

# PROVINCE LAKE

## 2025 SAMPLING HIGHLIGHTS

### Station Deep

Effingham, NH



Extension

Blue = Oligotrophic

Light Green = Mesotrophic

Dark Green = Eutrophic

Gray = No Data

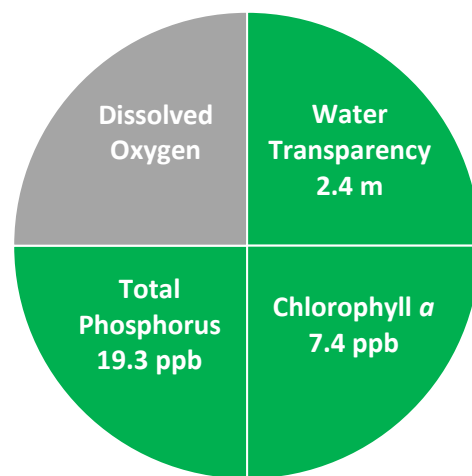


Figure 1. Province Lake Water Quality (2025)

Table 1. 2025 Province Lake Seasonal Averages and NH DES Aquatic Life Nutrient Criteria<sup>1</sup>

| Parameter                               | Oligotrophic | Mesotrophic | Eutrophic     | Province Lake Average (range) | Province Lake Classification |
|-----------------------------------------|--------------|-------------|---------------|-------------------------------|------------------------------|
| Water Clarity (meters)                  | > 4.0 – 7.0  | 2.5 - 4.0   | < 2.5         | 2.4 meters (1.2 – 3.0)        | Eutrophic                    |
| Chlorophyll <i>a</i> <sup>1</sup> (ppb) | < 3.3        | 3.3 – 5.0   | > 5.0 – 11.0  | 7.4 ppb (4.9 – 10.6)          | Eutrophic                    |
| Total Phosphorus <sup>1</sup> (ppb)     | < 8.0        | 8.0 – 12.0  | > 12.0 – 28.0 | 19.3 ppb (15.5 – 20.8)        | Eutrophic                    |
| Dissolved Oxygen (ppm)                  | > 5.0 – 7.0  | 2.0 – 5.0   | < 2.0         | Not Assessed *                | Not Assessed                 |

\* Province Lake did not develop a stable mid or deep-water layer that is the basis for the dissolved oxygen classification criteria.

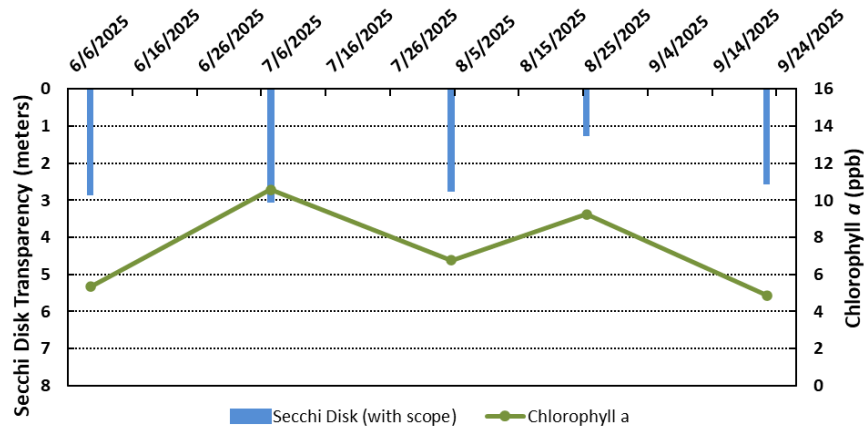
Table 2. 2025 Province Lake Seasonal Average Accessory Water Quality Measurements

| Parameter                     | Assessment Criteria                                      |                                |                                                          |                                                                     |                       | Province Lake Average (range)         | Province Lake Classification                      |
|-------------------------------|----------------------------------------------------------|--------------------------------|----------------------------------------------------------|---------------------------------------------------------------------|-----------------------|---------------------------------------|---------------------------------------------------|
| Color (color units)           | < 10 uncolored                                           | 10 – 20 slightly colored       | 20 – 40 lightly tea colored                              | 40 – 80 tea colored                                                 | > 80 highly colored   | 27.0 color units (range: 17.4 – 38.6) | Lightly tea 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 | 6.5 ppm (range: 6.0 – 6.9)            | 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 |                       | 59.6 uS/cm (range: 54.7 – 64.1)       | Characteristic of lakes with some human influence |

