# LAKE WENTWORTH

**2022 SAMPLING HIGHLIGHTS**

## Station 12 Governors

**Wolfeboro, NH**

Extension

Water quality data displayed in Tables 1, 2 and 3 are surface water measurements with the exception of the dissolved oxygen data that are collected near the lake bottom. Summary statistics are provided for samples collected between July 1 and September 15, 2022.

**Blue** = Oligotrophic

**Yellow** = Mesotrophic

**Red** = Eutrophic

**Gray** = No Data

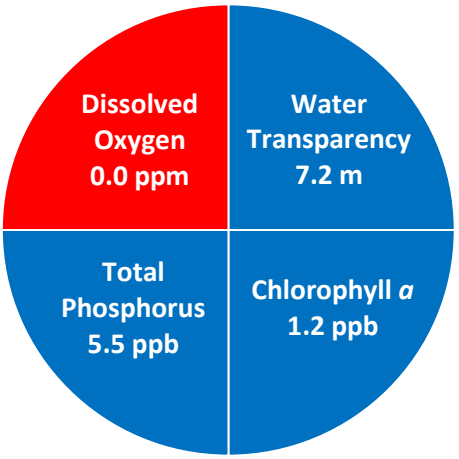



**Figure 1. Lake Wentworth Water Quality (2022)**

**Table 1. 2022 Lake Wentworth Seasonal Averages and NH DES Aquatic Life Nutrient Criteria[1]**

| Parameter | Oligotrophic "Excellent" | Mesotrophic "Fair" | Eutrophic "Poor" | Lake Wentworth Site 12 Governors Average (range) | Lake Wentworth Site 12 Governors Classification |
|---|---|---|---|---|---|
| Water Clarity (meters) | 4.0 – 7.0 | 2.5 - 4.0 | < 2.5 | **7.2** meters (range: 6.5 – 8.0) | **Oligotrophic** |
| Chlorophyll *a* [1] (ppb) | < 3.3 | > 3.3 – 5.0 | > 5.0 – 11.0 | **1.2** ppb (range: 0.3 – 2.5) | **Oligotrophic** |
| Total Phosphorus [1] (ppb) | < 8.0 | > 8.0 – 12.0 | > 12.0 – 28.0 | **5.5** ppb (single value) | **Oligotrophic** |
| Dissolved Oxygen (ppm) | 5.0 – 7.0 | 2.0 – 5.0 | <2.0 | **0.0** ppm (range: 0.0 – 0.1) * | **Eutrophic** |

* Dissolved oxygen concentrations were measured between 15.0 and 19.5 meters, in the deep cold water layer, on September 15, 2022.

**Table 2. 2022 Lake Wentworth Seasonal Average Accessory Water Quality Measurements**

| Parameter | Assessment Criteria | | | | | Lake Wentworth Site 12 Governors Average (range) | Lake Wentworth Site 12 Governors Classification |
|---|---|---|---|---|---|---|---|
| Color (color units) | < 10 uncolored | 10 – 20 slightly colored | 20 – 40 lightly tea colored | 40 – 80 tea colored | > 80 highly colored | **15.9** color units (range: 9.9 – 24.3) | 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 | **7.3** ppm (range: 7.0 – 8.0) | Moderately vulnerable |
| pH (std units) | < 5.5 suboptimal for successful growth and reproduction | | 6.5 – 9.0 optimal range for fish growth and reproduction | | | **6.6** standard units (single value) | Optimal range for fish growth and reproduction |
| Specific Conductivity (*u*S/cm) | < 50 *u*S/cm Characteristic of minimally impacted NH lakes | | 50-100 *u*S/cm Lakes with some human influence | > 100 *u*S/cm Characteristic of lakes experiencing human disturbances | | **74.5** *u*S/cm (single value) | Characteristic of lakes with some human influence |

