FINNISH METEOROLOGICAL INSTITUTE

Remote Sensing of Sea Ice

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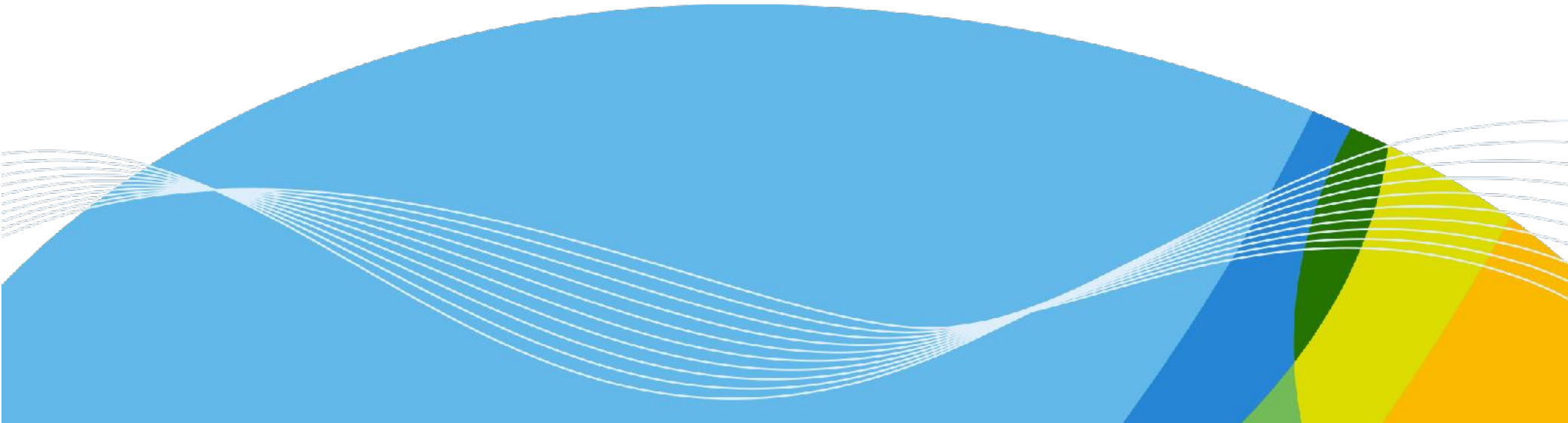


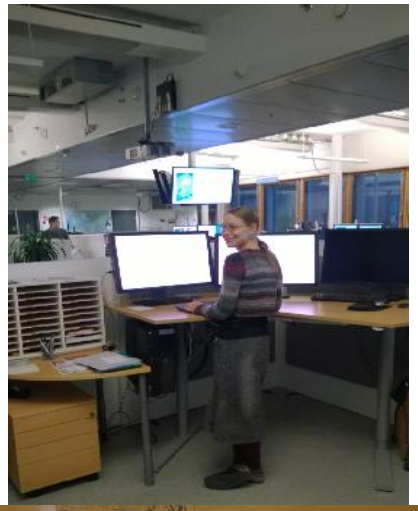
Sea ice remote sensing teams in FMI

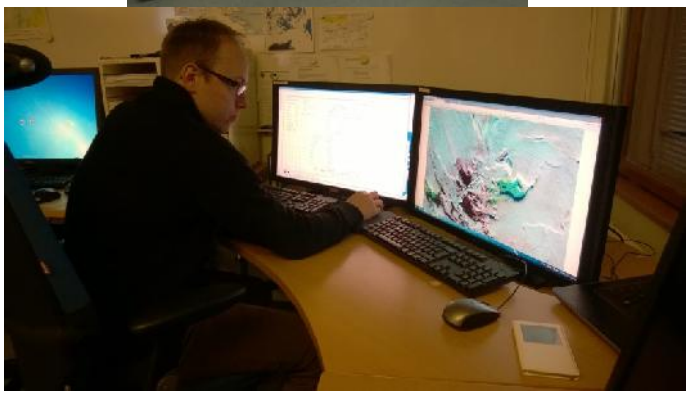
- **Strong research group**
  - Support to operations
  - Basic research
  - Climate research
  - Supports / gets support from modelling team
- **Ice service**
  - A traditional and well known player in ice charting
- **A satellite ground station**
  - Conveniently based in Sodankylä
  - Smooth co-operation with ice research and service

