We use cookies to ensure that we deliver the best user experience of our website. If you would like to, you can change your cookie settings at any time. Continue

Warming Ocean Contributes to Global Warming

Posted on Thursday 20th August 2009

The warming of an Arctic current over the last 30 years has triggered the release of methane, broken down from methane hydrate stored in the sediment beneath the seabed.

Scientists at the University of Birmingham, working in collaboration with researchers from the National Oceanography Centre Southampton, Royal Holloway London and IFM-Geomar in Germany have found that more than 250 plumes of bubbles of methane gas are rising from the seabed of the West Spitsbergen continental margin in the Arctic, in a depth range of 150 to 400 metres.

Methane released from gas hydrate in submarine sediments has been identified in the past as an agent of climate change. The likelihood of methane being released in this way has been widely predicted.

The data was acquired from the research ship RRS James Clark Ross, as part of the Natural Environment Research Council's Arctic Initiative. The bubble plumes were detected using sonar and then sampled with a water-bottle sampling system over a range of depths.

Graham Westbrook, Professor of Geophysics at the University of Birmingham, says: "It appears that the warming of the northward-flowing West Spitsbergen current by 1° over the last thirty years has caused the release of methane by breaking down methane hydrate in the sediment beneath the seabed."

Methane hydrate is an ice-like substance composed of water and methane which is stable in conditions of high pressure and low temperature. At present, methane hydrate is stable at depths greater than 400 metres in the ocean off Spitsbergen. However, thirty years ago it was stable at depths as shallow as 360 metres.

This is the first time that such behaviour in response to climate change has been observed in the modern period.

While most of the methane currently released from the seabed is dissolved in the seawater before it reaches the atmosphere, methane seeps are episodic and unpredictable and the possibility of periods of more vigorous outflows of methane into the atmosphere cannot be excluded.

Professor Westbrook warns: "If this process becomes widespread along Arctic continental margins, tens of megatonnes of methane per year – equivalent to 5-10% of the Earth's annual atmospheric methane budget, could be released into the ocean."

The team is carrying out further investigations of the plumes; in particular they are keen to observe the behaviour of these gas seeps over time.

Ends

Further Media Information:

Professor Westbrook's paper is published in the Geophysical Research Letters.

Professor Westbrook is available for interview. Please contact Anna Mitchell on 0121 414 6029 / 07920 593946.

© University of Birmingham 2014