

Floating islands project expands on water quality research to study pollinator plants

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Diba Malekpour Koupaei, right, a graduate student in sustainable environments, waters plantings on segments of a floating island she helped design for Lake LaVerne. Mimi Wagner, associate professor of landscape architecture and director of the sustainable environments graduate program, looks on at left. Credit: Christopher Gannon

Islands have returned to Lake LaVerne.

The sustainable environments interdisciplinary graduate program's floating islands research project is back on Iowa State University's landmark lake for the first summer since 2015. While the project still measures nutrient uptake from the water, this year's research adds a new twist. Pollinator [plants](#) are being used to determine if floating islands could have a twofold benefit by helping threatened insects such as bees and butterflies.

"This summer we're going to assess the performance of pollinator plants, which are different from the plants we used last time," said Mimi Wagner, director of the sustainable environments program and associate professor of landscape architecture. "These plants have not been tested in the literature for [nutrient uptake](#)."

The sustainable environments program is leading this interdisciplinary research, which includes the departments of civil, construction and environmental engineering and entomology.

"Our long-term goal has always been to develop this practice for farmers and rural landowners to use on farm ponds," Wagner said. "Farm ponds are common in Iowa and many of those have high nutrient problems."

Twelve floating islands, each a 2-foot cube, form a larger island on the lake. Bird netting surrounds the islands so geese don't eat the plants. The base of each island is formed with pond filter material and a layer of marine foam to provide flotation. Holes drilled into the filter material are filled with peat moss and used to contain the individual pollinator plants. This year, 12 pollinator plant species – a different species on each island – are being used for the project. Their roots wick up nutrients from the lake. ISU entomologists are providing insight into the pollinator plants, which include common milkweed, wild bergamot, New England

aster and swamp milkweed; and associated insects.

"Floating islands already help farm ponds reduce excess nutrient levels, so why not also help by providing more pollinator habitat acres, too?" Wagner said.



Kaveh Abbasi Hafshejani, a graduate student in sustainable environments, launches a floating island into Lake Laverne. He helped design the island to study nutrient uptake and pollinator plants in Lake Laverne. Credit: Christopher Gannon

You may have noticed that Lake LaVerne has lost some of its algae cover in recent weeks. Facilities Planning and Management says that's

because they applied liquid aluminum sulfate (alum), which binds phosphorous suspended in the water and settles it to the bottom of the pond. This helps clear the water and slows the growth of algae, but it's a temporary treatment.

Wagner says 15 percent of a [pond](#) area would need to be covered with vegetated floating islands in order to positively impact [water quality](#). These research floating islands cover only a small percentage of Lake LaVerne.

The results of the floating islands research, however, will be valuable in the scale-up for farm ponds.

An Chen and Kaoru Ikuma, both assistant professors of civil, construction and environmental engineering, are helping the team study structure, flotation, water quality and future scaling.

"In the past, materials such as bamboo, concrete and polyester have been used to construct the island," Chen said. "My research goal is to come up with a cost-effective structural supporting system for an island with a given size."

The floating islands will remain on the lake through early October, when they will be removed to analyze nutrient content. Signage will be placed around the [lake](#) describing the project for passersby.

"Some of our research goals are to quantitatively examine how much improvement in water quality these [floating islands](#) can provide and to optimize the environmental benefits of the [islands](#)," Ikuma said.

Provided by Iowa State University

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