Flow of data through FMI

T = 0

T = ~ 20 min





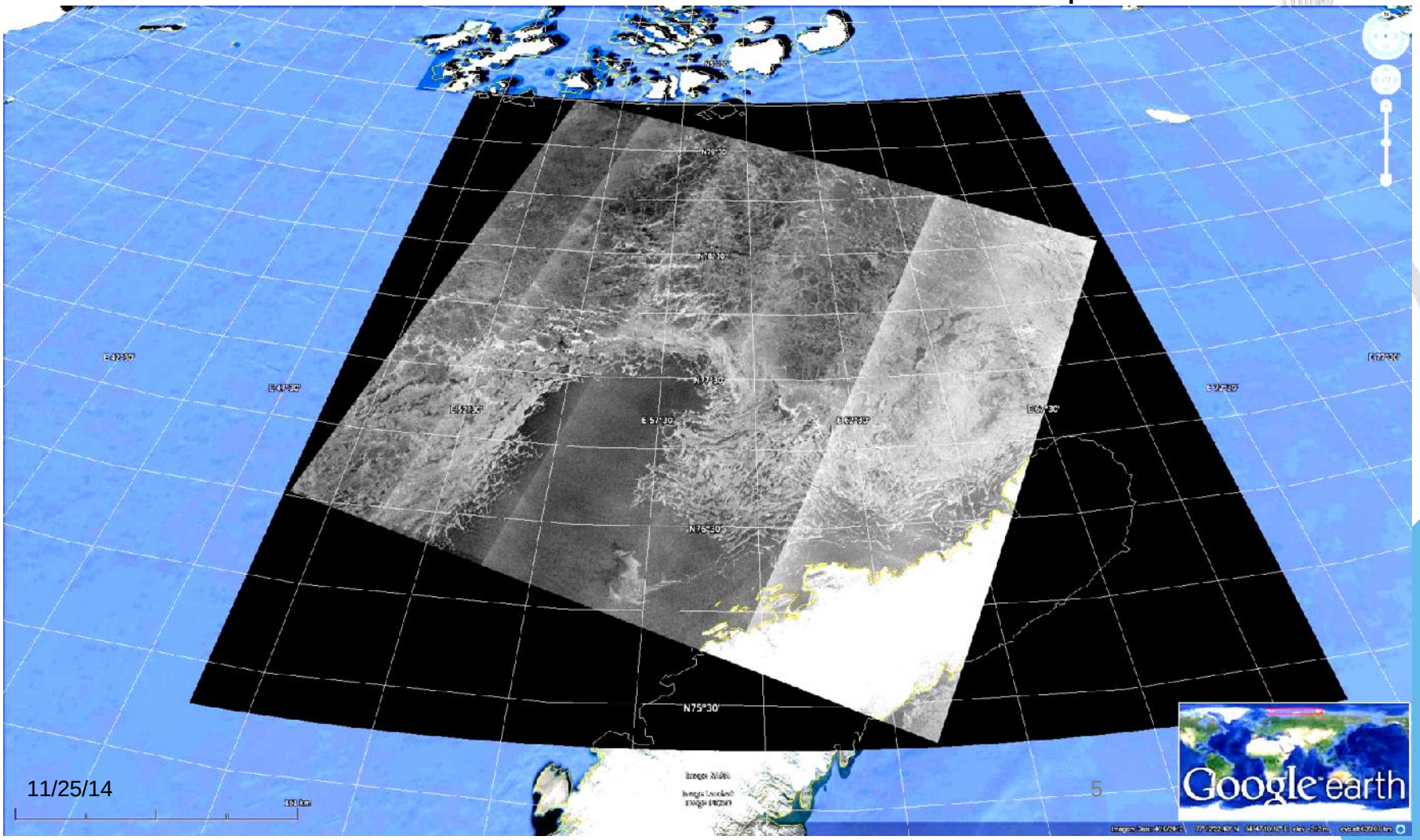
T ~ 30 min (images and automatic products)
T ~ 30 min - 2 h (human analysis)

