

Invasive Asian carp respond strongly to carbon dioxide

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Adding carbon dioxide gas to water, a process similar to making carbonated soda water, could help control the movement and behavior of invasive carp in the Great Lakes basin, according to a recent study.

"This study demonstrates the ability of [carbon dioxide](#) to act as a non-physical barrier on a large scale," says University of Illinois researcher Cory Suski. " Work on this topic to date has primarily been performed in small, laboratory studies, and so this work showed the potential for CO₂ to be effective at larger scales more relevant to field applications."

Bighead carp and silver carp are species of invasive Asian carp that threaten the Great Lakes. Scientists with the University of Illinois and U.S. Geological Survey tested the effectiveness of infusing water with recycled CO₂ gas to discourage the movement of bighead and silver carp. Both carp species avoided CO₂-infused water in a research pond at the USGS Upper Midwest Environmental Sciences Center in La Crosse, Wis.

"These fish responses provide evidence that CO₂ could be used as a tool to deter the movement of bighead and silver carp," says Michael Donaldson, a U of I researcher and the study's lead author. "The results are encouraging because there is a need for additional methods to prevent the entry of Asian carp into the Great Lakes."

The scientists gradually added light plumes of CO₂ gas to one end of the USGS test pond. They monitored the behavior of individual bighead and

silver carp, as well as the behavior of native fish species such as bigmouth buffalo, channel catfish, paddlefish, and yellow perch before, during, and after the addition of CO₂.

The findings include:

- Each fish species except for paddlefish avoided the areas of the pond with CO₂-infused water.
- Certain bighead and silver carp movements slowed down after CO₂ was injected.
- Bighead carp used a smaller area of the pond furthest from the injection sites after CO₂ was added.

"Further tests are needed before CO₂ can be used in Asian carp management," says Jon Amberg, a USGS scientist and co-author of the study. "Understanding the effects of long-term, elevated CO₂ exposure on fish and other organisms can help assess its risks to native species." The next research step is to test the usefulness of CO₂ gas in controlling bigheaded carp movement in a natural river.

Non-native Asian carp have the potential to damage ecosystems in the Great Lakes basin by competing with native fish and mussels for food. Large silver carp are also hazardous to boaters because they can leap up to 10 feet out of the water when startled.

"Carbon dioxide as a tool to deter the movement of invasive Bigheaded Carps" co-authored by Michael Donaldson, Shivani Adhikari, Adam Wright, and Cory Suski from U of I, Jon Amberg, Aaron Cupp, Nathan Jensen, Mark Gaikowski, and Jason Romine from the U.S. Geological Survey. The study is published in *Transactions of the American Fisheries Society* and is available online.

Provided by University of Illinois at Urbana-Champaign

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