



# How Does the Quality of the Maumee River Water Change from Fall to Spring?

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Sites on Map: 284

5 km

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Legends

# Introduction

We are Grace, Sophia, Mary Kate, Santiago, Luke, and AJ. We are eighth graders at Saint Rose School in Perrysburg, Ohio.

The Maumee River is important for our community's ecology, economics, and recreation. The Maumee River is also a major tributary to Lake Erie, which is an important source of drinking water for the community.

It is important for us to understand the factors that affect our water quality so that we can become good stewards for it.



# How does the water quality change from the fall to spring?



Between October and November we noticed how much the water temperature cooled down in just a few weeks.

We were interested in studying if the seasonal changes affected other water quality factors beside temperature.



# Research Methods

We used GLOBE Protocols to measure water quality on the Maumee River in September, October, November, December, and April. Our testing included:

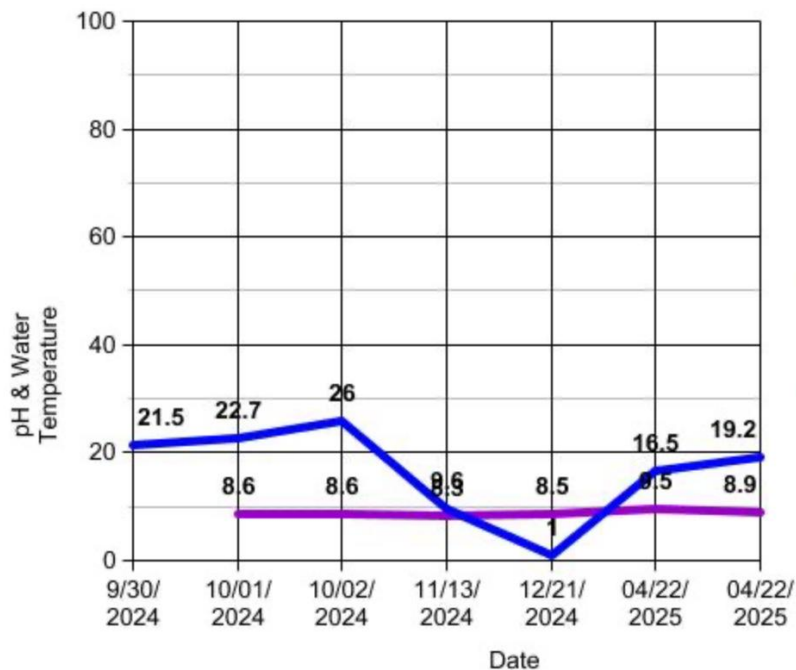
- Water temperature with a Vernier probe
- Dissolved oxygen with a Vernier DO meter
- pH with a meter
- Transparency with a turbidity tube
- Phosphates with LaMotte test strips





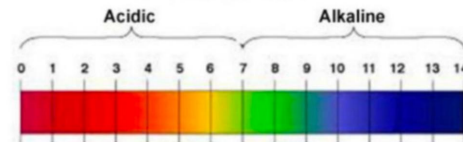
# Results: pH and Water Temperature

Maumee River: pH and Water Temperature



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## pH: MEASURING ACIDIFICATION



