Copernicus Marine Service

Service Evolution
Focus on coastal

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Marine Monitoring

April 16, 2018

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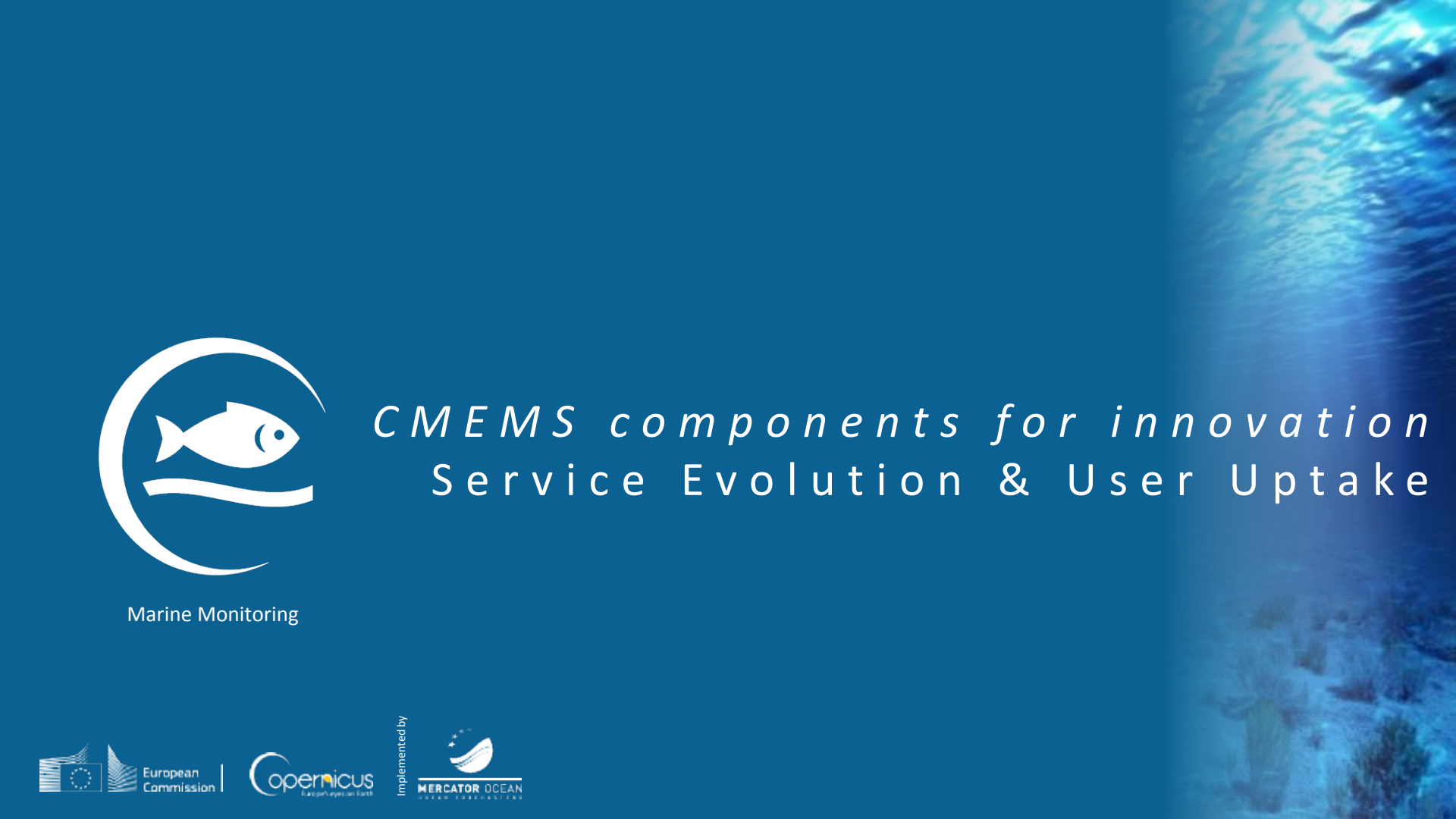
Outline

