

94-million-year-old climate change event holds clues for future

June 22 2016

A major climate event millions of years ago that caused substantial change to the ocean's ecological systems may hold clues as to how the Earth will respond to future climate change, a Florida State University researcher said.

In a new study published in *Earth and Planetary Science Letters*, Assistant Professor of Geology Jeremy Owens explains that parts of the [ocean](#) became inhospitable for some organisms as the Earth's climate warmed 94 million years ago. As the Earth warmed, several natural elements—what we think of as vitamins—depleted, causing some organisms to die off or greatly decrease in numbers.

The elements that faded away were vanadium and molybdenum, important trace metals that serve as nutrients for ocean life. Molybdenum in particular is used by bacteria to help promote nitrogen fixation, which is essential for all forms of life.

"These trace metals were drawn down to levels below where primary producing organisms, the base of the ocean food chain, can survive," Owens said. "This change inhibited biology."

The warming of the Earth during this time period took place over millions of years. At the time, the world was a drastically different place. Palms were found in Canada and lily pads dotted the Arctic Circle, while dinosaurs existed on land.

But as the world continued to warm, it caused "a natural feedback that had a dramatic effect on the world's ocean chemistry, which is recorded in the rock record," Owens said.

Owens and a team of researchers examined samples of sediment provided through the Ocean Drilling Program, a National Science Foundation-supported program that uses the scientific drill ship JOIDES Resolution to recover samples beneath the ocean floor off the coast of Venezuela. They examined a 10-meter portion that they pinned to the climate turnover event by analyzing microfossils or tiny shell organisms in the layer.

Owens found that ecological communities experienced a substantial shift 94 million years ago because many types of bacteria and algae were affected by the changes in ocean nutrients.

"Some of these species didn't totally die, but they didn't flourish the way they used to," Owens said.

The decrease of these trace metals also suggests a global expansion of oxygen deficiency, which could lead to larger dead zones in bodies of water around the world, meaning little to no life could exist in those areas.

That is of concern to scientists as they try to understand what will happen to the world around us as the Earth continues to warm. For scientists, the events of 94 million years ago provide a possible glimpse into future [climate change](#) scenarios.

"This is the best window to understanding future climate change," Owens said. "It gives us insight into the cascade of events that can affect the entire ocean."

Provided by Florida State University

Citation: 94-million-year-old climate change event holds clues for future (2016, June 22)
retrieved 26 April 2024 from

<https://phys.org/news/2016-06-million-year-old-climate-event-clues-future.html>

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.