

Fewer fish and more algae? Scientists seek to understand impacts of historic lack of Great Lakes ice

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Rae-Ann Eifert, a lake monitor for the Wisconsin Department of Natural Resources, braved sub-freezing temperatures to gather buckets of water for testing off a Lake Michigan breakwater in Racine, Wis., on Feb. 28, 2024, as part of an effort across the Great Lakes to understand the effects of an iceless winter. Unseasonable warmth has left the Great Lakes all but devoid of ice, leaving scientists scrambling to understand the consequences as climate change

accelerates. Credit: AP Photo/Teresa Crawford

Michigan Tech University biologists have been observing a remote Lake Superior island's fragile wolf population every winter since 1958, but they had to cut this season's planned seven-week survey short after just two weeks.

The ski plane they study the wolves from uses the frozen lake as a landing strip because there's nowhere to touch down on the island. But this weirdly warm winter left the Great Lakes nearly devoid of ice.

As climate change accelerates, scientists are scrambling to understand how iceless winters could affect the world's largest freshwater system. Most of the effects are still theoretical since the lakes are generally too treacherous for data-gathering expeditions during the coldest months and biologists have long thought that little ecological activity takes place under the ice anyway. But they say the changes could have serious environmental, economic and cultural impacts, including by harming certain fish species, eroding beaches, fueling algae blooms and clogging shipping channels.

"This year really drives home the point that we need to collect more data," said Trista Vick-Majors, an assistant biology professor who studies aquatic ecosystems at Michigan Tech. "There's just no way you can predict how an ecosystem is going to respond to the large-scale changes we're looking at."



Sunlight reflects off of Lake Michigan at Montrose Harbor on an unseasonably warm day, Tuesday, Feb. 27, 2024, in Chicago. Credit: AP Photo/Erin Hooley

The planet [experienced record heat](#) for an eighth-straight month in January, according to the European climate agency. The upper Midwest has been no exception, with Chicago enjoying temperatures of around 70 degrees (21 degrees Celsius) late last month and Wisconsin getting its first February tornadoes.

Ice coverage on the lakes, which have a combined surface area roughly the size of the U.K., has generally peaked in mid-February over the last 50 years, with as much as 91% of the lakes covered at times, according to the [Great Lakes Ice Tracker website](#). As of mid-February this year, only 3% of the lakes was covered, which was the lowest figure since at

least 1973, when the site's records begin.

Researchers don't have much data about how years of iceless winters could change the lakes, but they have plenty of theories.



Pancake ice floats on Lake Michigan, Thursday, Feb. 2, 2023, in Chicago.
Credit: AP Photo/Erin Hooley

Iceless lakes could absorb sunlight faster and warm up sooner in the spring. Some biologists speculate that this could lead to earlier and larger blue-green algae blooms, which can be toxic to humans and put a damper on summer tourism.

Without ice, the lakes' upper levels will likely warm even more quickly than usual, contributing to thermal stratification, in which layers of colder and warmer water form. Less oxygen would make it into the lower, colder and denser levels, which could cause plankton and other organisms to die, some scientists believe. Whitefish and lake trout typically hatch in the spring and feed on plankton, so less plankton would likely cause fish populations to shrink, potentially leading to tighter fishing quotas and higher prices at grocery stores and restaurants.

Less ice could translate to longer fishing seasons, but winter storms could wreck nets and traps and destroy whitefish eggs that rely on the ice for protection, said Titus Seilheimer, a University of Wisconsin-Madison fisheries specialist.



A layer of ice covers Lake Michigan, Thursday, Feb. 2, 2023, in Chicago.
Credit: AP Photo/Erin Hooley

Charlie Henrikson runs a small commercial fishing operation off Wisconsin's Door County peninsula. He said his boats have been setting nets in February when they typically don't start the season until late March. He said he's most concerned about the lack of ice leading to more evaporation, which would cause lake levels to drop and make it harder to get his boats into port.

"I'm 71 years old, so I of course like it warmer. I like being able to walk out on the dock here and not have icy conditions. Whatever you want to call it, the weather's changing. And we're getting more extreme conditions. It will change our strategy and we'll be able to figure out ways to make use of it. You always have to adapt."

Less ice also could lead to a longer lake shipping season. But without ice blanketing the lakes, powerful winter storms could erode shorelines more than usual, which could push more sediment into harbors and make them shallower and trickier to navigate, said Eric Peace, vice president of the Lake Carriers Association, a trade group. Coupled with lower lake levels due to increased evaporation, ships might have to carry less cargo so they would sit higher in the water, he said.



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George Miller climbs out of the icy waters of Lake Michigan, Thursday, Feb. 2, 2023, in Chicago. Credit: AP Photo/Erin Hooley



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This year's lack of ice enabled Michigan Tech's Vick-Majors to launch a project to gather winter-specific data that scientists can compare to summer data. Researchers from around the Great Lakes are participating in sampling this month.

On a recent day, Madeline Magee and Rae-Ann Eifert, lake monitors for

the Wisconsin Department of Natural Resources, braved sub-freezing temperatures to gather buckets of lake water off a Racine breakwater as part of Vick-Majors' project.

The lake was completely open, an emerald expanse stretching to the horizon, and the wind was howling. High swells pounded the beach and showered Eifert as she stood on the breakwater, leaving her ski pants coated with beads of ice. Magee said the project is worth it.

"Continuing the data collection moving forward will only further inform what we know about the Great Lakes and how we might be able to manage the lakes more efficiently. ... If we lose ice cover, we really are changing the fundamental ecosystem of the Great Lakes in ways that we don't really understand right now," she said.

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