White Lake, Bladen County, NC

Lake Monitoring Results 2025

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LIMNOSCIENCES

April 6, 2026

Introduction

White Lake is a valuable natural resource that has undergone changes recently due to human activities. There are, however, several fundamental attributes of White Lake that have not changed over time:

- It is a small and very shallow Bay lake (a lake type described in Frey 1949). The maximum depth is less than 3 meters, with a mean depth of less than 2 meters.
- It is well-mixed, and water temperatures can change quickly. The growing season extends through most of the year.
- Roughly half of the lake bottom is muddy sediments (Frey 1949), with sandy sediments found in the shallow perimeter of the lake.
- It is a rain basin, or seepage lake, as there is no natural surface water inlet to the lake. Rainfall on the lake surface is the primary source of water with groundwater being a secondary source.
- The clarity of the lake water is due to the minimal influence of wetlands (whereas the other Bay lakes are wetlands-influenced, blackwater systems) and to the natural water flow patterns east to west (Frey 1949).

Understanding what has changed (and why) has been a focus of recent study of White Lake. Lake chemistry (pH in particular) and productivity have changed since 2008, with phytoplankton blooms (2013 and 2017-18) and the presence of the invasive aquatic weed hydrilla in most of the lake (in 2017). Special projects that have been conducted in recent years include:

- <u>May 2018 Alum Treatment</u>: The treatment was done to mitigate the 2017-2018 filamentous cyanobacterial bloom, which had caused pH levels to spike rapidly (to 9+, which denotes impaired waters) by the time the treatment was initiated; the extreme conditions resulted in a fish kill, which subsided as the treatment lowered pH to pre-bloom levels.
- <u>NCSU 2019-2020</u>: Propagation of a rare aquatic plant found in the lake, and an assessment of different herbicides effects on the plant (if hydrilla recurrence indicated the need for herbicide treatment).
- <u>Lauritsen et al. 2019</u>: Sediment phosphorus analysis, and comparisons with Lake Waccamaw. Aluminum-bound phosphorus is the dominant fraction with iron-bound phosphorus secondary in the muddy sediments of both lakes.
- <u>Shank and Zamora 2019</u>: Development of a groundwater model, delineation of the groundwatershed, confirmation that rainfall on the lake surface is the primary source water for the lake, and confirmation that the surficial aquifer is the source of the springs.
- <u>Consolvo 2022</u>: A geohydrological assessment of groundwater flow in the area, and confirmation that the semi-confined surficial aquifer is the source of the springs.
- <u>Lumber River Council of Governments 205(j) Grant 2018-2020:</u> Assessment of stormwater outfalls to the lake, rainfall nutrient monitoring, and winter waterfowl counts.
- <u>Lumber River Council of Governments 2022:</u> Lake Management Strategic Plan, Town of White Lake. Included land use strategies and a draft stormwater ordinance to facilitate lake stewardship. This ordinance was not acted upon.

- WithersRavenel 2025: A consultant was engaged in late 2024 to develop a different stormwater ordinance, and they presented their work in late 2025. The proposal includes a stormwater administrator position, and who and how that would work was still under consideration.

The Town of White Lake has also invested $5 million in its wastewater collection system since 2019, rehabilitating or replacing about 25% of this infrastructure.

White Lake water quality monitoring has been conducted for the past eight consecutive years (2018-2025). White Lake annual monitoring reports are available at www.whitelakewatch.com, along with a quality assurance QAPP document. A September 2025 paper in the journal Lake and Reservoir Management summarizes much of the data that has been collected on White Lake in recent years, including from the alum treatment monitoring (Lauritsen 2025).

This 2025 monitoring report focuses primarily on the data collected for the year, including:

- Lake levels, rainfall, and physical-chemical parameters
- White Lake's nutrient levels, including comparisons with nearby Singletary Lake
- The productivity of the lake and its variability over time

The Town of White Lake has provided financial support for special studies and lake monitoring work, while personnel from the Singletary Lake office of NC State Parks have provided logistical assistance. Dr. Linda Ehrlich, with Spirogyra Diversified Environmental Services, has provided detailed taxonomic work on phytoplankton abundance and biovolumes. Aquatic vegetation sampling was conducted in September 2025 by NC State Aquatic Weed Program personnel. Local resident Steve Bunn collected rainfall and lake level information.

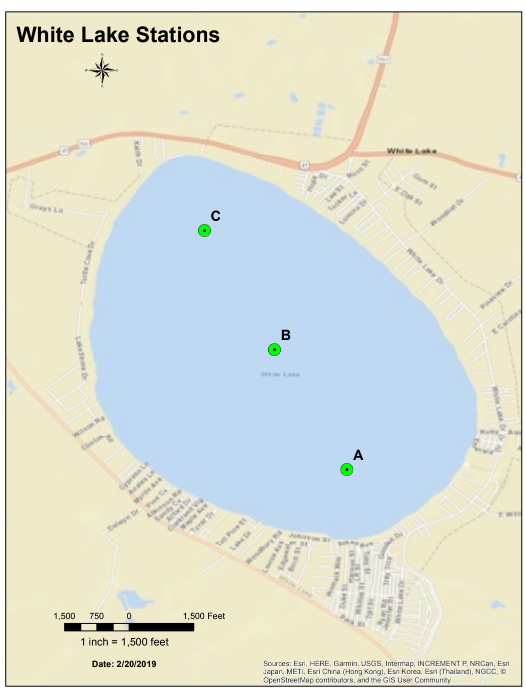


Figure 1. White Lake monitoring stations, which correspond to NCDEQ sample stations.

Results

1. 2025 Rainfall and Lake Level Variability

Monthly rainfall at White Lake was below normal through May and again during the fall of 2025 (Fig. 2). Total rainfall in 2025 was >10 inches below average for the region at 42.8 inches, a volume of water which equates to 56% of the total volume of the lake (Table 1).

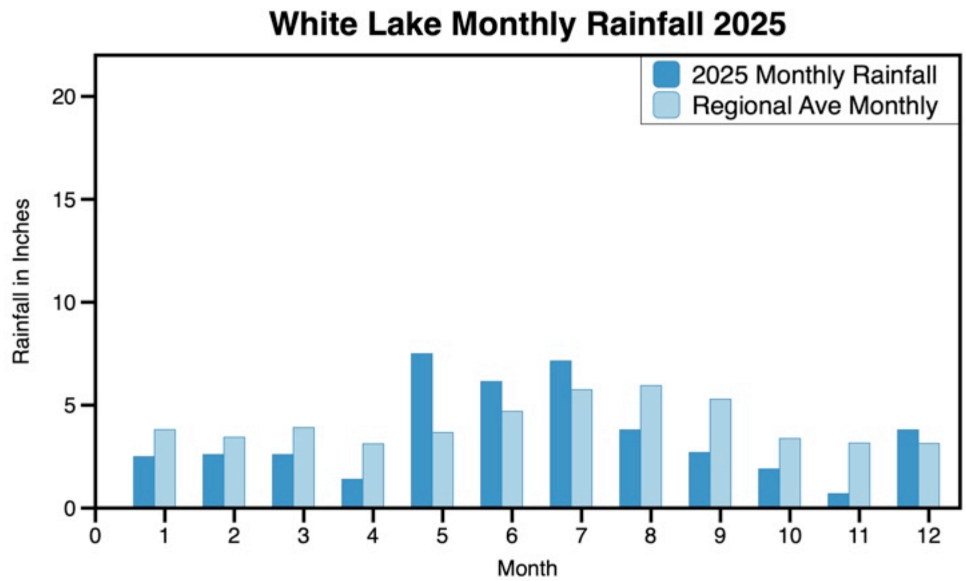


Figure 2. White Lake monthly rainfall, in inches, measured at the Town WWTP for 2025 and 2024, with long-term monthly averages for the region (measured at Elizabethtown, NC).

