

## 2023 Secchi Day on Beaver Lake - Water Quality Results

For the 18<sup>th</sup> annual Secchi day, 32 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 in late August is inversely related to the concentration of Chlorophyll-*a*. Therefore, as Chlorophyll-*a* decreases, Secchi depth increases. When it comes to producing drinking water, higher Secchi depths and lower 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.
  - The average Secchi depth for Beaver Lake was 3.10 meters or 10.2 feet.
  - The minimum depth was 0.52 meters (1.7 ft) near White River and Richland Creek confluence.
  - The maximum depth was 8.0 meters (26.2 ft) near Starkey Marina.
  - Average whole-lake Secchi depth for 2023 was 3.10 meters, greater than the 18-year Long Term Average (LTA) of 2.71 meters (8.89 ft).
- **Chlorophyll-*a* (Chl-*a*):** A pigment in algae that is used to measure the density of the algal population of a lake.
  - Average Chl-*a* concentration for Beaver Lake was 8.86 µg/L.
  - Minimum Chl-*a* concentration was 1.54 µg/L near the Beaver Lake dam.
  - Maximum Chl-*a* concentration was 39.24 µg/L near Camp War Eagle.
  - Near surface mean concentration of Chl-*a* in 2023 was 8.86 µg/L, greater than the 18-year LTA of 7.59 µg/L.
- **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.
  - Average TP concentration for Beaver Lake was 17 µg/L.
  - Minimum TP concentration was 0 µg/L near Starkey Marina.
  - Maximum TP concentration was 79 µg/L near Camp War Eagle.
  - Near surface mean concentration of TP in 2023 was 17 µg/L, slightly greater than the 18-year LTA of 16 µg/L.
- **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 N-fixation in water.
  - Average TN concentration for Beaver Lake was 363 µg/L.
  - Minimum TN concentration was 243 µg/L in the Monte Ne Cove.
  - Maximum TN concentration was 504 µg/L near the White River and Richland Creek confluence.
  - Near surface mean concentration of TN in 2023 363 µg/L, was greater than the LTA of 319 µg/L.