Synthetic Aperture Radar (SAR)

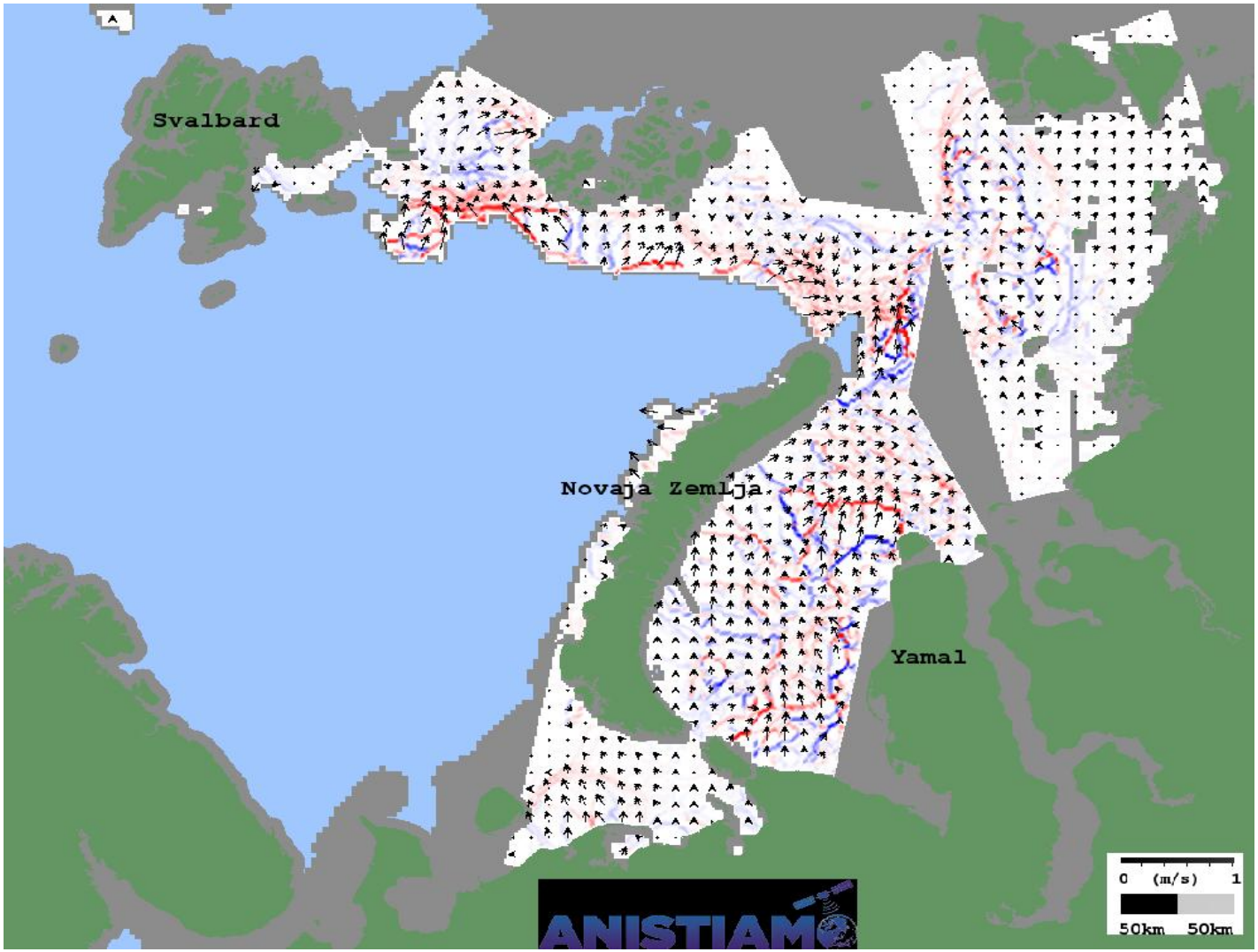
- Backbone of modern ice charting
- Imaging radar

