

Integrating Copernicus products with in situ products for sustainable field studies in Svalbard

Shridhar Jawak

Remote Sensing Officer, SIOS

07 November 2018
Copernicus & Polar Regions Industry
Workshop, Brussels.

SIOS Knowledge Centre
9171 Longyearbyen, Norway
www.sios-svalbard.org

Shridhar D. Jawak
Remote Sensing Officer
remotesensing@sios-svalbard.org



SIOS – an international collaboration to create a regional observing system for Arctic Earth System Science

The regional scope

- The Norwegian archipelago Svalbard and surrounding waters



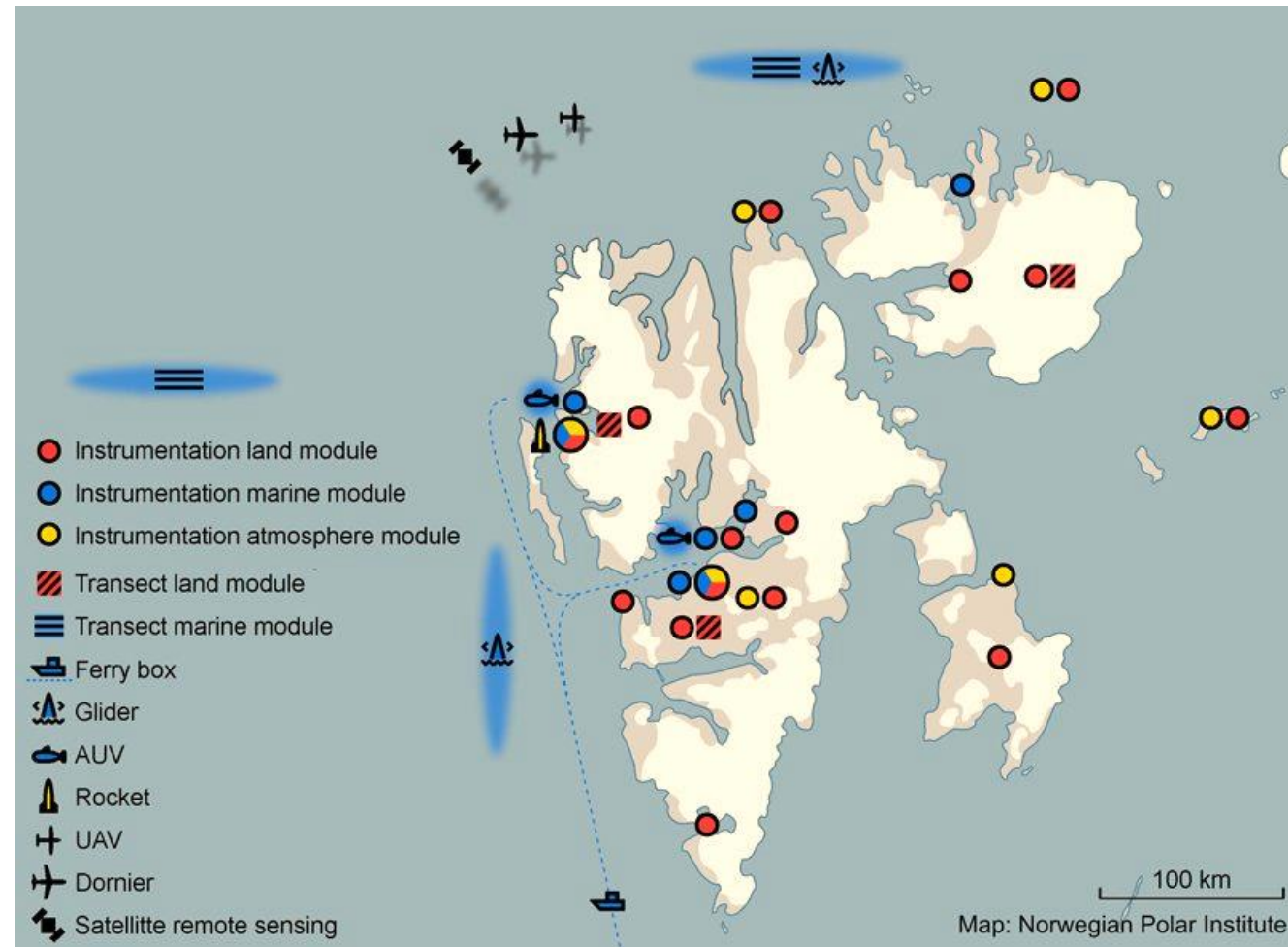
The Consortium

- 25 institutions from 10 nations

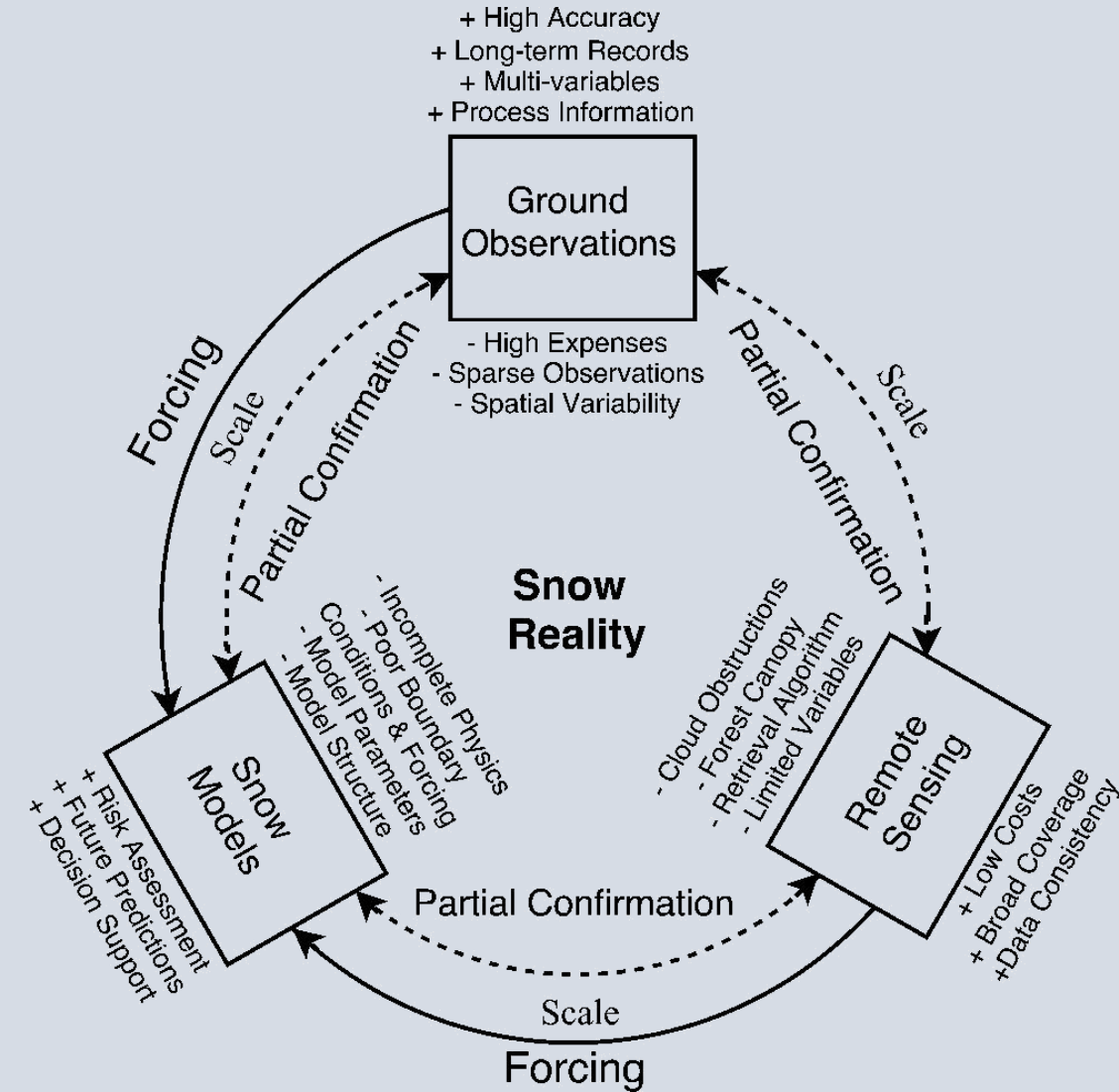
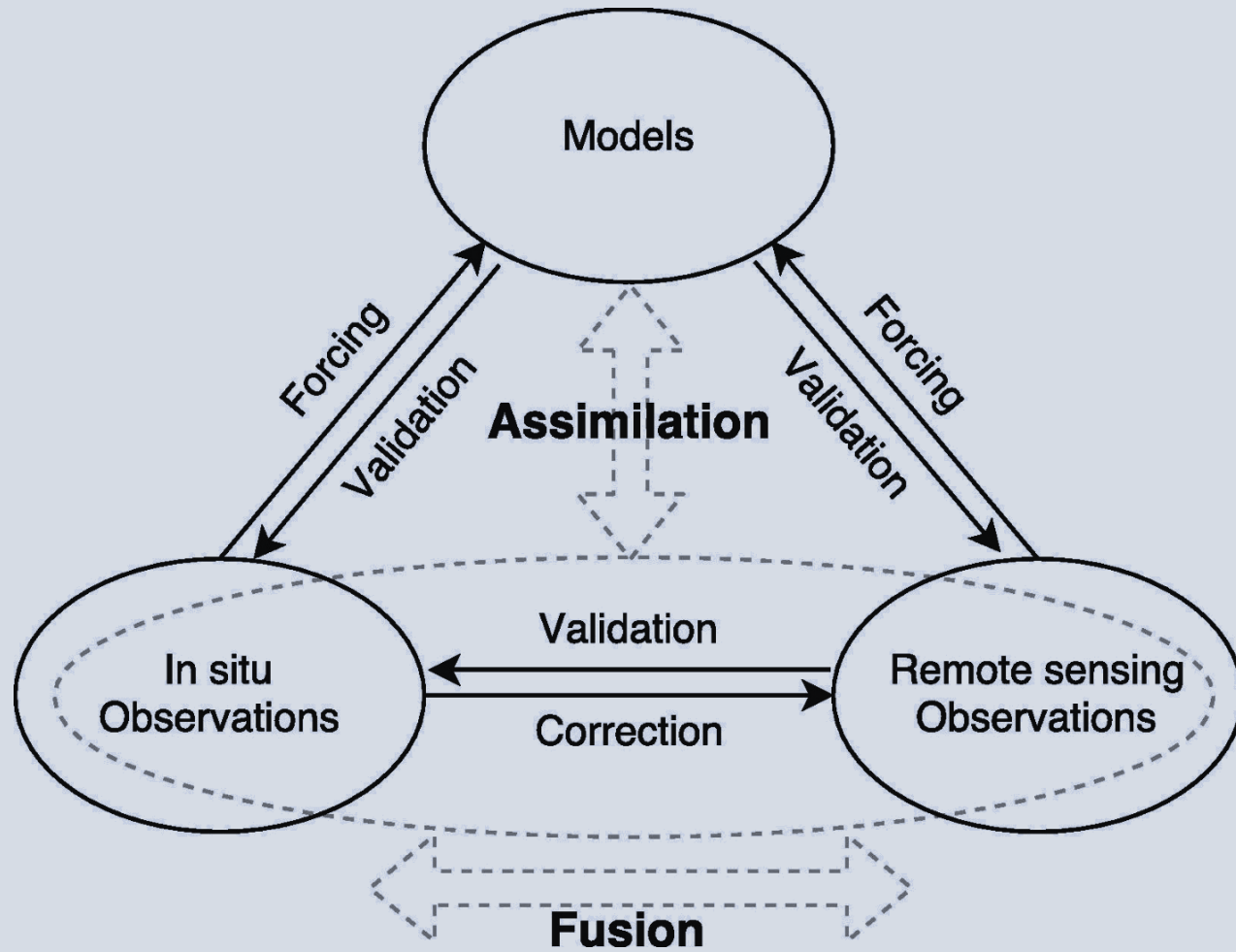