# Secchi Day 2023

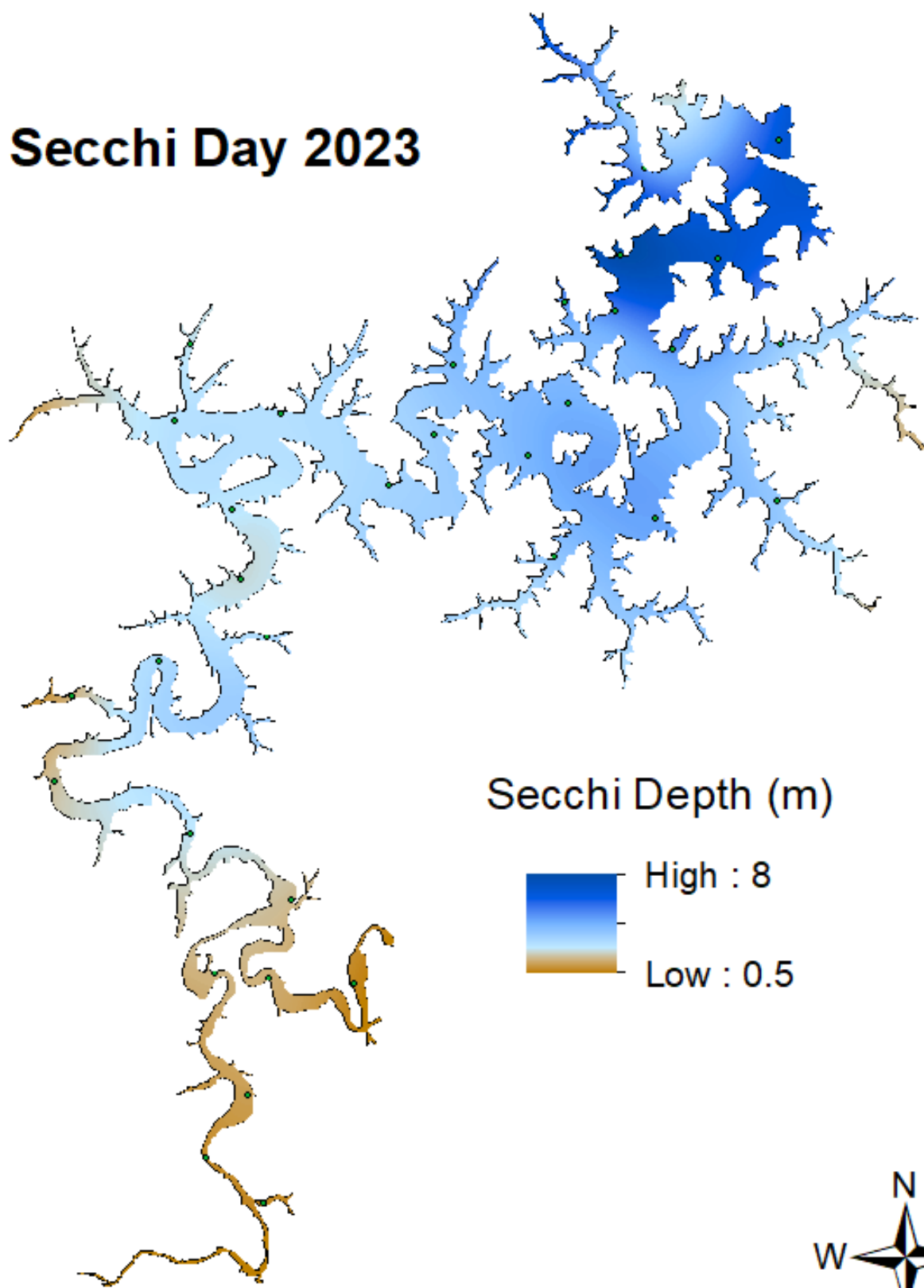


Figure 1: Secchi Depths ranged from 0.5 meters to 8.0 meters.

