Matteson Lake 2025 Water Quality Report

We sampled water from Matteson Lake and its inlet and outlet on August 11, 2025. On the same day, we sampled five locations along tributaries within the Matteson Lake watershed. The weather was dry that day (and in the preceding days) so the information we collected represents a late-summer snapshot of water quality in the lake during dry conditions.

2025 Matteson Lake Inlet-Outlet Sampling Results

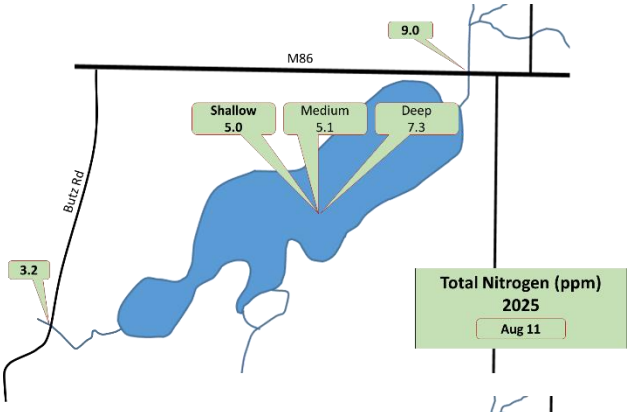
	Nitrogen (mg/L)		Phosphorus (ug/L)		TSS (mg/L)	
Date	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
08/11/25	9.0	4.2	35	21	<4.0	10

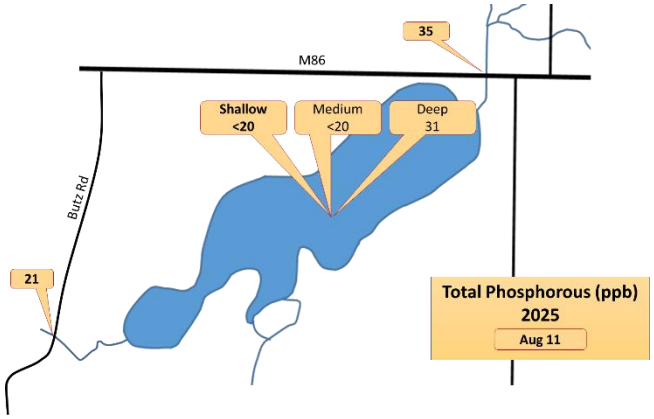
Our measurements indicate that on August 11th, water flowing into the lake at the M-86 bridge contained higher concentrations of ***Phosphorous*** and ***Nitrogen*** than water flowing out at the Butz Road dam. In contrast, the concentration of ***Total Suspended Solids (TSS)*** leaving the lake was higher than that flowing in (which is consistent with observations in past years).

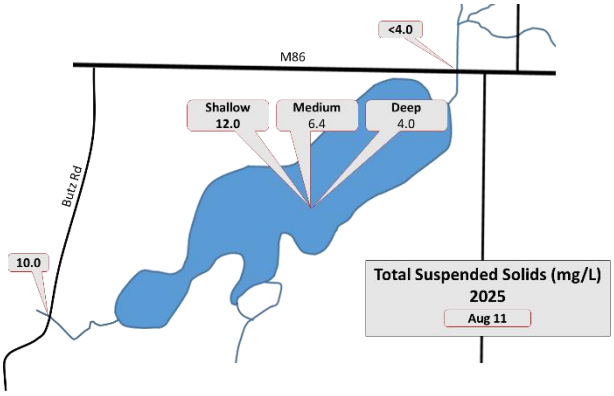
2025 Matteson Center-of-Lake Sampling Results

	Nitrogen (mg/L)			Phosphorus (ug/L)			TSS (mg/L)		
Date	3 ft	16 ft	30 ft	3 ft	16 ft	30 ft	3 ft	16 ft	30 ft
08/11/25	5.0	5.1	7.3	<20	<20	31	12	6	4

In the lake center, we sampled near the surface, half-way down, and near the bottom of the lake. Nitrogen values were less than those flowing into the lake. Phosphorous values were also lower. Total Suspended Solids in the shallowest portion of the water column were greater than water flowing into (and out of) the lake. We have observed this in prior years.

