

2024 Secchi Day on Beaver Lake - Water Quality Results

For the 19th annual Secchi Day, 34 teams covered 35 sample sites in duplicate throughout Beaver Lake. Sampling teams take Secchi disk readings to determine water clarity and collect water samples which are tested for Chlorophyll-*a*, Total Phosphorus, and Total Nitrogen to determine algal density and nutrient concentration. Secchi depth is inversely related to Chlorophyll-*a* concentration. Therefore, as Chlorophyll-*a* decreases, Secchi depth increases. When it comes to producing drinking water, greater Secchi depths and lesser Chlorophyll-*a* concentrations are best. Below is a summary of results.

- **Secchi Depth:** The maximum depth at which a Secchi disk can be viewed from the surface of the water (Figures 1 and 3 below).
 - Across all sites, the whole-lake average Secchi depth for Beaver Lake was 2.71 meters or 8.9 feet, equaling the 19-year Long Term Average (LTA) of 2.71 meters.
 - The minimum depth was 0.39 meters (1.28 ft) near White River and Richland Creek confluence.
 - The maximum depth was 4.8 meters (15.9 ft) near Beaver Dam.
- **Chlorophyll-*a* (Chl-*a*):** A pigment in algae that is used to measure the density of the algal population of a lake. Chl-*a* is presented in µg/L (micrograms per liter), or parts per billion (Figures 2 and 4 below).
 - Across all sites, the whole-lake average Chl-*a* concentration for Beaver Lake was 7.66 µg/L, slightly greater than the 19-year LTA of 7.6 µg/L.
 - Minimum Chl-*a* concentration was 1.76 µg/L near Starkey Marina.
 - Maximum Chl-*a* concentration was 39.15 µg/L near White River and Richland Creek confluence.
- **Total Phosphorus (TP):** A nutrient that promotes algal growth. Phosphates come from a variety of sources including agricultural and urban runoff, sewage treatment plant effluent, and faulty septic systems. TP is presented in mg/L (milligrams per liter), or parts per million.
 - Across all sites, the whole-lake average TP concentration for Beaver Lake was 0.02 mg/L, greater than the 19-year LTA of 0.016 mg/L.
 - Minimum TP concentration was 0.003 mg/L near Starkey Marina.
 - Maximum TP concentration was 0.081 mg/L near White River and Richland Creek confluence.
- **Total Nitrogen (TN):** A nutrient that promotes algal growth. Nitrogen also comes from a variety of sources including fertilizer runoff, faulty septic systems, municipal wastewater and animal wastes, erosion of natural deposits, as well as atmospheric Nitrogen fixation in water. TN is presented in mg/L (milligrams per liter), or parts per million.
 - Across all sites, the whole-lake average TN concentration for Beaver Lake was 0.207 mg/L, greater than the LTA of 0.303 mg/L.
 - Minimum TN concentration was 0.115 µg/L near Prairie Creek Marina.
 - Maximum TN concentration was 0.664 µg/L near the White River and Richland Creek confluence.
- **Secchi Depth and Chlorophyll-*a* are inversely related.** From the Highway 412 Bridge to the Beaver Dam, Chlorophyll-*a* decreases while Secchi Depth increases with greater water clarity (Figure 5).