Sentinel 1A frame 24.11.2014

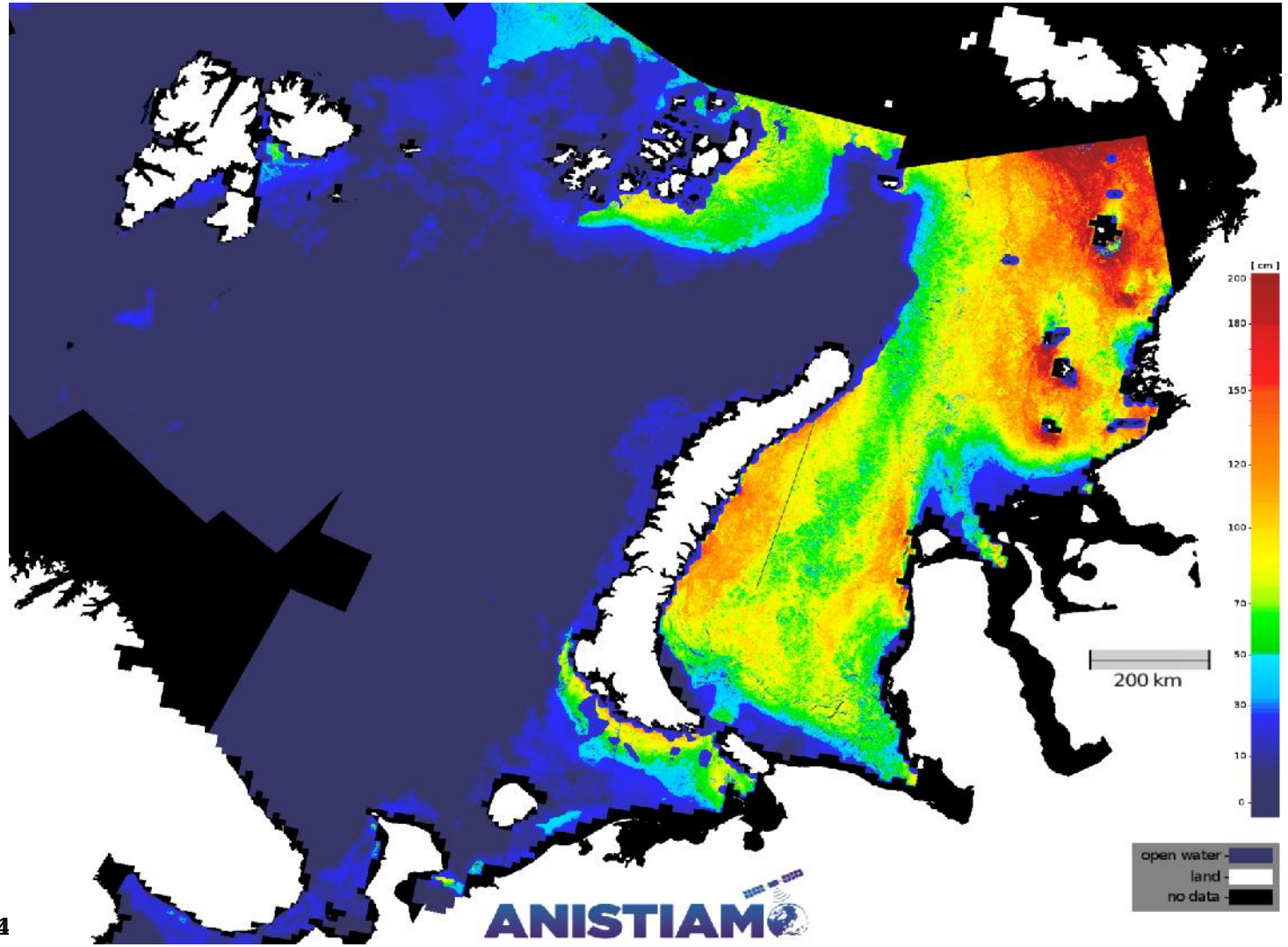
Copernicus data 2014



Ice motion and convergence



Thickness


[cm]
200
180
150
120
100
70
50
30
10
0
200 km
open water
land
no data
ANISTIAMO

We can do the traditional stuff too

”The ice has grown rapidly in the past few days. The river Ob seeds ice that flows out through the island of Ostrov Belyy. This ice is thicker – I’d say 10 cm – 30 cm. The edge of this thicker ice goes North from the Eastern edge of the Ostrov Belyy island. West of the island there is new thin ice …

