COPERNICUS MARINE SERVICE CONTRIBUTION TO POLAR REGIONS MONITORING

Copernicus Marine Service

Presented by Valentina Giunta
(Mercator Ocean International)

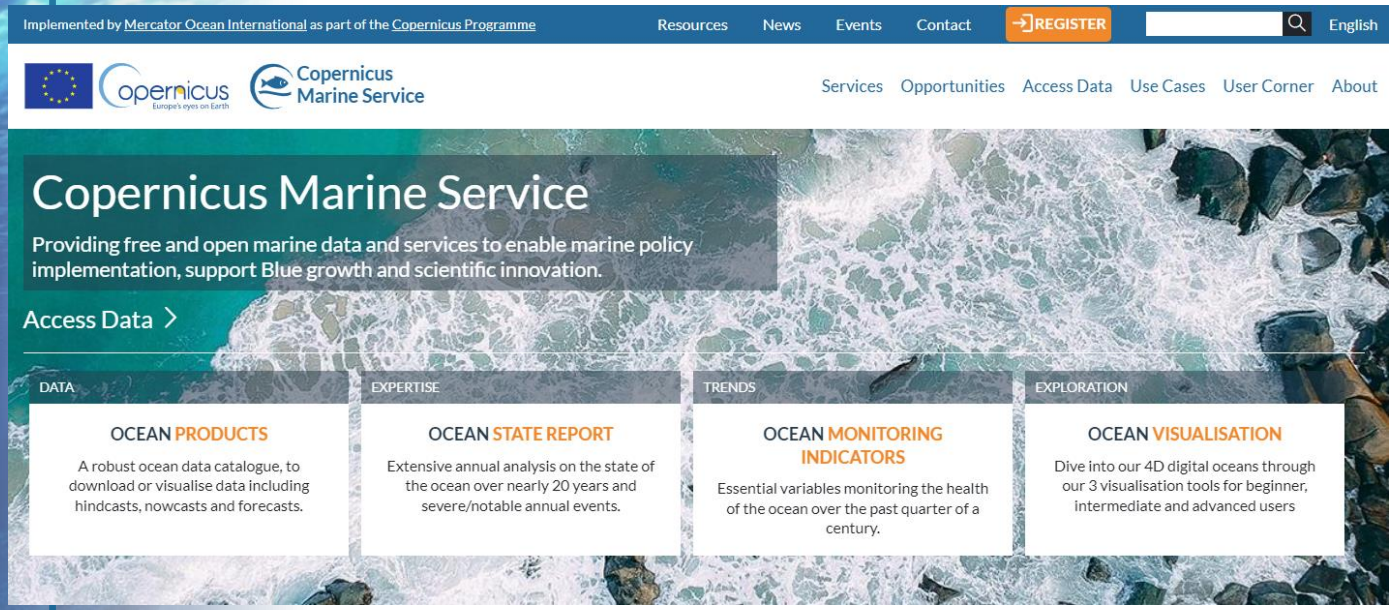
PROGRAMME OF THE EUROPEAN UNION

Copernicus Marine Service

Implemented by MERCATOR OCEAN INTERNATIONAL