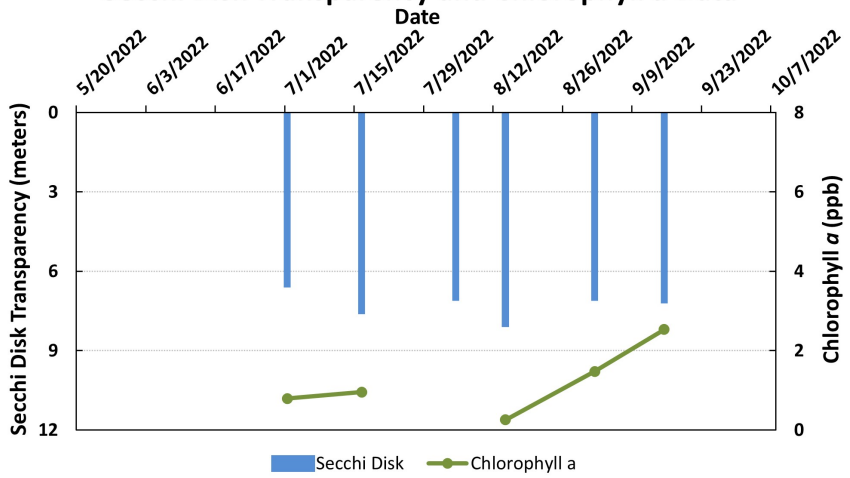
### Strategies to stabilize and improve water quality

Implement Best Management Practices (BMPs) within the Lake Wentworth watershed to minimize the adverse impacts of polluted runoff and erosion into Lake Wentworth. Refer to Landscaping at the Water's Edge: An Ecological Approach, New Hampshire Homeowner's Guide to Stormwater Management: Do-It-Yourself Stormwater Solutions for Your Home and the Lake Wentworth and Crescent Lake Watershed Management Plan for information on how to reduce nutrient loading caused by overland run-off. NH Lakes also provides a series of resources aimed at educating residents and protecting our lakes and ponds.

- https://extension.unh.edu/resources/files/Resource004159_Rep5940.pdf
- https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/homeowner-guide-stormwater.pdf
- https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/wentworthcrescentlake-wbp-ada.pdf
- https://nhlakes.org/lakesmart-resource-library/

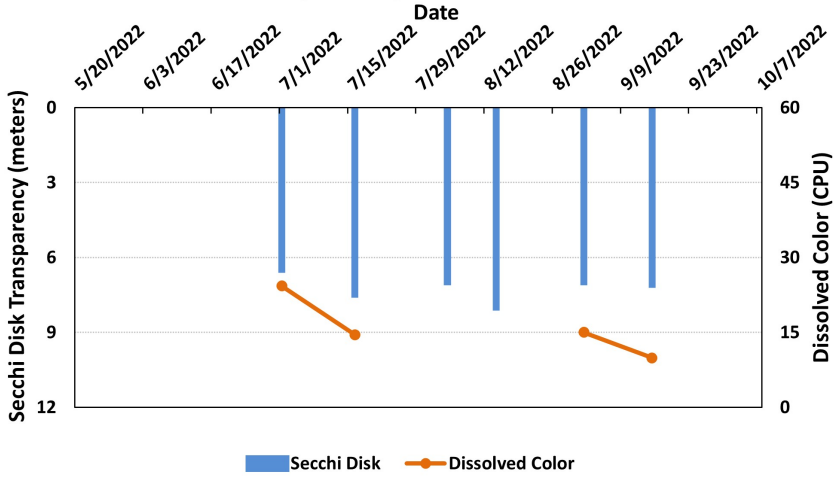
## Figure 2. Lake Wentworth (2022 Seasonal Data)