Secchi Day 2024

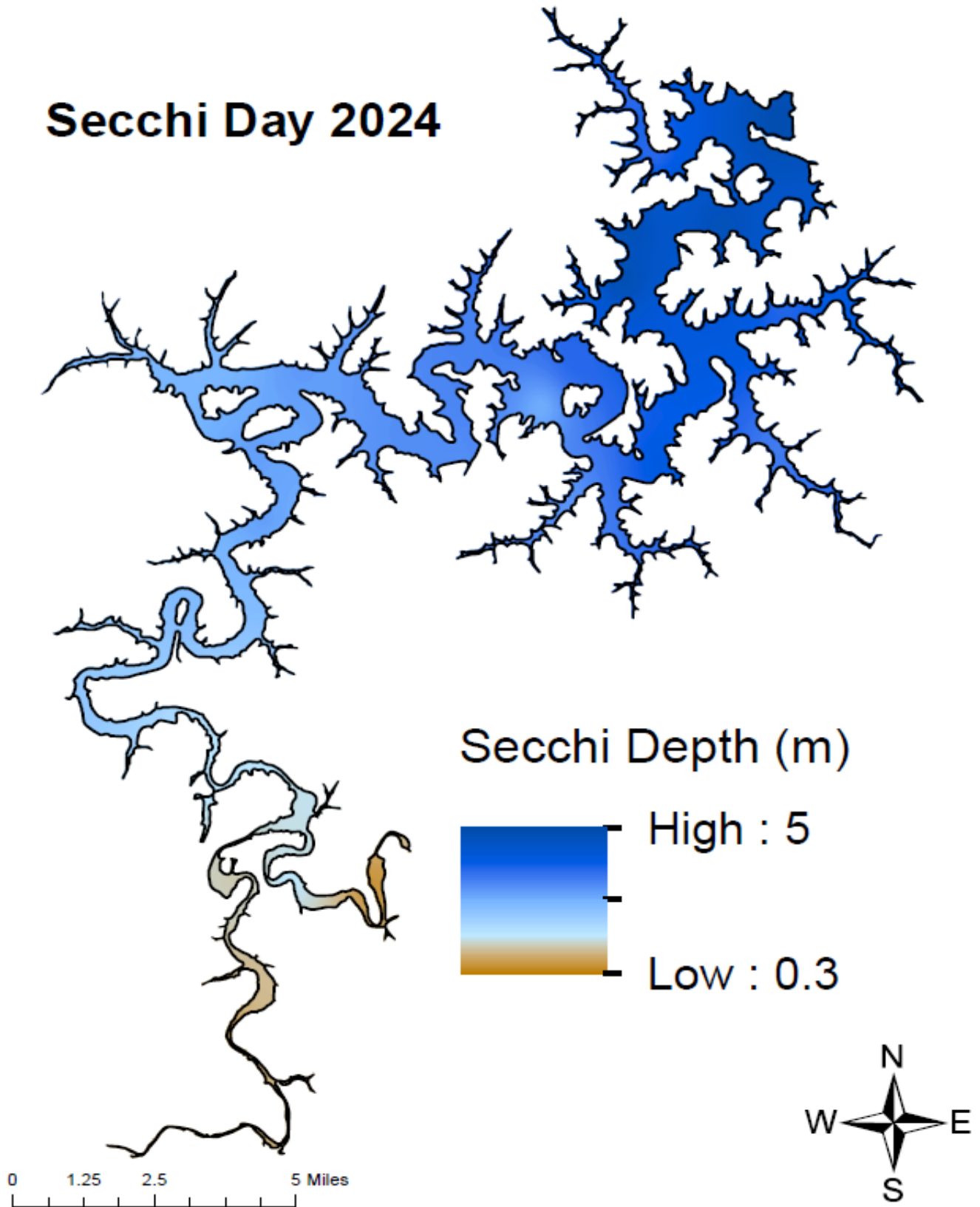


Figure 1: Secchi Depths ranged from 0.3 meters to 4.8 meters.

