Waves

Copernicus Marine Environment Monitoring Service

Marine Monitoring

- **Presentation of the new products available in the CMEMS catalogue: WAVE products.**

- **Copernicus catalogue: http://marine.copernicus.eu/**

- This CMEMS module shortly present information on Wave products based on the Copernicus Marine Service website.

Marine Monitoring

- **Copernicus Marine Environment Monitoring Service (CMEMS) new products: WAVE PRODUCTS**

- **From 19th april 2017 : wave products enter the Copernicus Marine Service.**

- **Major improvement:**

    – **Wave products from models**

    – **Wave products from satellite**

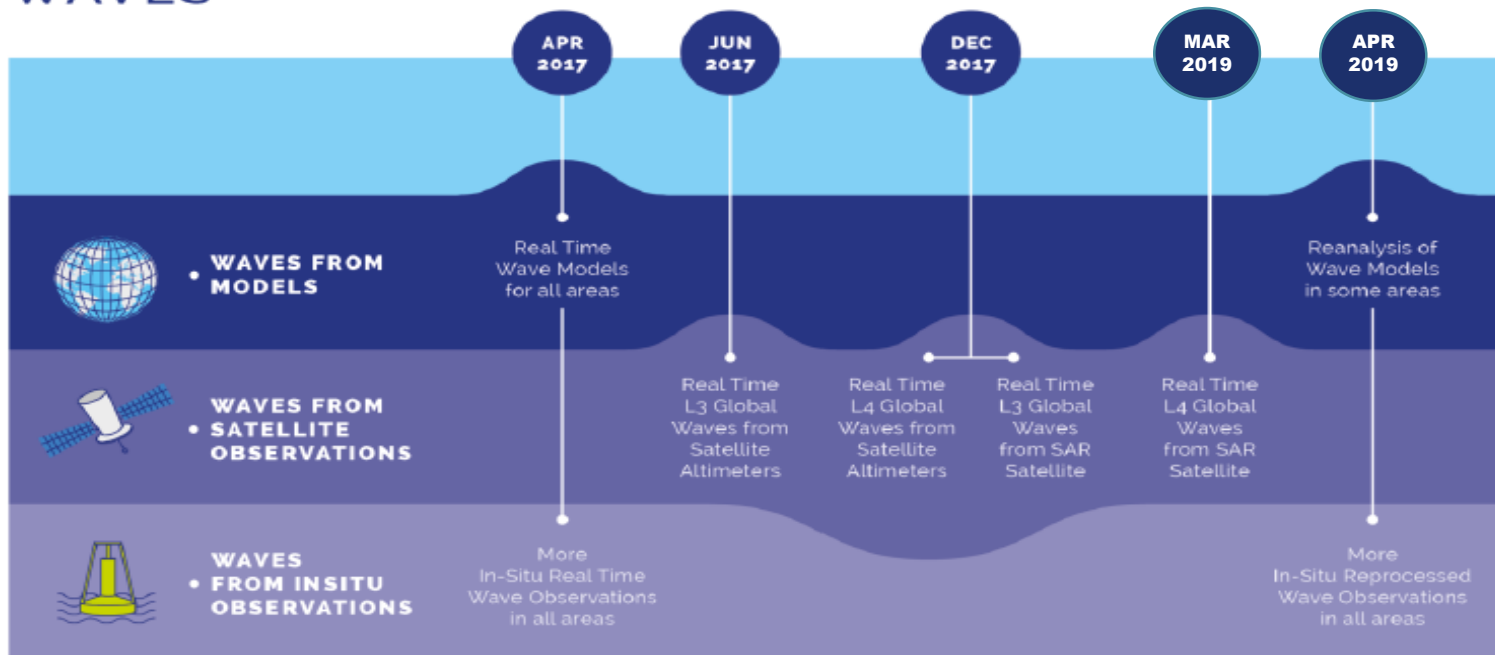   – **Wave products from in-situ observations**

    – **Full, Free and Open policy**

FULL, FREE and OPEN

Copernicus
Europe's eyes on Earth

European Commission

Marine Monitoring

WAVES

WAVES FROM MODELS
Real Time Wave Models for all areas
Reanalysis of Wave Models in some areas

