

Study of past warming signals major sea level rise ahead

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Scientists have already predicted the Earth is likely to see multiple meters of sea level rise in the years to come, a development that will swallow many of the planet's coastal communities

Scientists who study patterns of natural shifts in the Earth's climate said Thursday they have uncovered a "worrisome" signal that major sea level rise could be on the way.

The findings in the journal *Science* show that ocean surface temperatures during the Earth's last warm period, some 125,000 years ago, were remarkably similar to today.

But what concerns scientists is that [sea level](#) back then was 20-30 feet (six to nine meters) above what it is today.

"The trend is worrisome," said the report led by researchers at Oregon State University, University College Dublin, the University of Wisconsin and the Science Museum of Virginia.

"Collectively, these results may help scientists better understand how oceans will respond to modern warming."

Our planet goes through periods of warm and cold that last tens of thousands of years, and are influenced by changes in Sun exposure caused by natural variations in the Earth's orbit, combined with the influence of greenhouse gases in the atmosphere.

These naturally occurring shifts are different than the much faster pace of warming facing the Earth today, as humans burn fossil fuels for energy and send heat-trapping carbon emissions into the air, leading to ice melt and [sea level rise](#).

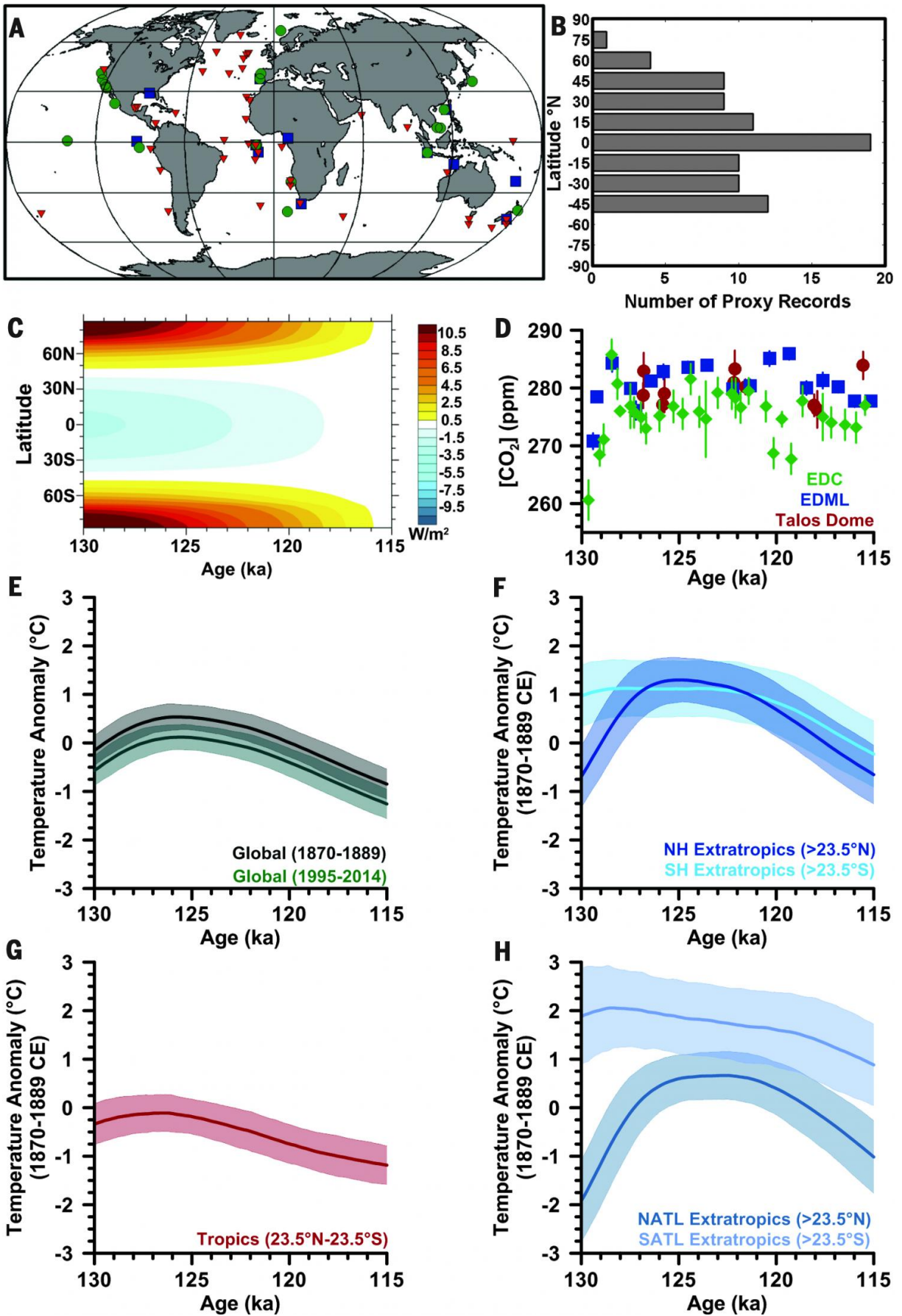
The last time the climate was unusually warm—in the absence of human influence—was about between 116,000 and 129,000 years ago, during what is known as the Last Interglacial Period.