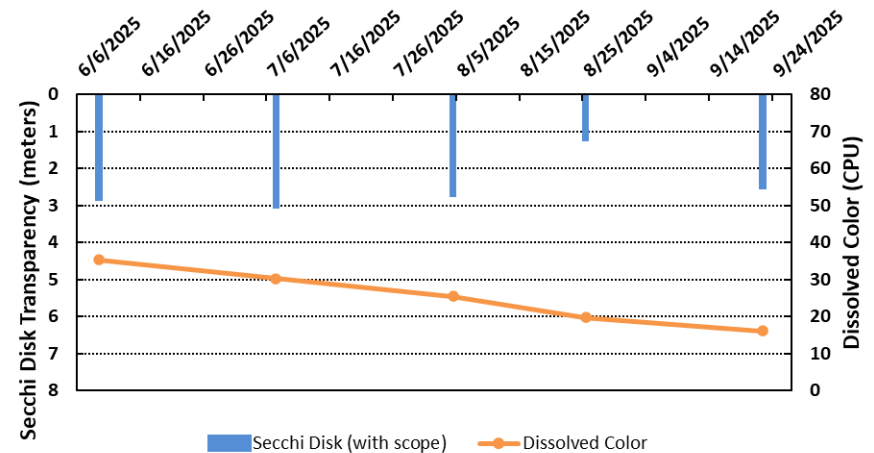
### Strategies to stabilize and improve water quality

Implement Best Management Practices (BMPs) within the Province Lake watershed to minimize the adverse impacts of polluted runoff and erosion into Province 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”](#) and the [Acton Wakefield Watershed Alliance webpages](#) for more information on how to reduce nutrient loading caused by overland runoff. NH Lakes also provides a series of resources aimed at educating residents and protecting our lakes and ponds.

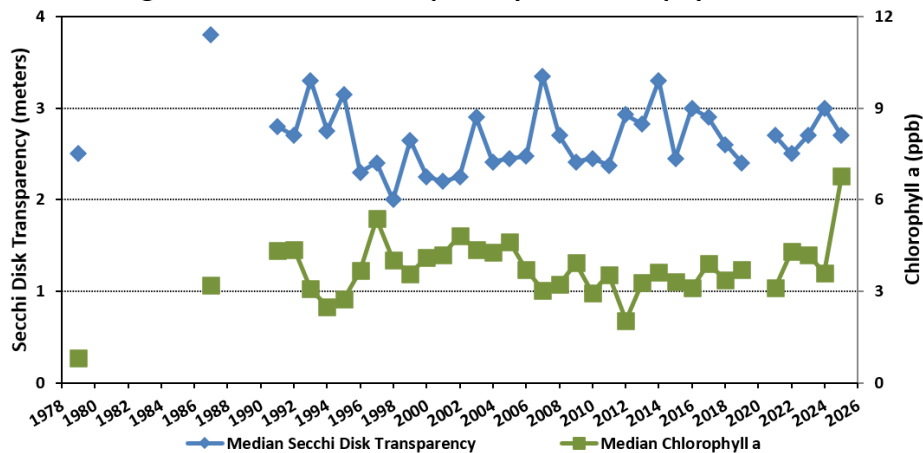
**Figure 2. Province Lake (2025 Seasonal Data)  
Secchi Disk Transparency and Chlorophyll *a* Data**