Copernicus Marine Service Offer

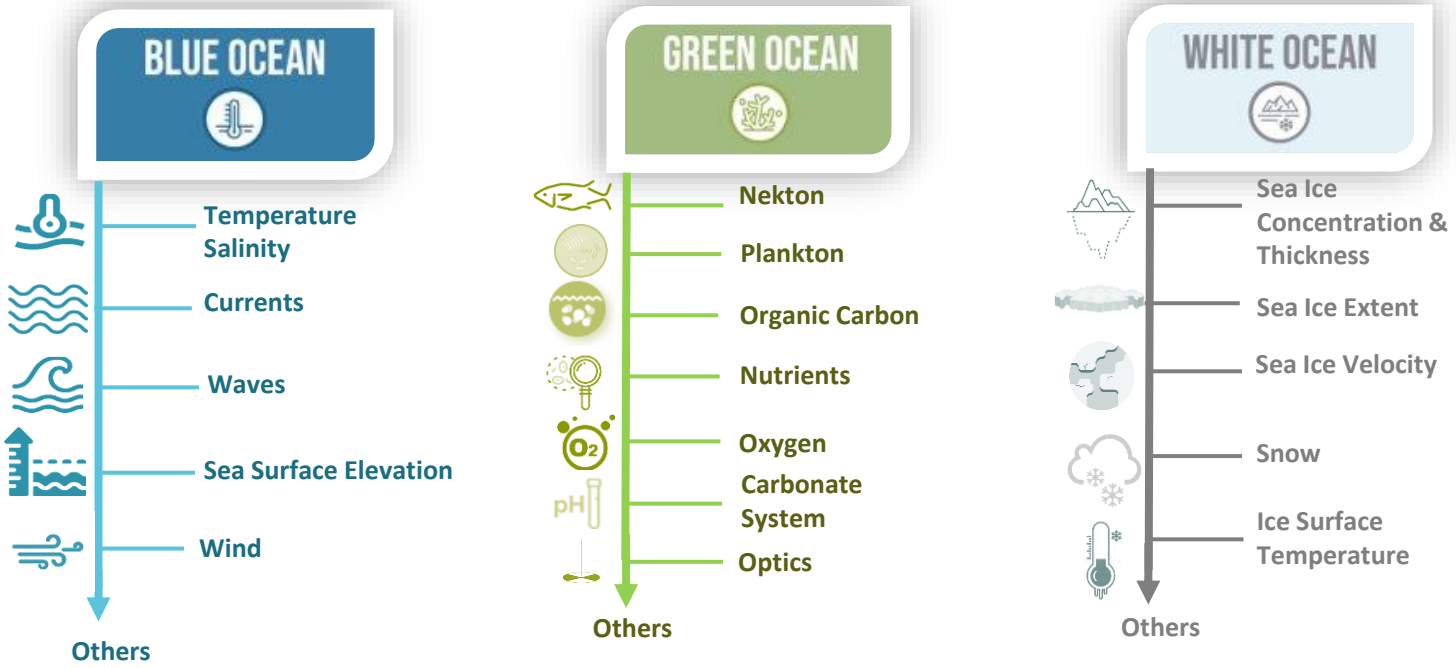
Single Access Point



- **Online Data Store**
- **>275 scientifically qualified products**
- **Open & Free**
- **User driven**
- **Common format NetCDF**
- **> 60 K registered users**
- **> 450 K single visits/year**

