



# Polar Copernicus – current status and future plans

Maria Høegh Berdahl

DG DEFIS, European Commission





## Copernicus in the EU Arctic Policy

- The EC will:
- Strengthen the capacity of the Copernicus Marine Environment Monitoring Service to address the specific needs of the Arctic Ocean;
- Expand the Arctic services of Copernicus, and use knowledge and data gathered by projects like Arctic Passion, and;
- Explore the establishment of a Copernicus Arctic thematic hub to present as a “one-stop-shop” all relevant services to monitor the poles, both inland and at sea.

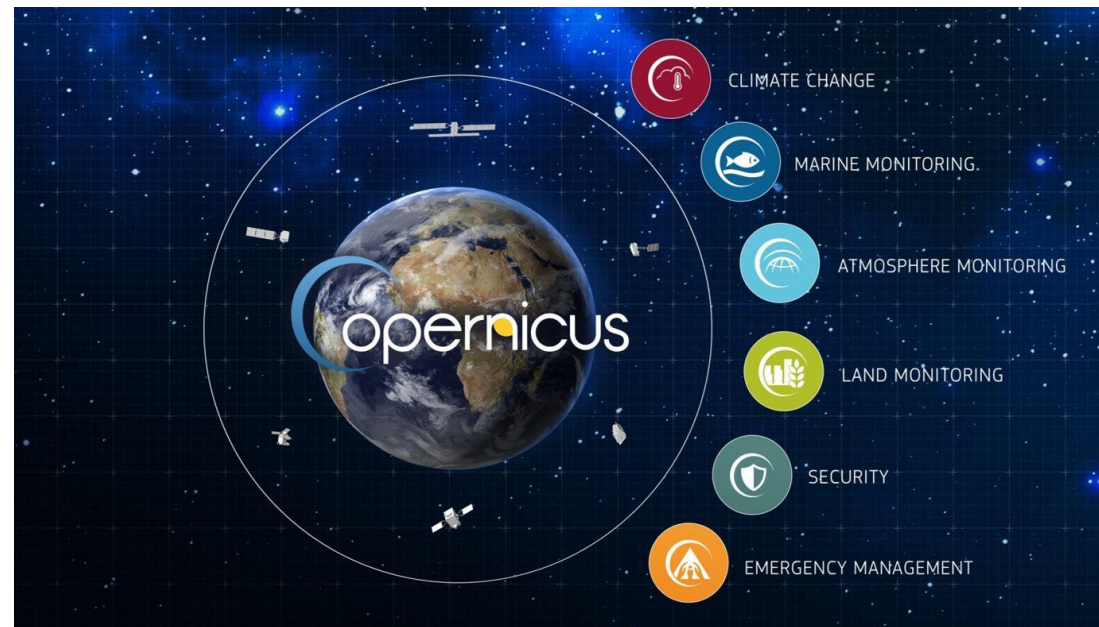
# COPERNICUS ARCHITECTURE

FULL,  
FREE  
AND  
OPEN



Sentinels

6 services use Earth  
Observation data to  
deliver...



...added-value products



Contributing  
missions





## Land:

- Lake ice extent
- Snow cover extent
- Snow water equivalent



## Atmosphere:

- Black Carbon
- Methane
- Fire radiative power
- Ozone layer



## Marine (not complete list):

- Ocean Physics
- Biogeochemistry transparency, turbidity, primary production, pCO<sub>2</sub>, planktons, optics, nutrients
- Ocean waves (significant height, mean period, direction, stokes drift, wind waves, swells)
- Sea Ice Surface Temperature
- Sea Ice parameters (concentration, extent, thickness, edge, velocity and drift, age, albedo)
- Snow over sea ice
- SAR Sea Iceberg Concentration



## Climate:

- Albedo, leaf area index and fraction absorbed photosynthetically active radiation
- Glaciers elevation and mass change data
- Glaciers extent data
- Methane data
- Ozone
- Soil moisture
- Sea surface temperature daily
- Sea ice monthly and daily
- Sea surface heights NRT



Not including On-demand services as Copernicus Emergency Management and Security Services





