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Fast-melting Arctic ice may contribute to an 'extraordinary increase' in ocean acidification

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By Responsible Seafood Advocate

Ocean acidification in Arctic waters a 'big deal' that impacts marine life globally

An international team of researchers has found an “extraordinary increase” in ocean acidification and a strong correlation with the increasing rate of Arctic ice melting. The study, which was published in *Science* (<https://www.science.org/doi/10.1126/science.abo0383>), is the first analysis of Arctic acidification that includes data from more than two decades, spanning the period from 1994 to 2020.

Reviewing the data, the researchers found that the acidity of the Arctic waters was increasing three to four times faster than ocean waters elsewhere. An analysis of data gathered over 26 years confirmed a strong correlation between the accelerated rate of melting Arctic ice in the region and the rate of ocean acidification – a “perilous combination” that threatens the survival of plants, shellfish, coral reefs and other marine life and biological processes throughout the planet’s ecosystem.

Dr. Wei-Jun Cai, an expert in marine chemistry at the University of Delaware who was part of the research team, said more research is required to better understand the changing ocean chemistry and to better predict future changes, but so far, the data show the “far-reaching ripple effects of climate



An analysis of data gathered over 26 years confirmed a strong correlation between the accelerated rate of melting Arctic ice in the region and the rate of ocean acidification. Photo courtesy of Photo by Jaymantri (<https://www.pexels.com/photo/cold-glacier-iceland-melting-4797/>).

change.”

“If all of the multiple-year ice is replaced by first-year ice, then there will be lower alkalinity and lower buffer capacity and acidification continues,” he said. “By 2050, we think all of the ice will be gone in the summer. Some papers predict that will happen by 2030. And if we follow the current trend for 20 more years, the summer acidification will be really, really strong.”

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Due to human-caused climate change, scientists have predicted that by 2050 – if not sooner – Arctic sea ice in this region will no longer survive the increasingly warm summer seasons. As a result of this sea-ice retreat each summer, the ocean's chemistry will grow more acidic, with no persistent ice cover to

slow or otherwise mitigate the advance.

That creates life-threatening problems for the enormously diverse population of sea creatures, plants and other living things that depend on a healthy ocean for survival. For example, crabs live in a crusty shell built from the calcium carbonate prevalent in ocean water. Polar bears rely on healthy fish populations for food, fish and sea birds rely on plankton and plants and seafood is a key element of many humans' diets.

Ultimately, ocean acidification in these distant waters is "a big deal" that impacts the entire world. However, Cai said no one can predict what it will do to marine life and other living things that depend on healthy ocean waters.

"How will this affect the biology there?" Cai asked. "That is why this is important."

[Read the full article here \(https://www.science.org/doi/10.1126/science.abo0383\)](https://www.science.org/doi/10.1126/science.abo0383).

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