An Ecological Approach” and “New Hampshire Homeowner’s Guide to Stormwater Management: Do-It-Yourself Stormwater Solutions for Your Home” for more information on how to reduce nutrient loading caused by overland run-off.

- <https://www.des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-11-11.pdf>
- https://extension.unh.edu/resources/files/Resource004159_Rep5940.pdf

Figure 7. Lake Wentworth and Crescent Lake

Wolfeboro, NH

2018 Deep water sampling site locations with seasonal average water clarity



0 0.4 0.8 1.2 1.6 Miles

Site location GPS coordinates were collected by the UNH Center for Freshwater Biology
Aerial Orthophoto Source: 2015 Statewide High Resolution Aerial Photography, NH GRANIT



Extension