- CMEMS Service Evolution & User Uptake activities

- Focus on the coastal zone
  - User needs and role of CMEMS core service and coastal downstream services.
  - Land and Marine Service evolution to better address needs from coastal dowstream services: outcomes of two expert workshops
  - Initial responses of CMEMS and longer term perspectives



CMEMS components for innovation
Service Evolution & User Uptake

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CMEMS Service Evolution – Principles

- **Users are explicitly and transparently involved:**
  - Users needs drive service evolution,
  - User feedbacks and needs are regularly monitored and collected,
  - Work to translate user requirements into achievable service evolution objectives.
- **Scientific** (satellite and in-situ observations, modelling, data assimilation) **and technological** (e.g. computing capabilities, information systems & big data) **advances** relevant for the CMEMS are to be fully taken into account.
- Need to maintain **competitiveness** wrt international actors.
- **Innovation capacity** required to attract new users.
- **Delineation with downstream activities**:
  - The core service focuses on activities best performed at pan-European scale.

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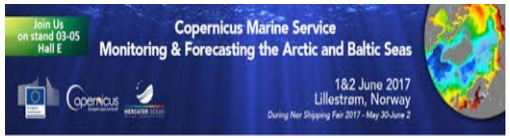
CMEM: gathering user requirements

Collect of feedback, suggestions

- Sent to service desk
- Heard during workshops& EU user forum
- Picked up from projects
- Picked up from *1 annual* questionnaire
- And from face to face, *2-3 by year*, user workshops

Record and analyze

- More than 1500 users' request
- Analyzed every 12-18 months



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Service Evolution: Roadmap

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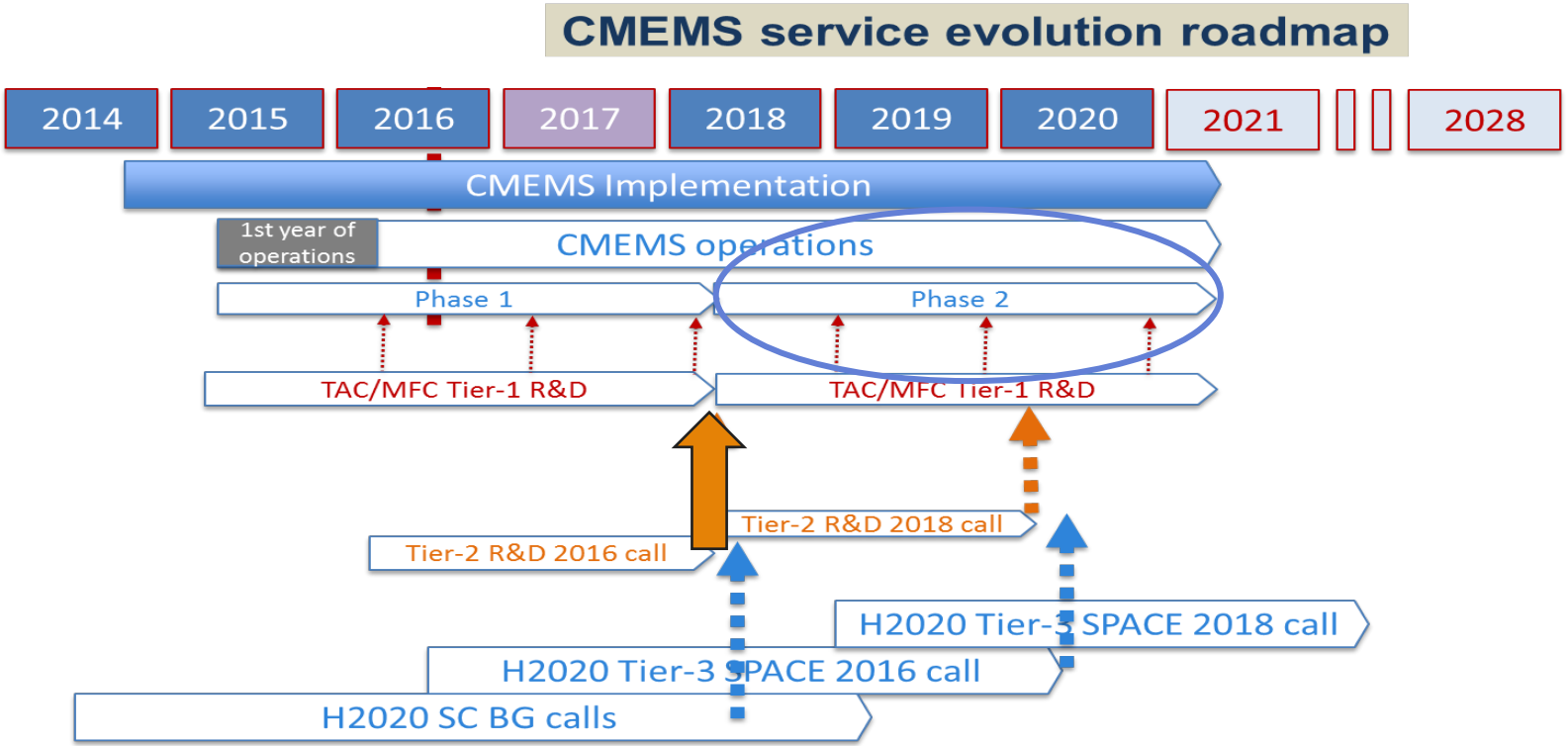
Operations

