

Dynamic dead zones alter fish catches in Lake Erie

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New research shows that Lake Erie's dead zones are actually quite active, greatly affecting fish distributions, catch rates and the effectiveness of fishing gear.

Scientists with the U.S. Geological Survey, the Illinois-Indiana Sea Grant and partners recently found that [dead zones](#) caused by hypoxia, the depletion of oxygen in water, are unexpectedly variable in Lake Erie, sometimes disappearing and reemerging elsewhere in the matter of hours. They also found that [fish](#) like yellow perch cluster at the edges of these areas. The discovery of erratic dead zones can help commercial fishers and scientists determine where and how to effectively catch and study fish.

The study, conducted near Fairport Harbor, Ohio, during August and September of 2011-2013, was recently published in the *Canadian Journal of Fisheries and Aquatic Sciences*.

"We were amazed by how quickly hypoxic areas moved during our study," said Richard Kraus, a USGS scientist and the lead author. "These findings can help managers sustain valuable [fish populations](#) in Lake Erie, which is one of the world's largest commercial fisheries."

Hypoxia at the bottom of Lake Erie occurs during the summer as a result of biological activity in the colder bottom layer that consumes dissolved oxygen in the water. The warmer surface layer floats on top, preventing oxygen from mixing down to the bottom. The researchers used sensors

to measure oxygen levels and lakebed temperatures, and found that dead zones are frequently moving as a result of internal waves in the lake.

Although bottom waters might be a refuge for cool-water fish species, hypoxia can force fish to seek less suitable habitats. Acoustic surveys during the study revealed that when fish shift because of seasonal hypoxia, they cluster at the edges of dead zones rather than avoiding hypoxic areas entirely. Using [fishing gear](#) like trawls and nets, the scientists caught fish at the highest rates along dead zone boundaries.

"Our study shows that Lake Erie contains a patchwork of low and high-density fish populations," said Paris Collingsworth, a Great Lakes Ecosystem Specialist with Sea Grant. "This understanding of fish distributions can inform policy decisions, such as how many walleye, yellow perch and others can be fished from the [lake](#)."

More information: Dynamic hypoxic zones in Lake Erie compress fish habitat, altering vulnerability to fishing gears,
www.nrcresearchpress.com/doi/f...14-0517#.VSbXRV2UfGM

Provided by United States Geological Survey

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