



Report on Norwegian Cal/Val Activities

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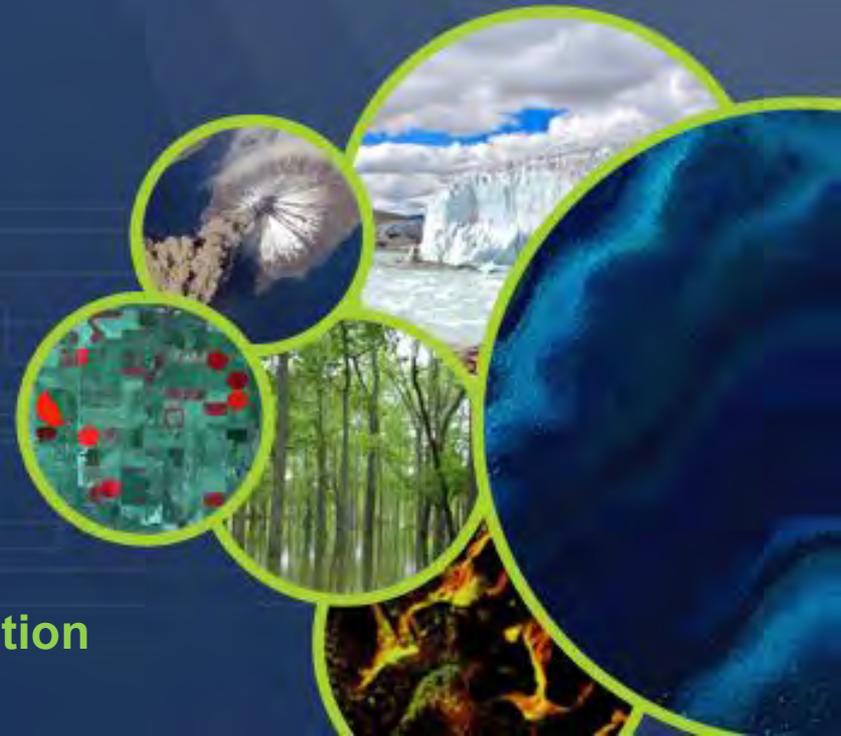
Agenda Item #

WGCV Plenary # 40

Canberra

March 14 - 18, 2016

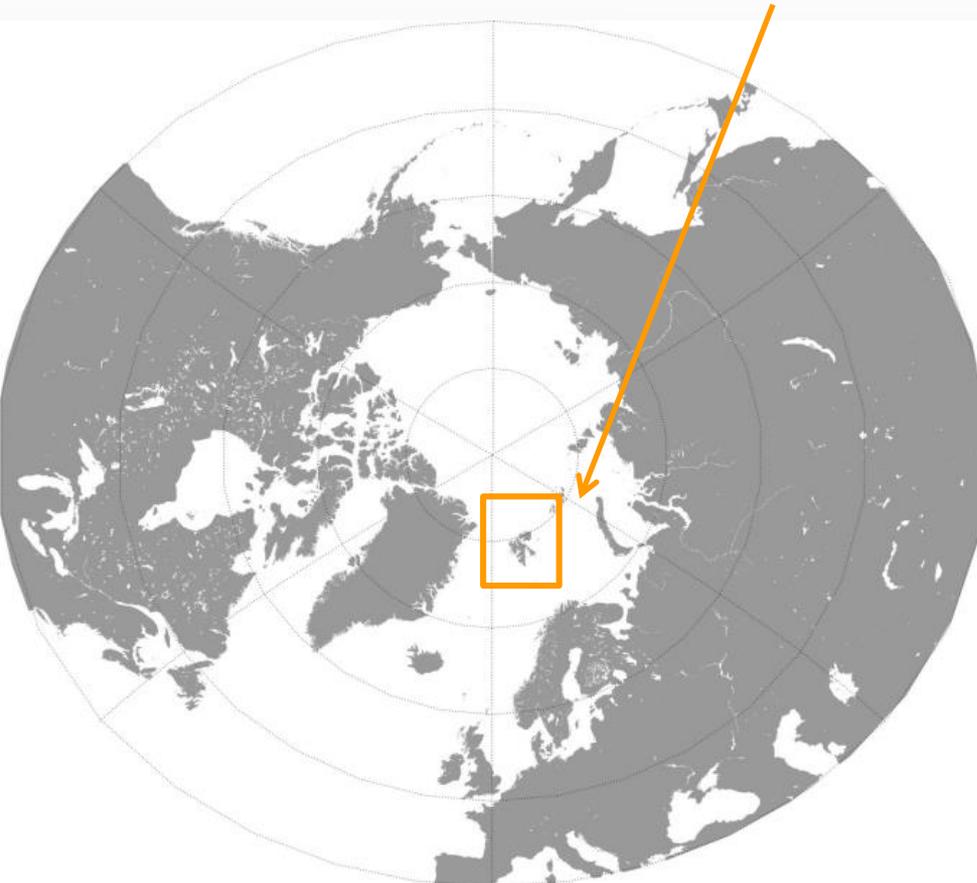
Working Group on Calibration and Validation





