# I CONVEGNO ISTITUTO DI SCIENZE POLARI

## Biogeographical shifts and climate discontinuities: understanding polar and sub-polar spatial patterns and temporal processes


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Roma, 22 – 24 settembre 2021

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## Biophysical parameters retrieval in Svalbard with the new generation of satellite sensors

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# Generation of biophysical variables: Essential Variables for Climate and Biodiversity

to evaluate the status of, and changes in: ecosystem functions and structures, ecosystem services, ecosystem pressures and drivers of changes in polar systems

Optical hyper-multispectral sensors

Microwaves and Radar altimeters

Thermal emissivity and reflection

Climate scenarios & Climate models

*Mapping Terrestrial and Aquatic variables*

*Modelling dynamics of cross-scale geosphere-biosphere interactions*

*Measuring and predicting changes in surfaces properties*

**TOWARDS OPERATIONAL SERVICES**
*addressing long-term and large-scale environmental - ecological challenges*

**AT INTERNATIONAL LEVEL**
e.g.: Copernicus Climate (ECMWF) and Land / Marine Services

**AT NATIONAL LEVEL**
e.g.: Operational Climatology and Climate Services in Italy

identifying the mechanisms underlying non-polar systems changes

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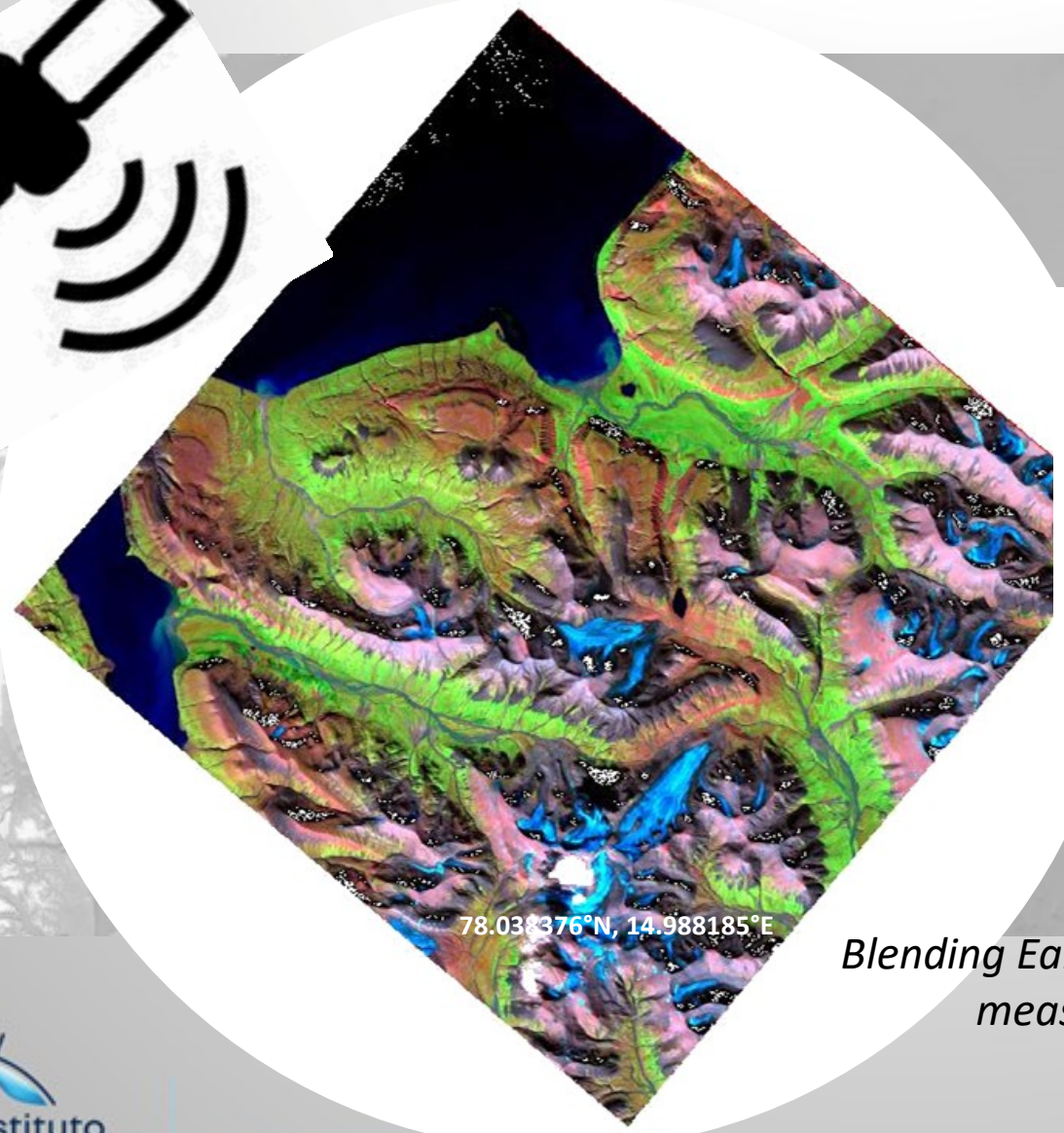



