

# Copernicus Marine Service *Ocean Model Products*

## #MarineData4SouthAmerica

**Valentina Giunta**

Product Analyst

Mercator Ocean International

*22<sup>nd</sup> of February 2024*



Copernicus  
Marine Service



PROGRAMME OF THE  
EUROPEAN UNION



MERCATOR  
OCEAN  
INTERNATIONAL



noLogin

# SINGLE ACCESS POINT

*marine.copernicus.eu*

93 ocean model  
products

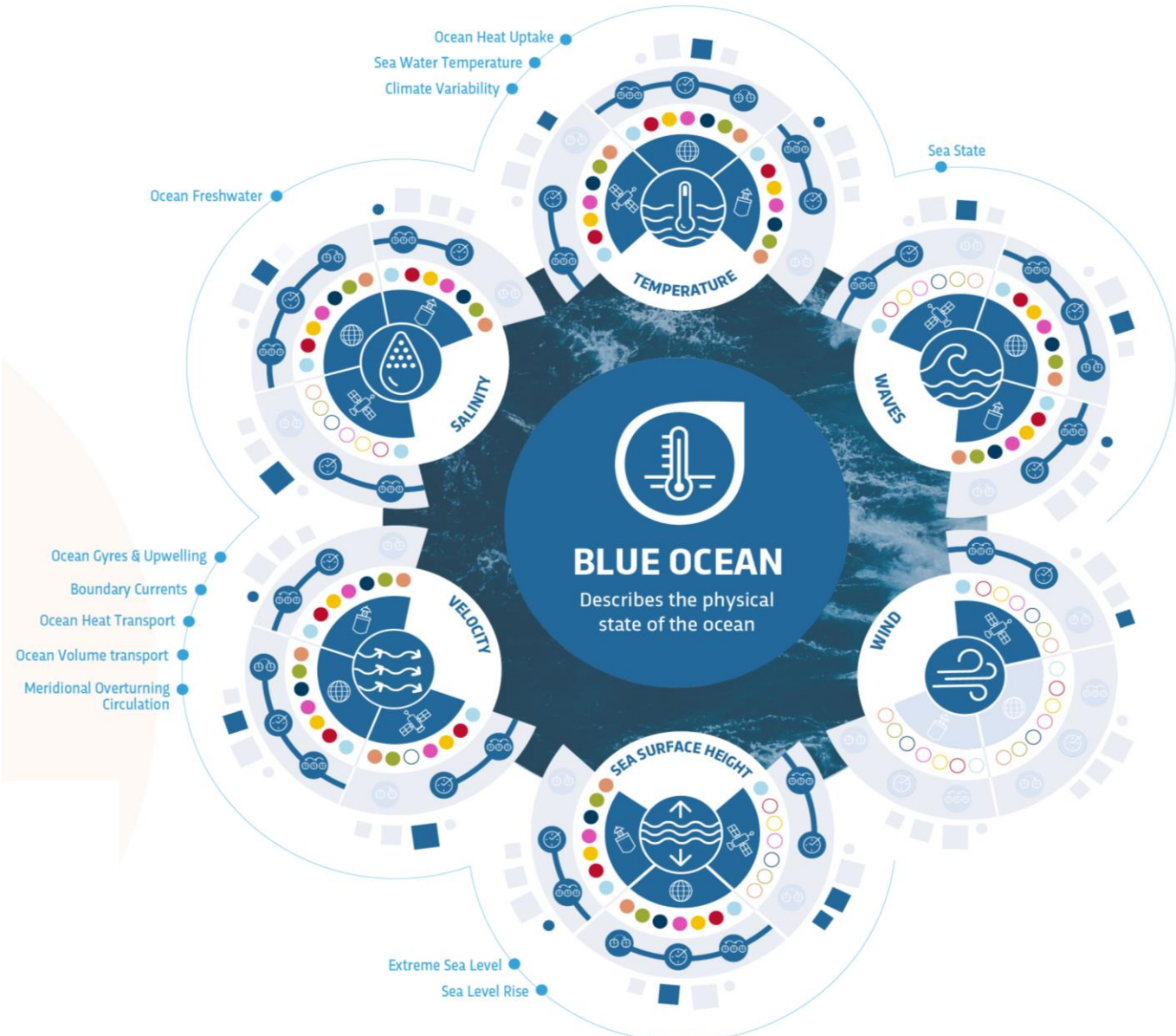
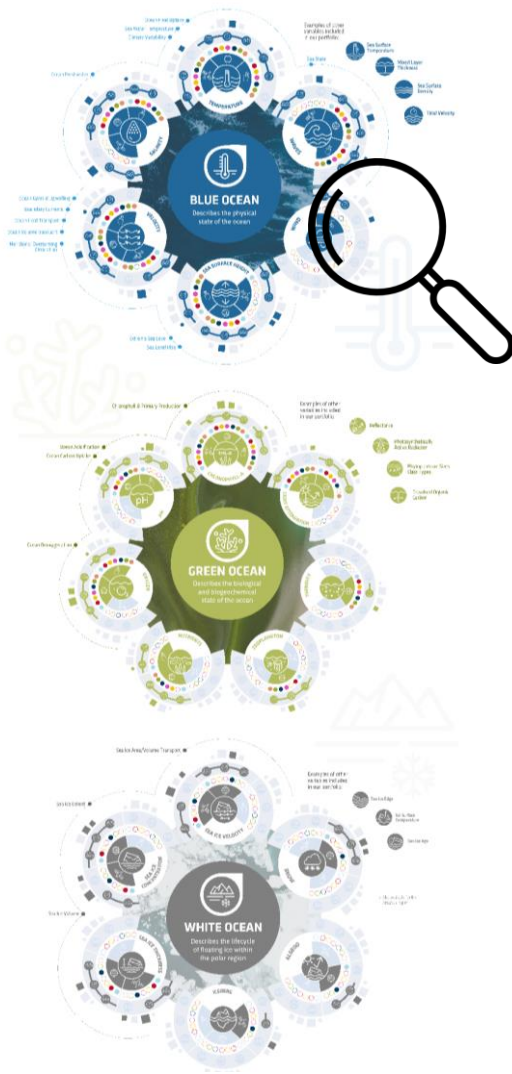
More than 250  
scientifically qualified  
products & ocean  
monitoring indicators

