Norwegian Space Centre Report on Cal/Val Activities

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Norwegian Space Centre

Agenda Item #

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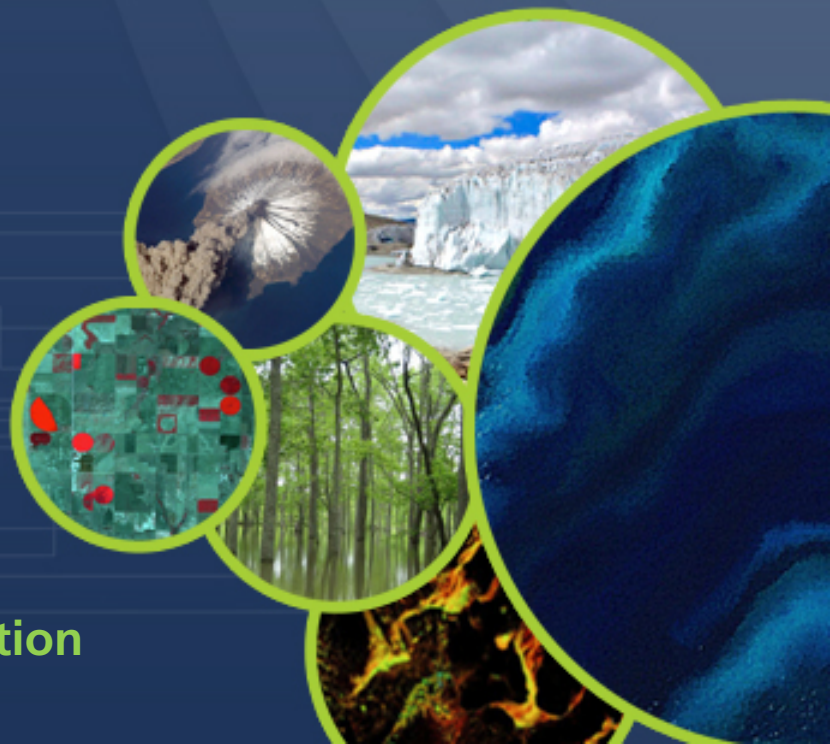


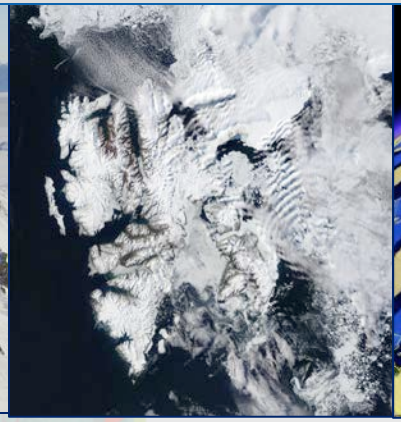
Working Group on Calibration and Validation

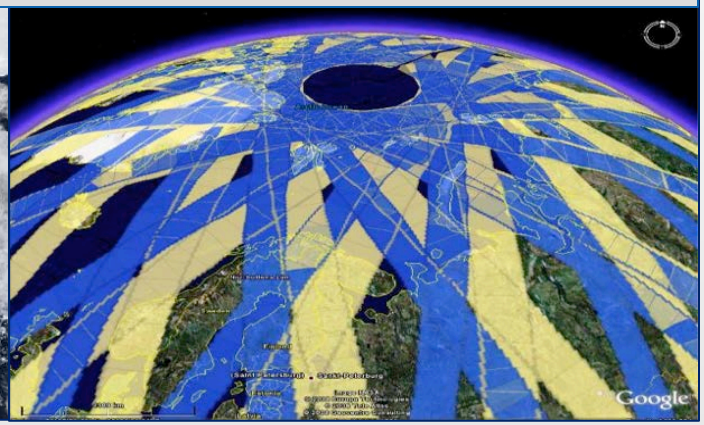
Svalbard Integrated Arctic Observing System (SIOS) – update

Timeline:

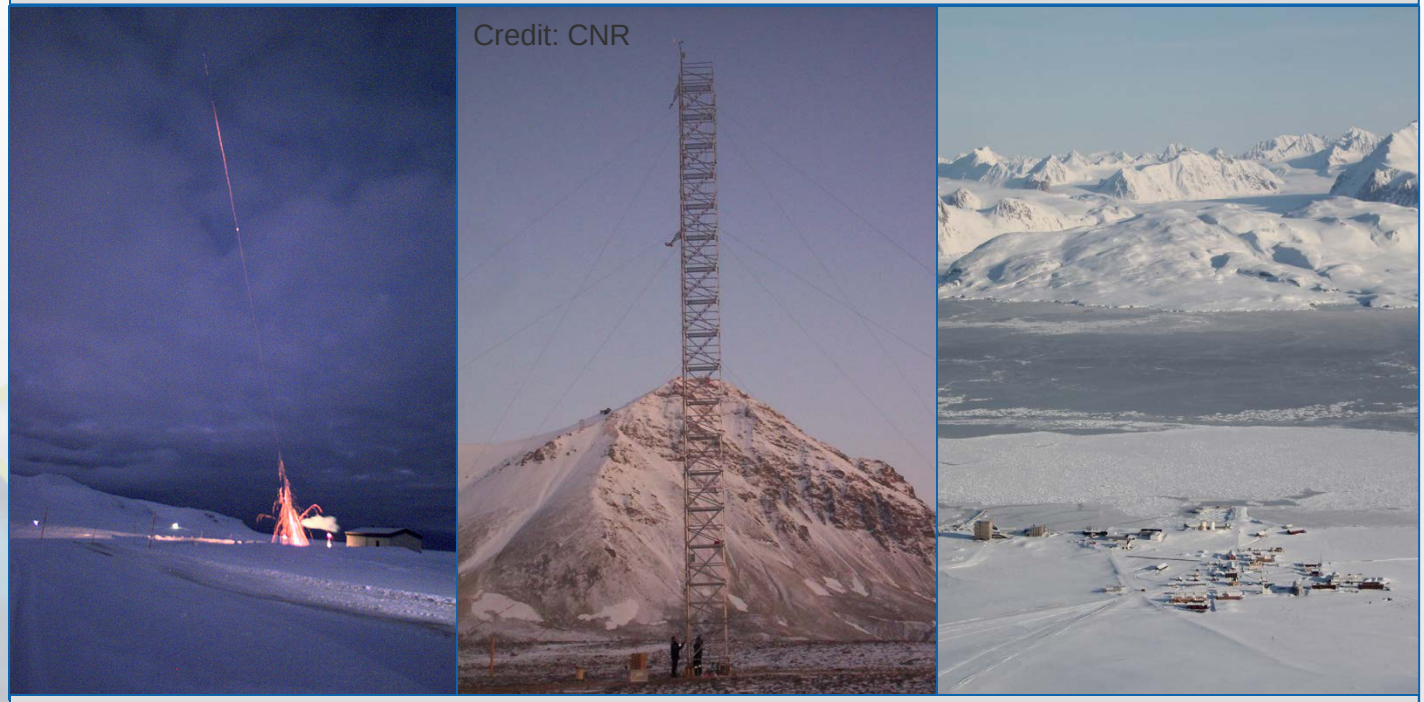
- Preparatory phase: 2010 – 2014
- Implementation phase: 2015 – 2017
- Upgrade phase: 2018 – 2019
- Operational phase: 2020 →

SIOS will establish a regional observational system for long term measurements in and around Svalbard, addressing Earth System Science (ESS) questions related to Global Change.





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.

Governance structure and legal form

- SIOS will be a membership based organization with a legally non-binding MoU establishing and regulating the cooperation between the partners

- The partners of the MoU will accept the Statues and the membership fees for running the Knowledge Centre and its services

