Methane bubbling out of Arctic Ocean – but is it new?

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A wide expanse of Arctic Ocean seabed is bubbling methane into the atmosphere. This is the first time that the ocean has been found to be releasing this powerful greenhouse gas into the atmosphere on this scale.

The discovery will rekindle fears that global warming might be on the verge of unlocking billions of tonnes of methane from beneath the oceans, which could trigger runaway climate change. The trouble is, nobody knows if the Arctic emissions are new, or indeed anything to do with global warming.

Between 2003 and 2008 Natalia Shakhova of the University of Alaska Fairbanks and colleagues collected 5000 samples of seawater over the East Siberian Arctic Shelf, the world's largest area of continental shelf, and measured the levels of methane at different depths. They also measured levels of the gas in the atmosphere above the shelf in 2006.

The team located more than 100 hotspots where methane is leaking from seabed permafrost. Most of the water in the region had methane concentrations more than eight times the normal amount in the Arctic Ocean, and concentrations of the gas in the air above averaged four times the Arctic norm.

Straws in the wind?

The team used their measurements to calculate that the region is releasing about 7 million tonnes of methane a year – about 2 per cent of overall methane emissions to the atmosphere, half of which result from human activity.

That doesn't sound like much, but the fear is that as the Arctic warms, it could release more and more of the gas. Shakhova warns that the release of "only a small fraction of the methane held in the ice shelf could trigger abrupt climate warming".

Larry Smith of the University of California, Los Angeles, says the newly discovered emissions from the continental shelf appear to be "one of the largest known methane sources of the northern hemisphere".

Until now, stores of methane frozen in Arctic water and land appeared safe. But recent studies by Sergey Kirpotin at Tomsk State University in Russia and others have shown that emissions from thawing peat bogs in western Siberia are growing. The latest study adds evidence that the gas is slowly leaking from its frozen Arctic vaults.

Researchers have speculated that the Siberian emissions could explain an unexpected rise in concentrations of methane in the atmosphere, globally, over the past three years.

However, it is not clear whether the leakage is a new phenomenon. Graham Westbrook of the University of Birmingham, UK, reported 250 submarine methane hotpots off the Arctic islands of Svalbard last year, but did not determine whether they were affecting the atmosphere above.

"The subsea permafrost has been degrading and leaking methane beneath for thousands of years," he told *New Scientist*.

He added that nobody knows how much of the recently detected methane releases are due to human influence on climate and that the fraction "is probably quite small".

Shakhova and her colleagues are calling for "urgent" investigations to determine whether the methane venting they have found is an ongoing phenomenon or signals the start of a larger release.

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