CONWAY LAKE

2014 SAMPLING HIGHLIGHTS

Station – 2 Gull

Conway and Eaton, NH

University of New Hampshire Cooperative Extension

Station 2 Gull (Figure 7) was used as a reference point to represent the overall Conway Lake water quality. Water quality data displayed in Tables 1 and 2 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

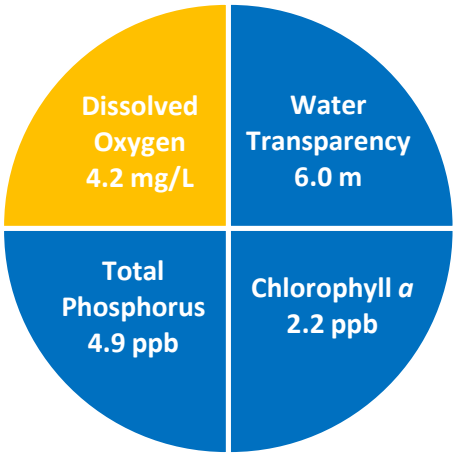


Figure 1. Conway Lake Water Quality (2014)

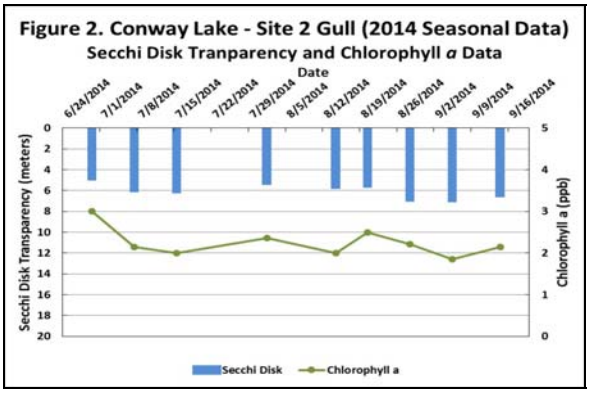
Table 1. 2014 Conway Lake Seasonal Averages and NH DES Aquatic Life Nutrient Criteria

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Conway Lake Average (range)	Conway Lake Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	**6.0** meters (4.9 – 7.0)	Oligotrophic
Chlorophyll *a* (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	**2.2** ppb (1.9 – 3.0)	Oligotrophic
Total Phosphorus (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	**4.9** ppb (single value)	Oligotrophic
Dissolved Oxygen (mg/L)	5.0 – 7.0	2.0 – 5.0	<2.0	**4.2** mg/L (2.7 – 6.3)	Mesotrophic

* Dissolved oxygen concentrations were measured on August 28, 2014 between 7.0 and 12.0 meters, in the bottom waters.

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

Parameter	Assessment Criteria					Conway Lake Average (range)	Conway Lake Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	**26.5** color units (23.5 – 30.4)	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	**4.6** mg/L (4.2 – 5.0)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			**7.1** standard units (range: 7.0 – 7.1)	Optimal range for fish growth and reproduction
Specific Conductivity (*u*S/cm)	< 50 *u*S/cm Characteristic of minimally impacted NH lakes		50-100 *u*S/cm Lakes with some human influence	> 100 *u*S/cm Characteristic of lakes experiencing human disturbances		**45.1** *u*S/cm (range: 45.0 – 46.0)	Characteristic of minimally impacted NH lakes



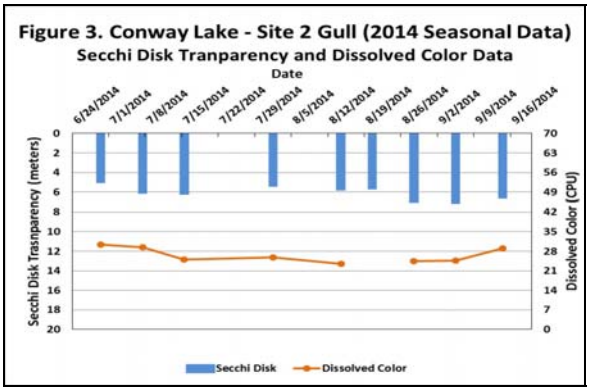


Figure 2 and 3. Seasonal Secchi Disk transparency, chlorophyll *a* changes and dissolved color concentrations. Figures 2 and 3 illustrate the interplay among Secchi Disk transparency, chlorophyll *a* and dissolved color. Shallower water transparency measurements oftentimes correspond to increases in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

LONG-TERM TRENDS

WATER CLARITY: The Conway Lake water clarity measurements, measured as Secchi Disk transparency, display a trend of slightly increasing water clarity over a thirty-two year span, however the trend is relatively stable (Figure 4).

CHLOROPHYLL: The Conway Lake chlorophyll *a* concentrations, a measure of microscopic plant life within the lake, display a trend of increasing concentrations over a thirty-two year span (Figure 4).