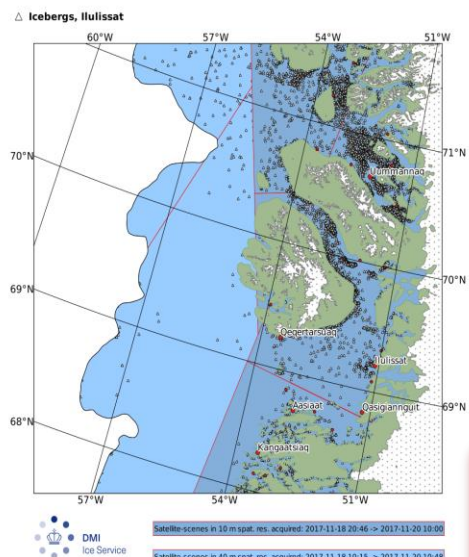
## Copernicus Contributing Mission supporting operational ice products

CCM (e.g. **TerraSAR-X**, **CosmoSkyMed**, **Radarsat-2**, **RCM**) provide important contribution to Copernicus Marine operational ice products (Icebergs, Sea-Ice products) complementing Sentinels data.

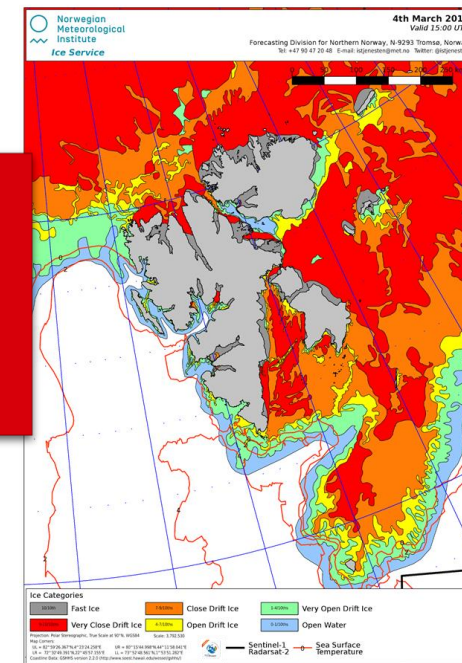
New missions' potentials are evaluated regularly with support from expert product-providers.

Recently a first evaluation of the **ICEYE** constellation to support operational ice products has been performed.

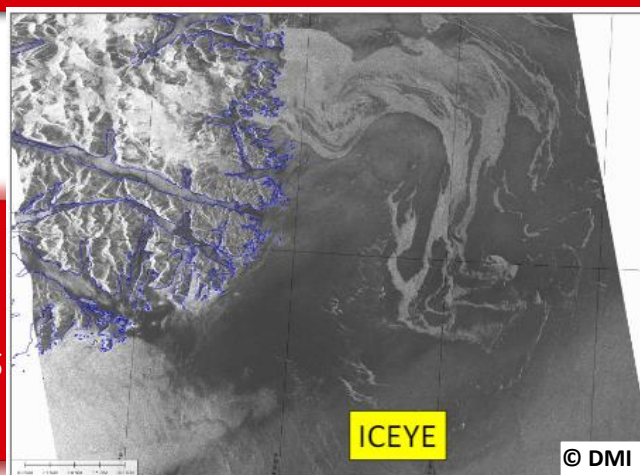
New pilots to assess the usefulness of very-high resolution optical constellations are under development.