Svalbard Integrated Arctic Observing System (SIOS) – update

The SIOS area



Timeline:

- Preparatory phase: 2010 – 2014
- Implementation phase: 2015 – 2017
- Upgrade phase: 2018 – 2019
- Operational phase: 2020 →



SIOS builds on the extensive research installations and observation capacity already in place by many international research institutions in Svalbard.



The SIOS Research Infrastructure (RI) will continue to be owned and operated by each individual partner of SIOS.



The central coordinating and integrating unit

- 5 positions developing the core services
 - Data Management
 - Remote Sensing (including developing Svalbard towards a supersite for Cal/Val)
 - Information services – logistics, training and outreach
 - Open access to RI
 - Web portal - One entrance
 - the place where all services are integrated and visualised



EVDC - ESA atmospheric Validation Data Centre

The ESA Validation Data Centre (EVDC) serves as a central, long-term repository in Europe for archiving and exchange of correlative data for validation of atmospheric composition products from satellite platforms. EVDC builds on the previous ENVISAT Cal/Val database system in operation at NILU since the early 2000s, and provides tools for extraction, conversion and archival of a large amount of EO data. The objective of the EVDC is to provide an online information system that supports users in managing and exploiting campaign datasets for Earth Observation missions and applications.

The database helps as a tool to monitor the quality and availability of the data provided by the data acquisition teams contracted by ESA, and it aims to support field campaigns over various seasons and latitudes.

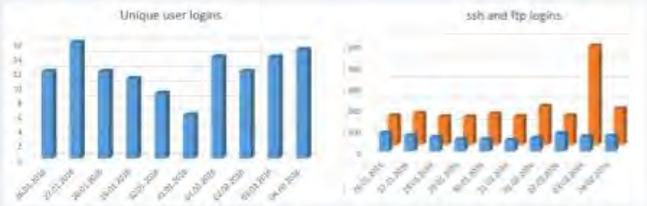
To facilitate exchange of validation data among investigators and missions a common effort between the GEOMS group that consists of representatives of NASA, ESA, the NDACC and related universities and organizations, has led to a set of harmonized guidelines, The Generic Earth Observation Metadata Standard (GEOMS) guidelines. EVDC is fully compatible with GEOMS.

Through collaboration with the ECMWF, EVDC is providing access to daily updated analyses and forecast data files of global gridded meteorological parameters.



News and information

5. February 2016: As the MATCH campaign proceed; user statistics shows increased activity on the server.



21. January 2016: The MATCH campaign is ongoing. Data are uploaded to zardoz on a daily basis.

15. October 2015: Data from AVDC and NDACC are mirrored to EVDC on a daily basis.

MET and NILU participate in the ESA aerosol cci phase 1 + 2 (--- 2017)

MET

Climate Research Group / EO science team (Independent Validation experts)

