



H2020 – Coordination and Support Action



BE-OI

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Set up and maintenance of field drilling camp DC

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EXECUTIVE SUMMARY

This report describes the Antarctic logistic activities to set up and maintain the field drilling camp at the Little Dome C sites (RAID2 and SUBGLACIOR) and at Concordia (SUBGLACIOR).

1. Introduction

At the beginning of the 2017-18 season a mini-traverse was performed (D1.4) to revisit the area of Little Dome C established in the previous season (T1.1.1). The test site for the SUBGLACIOR probe was re-activated at Concordia, following the change of schedule decided by the BE-OI consortium.

2. Methodology

Based on site decisions from D2.3 and 2.4, a camp was set up using ITASE traverse vehicles to enable the deployment of the rapid access drill RAID (BAS, T3.1) and geophysical measurements (T2.1.1). A second mini traverse has been performed at another site (SUBGLACIOR) selected based on T2.1.5 (D2.5). During the field camp, in the Little Dome C area new pRES and GPS stations has been installed around the selected target site and the pRES and GPS stations established during 2016-17 season (T2.1.1) have been re-measured. A ground based profiling radar DELORES was employed for more than 1000 km to improve our detection of bedrock and to follow deep internal layers in the Little Dome C area. Data has been acquired with a very fine spatial resolution at sites identified from 2.3 and 2.4. At Concordia, logistic movements took place around the SUBGLACIOR site to enable a new deployment test of the probe.

3. Results and Discussion

The deployment of ITASE traverse vehicles and modules at “Little DC” allowed over 44 days of fieldwork. The fieldwork team at RAID2 site was composed of six people and it worked there from November 19th, 2017 to December 22nd, 2017. On the base of the surveys and their analysis a decision on the deployment location of SUBGLACIOR during a coming field season was taken in the field. The vehicles were moved to the new site to established a new field camp from December 22nd, 2017 to January 5th, 2018. The field work team at this site changed over this time window with the support of researchers from Concordia. At the LDC SUBGLACIOR site a borehole down to 120 m was drilled from December 23rd, 2017 up to January 5th, 2018. The borehole was then reamed to a diameter of 220 mm in anticipation of the casing setup and SUBGLACIOR deployment during the following seasons. The total consumption of the vehicles traverse (PB300, PB330 and Caterpillar 65C), power generator for pRES, GPS and radar survey (1200 km) at “Little Dome C” was 12,000 litres. The consumption of fuel has been much higher compared to the previous season due to the hardest climatic conditions encountered at LDC, with windchill temperatures frequently below -50°C and reaching a minimum of -65°C, with an average value of -36°C as measured temperature and -52°C as windchill temperature.

For the analysis of the data and exchange of information with colleagues in Europe, we used the Broadband Global Area Network (BGAN) provided by Inmarsat satellite, with a consumption of about of 5 Gb of satellite transmission.

The team which prepared and conducted the traverse from Concordia Station to LDC was composed of 6 people (°), whereas the team at “RAID2” (°) and “SUBGLACIOR” field camp were composed of 6 people from November 22nd up to December 29th, and from December 29th of 3 people (*) for a total of 377 man/day of presence.

Frezzotti Massimo° ENEA	10/11/17	04/01/18
Mulvaney Rob° (NERC-BAS)	10/11/17	04/01/18
Panichi Saverio° ENEA	10/11/17	04/01/18
Possenti Phillippe* (CNRS)	22/12/17	05/01/18
Ritz Catherine °(CNRS)	10/11/17	22/12/17
Rix Julius° (NERC-BAS)	10/11/17	04/01/18
Scalet Michele°* (PNRA)	10/11/17	12/02/18
Spolaor Andrea* (CNR)	29/12/17	05/01/18

At Concordia, the SUBGLACIOR team was composed of 5 people who conducted the probe tests. One of the people (P. Possenti) spent part of the time at LDC for the pilot hole drilling and reaming. IPEV and PNRA provided support to the SUBGLACIOR team through the running of the whole Concordia system as well as through specific support of technical staff (mechanics, vehicle driver, electrician, carpenter, ...).

Alemany Olivier (CNRS)	09/12/17	31/01/18
Chappellaz Jérôme (CNRS)	09/12/17	31/01/18
Lefebvre Eric (CNRS)	06/12/17	31/01/18
Possenti Phillippe (CNRS)	06/12/17	06/02/18
Teste Grégory CNRS)	06/12/17	31/01/18

4. Conclusion

Both the deliverables (D1.4 and D1.5) and the Milestone (MS4) decision on deployment location SUBGLACIOR have been achieved with 100% of success and as originally planned. The logistic handling of SUBGLACIOR activities at Concordia took place as expected and was a success as well.