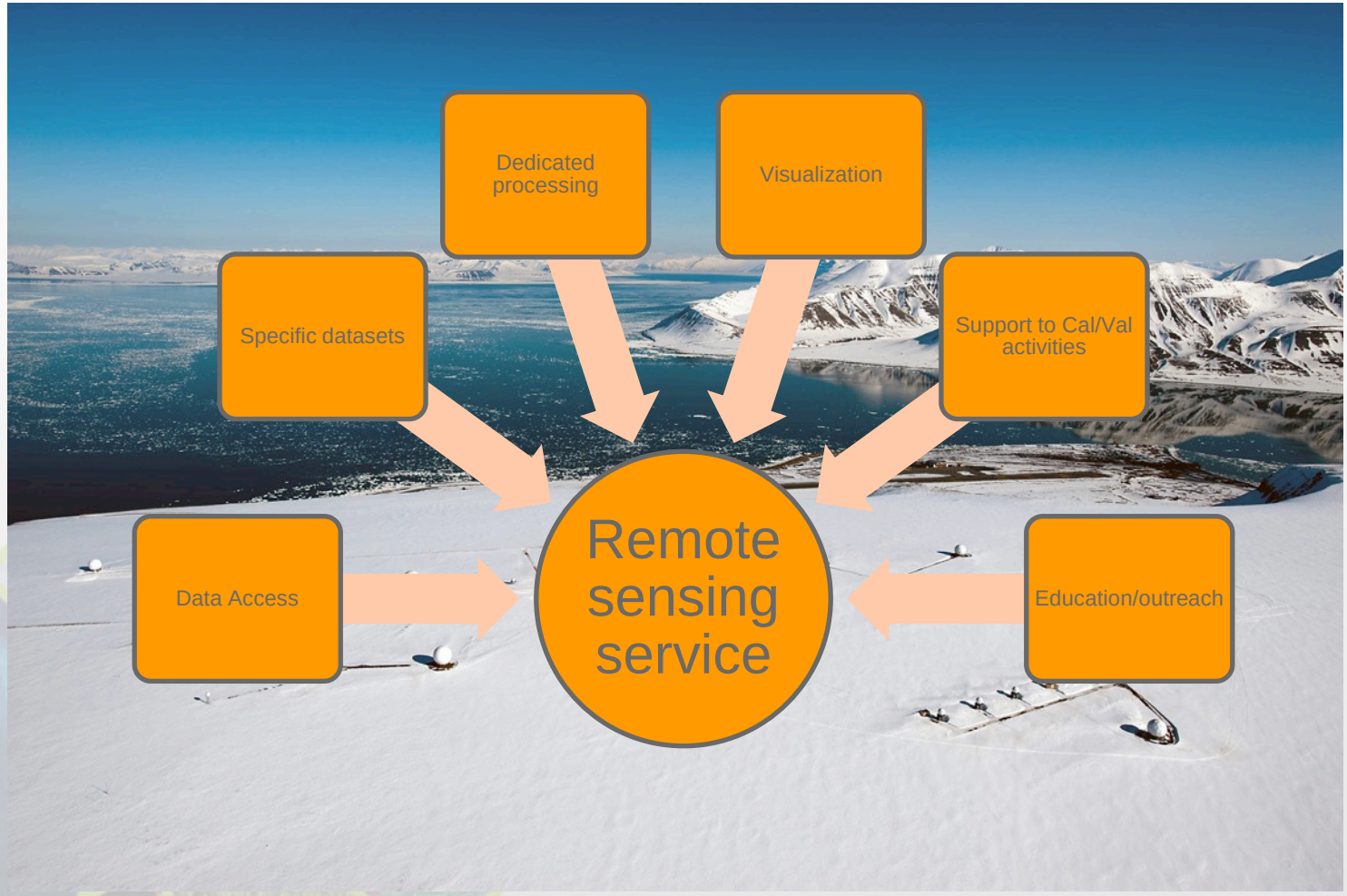
- The legal form will be a Norwegian limited company (AS)

