

2025 Lakes Monitoring Annual Report

Lake Tom John

Lake Tom John, a private community lake, is located north of the Killearn Estates Subdivision off Velda Dairy Road, within the City of Tallahassee corporate limits.

- Lake Tom John Physiographic Province: Red Hills
- Publicly Accessible: No
- Surface Area: 40 acres
- Drainage Basin: 937 acres
- Maximum Depth: 10 feet
- Average Depth: 6 feet
- Drainage Basin: Lake Lafayette
- Trophic Classification: [Eutrophic](#)
- [Fish Consumption Advisories](#): Yes, Mercury (Largemouth Bass)
- Lake Type: Clear-Acidic
- Water Quality Conditions: Marginal
- Water Quality Impairments: Chlorophyll-*a*, Total Nitrogen (TN), Total Phosphorus (TP)
- Biological Health: Undetermined/Healthy



Evaluation of Lake Health

Healthy lake systems often exhibit well-balanced populations of flora and fauna. While some level of disturbance can be tolerated, excessive human activities may result in lake degradation. Human stressors such as increased inputs of nutrients, sediments and pesticides from watershed runoff, undesirable removal of native shoreline and upland buffer vegetation, and introduction of nuisance (generally exotic) plants and animals all contribute to degradation of our water resources. The Florida Department of Environmental Protection (FLDEP) has developed methods to evaluate if anthropogenic activities have resulted in conditions where a particular waterbody has exceeded water quality criteria, (Chapter 62-302, Florida Administrative Code), including whether adverse impacts to biological communities have occurred. The most common criteria used by FLDEP to determine lake health is called "Numeric Nutrient Criteria". FLDEP water quality standards are designed to protect the designated uses of waters of the state (*e.g.*, recreation, aquatic life support). This criterion will show exceedances of these standards that may impede the designated use of a particular waterbody. The Numeric Nutrient Criterion evaluates Chlorophyll-*a*, Total Nitrogen and Total Phosphorus. Chlorophyll-*a* is a measure of algal biomass in a water column and is generally found in higher concentrations as a response to increased levels of nitrogen and/or phosphorus. In clear, low alkalinity lakes (a lake where color is ≤ 40 PCU and the alkalinity is ≤ 20 mg/L CaCO_3), a healthy system is expected to have < 6 $\mu\text{g/L}$ of chlorophyll-*a*. In colored (> 40 PCU) lakes or clear, high alkalinity (> 20 mg/L CaCO_3) lakes,

healthy systems are expected to have < 20 $\mu\text{g/L}$ of chlorophyll-*a*. Chlorophyll-*a* values greater than those referenced may result in unwanted shading of aquatic plants and/or greater potential for harmful algal blooms. **Table 1** below represents the FLDEP Numeric Nutrient Criteria for Florida lakes.

Table 1. Florida Numeric Nutrient Criteria

Long Term Geometric Mean Lake Color and Alkalinity	Annual Geometric Mean Chlorophyll <i>a</i>	Minimum calculated numeric interpretation		Maximum calculated numeric interpretation	
		Annual Geometric Mean Total Phosphorus	Annual Geometric Mean Total Nitrogen	Annual Geometric Mean Total Phosphorus	Annual Geometric Mean Total Nitrogen
> 40 Platinum Cobalt Units	20 $\mu\text{g/L}$	0.05 mg/L	1.27 mg/L	0.16 mg/L ¹	2.23 mg/L
≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO_3	20 $\mu\text{g/L}$	0.03 mg/L	1.05 mg/L	0.09 mg/L	1.91 mg/L
≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO_3	6 $\mu\text{g/L}$	0.01 mg/L	0.51 mg/L	0.03 mg/L	0.93 mg/L

From a biological perspective on lake health, the Lake Vegetation Index (LVI) is utilized as the primary bioassessment tool. This rapid field assessment method was developed by FLDEP to assess the subject lake's plant community.

For the LVI, the lake is divided into twelve sections, with four of these sections chosen at random to be evaluated. The evaluation typically occurs during the summer months of the year when vegetation is actively growing. Criteria documented are "percent native species", "percent invasive exotic species", "percent sensitive species", and the "coefficient of conservatism" (C of C; a measure of how tolerant a species is to disturbance) of the dominant species. According to DEP SOP LT 7000, the LVI score ranges and categories are: (78-100) Exceptional; (43-77) Healthy; and (0-42) Impaired. DEP's revised impairment threshold score of 43 and higher fully meet the expectation of a healthy, well-balanced community, and scores below 42 are considered

impaired. The LVI was sampled per DEP SOP FS7310 and calculated per DEP SOP LT7000.