R&D

Tier 1

Tier 2

Tier 3



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CMEMS Service Evolution Activities

Activities carried out by Mercator Ocean with the support of the CMEMS Science and Technological Advisory Committee (STAC) include:

- **Preparation of a CMEMS service evolution high level strategy and R&D priorities.** This strategy will guide service upgrade over the period 2015-2025 with a focus for the next 4 years. It identifies short term (< 1 year – Tier 1), mid-term (1 to 2 years – Tier 2) and long term (3 to 10 years – Tier 3) R&D priorities.

- **Define/agree on/monitor short term and part of mid-term R&D (Tier-1&2)** within CMEMS production centers (TACs and MFCs).

- **Organize other mid-term (Tier-2) R&D activities through tenders for CMEMS service evolution** and the corresponding evaluation, selection and monitoring processes.

- **Interface with EC for longer term R&D activities** (Horizon 2020).

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CMEMS High Level Service Evolution Strategy

The document **captures the short, medium-term and longer-term research and development** needed to maintain systems at **state-of-the-art** and respond to evolving user needs.

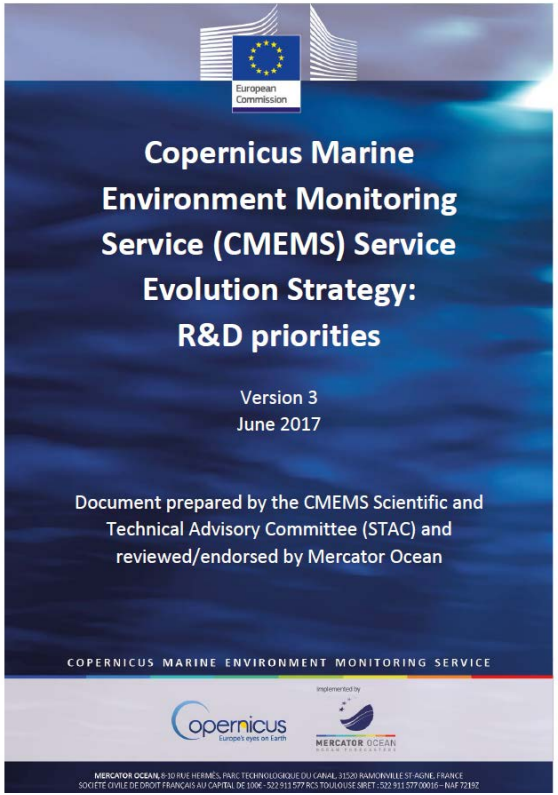
Four key areas of innovation and research are identified:

(i) **Ocean circulation and Ocean-wave and Ocean-ice coupling**

(ii) **Biogeochemistry and ecosystems in the marine environment**

(iii) **Coastal**

(iv) **Ocean, atmosphere and climate.**



http://marine.copernicus.eu/science-learning/service-evolution/service-evolution-strategy/

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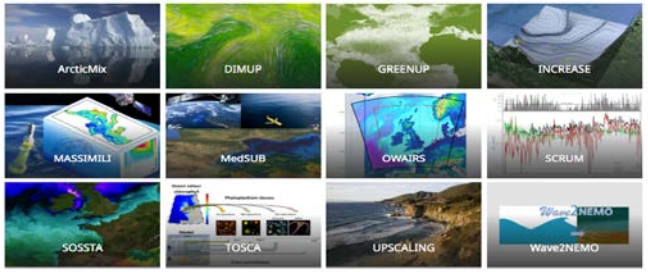
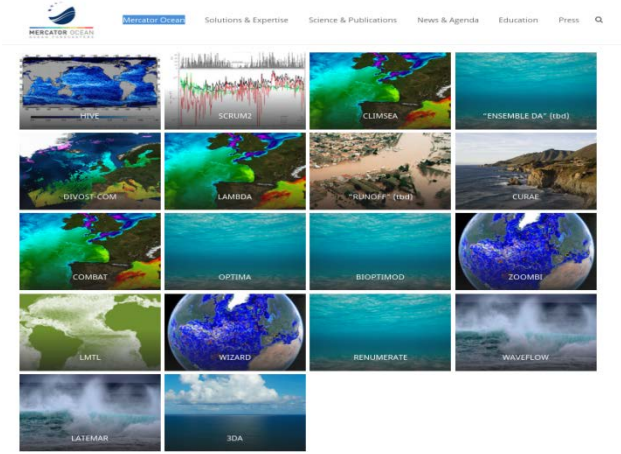
CMEMS Service Evolution R&D projects

Evaluation of projects by the STAC after external reviews. 1st Call (2016-2018), 2nd Call (2018-2020).

Tier-2 R&D



First call - 12 projects



2nd call - 18 projects

Several projects dealing with the coastal zone : HF radars, coupling with downstream coastal models, river inputs

Tier-2 R&D: aiming at improving the operational service within 2 to 3 years

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CMEMS User Uptake Activities

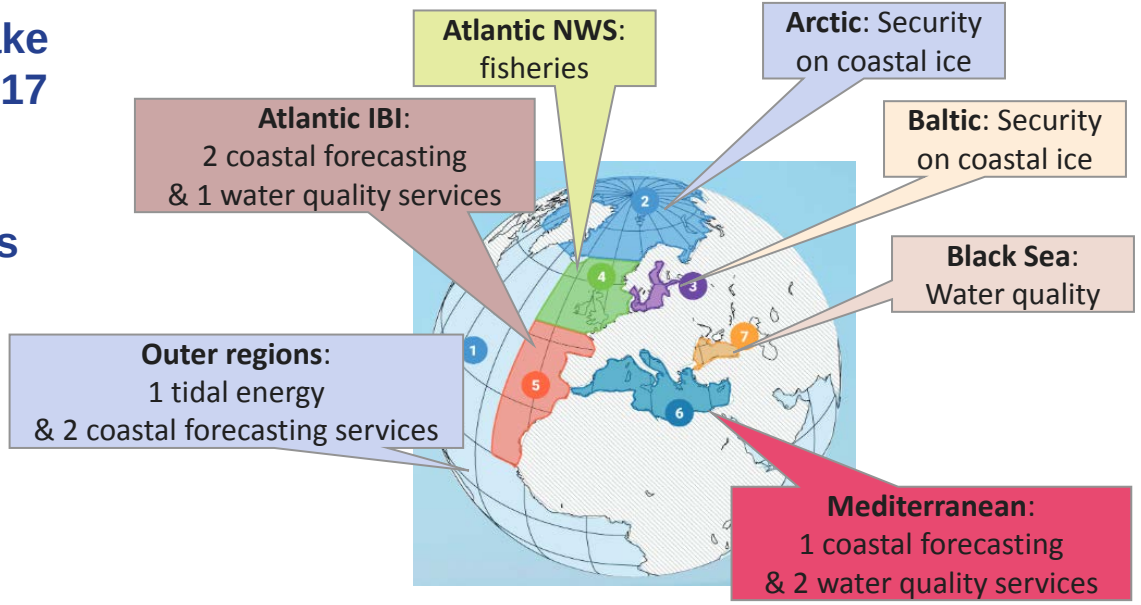
1st batch of User Uptake contracts in March 2017