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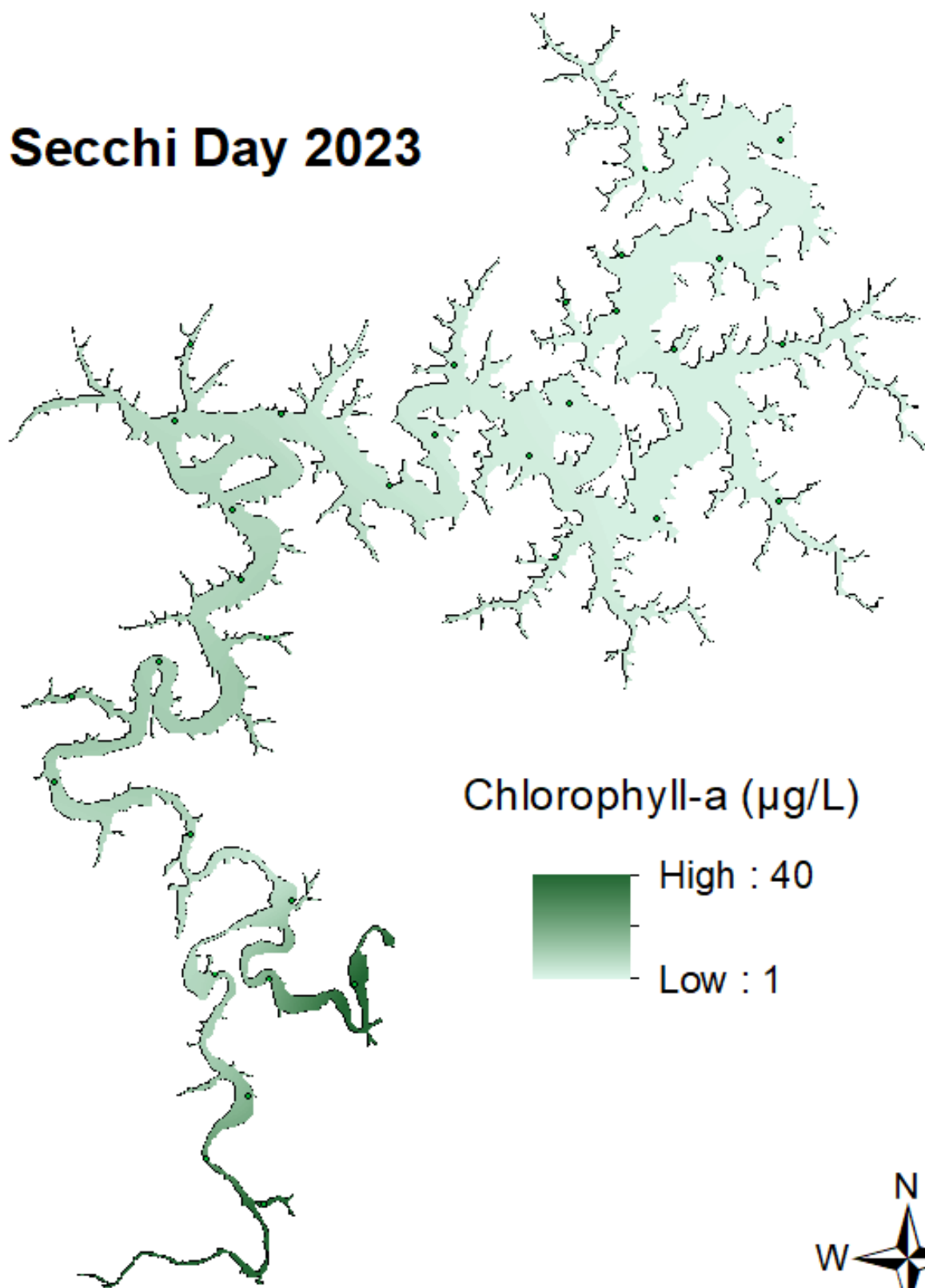