https://marine.copernicus.eu/

COPERNICUS MARINE SERVICE Offer



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Copernicus
Copernicus Marine Service
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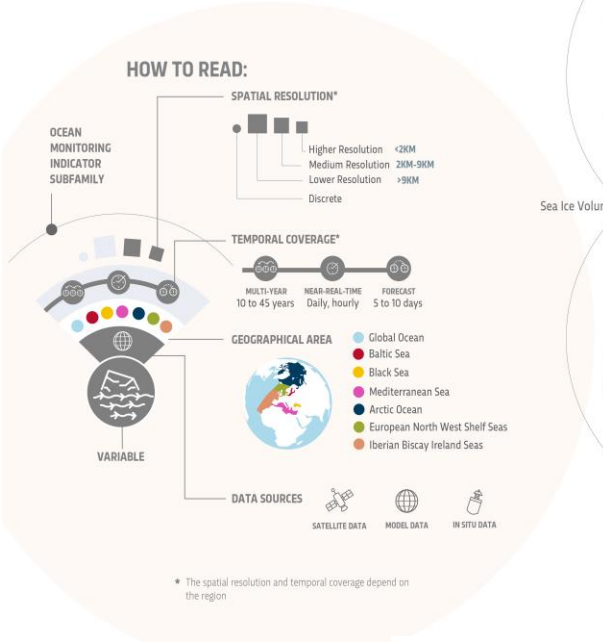
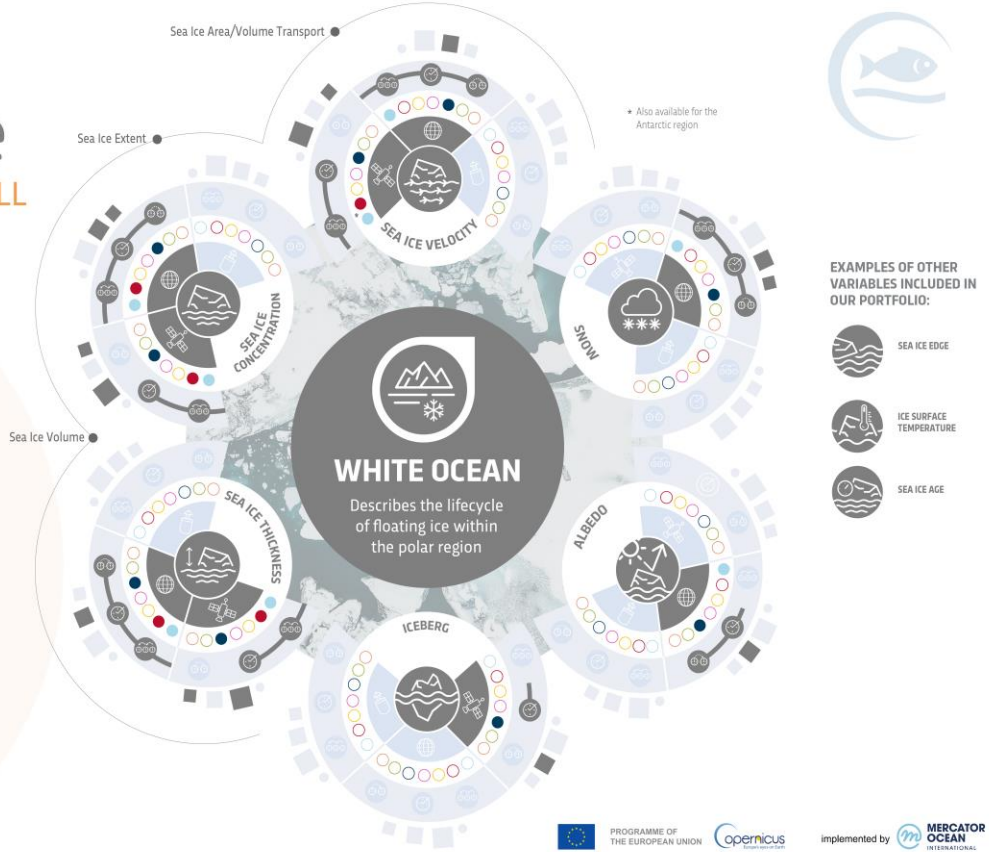
OUR OFFER

Copernicus Marine Service

WHITE OCEAN DATA IN A NUTSHELL





https://marine.copernicus.eu/services/data-in-a-nutshell

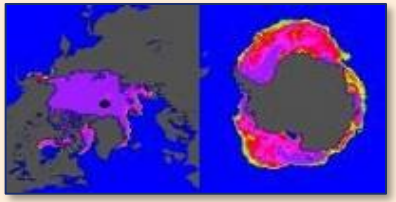
Ice Products - STATUS

Catalog → https://data.marine.copernicus.eu/products

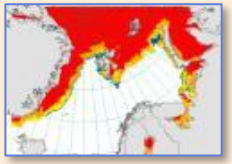
- **Model & Satellite**
- **Near Real Time & Past long time series**
- **19 products derived from satellite**

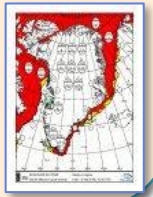
Sea Ice Concentration

Model analysis and forecasts, reanalysis
- From Global system 8km [1991 to 10D forecast]
- Arctic system 3km [1993 to 10D forecast]
- Baltic Sea System : 2km [1993 to 10D forecast]



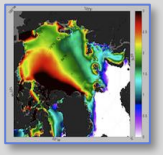
NRT and Reprocessed **satellite**
data 1979-present
1km in Arctic area
0.5km in the Baltic Sea

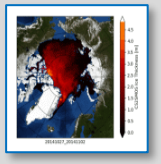




Sea Ice Thickness

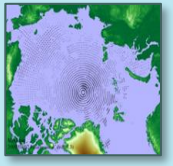
- Analysis and forecasts, reanalysis, Arctic (3km)/Bal (2km)/Global (**1/12°**) ;
- Satellite NRT and Reprocessed Arctic L3 data 25km; BAL L4 0.5km