Table 1. White Lake monthly rainfall, in inches, measured at the Town WWTP from 2012-2025, with long-term monthly averages for the region measured at Elizabethtown, NC.

Monthly Rainfall (inches) for White Lake 2012-2025

Month	2025	2024	2023	2022	2021	2020	2019	2018	2017	2016	2015	2013	2012	Monthly Average for Region
January	2.5	2.75	4.3	5.75	8.25	4.5	2.75	4.20	7.0	3.0	2.5	1.75	2.75	3.81
February	2.6	2.5	3.6	1.0	9.2	6.7	2.25	2.00	1.5	10.7	5.5	2.5	4.0	3.44
March	2.6	5.0	2.5	2.45	2.7	3.7	3.25	3.95	3.7	1.55	4.15	1.0	7.0	3.91
April	1.4	1.75	8.5	3.75	1.75	5.1	7.25	6.75	6.75	6.75	4.55	1.75	2.25	3.12
May	7.5	2.3	1.5	2.2	3.0	12.25	1.20	7.70	2.7	4.5	4.20	2.25	9.25	3.67
June	6.15	1.5	6.3	6.2	7.9	7.15	5.25	10.00	4.5	3.65	8.70	17.0	2.0	4.70
July	7.15	9.5	3.8	10.5	7.5	6.85	6.00	4.75	6.75	3.75	3.0	11.25	8.6	5.75
August	3.8	21.6	7.5	5.5	6.5	7.55	5.35	6.25	5.6	4.12	9.4	8.25	9.75	5.95
September	2.7	15.4	3.05	6.5	3.2	5.95	5.00	29.45	5.2	15.0	4.7	1.0	5.0	5.29
October	1.9	0.0	1.75	0.6	0.6	3.35	3.60	2.25	2.95	14.25	9.75	1.75	2.25	3.38
November	0.7	1.0	3.25	1.55	0.4	7.5	4.90	4.25	1.0	0.50	7.25	0	2.25	3.16
December	3.8	2.3	8.5	1.2	3.4	4.25	6.00	7.5	5.45	5.1	6.5	5.75	4.25	3.14
Total	**42.8**	**65.6**	**54.55**	**47.2**	**54.4**	**74.85**	**52.80**	**89.05**	**53.1**	**72.87**	**70.20**	**54.25**	**59.35**	**49.32**
% of Lake Volume	**56**	**85.9**	**71.4**	**61.8**	**71**	**97**	**69**	**116**	**69**	**95**	**91**	**70**	**77**	**64**

There was a moderate variation in lake elevations in 2025 (10.8 inches) with the lowest level, 63.7 ft NAVD 88 seen in November (Fig. 3). The seven-year (2019-2025) mean high-water level for White Lake was 64.86 feet NAVD 88 (note that the NAVD 88 datum that surveyors presently use is approximately one foot <u>lower</u> than the old NGVD 29 datum [65 ft NAVD 88 = 66 ft NGVD 29]). The total variation in lake levels (high to low) over the five-year period was 22.8 inches which is in line with what has been measured historically.

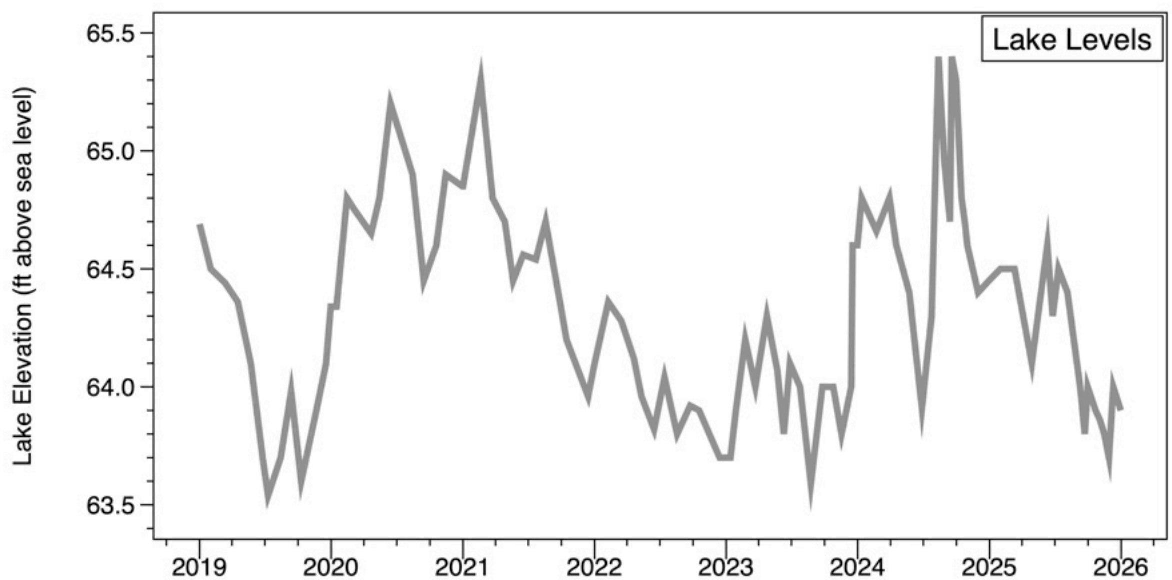


Figure 3. White Lake lake levels for the period 2019-2025 (elevation reported in feet above sea level, NAVD 88 datum).

Annual Lake Elevations, High and Low

2019 High (January 25): 64.6 Ft NAVD 88
2020 High (June 16): 65.2 Ft NAVD 88
2021 High (February 19): 65.3 Ft NAVD 88
2022 High (January 17): 64.3 Ft NAVD 88
2023 High (December 18): 64.6 Ft NAVD 88
2024 High (Aug. 12, Sept. 18): 65.4 Ft NAVD 88
2025 High (June 10): 64.6 Ft NAVD 88

2019 Low (July 9): 63.5 Ft NAVD 88
2020 Low (January 1): 64.3 Ft NAVD 88
2021 Low (November 29): 63.9 Ft NAVD 88
2022 Low (May, Oct-Dec.): 63.7 Ft NAVD 88
2023 Low (August 28): 63.6 Ft NAVD 88
2024 Low (July 5): 63.7 Ft NAVD 88
2025 Low (November 3): 63.7 Ft NAVD 88

2019 Lake Level Variation (High to Low): 12.7 Inches
2020 Lake Level Variation (High to Low): 10.3 Inches
2021 Lake Level Variation (High to Low): 16.8 Inches
2022 Lake Level Variation (High to Low): 7.2 Inches
2023 Lake Level Variation (High to Low): 12.0 Inches
2024 Lake Level Variation Between Jul 5 and Aug 12: 20.4 inches
2025 Lake Level Variation (High to Low): 10.8 Inches

2. Rainfall pH in the Region

Improvements in air quality have resulted in the elimination of acid rain across the continent in recent years, including at White Lake, so that the annual median pH of the rainfall and lake water has increased about 1.5 standard units since the mid 1970s. The National Atmospheric Deposition Program station at Clinton monitors rainfall and posts results to their web site, with a time lag of about a year in the generation of trend plots. In 2024, the median pH of rainfall at the was 5.76 standard units (Fig. 4), with a range from 5.44 to 6.55 (weekly data accessible at the NADP web site using the link below).