Lake Tom John maintains a consistent permanent pool of water, which is conducive to water quality and biological monitoring activities. Water quality monitoring for this lake began in 2019 with an LVI assessment yet to be performed. The following tables and charts provide water quality (annual geometric means) results covering the time-period of 2019-2024. **Figure 1** shows the water quality monitoring location within Lake Tom John.

Figure 1. Water Quality Monitoring Locations



Table 2. Water Quality Annual Geomeans

Yearly Geomeans of FLDEP Nutrient Criterion Parameters					
Lake Tom John					
Year	Chlorophyll*	Color	Alkalinity	TN*	TP*
2019	2	6	20	0.40	0.009
2020	9	16	25	0.64	0.019
2021	9	11	20	0.59	0.033
2022	6	10	20	0.60	0.024
2023	7	8	17	0.62	0.039
2024	9	14	19	0.76	0.038

Chart 1. Color

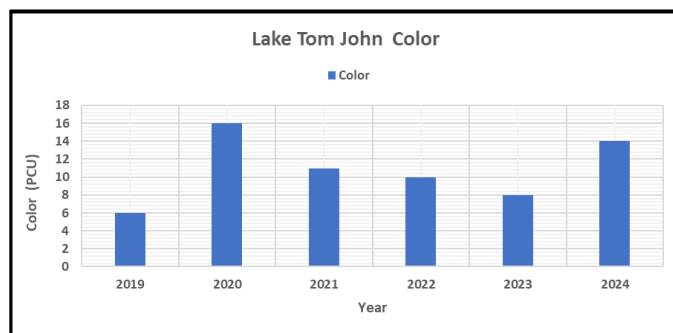


Chart 2. Alkalinity

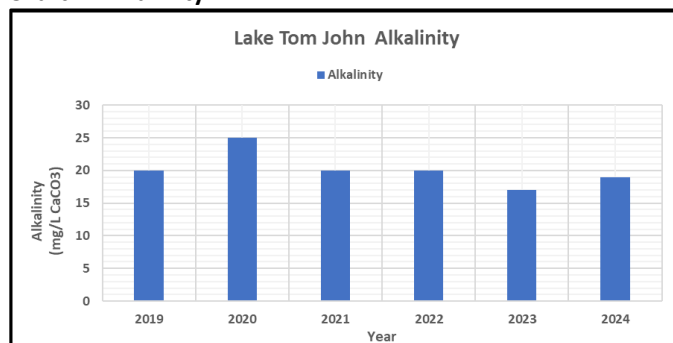


Chart 3. Chlorophyll

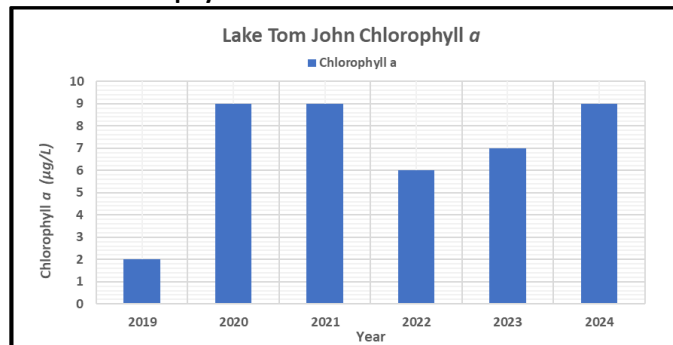


Chart 4. Total Nitrogen

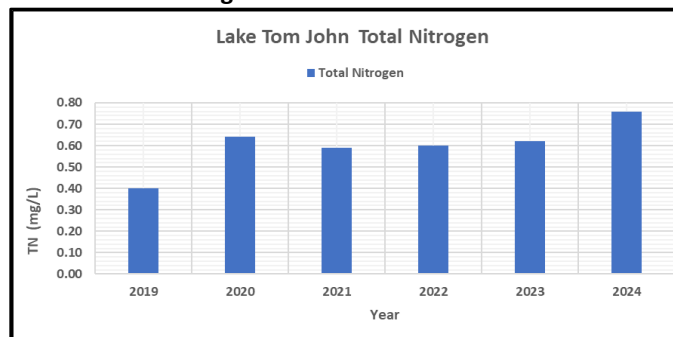
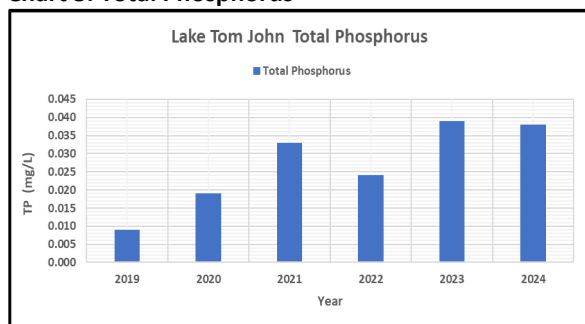