TOTAL PHOSPHORUS: Phosphorus is the nutrient most responsible for microscopic plant growth. The Conway Lake total phosphorus concentrations display a trend of decreasing concentrations over a thirty-two year span (Figure 5).

COLOR: The Conway Lake color data, the result of naturally occurring "tea" color substances from the breakdown of soils and plant materials, display a trend of increasing concentrations over a thirty year span (Figure 5).

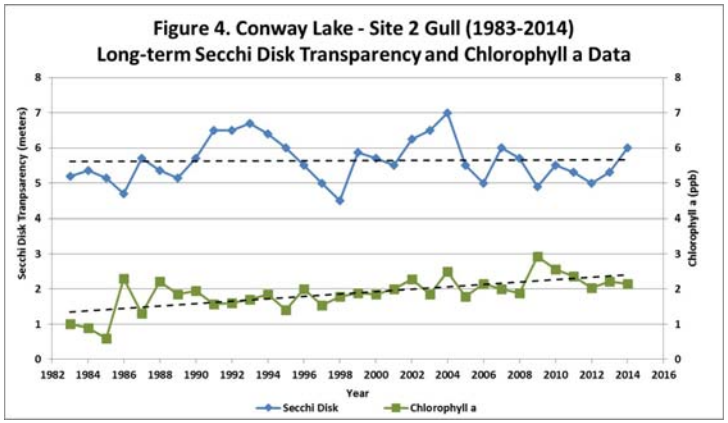
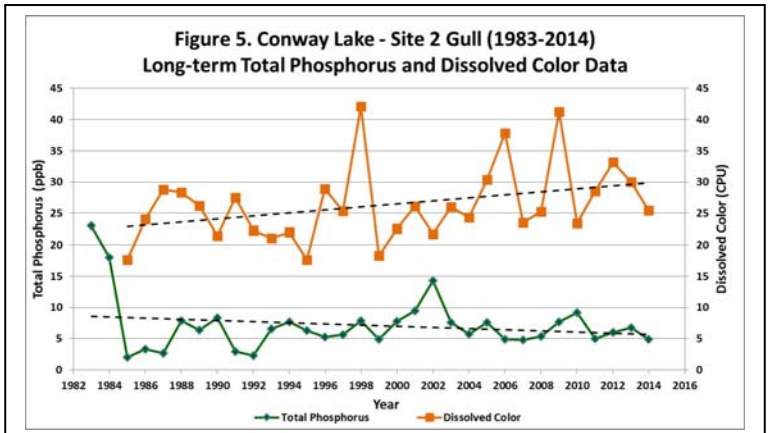


Table 3. Conway Lake Seasonal Average Water Quality Inter-Site Comparison (2014)

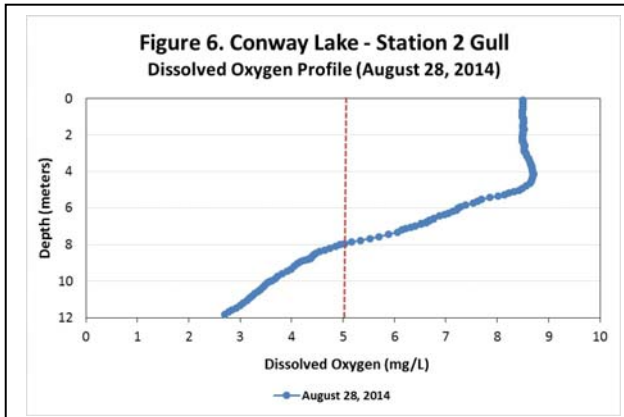
Sampling Station	Average (range) Secchi Disk Depth (meters)	Average (range) Total Phosphorus (ppb)	Average (range) Chlorophyll *a* (ppb)	Average (range) Dissolved Color (CPU)
1 Andrews	**6.0** m (5.4 – 6.4)	**4.7** ppb (single value)	**2.1** ppb (1.1 – 2.8)	**24.8** CPU (19.9 – 30.4)
2 Gull	**6.0** m (4.9 – 7.0)	**4.9** ppb (single value)	**2.2** ppb (1.9 – 3.0)	**26.5** CPU (23.5 – 30.4)
3 Dolloff	**5.7** m (4.7 – 6.7)	**4.9** ppb (single value)	**2.3** ppb (1.5 – 2.9)	**27.2** CPU (21.7 – 34.0)
South Cove	**5.6** m (4.4 – 7.0)	**4.9** ppb (single value)	**2.4** ppb (1.8 – 3.6)	**30.6** CPU (24.4 – 38.3)
Paige Brook	------	**5.6** ppb (single value)	**2.0** ppb (1.5 – 2.5)	**34.7** CPU (28.9 – 41.2)

- ------ indicates the Secchi disk was consistently visible on the lake bottom at a depth of approximately 2.6 meters.