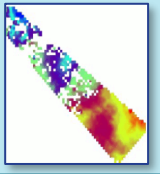




Sea Ice Drift

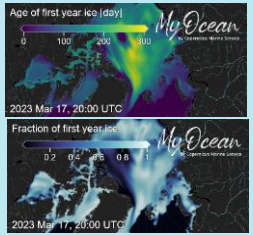
- Analysis and forecasts, reanalysis, Arctic (3km) / Global (**1/12°**) ;
- Satellite data (L3 & L4) Reprocessed Arctic data: 62km, 31 km and Baltic data : 0.8km





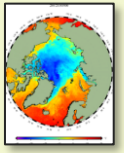
First Year Ice

- Analysis and forecasts, Arctic data 6.5km



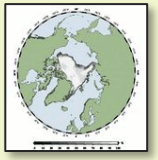
Ice surface temperature

- Analysis and forecasts Glo (1/12°)
- Satellite data 5km



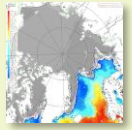
Sea Ice Edge & Type

- Satellite NRT data Arctic L4 10km and Antarctic L3 , 1km.



Snow Thickness & Sea Ice albedo

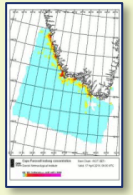
Analysis and forecasts, and reanalysis since 1991 ➔ 10D forecast
- Arctic system (3km),
- Global system (1/12°)



Density/Individual icebergs

- Satellite data:

Arctic L4 data 10km
Antarctic L3 data 1km.



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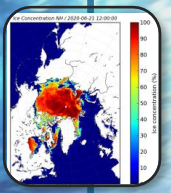
IN SITU NEEDS AND REQUIREMENTS

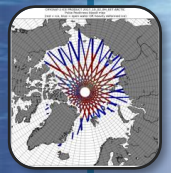
- A more **complete portfolio of sea ice variables** (e.g., melt ponds, pressure ridges)
- Analysis and forecasts for **iceberg monitoring**
- **High resolution** pan-Arctic products (<100m)
- **Uncertainties** estimates/**quality metrics** of sea ice products
- **Advanced signal processing** and data science/AI methods
- Development of **reanalysis**, **high-resolution** forecast systems and appropriate **data assimilation** techniques

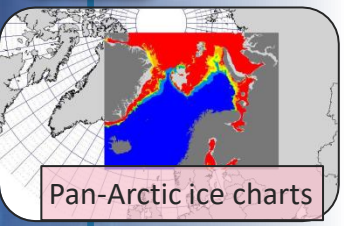
Lack of in situ (sea ice) data repository

- In situ **velocity** observations
- **Under ice** observations
- In situ ice observations including **thickness per ice/snow category**
- More ice mass balance (**IMB**) buoys, Ice Tethered Profilers (**ITP**), and **BGC ARGO floats**
- **Assembly** of all **wave buoys** data across the Arctic
- **Coordination** and **collaboration** between data providers and stakeholders
- Access to more **ice drifting buoys**
- New type of platform for **seasonal ice zones**

TOWARDS A MORE TAILORED AND COMPREHENSIVE POLAR PROVISIONS IN COPERNICUS MARINE

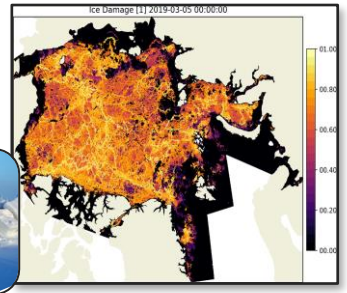






A step-change in Arctic Ocean monitoring, modelling and forecasting thanks to:

- **Improved satellite products** on sea-ice detection for European sea-ice services.
- The production of a **pan-Arctic ice chart**,
- The **preparation of the uptake of Sentinel HPCM** missions (CIMR, CRISTAL and ROSE-L).
- **A major upgrade in sea-ice models** and improved coupling with the atmosphere and hydrology (river discharge and nutrient loads).
- **A major step improvement in sea-ice forecasting** will be achieved through higher-resolution, extended forecasting range from a week to a month, and ensemble forecasting for an improved characterization of forecasting uncertainties.
- Horizon Europe projects (ACCIBERG) and R&D
- Ocean Monitoring Indicators (OMIs) for decision-making



