

NEWFOUND LAKE

2016 SAMPLING HIGHLIGHTS

Station – Cockermonth 5



Blue = Excellent = Oligotrophic

Yellow = Fair = Mesotrophic

Red = Poor = Eutrophic

Light Gray = No Data

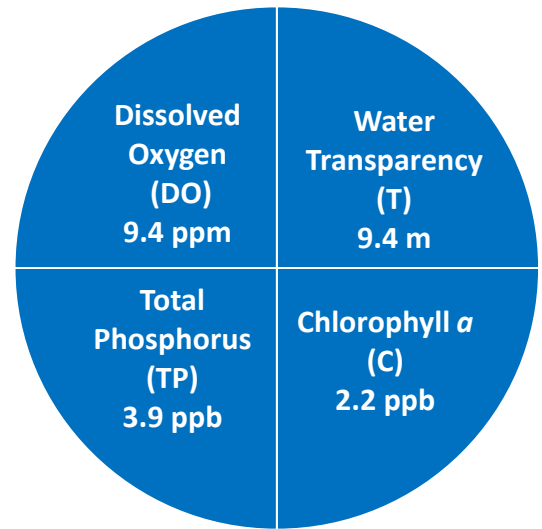


Figure 1. Station Cockermonth 5 Water Quality

Table 1. 2016 Station Cockermonth 5 Seasonal Averages and NHDES Trophic Level Classification Criteria

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Station Cockermonth 5 Average (range)	Station Cockermonth 5 Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	9.4 meters (range: 8.2 – 10.9)	Oligotrophic
Chlorophyll a (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	2.2 ppb (range: 1.5 – 2.7)	Oligotrophic
Total Phosphorus (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	3.9 ppb (range: 3.6 – 4.5)	Oligotrophic
Dissolved Oxygen (ppm)	5.0 – 7.0	2.0 – 5.0	<2.0	9.4 ppm (range: 8.2 – 10.0)	Oligotrophic

* Dissolved oxygen concentrations measured on 8/23/16 between 15.0 and 30.0 meters in the bottom water layer.

Table 2. 2016 Station Cockermonth 5 Seasonal Average Accessory Water Quality Measurements.

Parameter	Assessment Criteria					Station Cockermonth 5 Average (range)	Station Cockermonth 5 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	3.9 color units (range: 3.6 – 4.5)	Uncolored
Alkalinity (ppm)	< 0.0 acidified	0.1 – 2.0 extremely vulnerable	2.1 – 10 moderately vulnerable	10.1 – 25.0 low vulnerability	> 25.0 not vulnerable	4.2 ppm (range: 3.4 – 4.9)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			7.0 standard units (range: 6.9 – 7.1)	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		39.4 uS/cm (range: 38.1 – 40.7)	Characteristic of minimally impacted NH lakes

Recommendations for Property Owners:

Implement Best Management Practices within the Newfound Lake 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 more information on how to reduce nutrient loading caused by overland run-off.

- o https://extension.unh.edu/resources/files/Resource001799_Rep2518.pdf
- o <http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-11-11.pdf>

LONG TERM WATER QUALITY

Site Cockermouth 5 is located near the Cockermouth River in the northwesterly section of Newfound Lake (Figure 4). The condition of Site Cockermouth 5 is influenced by the Cockermouth River drainage as well as other local near-shore and upstream sources. Further review of water quality measurements at the other Newfound Lake sampling locations will provide a better assessment of more localized pollutant inputs that impact the other sampling locations (refer to the 2016 summary data contained in Table 3).

WATER CLARITY: The site Cockermouth 5 water clarity data do not display a trend over the past eighteen years of sampling (1999–2016).

CHLOROPHYLL: The site Cockermouth 5 chlorophyll *a* data display a trend of increasing chlorophyll *a* concentrations over the eighteen years of sampling (1999–2016).

COLOR: The site Cockermouth 5 color data do not display a trend over the past fourteen years of sampling (2000–2016).

TOTAL PHOSPHORUS: The site Cockermouth 5 total phosphorus concentrations have decreased over the fourteen years of sampling (2001-2016).

