Field report on the Ridge activity during N-ICE2015, Leg 6

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General Overview

Two ridges (R1, R2) and three melt ponds (MP1, MP2, MP3) near three other ridges were studied during Leg 6 (Fig.1). Morphology mapping by 2” augers, STD (Sal, Temp, Density) coring, uniaxial compression tests and GEM profiling were performed on ridges. In melt ponds, CTD measurements were organized using SBE 39 and Conductivity sensor 3919A (Aanderaa). In addition, Oceanatic Thermistor Buoy Model 908 (Oceanatic Measurement Limited) was deployed into ridge R2 and samples from level ice were collected for UNIS laboratory work.

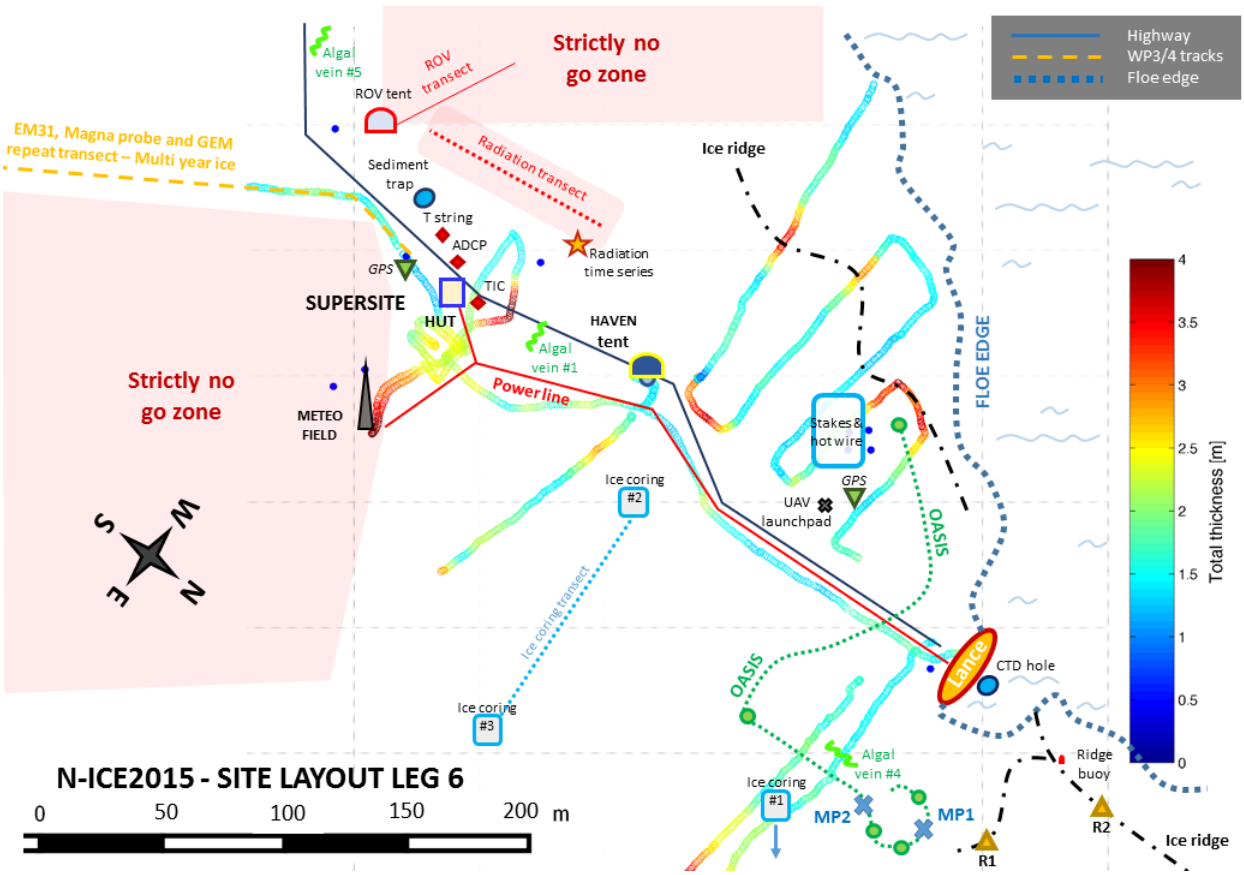


Fig. 1. Schematic map of ice floe with all activities performed during leg 6.

Ridge Studies

Table 1 shows the schedule of work on ice ridges.

Table 1. Ridge activities.

Date	**R1**		**R2**	
	activity	file name	activity	file name
10 Jun 2015	MP, ST	2015_06_10_R1_MP_ST		
12 Jun 2015			MP	2015_06_12_R2_MP
			OTB	not available yet
13 Jun 2015	Kompis	2015_06_13_R1_kompis		
	GEM	not available yet		
17 Jun 2015	STD	2015_06_17_R1_STD	STD	2015_06_17_R2_STD
	MP	2015_06_17_R1_MP		

MP – moprpholgy mapping / profiling with 2" augers
STD – salinity, temperature, density core
OTB – Oceanic Thermistor Buoy deployment
Kompis – uniaxial compression tests
GEM – electromagnetic profiling

Ridge R1 was mapped (MP) and cored (STD) on June 10th, and then one week later on June 17th. Uniaxial compression tests and electromagnetic profiling were performed only once and only on ridge R1 on June 13th.

Ridge R2 was mapped (MP) on June 12th. After what the decision to deploy OTB on ridge R2 was made and OTB was deployed on June 12th (~ 11:00 UCT). Later on June 17th ridge R2 was cored (STD).