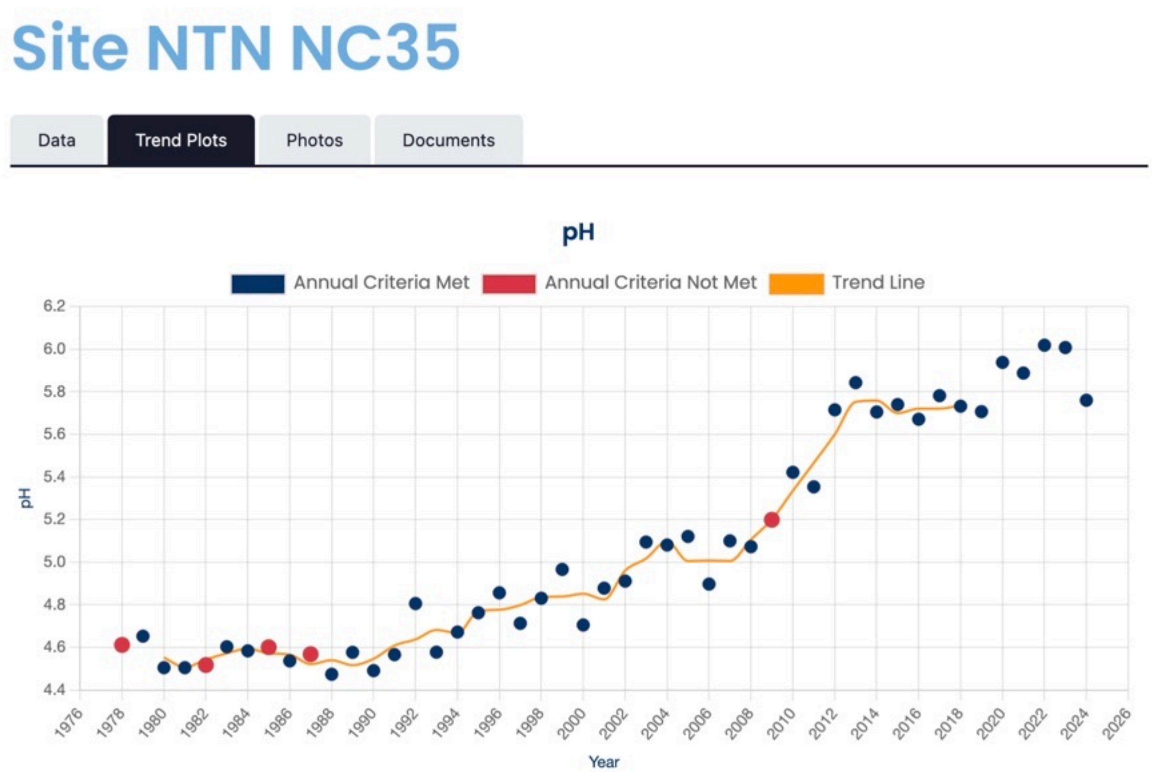


Figure 4. Median annual pH (SU) of rainfall at the Clinton Crops Research Station in Sampson County (NC35). NADP web site, https://nadp.slh.wisc.edu/sites/ntn-NC35/ accessed 12/11/25.

3. Lake Clarity and Turbidity

Lake clarity, as measured by Secchi depth, was highest in February (1.75 m) and lowest (0.8 m) in June (Fig. 5). Turbidity levels were also lowest in Feburary (1.7 NTU) and highest in April and June (3.4 NTU) (Fig. 6).

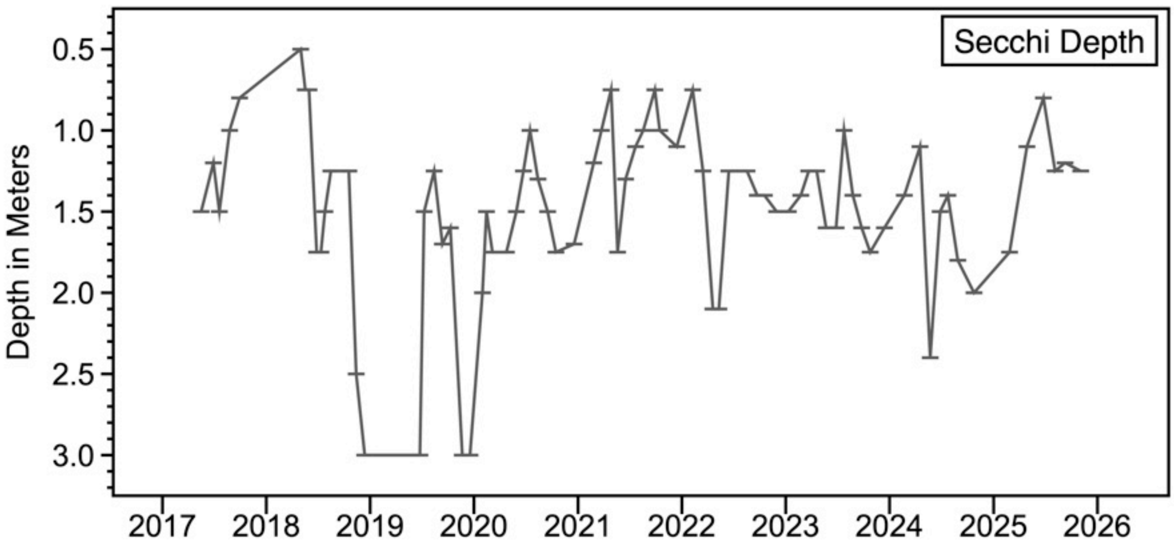


Figure 5. White Lake water clarity (in meters), as measured with a Secchi disk, from 2017 (NC DEQ data) through 2025 (LIMNOSCIENCES data for 2018-2025). Note that the y-axis is inverted, so that the top of the graph is equivalent to the lake surface. As the lake depth varies with lake level, during periods when the Secchi disk was visible on the bottom, it was reported as 3 meters, even though the actual depth was not 3 meters.

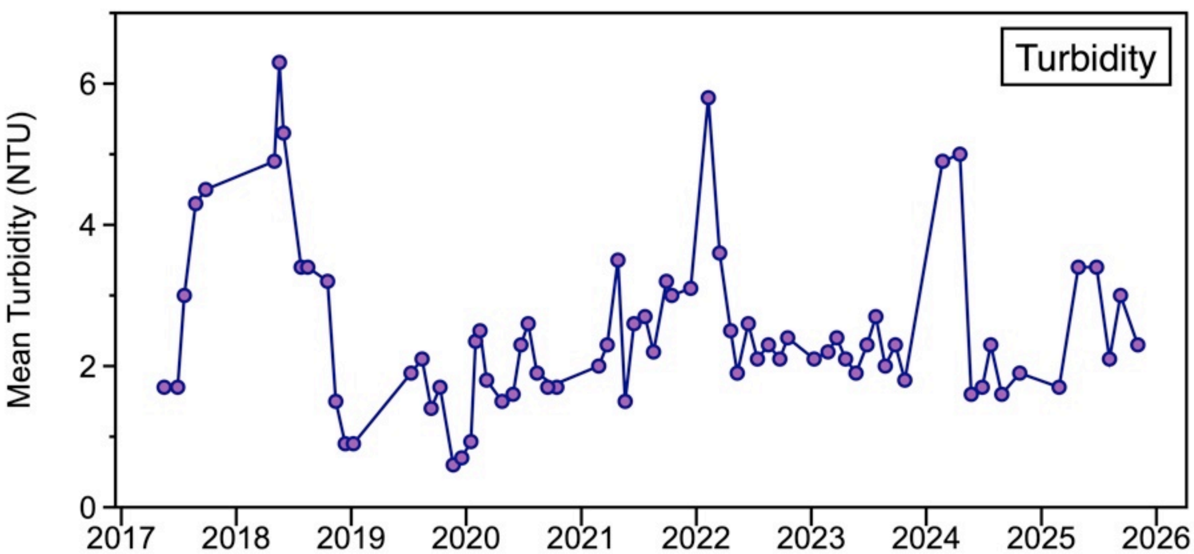


Figure 6. White Lake turbidity (in NTU), from 2017 (NC DEQ data) through 2025 (LIMNOSCIENCES data for 2018-2025).

Nearshore conditions may vary considerably over time, particularly at places along the western shoreline where sediments and vegetation accumulate (Fig. 7). A visitor staying at the condos called town hall on July 3 to report the lakeshore situation there, asking what could be done about it.

