

## Subproject: Quantification of Ikaite

Actual field dates: February 5-25, 2015

Field site: Sea-ice Environmental Research Facility (SERF), University of Manitoba, Winnipeg (Canada)

Number of man-days in the field: 3

---

### Summary:

Ice cores were collected on three days during the 2015 SERF experiment to determine ikaite concentration. Each core was cut into 5 cm subsamples and stored in a -20°C freezer for 24 to 48 hours before being examined with a microscope for image analysis. After each section was photographed, each subsample was melted at 2°C to ensure that ikaite did not dissolve during melting. The meltwater was filtered and the filters were placed in exetainers filled with deionized water. The samples were analyzed for dissolved inorganic carbon (DIC) content to determine ikaite concentration. It was also attempted to determine Ikaite concentrations using image analysis. However, image analysis was very difficult due to the high abundance of non-ikaite particles (*e.g.*, dust) in the SERF ice. To determine the effectiveness of the DIC technique of determining ikaite concentration, results from the DIC analysis are being compared to the results from image analysis.

Analysis of ice cores at SERF in 2015 was primarily done to test the image analysis and DIC techniques of ikaite quantification and to simplify the sampling procedure as much as possible prior to the field campaign in Station Nord, Greenland later in 2015, where a much larger data set was obtained.

---

### Photos:

Fig.1: Sea ice growing under calm condition at SERF. Credit: Yubin Hu

Fig.2: Ice coring at SERF. Credit: Feiyue Wang

Fig.3: Ikaite crystals observed at SERF – February 2015 Credit: Heather Kyle

Fig.4: Image of ikaite crystals converted to binary to determine ikaite concentration using image analysis Credit: Heather Kyle

---

### Participants:

Heather Kyle (CEOS); Soeren Rysgaard (CEOS)

---

### Acknowledgements:

Canada Excellence Research Chair (CERC) and Canada Research Chair (CRC) programs, Natural Sciences and Engineering Research Council (NSERC) of Canada, the Canada Foundation for Innovation and the University of Manitoba. This work is a contribution to the ArcticNet Networks of Centres of Excellence and the Arctic Science Partnership (ASP).

For more information contact: [Heather.Kyle@umanitoba.ca](mailto:Heather.Kyle@umanitoba.ca)

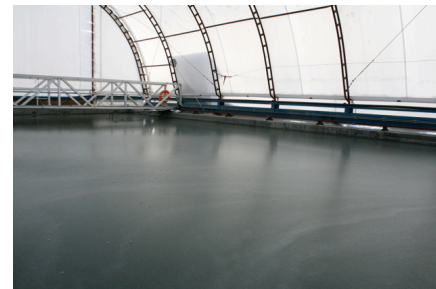


Figure 1



Figure 2

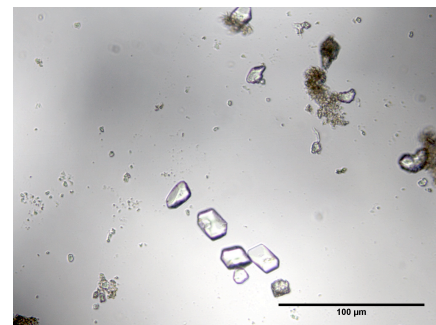


Figure 3

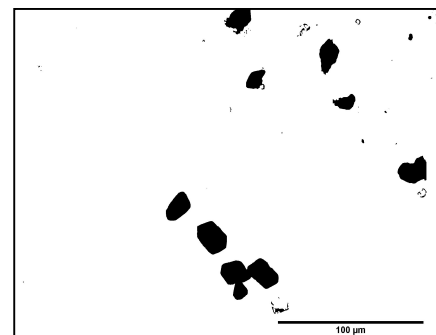


Figure 4