WAVES FROM SATELLITE OBSERVATIONS
Real Time L3 Global Waves from Satellite Altimeters
Real Time L4 Global Waves from Satellite Altimeters
Real Time L3 Global Waves from SAR Satellite
Real Time L4 Global Waves from SAR Satellite

WAVES FROM INSITU OBSERVATIONS
More In-Situ Real Time Wave Observations in all areas
More In-Situ Reprocessed Wave Observations in all areas

Timeline: APR 2017 · JUN 2017 · DEC 2017 · MAR 2019 · APR 2019

Roadmap extracted and adapted from Copernicus Marine Service web site, realised by Mercator Ocean

4

Marine Monitoring

In the Copernicus Marine Service, real time global wave products from satellite are sorted into 2 categories:

- **Waves from Altimeter**
  - Wave parameter available:
    - significant wave height (Hs)
  - Temporal resolution: 3h
  - From 07/2017: L-3 processing real time global wave product are delivered.
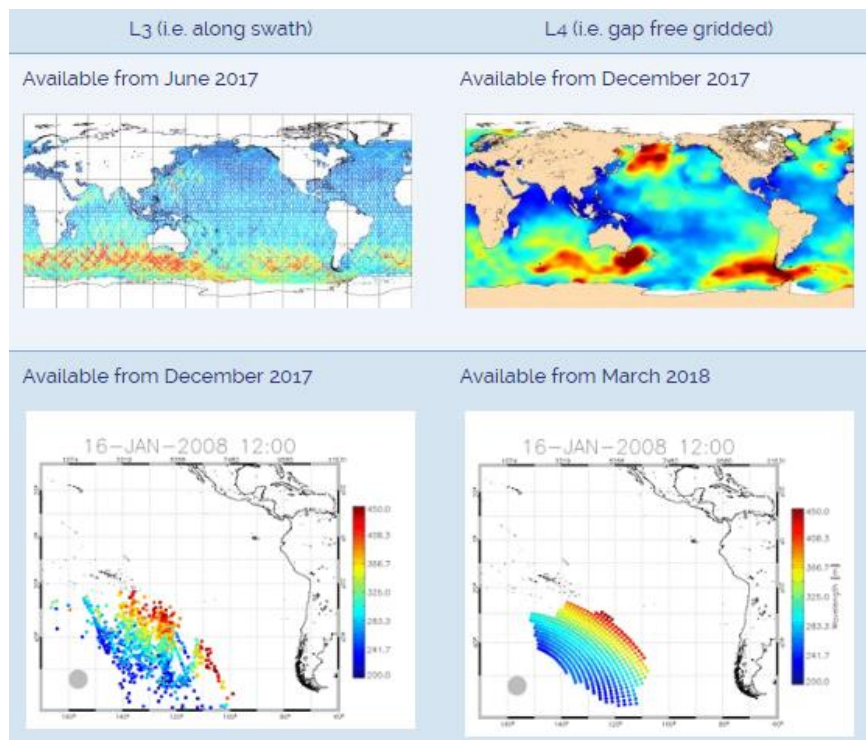 - From mid 2019, L-4 real time global product (100km spatial resolution)

- **Waves from Synthetic Aperture Radar (SAR).**
  - Wave parameters available:
    - significant swell height (Hs), peak period (Tp), peak direction (Dir)
  - Daily temporal resolution.
  - From 03/2018, real time global L-3 wave products are delivered (Sentinel-1).
  - From mid 2019, real time global L-4 wave product (from Sentinel-1A and -1B) (100 km spatial resolution)

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Example of real time global wave product from satellites in the Copernicus Marine Service catalogue.
Credits: CLS/EU Copernicus Marine Service.
from Copernicus Marine Service web site

Marine Monitoring

- **Large user panel** (in various market) in need of wave information in all ocean basins and **the blue economy** shall profit from those new open and free waves products:
- Maritime transport sector,
- Shipping industry,
- Coast guards,
- Port authorities,
- Research and academic community.

- **Example of applications**:
- Secure operations at sea,
- Save fleet fuel consumption using more accurate routing,
- Prevent from potential ship and platform oil spill drift,
- Research topics (ocean-atmosphere interaction,…)
- Reducing the fossil print (using the energy of the sea to product electricity for ex.)