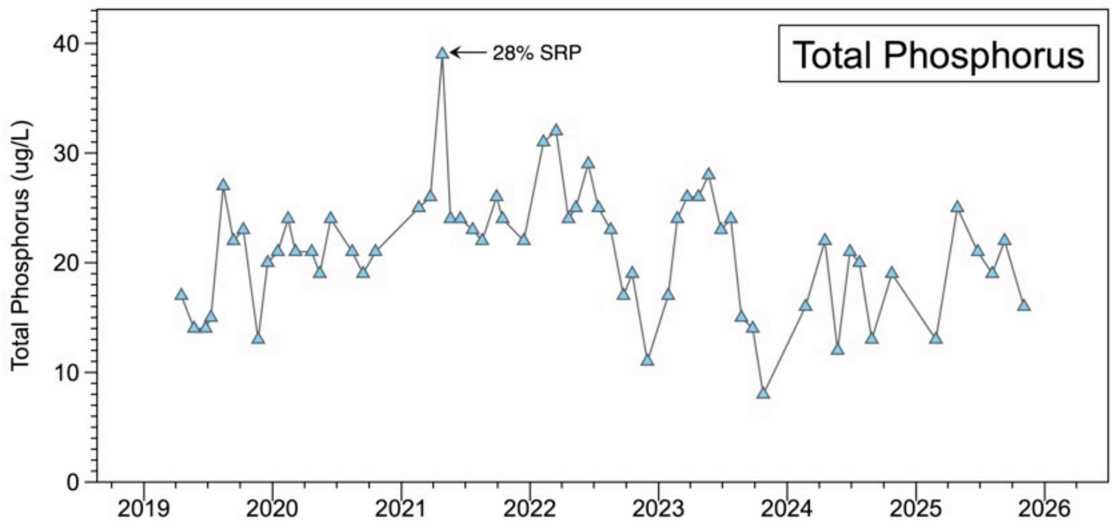
Figure 7. The view from the southwestern shoreline at Lake Place condos (top left photo taken February 26, 2025; top right photo taken August 5, 2025, showing a brown “skin” along the shoreline; bottom photo taken November 3, 2025, when the lake level was at its lowest point, and the rubbery material along the shore had dried out).

4. White Lake Nutrient Levels

Total phosphorus (TP) levels were lowest in February (mean of 13 µg/L) and highest in April (mean of 25 µg/L) (Fig. 8a). Soluble reactive phosphorus (SRP) levels were at or below detection limits (1 µg/L) in June, August, and September, and only slightly higher (mean of 2 µg/L) in February, April, and November (Appendix 1).

Total nitrogen (TN) was also lowest in February (mean of 539 µg/L) but highest in September (mean of 1,130 µg/L; Fig. 8b) with dissolved nitrogen (DN) averaging 66.7% of TN that month (DN mean of 749 µg/L).

a.



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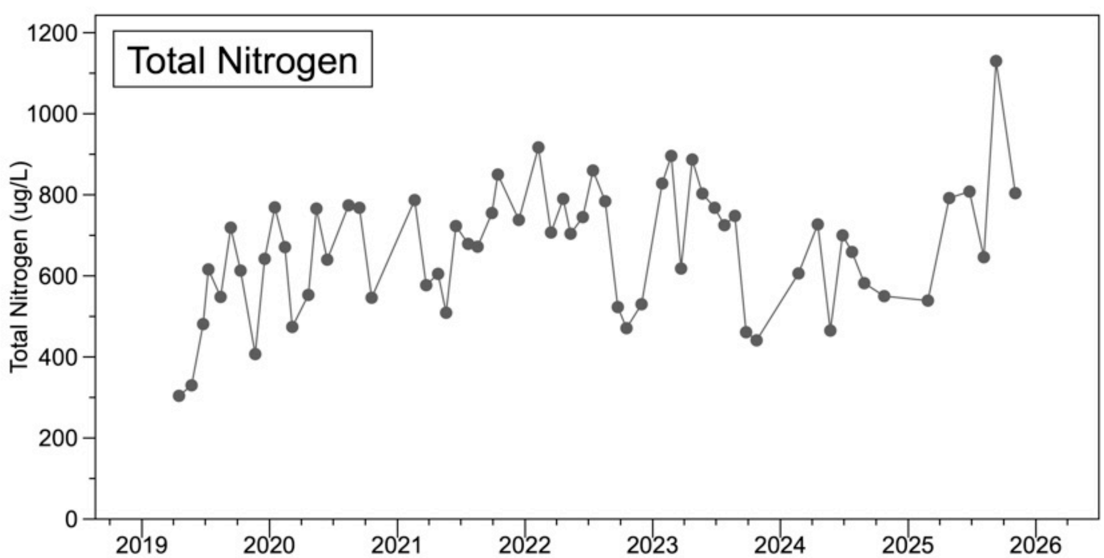


Figure 8. White Lake monthly means for: a) total phosphorus (TP, µg/L), and b) total nitrogen (TN, µg/L), from 2017 (NC DEQ data) through 2024 (LIMNOSCIENCES data for 2018-2024).

Ammonia levels were generally below detection in each sampling month, with the exception being September, at the northern sample station. The highest mean NO_3-NO_2 (62 µg/L, 7.8% of TN) was found in April (Appendix 1). In November, there was a consistent difference in nitrate-nitrite values between the two sample depths at each of the stations: 14, 18, 19 µg/L at 0.5 m; and below detection at 2.0 m depths. There had been a 0.5-inch rainfall event recorded at the WWTP the previous day.

Mean ratios of TN/TP (mass) in 2025 ranged from 31.3 in April, to 51.1 in September (Appendix 1).

Dissolved Organic Carbon (DOC) levels can vary considerably from month to month in White Lake, although much less variability was seen in 2025. The highest mean DOC was measured in April (Fig. 9) and levels remained high through the remaining sample dates. Note that the graphs for TN and TP show units as µg/L, while the graph for DOC shows units as mg/L.