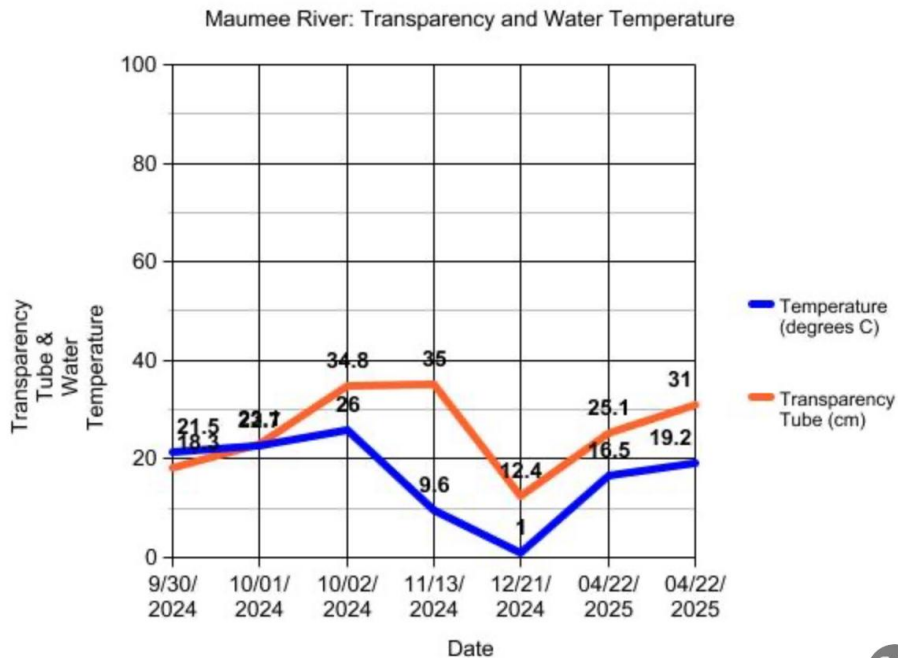
- Most aquatic organisms function at the optimal pH range of 6.5 to 8.5.

The river water is alkaline because the geology for our region consists of limestone rock, which helps to buffer the river water.





# Results: Transparency and Water Temperature



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## Turbidity Tube Levels and TSS Concentration

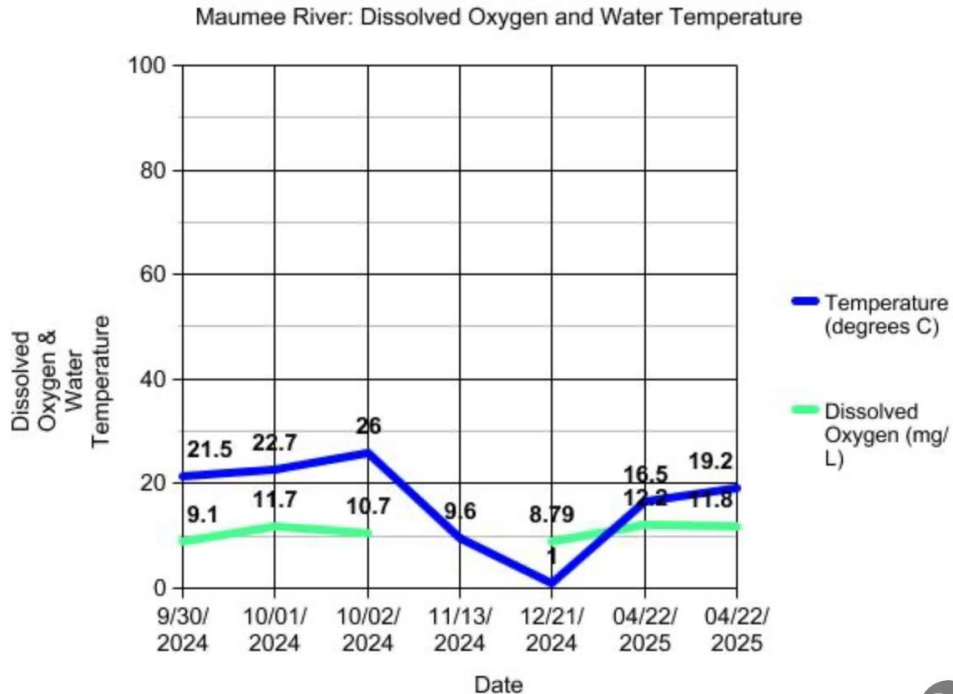
| Tube Level | TSS concentration | Water Quality            |
|------------|-------------------|--------------------------|
| 120 cm     | < 6 mg/L TSS      | Excellent (very clear)   |
| 65 cm      | 10 mg/L TSS       | Excellent (clear)        |
| 30 - 65 cm | 10 - 28 mg/L TSS  | Normal water quality     |
| 10 - 30 cm | 29 - 133 mg/L TSS | Impaired stream quality  |
| <10 cm     | > 133 mg/L TSS    | Severely impaired stream |

The “muddy” Maumee River watershed includes a lot of agricultural land, which runs off into the river making it “muddy” especially after rainstorms.