The screenshot shows the Copernicus Marine Service website. At the top, there is a navigation bar with links for Resources, News, Events, Contact, and a REGISTER button. Below this is the Copernicus logo and the text 'Copernicus Marine Service'. The main header features the title 'Copernicus Marine Service' and a sub-header: 'Providing free and open marine data and services to enable marine policy implementation, support Blue growth and scientific innovation.' Below the header, there are four main sections: DATA, EXPERTISE, TRENDS, and EXPLORATION. Each section has a corresponding card with a title and a brief description. The DATA card is titled 'OCEAN PRODUCTS' and mentions a robust ocean data catalogue. The EXPERTISE card is titled 'OCEAN STATE REPORT' and mentions an extensive annual analysis. The TRENDS card is titled 'OCEAN CLIMATE TRENDS' and mentions monitoring the health of the ocean. The EXPLORATION card is titled 'OCEAN VISUALISATION' and mentions 4D digital oceans. Below these sections is a 'Quick Links' section with four cards: 'User corner', 'Policy tools', 'Services', and 'User learning services', each with a brief description of the service.

User driven      Common format (NetCDF)      Open and Free



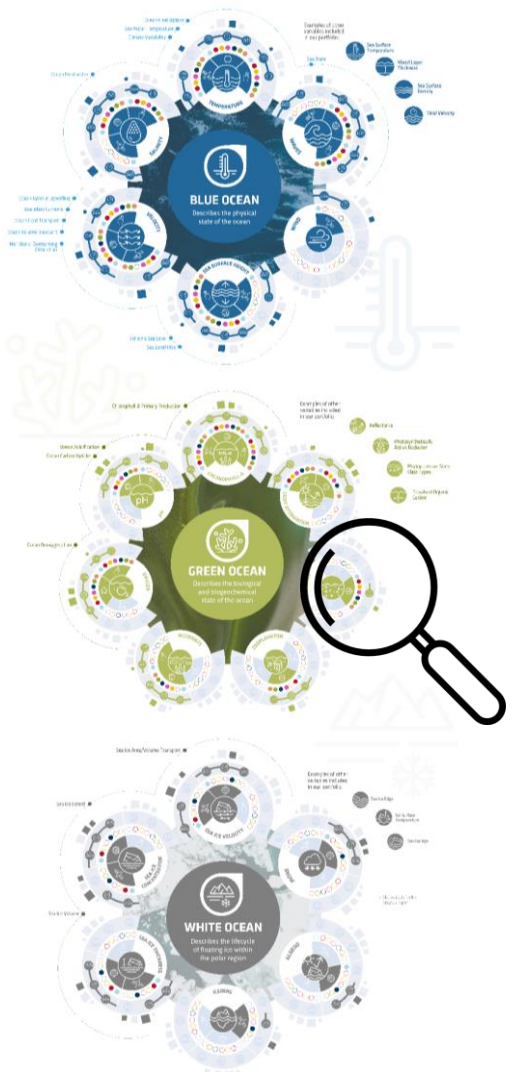
# DATA IN A NUTSHELL-BLUE OCEAN







**EXAMPLES OF OTHER VARIABLES INCLUDED IN OUR PORTFOLIO:**

- SEA SURFACE TEMPERATURE
- MIXED LAYER THICKNESS
- SEA SURFACE DENSITY
- TIDAL VELOCITY

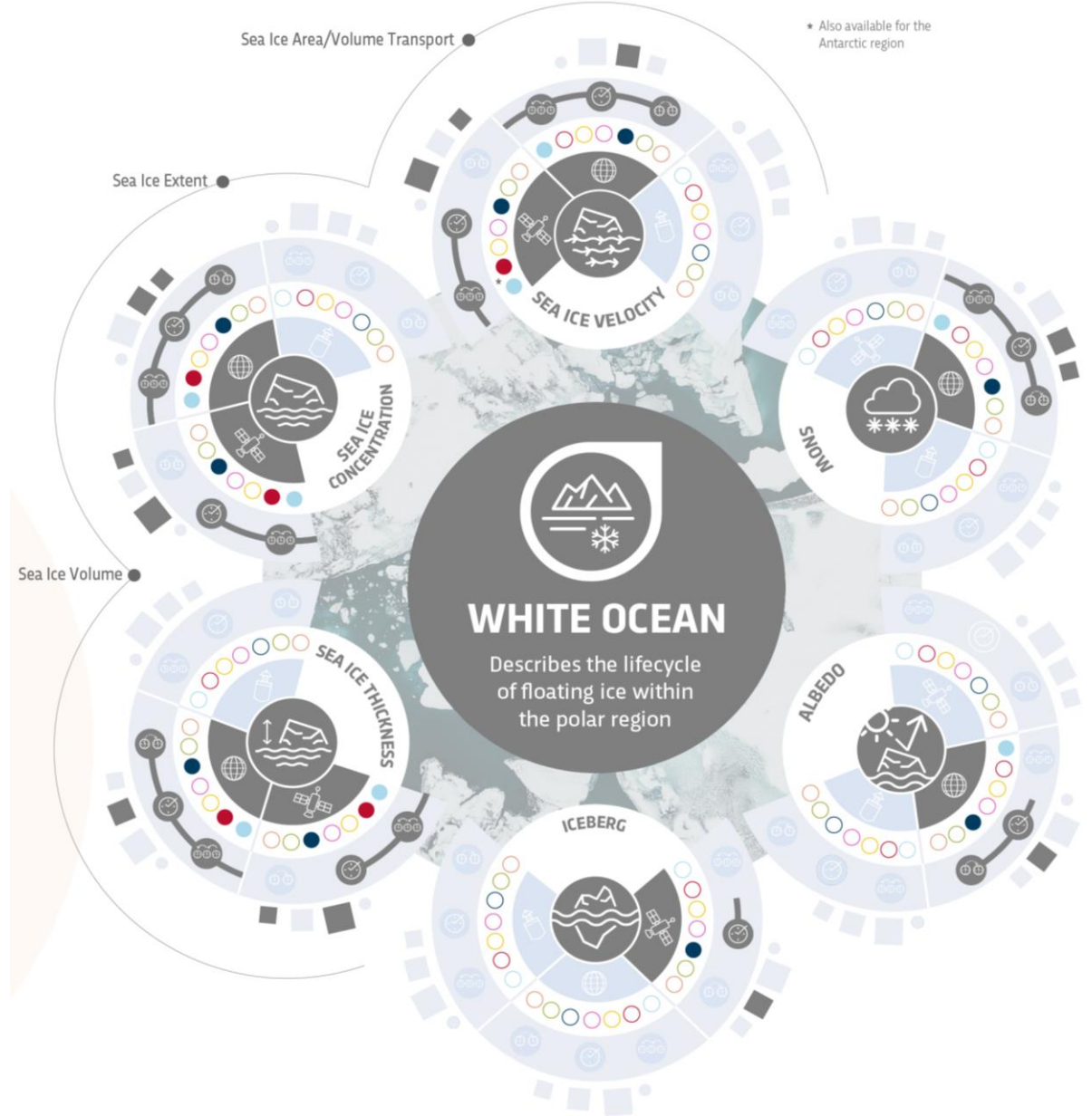
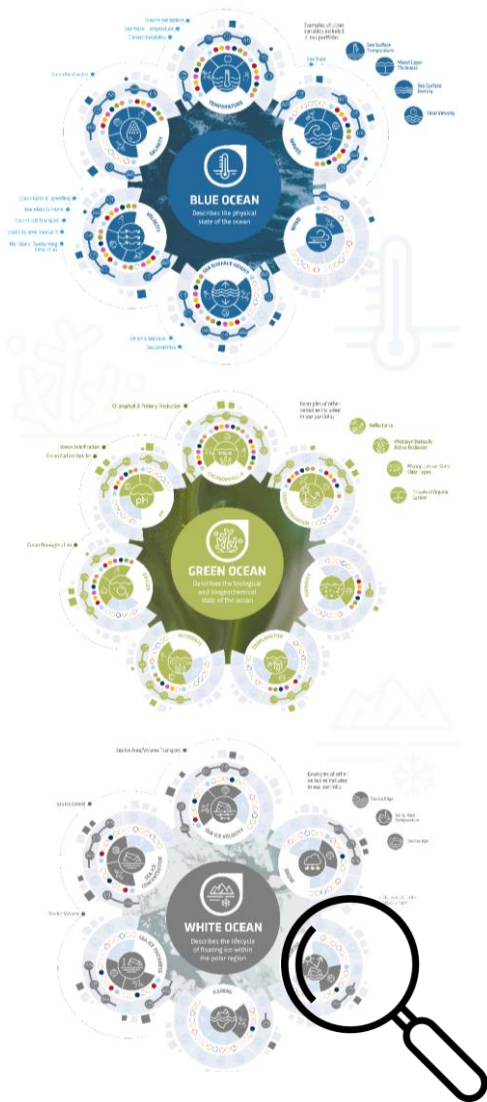
# DATA IN A NUTSHELL – GREEN OCEAN



