

# Ancient global warming a warning for modern era, researchers say

**David Perlman, San Francisco Chronicle, 3-30-15**

An ancient episode of global warming swiftly destroyed the balance of life in the world's oceans, and it took thousands of years before that life recovered, California climate researchers report.

The scientists said they saw a clear warning for today, when the climate is changing rapidly and the world depends increasingly on the ocean's ecosystems for sustenance.

"When an ecosystem is affected by the changing climate, it can collapse very quickly," said Peter Roopnarine, curator of invertebrate zoology and geology at the California Academy of Sciences and a member of the team reporting on the ancient climate episode. "We humans rely on the ocean's life for our own lives, and this evidence tells us how urgent it is to stop our own continued global warming."

Scientists at the UC Davis Bodega Marine Laboratory and the California Academy of Sciences studied more than 5,400 fossil organisms — sea snails, clams, sand dollars, sea urchins and innumerable other species — all recovered from inside a 34-foot-long core of sedimentary rock taken by a research vessel from the sea floor off Santa Barbara six years ago.

Those organisms had lived between 3,400 and 16,100 years ago, and earlier research has shown that the beginning of the period was marked by clear evidence of global warming.

Polar ice caps were melting, glaciers were falling from mountains into the seas, and lowered oxygen levels were turning large ocean areas into "dead zones" similar to those that are being detected today off the Pacific Coast.

At the beginning of that ancient period, evidence from the core sample shows that life with all its varied species was abundant on the ocean floor and the ocean itself was well-oxygenated, the researchers said. Then, as the climate warmed, oxygen levels in the ocean fell swiftly — in less than 100 years, the researchers said — and the variety of species on the ocean floor diminished rapidly. The fossils in the core sample nearly disappeared, they reported.

Earlier studies of single-cell organisms called foraminifera indicated the species may have recovered in barely 100 years, but the new research shows clear evidence that recovery of abundant life forms took thousands of years, the scientists said.

The report by the California researchers was published Monday in the Proceedings of the National Academy of Sciences.

Sarah Moffitt, a postdoctoral scholar at UC Davis and the university's Bodega Marine Lab in Bodega Bay, led the research team and analyzed each type of fossil life in each segment of the core sample.

"These past events show us how sensitive ecosystems are to changes in the climate," Moffitt said. "I was struck by how little time it took for species of life in the nearby ocean to be disturbed by changes in the Earth's climate, and how long it took for them to recover. We humans don't have those thousands of years to recover."