

Global Warming Doubles Rate Of Ocean Rise

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Global ocean levels are rising twice as fast today as they were 150 years ago, and human-induced warming appears to be the culprit, say scientists at Rutgers, The State University of New Jersey, and collaborating institutions.

While the speed at which the ocean is rising – almost two millimeters per year today compared to one millimeter annually for the past several thousand years – may not be fodder for the next disaster movie, it affirms scientific concerns of accelerated global warming.

In an article published in the Nov. 25 issue of the journal *Science*, Rutgers professor of geological sciences Kenneth G. Miller reports on a new record of sea level change during the past 100 million years based on drilling studies along the New Jersey coast. The findings establish a steady millimeter-per-year rise from 5,000 years ago until about 200 years ago.

In contrast, sea-level measurements since 1850 from tidal gauges and more recently from satellite images, when corrected for land settling along the shoreline, reveal the current two-millimeter annual rise.

"Without reliable information on how sea levels had changed before we had our new measures, we couldn't be sure the current rate wasn't happening all along," said Miller. "Now, with solid historical data, we know it is definitely a recent phenomenon.

"The main thing that's changed since the 19th century and the beginning

of modern observation has been the widespread increase in fossil fuel use and more greenhouse gases," he added. "Our record therefore provides a new and reliable baseline to use in addressing global warming."

The new sea level record spanning 100 million years of geologic time is the first comprehensive one scientists have produced since a commercial research endeavor in 1987, which, according to Miller, was not fully documented and verifiable.

The findings by Miller's team argue against some widely held tenets of geological science. Miller claims, for example, that ocean heights 100 million years ago and earlier were 150 to 200 meters lower than scientists had previously thought. Changes at these levels can only be caused by the Earth's crust shifting on the ocean floor. Miller's findings, therefore, imply less ocean-crust production than scientists had widely assumed.

During the Late Cretaceous period (the most recent age of dinosaurs), frequent sea-level fluctuations of tens of meters suggest that the Earth was not always ice-free as previously assumed. Ice-volume changes are the only way that sea levels could change at these rates and levels, Miller claims. This suggests small- to medium-sized but short-lived ice sheets in the Antarctic region, and casts doubt whether any of the Earth's warmer eras were fully ice-free.

Miller's team took five 500-meter-deep core samples of sediments onshore along New Jersey's coastline from Cape May to Sandy Hook. The scientists examined the sediment type, fossils, and variations in isotopes, or different forms of the same elements, at different levels in the cores they extracted. Miller also correlated these measurements with others from throughout the world to substantiate the global nature of their record.

The Rutgers study included participants from the New Jersey Geological Survey, the Lamont-Doherty Earth Observatory of Columbia University, Western Michigan University, the University of Oregon and Queens College in Flushing, N.Y. The National Science Foundation provided major funding for the study.

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