Figure 2: Chlorophyll-a concentrations ranged from 1.5  $\mu\text{g/l}$  to 39.2  $\mu\text{g/L}$ .

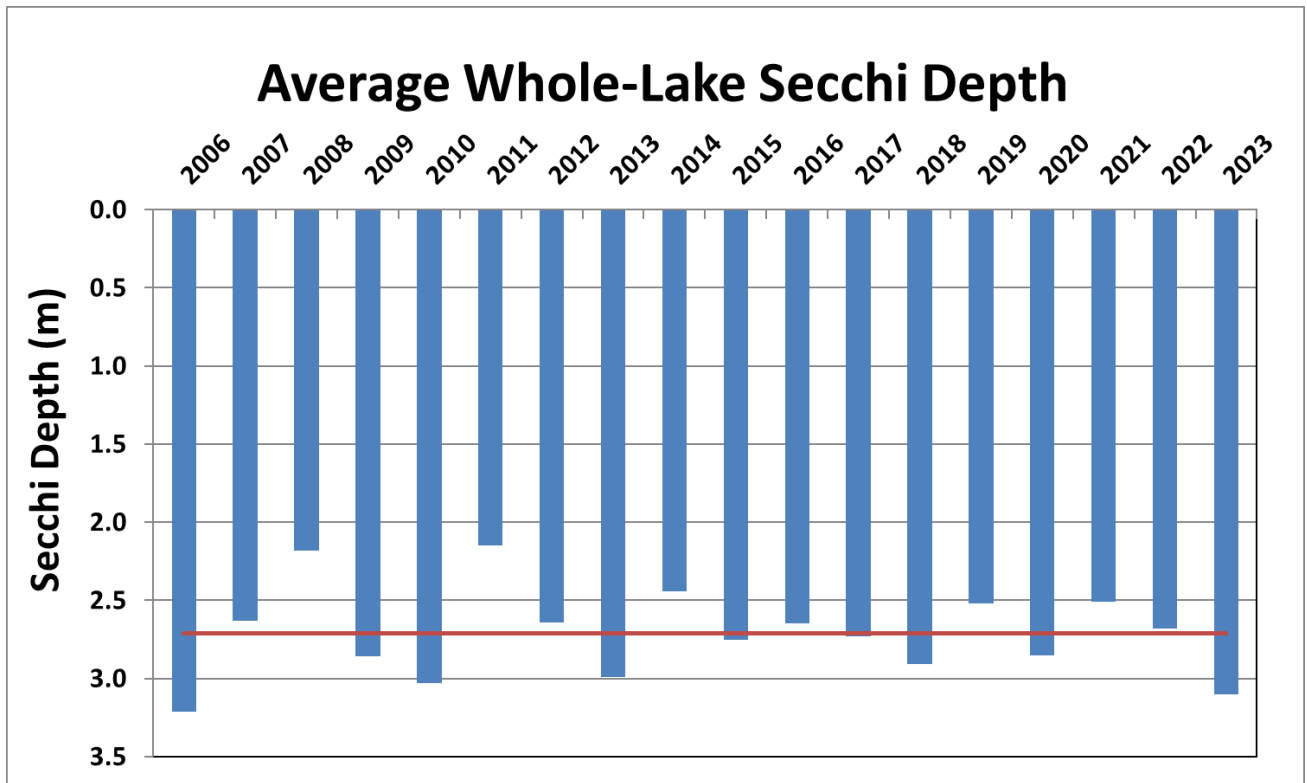


Figure 3: Whole-Lake Secchi Depth average by year. The red line indicates the 18-year LTA of 2.71 m.

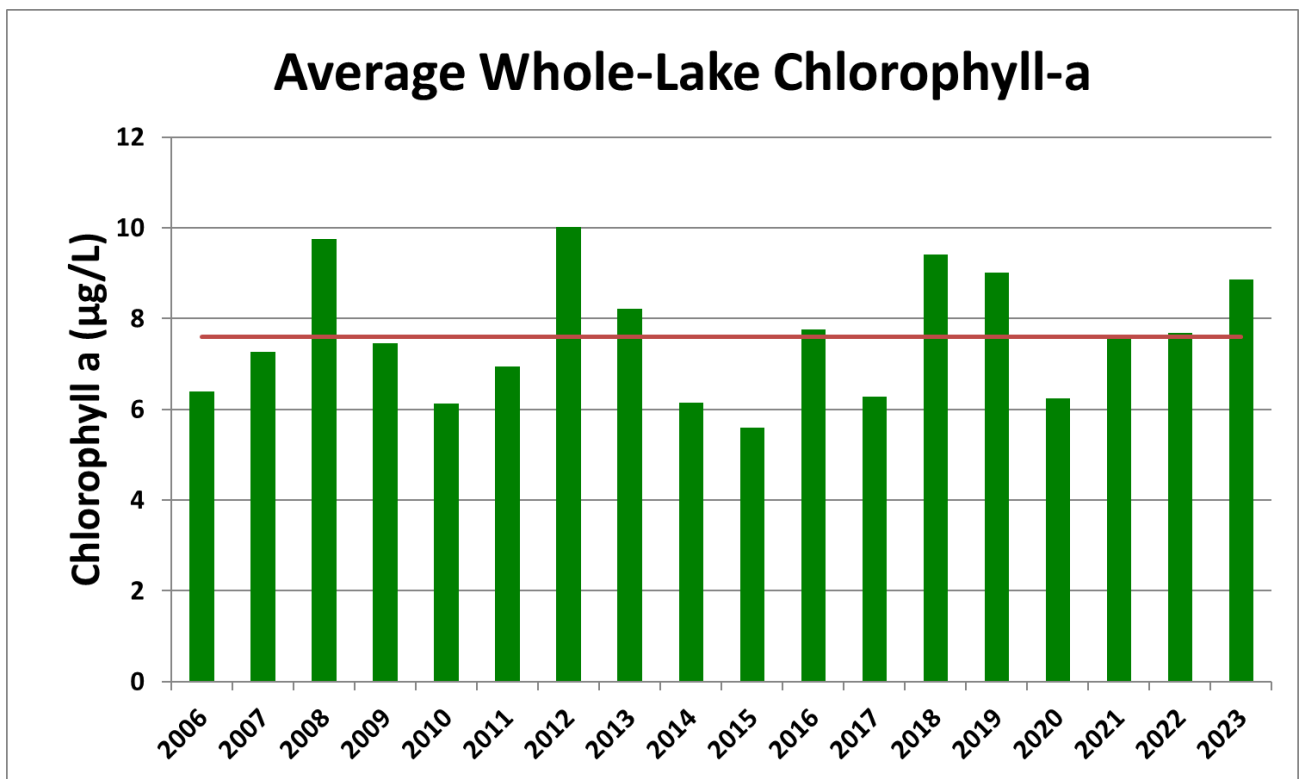


Figure 4: Whole-Lake Chlorophyll-a average by year. The red line indicates the 18-year LTA of 7.60 µg/L.