SIOS Knowledge Centre

The central coordinating and integrating unit

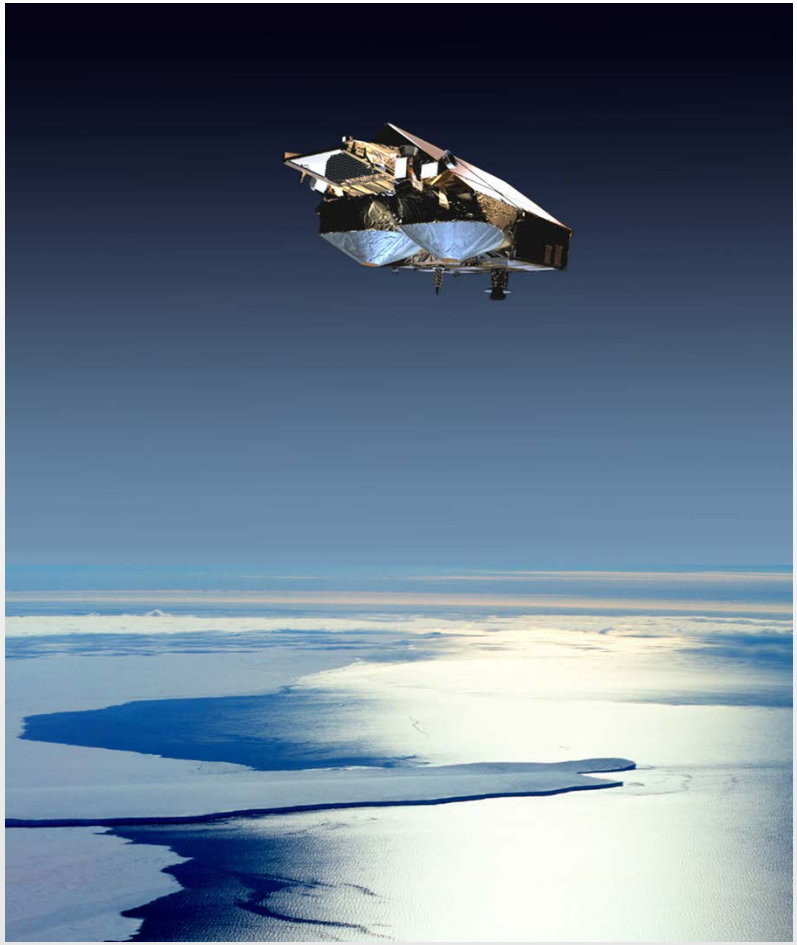
- open access to the research facilities, observations and data
- integrated and better access to logistical resources
- infrastructure, overview of research sailing routes, field experiments and campaigns
- tailor made courses/training in use of infrastructure
- facilitation of scientific integration, workshops and meeting places on specific ESS issues for scientists and students
- outreach activities for scientists and public

The sub-services



Cal/Val

- Research infrastructure on Svalbard offers a unique possibility for performing ground-based validation of satellite data for multidisciplinary research
  - Inventory of available/relevant satellite instruments and observations
  - Validation needs
  - Long-term validation and cooperation agreements with satellite owners



