

LAKE WENTWORTH

2017 SAMPLING HIGHLIGHTS

Station – 1 Fullers

Wolfeboro, NH



This report provides a water quality overview for data collected in Lake Wentworth, Site 1 Fullers, between 1984 and 2017. 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

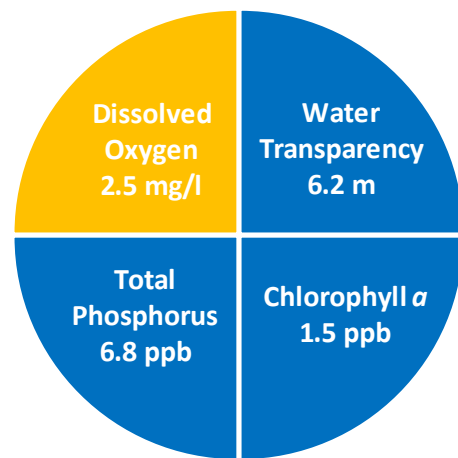


Figure 1. Lake Wentworth Water Quality (2017)

Table 1. 2017 Lake Wentworth Seasonal Averages and NH DES Aquatic Life Nutrient Criteria¹

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Lake Wentworth, Site 1 Fullers Average (range)	Site 1 Fullers Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	6.2 meters (4.3 – 8.1)	Oligotrophic
Chlorophyll a ¹ (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	1.5 ppb (1.1 – 2.8)	Oligotrophic
Total Phosphorus ¹ (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	6.8 ppb (4.4 – 8.8)	Oligotrophic
Dissolved Oxygen (mg/l)	5.0 – 7.0	2.0 – 5.0	<2.0	2.5 mg/l (range: 2.0 – 3.1)	Mesotrophic

* Dissolved oxygen concentrations were measured on August 8, 2017 between 13.0 and 24.0 meters, in the bottom waters.

Table 2. 2017 Lake Wentworth Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Lake Wentworth, Site 1 Fullers Average (range)	Site 1 Fullers Classification
	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored		
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	16.2 color units (7.9 – 24.7)	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	6.6 mg/L (5.9 – 7.1)	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 – 7.2)	Optimal range for fish growth and reproduction
Specific Conductivity (uS/cm)	< 50 uS/cm Characteristic of minimally impacted NH lakes		50-100 uS/cm Lakes with some human influence	> 100 uS/cm Characteristic of lakes experiencing human disturbances		67.6 uS/cm (range: 67.5 – 67.7)	Characteristic of lakes with some human influence

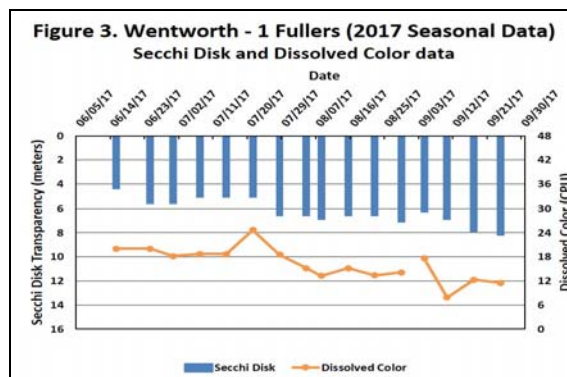
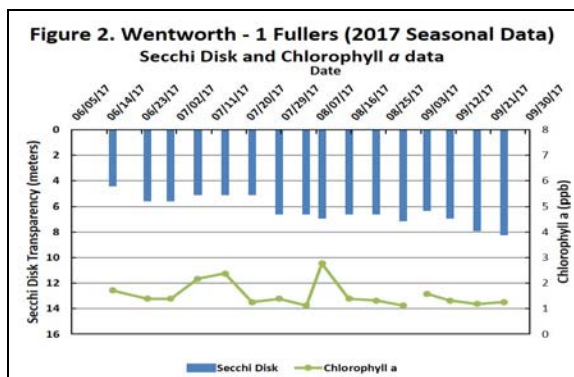


Figure 2 and 3. Seasonal Secchi Disk transparency, chlorophyll *a* changes and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll *a* and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in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

LONG-TERM TRENDS – SITE 1 FULLERS

WATER CLARITY: The Lake Wentworth water clarity measurements, measured as Secchi Disk transparency, display a trend of decreasing water transparency between 1984 and 2017 (Figure 4).

CHLOROPHYLL: The Lake Wentworth chlorophyll *a* concentrations, a measure of microscopic plant life within the lake, display a relatively stable trend between 1984 and 2017 (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 2017 (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 1986 and 2017 (Figure 5).