In summary, the site Cockermouth 5 continues to display good water quality. The long-term water transparency do not display a trend while the chlorophyll *a* concentrations have increased and the total phosphorus concentrations have decreased. One should be aware that total phosphorus data have not been collected on an annual basis and that data gaps exist among years (Figure 3).

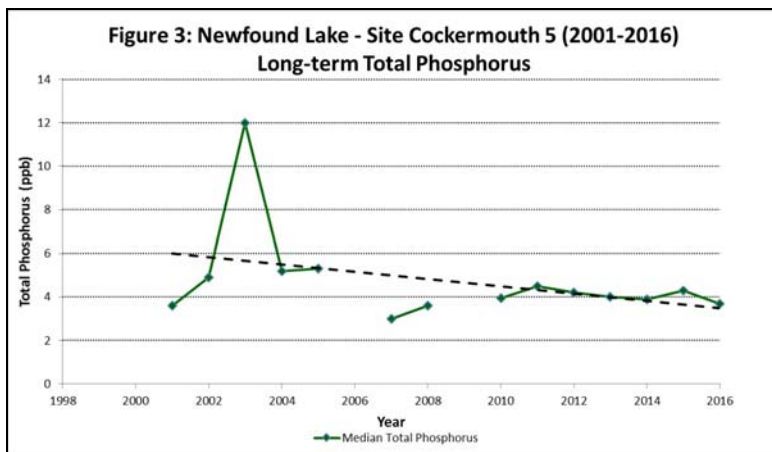
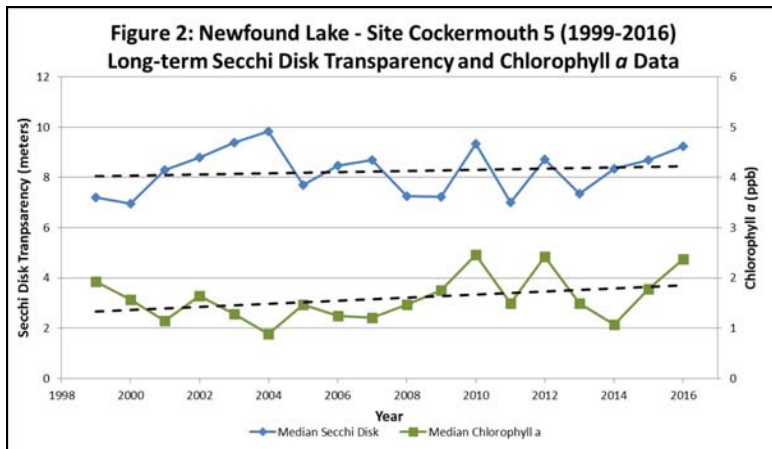


Table 3. Seasonal Average Water Quality by Sampling Location (2016)

Site	Average Secchi Disk Transparency (meters)	Average Chlorophyll <i>a</i> (ppb)	Average Total Phosphorus (ppb)	Average Dissolved Oxygen (ppm)
Deep 1	10.3	2.0	3.6	10.6
Mayhew 2	8.5	1.9	3.8	0.6
Pasquaney 3	8.7	3.1	4.9	11.2
Loon Island 4	9.7	1.6	4.0	XXXX
Cockermouth 5	9.4	2.2	3.9	9.4
Beechwood 6	9.4	2.2	4.2	10.7
Follansbee 8	10.0	2.1	4.5	10.9

