

Quantifying microbial trophic pathways in a changing Lake Huron ecosystem



CORE QUESTION:

How have invasive zebra and quagga mussels changed
the flow of energy in Lake Huron's food web?

Carried to North America by ocean-going freighters, invasive zebra and quagga mussels have massively altered the flow of energy and nutrients through Great Lakes food webs. Adult mussels are highly effective at filtering tiny, nutritious plankton out of the water, leaving little behind for other microscopic organisms and larval fish to eat. In Lake Huron, this lack of nutrients has affected all levels of the food chain and caused significant harm to larger fish species.

WHO'S EATING WHO

HHunter Carrick, a professor of biology at Central Michigan University, is studying the new dynamics of Lake Huron's lower food webs. He and his research collaborators are analyzing water samples taken from Lake Huron during different seasons to determine which microscopic organisms are present and in what proportions. They will catalog the organisms that produce energy (phytoplankton) and those that get energy from eating other plankton (zooplankton). DNA analysis will help identify the tiny contents

of microscopic guts to see which prey the predatory zooplankton have consumed. The team will also use controlled lab experiments to determine feeding rates and gut contents of key zooplankton species.

Their results can inform Lake Huron and Great Lakes food web models to better account for the changes triggered by invasive mussels. These updates would be vital in helping Lake Huron managers make timely decisions about fish stocking, harvest limits, and other strategies for managing changing fisheries.

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