

Report to White Lake Town Board April 2024

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LIMNOSCIENCES

John Holz, with HAB Aquatic Solutions, made a visit to White Lake six years ago this month (April 18, 2018), to conduct a jar test with lake water to determine the proper dose and alum-to-buffer ratio needed to strip phosphorus and phytoplankton from the water column. Two weeks later, the entire HAB crew arrived, as did all the supplies needed to do the treatment. It was a complex operation to stage and execute, particularly in such a short period of time.

We were working from data collected by NC DEQ in 2017, which showed high nutrient levels and a bloom of filamentous cyanobacteria in September, while a survey of the aquatic vegetation by NCSU personnel that month found the aquatic invasive weed hydrilla in most (85%) of the lake.

This is what the southeastern shore of the lake looked like in October 2017:



This bloom persisted over the winter (the type of bloom and its persistence were unusual), and many ideas (and a few proposals) were offered for what to do. The alum treatment provided a relatively quick means for nutrient reductions, which would negatively influence, and hopefully eliminate, the cyanobacteria.

While the bloom had caused an increase in the pH of the lake water, what we did not realize was that the pH would continue to ratchet up with the jump start in photosynthesis by the

cyanobacteria. The pH that John measured on the morning of May 3, when treatment started, was a full unit higher (which was a 10-fold difference) than what he had measured two weeks previously. Hence the fish kill.

John and his partner returned in February 2019 to sample the muddy sediments for phosphorus levels. This nutrient is often abundant in shallow muddy sediments, and sometimes adding a substance like alum or Phoslock is warranted as a medium-term management option to prevent future cyanobacterial blooms. The sediments of White Lake (and Lake Waccamaw) contain a good deal of naturally occurring aluminum, which binds up with phosphorus, so this option is not warranted. This is not the same as saying that an alum floc from the treatment persists on the lake bottom—there was no evidence of that—and that stirring up the bottom sediments is beneficial for the lake. It has always been understood that boating activity which stirs up the bottom reduces shoreline aesthetics, and that is even more the case with bigger boats with higher displacement that are stirring up mud as well as bottom vegetation.

We did not know enough about the lake prior to the treatment (what had changed and why), and some speculations before and after were off base. However, ***no cyanobacterial bloom has occurred since the treatment, and the presence of hydrilla is very low.***

This is what the eastern shore of the lake looked like on May 23, 2023:



First quarter 2024 rainfall totaled 10.25 inches, which is slightly below the long-term average for the region. The lake level has fluctuated 2.4 inches in each month of the quarter.