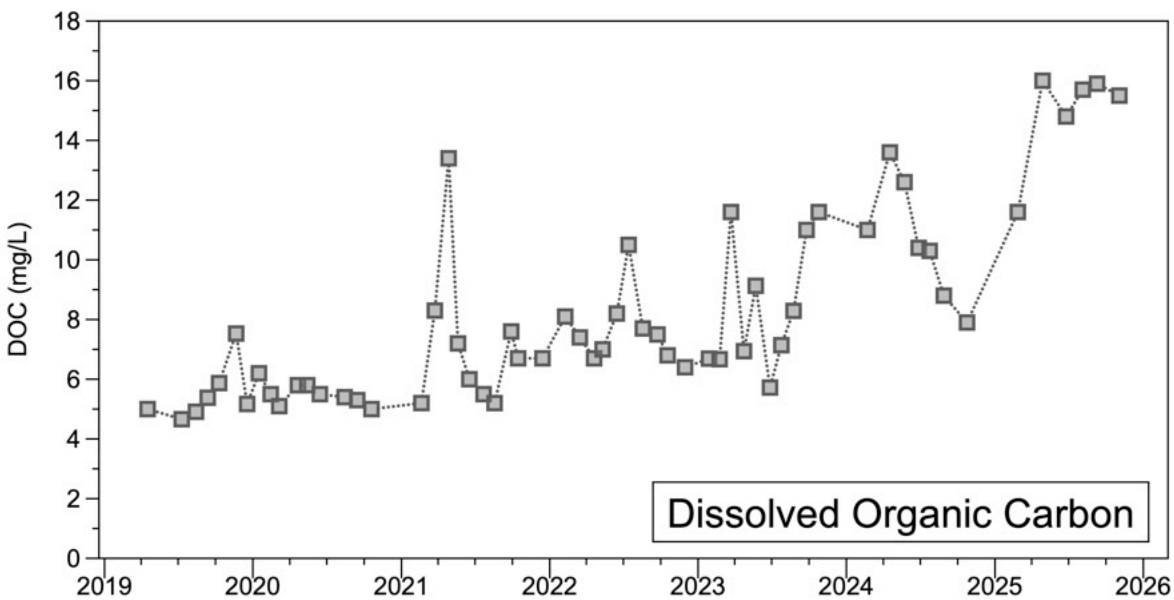


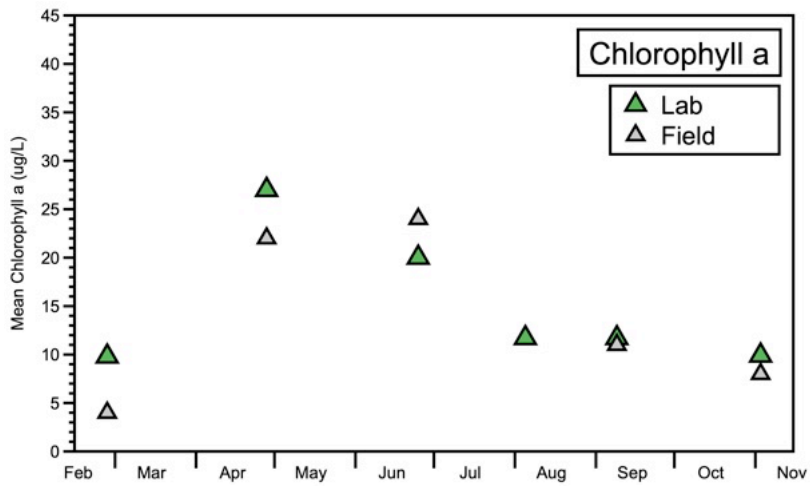
Figure 9. White Lake monthly means for dissolved organic carbon (DOC, mg/L) from 2019 through 2025. Note the difference in scale for DOC (mg/L) compared to TP and TN graphs (µg/L).

5. <u>Chlorophyll *a*, pH and Phytoplankton Biovolumes</u>

Phytoplankton biomass (as measured by chlorophyll *a* levels) were different in 2025 compared to previous years, with mean chlorophyll $a \geq 20$ µg/L from April through June (Fig. 10a). A comparison of chlorophyll *a* data using two methods, 1) laboratory analysis of samples, and 2) field measurements with a handheld Turner fluorometer found generally good agreement between the two, so field measurements can be a reliable method for assessing conditions quickly.

Median pH levels were elevated during the periods when chlorophyll levels were higher, which was another indicator of strong photosynthesis (Fig. 10b). Phytoplankton biovolume was highest in April, when the desmid *Staurodesmus dejectus v. apiculatum* was very abundant (constituting 92% of total biovolume).

a.



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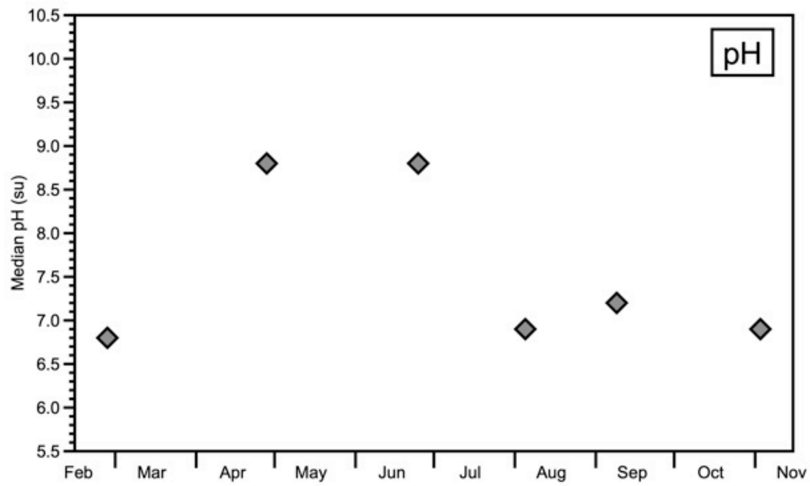

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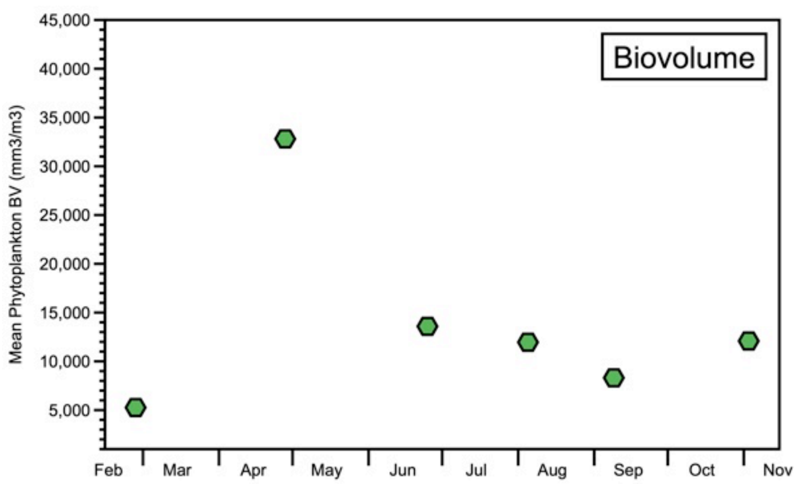
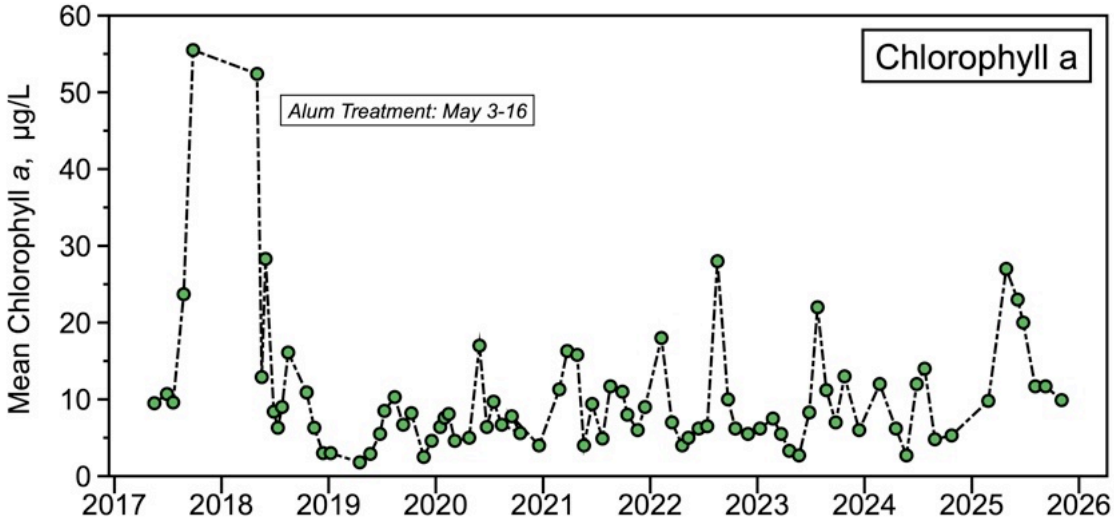


Figure 10. White Lake 2025 data for a) mean chlorophyll *a* (µg/L) (field measurements were taken with a handheld fluorometer); b) median pH (standard units); and c) phytoplankton biovolumes (mm^3/m^3).

Figure 11 shows how chlorophyll and pH data compared over time (2017 data collected by NC DEQ, and 2018-2025 data collected by LIMNOSCIENCES).

a.



