

# Matteson Lake 2022 Water Quality Summary

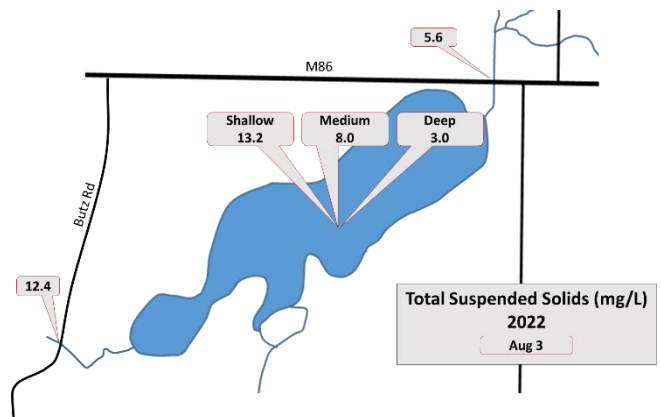
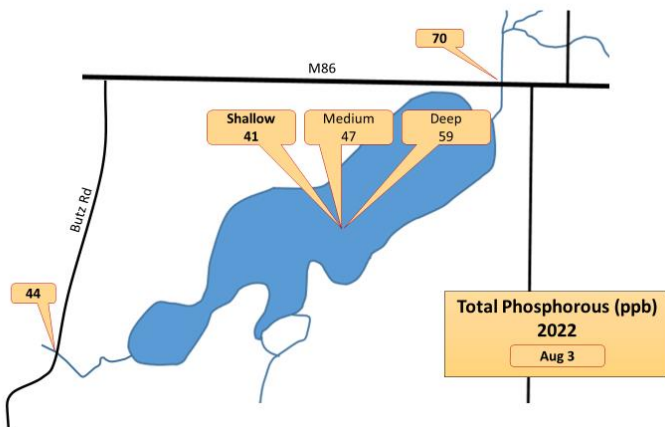
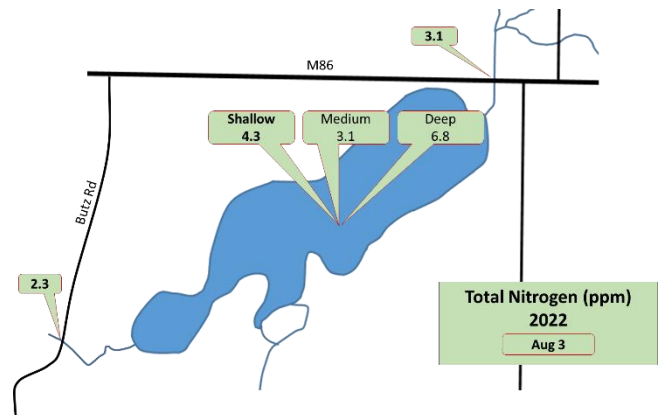
In 2022, we sampled water from Matteson Lake and its inlet and outlet on August 3, 2022. On the same day, we sampled five locations along tributaries within the Matteson Lake watershed. The weather was dry that day (and in the preceding days) so the information we collected represents a mid- to late-summer snapshot of water quality in the lake during dry conditions.

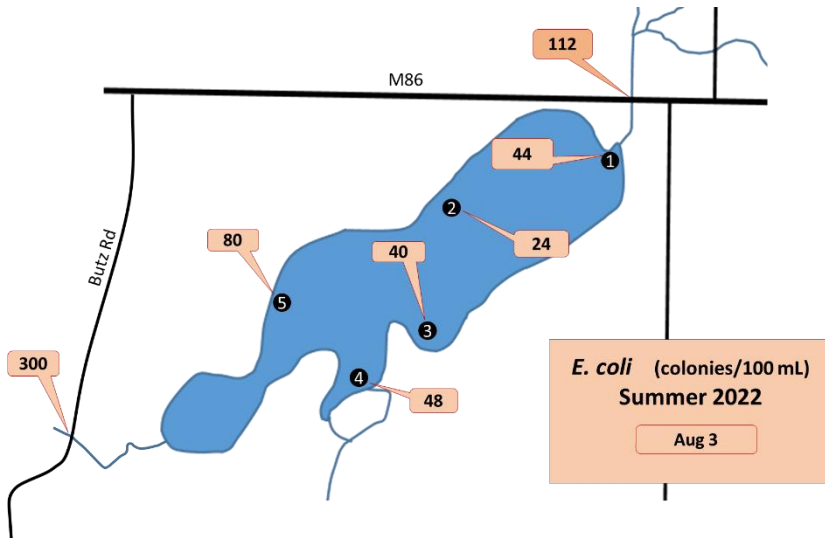
2022 Matteson Lake Inlet-Outlet Sampling Results						
Date	Nitrogen (mg/L)		Phosphorus (ug/L)		TSS (mg/L)	
	Inlet	Outlet	Inlet	Outlet	Inlet	Outlet
08/03/22	3.1	2.3	70	<27	5.6	12.4

Our measurements indicate that on August 3<sup>rd</sup>, 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. The opposite was observed for **Total Suspended Solids (TSS)**. The concentration of **TSS** leaving the lake was higher than that flowing in.

