

## Subproject: Dynamics of CO<sub>2</sub> and greenhouse gases within sea ice

Actual field dates: May 1 – July 3, 2014

Field site: Daneborg Fjord, Northeast Greenland

Number of man-days in the field: 168

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### Summary:

During this project we monitored melt ponds formation over the landfast sea ice in Daneborg. Three sites were chosen depending on the ice and snow thickness. Our goal was to assess how melt ponds form from the melting snow and how it will affect the uptake of CO<sub>2</sub> from the atmosphere. CH<sub>4</sub> samples were collected in sea ice and seawater to estimate the role of sea ice in the CH<sub>4</sub> exchanges between the fjord and the atmosphere. During the 9 weeks experiments temperature and salinity profiles were measured in the ice and snow cover in collaboration with the outstanding team of sea ice geophysics from UoM as an incredible shoveling effort was performed by RG (but always with a joke in his lips!!!!). CH<sub>4</sub> and CO<sub>2</sub> samples were collected from snow, sea ice, melt ponds and underlying seawater as well as air-ice/melt ponds CO<sub>2</sub> fluxes, using the chamber method.

Collaboration with the atmospheric team from UoM and AU was also realized as they used a meteorological tower (EC) to measure the air-ice CO<sub>2</sub> fluxes at large scale. From this work, we will be able to compare and validate the chamber measurement from the EC measurements and link the fluxes to the inorganic carbon dynamics in the ice/melt ponds cover and estimate the impact of the sea ice melt on the uptake of atmospheric CO<sub>2</sub>.

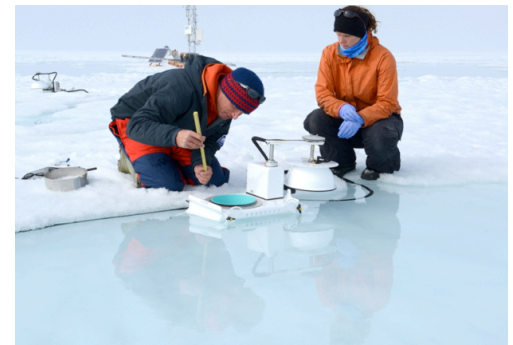


Figure 2

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### Photos:

Fig.1: Sea ice sampling (Kerri Warner-CEOS, Nix Geilfus-ARC and Siiri Wickström-FMI).

Credit: Marie Kotovich

Fig. 2: Nix Geilfus (ARC), and Kerri Warner (CEOS), taking measurements of CO<sub>2</sub> using chamber method over melt pond.

Credit: Peter Bondo Christensen

Fig. 3: Nix Geilfus (ARC) and Kerri Warner (CEOS), collecting seawater

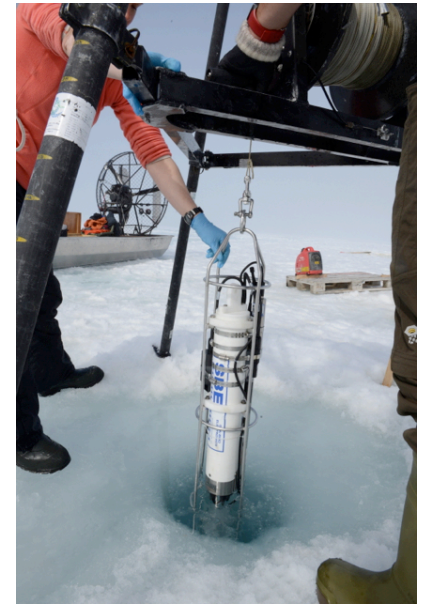


Figure 3

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### Participants:

Nicolas-Xavier Geilfus (ARC); Odile Crabeck (CEOS); Bruno Delille (ULg); Marie Kotovich (ULg); Heidi Sorensen (GCRC); Siiri Wickström (FMI); Dr. Soren Rysgaard (CEOS, ARC, GCRC).

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