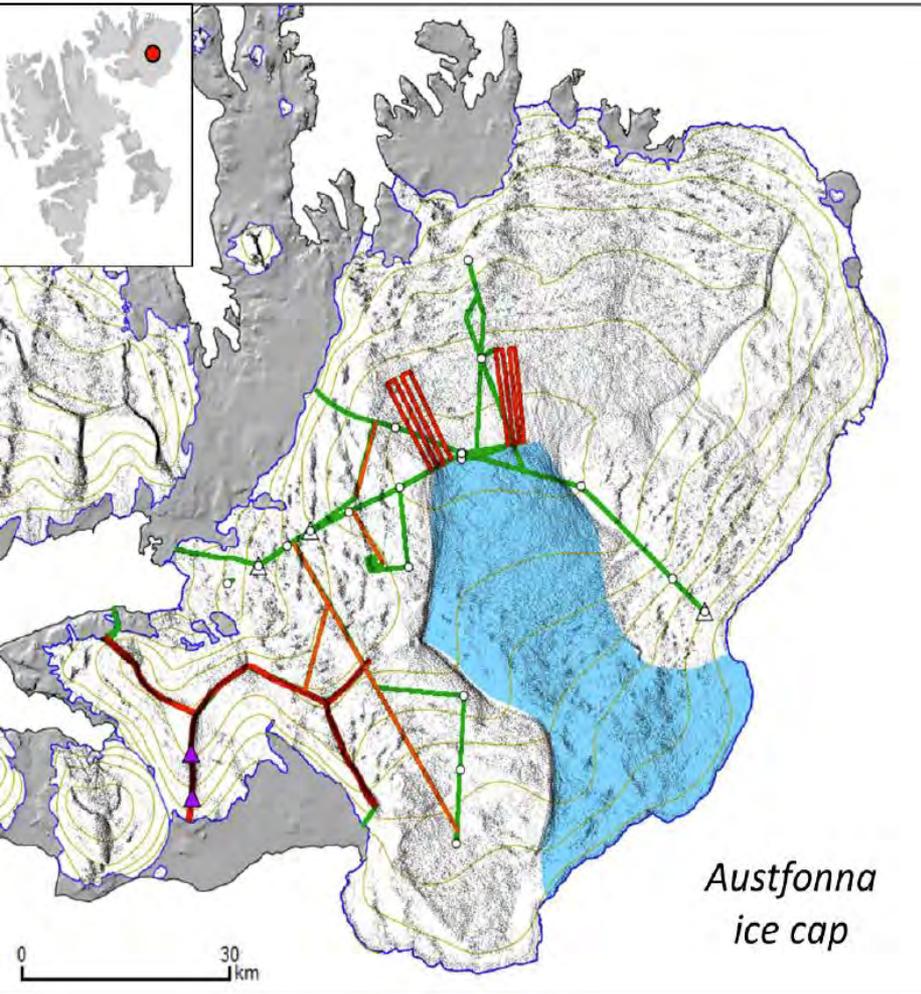
- Lead user involvement
- Inter-comparison to model datasets (AEROCOM)
- LEVEL 3 validation AATSR/IASI, Aerosol type validation
- *User case studies: trends in natural, in particular coarse mode aerosol (planned)*

NILU

EO science team (Independent Validation experts)

- **Validation of stratospheric extinction from GOMOS**
- **Validation of aerosol (AOD) uncertainties**
- **Validation of aerosol layer height (dust, biomass burning)**
- **Cross-ECV consistency analysis**

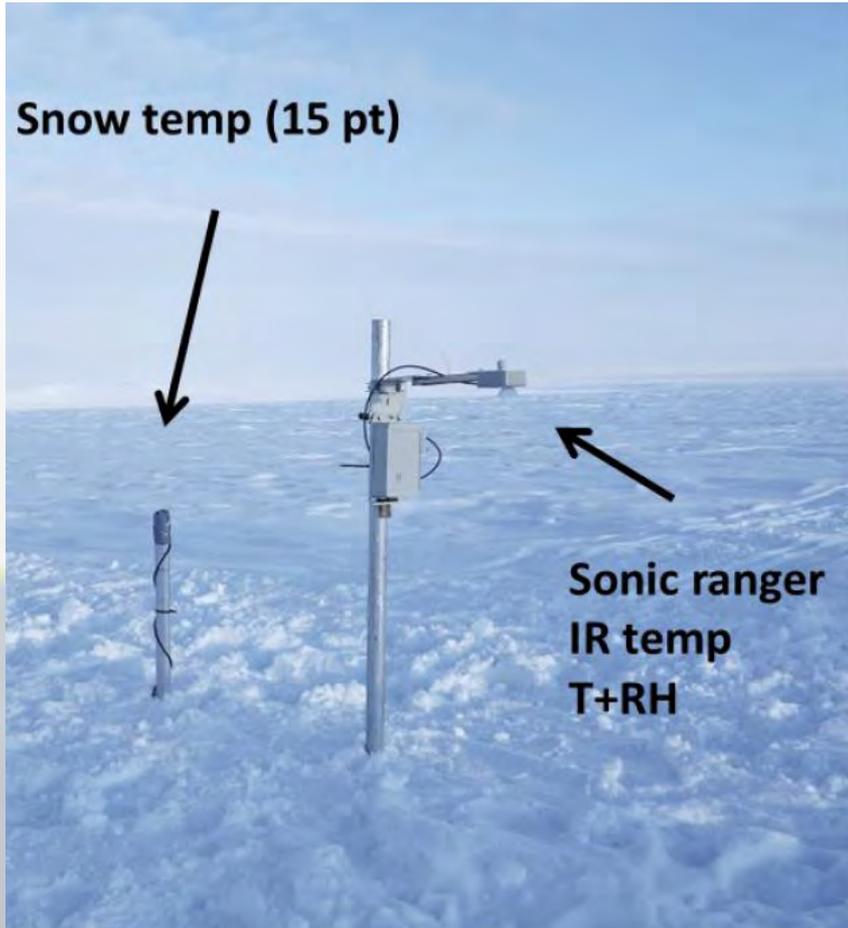
- Consortium formed by the Norwegian Polar Institute (NPI) and the Department of Geosciences at the University of Oslo (UiO)
- Glaciological investigations on Austfonna, Svalbard
 - Successful fieldwork yearly since 2004
 - 2-3 weeks in April/May when snow thickness usually is at its maximum.
- Included as test area for the Cal/Val of CryoSat-2
- Cal/Val activities described in ESA document CryoVEx Campaign Implementation Plan



