Katey Walter has already made news. Thanks to Alaska EPSCoR, she’s also continued to make strides in her groundbreaking studies of methane bubbling in Arctic Lakes.

Walter’s research made headlines in 2007, when she led a team of researchers who determined that Arctic bubbling was the likely source of a huge spike in atmospheric methane in the last Ice Age. Her research was published in Science and led to a host of nationwide publicity, including selection as a National Geographic Emerging Explorer.

Methane is a greenhouse gas believed to contribute to climate change, and Walter’s research suggests the current warming trend could melt some of the permafrost which keeps methane trapped, leading to a mass gas release and exacerbating the warming. “It tells us that this isn’t just something that is ongoing now. It would have been a positive feedback to climate warming then, as it is today,” Walter said.

Walter’s research focused on areas of Siberia and Alaska that, during the last ice age, were dry grasslands atop ice-rich permafrost. As the climate warmed, the permafrost thawed and formed lakes. Organic material in the permafrost sunk into the lakes, Walter hypothesized, and fed methane-producing bacteria. “All that carbon that had been locked up in the ground for thousands of years is converted to potent greenhouse gases: methane and carbon dioxide,” Walter said.

Walter had aimed that original research at methane created when microbes feasted on old organic matter freed up by melting permafrost. But in the course of her studies, she realized that there are other possible sources of lake methane emissions, including the decomposition of modern vegetation, or older methane which is now being freed.

These other possible origins moved to the center of her research in 2008, which was funded in part by a $30,000 Alaska EPSCoR early-career award. Under the grant, she made multiple trips to a methane seep near the northern Alaska village of Atqasuk to look for some answers.

There’s a more pragmatic side to her recent research as well: she has also been assessing whether lake releases of methane could be utilized by rural Alaskan residents as an alternative fuel source. “If there’s a local natural gas source that can take the place of using diesel, then that helps the people living in villages economically,” Walter noted. “But it also helps to fight climate change: we’re talking about taking methane that’s right now already being emitted in a very large quantity, capturing it, and converting it to water and carbon dioxide, which are weaker greenhouse gases.”

Naturally occurring methane seeps have been used for power generation before, Walter noted, including some reported instances in Alaska – but nothing recently, and likely nothing to the scale she’s considering in Atqasuk.

“What we’re proposing to do is just flare it off to show that you can sustain a year-round, long-term energy source from this gas,” Walter said. “And we are also beginning to consider some development ideas - could we build a greenhouse, could we fuel or heat a community center? It certainly might power a number of households in Atqasuk.”

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