**Report to White Lake Town Board**
**July 2024**
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Water temperatures were as high in June as they typically are in July, and there were a lot of floating blobs around the marina and the northern portion of the lake, likely related to the increased boating activity, as this material—mucus balls with tiny cyanobacterial cells inside—originates at the lake bottom.

When I was at the lake earlier in June, I noticed solitary balls had washed up along the shoreline at Lake Place (they looked yellow instead of green, indicating that they were just hardened mucus, without living cells inside.

Photos of the lakeshore at Lake Place (L) and Nathans Cove (R) on June 6:

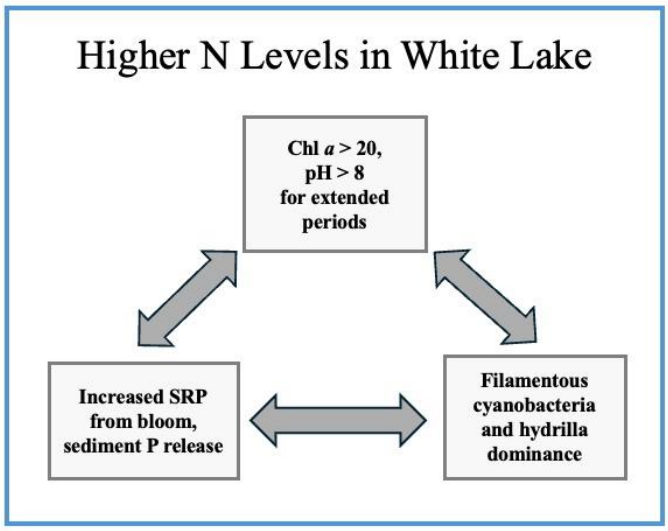
By June 25 the appearance of this shoreline had changed, as more bottom material had accumulated and washed up onto the shore:

A resident of Nathan's Cove recently sent an email to the town asking if this material is harmful to swimmers. Unfortunately, this part of the lake is an accumulation zone for what has gotten stirred up from the lake bottom. The material that has washed up in recent years becomes rubbery, so it can be picked up (as the photo below shows) and the shoreline should be maintained by raking up and removing what is washing up onto the sand. Recall that last summer residents placed a barrier in the water at Nathans Cove to try to keep the swimming area clear, but it did not survive the wave action. It is possible for swimmers to enter the lake from a pier to avoid the material, but it is an ongoing issue at this location during summer months.

I submitted a paper on White Lake to a professional journal, **Lake and Reservoir Management**, in April. It went through a peer review process, and I received notice of acceptance in June. It includes a huge amount of information and data, which addresses why and how the lake has changed, the results of the alum treatment, and additional studies that have been done on the lake. I plan to publish the paper as open access, so that it is readily available, and it will include links to a lot of material (such as reports) that can be accessed online as well.

One of the reviewers suggested I add a figure which shows the pH-cyanobacterial-phosphorus feedback loop which I had described in the text of the paper, which I am including here, with annotations:

More nitrogen means the lake is more productive compared to the past, and there will be times when productivity stays high. This creates conditions that cyanobacteria like, and when a bloom forms, it can become self-perpetuating and potentially worsen, as happened in 2017-18.

