

Researchers find climate change impacts plankton, a key marine food source

April 27 2021



Credit: AI-generated image (disclaimer)

A key type of zooplankton's inability to adapt to climate change could have adverse implications for marine food chains across the world if a severe global warming event were to occur, researchers at Oxford University have found.



Their study investigated how planktonic foraminifera adapted to changing <u>climatic conditions</u> over the last 700,000 years, or seven global ice ages—with results demonstrating that the species maintained a static thermal niche over the period. This meant that they would need to seek out <u>suitable habitats</u> or risk extinction if the climate change were sudden and dramatic.

In comparison, zooplankton species with flexible niches would be able to adapt to such changing conditions.

The scientists used an atmosphere-ocean global climate model to chart species' occupied mean annual temperatures at both sea surface and the depth of their habitats. They were also able to use the fossil records of the foraminifera to build an accurate record of the species' past distribution patterns. The species constructs "shells" of calcite that capture carbon and record an isotopic signature of past ocean conditions, accumulating in abundance over large areas of the seafloor.

Lead author and Ph.D. student Gwen Antell, from the Department of Earth Sciences, University of Oxford, said: "There are so many unknowns when it comes to how climate change impacts any given species' ability to adapt.

"Our research provides an important starting point in efforts to understand how sensitive underwater environments are to climate change and how it can affect even single-celled <u>species</u> in our oceans."

While it is unlikely foraminifera will completely disappear from our oceans in the event of a sudden <u>warming</u> event, they would most probably redistribute across the world, say the scientists. This, they added, will likely have a cascade effect on the rest of the marine food-chain.



Gwen Antell said: "At this stage it is unclear what that effect would be.

"What we can be sure of is that <u>climate</u> change is ongoing, as demonstrated by continuously warming and acidifying oceans. Therefore, taking steps to mitigate this is paramount."

The scientists have also called for further support to drive research that aims to better understand how marine populations change and migrate as <u>global warming</u> continues.

"Thermal niches of planktonic foraminifera are static throughout glacial-interglacial <u>climate change</u>" is published in *Proceedings of the National Academy of Sciences*.

More information: Gwen S. Antell et al. Thermal niches of planktonic foraminifera are static throughout glacial–interglacial climate change, *Proceedings of the National Academy of Sciences* (2021). DOI: 10.1073/pnas.2017105118

Provided by University of Oxford

Citation: Researchers find climate change impacts plankton, a key marine food source (2021, April 27) retrieved 6 May 2024 from <u>https://phys.org/news/2021-04-climate-impacts-plankton-key-marine.html</u>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.