

White Lake Clarity Treatment Completed Prior to 2021 Water Festival

It didn't take long, it was done quietly, and even better, it was done for free.

White Lake can experience winter algae blooms, as a result of the fertilizing effect of big rains. This February there was a double whammy: two rain events exceeding 3 inches.

The lake has a unique and diverse team of fast responders who can manage the incoming nutrients very quickly, and this management process involves changes in lake clarity: the lake greens up because the algae teams are successfully competing for the nutrients which fuel their growth. When their growth is very rapid, the pH of the lake water can increase: at the height of the bloom in late April, the pH had increased 2+ units.



View from Goldston's Pier, April 26, 2021

The nutrient management done by algae—the bloom—created a virtual smorgasbord for the tiny creatures who like to dine on algae (living or dead). The pulse of nutrients was responded to and very effectively processed by the natural lake life. The improved lake clarity and substantially lower pH that we are seeing now are clear signals that the bloom has run its course.



View from Goldston's Pier May 20, 2021

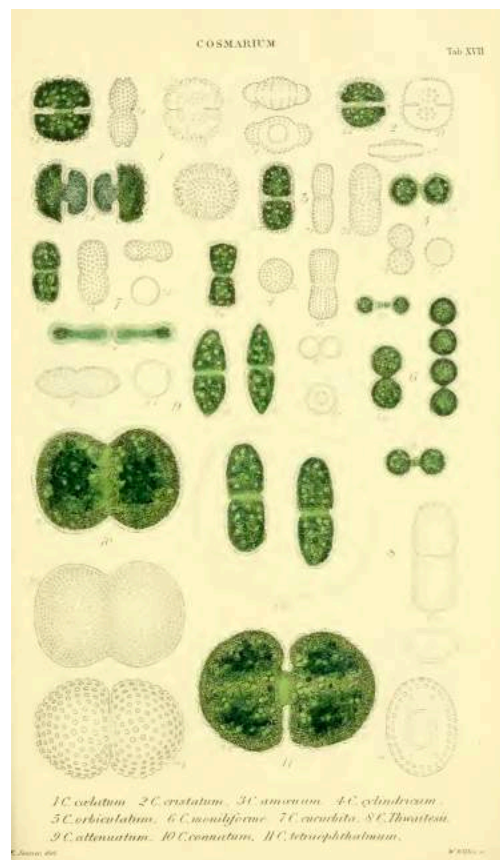


Clear water at sample station May 20, 2021

How does this outcome compare with the alum treatment of May 2018? That bloom was more substantial, and involved a different type of algae, but their growth had similar consequences: a rapid escalation in pH, with afternoon levels well above 9. The treatment mostly acted on phosphorus and the blooming cyanobacteria, and pH levels dropped several units as the treatment progressed. However, measurements of clarity after the treatment were not that much different (although the water looked less green). It was the end of June before the clarity improved significantly. Thus, the natural algae nutrient management that has taken place this year is clearly (pun intended) preferable, with a better outcome.