- 17 projects

2nd batch of contracts in May 2018

- 10 projects

COASTAL PILOT SERVICES USING CMEMS (1st call)



Overall objectives :

- To show the integration and the impact of the Copernicus Marine Service products and services for downstream applications.
- To encourage intermediate users to develop their own (private or public) downstream operational systems based on CMEMS.
- Strong focus on the coastal downstream sector.

CMEMS components for innovation
addressing the coastal zone

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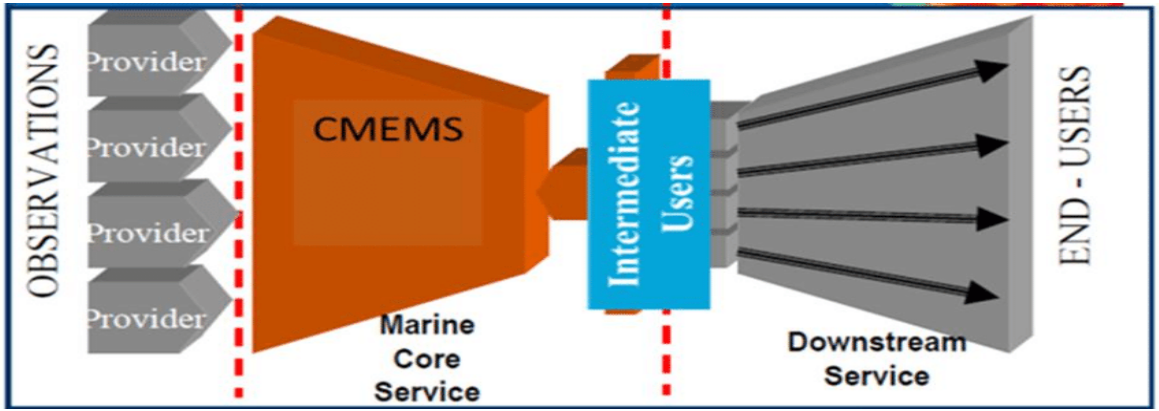
CMEMS activities wrt coastal applications/services

CMEMS Service Evolution and User Uptake activities aim at improving CMEMS products and services and their uptake by the downstream sector



Service Evolution (Tier 1, 2 and 3): improving CMEMS products and services.

User Uptake : support the development of downstream services

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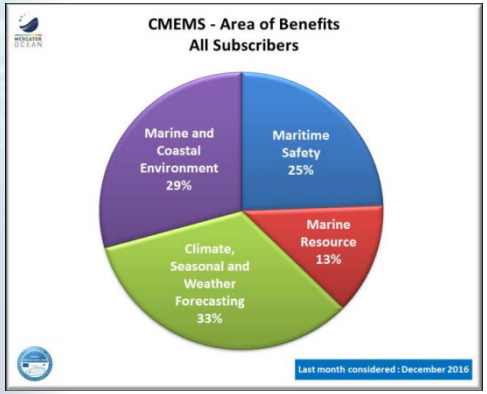
Coastal downstream services
A major target for the Copernicus Marine Service



CMEMS = core and european service ⇔ focuses on generic/core activities best done at European level.

