

Polar Sea Ice replicated in Hamburg

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(PhysOrg.com) -- As northern Europe enjoys a rather warm start to autumn, an international team of 20 polar scientists have brought icy winter conditions to the middle of Hamburg, Germany. They are studying the effect of pack ice on carbon dioxide and instead of travelling to the Arctic or Antarctic they have reproduced realistic ice conditions closer to home.

"At a time when the Polar oceans, in particular the Arctic, is such a focus of scientific and general interest, it is important that we understand the fundamental chemical processes that govern the transfer of carbon dioxide between the atmosphere and the ocean," explains project leader, Professor David Thomas.

Since 1 September the team of researchers from Belgium, Denmark, Finland, Germany, Norway and U.K. have frozen a tank the area of a tennis court filled with seawater to investigate, on a small scale, the effect of sea ice on the concentration of carbon dioxide in the underlying water as well as the atmosphere above it. They will continue their investigations until 10 October.

The whole project is led by Professor David Thomas from Bangor University, and Drs Hilary Kennedy, Stathis Papadimitriou and Miss Louiza Norman also from Bangors' School of Ocean Sciences have joined the team.

Sea ice covers millions of square kilometres in the frozen oceans of the Arctic and Antarctic. However, to study the ice scientists normally have

to plan research expeditions years in advance and take long, and expensive voyages aboard icebreaking research vessels. These scientists are using the unique facilities at the Hamburg Ship Model Basin (HSVA) a testing facility that has a specially designed environmental basin in which the air temperature can be kept at an icy -15°C (about the same temperature of a domestic freezer).

"The use of tanks such as those at the HSVA helps us replicate polar environmental conditions with a high degree of reliability without having to travel to the polar regions. Each researcher comes with a different set of scientific skills that will be combined to give a detailed understanding of the chemistry of freezing water. It is rather like the team that comes together to go on research expeditions such as on the *RV Polarstern*. However, the big difference is that at the end of the day you can step out of the [ice](#) tank and have go back to normal life," explains Prof Thomas. "Although it probably seems extravagant that we are doing this, it is far less expensive than taking a research vessel to the Arctic or Antarctic. We learn a lot from these experiments that will form the basis for our future fieldwork in the high latitude frozen seas".

The current experiments are conducted in large bags (1m³) suspended in the basin. By using the bags the scientists can change the nature of the water to simulate possible different chemical conditions found in nature. The scientists are measuring the daily changes in the chemical properties of these experimental bags, and in particular have concentrated on what happens to the [carbon dioxide](#) in the seawater.

Each of the experimental bags contains 1 ton of seawater and the scientists are using 24 bags to investigate the basic chemical reactions that take place when seawater freezes.

Provided by Bangor University ([news](#) : [web](#))

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