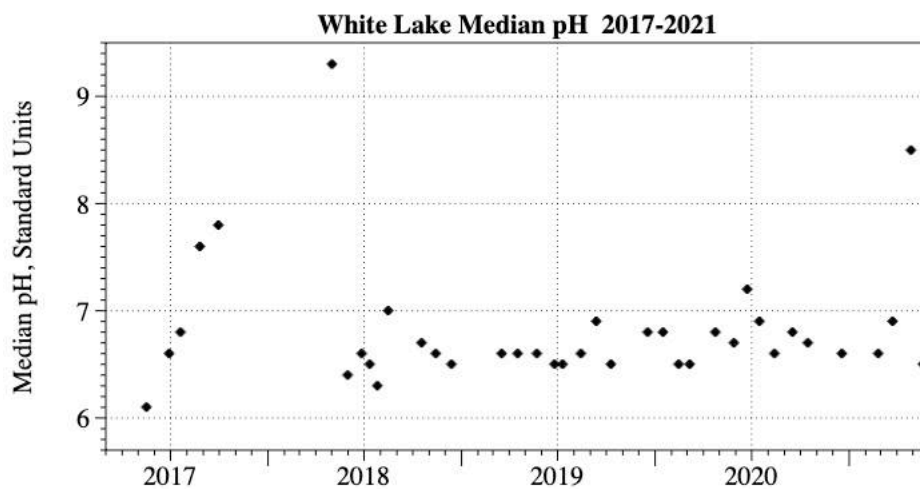
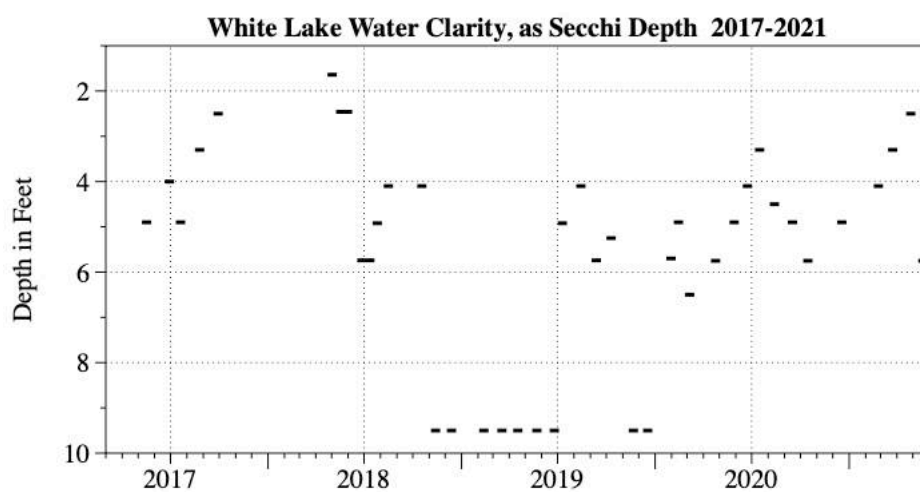
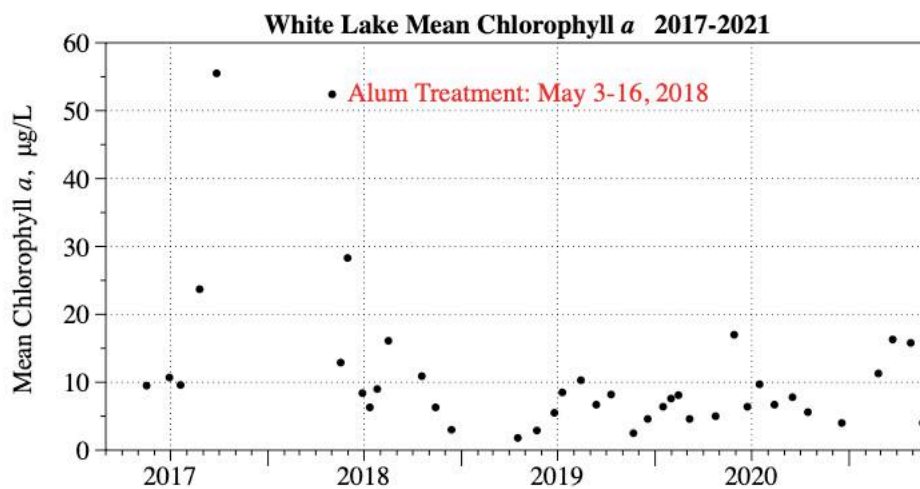
White Lake is a very unique natural system. Understanding the lake chemistry, understanding how it is influenced by changing weather (more big rains), and understanding nutrient-algae dynamics requires detailed study. From these studies, trends can be discerned; in the case of the recent algae bloom, the resemblance to the bloom which occurred in July 2013 (after extreme rainfall in June) was striking.

That bloom subsided relatively quickly, so there was no reason to expect that the same would not happen this year, as the lake ecosystem is now more well-rounded (a large diverse team). The nutrient-managing team leader in both blooms was a very small symmetrical desmid—its efficiency in utilizing nutrients is a consequence of its small size (smaller is better).



Drawings of *Cosmarium*, the nutrient-managing desmid found in White Lake, from an 1848 British publication.

White Lake is a dynamic ecosystem because of its shallowness and relatively small size. Because of the ongoing monitoring efforts, we can discern what changes are natural (=normal) and how the system is managing itself. Human management efforts can and should focus on reducing human-caused impacts to the lake.



White Lake Mean Chlorophyll *a*, Mean Secchi Depth, Median pH Through May 2021

(Dec. 2020 and May 2021 chlorophyll *a* data from Turner handheld fluorometer)

Sampling is done between 10-11 am every month; afternoon pH values on 4/26/21 and 5/20/21 noted beside graph