Chart 5. Total Phosphorus



Data Discussion

The data within the above charts and **Table 2** are used to determine overall lake health and to assess whether any existing data trends are evident. The City's Lakes Program utilizes the Mann-Kendall (MK) Statistical Trend Analysis test to determine if there are trends that could be statistically significant. Usage of this analysis shows that of the three key nutrient parameters (Chlorophyll *a*, Total Nitrogen and Total Phosphorus), total nitrogen and total phosphorus are increasing over this 6-year sampling period. Typically, the "annual geomean" is used to calculate the exceedance of DEP's nutrient criteria and the MK trend analysis. However, due to a small history of collecting data, the entire data set is being utilized for the trend test analysis.

The water quality within Lake Tom John can be characterized as marginal. This characterization concurs with the FLDEP assessment of water quality, which notes exceeding Chlorophyll-*a*, TN, and TP concentrations within the lake. The lake is currently classified as a clear-acidic system. However, based on samples collected by the city, data shows that alkalinity can bounce above or below that criterion limit of > 20 mg/L CaCO₃. This could result in the lake being defined as a "clear-alkaline" water body in the

future. Such a change would allow Lake Tom John to meet the nutrient criteria, and the lake would no longer be considered impaired.

The most likely source of nutrient inputs to this lake are from the surrounding residential development. It should be noted that the lake is divided, with the West shoreline being within the Tallahassee City limits and the East shoreline within Leon County limits. City sanitary sewer is provided for homes on the West shoreline while residences on the East shoreline dispose of wastewater via septic systems, which is a possible source of incoming nutrients into the lake. Other potential sources of nutrient inputs can be fertilizer runoff from the well-maintained yards surrounding the lake; however, most properties do leave a buffer zone of littoral vegetation to help mitigate localized yard runoff.

Lake Tom John's vegetation community is diverse, with native plant species along the littoral shoreline and as submerged vegetation. However, a Lake Vegetation Survey (LVI) has not been performed to date because there is no access point from which to launch a motorized vessel.

While collecting water samples via kayak, some of the noted plant species include Water Tupelo trees, *Nyssa sylvatica biflora*; Red Maple, *Acer rubrum*; Button Bush shrub *Cephalanthus occidentalis*; Purple Pickerel Weed, *Pontederia cordata*; White-flower Lily Pads, *Nymphaea odorata*. Unfortunately, Water Hyacinth, *Eichornia crassipes*, has established itself within the lake and seems to be increasing in abundance. A concerted effort by residents to manually remove the water hyacinth would be a proactive strategy to control the invasive exotic plant.

Otherwise, a mechanical aquatic harvester will be required to remove and control this nuisance vegetation. Herbicide treatment is another option to control the hyacinth, however, decaying plant material can cause adverse reactions, such as increased nutrients and subsequent algal blooms.

Photo 1. City Tallahassee biologist kayaking to collect water quality samples.



Photo 2. Dock representative of typical shoreline conditions.



Thank you for your interest in maintaining the water quality of City of Tallahassee area lakes. Visit the web-links below for more information on the City of Tallahassee, Leon County and Florida natural water resources.

City of Tallahassee Think About Personal Pollution (TAPP) Program

<https://tappwater.org/>

City of Tallahassee Stormwater Management

<https://www.talgov.com/you/stormwater>

Leon County Water Resources

<https://cms.leoncountyfl.gov/waterresource>

Best Management Practices for Protection for Water Resources

https://ffl.ifas.ufl.edu/media/fflifasufledu/docs/GIB_MP_Manual_Web_English.pdf

DEP biological assessment resources:

<https://floridadep.gov/dear/bioassessment/content/bioassessment-training-evaluation-and-quality-assurance#LVI>

FWCC Aquatic Plant Management:

<http://myfwc.com/wildlifehabitats/habitat/invasive-plants/aquatic-plant/>

Freshwater Algal Bloom information:

<https://floridadep.gov/AlgalBloom>

Florida Invasive Exotics, please click on the Florida Exotic Pest Control Council

<https://www.floridainvasives.org/>