

NEWFOUND LAKE

2014 SAMPLING HIGHLIGHTS

Station – Cockermouth 5



Refer to the Newfound Lake Watershed Assessment (2013) for additional information,

<https://drive.google.com/file/d/0B3Zgrj7TV9sZRTJwaVk3S2IHMF/view?pli=1>

Blue = Excellent = Oligotrophic

Yellow = Fair = Mesotrophic

Red = Poor = Eutrophic

Light Gray = No Data

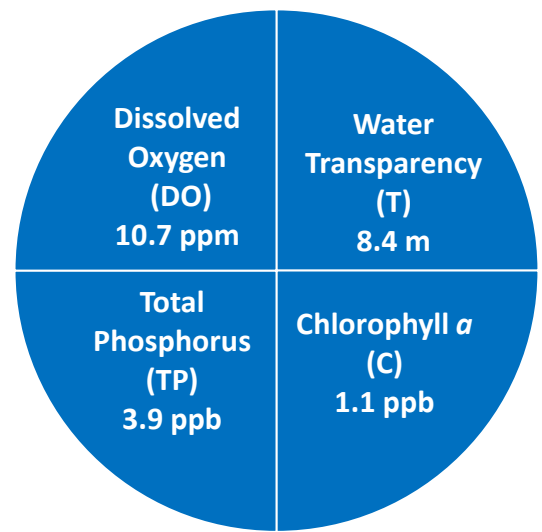


Figure 1. Station Cockermouth 5 Water Quality

Table 1. 2014 Station Cockermouth 5 Seasonal Averages and NHDES Trophic Level Classification Criteria

| Parameter | Oligotrophic “Excellent” | Mesotrophic “Fair” | Eutrophic “Poor” | Station Cockermouth 5 Average (range) | Station Cockermouth 5 Classification |
|----------------------------|--------------------------|--------------------|------------------|---------------------------------------|--------------------------------------|
| Water Clarity (meters) | 4.0 – 7.0 | 2.5 - 4.0 | < 2.5 | 8.4 meters (range: 7.5 – 9.4) | Oligotrophic |
| Chlorophyll <i>a</i> (ppb) | < 3.3 | > 3.3 – 5.0 | > 5.0 – 11.0 | 1.1 ppb (range: 0.4 – 1.5) | Oligotrophic |
| Total Phosphorus (ppb) | < 8.0 | > 8.0 – 12.0 | > 12.0 – 28.0 | 3.9 ppb (single value) | Oligotrophic |
| Dissolved Oxygen (ppm) | 5.0 – 7.0 | 2.0 – 5.0 | <2.0 | 10.7 ppm (range: 10.6 – 10.9) | Oligotrophic |

* Dissolved oxygen concentrations measured between 13.0 and 21.0 meters in the bottom water layer.

Table 2. 2014 Station Cockermouth 5 Seasonal Average Accessory Water Quality Measurements.

| Parameter | Assessment Criteria | | | | | Station Cockermouth 5 Average (range) | Station Cockermouth 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 | 13.0 color units (range: 8.9 – 17.2) | 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 | 4.0 mg/L (range: 3.7 – 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 | | | 7.1 standard units (single value) | 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 | | 37.0 uS/cm (range: 37.0 – 37.0) | 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.

- https://extension.unh.edu/resources/files/Resource001799_Rep2518.pdf
- <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 2014 summary data contained in Table 3).

WATER CLARITY: The site Cockermouth 5 water clarity data do not display a trend over the past sixteen years of sampling (1999–2014).

CHLOROPHYLL: The site Cockermouth 5 chlorophyll *a* data display a trend of increasing chlorophyll *a* concentrations over the sixteen years of sampling (1999–2014).

COLOR: The site Cockermouth 5 color data display a trend of increasing color concentrations over the fourteen years of sampling (2000–2014).

TOTAL PHOSPHORUS: The site Cockermouth 5 total phosphorus concentrations have decreased over the twelve years of sampling (2001–2014).

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).

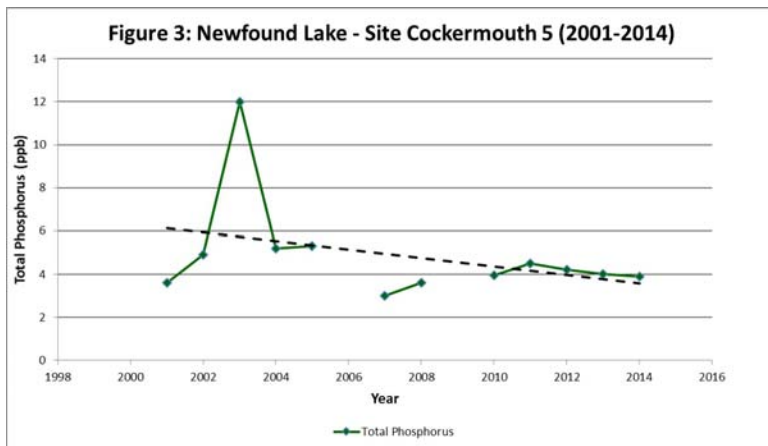
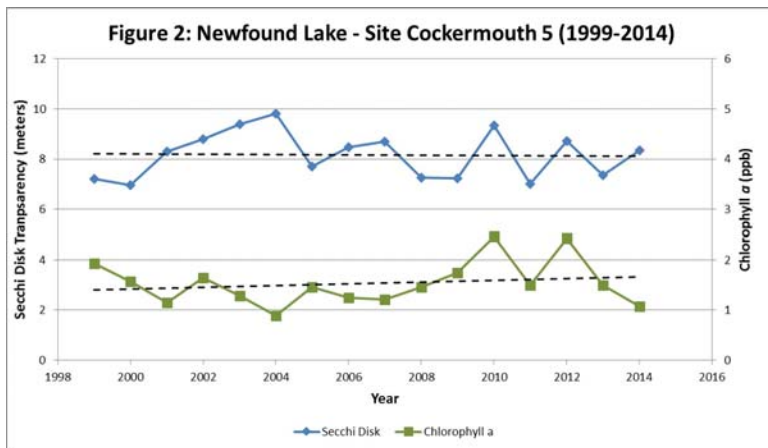


Table 3. Seasonal Average Water Quality by Sampling Location (2014)

| Site | Average Secchi Disk Transparency (meters) | Average Chlorophyll <i>a</i> (ppb) | Average Total Phosphorus (ppb) | Average Dissolved Oxygen (ppm) |
|---------------|---|------------------------------------|--------------------------------|--------------------------------|
| Deep 1 | 10.5 | 0.9 | 2.9 | 10.7 |
| Mayhew 2 | 7.2 | 2.4 | 5.0 | 5.3 |
| Pasquaney 3 | 7.9 | 2.2 | 3.6 | 10.7 |
| Loon Island 4 | 9.1 | 1.7 | 5.1 | XXXX |
| Cockermouth 5 | 8.4 | 1.1 | 3.9 | 10.7 |
| Beechwood 6 | 10.0 | 1.5 | 3.3 | 10.9 |
| Follansbee 8 | 8.8 | 1.7 | 4.5 | 10.7 |

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 2014 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 2014 when incomplete data were collected at site Cockermouth 5.

Figure 4. Newfound Lake

Bristol, Alexandria, Bridgewater & Hebron, NH

2014 Deep sampling sites with seasonal average water clarity

