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Op-Ed Columnist

The Big Burp Theory of the Apocalypse

By [NICHOLAS D. KRISTOF](#)

It's a dark and stormy night, and deep within the ocean the muddy bottom begins to stir.

Giant squids flee in horror as 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.

That's a scene from a new horror movie I'm envisioning, called "Killer Ocean." I'm hoping it might play in the White House and Congress, because it depicts one of the more bizarre and frightening ways in which global warming could devastate our planet — what scientists have dubbed the "methane burp."

Since President Bush is complacent about conventional risks from climate change, such as the prospect that those of us in Manhattan will end up knee-deep in the Atlantic, let's try fear-mongering.

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 — temperatures have risen about one degree Fahrenheit over the last 30 years — 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.

"The juiciest disaster-movie scenario would be a release of enough methane to significantly change the atmospheric concentration," suggests the excellent discussion of methane hydrates by scholars at www.realclimate.org.

One reason for concern about a methane hydrate apocalypse is that something like it may have happened several times in the past. For example, 251 million years ago, there was a catastrophe known as the Permian extinction that came close to wiping out life on earth.

Nobody is sure what caused the Permian extinction, but one theory is that it was methane burps.

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.

To be sure, some experts are skeptical. Daniel Schrag, a geochemist at Harvard, doubts that methane hydrates were the culprit 55 million years ago. For starters, he says, the theory doesn't offer a good explanation of the initial change that melted the methane hydrates.

For all the uncertainty, there is an important point here: The history of climate shows that it does not evolve slowly and gracefully, it lurches. There are tipping points, and if we trigger certain chain reactions, then our leaders cannot claim a mulligan. They could set back our planet for, say, 10 million years.

The White House has used scientific uncertainty as an excuse for its paralysis. But our leaders are supposed to devise policies to protect us even from threats that are difficult to assess precisely — and climate change should be considered even more menacing than a nuclear-armed Iran.

Moreover, uncertainty cuts both ways. The best guess of climate experts is that the seas will rise by two feet by 2100, but if the West Antarctic Ice Sheet were to melt, then that alone would raise the seas by 20 feet.

Frankly, it's the well-known risks of rising temperatures and sea levels — more than worry about a cataclysmic methane burp — that should drive us to curb carbon emissions.

But our political system doesn't seem able to grapple with scientific issues like climate. Our only hope for firm action would be a major U.S.-led global initiative to curb carbon, and the Bush administration has already dropped the ball on that.

The best reason for action on global warming remains the basic imperative to safeguard our planet in the face of uncertainty, and our leaders are failing wretchedly in that responsibility. If we need an apocalypse to concentrate our minds, then just imagine our descendants sitting on the top of Mount Ararat beside their ark, cursing us for triggering a methane burp.

John Tierney is on vacation.

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