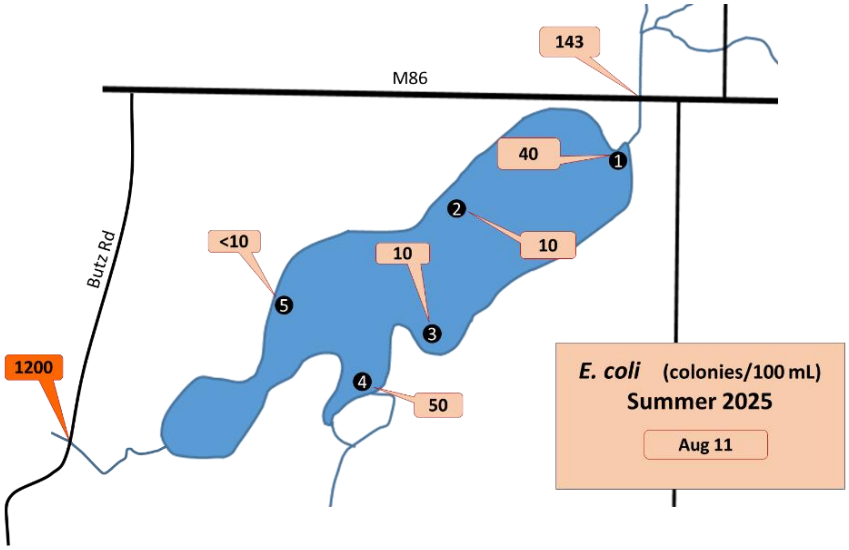






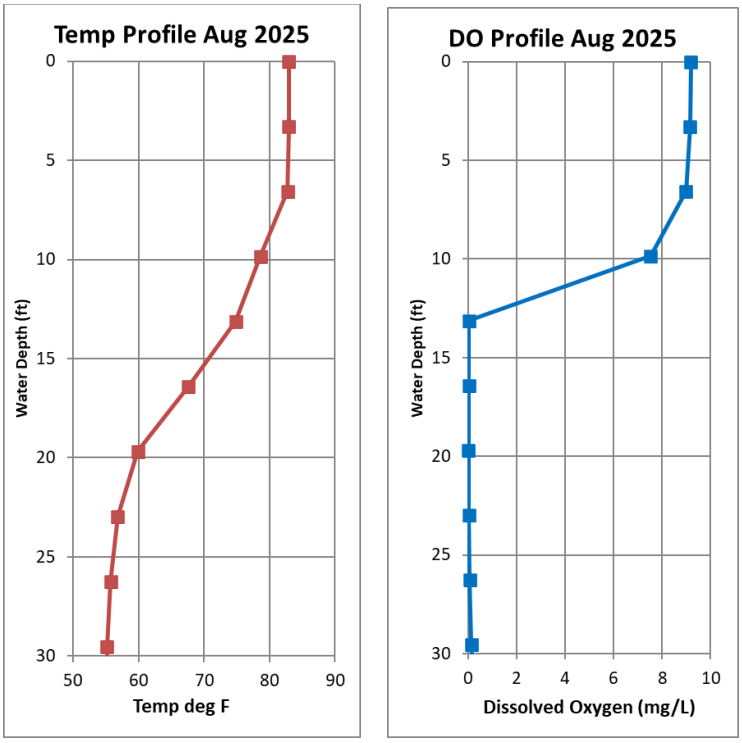
Bacteria

E. coli sampling at the inlet, outlet, and five locations within the lake found bacteria values that were similar to those seen in prior years. The highest values were found at the lake inlet and the outlet. <u>All values **in the lake** were safe for swimming</u>. However, swimming in the river above or below the lake is not recommended at any time because, in most years, bacteria counts higher than healthy levels for body contact have been found at the M-86 bridge and very high levels were found at the dam this year.



Depth Profiles

Each summer, Matteson Lake stratifies – it separates into a warmer, less dense layer of water that floats on top of a deeper, colder, denser layer of water. The uppermost layer, called the *epilimnion*, contains abundant dissolved oxygen that fish can use to breathe through their gills. The lower layer, called the *hypolimnion*, is relatively stagnant and low in dissolved oxygen. The depth profiles measured in 2025 were consistent with summer stratification seen in past years and the transition from warm, oxygenated water to colder, oxygen-poor water, called the *metalimnion*, was found between 10 and 15 feet below the lake surface this year.



As temperatures fall in autumn, the surface water layer cools. Eventually it becomes more dense than the underlying layer and the lake water ‘turns over’. This effectively mixes the lake water in late October or early November. The lake ‘turns over’ again in the spring when things warm up.

Watershed Sampling

We sampled for phosphorous, nitrogen, and total suspended solids in five places in streams that flow into Matteson Lake.

