

**Report to Board, Town of White Lake
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More results from the White Lake 2025 annual report, with this month's focus on nutrients. In summary:

- There is often variability from month to month in the levels of nutrients in this shallow lake, with a general tendency for levels to be higher in summer and lower in winter
- Higher phosphorus levels are seen when there is the most phytoplankton, which is often but not always in summer
- Higher phosphorus levels are also seen in the muddy plumes created by wakeboard boats
- Phosphorus levels in the lake have not increased compared to historical levels (50 years ago), except for times when there have been blooms. High phosphorus was the target for the alum treatment in 2018, when levels were about 3 times higher than normal during the filamentous cyanobacterial bloom
- Nitrogen levels HAVE increased compared to historical levels, by a large amount
- Nitrogen levels are often but not always lower in winter
- There was a sharp peak in nitrogen level in late summer last year
- Dissolved organic carbon levels were high for much of the year

From the report:

1. 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. 9a). 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. 9b) with dissolved nitrogen (DN) averaging 66.7% of TN that month (DN mean of 749 µg/L).

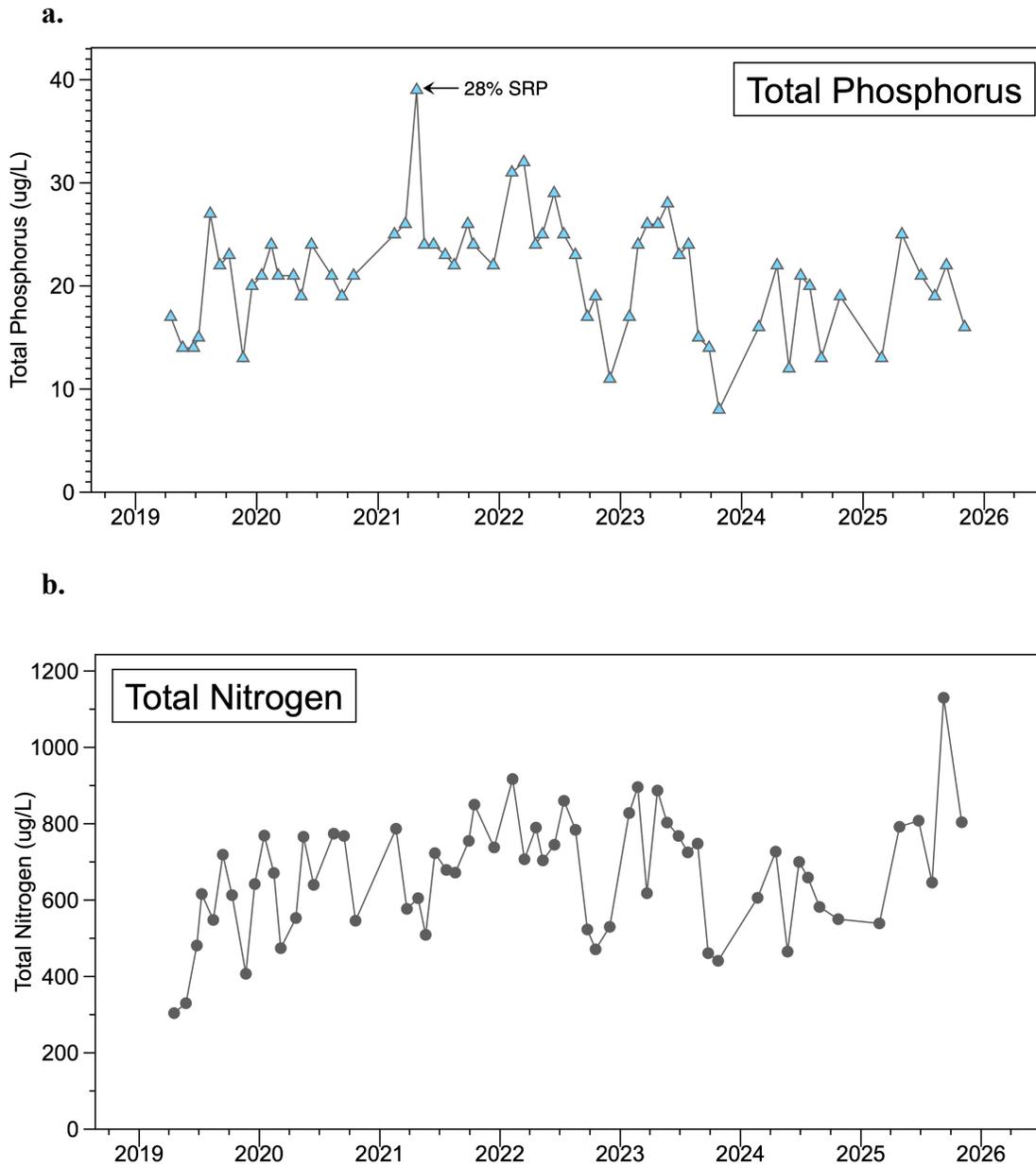


Figure 9. White Lake monthly means for: a) total phosphorus (TP, µg/L), and b) total nitrogen (TN, µg/L), from 2017 (NC DEQ data) through 2024 (LIMNOSCIENCES data for 2018-2024).

Ammonia levels were generally below detection in each sampling month, with the exception being September, at the northern sample station. The highest mean $\text{NO}_3\text{-NO}_2$ (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. 10) and levels remained high through the remaining sample dates. Note that the graphs for TN and TP show units as $\mu\text{g/L}$, while the graph for DOC shows units as mg/L .

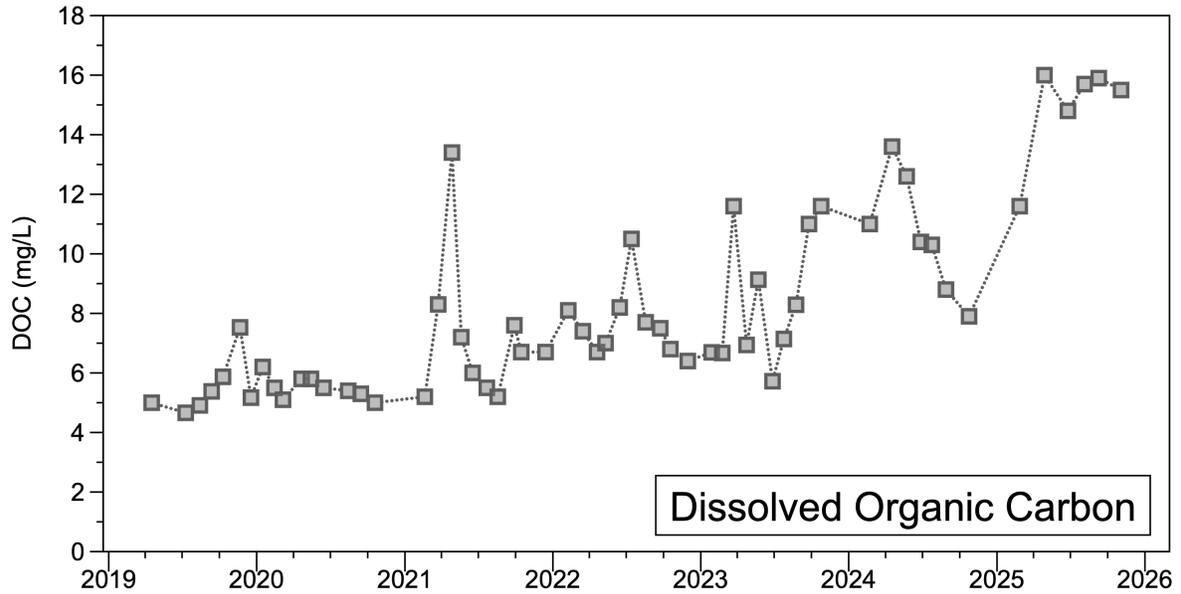


Figure 10. White Lake monthly means for dissolved organic carbon (DOC, mg/L) from 2019 through 2025. Note the difference in scale for DOC (mg/L) compared to TP and TN graphs ($\mu\text{g/L}$).