… you should be clear of ice soon after WP8 unless the wind changes”

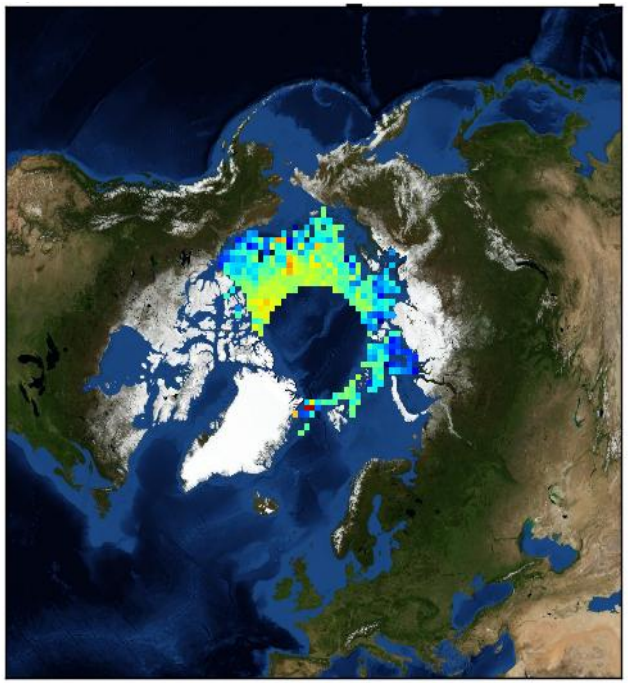
- - Actual FMI ice report from this October

Satellite altimetry

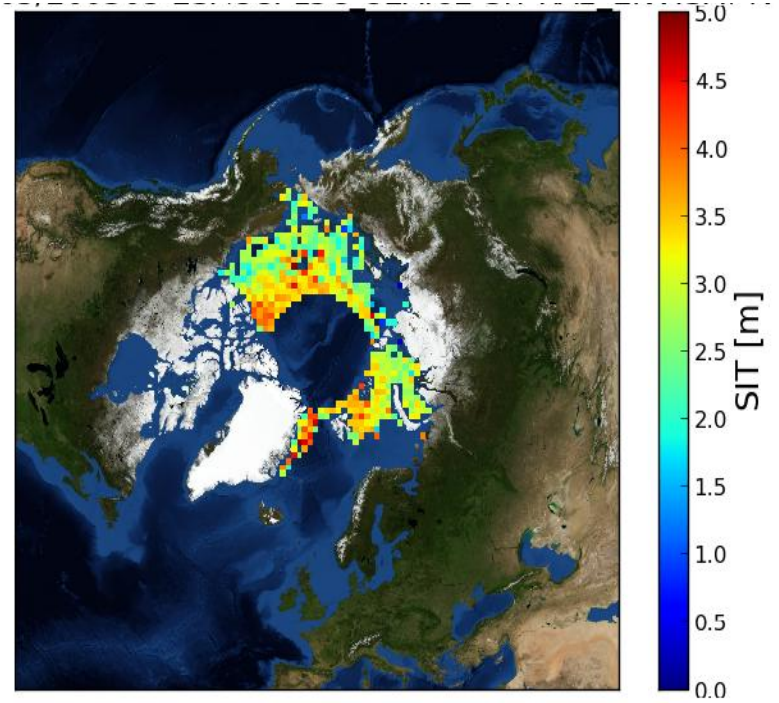
- Non-imaging
- Measures the target surface elevation
- Traditionally a tool for climate research