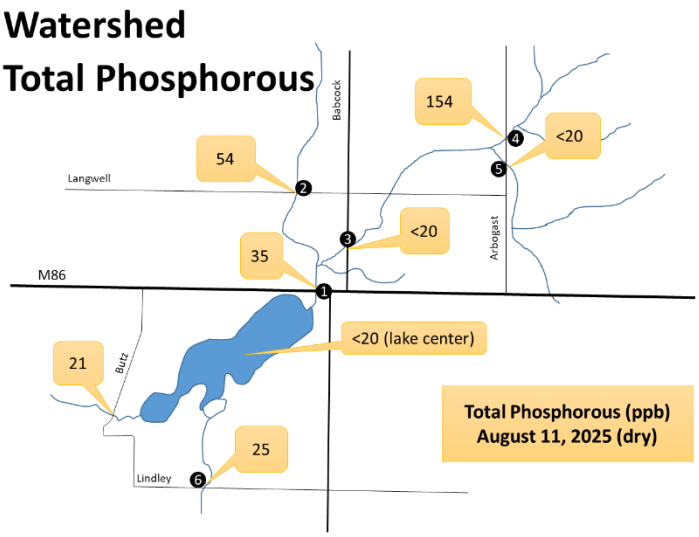
Phosphrous is the limiting nutrient in the lake, which means that adding more of it stimulates the growth of unwanted algae and contributes to water cloudiness. Phosphorous concentrations greater than those seen in the lake were present at several locations in the watershed. Water flowing into the lake at the M-86 bridge contained more phosphorous than water in the lake center and water flowing out of the lake at the Butz Road dam.

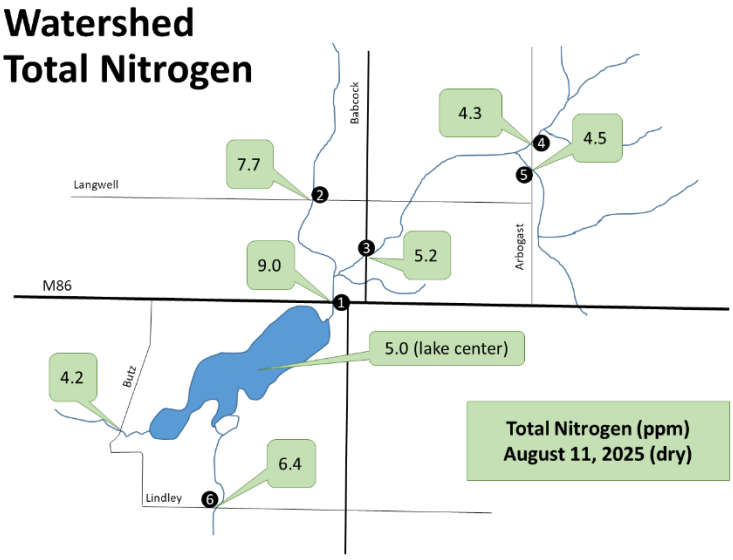
Nitrogen values in the watershed were similar to those in than in the lake.

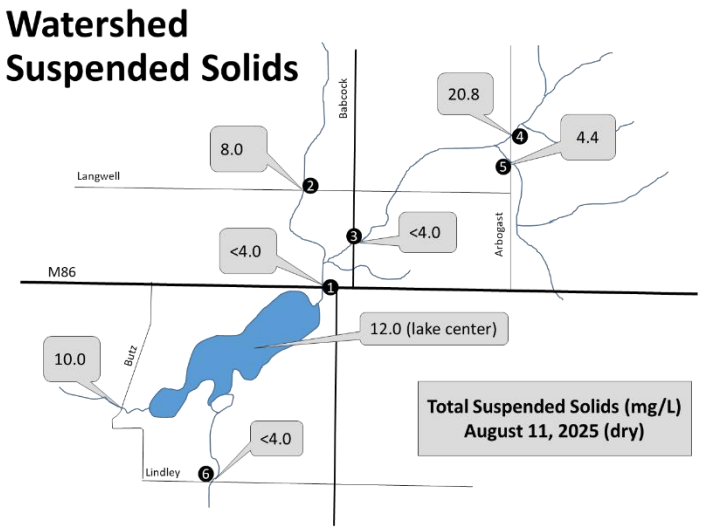
In contrast, with one exception, total suspended solid concentrations were lower in the watershed than in the lake. The same relationship was observed in 2024.

Collectively, these results and those of prior years suggest that:

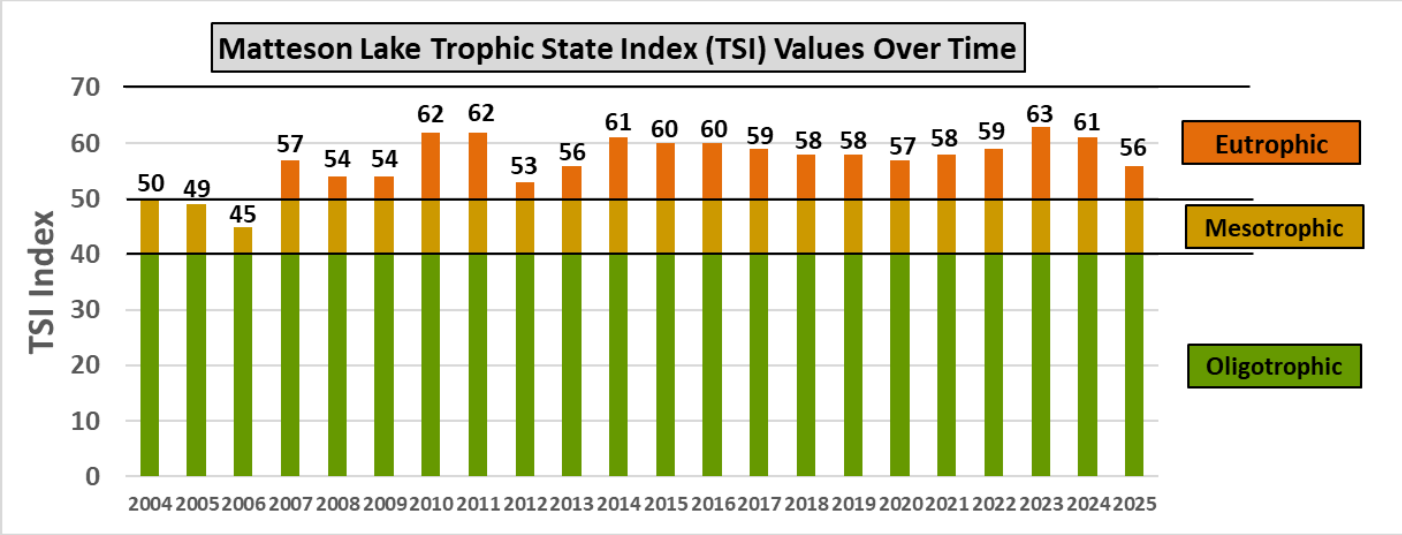
1. Nutrient cycling and sediment loading are complex and can be introduced into the lake through multiple pathways.
2. The watershed contributes phosphorous and nitrogen loading to the lake.
3. Residential properties along the lake shore contribute additional phosphorous and nitrogen loading to the lake.
4. Wave action and boating activity keep solids suspended in the upper layer of lake water.
5. The wetlands in the watershed just above and below the lake are beneficial because they remove sediment and nutrients from the water.







Trophic State



The **Trophic State Index (TSI)** combines three water quality variables (water clarity, green algae abundance, and phosphorous concentration) into a single score that we track over time to help us identify trends in water quality changes. The TSI score was **56** in 2025.

TSI Parameter	2022	2023	2024	2025
Secchi Disk Clarity (ft)	2.0	2.1	1.7	1.9
Chlorophyll-a (ppb)	9.6	7.8	22	9.7
Phosphorous (ppb)	41	116	27	20
TSI value	**59**	**63**	**61**	**56**

This is an improvement over 2024 resulting from a slight increase in water clarity (Secchi Disk), a decrease in algae (Chlorophyll-a), and lower phosphorous levels that yielded a combined lower TSI score. Nevertheless, Matteson Lake has been *eutrophic* (TSI > 50) for the past 19 years because of suspended sediments and excess nutrients that contribute to algae blooms and cloudy water. When algae die, their decomposition robs the water of oxygen that fish need to live. The brown water in Matteson Lake is unappealing and it also prevents sunlight from penetrating the lake to help beneficial aquatic plants grow.

Also, when the lake water is warm, an influx of phosphorous (with runoff after a rain, for example) can trigger a harmful algal bloom (HAB). HABs are caused by blue-green algae (also known as cyanobacteria). They are potentially harmful because they release toxins such as microcystins that can be dangerous to dogs and people who swim in the water. We tested for microcystins weekly throughout the summer of 2024 and fortunately did not detect them at levels of concern.

Long-term Outlook

Our long-term goal is to return Matteson Lake to mesotrophic conditions and to keep it there. To that end, the Matteson Lake Water Quality Committee and the Matteson Lake Association Executive Board are working with the Branch County Conservation District, St. Joseph County Conservation District, Branch County Drain Commission, St. Joseph County Drain Commission, Matteson Township, Colon Township Lake Board, and Friends of the St. Joseph River Association to develop a *Watershed Management Plan for Little Swan Creek.* We hope to submit another grant proposal seeking funding to support our efforts to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) this fall. Keep your fingers crossed!

*Special thanks to **Don Batey**, **Bob Kirchhofer**, **John Hoffman, Bill Shultz,** and **Bill Sweers** for taking measurements and helping to gather water quality samples on August11th!*
*Thanks also to **Paul Felcyn** for driving us around the lake on his boat!!*