Copernicus Marine Service Tomorrow: What offer for what needs?

Marine Monitoring

Extracted from a presentation made by P.Y. Le Traon, Mercator Ocean

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European Commission | Copernicus | Implemented by | MERCATOR OCEAN

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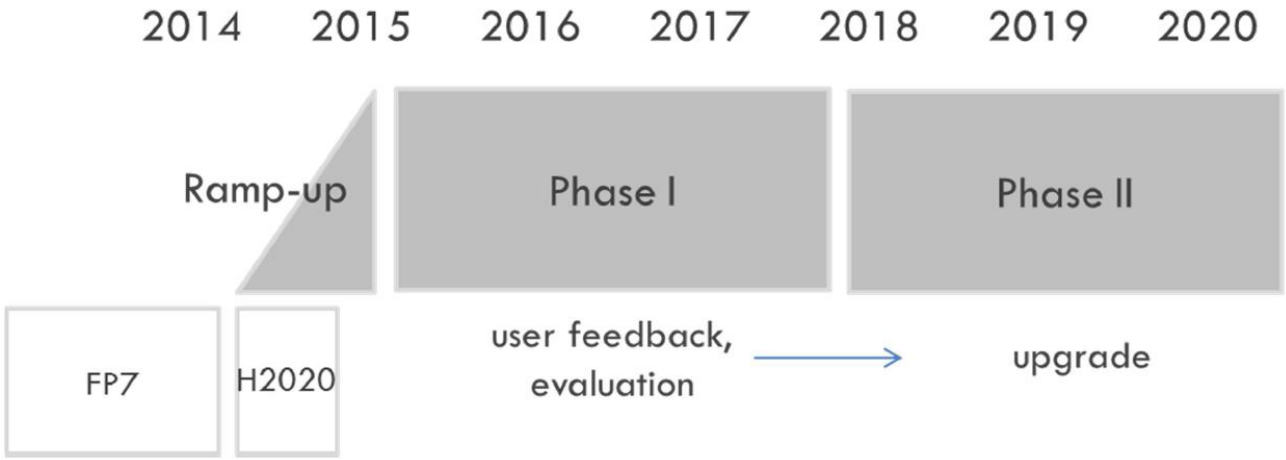
From CMEMS Phase I to CMEMS Phase II

Main objectives : ensure continuity of service, increase user uptake, continuous improvements, full uptake of Sentinel capabilities, upgrade of products and services based on phase I outcomes and user feedbacks.



CMEMS Phase I and Phase II from Technical Annex of the EU-Mercator Ocean Delegation Agreement for the implementation of the Copernicus Marine Service (2014)

Main foreseen evolutions /products (1)

Maritime transport and marine safety

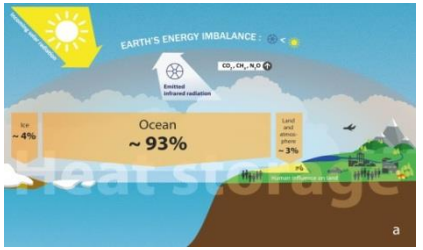
- Improved models (resolution, tides), ocean/wave coupling.
- improved assimilation schemes.
- new observed surface current products.
- new ice products (thickness) and assimilation.

Biogeochemistry: ocean health monitoring and marine resource management

- Improved CMEMS biogeochemical (BGC) products (satellite, in-situ, models).
- Assimilation of ocean colour in all BGC models. Assimilation of BGC Argo.
- Carbon, CO2 fluxes and pH from in-situ observations and models.
- New micronekton products (off line).

Coastal : better meet requirements from coastal zone users

- Improving satellite products (e.g. OC), new in-situ observations (HF Radars)
- Improved models (e.g. resolution, tides) to facilitate the coupling with downstream coastal models.
- Strengthening interfaces with downstream coastal models.



Main foreseen evolutions /products (2)

Ocean and Climate

- Longer time series (> 30 years) for reprocessed observations and ocean reanalyses – closer to real time : Circulation, Sea Ice, Waves, Carbon (CO2) and biogeochemistry. Global/Regional.

Improved assessments (expertise)

- New Ocean Monitoring Indicators and Ocean State Reports: from climate to ocean health assessment and applications (e.g. fishery and aquaculture management, marine renewable energy).

