

## Subproject: Physical processes controlling melt evolution

Actual field dates: May 15-June 30, 2014

Field site: Cambridge Bay, Nunavut, Canada

Number of man-days in the field: 138

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### Summary:

This was a moderately successful project. However, most of the initial research questions could not be addressed. The date of melt onset in Cambridge Bay, which in previous years occurred at the very start of June, was delayed more than two weeks until June 17. After melt onset the ice became almost entirely flooded, making our working conditions difficult. Consequently, we could not investigate melt pond processes in a way that we initially intended. Luckily, the delay in melt onset allowed us to collect a comprehensive dataset on the evolution of 3-D snow surface topography and properties during several major storms and changes in wind regime, prior to melt. We intend to use these data to examine the physical processes controlling the sea ice snow depth distribution and changes in snow drift topography. Further work on melt pond processes will be postponed until a later field campaign. We were also able to collect interesting physical data (including met, snow and ice data) over the delayed melt transition, and we intend to examine the reasons for this delay in melt onset in detail.



Figure 1



Figure 2



Figure 3

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### Photos:

Fig. 1: Collecting a model of the snow surface topography by Light Detection and Ranging (LiDAR)

Credit: Jack Landy

Fig. 2: Sea ice flooded with meltwater – June 19, 2014

Credit: Jack Landy

Fig. 3: Aerial photograph of the LiDAR scanning site – June 22, 2014

Credit: Jack Landy

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### Participants:

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