

NEWFOUND LAKE

2018 SAMPLING HIGHLIGHTS

Station - Deep 1



Blue = Excellent = Oligotrophic

Yellow = Fair = Mesotrophic

Red = Poor = Eutrophic

Light Gray = No Data

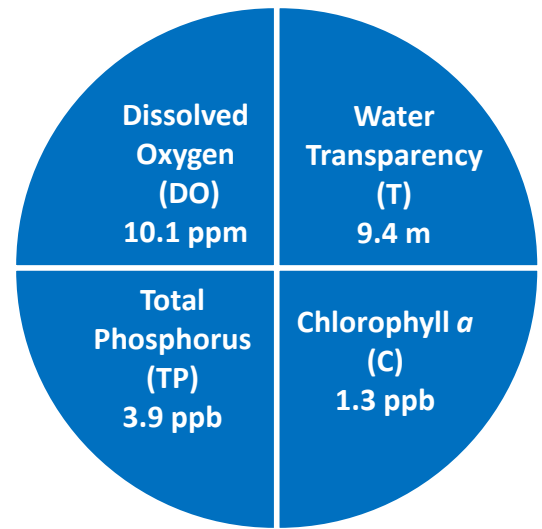


Figure 1. Station Deep 1 Water Quality (2018)

Table 1. 2018 Station Deep 1 Seasonal Averages and NH DES Aquatic Life Nutrient Criteria¹

| Parameter | Oligotrophic "Excellent" | Mesotrophic "Fair" | Eutrophic "Poor" | Station Deep 1 Average (range) | Station Deep 1 Classification |
|--|-----------------------------|-----------------------|---------------------|-----------------------------------|----------------------------------|
| Water Clarity (meters) | 4.0 – 7.0 | 2.5 - 4.0 | < 2.5 | 9.4 meters (range: 9.3 – 9.5) | Oligotrophic |
| Chlorophyll <i>a</i> ¹ (ppb) | < 3.3 | > 3.3 – 5.0 | > 5.0 – 11.0 | 1.3 ppb (range: 1.3 – 1.3) | Oligotrophic |
| Total Phosphorus ¹ (ppb) | < 8.0 | > 8.0 – 12.0 | > 12.0 – 28.0 | 3.9 ppb (range: 3.6 – 4.2) | Oligotrophic |
| Dissolved Oxygen (ppm) | 5.0 – 7.0 | 2.0 – 5.0 | <2.0 | 10.1 ppm (range: 9.9 – 10.3) | Oligotrophic |

* Dissolved oxygen concentrations measured on 8/23/18 between 14.5 and 30.5 meters in the bottom water layer.

Table 2. 2018 Station Deep 1 Seasonal Average Accessory Water Quality Measurements.

| Parameter | Assessment Criteria | | | | | Station Deep 1 Average (range) | Station Deep 1 Classification |
|--|--|--------------------------------------|--|---|-----------------------------|---|--|
| Color (color units) | < 10 uncolored | 10 – 20 slightly colored | 20 – 40 lightly tea colored | 40 – 80 tea colored | > 80 highly colored | 8.7 color units (range: 8.2 – 9.2) | 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 | 4.0 ppm (range: 3.9 – 4.0) | Moderately vulnerable |
| pH (std units) | < 5.5 suboptimal for successful growth and reproduction | | 6.5 – 9.0 optimal range for fish growth and reproduction | | | 7.0 standard units (range: 7.0 – 7.0) | Optimal range for fish growth and reproduction |
| Specific Conductivity (<i>uS/cm</i>) | < 50 <i>uS/cm</i> Characteristic of minimally impacted NH lakes | | 50-100 <i>uS/cm</i> Lakes with some human influence | > 100 <i>uS/cm</i> Characteristic of lakes experiencing human disturbances | | 41.6 <i>uS/cm</i> (range: 41.1 – 42.1) | 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 Deep 1 is the most centrally located of the Newfound Lake sampling locations (Figure 4) and provides the best representation of the overall condition of Newfound Lake. The condition of site Deep 1 is a reflection of the various inputs that enter the lake through the drainages to the north and many points to the east and west of Newfound Lake. 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 2018 summary data contained in Table 3).