Fig. 2 presents morphology maps of ice ridges R1 and R2, as they were mapped at first time. More details and data on each activity and some plots can be found in files according to Table 1. All activities, such as STD coring, uniaxial compression coring and OTB deployment took place always near 0m profile of the cross section of corresponding ridge.

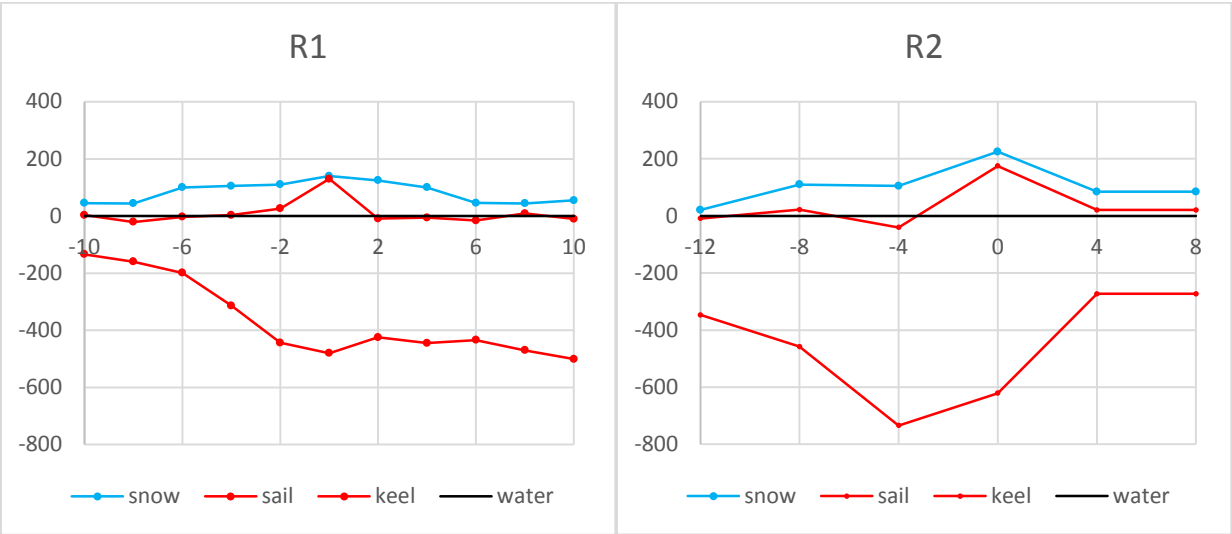


Figure 2. Morphology maps of ice ridges R1 and R2 (horizontal axis is in meters, vertical axis is in centimeters).

Melt Ponds Measurements

Table 2 shows schedule of melt pond measurements.

Table 2. Melt pond measurements.

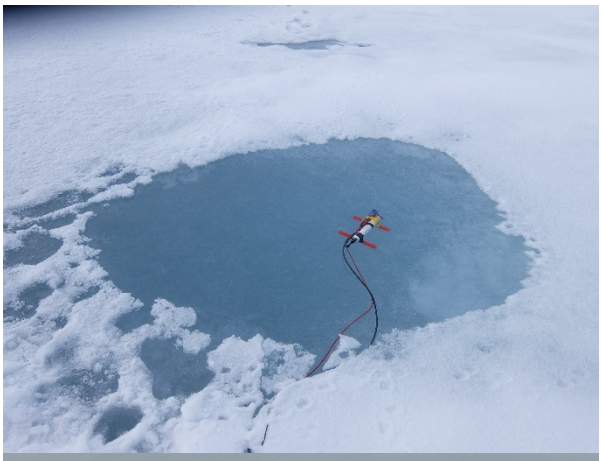
Melt Pond	Date and Time	Instruments	Files
MP1 (10 cm)	19:50 12th - 14:40 13th June 2015	SBE CTS	2015_06_11-13_MP1_SBE.asc 2015_06_11-13_MP1_CTS.dat
MP2 (5 cm)	19:00 15th – 19:00 17th June 2015	SBE CTS TS	2015_06_15-17_MP2_SBE.asc 2015_06_15-17_MP2_CTS.dat 2015_06_15-17_MP2_TS.dat
MP3 (20 cm)	19:00 17th – 08:40 19th June 2015	SBE CTS TS	2015_06_17-19_MP3_SBE.asc 2015_06_17-19_MP3_CTS.dat 2015_06_17-19_MP3_TS.dat

SBE – SBE 39Plus (Sea-Bird Electronics, US)
CTS – Conductivity sensor 3919A (Aanderaa, NO)
TS – Thermistor string (Geo Precision, DE)

Melt pond MP1 was covered with snow sometime during the night 12-13 June (Storm, snowdrift). MP2 has not developed much during the time of measurements. MP3 was the biggest and measurements there were interrupted by ice floe brake up. Table 3 shows melt ponds MP1-3 in the beginning and at the end of experiments and the set up of instruments in it.

Coring Samples

During Leg 6 samples of 7.2 cm in diameter were cored from site #1 and site #3. One zarges box was filled with samples (approximately half from site #1 and half from site #3). All samples were marked with standard note and packed into plastic bags. Samples are intended to be used during laboratory work at UNIS to study stratigraphy and mechanical properties of ice. During leg 5 another box was filled with samples (see report from leg 5).

Table 3. Melt ponds MP1-3 in the beginning and at the end of experiments. Location of the instruments.

	N/A, covered by snow of 10-15 cm thickness