# *Blending Earth Observations from remote sensing and field measurements, data analysis and modelling*

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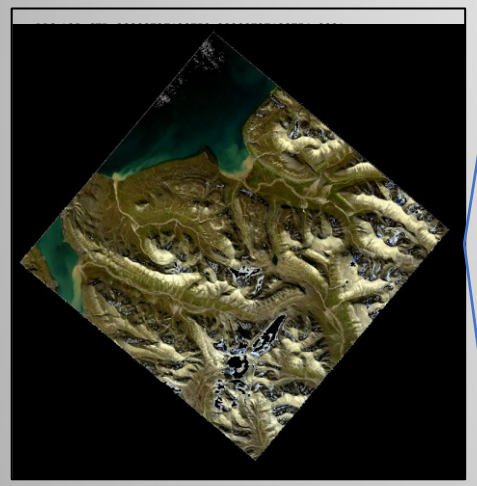
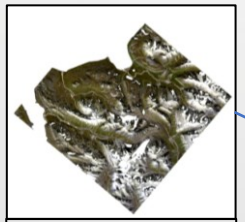
The potential of the new generation of satellite sensors (e.g. PRISMA) is tested in Svalbard (Norway)

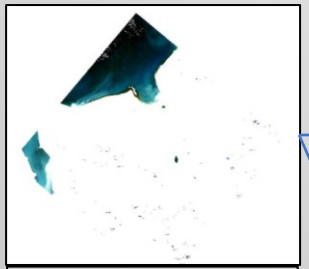


Land

Snow coverage



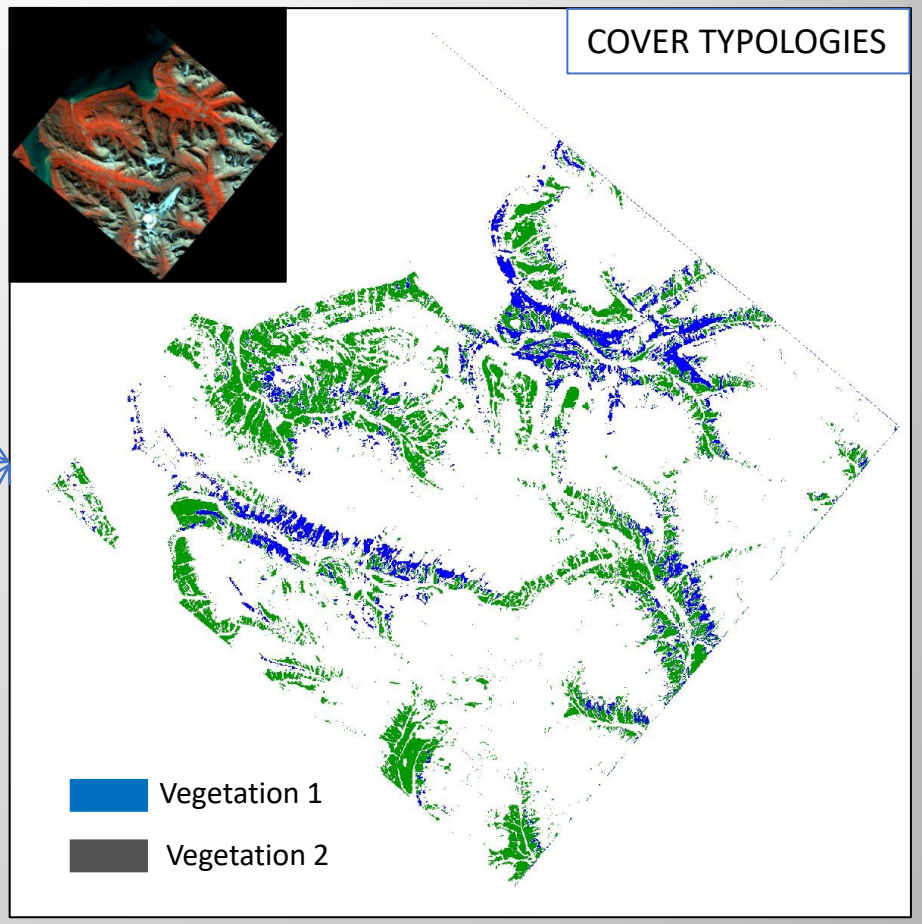
No_Snow coverage



Inland, Coastal and Sea Water

Turbid Water

Drainage system

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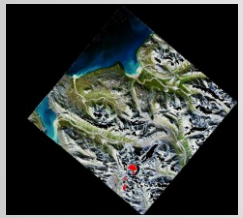
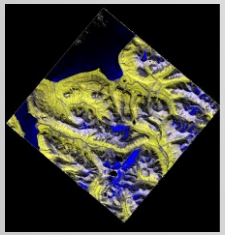
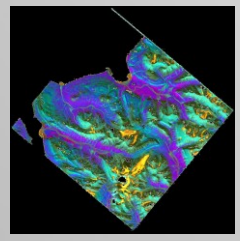


# Knowledge gaps in POLAR ECOSYSTEMS can be filled by mixing existing and new generation of EARTH OBSERVATIONS (EO)



## SNOW & ICE COVER surfaces changes are ESSENTIAL CLIMATE VARIABLES (i.e. PERMAFROST – CARBON CYCLE – WATER CYCLE)



## VEGETATION AND SOIL COVER surfaces changes are ESSENTIAL BIODIVERSITY VARIABLES (i.e. VEGETATION PRESENCE provides SOIL PROTECTION)

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