2022 Matteson Center-of-Lake Sampling Results									
Date	Nitrogen (mg/L)			Phosphorus (ug/L)			TSS (mg/L)		
	3 ft	16 ft	30 ft	3 ft	16 ft	30 ft	3 ft	16 ft	30 ft
08/03/22	4.3	3.1	6.8	41	47	59	13	8	3

In the lake center, we sampled near the surface, half-way down, and near the bottom of the lake. Nitrogen values were similar to those flowing into and out of the lake. Phosphorous values were less than those flowing into the lake, but greater than those flowing out which were below the detection limit (27 micrograms per liter). Total Suspended Solids were highest in the shallowest portion of the water column with concentrations similar to the water flowing out of the lake.





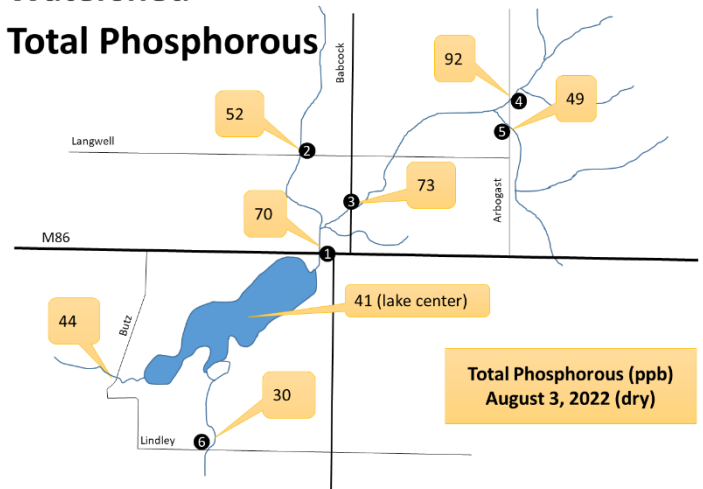
**E. coli** sampling at the inlet, outlet, and five locations within the lake found bacteria values that were similar to those seen in prior years. The highest values were found at the lake inlet and the outlet. All values in the lake were safe for swimming. However, swimming in the river is not recommended at any time because of bacteria counts higher than healthy levels for body contact observed at the M-86 bridge in past years.

## Watershed Sampling

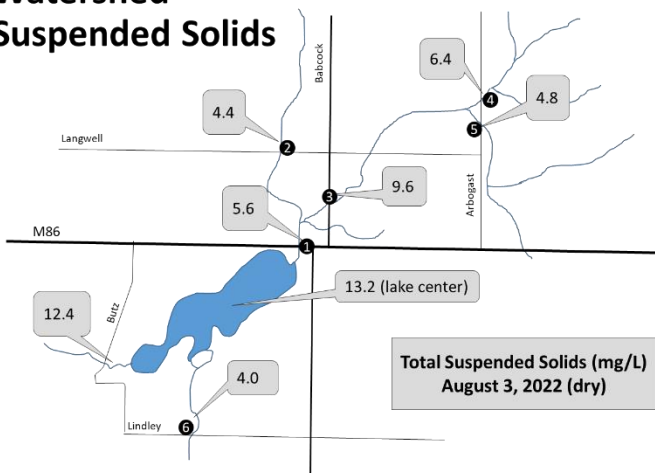
We sampled five tributaries to Matteson Lake for nitrogen, phosphorous, and total suspended solids. In the upper reaches of the watershed, phosphorous concentrations were consistently greater than those seen in the lake. In contrast, total suspended solids were lower in the watershed than in the lake. Nitrogen values were both higher and lower than lake values. These results suggest that 1) the watershed contributes phosphorous loading to the lake, 2) wave and boating activity keep solids suspended in the upper layer of lake water, and 3) properties along the lake shore may contribute nitrogen loading to the lake.