# 18-year Average Chlorophyll-*a* and Secchi

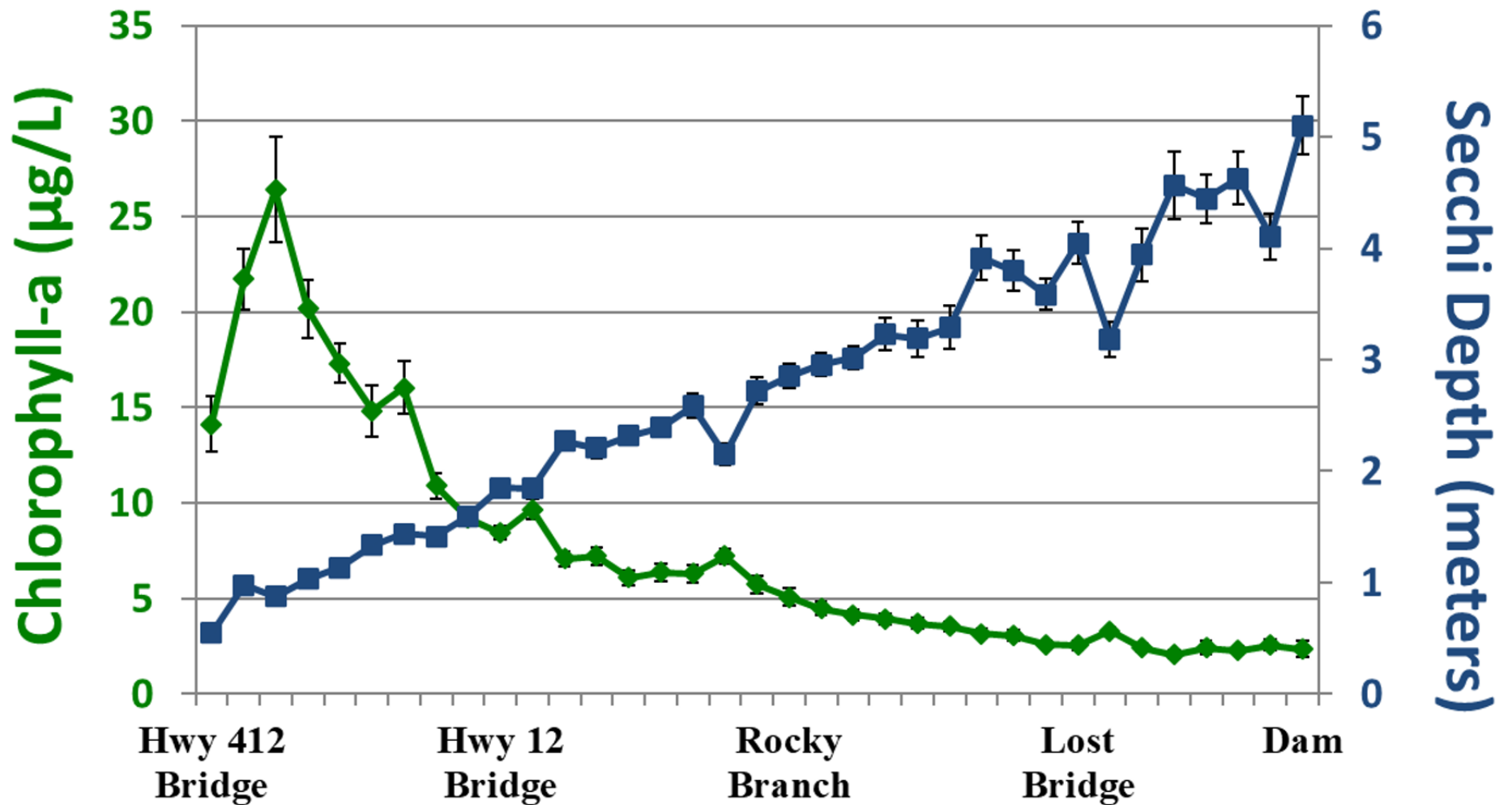


Figure 5: 18-year inverse relationship between Secchi depth and Chlorophyll-*a* concentration.