

Subproject: Melt pond evolution of Organic contaminants

Actual field dates: May 22 – July 2, 2014

Field site: Daneborg Research Station, Northeast Greenland

Number of man-days in the field: 42

Summary:

Our objective is to describe the role sea ice plays in the delivery of various organic contaminants (OCs) and current use pesticides (CUPs) to the marine environment. It is thought that CUPs and other OCs may be concentrated in brine, under-ice seawater, and melt ponds, therefore, posing a risk of increased exposures *via* dry and/or wet deposition to melt ponds. The process of atmospheric loading of contaminants to surface meltwater and subsequent drainage to the Arctic Ocean can be described as a ‘pump’ that transfers contaminants from the atmosphere to an ice-covered ocean *via* pond meltwater.

Snow (*in situ* and precipitation), sea ice, melt pond, under ice (ice-water interface) and 5m water were collected during a 3 day rotation at the “GAEL” inner fjord sampling site, in collaboration with sea ice and snow pit physical sampling (K. Warner) and within a reasonable distance to the on-ice MET station (T. Papakyraikou/LL. Sørensen). Snow melt, ice melt and under ice water were also analyzed for $\delta^{18}\text{O}$. Air was sampled continually on shore at a reliable continuous power source far away from out puts of diesel exhaust at 4m above ground level. Sample media were changed on a 3-4 day rotation schedule. The $\delta^{18}\text{O}$ has been analyzed (M. Lemes), and we will be analyzing the contaminant samples this spring.

Our goal was to sample for OCs through the on ice snow and sea ice melt season until ice break through. However, our field season time did not coincide with ice break up, we stopped sampling about 2 weeks prior to ice break up. We were not able to sample melt ponds for phytoplankton blooms that were artificially generated with nutrient additions (H. Sørensen), as there was not enough melt water available in the artificially generated melt ponds for our needs (100 L).

Photos:

Fig.1: Alexis Burt and Kerri Warner (CEOS) changing the air sampler
Credit: Peter Bondo Christensen

Fig. 2: Kerri Warner (CEOS) engaged in snow pit physical sampling at the GAEL field site. Credit: Alexis Burt

Fig. 3: Nix Geilfus (ARC) pointing out the melt pond at GAEL field site.
Credit: Alexis Burt



Figure 1

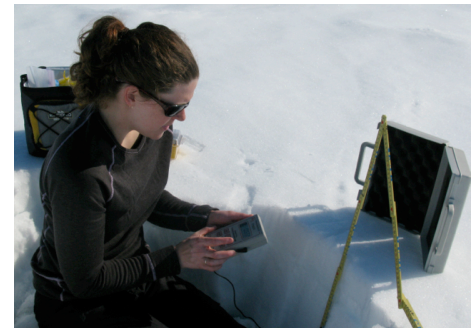


Figure 2



Figure 3

Participants:

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Acknowledgements:

ASP, Canada Excellence Research Chair Programme, ArcticNet.

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