Marine
Monitoring

Copernicus Marine Service wave products = **key input** for such technologies, as they shall allow **estimating the ocean energy resources available** in various areas in the past and the future, help minimizing the risks for operations at sea, and provide with relevant information for the mandatory environmental monitoring of offshore ocean.
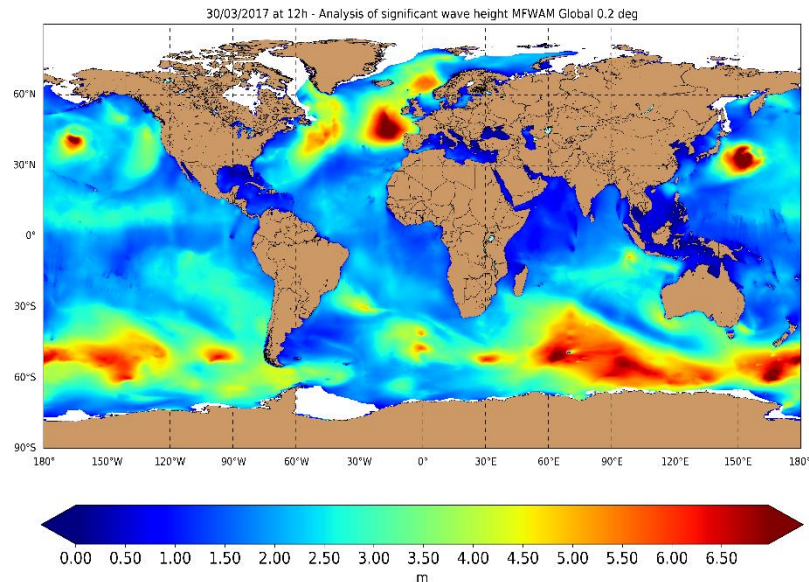

The Great Wave off Kanagawa by Hokusai

Marine Monitoring

Real-**time waves data from models** is available in all geographical areas :

- Global Ocean
- Mediterranean
- Black Sea
- Baltic Sea
- Arctic Ocean
- Iberian-Biscay-Irish Seas

Different **parameters** are provided such as:

- Significant wave height
- Swell (1 and 2)
- Stokes drift…

A more than **two year archive** is provided, as well as **hourly forecast** fields for the next 5 days updated daily, for all geographical areas.

30/03/2017 at 12h - Analysis of significant wave height MFWAM Global 0.2 deg

from Copernicus Marine Service web site

9

Marine Monitoring

Availability of **wave observations from in situ platforms** is also strengthened for real time wave observations, and from April 2018 for In situ wave products covering the last 20 years. Parameters like significant wave height is included.
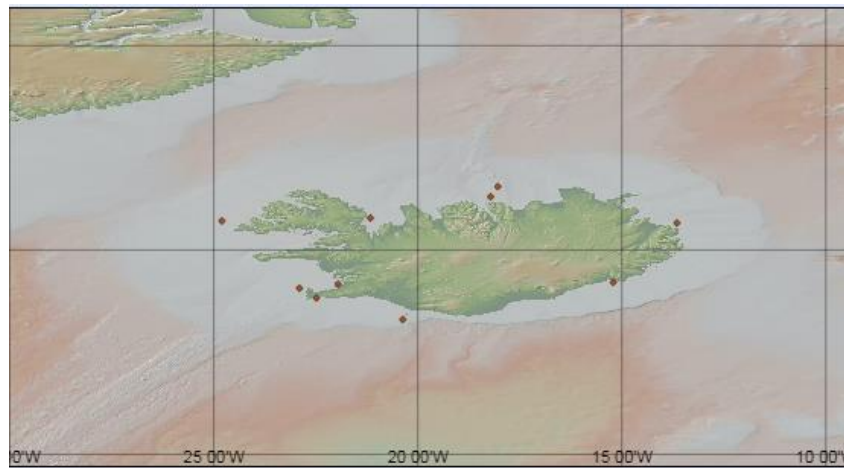
Location of real time in situ wave observations in the region of Iceland from Coriolis-Ifremer/ EU Copernicus Marine Service

Marine Monitoring

- Go to the Copernicus Marine Service : http://marine.copernicus.eu

- … To perform the downloading step, the registration to CMEMS is needed !
- More info here: http://marine.copernicus.eu/wave-products-enter-copernicus-marine-service-19-april-2017/

11