### Secchi Disk Transparency and Chlorophyll *a* Data



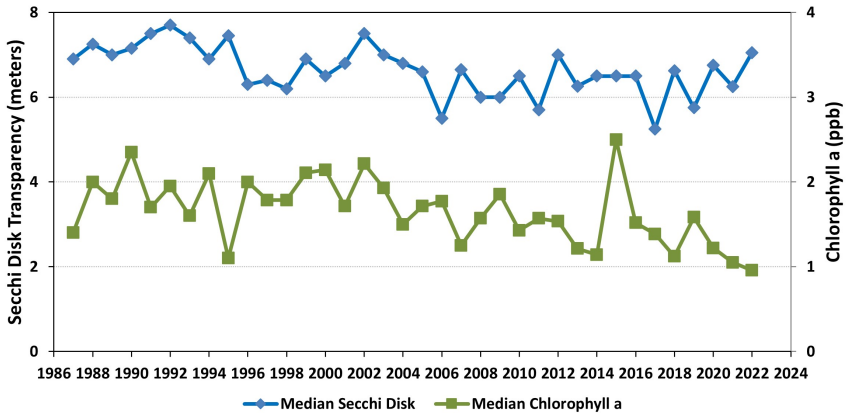

## Figure 3. Lake Wentworth (2022 Seasonal Data)

### Secchi Disk Transparency and Dissolved Color Data



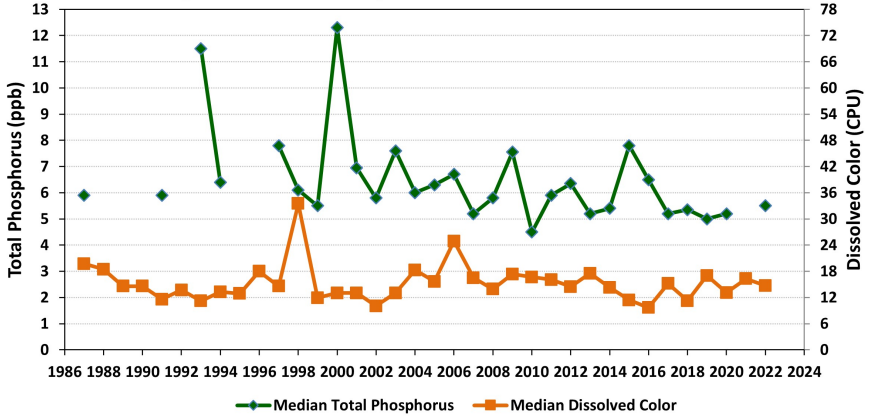

## Figure 4. Lake Wentworth - Site 12 Governors (1987-2022)

### Long-term Secchi Disk Transparency and Chlorophyll *a* Data




## Figure 5. Lake Wentworth - Site 12 Governors (1987-2022)

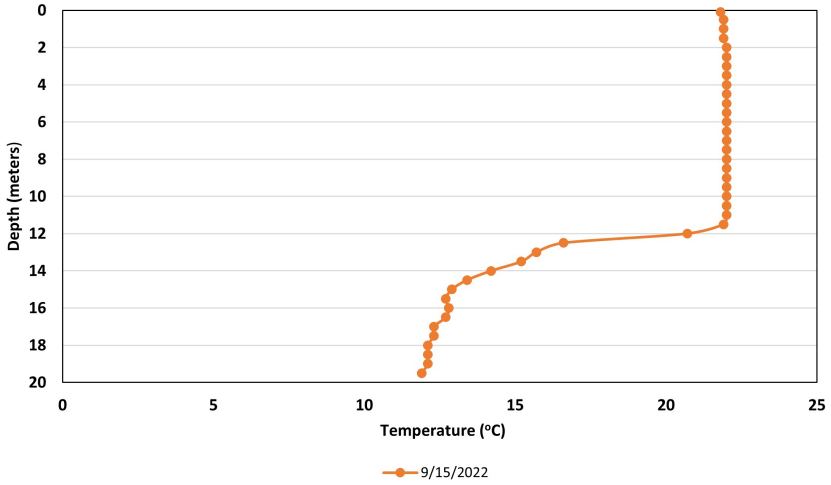
### Long-term Total Phosphorus and Dissolved Color Data



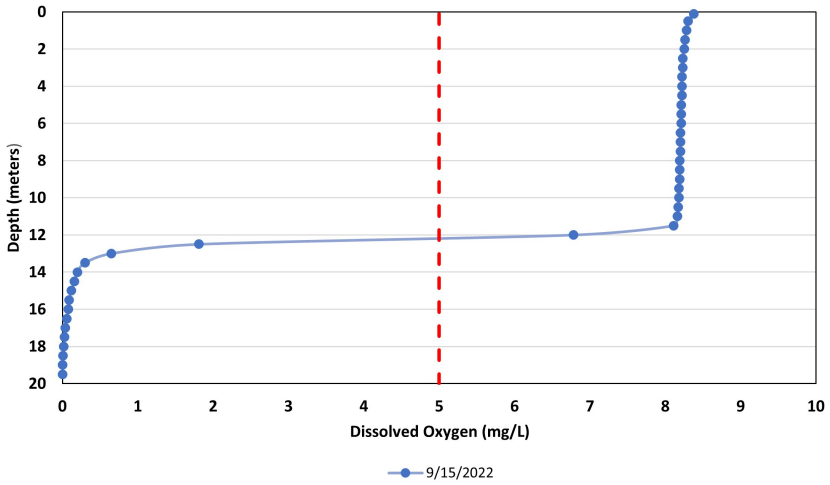

Figures 2 and 3. Seasonal comparison of Lake Wentworth-Site 12 Governors water transparency (Secchi Disk depth), chlorophyll *a* and dissolved color for 2022. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

Figures 4 and 5. Annual median Lake Wentworth – Site 12 Governors water transparency, chlorophyll *a*, dissolved color and total phosphorus concentrations measured through the New Hampshire Lakes Lay Monitoring Program between 1987 and 2022**.** The long-term data provide insight into the water quality fluctuations, among years, that have been documented in Lake Wentworth - Site 12 Governors.