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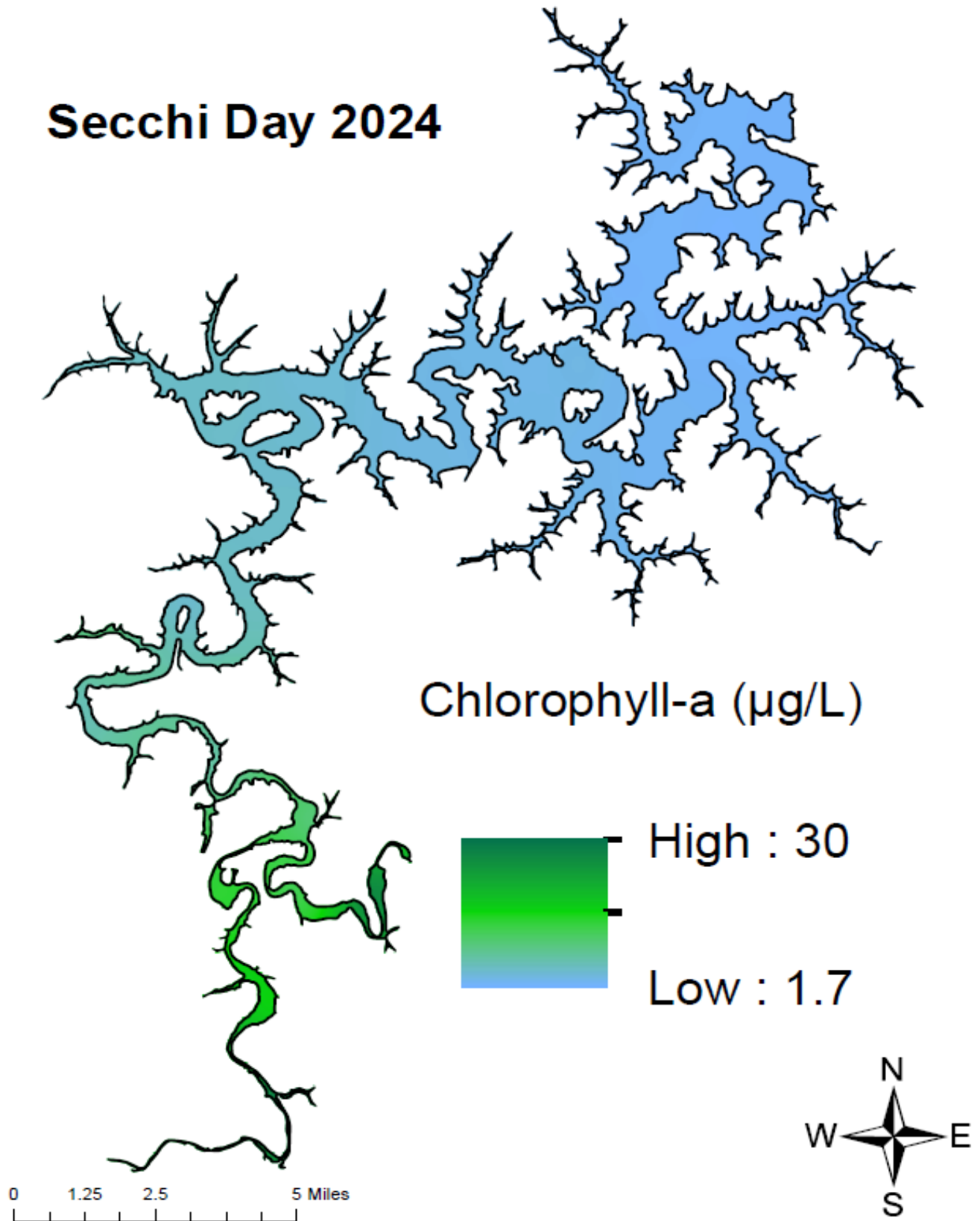


Figure 2: Chlorophyll-a concentrations ranged from 1.76 $\mu\text{g/l}$ to 39.15 $\mu\text{g/L}$.

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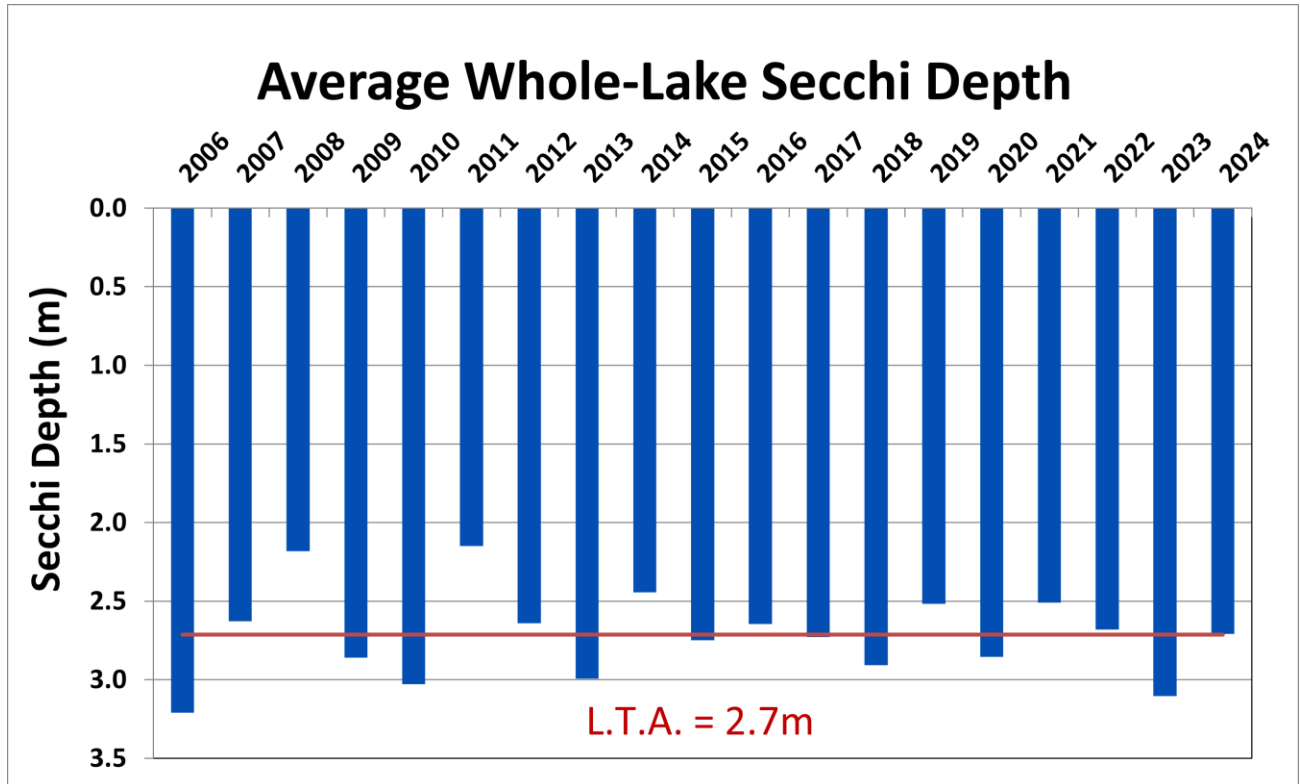