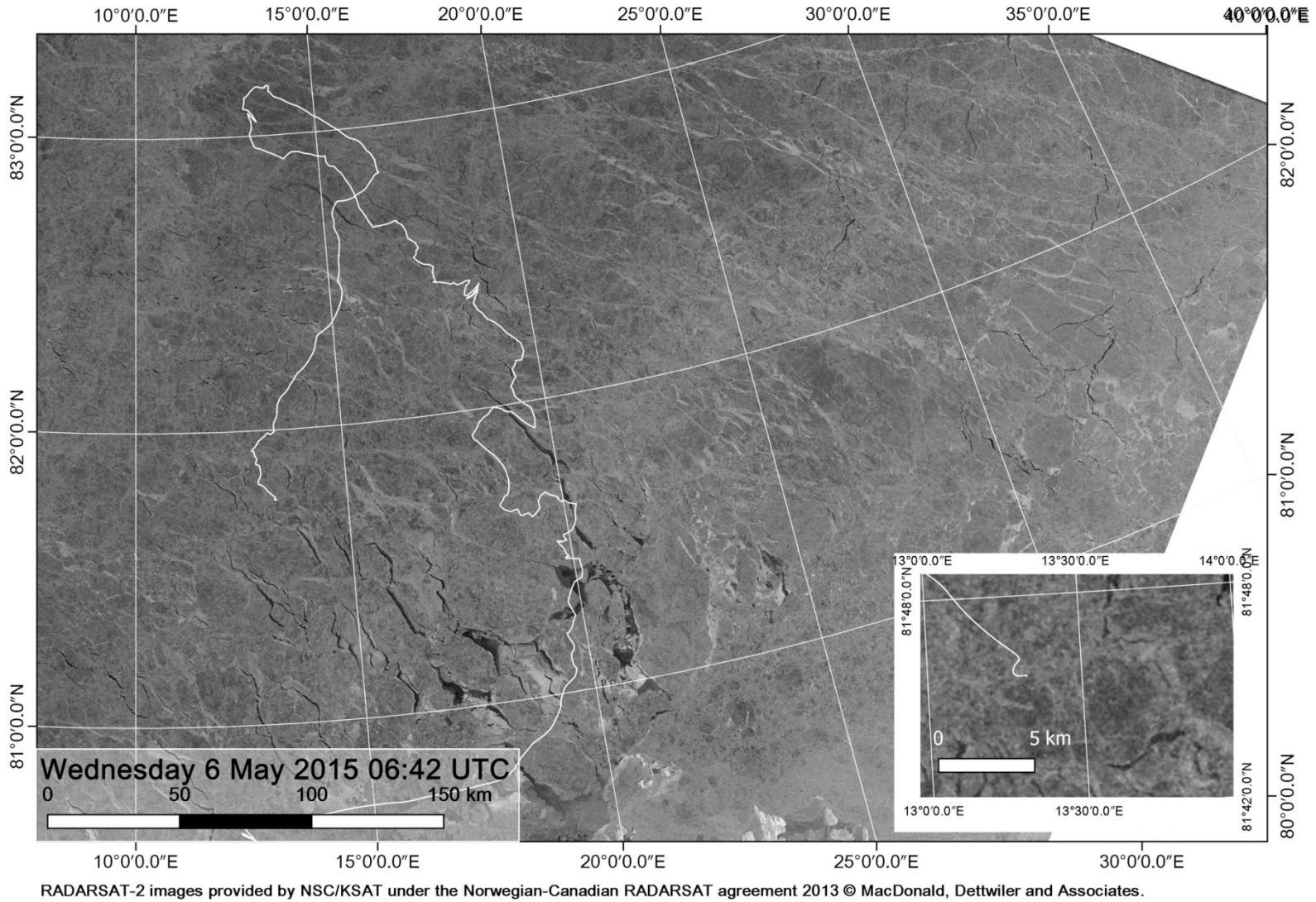
Norwegian Young sea ICE cruise

- 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.