- **Small black dots:** the point of closest approach (POCA) for all available CryoSat-2 elevation measurements since the launch in 2010
- **In red:** Measured ground-profiles of GPS and GPR for detailed surveys in areas with a high density of POCA data
- **In orange** for repeats of historic ICESat profiles
- **In green** for the traditional surface mass-balance transects.
- Permanent installations are shown as **white circles** for mass-balance stakes, **white triangles** for long-term automatic weather stations, and **purple triangles** for two weather/snow monitoring stations installed in 2015 for continuous air-snow temperature logging and surface ranging in a high-density POCA area.



Snow temp (15 pt)



**Sonic ranger
IR temp
T+RH**

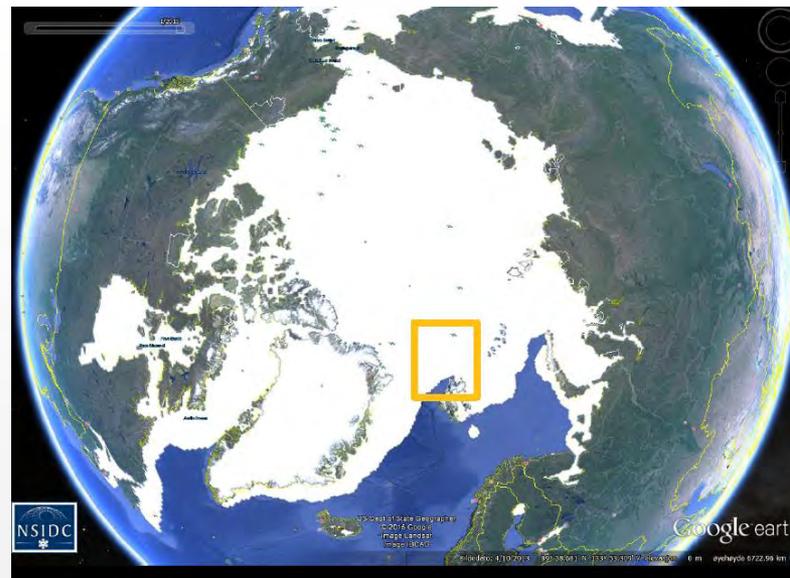
The left stake has a string of thermistors for logging air-snow temperatures at 15 different levels spaced at 10 cm interval.

The right stake contains an ultra-sonic ranger for surface ranging and a basic automatic weather station that measures infrared/air temperature, humidity and global radiation.



