

CO2 and Global Warming Models

Global Climate, Methane Burps and the 12 Mile Blob

By [Washington's Blog](#)

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Theme: [Environment](#)

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As USA Today recently [pointed out](#), a new study published in the journal *Nature Geoscience* shows that the models of CO2 and global warming used by most scientists could be wrong.

Specifically:

During the warming period, known as the “Palaeocene-Eocene thermal maximum” (PETM), for unknown reasons, the amount of carbon in Earth’s atmosphere rose rapidly. This makes the PETM one of the best ancient climate analogues for present-day Earth...

The conclusion, Dickens said, is that something other than carbon dioxide caused much of this ancient warming. “Some feedback loop or other processes that aren’t accounted for in these models — the same ones used by the Intergovernmental Panel on Climate Change for current best estimates of 21st century warming — caused a substantial portion of the warming that occurred during the PETM

Methane Burps?

A 2006 article in the New York Times [gives](#) one possible explanation for the “feedback loop or other process” which could have caused the warming during the PETM:

Reservoirs of methane frozen at the bottom of the ocean begin to thaw, releasing bubbles that rise to the surface. Soon the ocean surface is churning and burping gas like a billion overfed infants, transforming the composition of our atmosphere.

[The above scenario is] one of the more bizarre and frightening ways in which global warming could devastate our planet — what scientists have dubbed the “methane burp”...

Methane is a greenhouse gas that is 20 times more powerful than carbon dioxide. And thousands of gigatons of methane, equivalent to the total amount of coal in the world, lie deep within the oceans in the form of ice-like solids called methane hydrates.

The big question is whether global warming ... will thaw some of these methane hydrates. If so, the methane might be released as a gargantuan oceanic burp. Once in the atmosphere, that methane would accelerate the greenhouse effect and warm the earth and raise sea levels even more...

And as long as I’m fear-mongering, there was also a better understood

warming 55 million years ago, known as the Paleocene-Eocene Thermal Maximum, or PETM. That was a period when temperatures shot up by 10 degrees Fahrenheit in the tropics and by about 15 degrees in polar areas, and many scientists think it was caused by the melting of methane hydrates.

“The PETM event 55 million years ago is probably the most likely example of their impact, though there are smaller events dotted through the record,” says Gavin Schmidt, a NASA expert on climate change. He emphasizes the uncertainties, but adds that since we are likely to enter a climate that hasn’t been seen for a few million years, it’s reasonable to worry about methane hydrates.”

It is not just the Times speculating on methane burps as the main source of global warming. [Many scientists](#) have proposed that explanation (and see [this](#)). See also this [ABC report](#), and this [essay](#) from the Baltimore Sun.

So are “methane burps” from the ocean floor the source of runaway warming during the PETM?

Well, the methane burp hypothesis has suffered a setback over the past 3 years.

As a 2006 article from Nature [notes](#):

Methane escaping from the sea floor to the atmosphere has been a popular suspect for causing rapid climate changes during and at the end of the last ice age. But new data derived from a Greenland ice core have delivered a killer blow to the idea...

But now an isotope analysis of methane trapped in bubbles of a Greenland ice core seems to disprove the idea...

Todd Sowers, a palaeoceanographer at Pennsylvania State University in Philadelphia, measured hydrogen isotopes of atmospheric methane from three distinct warming episodes, 38,000, 14,500 and 11,500 years ago. Methane from clathrates [the rock strata that contains the methane] contains more deuterium (the heavy form of hydrogen) than methane from land-based sources...

He found no evidence whatsoever in the data for increased amounts of methane from marine clathrates. “This means that seafloor methane reservoirs must have been stable at these times, or at least that no significant amounts of methane escaped the ocean,” says Sowers, whose study is published in Science this week.

“The data are convincing,” says Kai-Uwe Hinrichs, a geochemist at the University of Bremen in Germany. “They won’t exactly increase the attractiveness of the clathrate gun hypothesis.” At least for the three periods Sowell has looked at in high resolution, they may even be a “killer argument”, adds Jerome Chappellaz, a geochemist at the CNRS Laboratory of Glaciology and Geophysics of the Environment in Grenoble, France.

And as the Saint Louis-Dispatch [wrote](#) in April:

And now for a little good news on the climate change front.

For years, scientists have worried that climate change could trigger a huge release of methane gas from seafloor deposits, sending planetary warming into overdrive. Fueling those concerns was a previously unexplained burp of methane that occurred about 12,000 years ago.

Scientists, however, have recently determined that ancient release of methane was likely due a large expansion of wetlands. Wetlands, which produce a large amount of methane from the breakdown of organic matter, are known to have spread during warming trends throughout history.

To reach that conclusion, scientists collected almost 15 tons of ice from a Greenland ice sheet and measured the ancient air trapped within. From those samples, they deduced that a particular isotope found in the ice did not come from seafloor methane deposits.

If the methane didn't come from the ocean floor, where did it come from? Expanding wetlands?

Maybe. But it turns out that [melting permafrost also releases methane](#).

The Blob

As you might have heard, a mysterious [blob of unknown organic material up to 12 miles long](#) has appeared off Alaska's northern coast:



Locals say that the blob is organic in nature, and isn't a chemical spill.

The question in my mind is whether the giant blob was caused by the melting of permafrost. In other words, melting permafrost could cause fragile surrounding vegetation to lose its anchoring and protection, causing it wash into rivers and the ocean. I'm not the only one who has [asked this question](#).

Other Causes

I have no idea whether it was really methane, or the sun, or something else which helped heat things up during the PETM.

I studied global warming in one of my classes at a top university several decades ago, and the professor didn't say anything about the sun's influence. It turns out, however, that [the sun does play a role of the sun in global climate](#).

And a new [peer-reviewed study](#) indicates that the Southern Oscillation (El Niño) may play a role.

So things are more complicated than I learned at school.

I also don't know whether the giant blob came from melting permafrost.

But scientists should figure it out. Climate scientists have to honestly address these issues, instead of being wedded to whatever theories will get them the most funding.

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