

Subproject: Seasonal Synergy between bacteria and algae in Kobbefjord sea ice

Actual field dates: Three day trips on March 13, 18 and 21
 Field site: Sea ice field in Kobbefjord
 Number of man-days in the field: 14

Summary:

Our sampling goals were accomplished in full. Our real-time experiments gave excellent results validating the first part of the seasonal synergy hypothesis. Initial ammonia measurements made by Heidi Sorensen looked promising in support of the second part of the hypothesis, though overall the ice appeared to be oligotrophic (low chlorophyll). We must await downstream analyses to know of other successes or failure, but the required collections were all made successfully. Access to the ice field was challenging, as it could not be approached directly by small boat. Instead, we offloaded from the boat and traveled overland, carrying/dragging our gear on the first day, with some support by snow machine at the end of the trek. Winds died down sufficiently for the air boat to be used for transit back to the small boat. Subsequent trips were also made in the same way, but with more organized snow machine support from the outset. Regardless of the difficulties, however, the field effort is considered very successful for the planned science.

Photos:

Fig.1: The team on the ice field in Kobbefjord at the end of the first sampling day: local coordinator Peter, Jody Deming, Shelly Carpenter, Eric Collins, Lorrie Maccario and Evan Firth. Not featured but also present were Heidi Sorensen (taking the photo) and Ivali Lennert (returning with the airboat).
 Credit: Heidi Sorensen



Figure 1



Figure 2

Fig. 2: Returning samples at the end of the first day on the air boat: Ivali driving, Jody and Lorrie in front, Eric behind Jody.

Credit: Shelly Carpenter

Fig. 3: Clearing a snow patch prior to drilling sackholes in the sea ice for brine collections: Evan Firth and Eric Collins on shovel.

Credit: Shelly Carpenter

Participants:

Jody Deming (PI, UW), Eric Collins (co-PI, UAF), Shelly Carpenter (Staff Oceanographer, UW), Evan Firth (Grad student, UW), Lorrie Maccario (Grad student, Univ of Lyon, France, co-advised by the PI). Heidi Sorensen (Grad student with Ronnie Glud in Denmark) joined us as our on-site collaborator in Nuuk.



Figure 3

Acknowledgements:

US-NSF-OPP award ARC-1203267 with logistics support committed by Soeren Rysgaard in a support letter to NSF. We are grateful to Soeren for this essential support. Everyone in Nuuk provided excellent support to our team – it would not be possible to list them all, but we especially thank Ivali, Peter, Karl and Flemming for their crucial help in the field, Malene Juul Simon and Peter Mikkelsen in helping to plan the logistics, Jens Weinell in ordering chemicals and organizing for waste disposal, and a great staff in the kitchen for wonderful lunches (that always accommodated a vegan diet). The work would not have been possible without collaborator Heidi Sorensen, who was indefatigable in the field, essential to acquiring near real-time ammonia measurements in the lab, and helpful at every turn in all of the planning and operations. We also benefited from, and enjoyed, science exchanges with the other graduate students and staff on site.

Other:

On Sunday, March 23, Heidi, Shelly and Jody went (on foot) to Malene Bay to scope out the site for future work for a new project (funded by the Gordon and Betty Moore Foundation in the US) that requires biologically productive sea ice. We determined from sackhole brine samples that Malene Bay sea ice was, at least at this time, richer biologically than the Kobbefjord ice, making it a possible candidate for this future work.

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