Figures 4 and 5. Changes in the Conway Lake water clarity (Secchi Disk depth), chlorophyll *a*, dissolved color and total phosphorus concentrations measured between 1983 and 2014. **These data illustrate the relationship among plant growth, water color and water clarity. Total phopshorus data are also displayed and are oftentimes correlated with the amount of plant growth.**

Figure 6. Conway Lake dissolved oxygen profile collected on August 28, 2014. The vertical red line indicates the dissolved oxygen concentration commonly considered the threshold for successful growth and reproduction of cold water fish such as trout and salmon. *Notice the decreasing dissolved oxygen concentrations near the lakebottom.*



Reccomendations

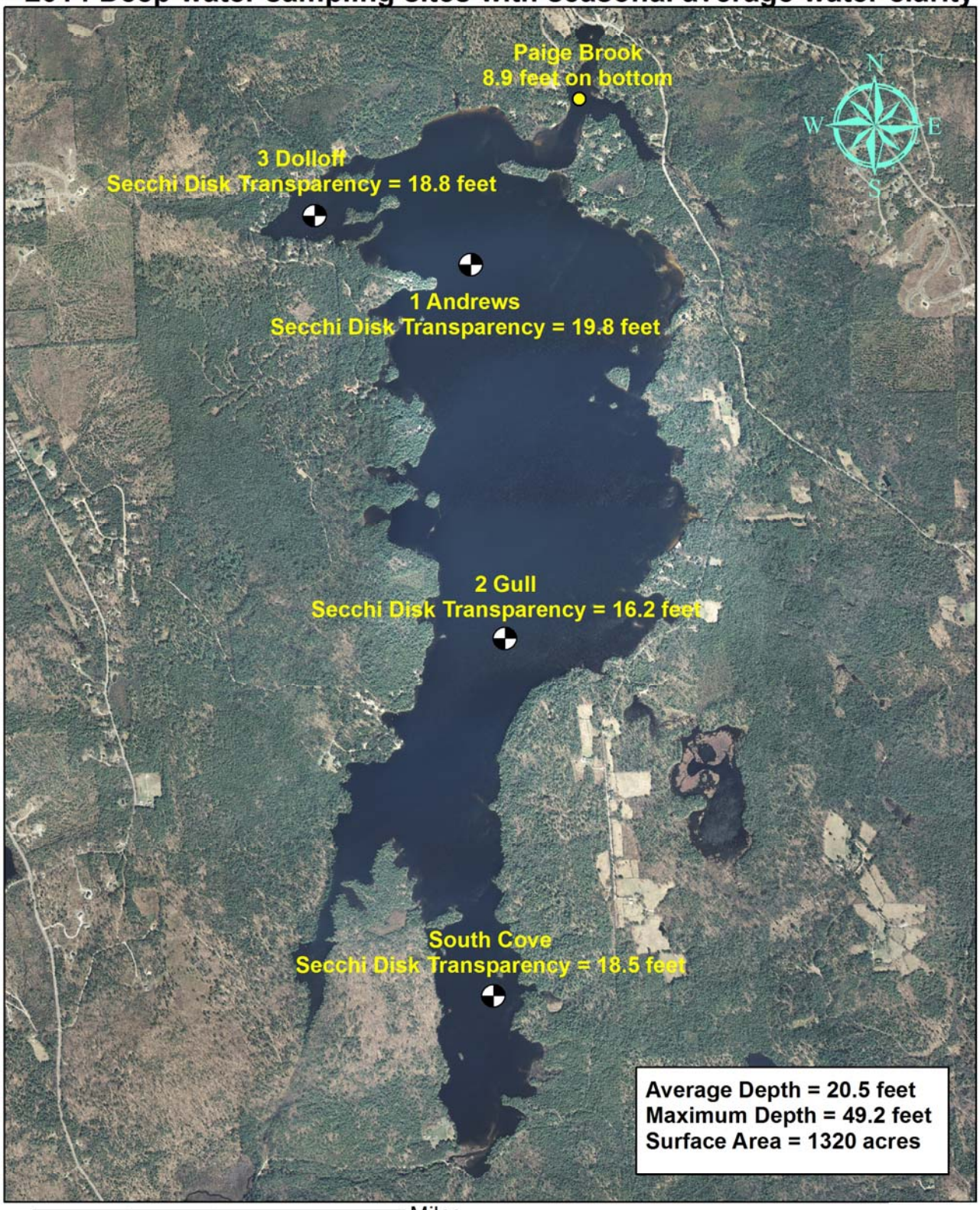
Implement Best Management Practices within the Conway Lake watershed to minimize the adverse impacts of polluted runoff and erosion into Conway Lake. Refer to "Landscaping at the Water's Edge: An Ecological Approach" and "New Hampshire Homeowner's Guide to Stormwater Management: Do-It-Yourself Stormwater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

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

Figure 7. Conway Lake

Conway & Eaton, NH

2014 Deep water sampling sites with seasonal average water clarity



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NEW HAMPSHIRE LAKES LAY MONITORING

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