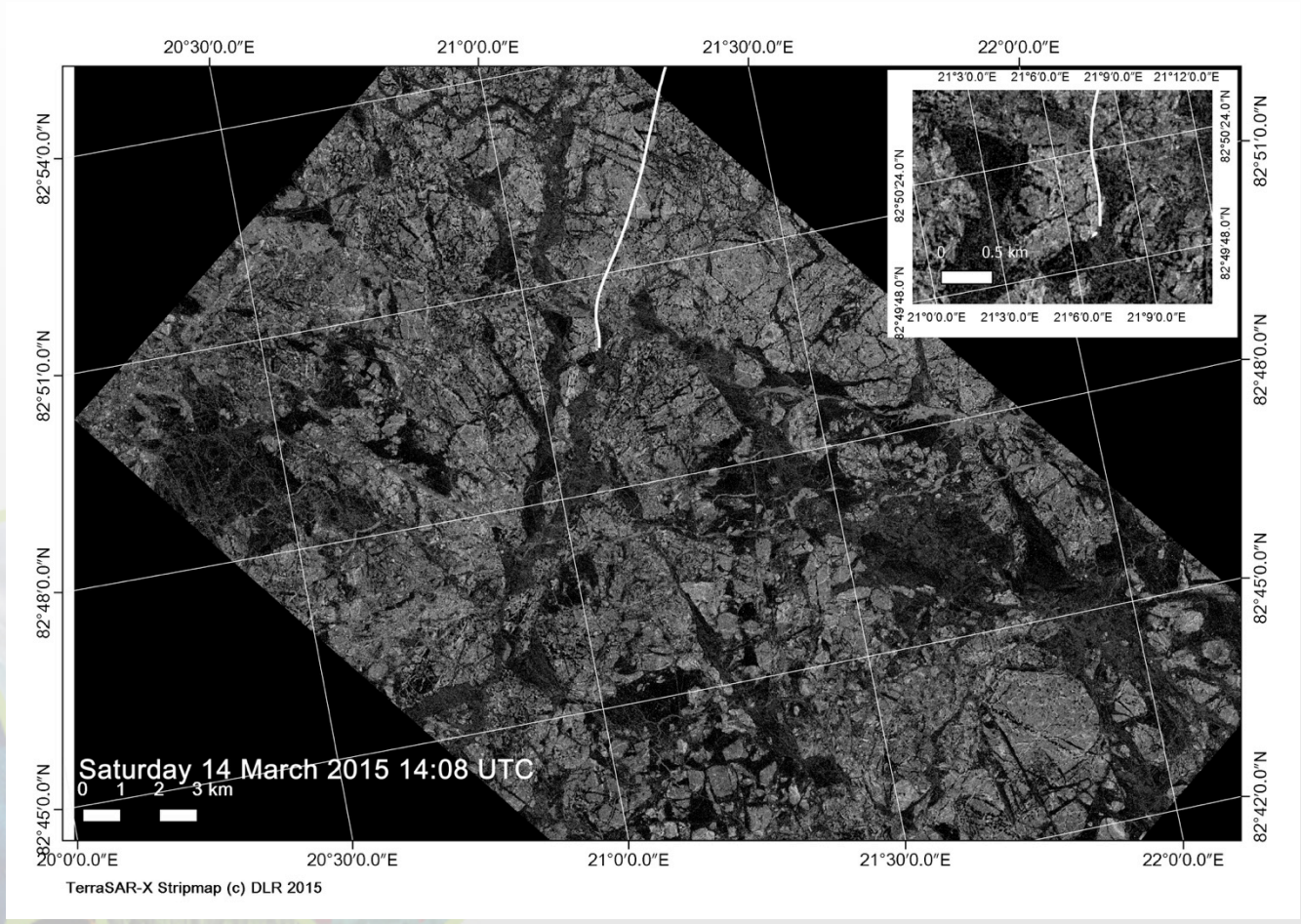
ork on the ice during the 2014 test cruise in preparation for N-ICE2015.
lar Institute