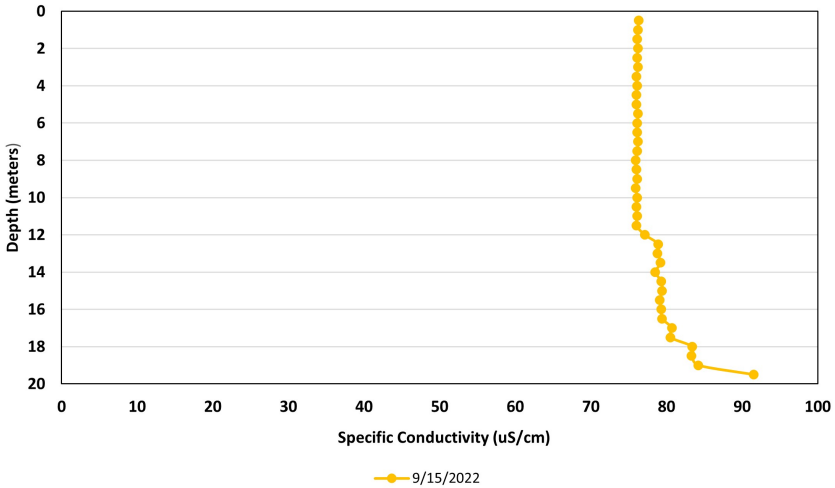
## Figure 6. Lake Wentworth - Site 12 Governors Temperature Profiles (September 15, 2022)




## Figure 7. Lake Wentworth - Site 12 Governors Dissolved Oxygen Profiles (September 15, 2022)

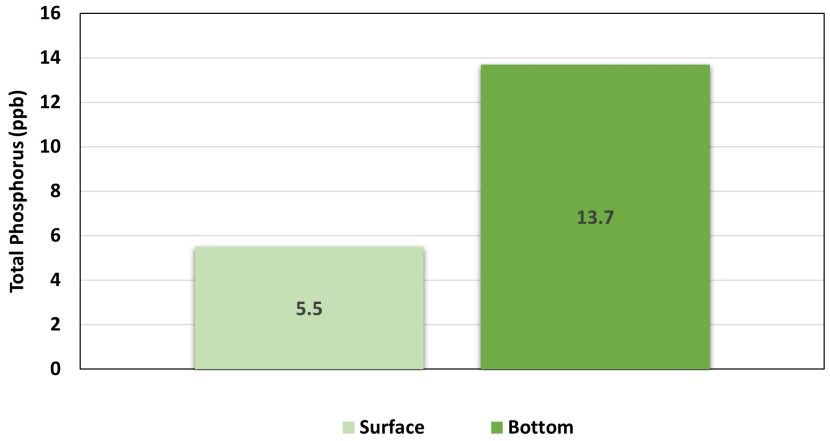



## Figure 8. Lake Wentworth - Site 12 Governors Specific Conductivity Profiles (September 15, 2022)




## Figure 9. Lake Wentworth - Site 12 Governors

### Total Phosphorus inter-comparison ( September 15, 2022)




Figures 6, 7 and 8. Temperature, dissolved oxygen and specific conductivity profiles displaying the water quality differences in 0.5-meter increments. Notice the decreasing dissolved oxygen concentrations, near the lake bottom. The dashed vertical red line in Figure 7 displays the dissolved oxygen threshold for the successful growth and reproduction of cold-water fish such as trout and salmon.

Figure 9. Total phosphorus comparison between the surface (epilimnion) and bottom water (hypolimnion) zones.