EXAMPLES OF OTHER VARIABLES INCLUDED IN OUR PORTFOLIO:

-  REFLECTANCE
-  PHOTOSYNTHETICALLY ACTIVE RADIATION
-  PHYTOPLANKTON SIZES CLASS TYPES
-  DISSOLVED ORGANIC CARBON

# DATA IN A NUTSHELL – WHITE OCEAN



- EXAMPLES OF OTHER VARIABLES INCLUDED IN OUR PORTFOLIO:**
- SEA ICE EDGE
  - ICE SURFACE TEMPERATURE
  - SEA ICE AGE

# COPERNICUS MARINE SERVICE PORTFOLIO

## DATA SOURCES

MODEL DATA

INSITU DATA

SATELLITE DATA

## TEMPORAL COVERAGE

**Multi-Year**  
~45 years

**REAL-TIME**  
Daily, hourly, 15'

**FORECAST**  
10 days

## GEOGRAPHICAL COVERAGE

- 1 Global
- 2 Arctic
- 3 Baltic
- 4 NWS
- 5 IBI
- 6 Med Sea
- 7 Black Sea

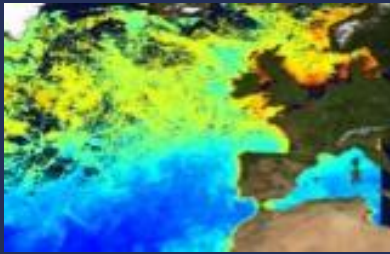


# COPERNICUS MARINE SERVICE PORTFOLIO

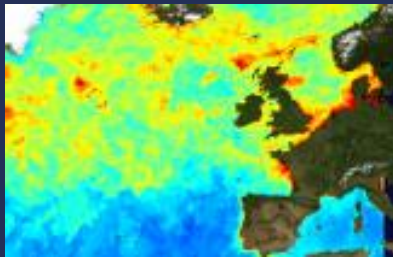
## Satellite observation data



- **L3** – daily composite products, single/multi sensor (Along Track or gridded product)