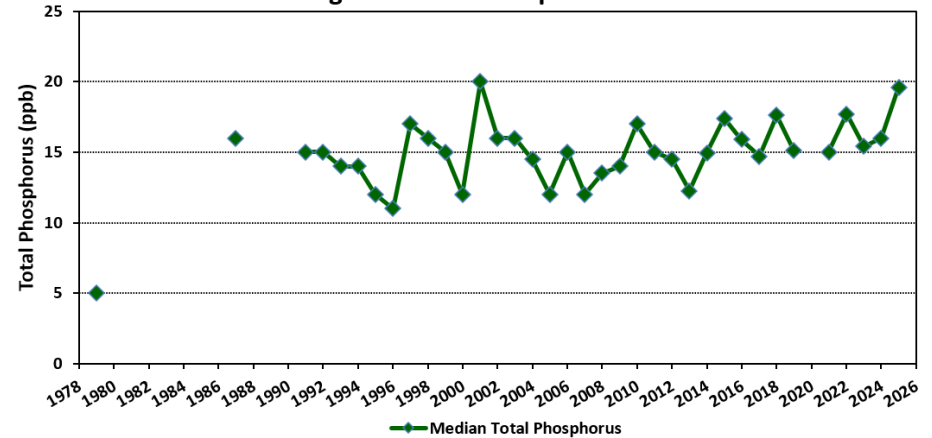
**Figure 3. Province Lake (2025 Seasonal Data)  
Secchi Disk Transparency and Dissolved Color Data**



**Figure 4. Province Lake - Deep Site (1979-2025)  
Long-term Secchi Disk Transparency and Chlorophyll *a* Data**



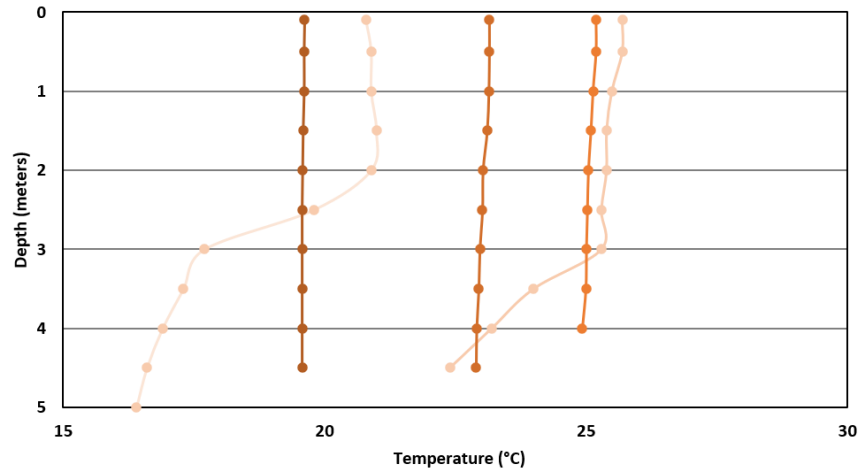
**Figure 5. Province Lake - Deep Site (1979-2025)  
Long-term Total Phosphorus Data**



Figures 2 and 3. Seasonal comparison of Province Lake water transparency (Secchi Disk depth), chlorophyll *a*, and total phosphorus for 2025. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

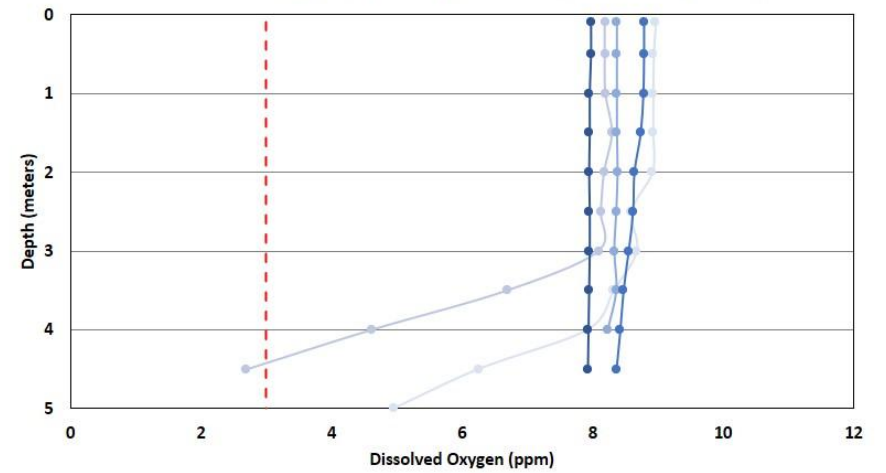
Figures 4 and 5. Annual median Province Lake water transparency, chlorophyll *a*, dissolved color, and total phosphorus concentrations measured between 1979 and 2025, through the New Hampshire Lakes Lay Monitoring Program and the New Hampshire Department of Environmental Services. The long-term data provide insight into the water quality fluctuations, among years, that have been documented in Province Lake.