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Longer term perspectives

Some of the identified issues for the post 2020 time period

- **Very high resolution** (e.g. 1/36° global, 1/108° regional) modelling (ocean & ice), new data assimilation methods (e.g. ensemble methods, probabilistic forecasting), extended range (e.g. one month).
- **Ocean/Wave/Atmosphere coupling** (for improved ocean analyses/forecasts)
- **Coastal :** operational interfaces with downstream coastal systems / coproduction with member states, joint offer from the Marine and Land Services.
- **Carbon / Biogeochemistry / Higher trophic levels** (up to fish) Improved modelling and assimilation capabilities for the representation of ocean biogeochemistry and the marine food web from primary production to higher trophic levels (plankton to fish)
- **Climate (Ocean)**: long term ocean reanalyses, long-term projections & scenarii for coastal ocean and ecosystems.
- **Service / integrated platform** (DIAS new paradigm – follow up)

Impact of resolution on performance

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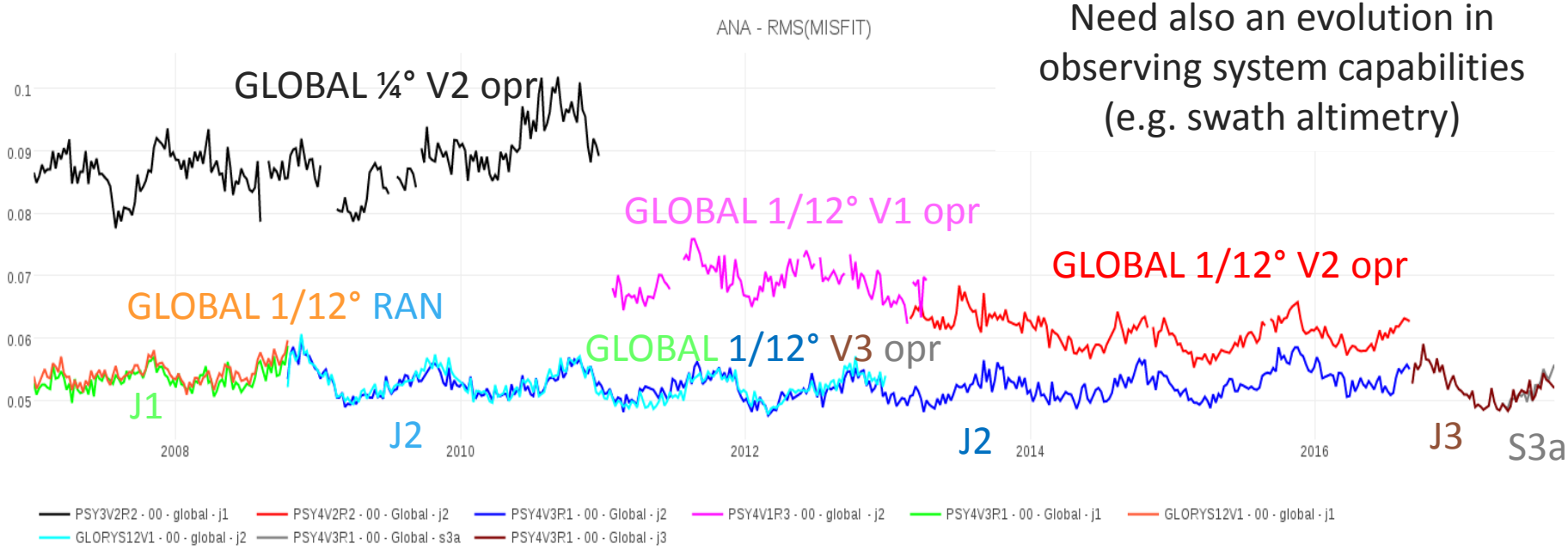

Need also an evolution in observing system capabilities (e.g. swath altimetry)

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The essential role of observing systems

CMEMS offer is highly dependent on the satellite and in-situ observing capabilities. CMEMS has defined its requirements both for in-situ and satellite observations (future Sentinels).

Future service evolution requires 1/ continuity and 2/ significant improvements of ocean observing capabilities :

- in-situ observing systems. Major sustainability and sampling gaps (biogeochemistry, deep ocean)
- Satellite : high space and time resolution, polar seas.