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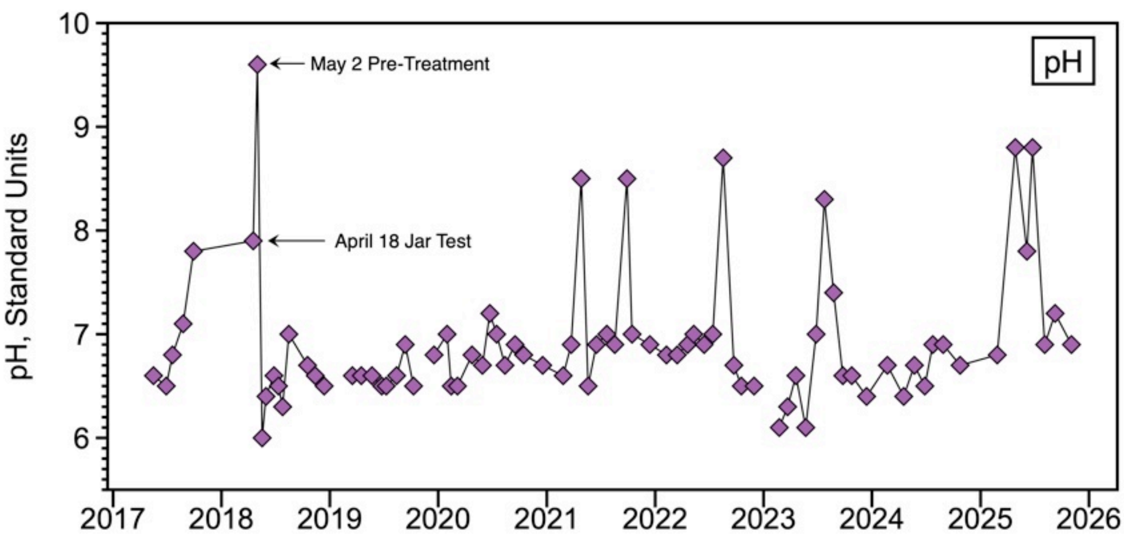

Figure 11. White Lake monitoring data for: a) mean chlorophyll *a* (µg/L), and b) median pH (standard units), from 2017 (NC DEQ data) through 2024 (LIMNOSCIENCES data for 2018-2025).

6. Phytoplankton Biovolume Comparisons

The “greening” of White Lake was first observed by NC DEQ in July 2013, during a 2-month period of high rainfall events. The phytoplankton was listed as “unidentified”, but the DEQ taxonomist who looked at the samples identified it as a desmid that is typically seen in a filamentous form (chains of cells) attached to bottom vegetation (VanderBorgh pers. comm.) rather than free-floating, tiny cells. Hence, July comparisons to that time provide important context for understanding longer-term phytoplankton community dynamics. Since 2017, desmids have generally dominated biovolumes in the month of July, although tiny cells of a filamentous cyanobacteria have often dominated in terms of total number of cells (filaments are composed of chains of individual cells bound by a mucus sheath). Overall, July results from 2025 were very similar to what was seen in 2024 (Table 2).

Table 2. White Lake physio-chemical parameters and phytoplankton densities and biovolumes in the month of July (2013 and 2017 data from NCDEQ, and 2018-2025 data from LIMNOSCIENCES, with phytoplankton identifications by Dr. Linda Ehrlich, Spirogyra Diversified Environmental Services.

	2013	2017	2018	2019	2020	2021	2022	2023	2024	2025
Secchi Depth (m)	1.25	1.5	1.75	1.5	1.0	1.2	1.25	1.0	1.4	1.25
Turbidity (NTU)	4.3	3.0	1.9	1.9	2.6	2.7	2.1	2.7	2.3	2.1
Chl a (µg/L)	28	10	6	9	10	5 (11)	7 (10)	22 (24)	14 (15)	12
Phyto Cells/mL	114,533	241,873	150,643	38,033	169,176	221,699	34,488	105,308	96,332	82,656
Dominant Taxa (#cells/mL)	*Unidentified green* (99%)	*Planktolyngbya* (79%)	*Synechococcus* (52%)	*Synechococcus* (36%) *Staurastrum* (34%)	*Staurodesmus* (43.6%)	*Aphanocapsa* (37%) *Planktolyngbya* (32%)	*Synechococcus* (42%) *Planktolyngbya* (13%)	*Planktolyngbya* (71%) *Staurodesmus* (21%)	*Planktolynbgya* (70%) *Staurastrum* (15%)	*Planktolyngbya* (70%) *Staurodesmus* (8%)
Phyto Biovolume (mm^3/m^3)	28,400	1,967	*18,307*	*12,128*	40,965	8,297	*1,011*	*13,974*	*11,296*	*11,958*
Total Cyano BV (mm^3/m^3)				*36 (0.3%)*	105 (0.3%)	527 (6.3%)	*48 (4.8%)*	*48 (0.3%)*	*99 (0.9%)*	*108 (0.9%)*
Total Desmid BV (mm^3/m^3)				*10,553 (87.1%)*	36,993 (90.3%)	5,253 (63.3%)	*413.6 (40.9%)*	*13,142 (94%)*	*10,211 (90.4%)*	*10,653 (89.1%)*
Dominant Taxa (Biovolume)	*Unidentified green* (99%)	*Gonatozygon* (53%)	*Staurastrum* (79%)	*Staurastrum* (61%)	*Staurodesmus* (82%)	*Cosmarium* (21%) *Staurastrum* (15%)	*Cosmarium* (23%)	*Staurodesmus* (89%)	*Staurastrum* (75%)	*Staurodesmus* (38%)
pH Range (su)	8.0-8.3	6.6-6.8	6.5-6.9	6.5-6.6	6.9-7.0	6.9-7.3	6.9-7.0	8.3-8.5	6.7-6.9	6.8-7.1
Total Nitrogen (µg/L)	410	610	700	616	641	679	860	725	659	646
Total Phosphorus (µg/L)	20	20	20	18	24	23	25	24	20	19

7. At the Lake Bottom

The colonial cyanobacteria *Aphanothece stagnina* is relatively well-known as colonies are visible to the naked eye. Colonies consist of tiny cells embedded in a ball of mucus, which can be very abundant on the bottom of White Lake (Fig. 12a); as they rise to the lake surface they often aggregate into loose clumps (Fig. 12b). The cyanobacterial cells contain polyphosphate granules, which are distinctive phosphorus storage particles (e.g., Sanz-Luque et al. 2020). This cyanobacterium also has the capacity to synthesize fatty acids and other metabolites, making them a nutritious food source for White Lake’s fish community (e.g., Delgado et al. 2025).

This material can be collected by lowering a Van Dorn sampling bottle to the bottom in the deeper benthic zone of White Lake, or by collecting clumps of colonies that are sometimes seen floating on the lake surface. Boating activity which stirs up the lake bottom is stirring up these cyanobacteria balls as well as muddy sediments and rooted aquatic vegetation, which collects along the lakeshore (Fig. 12).

a.

b.

Figure 12. Colonial cyanobacteria identified as *Aphanothece stagnina,* washed ashore at Lake Place in September 2025 (a). Small cells are embedded in a mucilaginous matrix, and these individual colonies are large enough to distinguish with the naked eye. Floating flocs generally appear more frequently in summer months, around the marina boat landing on the northern shore of the lake (b.) (photo taken June 25, 2025).

Aquatic vegetation is often seen in shallow nearshore areas in the month of April; commonly seen submerged aquatic plants include aquatic moss and dwarf milfoil (considered to be critically imperiled and endangered in NC by the Natural Heritage Program).

Figure 13. Aquatic vegetation collected at Lake Place shoreline in April 2025. The handful of vegetation includes two aquatic plants: the top right photo is the dark green aquatic moss (*Fontinalis* sp.); and the bottom photo is the delicate and shallow-rooted dwarf milfoil (*Myriophyllum tenellum*).

Personnel from NC State University's Aquatic Plant Management program conducted an annual whole-lake survey of White Lake on September 17, 2024 (Fig. 14). This survey found sparse amounts of three different aquatic vegetation species (they did not collect aquatic moss in 2025 but as it was seen in the lake in April (Fig. 13) the total number of species was four). No hydrilla has been found since 2021.