**Figure 6. Province Lake - Site Deep**  
Temperature Profiles (June 9 to September 22, 2025)



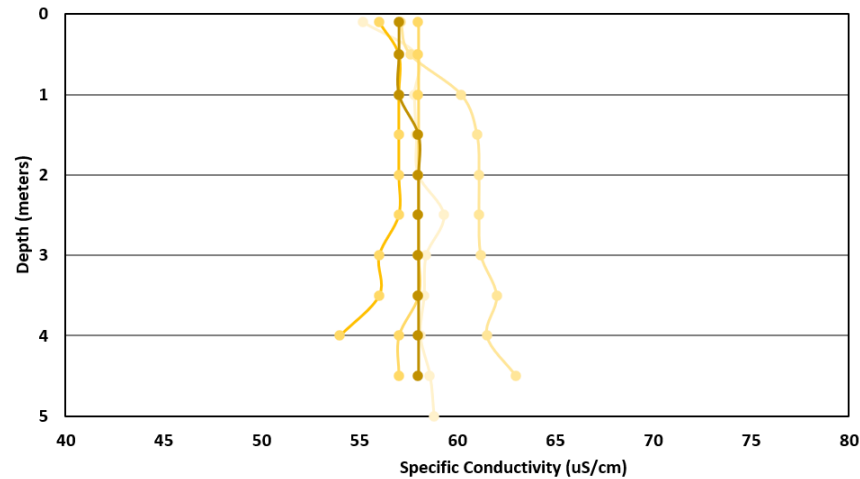
6/9/2025 7/7/2025 8/4/2025 8/25/2025 9/22/2025

**Figure 7. Province Lake - Site Deep**  
Dissolved Oxygen Profiles (June 9 to September 22, 2025)



6/9/2025 7/7/2025 8/4/2025 8/25/2025 9/22/2025

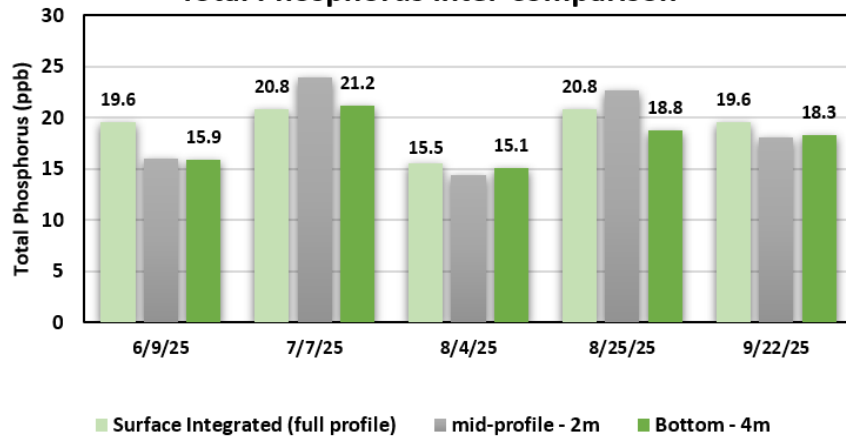
**Figure 8. Province Lake - Site Deep**  
Specific Conductivity Profiles (June 9 to September 22, 2025)