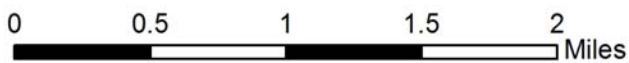
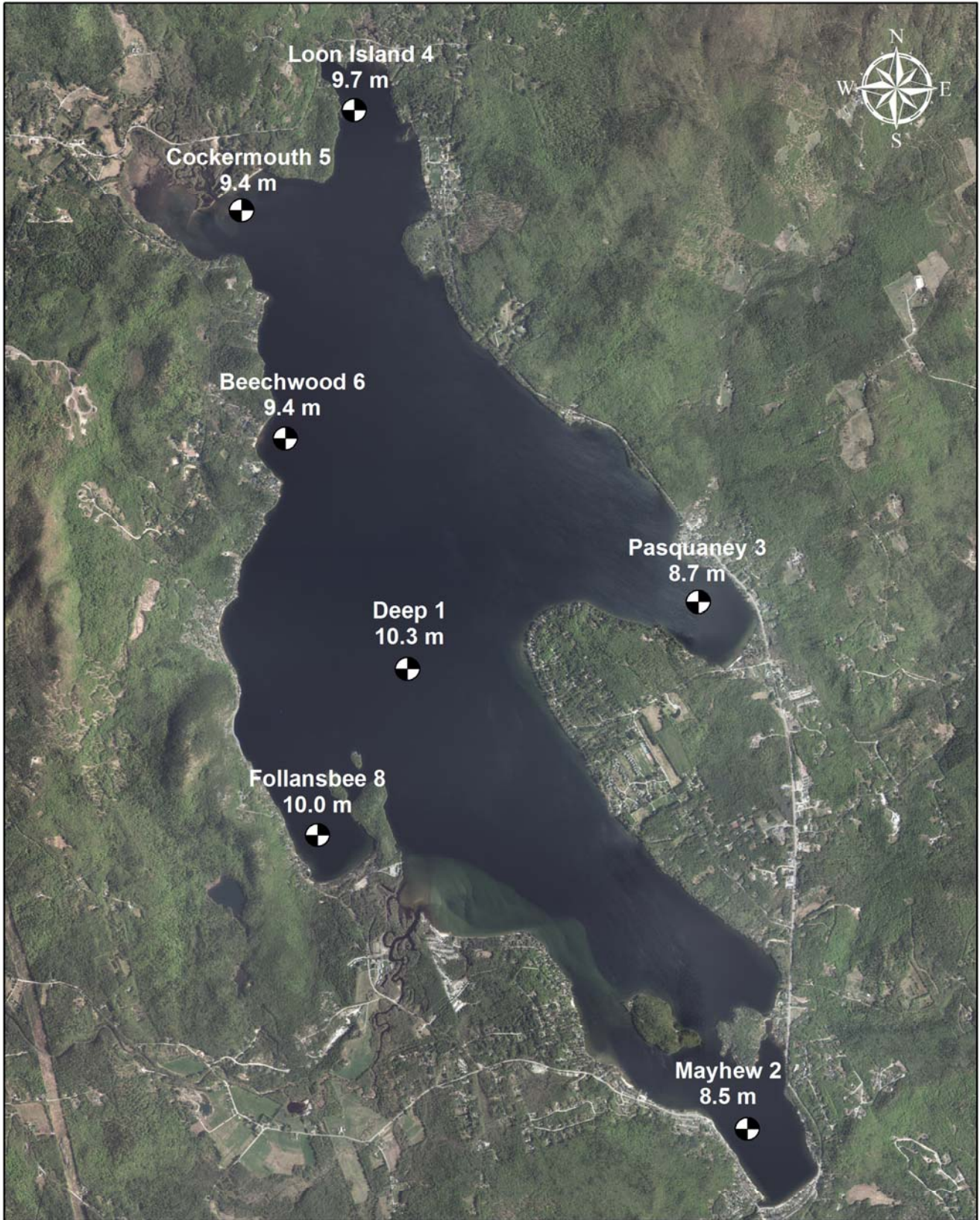
XXXX indicates site is too shallow to collect comparable oxygen data.

Figures 2 and 3. Changes in the Newfound Lake water clarity (Secchi Disk depth), chlorophyll *a* and total phosphorus concentrations measured between 1999 and 2016 at site Cockermouth 5. **These data indicate the relationship between plant growth and water clarity. Total phosphorus data are also displayed and are oftentimes correlated with the amount of plant growth.** Note: due to personnel limitations and budgetary constraints, there are years between 1999 and 2016 when incomplete data were collected at site Cockermouth 5.

Figure 4. Newfound Lake

Bristol, Alexandria, Bridgewater & Hebron, NH

2016 Deep sampling sites with seasonal average water clarity



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



Extension

