Medium

Why Boiling Methane in Arctic Seas Should Scare the Crap out of us: New Data Shows the Numbers Are Rising

Glenn Fay, Jr. Dec 16 · 4 min read

Photo by Glenn Fay

Recently scientists in the Arctic sea measured high methane in the air along with prolific underwater methane bubbles rising from the mud under the water.

Methane, the greenhouse gas that is produced by bacteria and found in flatulent mammals, natural gas wells, oilfields, among other things, is getting headlines. Unfortunately, methane is more than 20 times more potent than carbon dioxide in its ability to raise the temperature of the air.

Thawing Permafrost Releases Methane

Trillions of metric tons of methane, stored in chemical compounds are frozen into the permafrost mud and under oceans. As the permafrost warms and thaws, the methane is released into the air. Some believe the methane release has crossed a critical threshold that increases the risk of a relatively sudden release of methane. The 2019 Arctic Report Card, a federal study, reports that thawing permafrost throughout the Arctic could be releasing an estimated 300–600 million tons of net carbon per year to the atmosphere.

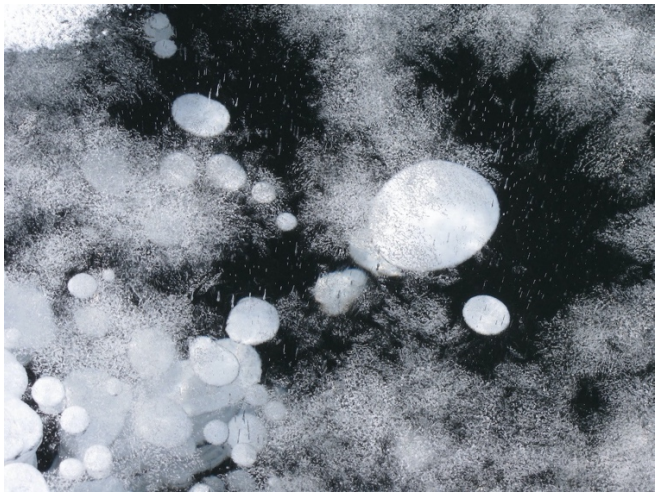


Photo by Glenn Fay

This phenomenon has been called a "methane bomb" by some, who fear that the potent greenhouse gas, once released will quickly heat the atmosphere, with the heat accelerating more methane release in a positive feedback loop. This scenario, although scary, is not likely to happen all at once though, according to Carolyn Ruppel of the USGS. But even if a bomb-like sudden release doesn't happen, there are still plenty of reasons to worry about it the permafrost methane.

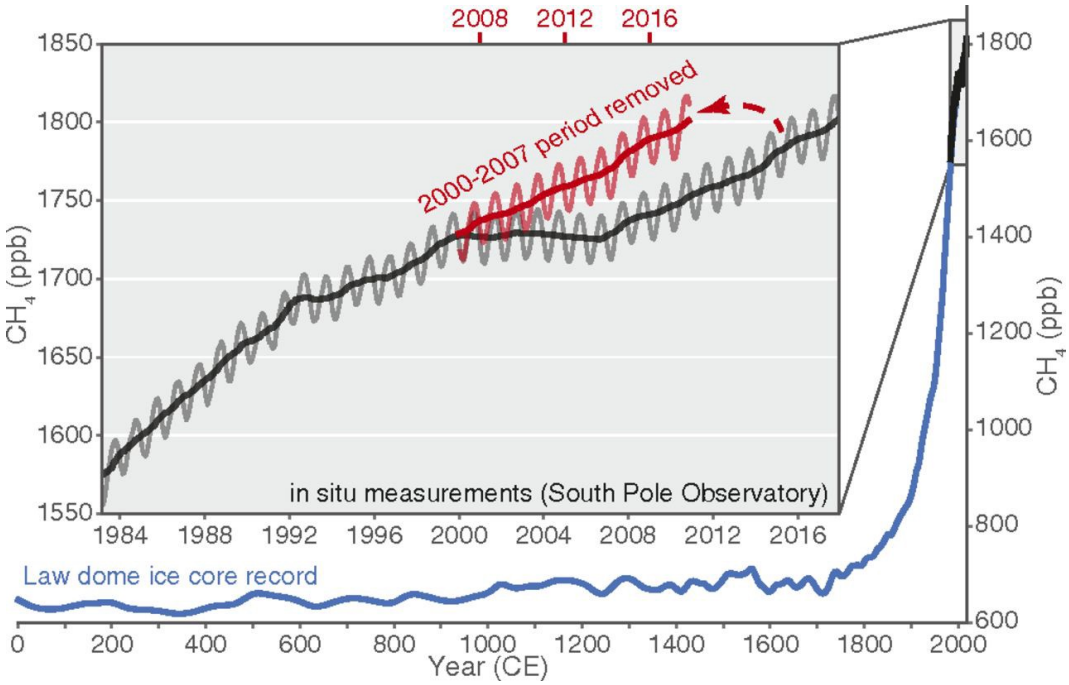
Since methane is so efficient at warming the air and there is so much of it available to be released, it is obviously still a threat over time. Unlike human-produced carbon dioxide, it is safely frozen in the crust — albeit temporarily. The threat of its eventual release, especially without hope of reversing it once it's in the air makes decarbonizing the air now all the more urgent.

Nonetheless, the permafrost research highlights, authored by Ted Schuur, in the 2019 Arctic Report Card include:

"Northern permafrost region soils contain 1,460–1,600 billion metric tons of organic carbon, about twice as much as currently contained in the

atmosphere. This pool of organic carbon is climate-sensitive. Warming conditions promote microbial conversion of permafrost carbon into the greenhouse gases carbon dioxide and methane that are released to the atmosphere in an accelerating feedback to climate warming. New regional and winter season measurements of ecosystem carbon dioxide flux independently indicate that permafrost region ecosystems are releasing net carbon (potentially 0.3 to 0.6 Pg C per year) to the atmosphere. These observations signify that the feedback accelerating climate change may already be underway."

Anthropogenic Emissions



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New research published in a 2019 article of the Proceedings of the National Academy of Sciences (PNAS) says that methane is consistently rising. As Turner, et. al. say in that article, "reducing anthropogenic methane emissions will slow or reverse the rise in atmospheric concentrations; however, depending on the timescale and magnitude of reduction, it may take decades before atmospheric levels decline. When considering recent decades, the stabilization period is emerging as anomalous due in part to fluctuations in natural sources/sinks, whereas the last decade of growth continues the long-term, increasing trend that is due to human activities."

And another November 2019 report published in Nature concludes that in addition to methane, large quantities of CO2 are being emitted due to warming from northernmost polar soils and since those emission outpace the CO2 being absorbed in the growing season, there is a likelihood of the amplified emissions outpacing the uptake in the future.

And anthropogenic methane emissions don't even include the trillions of metric tons of permafrost methane being released as global temperatures warm.

Whether or not we have triggered the threshold for a positive feedback loop at this point, one thing is for certain. Methane gas emissions, from pollution or from melting permafrost can be curbed with carbon mitigation. But, once the genie is out of the bottle, it can't be put back in. So far, the U.S. has not shown the fortitude to mitigate anything.