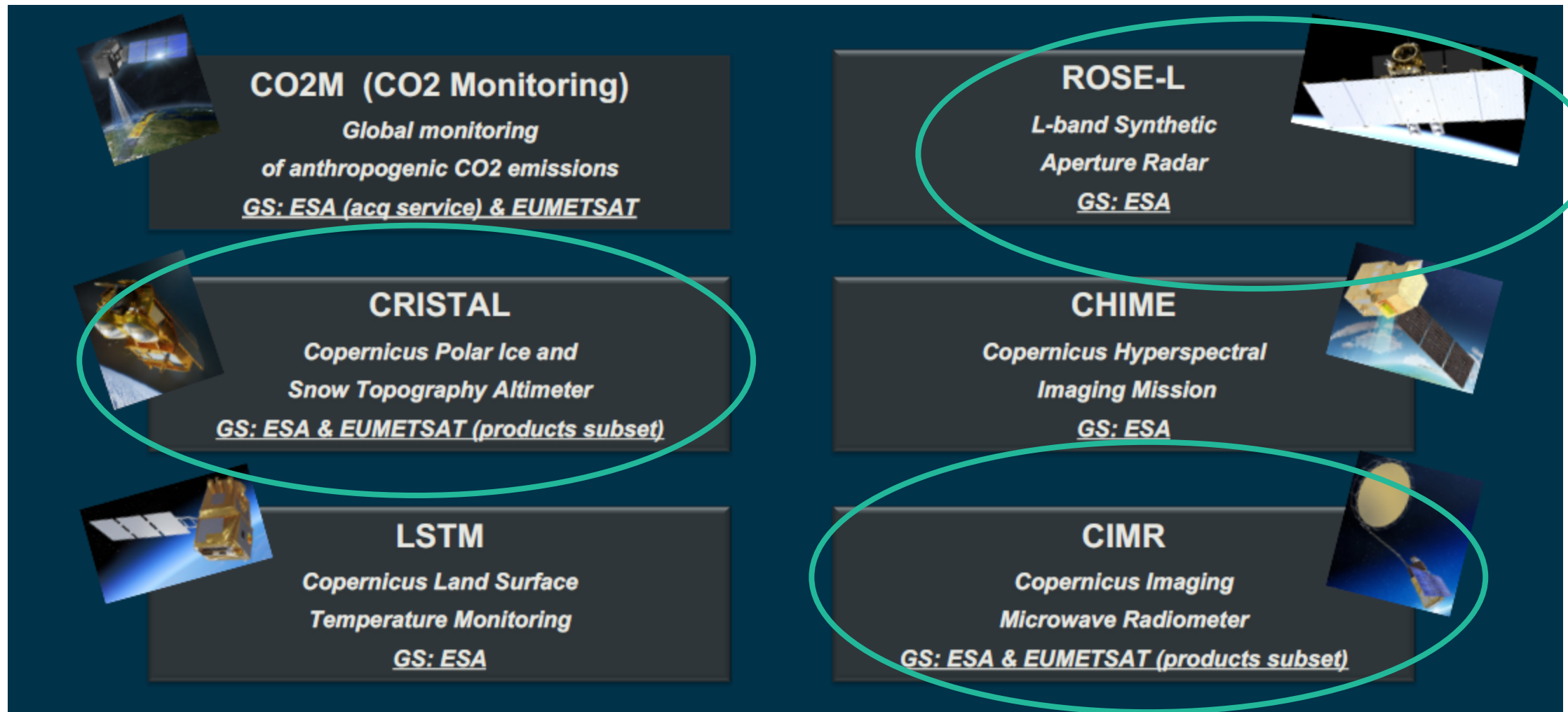
Map of Individual Iceberg positions



High resolution ice charts



# EUROGEO WORKSHOP 2022 Copernicus Expansion missions



ATHENS 7-9 DECEMBER 2022



## Polar Expert groups – PEG I, II & III

- PEG I: User Requirements and Priorities for a Copernicus Polar Mission, June 2017
- PEG II: High-level Mission requirements for a Copernicus Polar Mission, July 2017
- PEG III: User Requirements for a Copernicus Polar Observing System – Towards Operational Products and Services, April 2021



## Copernicus Polar Task Force (1)

- Builds on the work of previous Polar Expert Groups, and the recommendations in the PEG III report
- Chaired by DG DEFIS and JRC
- 6 external experts, including rapporteur
- Kick-off early 2023, works for around a year
- **The general objective of the Polar Task Force is to further elaborate and facilitate coordination of the Polar activities carried out by the various Copernicus Services, and stake out the direction for the polar dimension in Copernicus**





## Copernicus Polar Task Force (2)

- The Task Force will deliver:
- An updated inventory of the polar products in Copernicus
- A Polar roadmap for Copernicus service evolution
- Input for the Arctic Thematic Hub
- A plan for improving the coordination of in-situ data for the Polar regions
- A final report on the main findings in the above areas





## Copernicus Arctic thematic Hub

- Single entry point for the ensemble of data, products and information generated by the Copernicus services and components
- In support of the EU Arctic Policy
- All relevant products from Copernicus environmental and emergency services, coordinated by CMEMS
- Collaborate and capitalize on the “Copernicus window to the Arctic” from the H2020 Arctic PASSION project
- Polar task force governance and guidance





## Future Copernicus Polar portfolio

- CAMS: Deposition fluxes of aerosol and trace gases
- Improved monitoring of CO<sub>2</sub> and CH<sub>4</sub> concentrations and emissions estimates
- C3S: Ocean ECVs; **sea ice drift** and **sea ice surface temperature** will become available in the Climate Data Store in Jan 2023, and information products
- CMEMS: several updated polar products from 2022-24 (e.g. albedo, sea ice, iceberg) and polar ocean monitoring indicators (e.g. sea ice extent time series, Arctic ice surface temperature)





Thank you!