Svalbard is probably the most data rich region in the Arctic

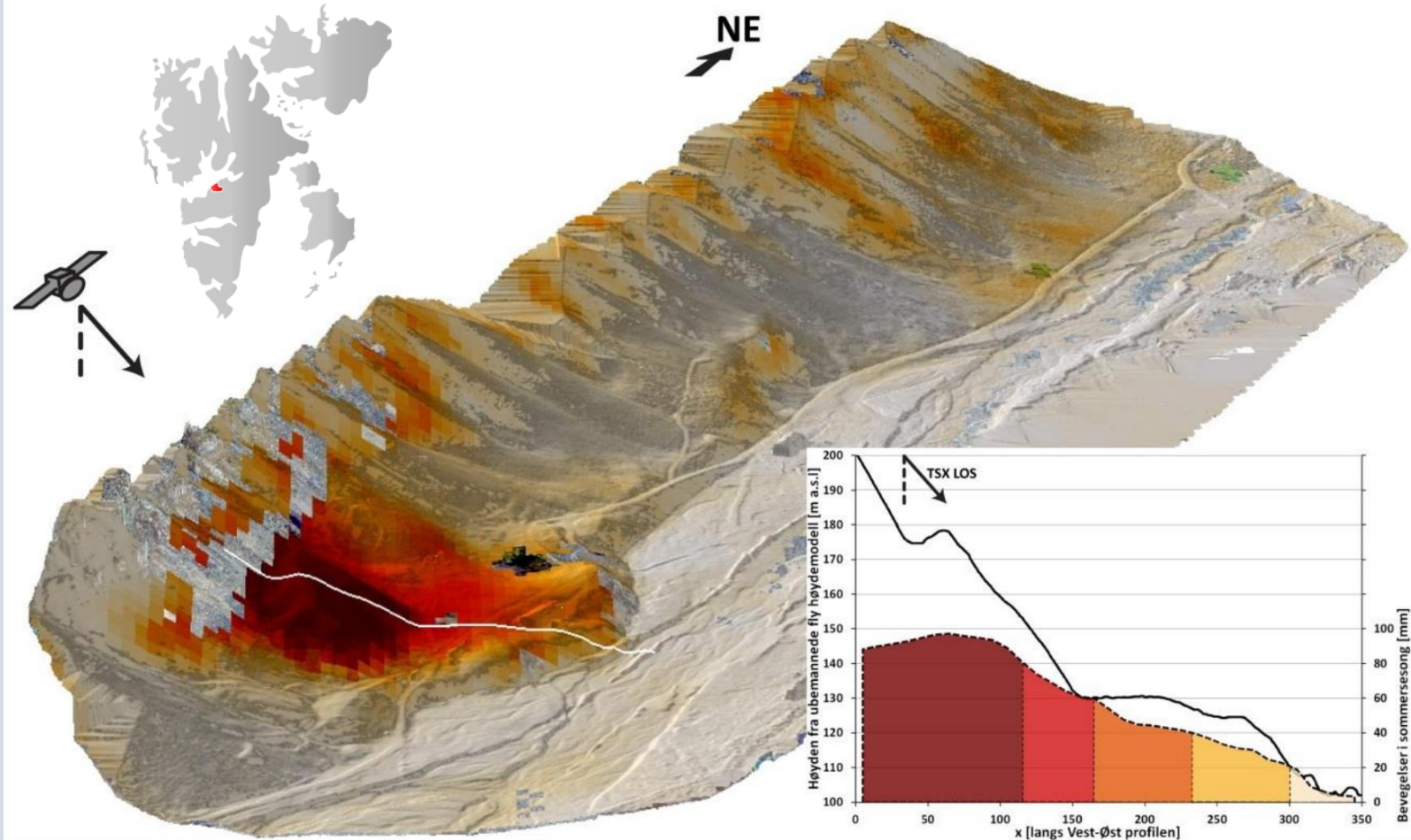
Still there are massive data gaps!



Why integration of in situ and Copernicus data?



Integration of Copernicus and in situ data for the polar regions industry



3D overview of Sverdrupbyen and the left side of the Longyear Valley from unmanned aerial elevation model and InSAR results from TerraSAR-X sensor in ascending geometry. Profile - height (black line) - and average movements in summer season (dotted line of colors per class of deformation, each 20 mm).

InSAR Based surface movements coupled with in situ ground validation.

The movements, averaged over **8 cm** during the summer seasons, are linked to internal deformation of a rock breach and surface depression.

During the summer of 2017 there was a big crack in the terrain and a small lake drained. This is a sign that changes in permafrost lead to increased deformation and, consequently, changes in the terrain that may affect infrastructure.

Benefits of integration of Copernicus data with in situ data

Benefits for field scientists !

Realtime to near real time satellite data to conform the ground truth value over large area

Point data with limited coverage can be integrated with satellite data with larger coverage

Integration of data from various spheres (bio-, geo-, hydro-, cryo-), various satellites (optical, SAR, LiDAR) and in situ data from various instrumentations can contribute to address broad scientific questions

Strengths can be optimized and weaknesses can be reduced by integration of data and information

Benefits for satellite owners !

Continuous ground truthing

Calibration and validation of satellite data

Mutual benefit for both scientists and owners