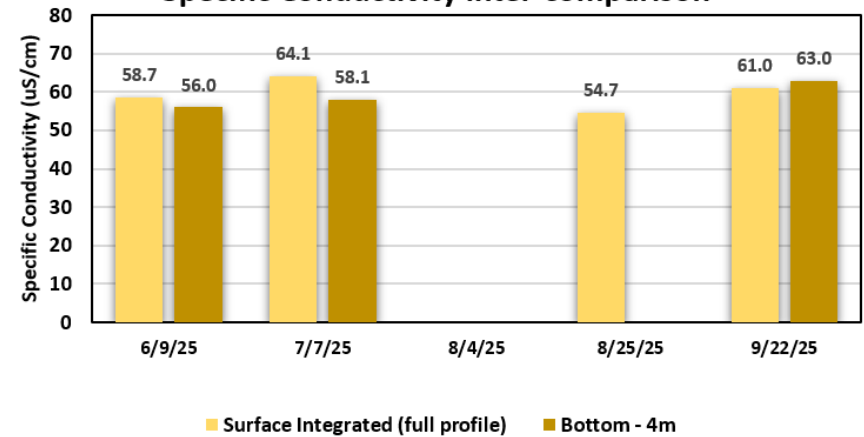
6/9/2025 7/7/2025 8/4/2025 8/25/2025 9/22/2025

Figures 6, 7, and 8. Temperature, dissolved oxygen, and specific conductivity profiles display the water quality differences in 0.5-meter increments. The dashed vertical red line in Figure 7 displays the dissolved oxygen threshold for the successful growth and reproduction of warm-water fish such as bass and perch.

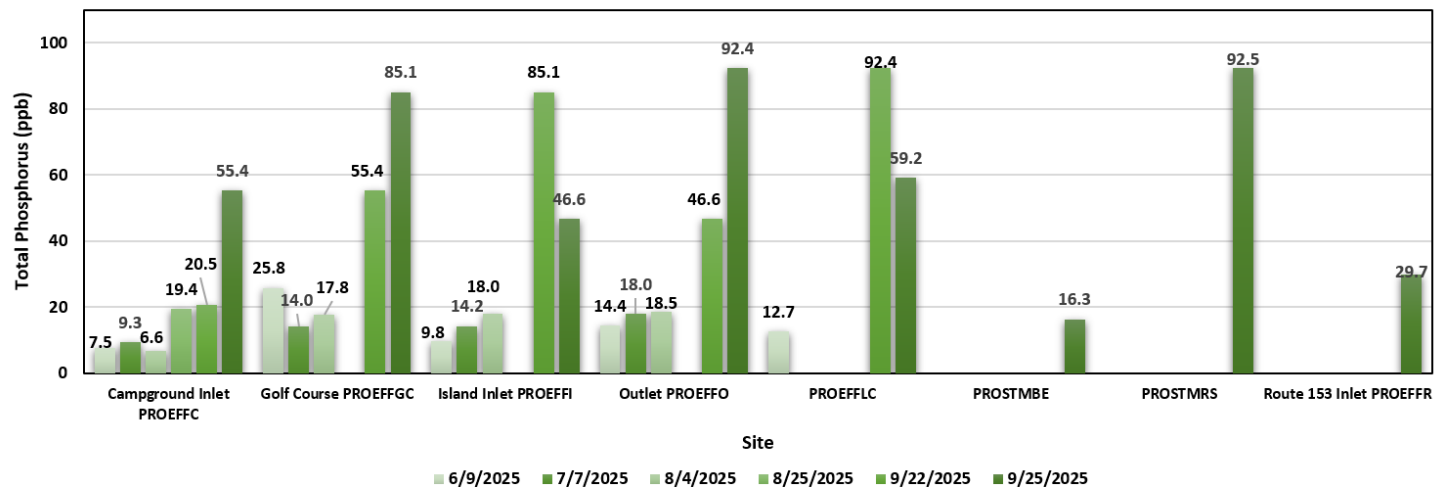
**Figure 9. Province Lake - Site Deep**  
**Total Phosphorus inter-comparison**



**Figure 10. Province Lake - Site Deep**  
**Specific Conductivity inter-comparison**



**Figure 11. Province Lake**  
**Tributary Total Phosphorus Results (June 9 to September 25, 2025)**



Figures 9 and 10. Total phosphorus and conductivity comparison between the surface and bottom waters.

