

NEWFOUND LAKE

2019 SAMPLING HIGHLIGHTS

Station – Beechwood 6



Blue = Excellent = Oligotrophic

Yellow = Fair = Mesotrophic

Red = Poor = Eutrophic

Light Gray = No Data

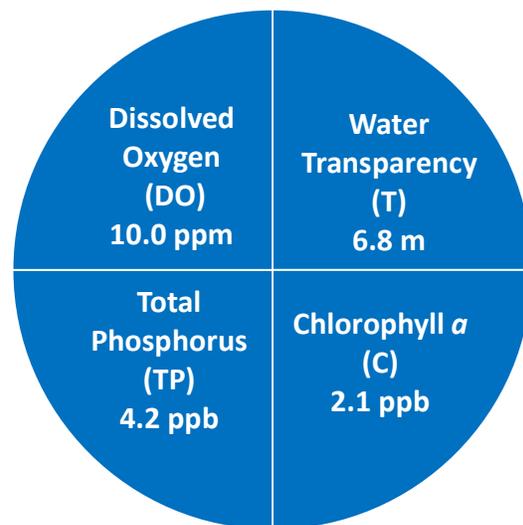


Figure 1. Station Beechwood 6 Water Quality (2019)

Water quality data displayed in Tables 1, 2 and 3 are surface water measurements with the exception of the dissolved oxygen data that were collected in the bottom water layer.

Table 1. 2019 Station Beechwood 6 Seasonal Averages and NH DES Aquatic Life Nutrient Criteria¹

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	6.8 meters (range: 2.0 – 9.8)	Oligotrophic
Chlorophyll a ¹ (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	2.1 ppb (range: 0.9 – 4.0)	Oligotrophic
Total Phosphorus ¹ (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	4.2 ppb (range: 3.6 – 4.7)	Oligotrophic
Dissolved Oxygen (ppm)	5.0 – 7.0	2.0 – 5.0	<2.0	10.0 ppm (range: 9.8 – 10.0)	Oligotrophic

* Dissolved oxygen concentrations measured on 8/15/19 between 12.5 and 15.5 meters in the bottom water layer.

Table 2. 2019 Station Beechwood 6 Seasonal Average Accessory Water Quality Measurements.

Parameter	Assessment Criteria					Station Beechwood 6 Average (range)	Station Beechwood 6 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	18.1 color units (range: 9.3 – 26.7)	Slightly colored
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	3.9 ppm (range: 3.4 – 4.1)	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 – 7.0)	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		40.1 uS/cm (range: 40.0 – 40.2)	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/Resource004159_Rep5940.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 2019 summary data contained in Table 3).

WATER CLARITY: The site Beechwood 6 water clarity data display an increasing water clarity trend over the past twenty-one years of sampling (1999–2019). However, when the atypically high 2014 through 2019 water clarity data points are removed, a decreasing water clarity 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 twenty-one years of sampling (1999–2019).

COLOR: The site Beechwood 6 color data do not display a trend over the twenty-one years of sampling (1999–2019).

TOTAL PHOSPHORUS: The site Beechwood 6 total phosphorus concentrations do not display a trend over the eighteen years of sampling (2001-2019).

In summary, the site Beechwood 6 continues to display good water quality. However, the trend of increasing chlorophyll concentrations over the past twenty-one years and a trend of decreasing water clarity 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).

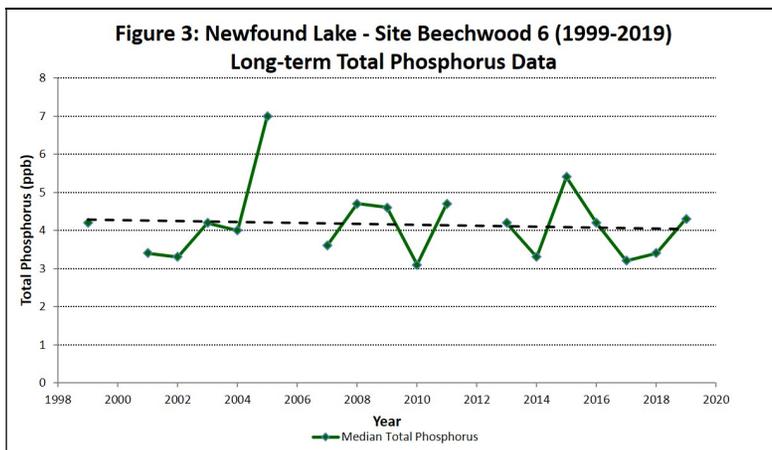
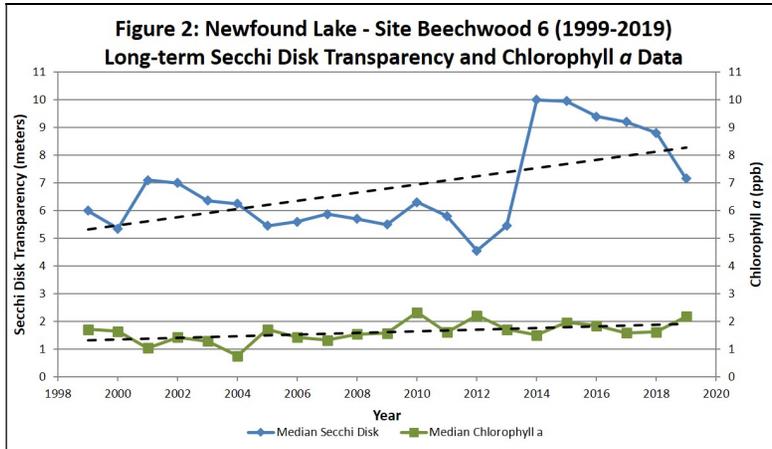