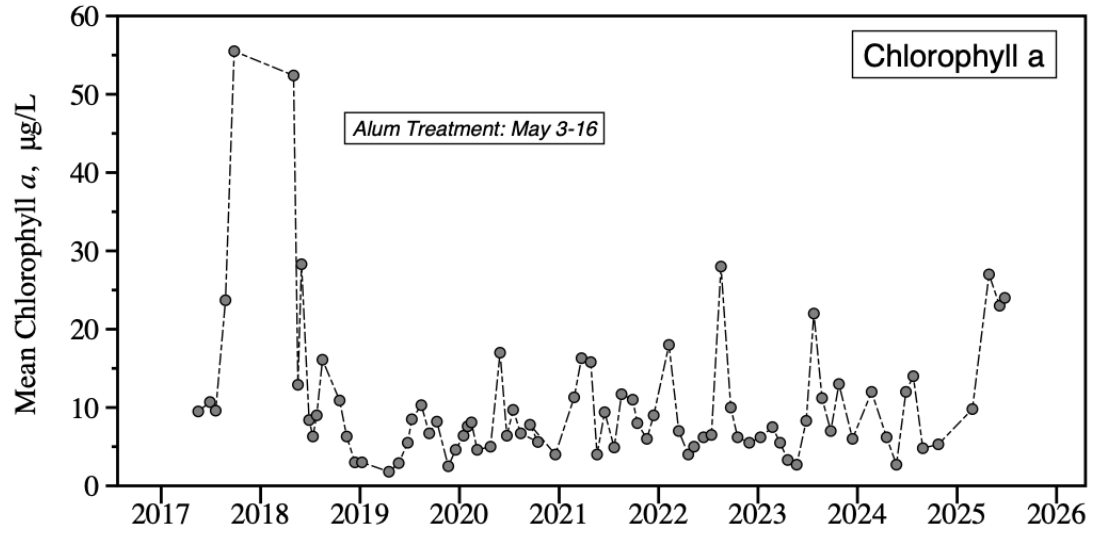


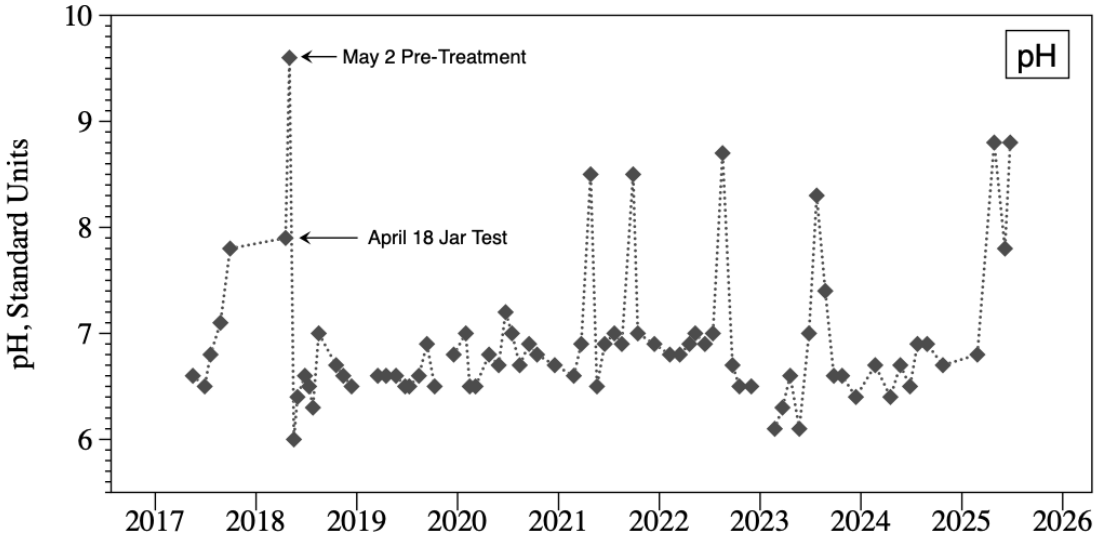

As I reported last month, the nitrate-nitrite (a form of inorganic nitrogen that can be readily utilized by phytoplankton) levels in the lake were relatively high in April, and pH and chlorophyll *a* levels indicated that there was a moderate bloom underway, as the phytoplankton were being fueled by the nitrogen.

I asked the person who identifies phytoplankton to take a quick look at an April sample, and she indicated that it was a species of desmid (healthy algae) that can be abundant in the lake. Algae will stick around if there are nutrients readily available, and this is the first year since 2019 in which there was not a spring drop off/clarity event prior to the summer growing season.

She has just taken a quick look at a June 25 sample and said that there is a lot of the same desmid that she saw in April, diatoms (another type of healthy algae), and more filaments of the cyanobacteria that dominated the bloom in 2017-18. I have not gotten the nutrient results back yet.

It bears repeating that the lake is very dynamic, and can change relatively quickly, but there are differences from one year to the next as well—for example, 2024 was a year with only moderate phytoplankton productivity, as the pH and chlorophyll levels in the graphs below show.




As higher pH and chlorophyll levels are persisting this year, a plan of action can be developed to target a filamentous cyanobacterial bloom, if one develops by the end of the summer. A plan could help with hydrilla management as well, but it would likely have little to no effect on the cyanobacteria encased in the mucus balls.

The soon to be available publication I mentioned earlier can play an integral role in the discussions of management approaches. As I was compiling NC DEQ data to attach to the manuscript, I noticed that their report of 2023 sampling in the Cape Fear Basin (including White Lake and other Bladen County lakes) had been posted online in March 2025 (so a very long lag time in making data available). I was interested in comparing their data with my data from 2023 and noticed that their detection limits for phosphorus and nitrogen were higher than they had been in earlier years (the last time they had sampled was 2018). High detection levels and bad QC are why I stopped using a lab in Wilmington and started using a lab in Seattle—the analyses

are more sensitive (lower detection limits) and I have not seen any QC problems in the 6+ years that I have been using them. That makes a big difference at White Lake, where nutrient levels are relatively low most of the time, and the bottom line is that this data set (2018 to the present) is quite valuable for scientists and lake management professionals—and it will be available to anyone.