Figure 11. Total phosphorus intercomparison among the Province Lake tributary samples collected between May 13 and September 9, 2025. Some sampling locations contain no water during dry periods or are only sampled during storm events. Thus, total phosphorus samples are not reported for all sampling sites on all sampling dates.

**Table 3. Saco River Watershed Lakes (Acton ME and Wakefield NH)**  
**(2025 water quality data – intercomparison between lakes - deep reference sampling locations)**

| Lake            | Average<br>(range)<br>Secchi Disk Transparency<br>(meters) | Average<br>(range)<br>Total<br>Phosphorus<br>(ppb) | Average<br>(range)<br>Chlorophyll- <i>a</i><br>(ppb) |
|-----------------|------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------|
| Balch Lake      | 4.8 meters                                                 | 7.9 ppb                                            | 4.1 ppb                                              |
|                 | (range: 4.0 – 5.4)                                         | (range: 4.4 – 9.2)                                 | (range: 3 – 5.2)                                     |
| Belleau Lake    | 2.2 meters                                                 | 13.9 ppb                                           | 5.6 ppb                                              |
|                 | (range: 2.0– 2.5)                                          | (range: 12.7 – 14.8)                               | (range: 4.9 – 6.2)                                   |
| Pine River Pond | 5.2 meters                                                 | 5.7 ppb                                            | 3.0 ppb                                              |
|                 | (range: 3.6 – 7.2)                                         | (range: 5.2 – 6.7)                                 | (range: 1.4 – 4.6)                                   |
| Province Lake   | 2.4 meters                                                 | 19.3 ppb                                           | 7.4 ppb                                              |
|                 | (range: 1.2 – 3.0)                                         | (range: 15.5 –20.8)                                | (range: 4.9 – 10.6)                                  |

