Chautauqua Lake

Internal Loading Study

Department of Environmental Conservation

DEC is conducting a study on Chautauqua Lake in 2025 to quantify internal loading of phosphorus throughout the lake. The goal of the project is to support the development of a TMDL Watershed Implementation Plan (WIP) to continue reducing phosphorus pollution in Chautauqua Lake. This study will result in recommendations of which management practices have the potential to be used to reduce anoxia driven internal loading of phosphorus.

What is Internal Loading?

Internal loading is a natural process in lake ecosystems where phosphorus is released from the sediments of the lake. Phosphorus released from internal loading can contribute to the growth of algae and aquatic plants. The rate of internal loading can increase based upon the amount of phosphorus entering the lake and the lake sediments from the watershed.

Algae growing in Chautauqua Lake

There are two ways that phosphorus can be released from sediments physically or chemically. Physical internal loading occurs when the sediments are agitated and stirred up into the water. Fish foraging and boat traffic can be common causes of physical internal loading. Chemical internal loading occurs when the water just above the sediment contains no oxygen, also known as anoxic. A lack of oxygen causes the phosphorus that is bound to the sediments to change form and be released into the water.

The focus of this study will be on quantifying anoxia driven internal loading. Anoxia driven internal loading has more established methods for quantification and more potential management options available to address that source of phosphorus. Other organizations are doing work to understand physical internal loading processes in the lake.

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How will the internal loading study inform the TMDL WIP?

The 2012 TMDL for total phosphorus in Chautauqua Lake estimated internal loading, it did not directly measure it. This internal loading study will provide measurements of internal loading to quantify where in the lake anoxic internal loading is occurring most frequently. The better understanding of the amount and location of anoxic internal loading will allow DEC to recommend management strategies that have the most potential to reduce phosphorus from internal loading. It will also allow DEC to make recommendations about additional feasibility studies that might need to be done to be able to obtain funding and permits for any of the potential implementation projects.

What data will be collected for the internal loading study?

DEC has contracted Ramboll and the Upstate Freshwater Institute to complete the internal loading study. The following data will be collected in between May and October of 2025:

- Water chemistry data from multiple depths to track internal loading of phosphorus throughout the season
- Bathymetry to understand where internal loading is most likely to occur in the lake based on depth
- Sediment chemistry to understand the types of phosphorus in the sediment and the likelihood that the phosphorus will be released under anoxic conditions
- Continuous monitors of dissolved oxygen and temperature to track when anoxic conditions occur

CONTACT INFORMATION

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