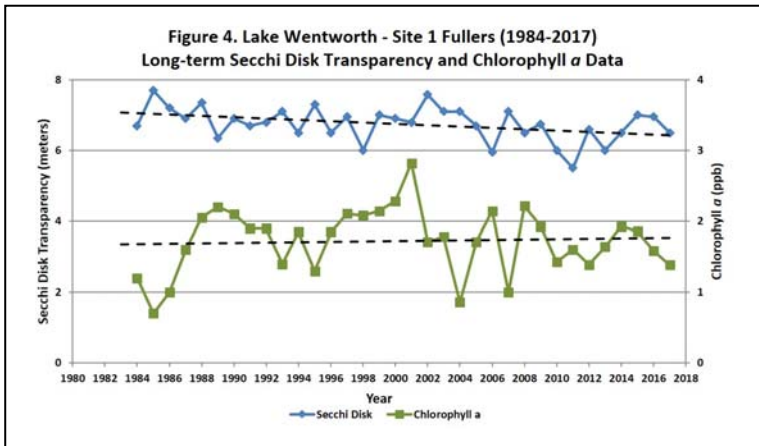
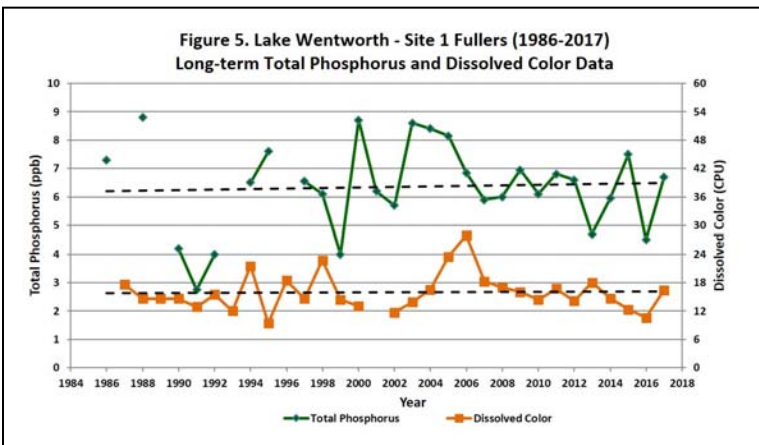


Table 3. Lake Wentworth and Crescent Lake, Site 6 Center, Seasonal Average Water Quality Inter-site Comparison (2017)

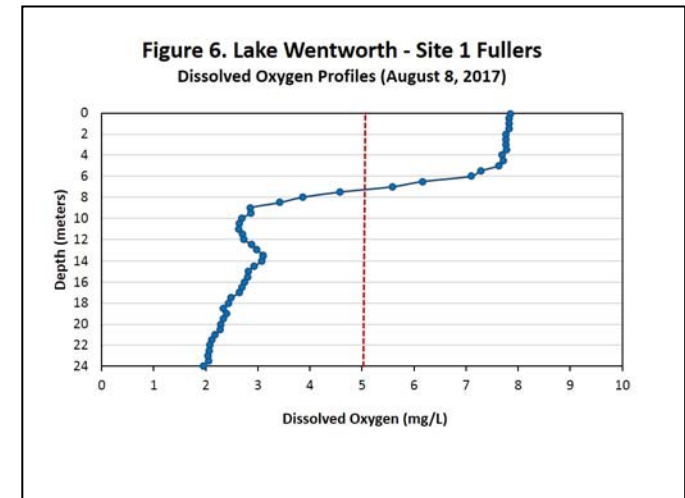
Sampling Station	Average (range) Secchi Disk Depth (meters)	Average (range) Total Phosphorus (ppb)	Average (range) Chlorophyll <i>a</i> (ppb)	Average (range) Dissolved Color (CPU)
Crescent Lake	* 4.7 m (3.5 – 5.6)	6.7 ppb (single value)	2.1 ppb (1.3 – 4.0)	24.9 CPU (15.1 – 33.7)
1 Fuller	6.2 m (4.3 – 8.1)	6.8 ppb (4.4 – 8.8)	1.5 ppb (1.1 – 2.8)	16.2 CPU (7.9 – 24.7)
2 Triggs	6.4 m (5.5 – 7.0)	6.1 ppb (single value)	1.4 ppb (0.7 – 2.0)	15.5 CPU (11.3 – 18.5)
12 Governors	5.4 m (3.8 – 6.6)	5.2 ppb (single value)	1.5 ppb (0.9 – 2.0)	16.1 CPU (12.4 – 20.9)

