

# Pacific Ocean warming 15 times faster than before

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**Doyle Rice, USA Today, 10-31-13**

Although the temperature of the Earth's atmosphere may have hit the "pause" button recently — with little global warming measured over the past few years — that hasn't been the case with the oceans.

In a study out today in the journal *Science*, researchers say that the middle depths of a part of the Pacific Ocean have warmed 15 times faster in the past 60 years than they did during the previous 10,000 years.

Most of the heat that humanity has put into the atmosphere since the 1970s from greenhouse gas emissions has likely been absorbed by the oceans, according to the most recent report from the Intergovernmental Panel on Climate Change, a United Nations-sponsored group of scientists that issues reports every few years about the effects of global warming.

"Increases in ocean heat content and temperature are robust indicators of global warming during the past several decades," according to today's *Science* study.

"We're pumping heat into the ocean at a faster rate over the past 60 years," said study lead author Yair Rosenthal, a climate scientist at Rutgers University. "We may have underestimated the efficiency of the oceans as a storehouse for heat and energy," he added. "It may buy us some time — how much time, I don't really know. But it's not going to stop climate change."

"It's not so much the magnitude of the change, but the rate of change," noted study co-author Braddock Linsley, a Columbia University climate scientist. "We're experimenting by putting all this heat in the ocean without quite knowing how it's going to come back out and affect climate."

He said that in the past six decades the temperature of the Pacific Ocean water studied (from the surface to about 2,200 feet below) has increased by about one-third of a degree Fahrenheit. (The specific area studied was in the Pacific near Indonesia, chosen because that's a typical sample of Pacific Ocean water.) Researchers say that while the amount of warming might seem small in the scheme of things, it's the rate of warming that's so alarming, Linsley said.

The researchers found that Pacific Ocean water has generally been cooling over the past 10,000 years, until about 800 years ago, when temperatures started to slowly rise. (Then fell again, during the so-called Little Ice Age from the mid-1500s to mid-1800s). It's been only in the past few decades, though, that the rate has dramatically increased.

The Earth's atmosphere has been about the same temperature for the past 15 years or so, providing fuel for skeptics of man-made global warming. However, this study, along with other recent research, finds that heat absorbed by the planet's oceans has increased significantly.

Obviously, there were no thermometers taking measurements of ocean temperatures over the past few thousand years (instrument records from buoys go back only to the 1960s). So scientists had to use "proxy" sources to measure temperature. In this case, it was fossils of ancient marine life — little shelled animals known as foraminifera — that could be analyzed to reconstruct the climates in which they lived over millennia.

"This is a relatively new way of measuring past temperature data," Rosenthal noted.

How long will this pause in atmospheric temperature last? It may be up to natural variability in the Pacific: When the La Niña climate pattern (cooler than average Pacific Ocean water) switches, and the Pacific reverts to a warmer-than-usual El Niño phase, global temperatures may likely shoot up again, along with the rate of warming, said Kevin Trenberth, a climate scientist at the National Center for Atmospheric Research in Boulder, Colo., who was not involved in the research.

"With global warming, you don't see a gradual warming from one year to the next," Trenberth said. "It's more like a staircase. You trot along with nothing much happening for 10 years and then suddenly you have a jump and things never go back to the previous level again."