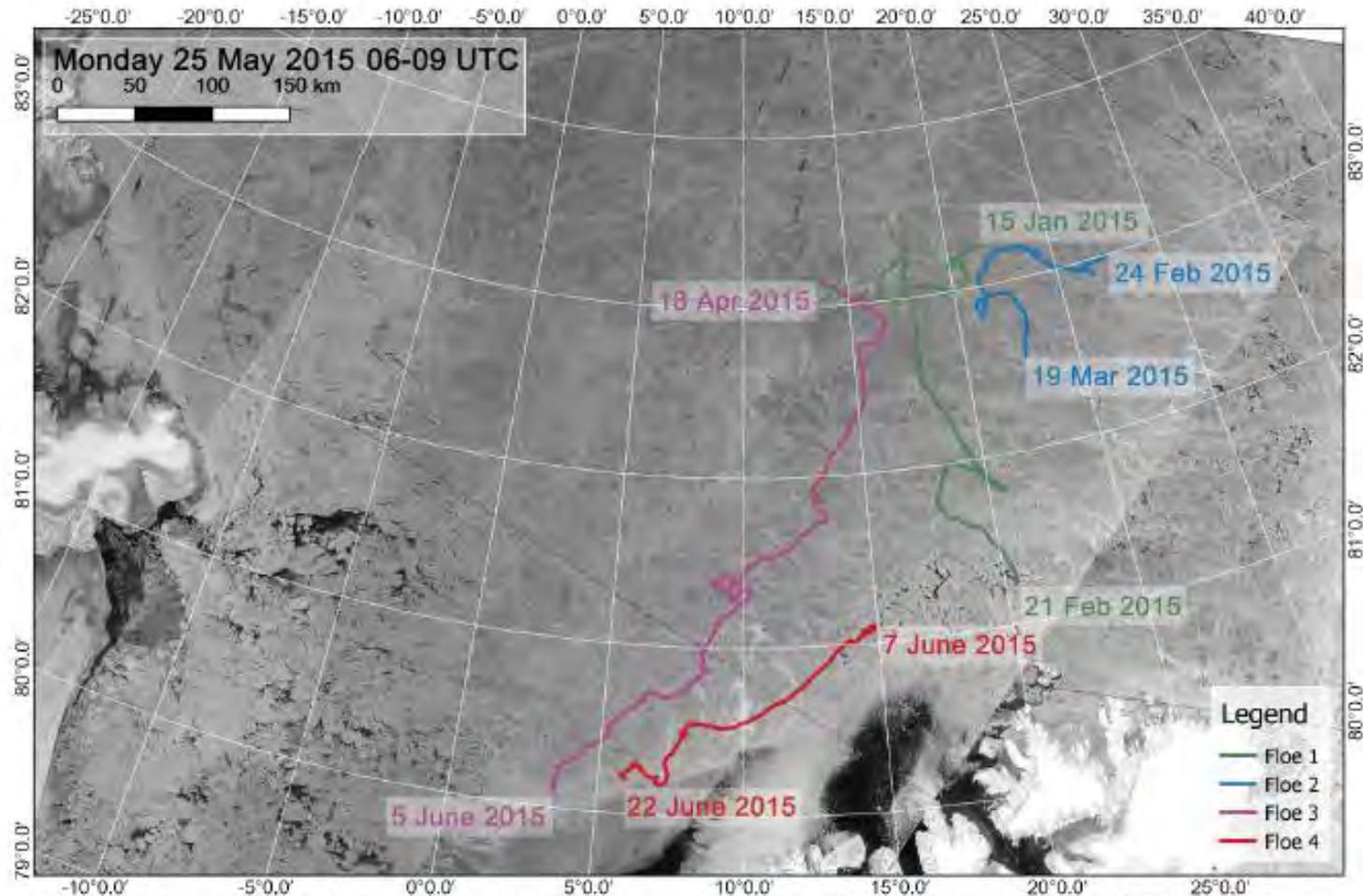


- Primary objective:
To understand the effects of the new thin, first year, sea ice regime in the Arctic on energy flux, ice dynamics and the ice associated ecosystem, and local and global climate.





