



PRESS RELEASE – LONDON TUESDAY 15 NOVEMBER 2011  
FROM CATLIN ARCTIC SURVEY

## **SEA ICE LOSS IS WEAKENING THE ARCTIC OCEAN'S ABILITY TO 'MOP UP' ATMOSPHERIC CARBON**

Research carried out at the Catlin Arctic Survey's Ice Base in March and April 2010 suggests that melting sea ice is weakening the Arctic Ocean's ability to capture and store atmospheric carbon.

This study, carried out by a team at the Department of Fisheries and Oceans, Canada, focuses on the efficiency of an important biological 'pump' that captures atmospheric carbon near the sea surface and then draws it down and stores it on the sea floor.

Phytoplankton (plant plankton), near the sea surface, capture atmospheric carbon and store it as non-sinking microscopic particles. Although these particles do not themselves sink, their sticky nature means they can capture heavier organic debris and become sufficiently dense that they fall to the ocean floor as 'marine snow', effectively removing significant amounts of atmospheric CO<sub>2</sub> to the deep ocean for thousands of years.

The findings also show that carbon-rich gel-like particles (so-called transparent exopolymer particles or TEPs) are stored in the sea ice during winter and are released into the water column during early spring. TEPs are an important feature in the carbon cycle as they both capture carbon and also give 'marine snow' its stickiness, enabling it to attract organic debris and therefore sink.

Future increases in surface freshwater from melting sea-ice will likely further strengthen water layering and could change carbon draw-down in the Arctic Ocean. Coupled with the continuing retreat of sea-ice, this has implications for the capacity of the Arctic Ocean to mitigate increasing atmospheric CO<sub>2</sub> emissions via carbon capture.

The oceans represent the largest active carbon sink on Earth, absorbing more than a quarter of the carbon dioxide that humans put into the air. According to a recent estimate, the Arctic is responsible for 5% to 14% of the world's CO<sub>2</sub> uptake, although it accounts for only 3% of its ocean surface area.

Dr Oliver Wurl, who carried out this research, was part of an international team of scientists who lived and worked at the Catlin Ice Base on the Arctic Ocean, during the brutally cold winter-spring transition, as part of the Catlin Arctic Survey 2010 expedition.

Dr Wurl commented: "The data was really hard-won. Collecting sea water samples in minus-40°C is not something I would recommend to anyone, but to see this data forming part of an important jigsaw puzzle makes all the hardship worthwhile."

The paper is published in the Journal of Geophysical Research.

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If you have questions or to interview Pen Hadow (Catlin Arctic Survey Director) or Dr Oliver Wurl, please contact the Catlin Arctic Survey press office on:

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To obtain access to the full scientific paper or for high-resolution imagery and video files please call Dominic Hilton on 07786 321273

#### **ABOUT CATLIN ARCTIC SURVEY**

The Catlin Arctic Survey, sponsored by global specialty insurer and reinsurer Catlin Group Limited involves an 'Ice Base' and an 'Explorer Team'.

The **Ice Base** is a unique, purpose-built field research station, located on floating sea ice in the Canadian Arctic archipelago (78°45'N, 103°30'W). This Winter/Spring Ice Base played host to an international team of research scientists from the UK, US and Canada in both 2010 and 2011.

The **Explorer Team**, in 2010, comprised Charlie Paton, Martin Hartley and Ann Daniels. The team undertook a long-range survey, travelling across the Arctic's sea ice, collecting water samples to provide data on ocean acidification. Explorer Teams also participated in the 2009 and 2011 Catlin Arctic Surveys.

For more information please visit [www.catlinarcticsurvey.com](http://www.catlinarcticsurvey.com) or contact our press office.