# Results: Dissolved Oxygen and Water Temperature

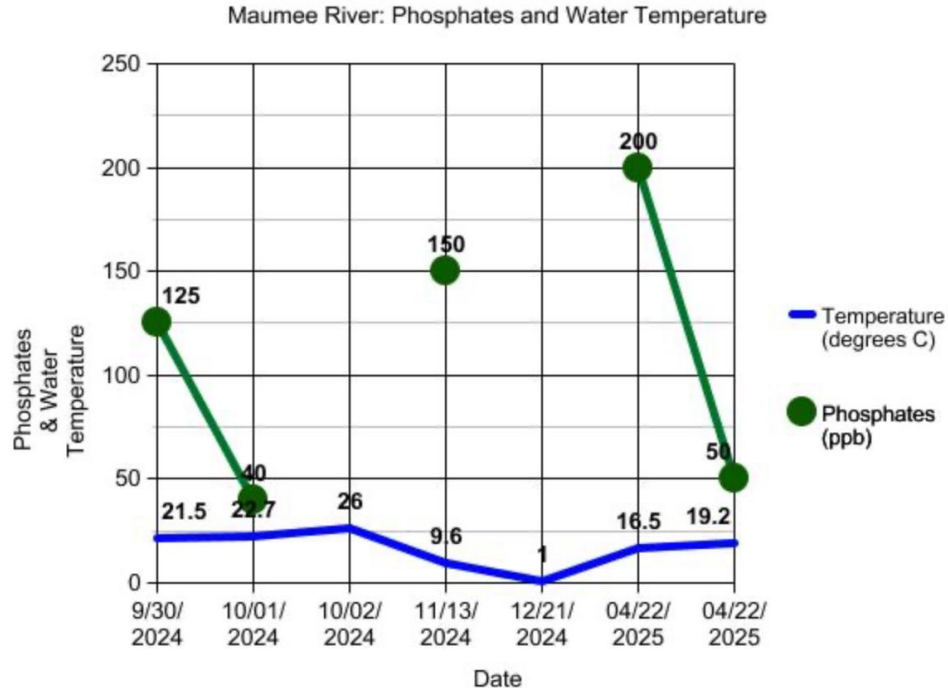


Dissolved oxygen levels measured in the river were healthy for survival of fish and aquatic animals.





# Results: Phosphates and Water Temperature



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Phosphates can get into the river from fertilizer and geese manure runoff. The phosphates can cause algae blooms in the river and in Lake Erie.



# Discussion

Water Temperature is sometimes called the “Master Variable” because it influences the rate that other substances are dissolved in it.

Our results showed that pH and dissolved oxygen remained relatively steady as the river changed temperature from fall to winter and spring.

Our results also showed that Phosphates and Turbidity fluctuated over the timeframe that we tested. Both phosphates and turbidity are affected by rainwater runoff into the river. It would be important to compare phosphate and turbidity levels with rainfall measurements. Both phosphates and turbidity can impair water quality and lead to algae blooms.



## Next Steps

If we had more time, there are other water quality tests that we could investigate like nitrates, conductivity, bacteria, macroinvertebrates.

It would also be interesting to study relationship between weather, especially rainfall, and water quality of the river.

Next year, Saint Rose is planning to participate in the Student Watershed Watch, which is sponsored by a local government agency.





# References

Carlsen, William S. Watershed Dynamics. NSTA Press, 2004.

“Hydrosphere Community - Hydrosphere - GLOBE.gov.” Globe.gov, 2018, [www.globe.gov/web/hydrosphere](http://www.globe.gov/web/hydrosphere).

Sara Mierzwiak, University of Toledo, GLOBE Mission Earth, visited and encouraged the students throughout the year.

# Water Quality for Maumee River Saint Rose, Perrysburg, Ohio



Water temperature obviously changes with the seasons, but pH and dissolved oxygen levels did not fluctuate significantly. Transparency and phosphate levels did fluctuate from fall to spring.