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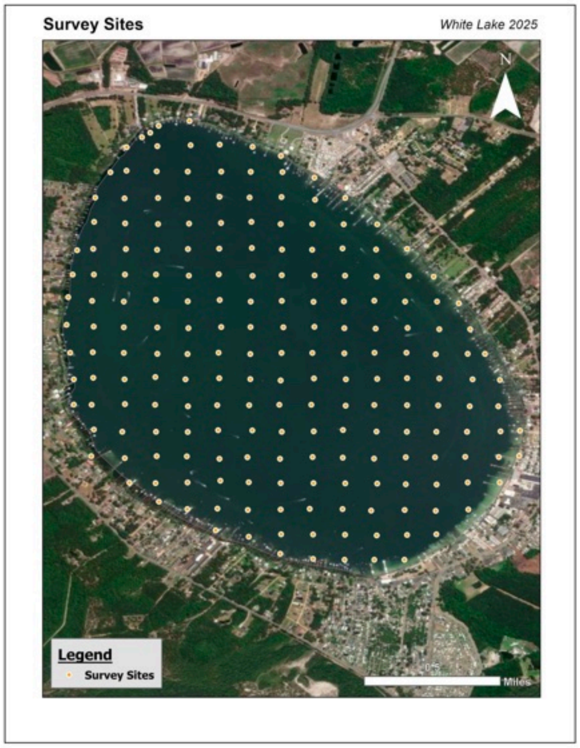

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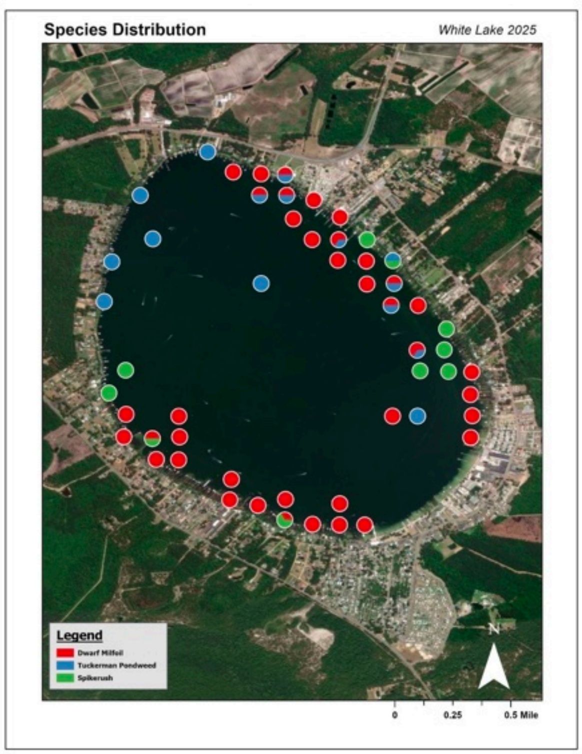

Figure 14. NC State 2025 aquatic vegetation survey of White Lake showing sample sites and the presence of submerged aquatic vegetation collected by rake tosses taken at each site: a) map of 197 survey points for sampling aquatic vegetation; and b) sites where sparse amounts of vegetation were collected (maps from NCSU Aquatic Plant Management 2025 White Lake Vegetation Survey report).

At the time of the survey, the lake elevation was 63.8 feet NAVD 88. The average depth of the lake was 5.75 feet, and the deepest recording was 8.2 feet (NCSU 2025; Fig. 15).

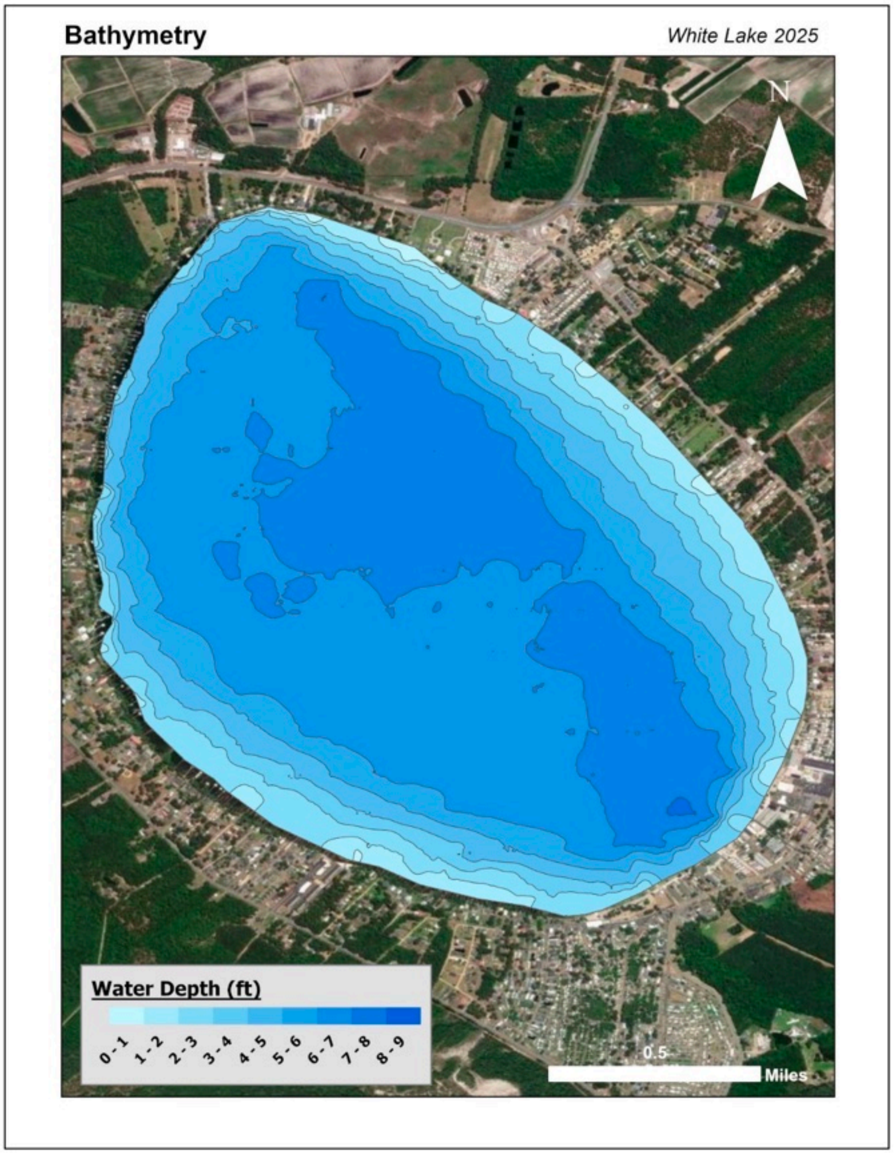

Figure 15. White Lake bathymetric map produced by NCSU personnel using Biobase software and Lowrance depth finder hardware.

8. <u>High Water Temperatures and Fish Kill</u>

A visitor to White Lake Campground called the State Parks office to report dead fish along the shoreline on July 15. A visit to the site on the morning of 7/16/2025 by the Superintendent indicated that the kill was comprised of 100-200 small (4-6”) yellow perch, a species that is at the southernmost extension of its range. Small kills of small yellow perch are relatively common at White Lake in June-July, when water temperatures exceed 30^{o} C.

Summary for 2025

1. Total rainfall in 2025 was more than 10 inches below average, with higher-than-average monthly rainfall only during summer months (May-July). Lake level fluctuation was about 10 inches high to low.

2. Flushing of the lake does not occur in the same way that it does in drainage lakes with significant surface inflow and outflow. Water loss is a result of evaporation and groundwater seepage (Shank and Zamora 2019) as groundwater flows through the lake (which can influence nitrogen dynamics, e.g., Stoliker et al. 2016). The small outlet at Turtle Cove should be maintained as a flood control device (which is why and how it was designed), as it does not serve to either regulate lake levels or facilitate flushing of the lake.

