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## **Methane Emissions from Thawing Permafrost**

*Warming produces more greenhouse effect gas*

A recent study run by an American team shows that the rate of methane emitting, a greenhouse effect gas, 20 times more potent than carbon dioxide, in the Siberian lakes has risen up to 6 times as a result of global warming. The result is the acceleration of this process. With the planet warming, permafrost, the frozen ground of high latitude-regions like Siberia, Northern Canada, Alaska and Greenland thaws out. The thawing permafrost releases frozen plant and animal remains, stocked there during the Pleistocene (The Ice Age), which gather on the bottom of lakes and pools where they decompose anaerobically and produce methane. "This material has been locked up in permafrost since the end of the last ice age. Now it is being released into the bottom of lakes, providing microbes a banquet from which they burp out methane as a byproduct of decomposition." said co-author Katie Walter. The majority of the gas escapes by bubbling into the air. Measuring this is technically difficult. Bubble hot spots were identified trapped in the ice, during the cold season when the gas bubble freeze in place. Placing bubble trap devices, they could measure daily the volume of methane released by the bubbles. Other methods used were remote sensing, aerial surveys and year-round, continuous measurements. "My fellow researchers and I estimate that an expansion of these thaw lakes between 1974 and 2000, a period of regional warming, increased methane emissions by 58 percent there," said co-author Professor Jeff Chanton. The researchers, based on their studies, estimate a release of more than 4 millions tons of methane per year, which is 10 to 63 percent higher than previously thought. Scientists estimate an amount of 500 billion tons of carbon being locked up in just one of the Siberian types of permafrost, called yedoma. 90 percent of it will be released at this rate of warming in the coming decades, with the subsequent increase of the methane level. Even though the methane has not an equivalent importance with the carbon dioxide emissions by industry and automobiles, it helps exacerbate the rhythm of global warming. As the planet warms more, the permafrost thaws at a higher rate, resulting a positive feed-back loop. Beside wetlands, an important source of methane releases are ruminants mammals, like cows, goats, sheep, camels, which produce huge quantities of methane in their stomach as a result of food fermentation. Other methane sources are energy production, landfills, biomass burning, waste treatment, termites.