N-ICE 2015



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

Ice chart TerraSAR-X



Implementation phase 2015 - 2017

- Establish the remote sensing service – version 1
  - detailed specification of the service
  - project manager at SIOS KC
  - 2 additional remote sensing experts as in-kind contributions
- Demonstrate a first set of pilot remote sensing products for SIOS
- Provide access to remote sensing data through the SIOS data management system
- Establish interface with Norwegian Copernicus Ground Segment and NORMAP

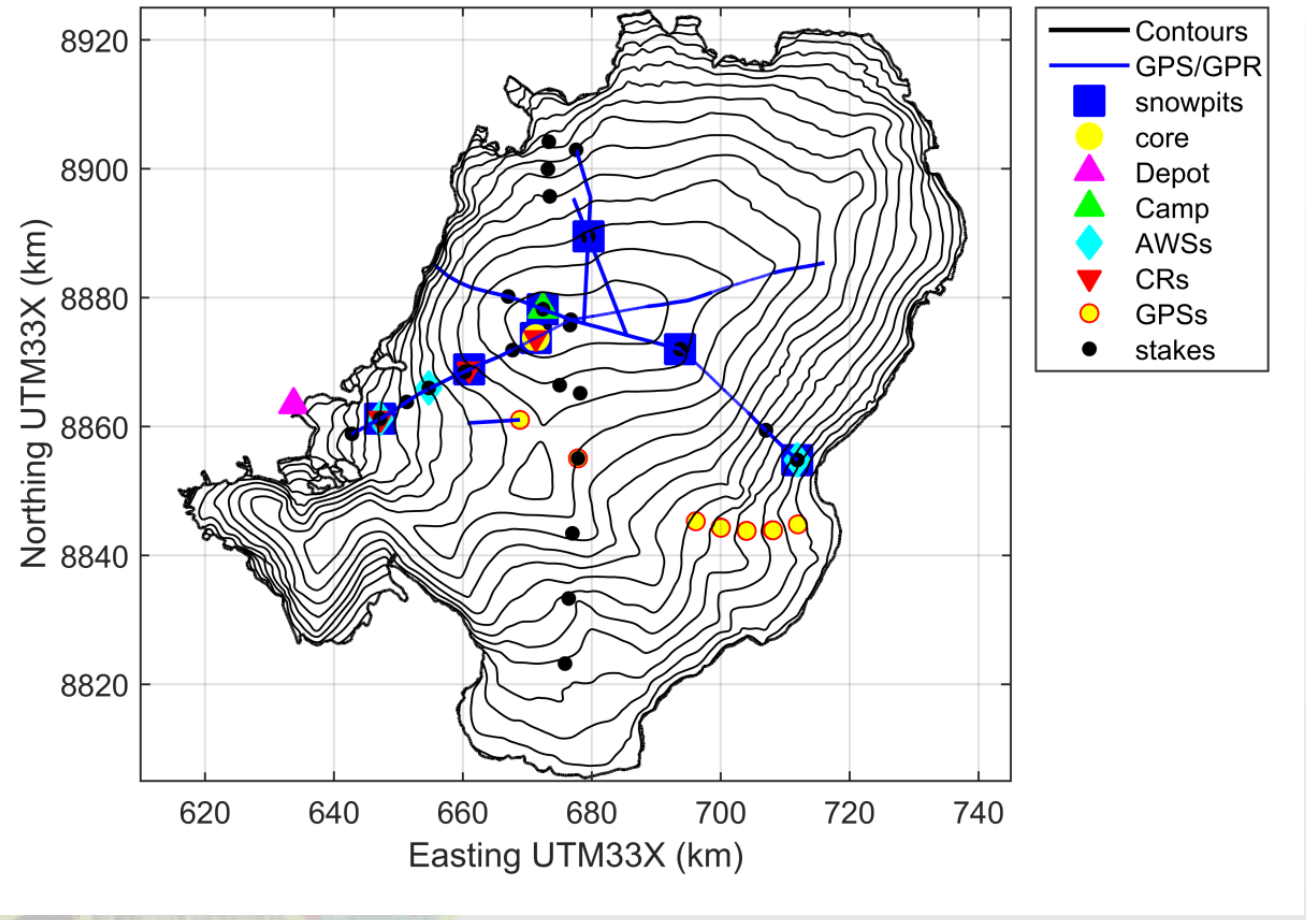
Cryovex

- Consortium formed by the Norwegian Polar Institute (NPI) and the Department of Geosciences at the University of Oslo (UiO)
- Glaciological investigations on Austfonna, Svalbard
- Included as test area for the Cal/Val of CryoSat-2
- Cal/Val activities described in ESA document CryoVEx 2014 Campaign Implementation Plan

Investigations include

- **differential GPS profiling** of the glacier surface along reference tracks for absolute calibration and calculation of elevation changes
- **radar profiling** of snow thickness and internal structure of firn
- maintenance and measurement of a **network of mass balance stakes** including their differential GPS measurement for calculation of ice surface velocities
- retrieval of **shallow ice cores** for reconstruction of accumulation rates and accumulation variability
- **neutron probe, borehole camera** and **DiElectric Profiling (DEP)** for firn properties
- detailed **snow-pit stratigraphy** and **Ku-band radar measurements** to gain a better understanding of radar scattering properties.

2014 field activities



ALOMAR Observatory

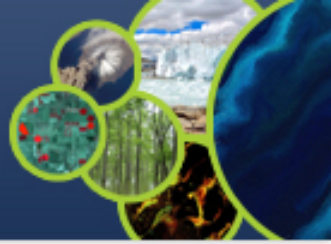
(Arctic Lidar Observatory for Middle Atmosphere Research)

- Participating in the DLR pre-launch campaign with Falcon aircraft in Iceland in May
- The Falcon is equipped with the ALADIN airborne demonstrator A2D and the 2-µm Doppler wind lidar.
- Will fly over Andøya/ALOMAR on the way back from Iceland to Germany
- Lidar, weather balloon and UAV

Kai Sørensen, Norwegian Institute for Water Research

Validation of satellite data in Norwegian waters using NIVAs Ferrybox network

NIVAs activity relevant for satellite validation



- NIVA worked on the MERIS validation using traditional in situ optical campaign and Ferrybox observation
- NIVA participate in the Sentinel validation team (S3VT)
- Norwegian Ferrybox network in operation in North Sea, Skagerrak/Kattegat, Atlantic, Coastal of Norway and Arctic
- Participate in the European Ferrybox Network through the ROOSes, MyOcean and JeriCO-NEXT.
- Making the Ferrybox Research infrastructure more available for satellite community through implementation of new methods and instrumentation onboard the ships of opportunity
- Works on processor tool for quality assessment of above water reflectance: corrections for aerosols and polarization
- Investigation the use of the Wave Glider platform for validation.
- Participate in two relevant FP7 satellite project (AquaUSERS and HighROC) with in situ validation campaigns and protocols.

NIVAs Ferrybox network for Ocean Colour and SST validation