Drift paths



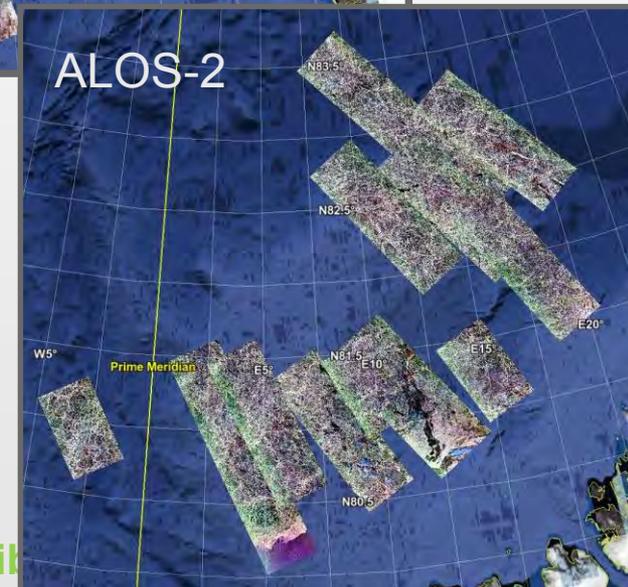
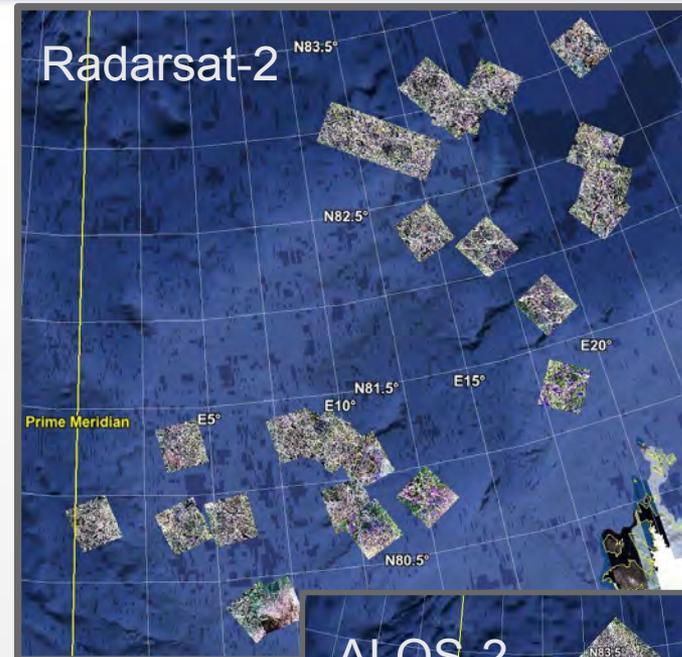
RADARSAT-2 images provided by NSC/KSAT under the Norwegian-Canadian RADARSAT agreement 2013 © MacDonald, Dettwiler and Associates.

Map created by the Norwegian Polar Institute / Max König

Comparison of radar satellite data



- N-ICE
 - January 2015 – June 2015
- Data gathered include;
 - ALOS-2 Palsar (QP, L-band)
 - Radarsat-2 (QP, C-band)
 - TerraSAR-X (Dual, X-band)
- Two days with 3 different wavelengths QP
- Multiple days has overlap between at least 2 different wavelengths



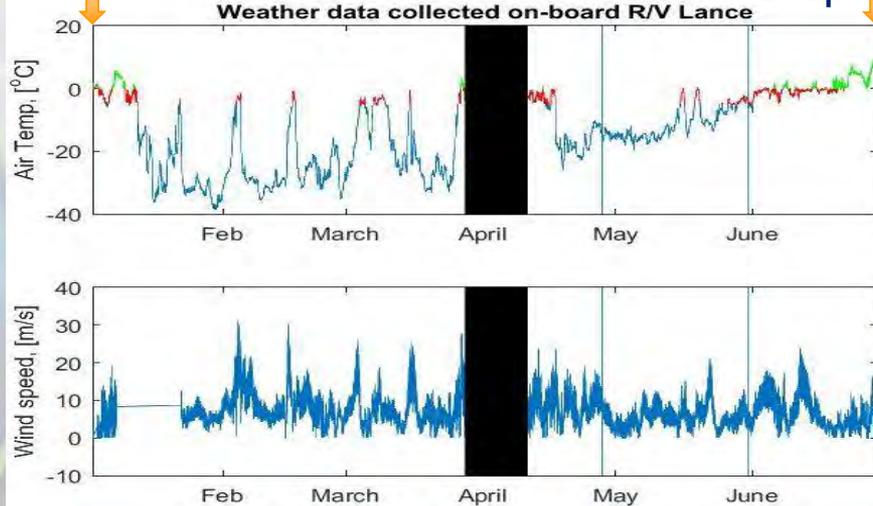
Acknowledgement;
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 2015) - All rights reserved.
 ALOS-2 data © 2015 ALOS- All rights reserved.



- Ground truth
 - Electromagnetic (EM) soundings
 - o From Helicopter
 - o Ground based
 - In-situ; coring
- On-board R/V Lance
 - Meteorological observations

Start cruise

Stop cruise



Helicopter EM