WATER CLARITY: The site Deep 1 Lake water clarity data do not display a trend over the twenty-two years of sampling (1986–2018).

CHLOROPHYLL: The site Deep 1 Lake chlorophyll *a* data display do not display a trend over the twenty-two years of sampling (1986–2018).

COLOR: The site Deep 1 color data display a trend of increasing color concentrations over the nineteen years of sampling (1988–2018).

TOTAL PHOSPHORUS: The site Deep 1 total phosphorus concentrations do not display a trend over the past twenty years of sampling (1986-2018).

In summary, site Deep 1 and Newfound Lake continue to show excellent water quality conditions. One should be aware that water quality data have not been collected on an annual basis and that data gaps among years exist (Figure 2 and 3).

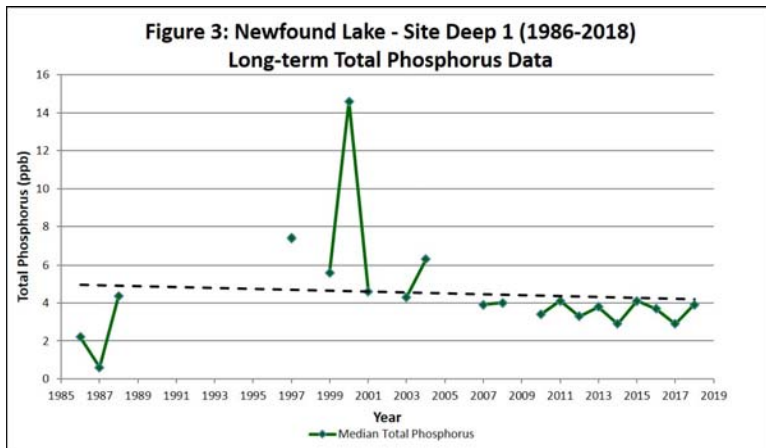
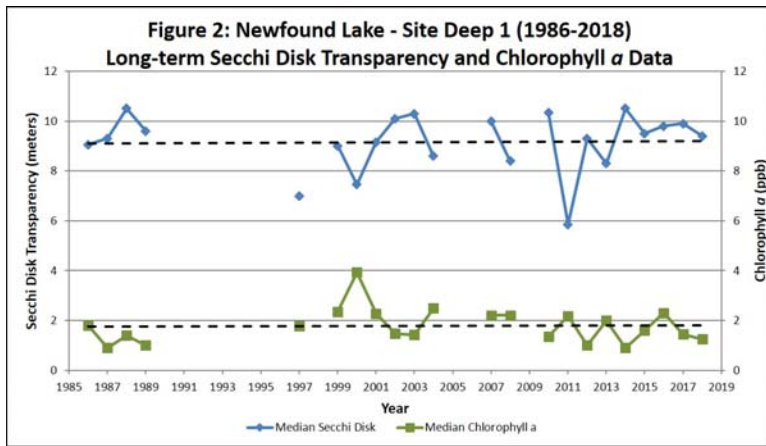


Table 3. Seasonal Average Water Quality by Sampling Location (2018)

| Site | Average Secchi Disk Transparency (meters) | Average Chlorophyll <i>a</i> (ppb) | Average Total Phosphorus (ppb) | Average Dissolved Oxygen (ppm) |
|---------------|---|------------------------------------|--------------------------------|--------------------------------|
| Deep 1 | 9.4 | 1.3 | 3.9 | 10.1 |
| Mayhew 2 | 7.7 | 1.4 | 2.9 | 2.9 |
| Pasquaney 3 | 9.3 | 1.2 | 3.1 | 9.9 |
| Loon Island 4 | 9.3 | 1.5 | 3.2 | XXXX |
| Cockermouth 5 | 8.8 | 1.5 | 3.9 | 9.9 |
| Beechwood 6 | 9.0 | 1.8 | 3.3 | 10.1 |
| Follansbee 8 | 10.0 | 1.5 | 3.8 | XXXX |