Annex

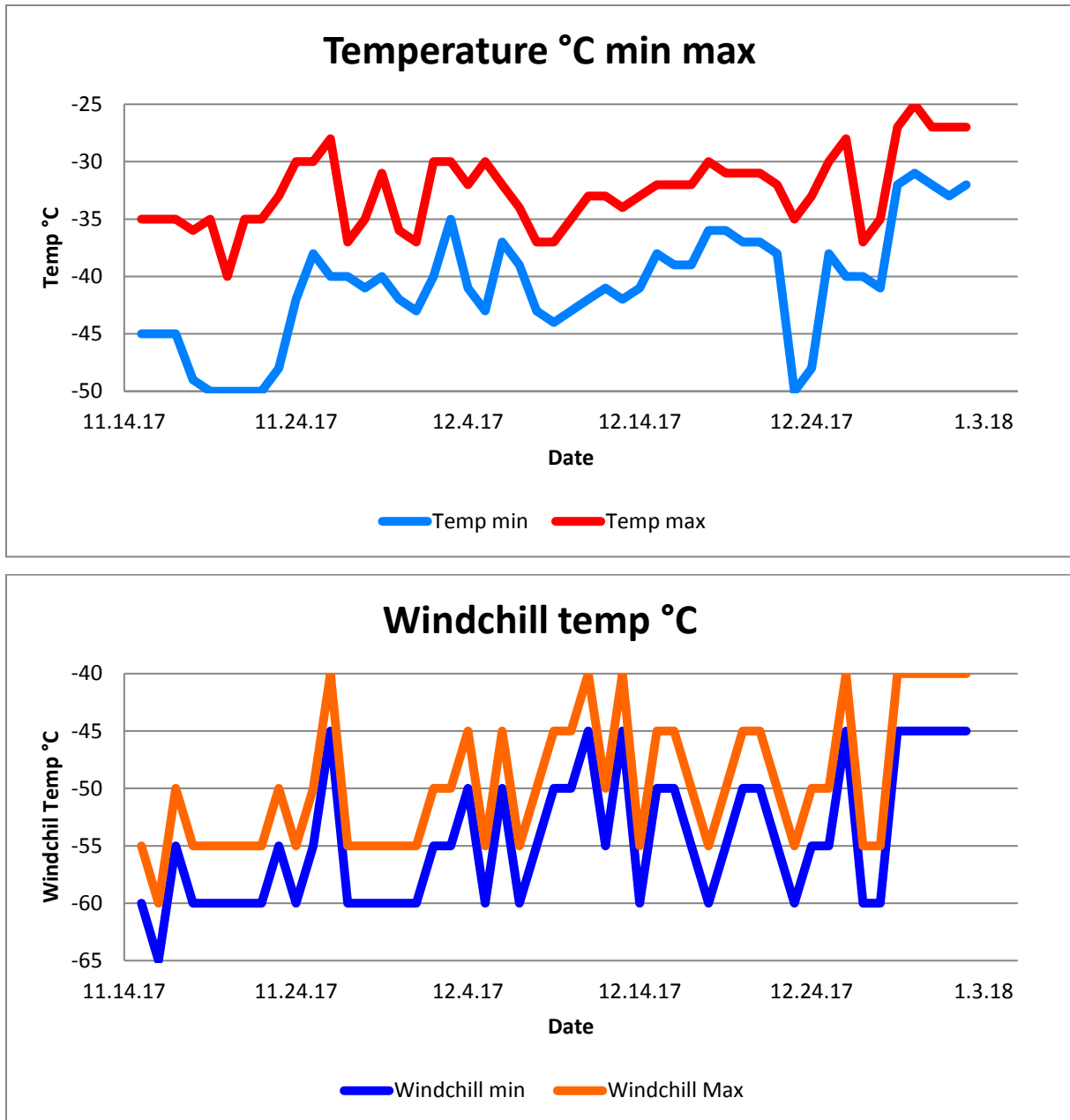


Fig. 1 Temperature Min and Max and Windchill temperature Min and Max from ECMWF data at Little Dome C area during the BE-OI field camp running.



Fig. 2 The ITASE Module and vehicles at Little Dome C “RAID2” camp air photograph



Fig. 3 The ITASE Module and vehicles at Little Dome C “RAID2” camp”



Fig. 4 The 2017/2018 SUBGLACIOR team in front of the main surface equipment used to deploy the probe at the Concordia test site.



Fig. 5 The SUBGLACIOR probe being positioned in its berth before deployment in the test borehole at Concordia station.