

Runaway Climate Change and rapid Global Warming

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The Carbon Tax/ETS Con will not affect Climate Change

Antarctic researchers found as much as 400 billion metric tons of carbon hidden under the ice sheets, with the potential to seep out as methane and accelerate global warming.



Methane released under sea ice as Climate Warms

The carbon stored under Antarctic ice is on par with the amount held in the northern hemisphere's frozen permafrost soils and the lower end of estimates for methane trapped under the Arctic Ocean, according to Jemma Wadham, professor of Glaciology at the U.K.'s University of Bristol and lead author of a study in the journal *Nature* yesterday.

Release of methane, a greenhouse gas 25 times more potent than carbon dioxide, from under melting ice has the potential to create a feedback loop where higher temperatures result in changes that add to global warming.

"There's a potentially large pool of methane hydrate in part of the Earth where we haven't previously considered it," Wadham said in a telephone interview. "Depending on where that hydrate is, and how much there is, if the ice thins in those regions, some of that hydrate could come out with a possible feedback on climate."

The United Nations Intergovernmental Panel on Climate Change in 2007 estimated the smaller West Antarctica ice sheet is shrinking and larger East sheet growing or stable, concluding that the continental balance ranged from an annual gain of 50 gigatons to a loss of 200 gigatons in the decade through 2003. Its next major assessment of the effects of climate change is due in four volumes from September 2013 to October 2014.

Methane Release

While complete melting of the ice sheets isn't likely for thousands of years, according to the UN, Wadham said smaller changes may release some of the methane trapped in hydrates.

"That hydrate is stable as long as you don't change the temperature or pressure," she said. "In Antarctica, though you might not have a big temperature change at the bed of the ice sheet, if the ice thins, the pressure drops and some of that hydrate could be converted into gas bubbles and then lost."

The concentration of methane in the atmosphere rose 0.28 percent to 1,808 parts per billion in 2010, the highest since records began, the UN said in November. Scientists including James Hansen have said the decline of Arctic sea ice, which this year has shrunk to the lowest extent on record, may be a harbinger of greater changes, including the release of methane compounds from the permafrost -- or frozen soils.

A study in *Nature* in December found thawing of permafrost may release the equivalent of 380 billion tons of carbon dioxide this century if the Arctic warms by 7.5 degrees Celsius (13.5 degrees Fahrenheit). That includes large quantities of methane, which may further increase the uptick in temperatures.

Study Countered

The International Energy Agency last year said with current energy policies worldwide, the global average temperature may climb by more than 3.5 degrees, which may translate to an increase of 7 degrees in the faster-warming Arctic. In its 2007 report, the UN observed "a cooling over most of interior Antarctica," a finding countered by a study in *Nature* in 2009.

Wadham's team used computer models to predict how much methane might be trapped under the ice. They also tested sub- glacial soils from Antarctica and the Arctic in laboratory conditions to confirm organisms in the earth below the ice can produce methane. It isn't yet possible to say over what period it may escape because of the "many uncertainties," she said.

"All these things throw up more questions than answers initially," Wadham said. "That provides you with a reason to go to look to perhaps drill into sediments underneath the ice sheet to see if hydrates are there."

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Thawing permafrost frees millions of tons of carbon: study

staff report [AFP](#)

PARIS — A vast outcrop of the Arctic Siberian coast that had been frozen for tens of thousands of years is releasing huge carbon deposits as rising temperatures thaw parts of its coastline, a study warned Wednesday.

The carbon, a potential source of Earth-warming CO₂, has lain frozen along the 7,000-kilometre (4,400-mile) northeast Siberian coastline since the last Ice Age.

But atmospheric warming and coastal erosion are gnawing at the icy seal, releasing about 40 million tonnes of carbon a year — 10 times more than previously thought, said a study in the journal *Nature*.

About two-thirds of the carbon escapes into the atmosphere as carbon dioxide (CO₂) and the rest becomes trapped in higher layers of ocean sediment.

About half the carbon pool in soil globally is held in permafrost in the Arctic, a region that is experiencing twice the global average of climate warming, said the study led by researchers at Stockholm University.

Earlier this week, US scientists said the sea ice in the Arctic Ocean had melted to its smallest point ever.

The region covered by the Nature study, called Yedoma, is twice the size of Sweden but has been poorly researched because it is so remote.

The finding touches on a vicious circle, or positive feedback in climate parlance.

Under this, man-made warming caused by the burning of fossil fuels releases naturally-occurring stocks of CO₂ that have been stored in permafrost since the last Ice Age, called the Pleistocene.

The released gases in turn add to global warming, which frees even more locked-up carbon, and so on.

“Thermal collapse and erosion of these carbon-rich Pleistocene coastline and seafloor deposits may accelerate the Arctic amplification of climate warming,” the paper warned.

The atmospheric leakage from Yedoma is equivalent to the annual emissions of around five million passenger cars, on the basis of average carbon output (five tonnes per year) of vehicles in the United States.

In a separate study also in Nature, researchers in Britain, the Netherlands and the United States used computer models to estimate there could be as much as four billion tonnes of methane under Antarctica’s icesheet.

Methane is 25 times more efficient at trapping solar heat than carbon dioxide.

Before it froze over, the region teemed with life whose organic remains became trapped in sediment later covered by ice sheets.

“Our modelling shows that over millions of years, microbes may have turned this old organic carbon into methane,” which could boost climate warming if released by icesheet collapse, the researchers said in a statement.

The collapse of the Antarctic icesheet is considered an extremely remote scenario by most climatologists, and some studies have suggested that parts of it could be thickening, due to localised increases in snowfall.

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Jungle Drum Prose/Poetry. <http://jungledrum.lingama.net/news/story-78.html>