3. Inorganic nitrogen fluxes to the biosphere from agricultural activities have increased five-fold in the past sixty years (Battye et al. 2017). Rainfall is a source of both organic and inorganic nitrogen to the lake (wet deposition), while dry deposition of N can also be high in this region (e.g., Wiegand et al. 2022). Total nitrogen and reduced (bioavailable) nitrogen deposition maps for 2024 show the very high deposition in this region of the state (Appendix 2)

4. White Lake nitrogen levels are substantially higher than historical levels (the same is true in the other Bay lakes as well), and levels can vary considerably from month to month, as was seen with the sizeable peak in September 2025. April levels of bioavailable nitrogen were relatively high, which caused increased photosynthetic activity and high pH.

5. Because phosphorus levels in White Lake are equivalent to historical levels (except during phytoplankton blooms), the N:P ratios in White Lake have changed substantially (this has been seen in many lakes around the world [e.g., Bergström and Jansson 2006, Li et al. 2016]).

6. Natural processes can help regulate nutrient levels. Incorporation of nutrients into the aquatic food web—microscopic to macroscopic life—and chemical transformations such as denitrification (e.g., Qin et al. 2020) influence the availability of water column nutrients.

7. White Lake's phytoplankton community continues to be healthy and quite dynamic, with general trends including the dominance of desmids, which is a group of algae that has been characteristic of the lake. Elevated pH levels were seen in April and June, indicating relatively high productivity (April levels of nitrate-nitrite [= bioavailable] nitrogen were the highest seen over the 8 years of monitoring).

8. Very small cyanobacteria (picoplankton) are often numerically dominant in White Lake, and Canadian researchers have found that picocyanobacteria abundance is much higher in oligotrophic to mesotrophic lakes with lower total phosphorus levels (Lavallée and Pick 2002). These extremely small cells could be contributing to the green appearance of the lake water.

9. Acidic, blackwater Singletary Lake has higher levels of bioavailable phosphorus and nitrogen, and at times has more phytoplankton biovolume than does White Lake. It is a much less diverse system, however (fewer, larger-bodied taxa).

10. Stewardship actions which can improve nearshore conditions include removal of seawalls and first and foremost, responsible boating practices which can reduce the amount of material stirred up from the lake bottom.

11. Bass fishing tournaments attract many fishers, and boat/trailer inspections would help to ensure that invasive weeds such as hydrilla and the filamentous cyanobacteria lyngbya are not re-introduced into the lake. The 2025 aquatic vegetation survey found that the lake is home to natural, beneficial vegetation, with no hydrilla or lyngbya found.

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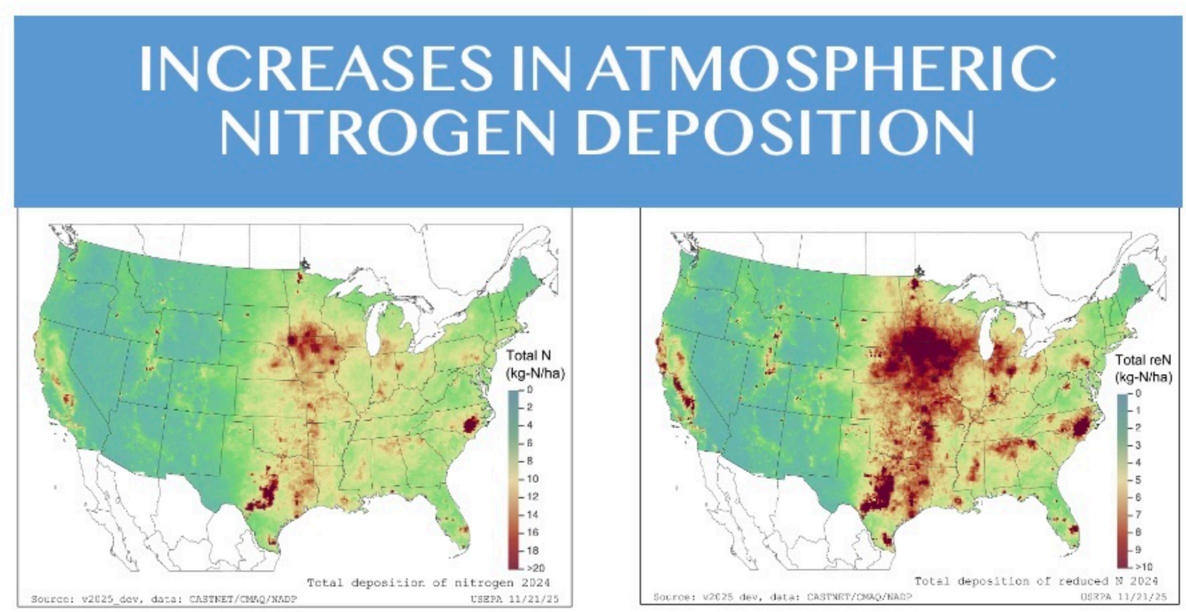
Appendix 1. White Lake Monitoring Data for 2025. Data is reported as monthly means for all parameters except pH, where ranges are given. Temperature, dissolved oxygen, conductivity and pH were measured with a YSI Pro DSS sonde at 0.5 and 2.5 m depths, and field measurements of chlorophyll *a* were made with a Turner handheld fluorometer, with mean data indicated in parenthesis. IEH Analytical Laboratories was used for analysis of nutrients, turbidity, chlorophyll *a,* phaeophytin, and in February, conductivity. Spirogyra Diversified Environmental Services provided identifications and biovolume measurements of phytoplankton samples.

White Lake Monitoring Project 2025

	2/26/2025	4/28/2025	6/25/2025	8/5/2025	9/9/2025	11/3/2025
Mean Temp (C)	10.6	23.4	32.0	27.2	24.5	15.6
Lake Elevation (ft)	64.5	64.1	64.3	64.4	64.0	63.9
Secchi Depth (m)	1.75	1.1	0.75	1.25	1.25	1.25
Mean Turbidity (NTU)	1.7	3.4	3.4	2.1	3.0	2.3
Mean DO (mg/L)	12.3	10.1	9.2	8.9	9.4	10.8
Mean DO % Sat.	110	118	126	111	112	108
Mean Cond. (uS/L)	44.1 (L)	56.2	64.0	58.8	55.3	47.0
Range pH (su)	6.62-6.87	8.39-8.96	8.50-8.87	6.81-7.14	7.14-7.29	6.60-6.97
Mean Chlorophyll a (µg/L)	10 (4)	27 (22)	20 (24)	12	12 (13)	10 (8)
Mean Phaeophytin a (ug/L)	3.3	4.1	3.8	6.2	4.4	1.7
Mean Phytoplankton BV (mm3/m3)	5,261	32,811	13,587	11,958	8,309	12,085
Mean Phytoplankton Density (cells/mL)	18,194	69,232	60,500	82,656	164,941	121,461
Mean TOC (mg/L)				15.9	16.4	15.8
Mean DOC (mg/L)	11.6	16.0	14.8	15.7	15.9	15.5
Mean Total N (mg/L)	539	792	808	646	1130	804
Mean NO3-NO2 (mg/L)	<10	62	13	12	<10	13
Mean Ammonia (mg/L)	<10	<10	<10	<10	11	<10
Mean TDN (mg/L)				398	749	587
Mean Total P (mg/L)	13	25	21	19	22	16
Mean SRP (mg/L)	2	2	<1	<1	1	2
Mean TN : TP (mass)	41.5	31.7	38.5	34	51.4	50.3
# of Samples	3	6	6	6	6	6

Appendix 2. US EPA Clean Air Status and Trends Network (CASTNET) Atmospheric Deposition 2024 maps for total Nitrogen deposition (accessed 3/5/2026):
https://gaftp.epa.gov/CASTNET/tdep/CURRENT_images/n_tw-2024.png
and reduced Nitrogen (=bioavailable, or inorganic):
https://gaftp.epa.gov/CASTNET/tdep/CURRENT_images/nred_tw-2024.png



Total N Deposition 2024   Bioavailable N Deposition 2024