

Reservoir management could prevent toxic algal blooms

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Managing reservoirs for water quality, not just flood control, could be part of the solution to the growth of toxic algal blooms in the Great Lakes, especially Lake Erie, every summer.

In a major study involving data from Canada and the United States, researchers at the University of Waterloo identified reservoirs on streams and rivers as sources of food for algae at the worst possible time.

The culprit is dissolved [phosphorus](#) released from upstream reservoirs when warm lake water is ideal for the growth of algal blooms, which can cause illness and contaminate water supplies.

"Algae love dissolved phosphorus and when it arrives in the summer, it arrives exactly when they want it the most," said Nandita Basu, a professor of civil and environmental engineering at Waterloo.

Dissolved phosphorus, which comes primarily from fertilizer, is generally expected only at low levels in rivers and streams in summer following the peak snow-melt in spring.

But researchers found unusually high summer levels of dissolved phosphorus in areas with reservoirs, which are created by damming rivers and streams to hold water back to prevent flooding.

Basu said reservoirs store phosphorus that has been washed off farm fields in sediment.

In the warm summer months, that stored phosphorus is released from the sediment and increases dissolved phosphorus concentrations in water flowing downstream.

"Our work shows reservoirs can play a significant role," said Basu, who analyzed data from more than 200 testing locations in Great Lakes watersheds. "They take in phosphorus that is attached to soil particles and release dissolved phosphorus that encourages more algae to grow."

Basu said strategies to tackle the problem could include adding oxygen or chemicals to the water in reservoirs to prevent the conversion of phosphorus attached to soil into dissolved phosphorus.

A paper on their research, "Biogeochemical Asynchrony: Ecosystem

Drivers of Seasonal Concentration Regimes across the Great Lakes Basin," appears in the journal *Limnology and Oceanography*.

More information: Biogeochemical Asynchrony: Ecosystem Drivers of Seasonal Concentration Regimes across the Great Lakes Basin, [aslopubs.onlinelibrary.wiley.c ... oi/10.1002/lno.11353](https://onlinelibrary.wiley.com/doi/10.1002/lno.11353)

Provided by University of Waterloo

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