## Watershed

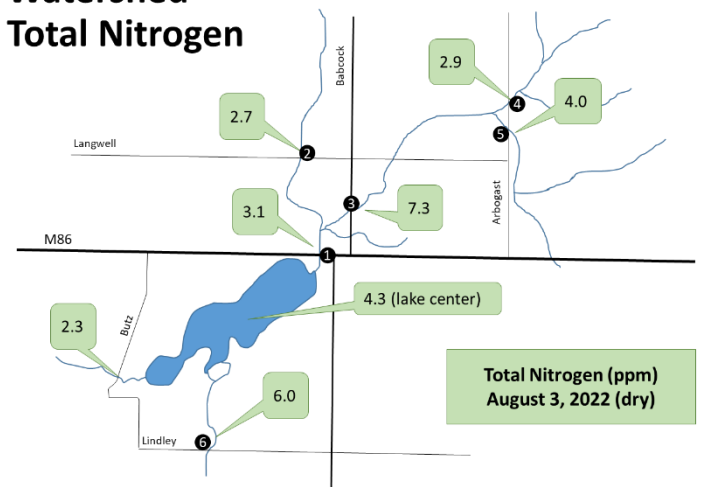
### Total Phosphorous

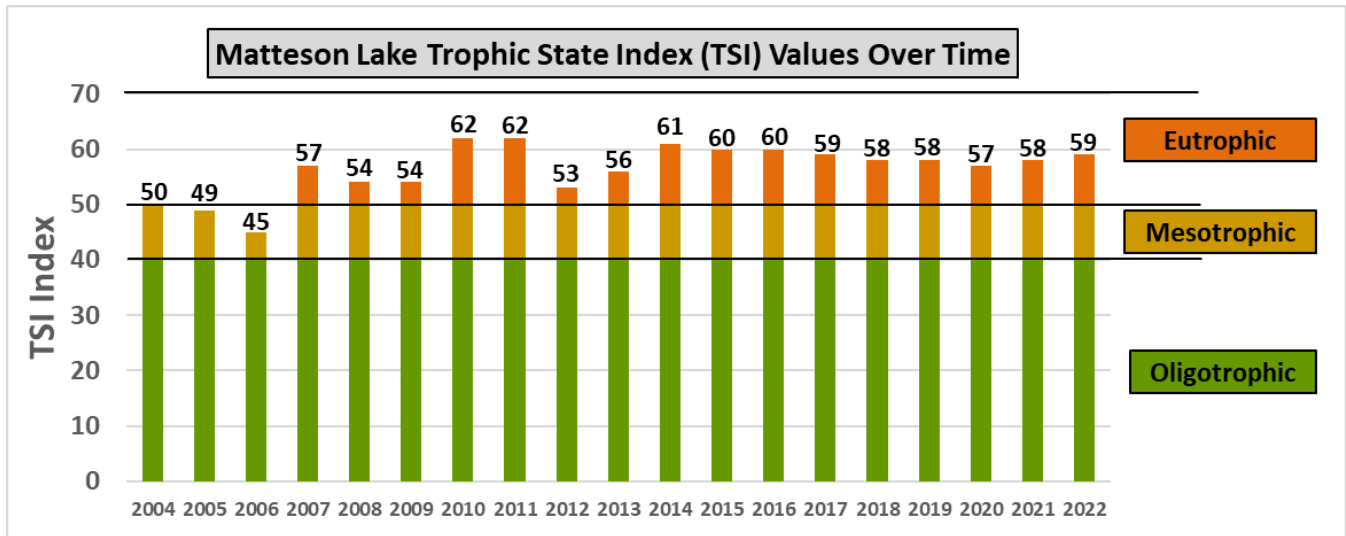


## Watershed Suspended Solids



## Watershed Total Nitrogen





The **Trophic State Index (TSI)** combines three water quality variables (phosphorous concentration, green algae abundance, and water clarity) into a single score that we track over time to help us identify trends in water quality changes. The TSI score for 2022 was 59, similar to the values measured in the last 8 years, which ranged from 57 to 61.

Over the past 16 years, Matteson Lake has been *eutrophic* (TSI > 50), with excess nutrients (primarily phosphorous) that contribute to algae blooms and cloudy water. This is not good for water quality in our lake. When algae die, their decomposition robs the water of oxygen that fish need to live. Moreover, the coffee brown color of the water in Matteson Lake is not only unappealing, it also prevents sunlight from penetrating the lake to help beneficial aquatic plants grow. Both algae and suspended solids contribute to the water’s cloudiness.

## Long-term Outlook

Our long-term goal is to return Matteson Lake to mesotrophic conditions and to keep it there. To that end, members of the Matteson Lake Water Quality Committee and the Matteson Lake Association Executive Board partnered 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 submit a proposal to develop a *Watershed Management Plan for Little Swan Creek* to the Michigan Department of Environment, Great Lakes, and Energy (EGLE).

We submitted our grant proposal to EGLE in August 2022. If funded, this planning grant would initiate a 2-year process to study the watershed and develop formal recommendations to improve water quality in Matteson Lake and the streams that flow into and out of it. This is an essential first step to making our Lake Association and our governmental partners eligible to apply for project grants to implement the water quality improvement recommendations over the subsequent decade. As of the date this report was written, EGLE has not completed its grant review process, so we continue to keep our fingers crossed!

*Special thanks to Bob Kirchhofer, Don Batey, and Marianne Hoffman for their assistance gathering water quality samples and taking measurements on August 3<sup>rd</sup>!*