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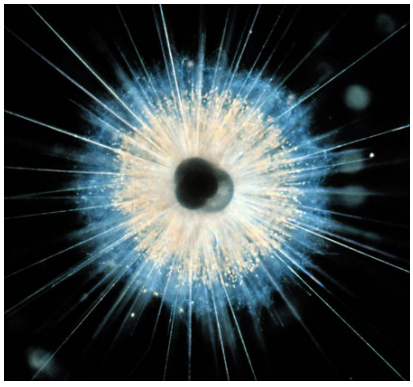

Climate recorder. Chemical changes over time in the fossils of microscopic sea creatures called planktonic foraminifera can help scientists track ancient sea levels.

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Lessons From an Interglacial Past

By Phil Berardelli
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When the Nobel Prize-winning Intergovernmental Panel on Climate Change (IPCC) issued its latest report on global warming last summer, one of its most dramatic predictions was that sea levels would rise as much as 0.58 meters during the next century--enough to threaten coastal cities in Southeast Asia and North America. That's nothing, however, compared to what happened about 124,000 years ago. At a certain point during the warm "interglacial" between the last two ice ages, scientist have calculated, sea levels rose almost three times as fast. Given that the IPCC report predicts surface temperatures will reach similar levels during the next 100 years, the panel's dire forecast may not be dire enough.

Locked in ice or flowing freely, the world's amount of water remains relatively constant. But sea levels can undulate 100 meters up or down over several millennia, depending on the ratio of water to ice. That's about how much seas dropped, for example, during the last ice age, which ended about 15,000 years ago--enough to allow the ancestors of Native Americans to walk from Siberia to Alaska courtesy of a land bridge that surfaced across the Bering Strait.

Now an international research team has discovered that during the warm period following the next-to-last ice age, when global temperatures reached at least 2°C above the current average, the seas rose by as much as 6 meters over just a few hundred years. The team reached this conclusion by analyzing microfossil-containing sediments from the floor of the Red Sea. Those sediments preserve the ratio of certain oxygen isotopes that provide strong signals about the strength of currents and other factors. By tracking the ratio over the time the sediments span, the researchers have been able to compute the rate of flow into the Red Sea from the Indian Ocean, which indicates the level of the water. Their analysis, reported online this week in *Nature Geoscience*, shows that as global warming was in the process of melting the continental glaciers about 124,000 years ago, sea levels began rising at the relatively blistering rate of about 1.6 meters per century. Some

of the evidence also shows downswings and upswings in sea level, presumably related to swings in global temperature during the interglacial period.

The rapid rate in ancient times remains relevant, says geoscientist and lead author Eelco Rohling of the University of Southampton's National Oceanography Centre in the U.K. It "offers a warning" to climatologists that sea-level changes can depend strongly on factors that influence ice formation and melting--factors that he says current IPCC climate models understate. The per-century rate of 0.6 meters that the models are predicting for the near future is 1.0 meter less than the findings of Rohling's team. That difference, he says, "clearly identifies" the need to improve the climate models to reflect the impact of glaciation and melting.

Other experts aren't so sure. Geologist William Thompson of Woods Hole Oceanographic Institution in Massachusetts says that although the IPCC estimates indeed "may be too conservative" and the Red Sea research provides an "important contribution to our understanding of past sea-level changes," there are "significant uncertainties" in the method used by the team, and other studies haven't shown "such high rates of sea-level change."

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