CMEMS provides essential products and services for downstream public (national) and private coastal services.

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Coastal Zone Monitoring: User needs

Aquaculture

Fishery

MSFD

Marine Renewable Energy

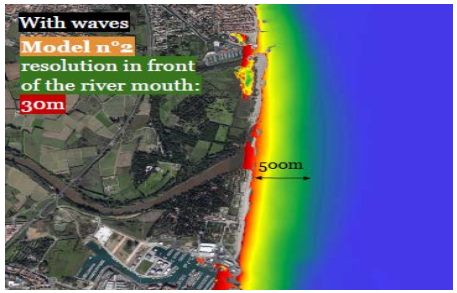
Water quality

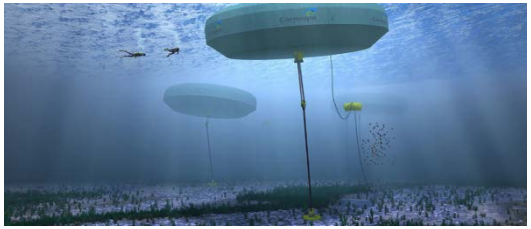
Pollution monitoring

Maritime safety

Coastal Hazards

Coastal Zone Management





Pressing and increasing needs (e.g. OECD)

Blue economy , sustainable management and policies

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Evolution of Copernicus Marine and Land Services to better handle the coastal zone

Marine and Land expert workshop
organized by EEA and Mercator Ocean
December 13 – 14, 2016

Copernicus Coastal Workshop
Brussels, June 29, 2017

First steps to address the complex issue of users/services in the coastal areas and interfaces between core/European and downstream public and private services.

Initial recommendations Marine and Land services (1)

- Better processing of satellite observations is required to improve the quality of coastal products. This applies, in particular, to ocean colour products in the coastal zone.
- New satellite products to better characterize the state of the coastal zone (e.g. coastline, coastal erosion) and its evolution should be proposed.
- Improved DEMs and Bathymetries are basic core requirements for the coastal zone.
- New satellite data/products required for the Regional Seas Conventions and EU policies (MSFD, MSP).
- Based on analysis of existing capabilities, need to extend the marine and land service activities to the monitoring and forecasting of all major EU rivers should be analysed
- The monitoring, short and long-term prediction of sea level close to the coasts should be improved.

Initial recommendations Marine and Land services (2)

- Stronger interfaces between CMEMS and downstream coastal marine monitoring systems should be developed.
- Links/interfaces with EMODnet portals and activities (e.g. bathymetry, seabed habitats, chemistry) should be reinforced.
- Products from national/member states coastal monitoring systems could be made available through CMEMS, CLMS or Copernicus (e.g. DIAS) data portals (coproduction EU & Member States).
- Copernicus could include in the longer run core/common/generic coastal activities to support the development of coastal downstream services and strong operational interfaces with the Copernicus Marine and Land services (e.g. short-term/mid-term R&D).
- Capacity building and development of best practices are also very important for the coastal zone monitoring activities developed by member states and local authorities. This is an area where a European approach would be beneficial.

Initial responses and activities of CMEMS (Phase 2)

Actions organized as part of our operational production contracts (MFCs, TACs) and CMEMS Service Evolution R&D and User Uptake activities.

CMEMS: core service, focuses on activities best done / or with benefits at a pan-European level.

- Improve CMEMS satellite and in-situ products to better serve coastal services and users (e.g. quality and quality assessment, resolution, new sensors) (e.g. ocean color, in-situ/HF radars).
- Make the best use of unique capabilities offered by the Sentinels (S1/S2/S3) .
- Improve CMEMS modelling and forecasting systems to better serve downstream coastal forecasting systems (e.g. tides, forcing and river inputs, resolution).
- Strengthen links with downstream coastal monitoring systems.

On the longer run an important objective will be to develop operational and much stronger interfaces between CMEMS and downstream coastal monitoring systems incl. standardization and harmonization issues. Co-production EU and member states.