- **L4** – daily interpolated and weekly/monthly composites



## InSitu observation data



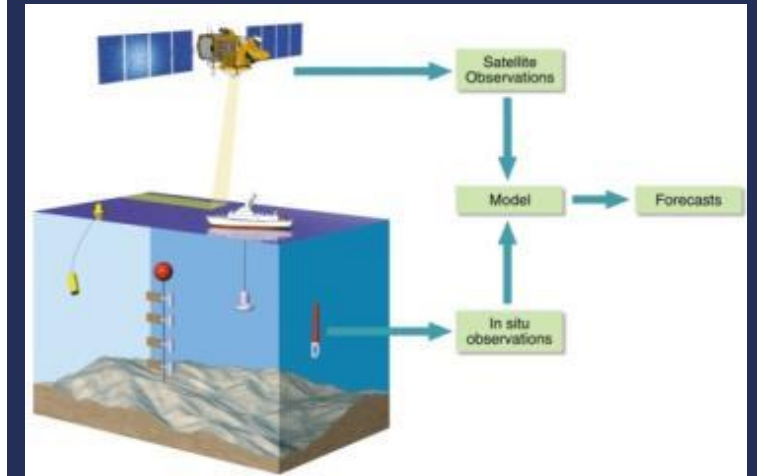
From different networks and platforms



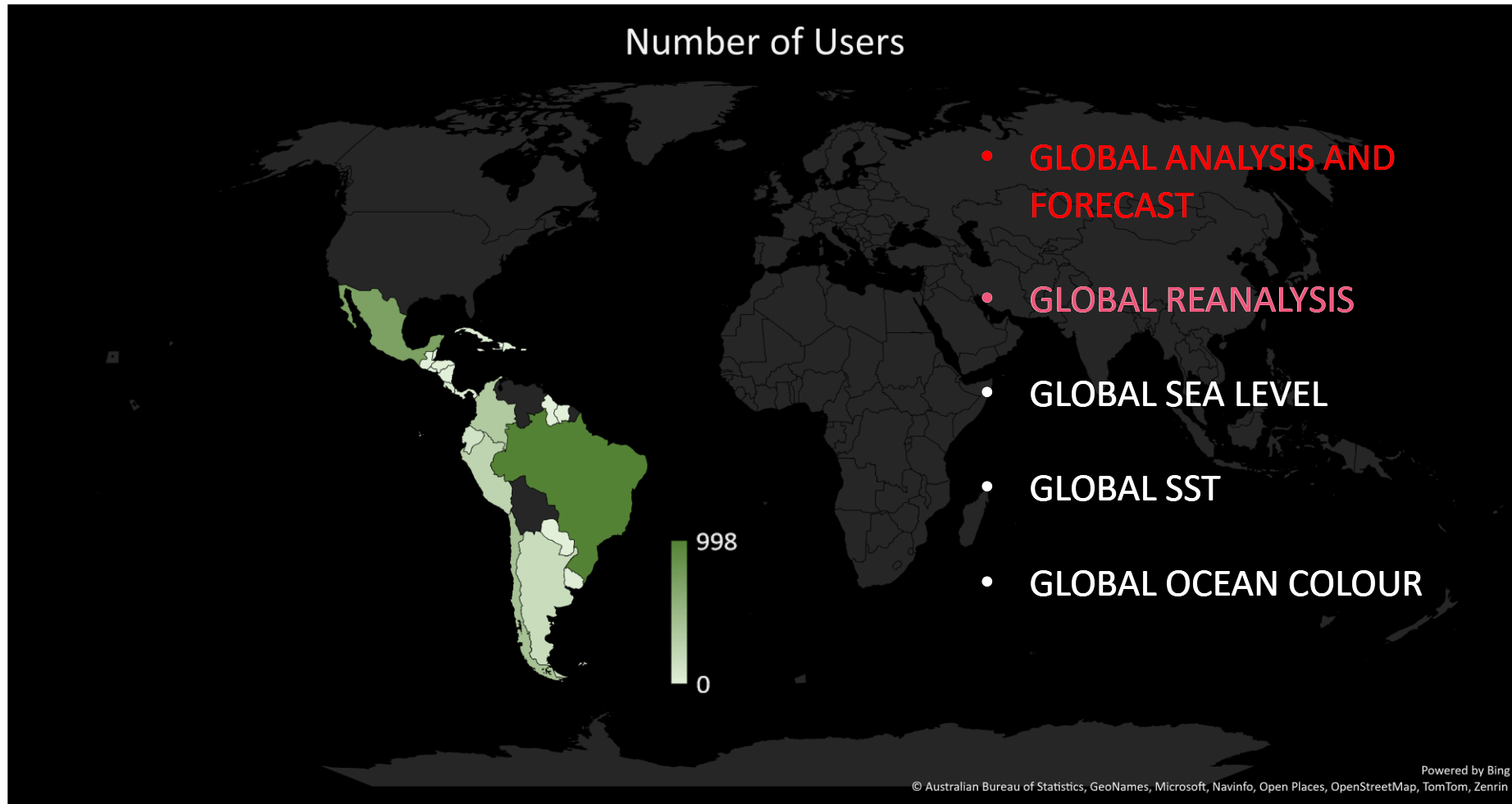
## Model data



From 3D numerical representation of the ocean with an assimilation of « real » data

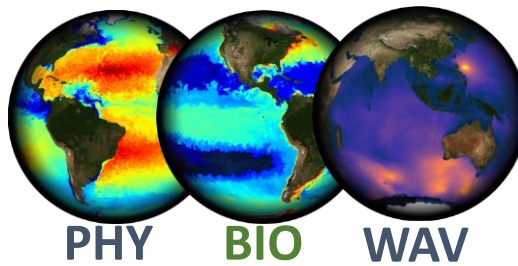


# FEATURED PRODUCTS





# MODEL Data Types



## Models

*Modelling the state of the ocean over a long period of time (several years) while correcting it with the best available past observations.*

*An assessment of the past state of the ocean variables made using numerical models, with or without data assimilation.*

*It is an assessment of the future state of the ocean variables, made using numerical models.*