**Table 3. Lake Wentworth and Crescent Lake**
**Seasonal Average Water Quality Inter-Site Comparison (2022)**

| Lake/Sampling Station | Average (range) Secchi Disk (meters) | Average (range) Chlorophyll *a* (ppb) | Average (range) Dissolved Color (CPU) | Average (range) Total Phosphorus (ppb) | Average (range) Dissolved Oxygen (ppm) |
|---|---|---|---|---|---|
| Crescent Lake 6 Center | * 5.0 m (range: 4.5 – 5.8) | 2.0 ppb (range: 1.2 – 3.3) | 15.3 CPU (range: 11.9 – 19.8) | 7.9 ppb (range: 5.1 – 12.2) | ------ |
| Lake Wentworth 1 Fullers | 7.0 m (range: 5.9 – 8.1) | 1.5 ppb (range: 1.1 – 2.0) | 12.9 CPU (range: 10.3 – 15.7) | 5.5 ppb (range: 4.1 – 8.3) | 0.9 ppm (range: 0.5 – 1.3) |
| Lake Wentworth 2 Triggs | 7.5 m (range: 6.0 – 8.8) | 2.0 ppb (range: 1.2 – 2.8) | 13.8 CPU (range: 11.0 – 22.5) | 5.9 ppb (range: 5.0 – 7.9) | ------ |
| Lake Wentworth 12 Governors | 7.2 m (range: 6.5 – 8.0) | 1.2 ppb (range: 0.3 – 2.5) | 15.9 CPU (range: 9.9 – 24.3) | ------ | 0.0 ppm (range: 0.0 – 0.1) |

* indicates the Secchi disk was occasionally visible on the lake bottom.

----- indicates a lack of data that are needed to assess total phosphorus or dissolved oxygen conditions.

# Figure 10. Lake Wentworth and Crescent Lake

## Tributary Total Phosphorus Results (April 8 and September 6, 2022)

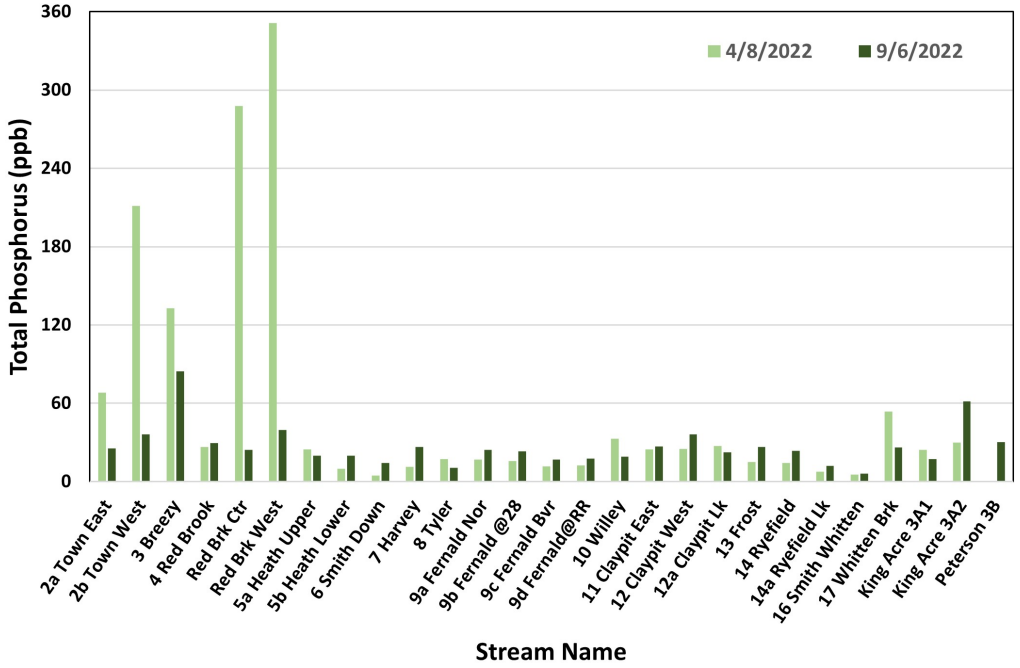



Figure 10. Total Phosphorus intercomparison among the Lake Wentworth and Crescent Lake tributary sampling locations. All samples were collected as part of wet weather sampling events on April 8 and September 6, 2022.