#### **Data Interpretation: Overview of factors to consider when reviewing the Province Lake data**

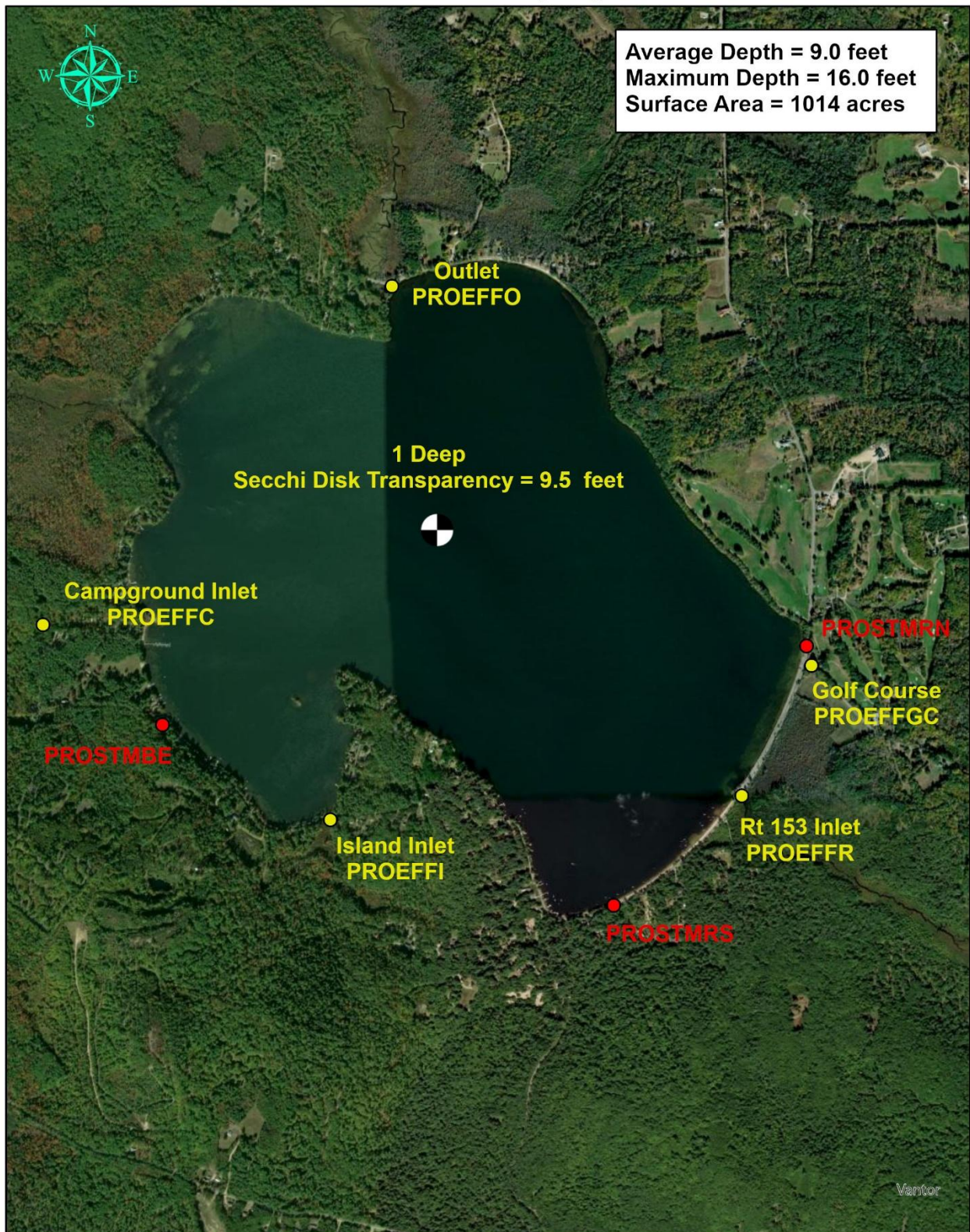
This highlight report provides a general overview of the current and historical conditions of Province Lake. The report is intended to provide a simple assessment of the water quality trends. Should you have additional questions about interpreting your water quality results, we would be happy to discuss the data with you and/or any concerns you may have. In general, some factors that influence the current and long-term water quality results/trends for our New Hampshire lakes and ponds include:

- **Land-use Patterns** within the watershed (drainage basin) – Research indicates land use patterns have an impact on how much phosphorus (nutrient) is washing into our lakes. In general, more urbanized watersheds have a greater degree of phosphorus runoff than highly forested/vegetated drainage areas.
- **Weather Patterns** – Rainfall and temperature can influence water quality. Wet periods, and overland runoff, tend to be a time when elevated nutrients and other pollutants are transported into our lakes. Temperature can also influence water quality conditions since many aquatic plants and algae tend to respond to changing seasonal conditions. Unusually warm periods are sometimes tied to short-term algal and cyanobacteria blooms.
- **Best Management Practices (BMPs)** – The presence/absence of best management practices can have an interplay on water quality. BMPs are measures that are used to manage nutrients and other pollutants that could otherwise make their way into our lakes. Properties that employ BMPs, designed specifically to remove pollutants of concern (e.g. sediments and phosphorus), are less likely to contribute nutrients and other pollutants into our lakes.
- **Temperature (Thermal) Stratification** – Many lakes become thermally stratified during the summer months and may form three distinct thermal layers: upper water layer (epilimnion), middle lake layer (metalimnion) and bottom cold-water layer (hypolimnion). These thermal zones form a barrier to lake mixing, during the summer months, and can coincide with differences in dissolved oxygen and specific conductivity through the water column.
- **Internal Nutrient Loading** (nutrients that are introduced from the sediments along the lake bottom) – Some of our lakes experience significant internal nutrient loading. Such lakes generally tend to be well stratified and exhibit increasing deep water phosphorus concentrations, relative to surface levels.



# Province Lake

Wakefield, NH and Parsonsfield, ME  
Lake and Stream sampling locations



Site location GPS coordinates collected by the UNH Center for Freshwater Biology



Extension