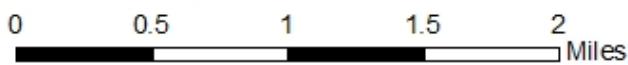
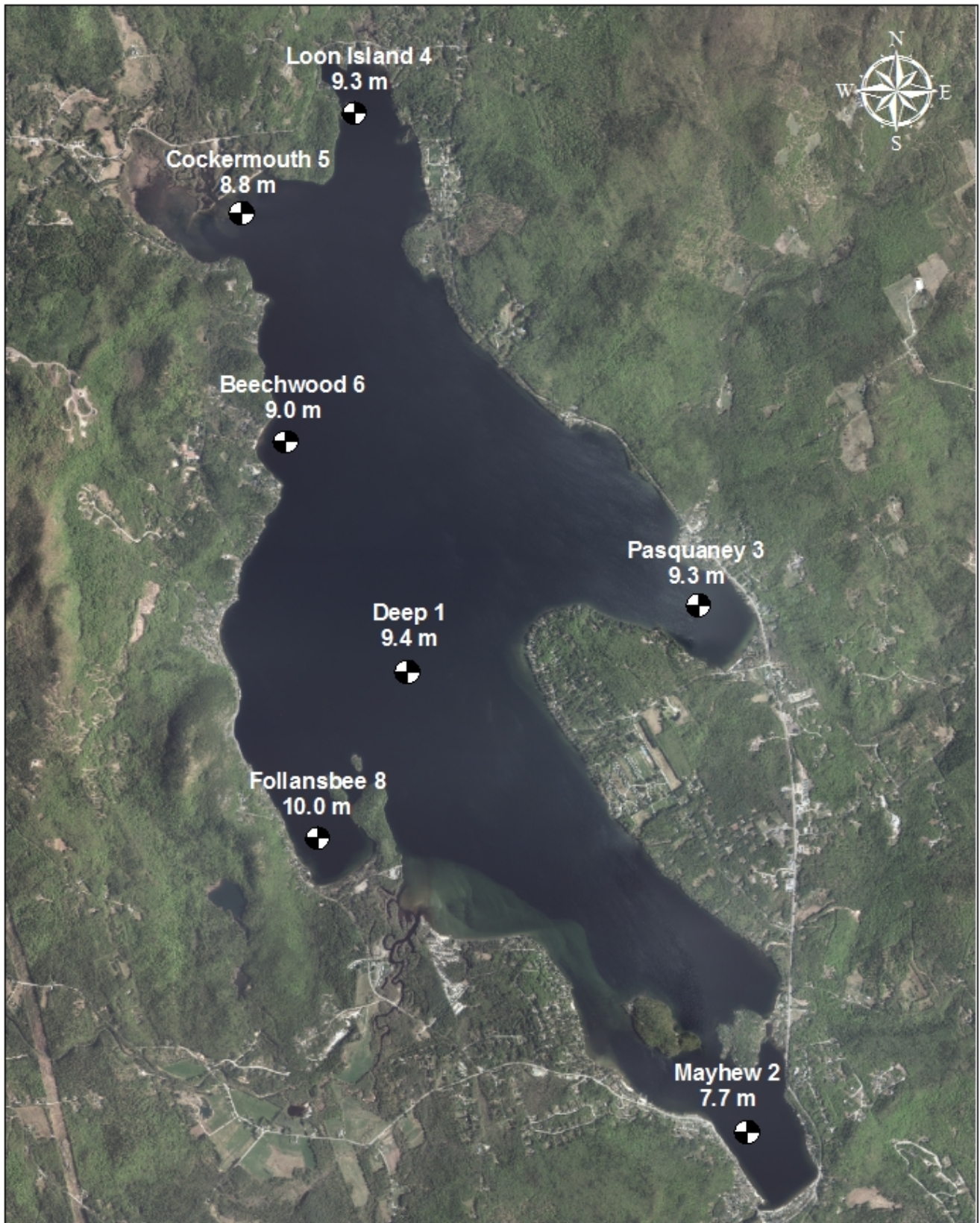
XXXX indicates site is too shallow to collect comparable oxygen data.

Figures 2 and 3. Changes in the Newfound Lake water clarity (Secchi Disk depth), chlorophyll *a* and total phosphorus concentrations measured between 1986 and 2018 at site Deep 1. **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 difficulties in accessing the deep site and personnel limitations, there are years when site Deep 1 was not sampled between 1986 and 2018.

Figure 4. Newfound Lake

Bristol, Alexandria, Bridgewater & Hebron, NH

2018 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

