

Zebra mussel impacts on walleye populations and mercury concentrations:

A collaborative project investigating the connections between zebra mussels, changes to lake food webs, and walleye success

Young sport fish, like walleye, can be negatively affected by zebra mussels. In lakes with and without zebra mussels, this project will compare the success of young-of-year walleye, compare the food sources of young-of-year and adult walleye, and measure mercury concentrations in walleye.

Our questions:

- 1. Do zebra mussels reduce walleye habitat?**
Increased water clarity can negatively affect walleye habitat and abundance.
- 2. How are walleye food sources affected by zebra mussels?**
Food web changes caused by zebra mussels could potentially reduce walleye abundance
- 3. Do changes in the food web from zebra mussel presence affect mercury concentrations in walleye?**
Food web changes caused by zebra mussels can increase mercury in fish, with important implications for consumption.

How will we answer these?

- 1. Sample walleye, other fish, zooplankton, and aquatic insects in the summer months**
 - *Intensive sampling will take place in July and August on each lake*
 - *Samples will be sent to a lab to evaluate mercury concentrations*
 - *We will use stable isotope tracers to determine who is eating who in each lake and how zebra mussels influence walleye diets.*
- 2. Analyze past and present data on walleye habitat and how it relates to abundance**
 - *We will use computer models to estimate how walleye habitat is affected by changes in water clarity*
 - *We will use historical walleye abundance to relate habitat to walleye population size in order to anticipate future changes caused by zebra mussels*



Where are we sampling?

Sampling will be conducted collaboratively by University of Minnesota researchers, students, and DNR biologists in the summers of 2021 and 2022.

- 16 small and medium sized lakes will be sampled in 2021 and 2022
 - 2021 sampling lakes: Buffalo, Big Sandy, Chippewa, Shamineau, Alexander, North Lida, Steamboat, Little Boy
 - 2022 sampling lakes may include: Big, Potato, Round (Aitkin), Round (Brainerd), Woman, Bemidji, and Reno
- Initial results can be expected in 2021, and will help managers proactively manage walleye fisheries in lakes with zebra mussel invasions.**

About zebra mussels

- Found in 409 water bodies in Minnesota
- Can become very abundant in lakes
- Increase water clarity
- Impacts on walleye and other fish can vary among lakes, and this project seeks to understand that variation.

More details

This project is funded by the United States Geological Survey and the University of Minnesota Water Resources Center, with additional support from the Minnesota Department of Natural Resources and the Environment and Natural Resources Trust Fund through the Minnesota Aquatic Invasive Species Research Center.