* 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 2017. **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. Lake Wentworth dissolved oxygen profile collected on August 8, 2017. 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.*



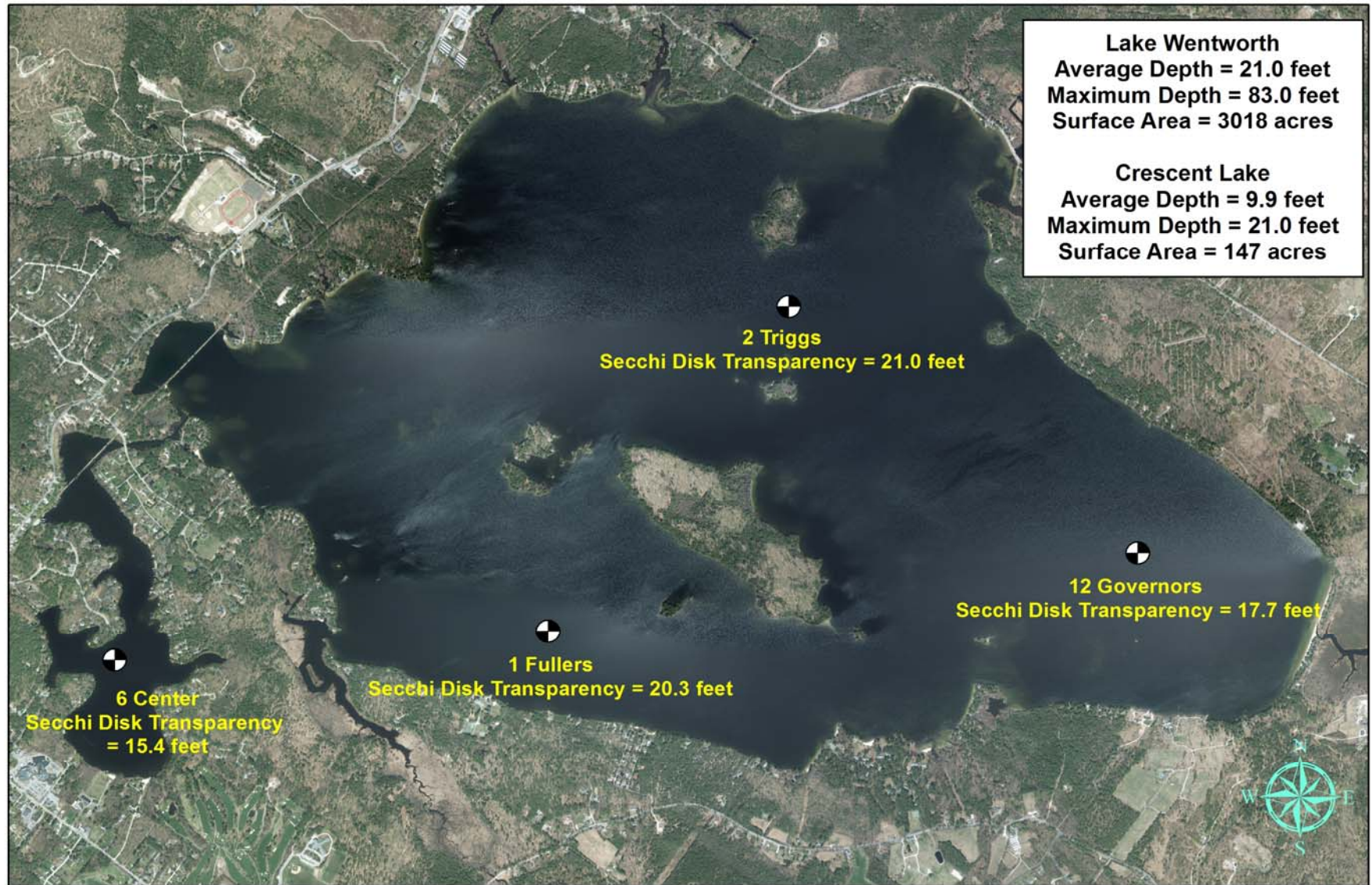
Recommendations

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.

- <http://soaknh.org/wp-content/uploads/2016/04/NH-Homeowner-Guide-2016.pdf>
- http://extension.unh.edu/resources/files/Resource004159_Rep5940.pdf

Figure 7. Lake Wentworth and Crescent Lake Wolfeboro, NH

2017 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