### Reanalysis

### Hindcast

### Forecast

Reanalysis

Ensemble

Simulation

*Without data assimilation*

Analysis

Best-Analysis

NRT-Analysis

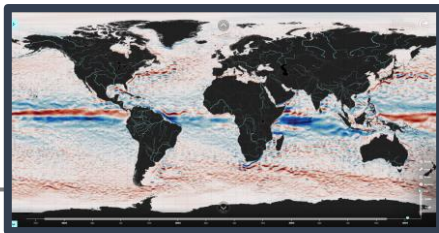
*Snapshot of the state of the ocean at any given time.*

*The first day of the forecast series is called "nowcast".*

*It considers multiple simulations to account for uncertainties*

# FEATURED PRODUCTS: GLOBAL ANALYSIS AND FORECAST

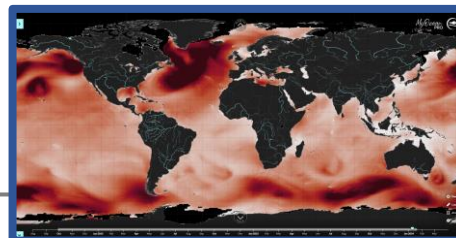
## PHYSICS



- 1/12° resolution
- Hourly, daily, and monthly means
- Temperature, salinity, currents, sea level, MLD and others
- 50 vertical levels (0 to 5500m)
- Nov. 2020 to Jan. 2024
- 10 days of 3D global ocean forecasts

[Global Ocean Physics Analysis and Forecast | Copernicus Marine MyOcean Viewer](#)

