

# NEWFOUND LAKE

## 2014 SAMPLING HIGHLIGHTS

### Station – Beechwood 6



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

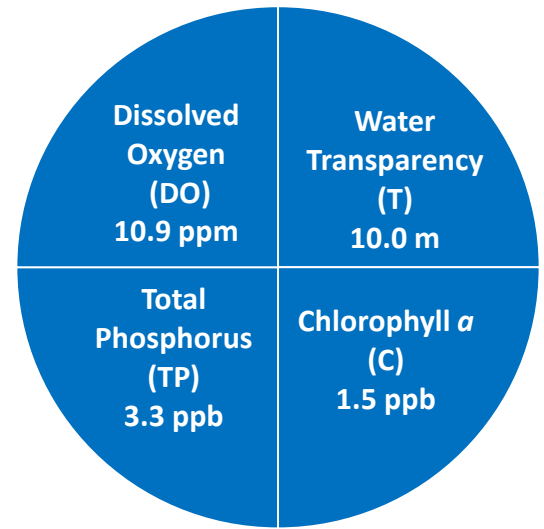


Figure 1. Station Beechwood 6 Water Quality

Table 1. 2014 Station Beechwood 6 Seasonal Averages and NHDES Trophic Level Classification Criteria

| Parameter              | Oligotrophic "Excellent" | Mesotrophic "Fair" | Eutrophic "Poor" | Station Beechwood 6 Average (range) | Station Beechwood 6 Classification |
|------------------------|--------------------------|--------------------|------------------|-------------------------------------|------------------------------------|
| Water Clarity (meters) | 4.0 – 7.0                | 2.5 - 4.0          | < 2.5            | 10.0 meters (single value)          | Oligotrophic                       |
| Chlorophyll a (ppb)    | < 3.3                    | > 3.3 – 5.0        | > 5.0 – 11.0     | 1.5 ppb (single value)              | Oligotrophic                       |
| Total Phosphorus (ppb) | < 8.0                    | > 8.0 – 12.0       | > 12.0 – 28.0    | 3.3 ppb (single value)              | Oligotrophic                       |
| Dissolved Oxygen (ppm) | 5.0 – 7.0                | 2.0 – 5.0          | <2.0             | 10.9 ppm (range: 10.8 – 11.0)       | Oligotrophic                       |

\* Dissolved oxygen concentrations measured between 13.5 and 20.0 meters in the bottom water layer.

Table 2. 2014 Station Beechwood 6 Seasonal Average Accessory Water Quality Measurements.

| Parameter                     | Assessment Criteria                                      |                                |  |   |                       | Station Beechwood 6 Average (range) | Station Beechwood 6 Classification             |
|-------------------------------|--|--------------------------------|--|---|-----------------------|-------------------------------------|--|
| Color (color units)           | < 10 uncolored   | 10 – 20 slightly colored       | 20 – 40 lightly tea colored                              | 40 – 80 tea colored   | > 80 highly colored   | 8.1 color units (single value)      | 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 | 4.5 ppm (single value)              | 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](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 Beechwood 6 is located along the westerly shoreline of Newfound Lake (Figure 4). The condition of Site Beechwood 6 is a reflection of the various nearshore and upstream sources in close proximity to the sampling site. 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).

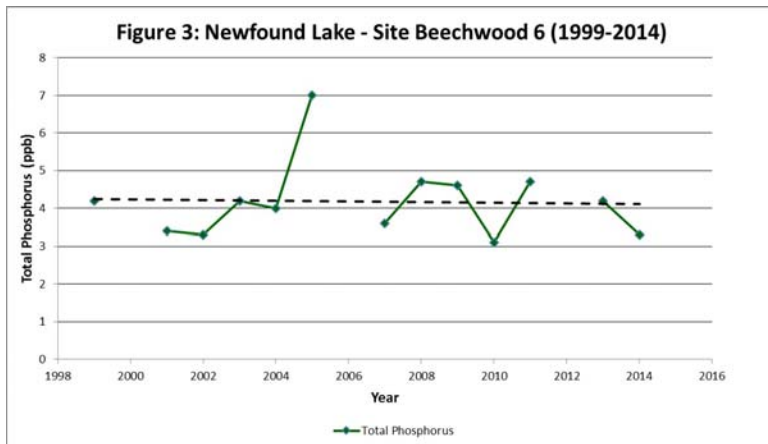
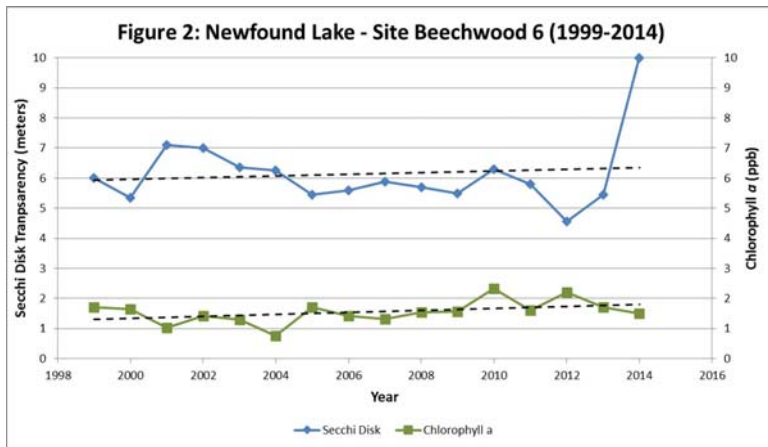
**WATER CLARITY:** The site Beechwood 6 water clarity data display an increasing trend in water clarity over the past sixteen years of sampling (1999–2014). However, when the atypically high 2014 water clarity data point is removed, a decreasing water transparency trend is evident between 1999 and 2013.

**CHLOROPHYLL:** The site Beechwood 6 chlorophyll *a* data display a trend of increasing chlorophyll *a* concentrations over the sixteen years of sampling (1999–2014).

**COLOR:** The site Beechwood 6 color data do not display a trend over the sixteen years of sampling (1999–2014).

**TOTAL PHOSPHORUS:** The site Beechwood 6 total phosphorus concentrations do not display a trend over the thirteen years of sampling (2001–2014).

In summary, the site Beechwood 6 continues to display good water quality. However, the trend of increasing chlorophyll concentrations over the past sixteen years and a trend of decreasing water transparency between 1999 and 2013 suggest this site remains susceptible to water quality problems. On the other hand, the long-term total phosphorus (nutrient) data do not display a trend. 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 Beechwood 6. **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 Beechwood 6.



# Figure 4. Newfound Lake

Bristol, Alexandria, Bridgewater & Hebron, NH

2014 Deep sampling sites with seasonal average water clarity