Figure 3: Whole-Lake Secchi Depth average by year. The red line indicates the 19-year LTA of 2.71 m.

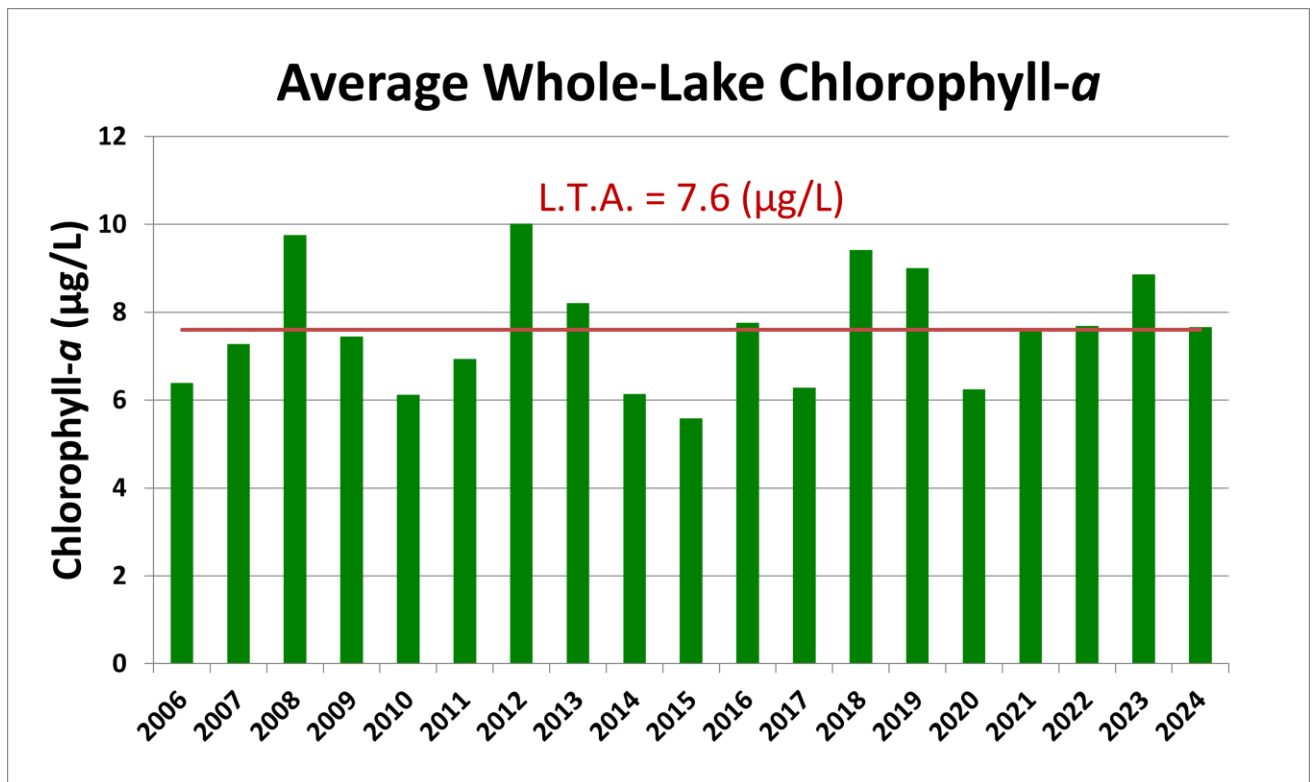


Figure 4: Whole-Lake Chlorophyll-*a* average by year. The red line indicates the 19-year LTA of 7.60 µg/L.

