

WILSON LAKE

2014 SAMPLING HIGHLIGHTS

Station – 1 Deep

Acton, ME



Blue = Excellent = Oligotrophic

Yellow = Fair = Mesotrophic

Red = Poor = Eutrophic

Gray = No Data

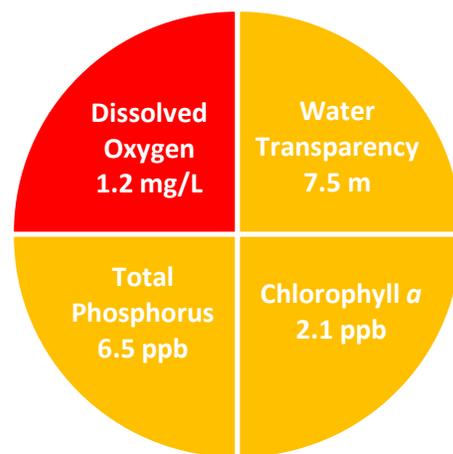


Figure 1. Wilson Lake Water Quality (2014)

Station 1 Deep (Figure 7) was used as a reference point to represent the overall Wilson Lake water quality.

Table 1. 2014 Wilson Lake Seasonal Averages and Maine DEP Trophic Level Classification Criteria

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Wilson Lake Average (range)	Wilson Lake Classification
Water Clarity (meters)	> 8.0	8.0 – 4.0	< 4.0	7.5 meters (6.7 – 9.0)	Mesotrophic
Chlorophyll <i>a</i> (ppb)	< 1.5	> 1.5 – 7.0	> 7.0	2.1 ppb (1.2 – 3.1)	Mesotrophic
Total Phosphorus (ppb)	< 4.5	> 4.5 – 20.0	> 20.0	6.5 ppb (5.2 – 7.7)	Mesotrophic
Dissolved Oxygen (mg/L)	5.0 – 7.0	2.0 – 5.0	< 2.0	1.2 mg/L (1.0 – 1.3)	Eutrophic

* Dissolved oxygen concentrations were measured between 9.5 and 14.5 meters, in the bottom waters, on September 8, 2014.

Table 2. 2014 Wilson Lake Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Wilson Lake Average (range)	Wilson Lake 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	16.6 color units (13.4 – 21.3)	Slightly 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	10.9 mg/L (10.3 – 11.9)	Low vulnerability
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			7.0 standard units (range: 6.7 – 7.4)	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		75.4 uS/cm (range: 72.4 – 76.8)	Lakes with some human influence

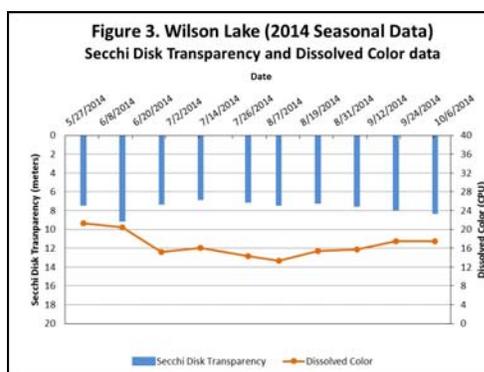
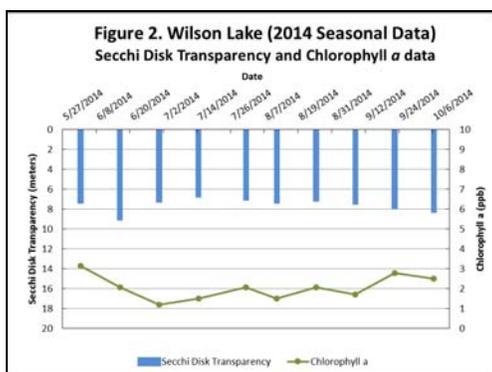


Figure 2 and 3. Seasonal Secchi disk transparency, chlorophyll *a* changes and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll *a* and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in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

LONG-TERM TRENDS

WATER CLARITY: The Wilson Lake water clarity measurements, measured as Secchi Disk transparency, display a trend of increasing water clarity over the past thirty-five years.

CHLOROPHYLL: The Wilson Lake chlorophyll *a* concentrations, a measure of microscopic plant life within the lake, have intermittently been collected over the span of nine sampling seasons. Due to the limited number of years sampled (less than ten sampling seasons) and the small sample size (generally one measurement collected per year) a trend analysis was not performed on the chlorophyll *a* data.

TOTAL PHOSPHORUS: The Wilson Lake total phosphorus concentrations, the nutrient most responsible for microscopic plant growth, have been intermittently collected over twelve sampling seasons. Due to the small sample size (generally one measurement collected per year) a trend analysis was not performed on the total phosphorus data.