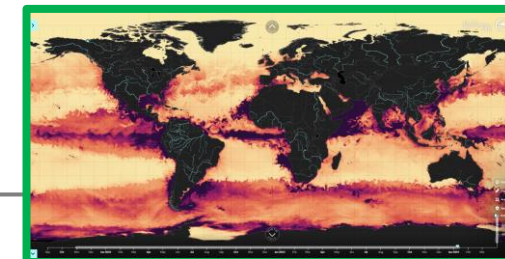
## WAVES



- 1/12° resolution
- Hourly
- wave parameters from the total spectrum (significant height, period, direction, Stokes drift) and following partitions: the wind wave, the primary and secondary swell waves
- Oct. 2021 to Jan. 2024
- 10 days forecast of global ocean sea surface waves

[Global Ocean Waves Analysis and Forecast | Copernicus Marine MyOcean Viewer](#)

## BIOGEOCHEMISTRY

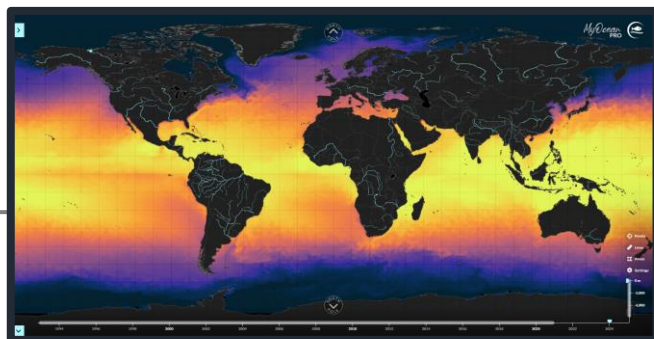


- 1/4° resolution
- Daily and monthly means
- Chlorophyll, nitrate, phosphate, dissolved oxygen, primary production, PH, carbon dioxide and others
- 50 vertical levels (0 to 5700m)
- Oct. 2021 to Jan. 2024
- 10 days of 3D global ocean forecasts

[Global Ocean Biogeochemistry Analysis and Forecast | Copernicus Marine MyOcean Viewer](#)

# FEATURED PRODUCTS: GLOBAL REANALYSIS

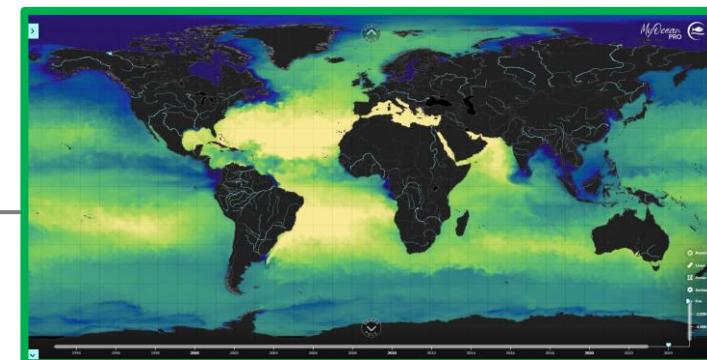
## OCEAN PHYSICS



- 1/12° resolution
- Daily and monthly means
- Temperature, salinity, currents, sea level, mixed layer depth and ice parameters from the top to the bottom
- 50 vertical levels
- Jan. 1993 to Oct. 2023
- Covering the altimetry (1993 onward)
- It is based largely on the current real-time global forecasting CMEMS system.

[Global Ocean Physics Reanalysis | Copernicus Marine MyOcean Viewer](#)

## OCEAN ENSEMBLE PHYSICS



- 1/4° resolution
- Daily and monthly means
- Temperature, salinity, currents, sea level, mixed layer depth and ice parameters
- 75 vertical levels
- Jan. 1993 to Dec. 2022
- It uses four reanalyses to create the ensemble, covering “altimetric era” period (starting in January 1993)
- The multi-model ensemble approach allows uncertainties or error bars in the ocean state to be estimated.

[Global Ocean Ensemble Physics Reanalysis | Copernicus Marine MyOcean Viewer](#)



# THANK YOU



@CMEMS\_EU



Copernicus Marine Service



Quarterly newsletter