Table 3. Seasonal Average Water Quality by Sampling Location (2019)

Site	Average Secchi Disk Transparency (meters)	Average Chlorophyll <i>a</i> (ppb)	Average Total Phosphorus (ppb)	Average Dissolved Oxygen (ppm)
Deep 1	7.7	1.5	4.2	10.4
Mayhew 2	6.5	1.6	4.5	3.0
Pasquaney 3	7.7	1.8	3.8	9.9
Loon Island 4	7.0	1.6	4.9	XXXX
Cockermouth 5	6.9	1.9	4.2	9.3
Beechwood 6	6.8	2.1	4.2	10.0
Follansbee 8	7.9	1.3	3.7	10.0

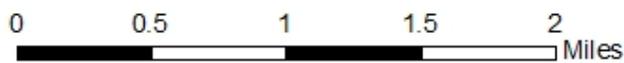
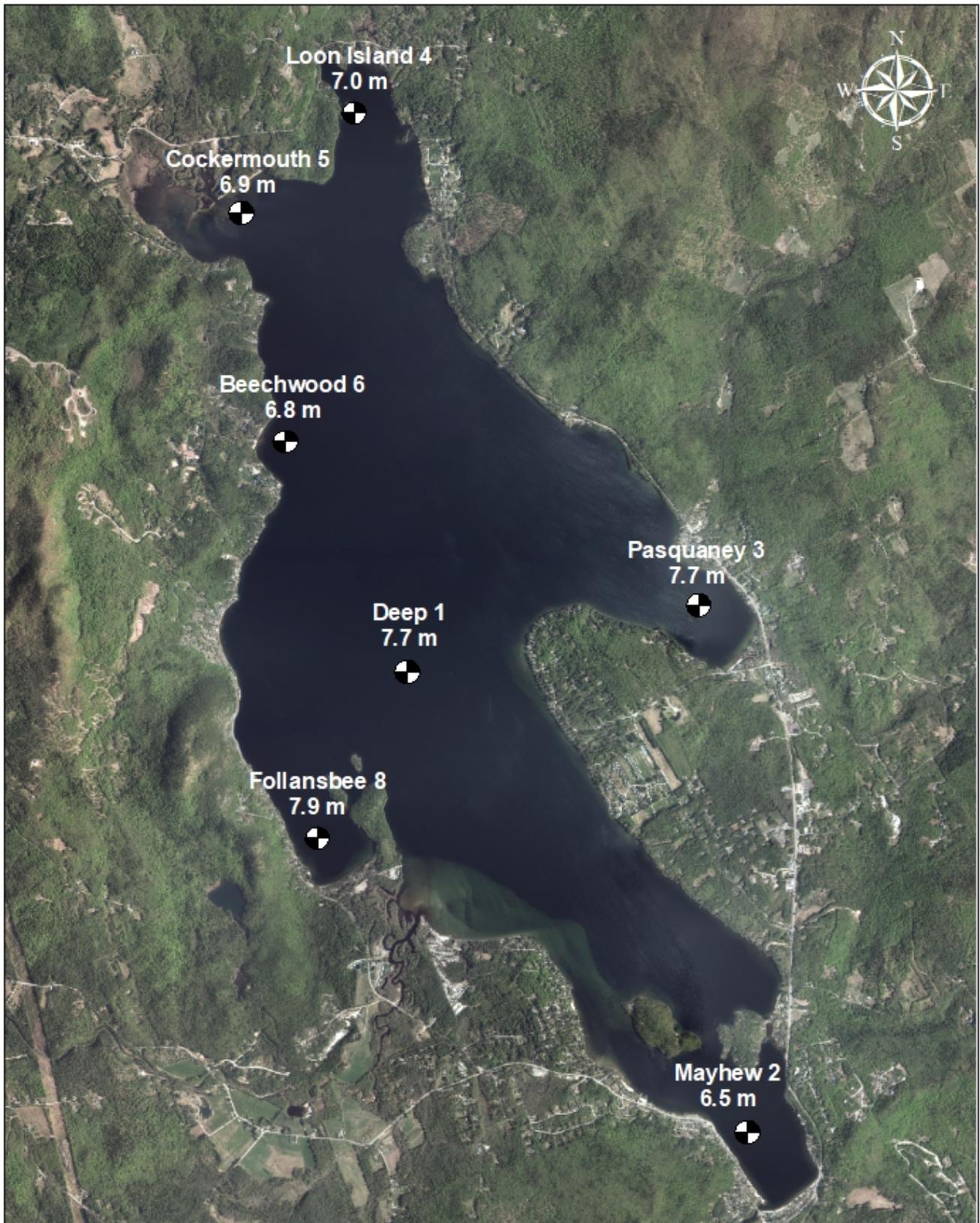
XXXX indicates site is too shallow to collect comparable oxygen data.

Figures 2 and 3. Changes in the Newfound Lake water clarity (Secchi Disk depth), chlorophyll *a* and total phosphorus concentrations measured between 1999 and 2019 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 2019 when incomplete data were collected at site Beechwood 6. Median trend graphs are developed using median annual values to minimize the impact of outlier data.

Figure 4. Newfound Lake

Bristol, Alexandria, Bridgewater & Hebron, NH

2019 Deep sampling sites with seasonal average water clarity



Extension



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