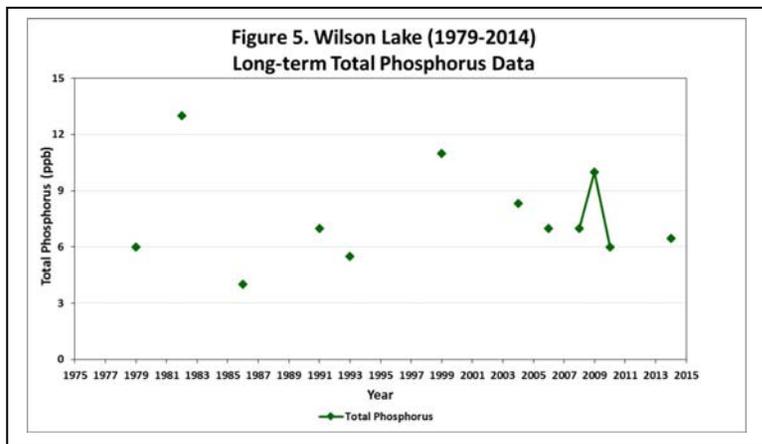
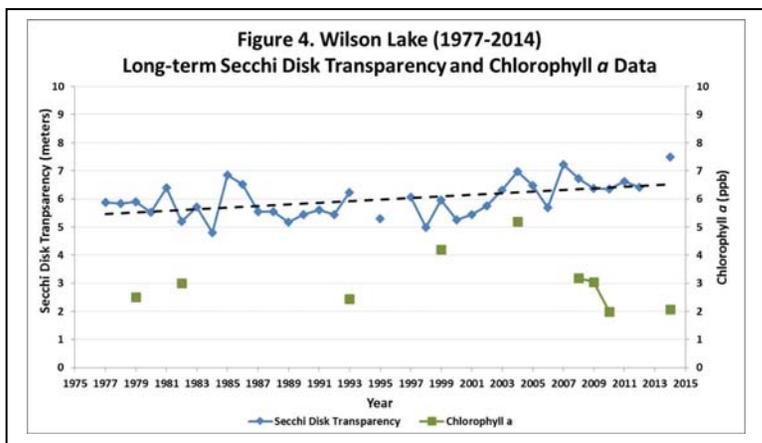


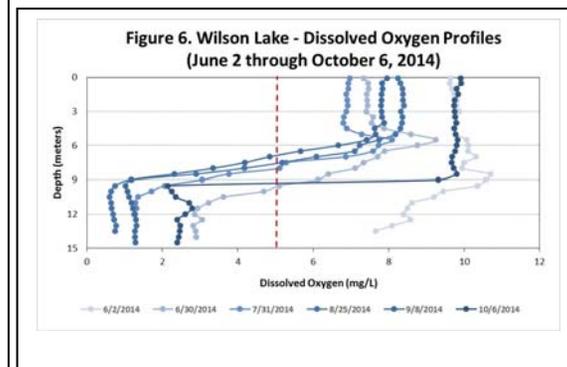
Table 3. Salmon Falls Headwaters Seasonal Average Water Quality Inter-comparison (2014)

Lake	Average Secchi Disk Transparency (meters)	Average Chlorophyll <i>a</i> (ppb)	Average Total Phosphorus (ppb)	Average Dissolved Oxygen (ppm)
Great East Lake	10.5	1.1	6.2	4.6
Wilson Lake	7.5	2.1	6.5	1.2
Lovell Lake	7.8	2.7	7.1	1.6
Horn Pond	8.1	2.1	6.7	1.3
Lake Ivanhoe	4.2	6.0	9.0	-----

- Water quality data are reported for a deep reference sampling location in each water body
- Dissolved oxygen measurements were taken late season (early-mid September) and from the bottom water layer (hypolimnion).
- ----- Indicates the site is too shallow to form a bottom water layer (hypolimnion).

Figures 4 and 5. Changes in the Wilson Lake water clarity (Secchi Disk depth), chlorophyll *a* and total phosphorus concentrations measured between 1977 and 2014. **These data illustrate the relationship between plant growth and water clarity. Total phosphorus data are also displayed and are oftentimes correlated with the amount of plant growth.** Trendlines are displayed when sufficient data are available.

Figure 6. Monthly Wilson Lake dissolved oxygen profiles collected between June 2 and October 6, 2014. 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 oxygen concentrations near the lake bottom between June 30 and October 6.*



Recommendations

Implement Best Management Practices within the Wilson Lake watershed to minimize the adverse impacts of polluted runoff and erosion into the lake. Refer to the Acton Wakefield Watershed Association website of a list of “Conservation Practices for Homeowners” that provides a summary of problems associated with polluted runoff and what can be done to fix the problems. The website includes a series of Do-it-Yourself guides produced by the Maine Department of Environmental Protection.

- <http://awwatersheds.org/healthy-lakes/conservation-practices-for-homeowners/>

Figure 7. Wilson Lake

Acton, ME

2014 Deep water sampling site and seasonal average water clarity



0 0.1 0.2 0.3 0.4 0.5 Miles

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



University of New Hampshire
Cooperative Extension