Sea Ice Thickness for climate research

Monthly thickness maps for winters 2002 - present

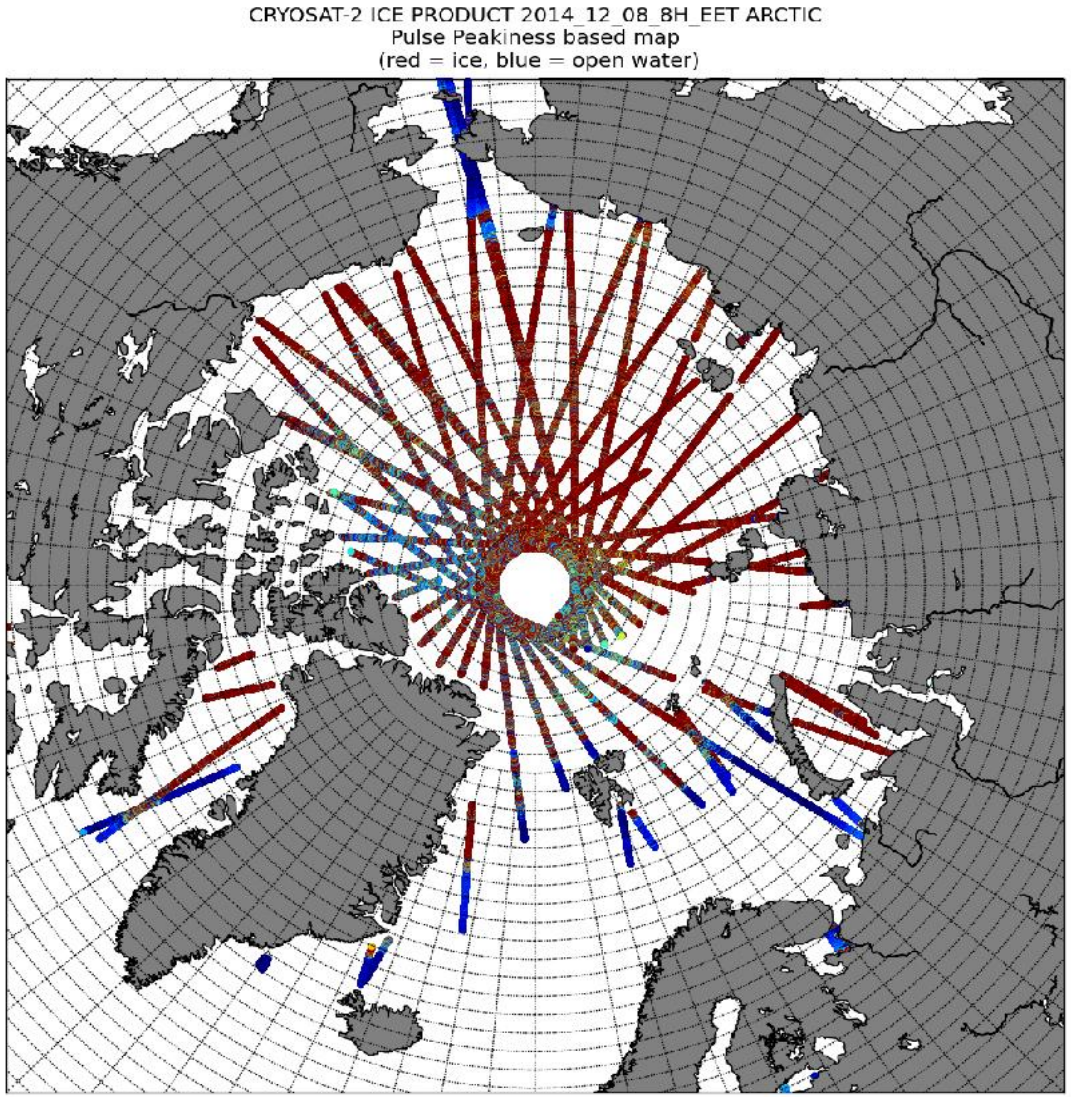


November 2003



March 2004

Cryosat-2 “FMI Ice Product”



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