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

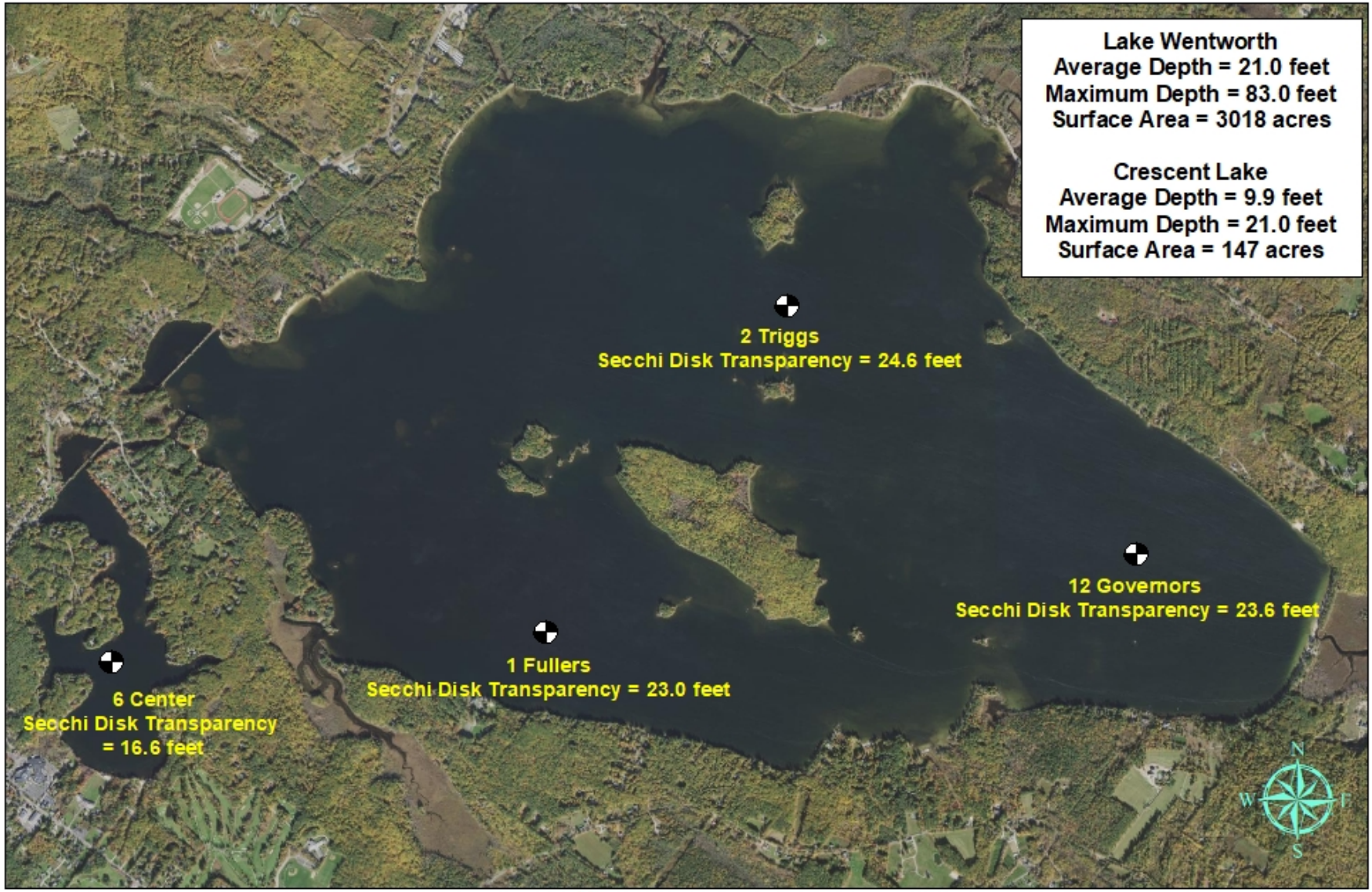
This highlight report provides a general overview of the current and historical conditions of Lake Wentworth. The report is intended to provide a simple assessment of the water quality trends. Should you have additional questions about interpreting your water quality results, we would be happy to discuss 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. Lakes that exhibit internal nutrient loading may also exhibit increasing deep water specific conductivity concentrations (a measure of dissolved materials) through the summer months.

# Figure 11. Lake Wentworth and Crescent Lake

**Wolfeboro, NH**

**2022 Deep water sampling site locations with seasonal average water clarity**




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

NH Extension

# Figure 12. Lake Wentworth and Crescent Lake

## Wolfeboro, NH

## 2022 in-lake and tributary sampling locations


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

NH Extension