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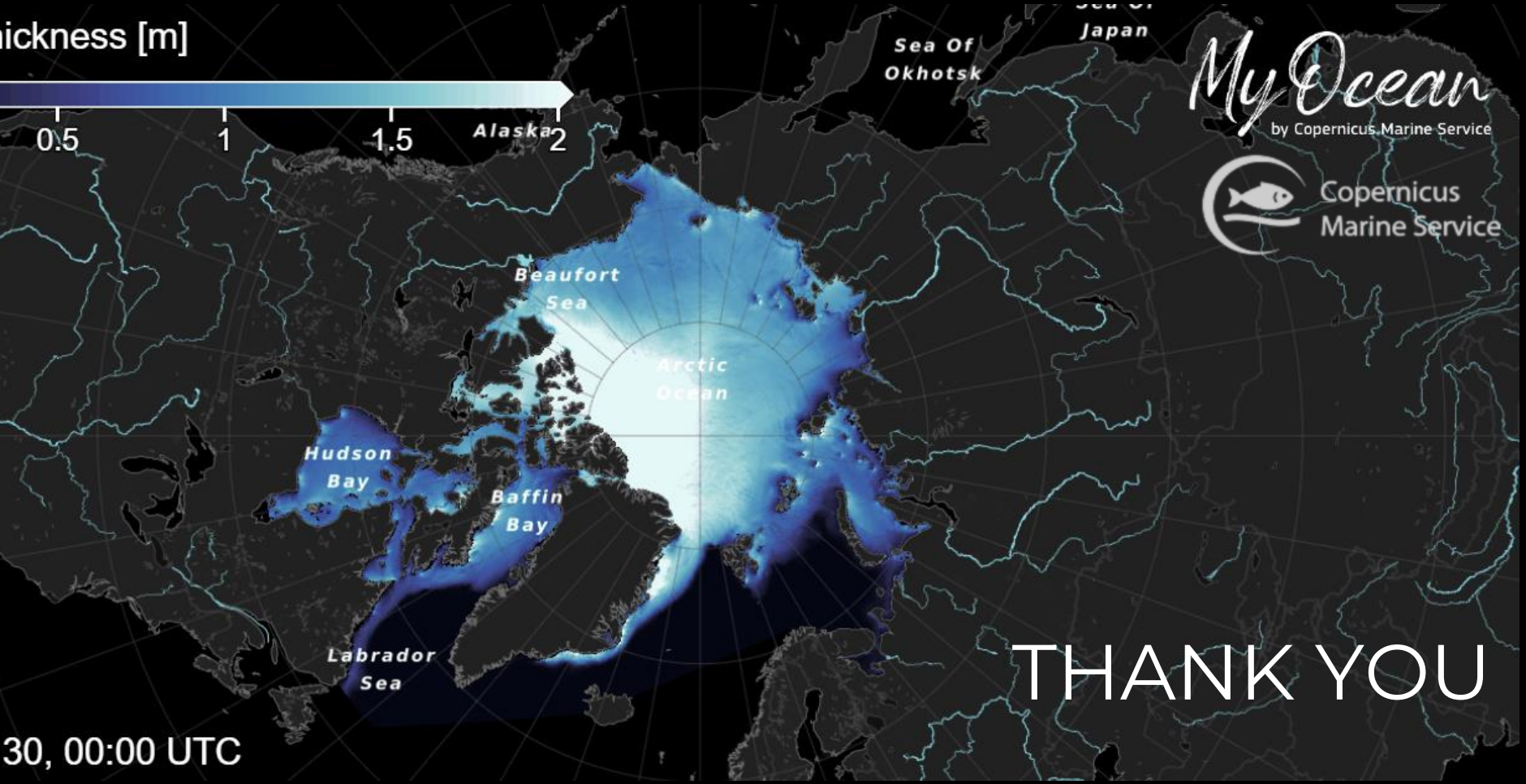
Copernicus
Europe's eyes on Earth

THE COPERNICUS ARCTIC HUB

Available at www.arctic.hub.copernicus.eu

- A new segmentation of the Copernicus offer: A better **readability and understanding** of the Copernicus offer among the EU Space program
- Based on **concrete use cases** to support MS and implementation of **EU Arctic Policy** (safety, sustainability and prosperity)
- Cross-fertilize between Copernicus Services and rely on all **EEs data and expertise**
- Rely of Copernicus **WEkEO** infrastructure and its Copernicus transverse management

The Copernicus Arctic Hub was officially launched during **EU Space Week (7-9 Nov 2023, Sevilla)**.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by Copernicus Marine Service
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THANK YOU