It was one of the warmest periods in the last 800,000 years, according to the report.

'Humanity's rapid impact'

The basis for the study was an analysis of 83 marine sediment core sites, which can give clues to how warm the Earth and oceans were in the past.

Each core site was compared to data sets from 1870-1889 and 1995-2014, respectively.



Data from the study by Jeremy Hoffman et al. representing sample sites, sea surface temperatures, and historic carbon dioxide levels. Credit: J.S. Hoffman et al., Science (2017)

The analysis showed that 129,000 years ago, the global [ocean surface temperature](#) "was already similar to the 1870-1889 average."

The temperature rose over the next 4,000 years, "reaching a temperature indistinguishable from the 1995-2014 average."

The finding means that some scientific models that have been used to estimate sea levels at various temperatures could have been underestimates.

Scientists have already predicted the Earth is likely to see multiple meters of sea level rise in the years to come, a development that will swallow many of the planet's coastal communities, currently home to one billion people.

No one knows how fast the seas may rise in the decades to come, but some experts say the latest study is cause for alarm.

"The result that present global sea surface temperatures are indistinguishable from those at the last interglacial 125,000 years ago is extremely worrying since sea levels were six to nine meters higher then compared to present," said Richard Allan, professor of climate science at the University of Reading, who was not involved in the study.

Allan said it could be thousands of years before modern sea levels catch up, and that cuts in fossil fuel use could still help.

"Due to the length of time it takes to heat up the depths of our vast oceans and to melt giant ice sheets it would take thousands of years before sea level could potentially rise to such levels, so sustained and substantive cuts in greenhouse gas emissions from energy-intensive activities remain vital and beneficial to societies."

Meric Srokosz, a marine physics and ocean climate scientist at the University of Southampton, said the study is significant because it shows that changes in temperatures which occurred over thousands of years, are now occurring in the space of a single century.

"This demonstrates humanity's rapid impact on the planet and raises the possibility of significant longer-term rises in sea level," added Srokosz.

Andrew Watson, a professor at the University of Exeter, said the study's takeaways are both good and bad.

"The study suggests that in the long term, sea level will rise six meters at least in response to the warming we are causing," he said.

"The good news is that with luck it will continue to rise slowly, so that we have time to adapt, but the bad news is that eventually all our present coastal city locations will be inundated."

More information: "Regional and global sea-surface temperatures during the last interglaciation," *Science*, [science.sciencemag.org/cgi/doi/... 1126/science.aai8464](https://doi.org/10.1126/science.aai8464)

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