



Copernicus Marine Environment Monitoring Service: products, service and users

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- La struttura del Servizio Ambientale Marino di Copernicus
- I progetti di implementazione: MyOcean & MyOcean2
- I prodotti e il servizio agli utenti
- Gli utenti e le loro applicazioni

EU operational oceanography: the Copernicus Marine Environment Service



The goal

Build an operational oceanographic **common observing, modeling and service infrastructure for ocean analysis, re-analyses and forecasting.**

The strategy

Develop and operate a pan-European **public good** marine 'core' service, using state-of-the-art science and have a user-oriented strategy for product development

The challenge

Incorporate the research innovations in the service

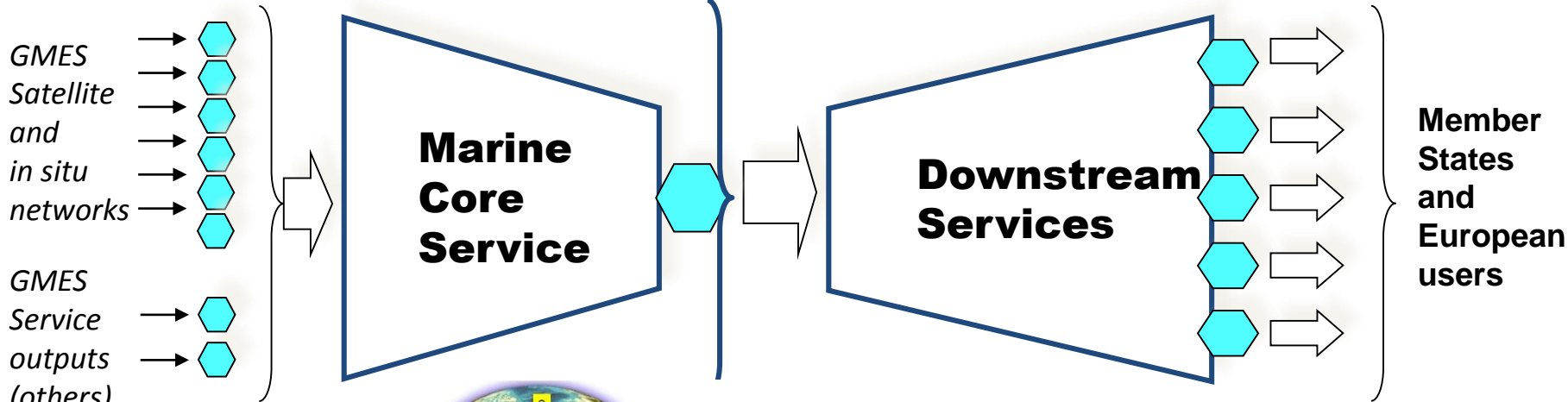
The high level structure of the Copernicus Marine Service

Input information

Generic information

Intermediate Users

User customized information



GMES Satellite and in situ networks

GMES Service outputs (others)

Marine Core Service

Downstream Services

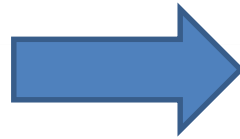
Member States and European users



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



The development line



GMES Initial Phase
1998-2004

GMES Implementation
Phase 2004-2013

Copernicus Operational
Phase 2014-2020

For Marine:
MFS, MERSEA

For Marine:
MyOcean 1 & 2






The Copernicus marine service: a distributed system to leverage expertise



4 Thematic Assembly Centres


7 Monitoring and Forecasting Centres

Observations

- Sea Level 
- Ocean Color 
- Temp, Sea Ice & Winds 
- In Situ 

Models

- Global Ocean 
- Arctic Ocean 
- Baltic Sea 
- Atlantic NWS 
- Atlantic IBI 
- Mediterranean Sea 
- Black Sea 

Service Desk 



The Copernicus Marine Service products

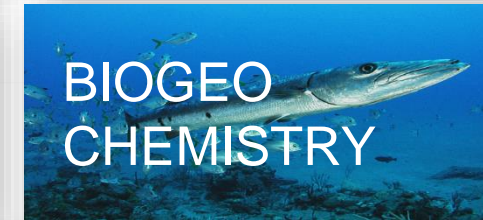


ESSENTIAL MARINE VARIABLES



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

- DISCOVER
- VIEW
- DOWNLOAD
- Open & Free



The Marine Service for users: 4 areas of benefits

■ **MyOcean** delivers a daily service to:

- **Member State Users:**
National / Regional Service Providers (public or private)
- **European agencies** (EEA, EMSA, EDA, ...)
- **Intergovernmental bodies** (OSPAR, UNEP-MAP, HELCOM, ICES, ...)
- **Private companies**



MARINE AND COASTAL ENVIRONMENT



MARINE RESOURCES



MARINE SAFETY

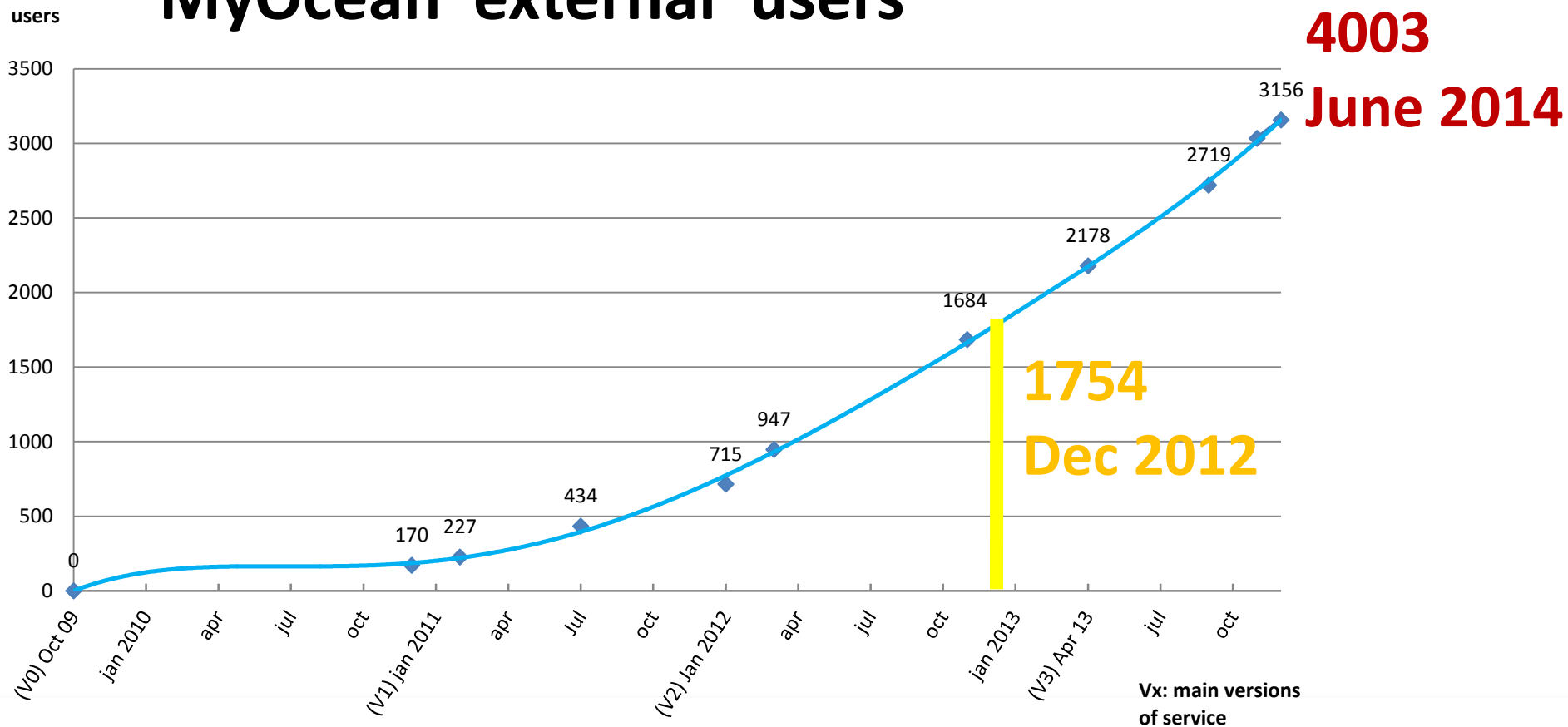


WEATHER, CLIMATE & SEASONAL FORECASTING



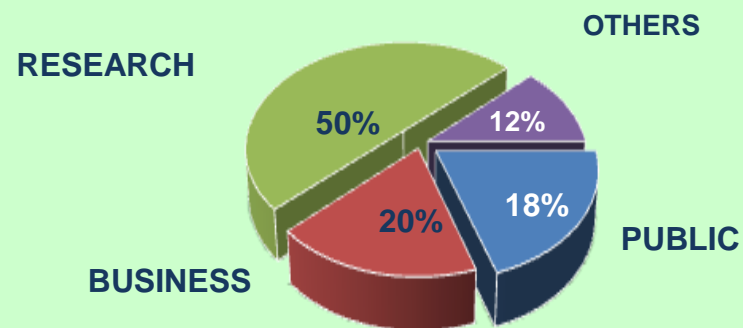
MyOcean service users from the start

MyOcean 'external' users



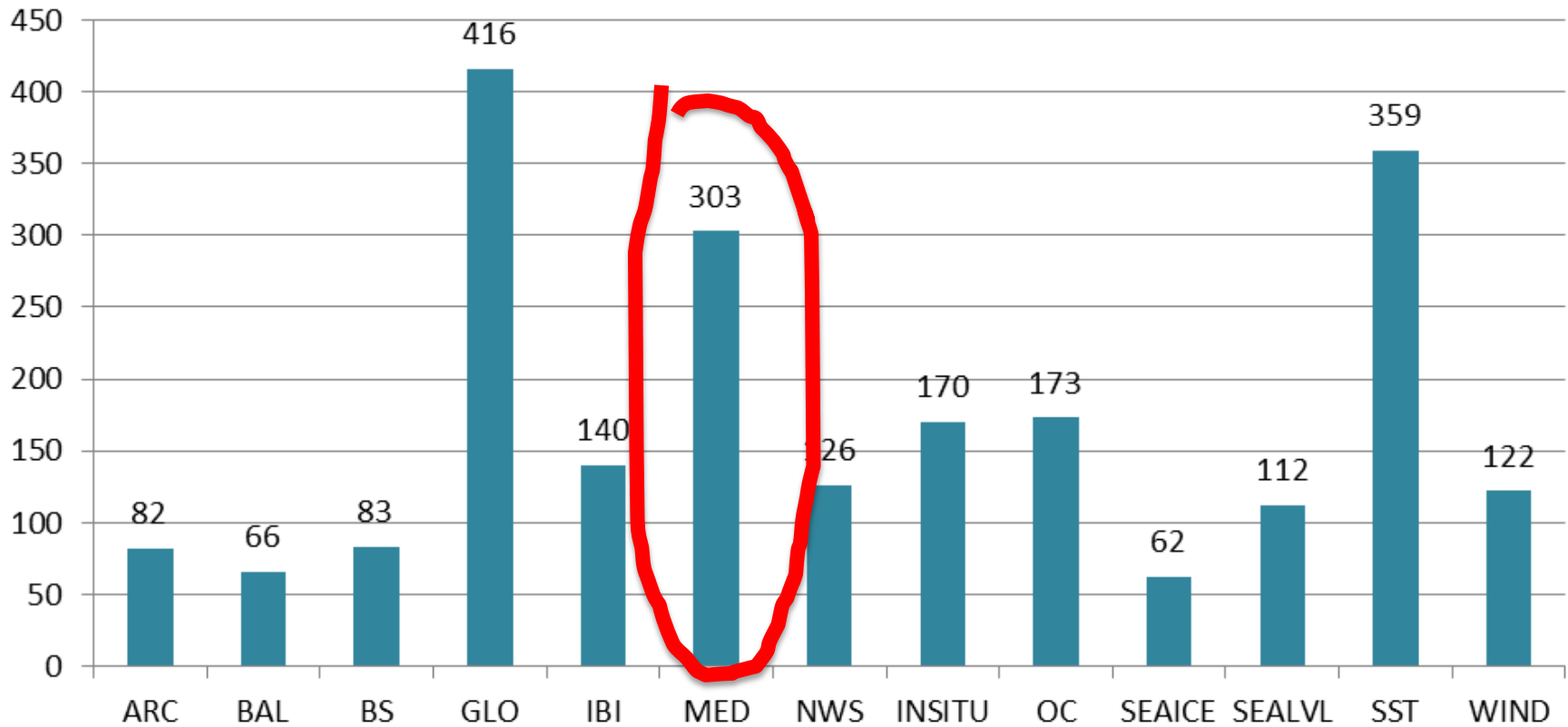
MyOcean service stakeholders/users identification

4000 Users in 101 different countries



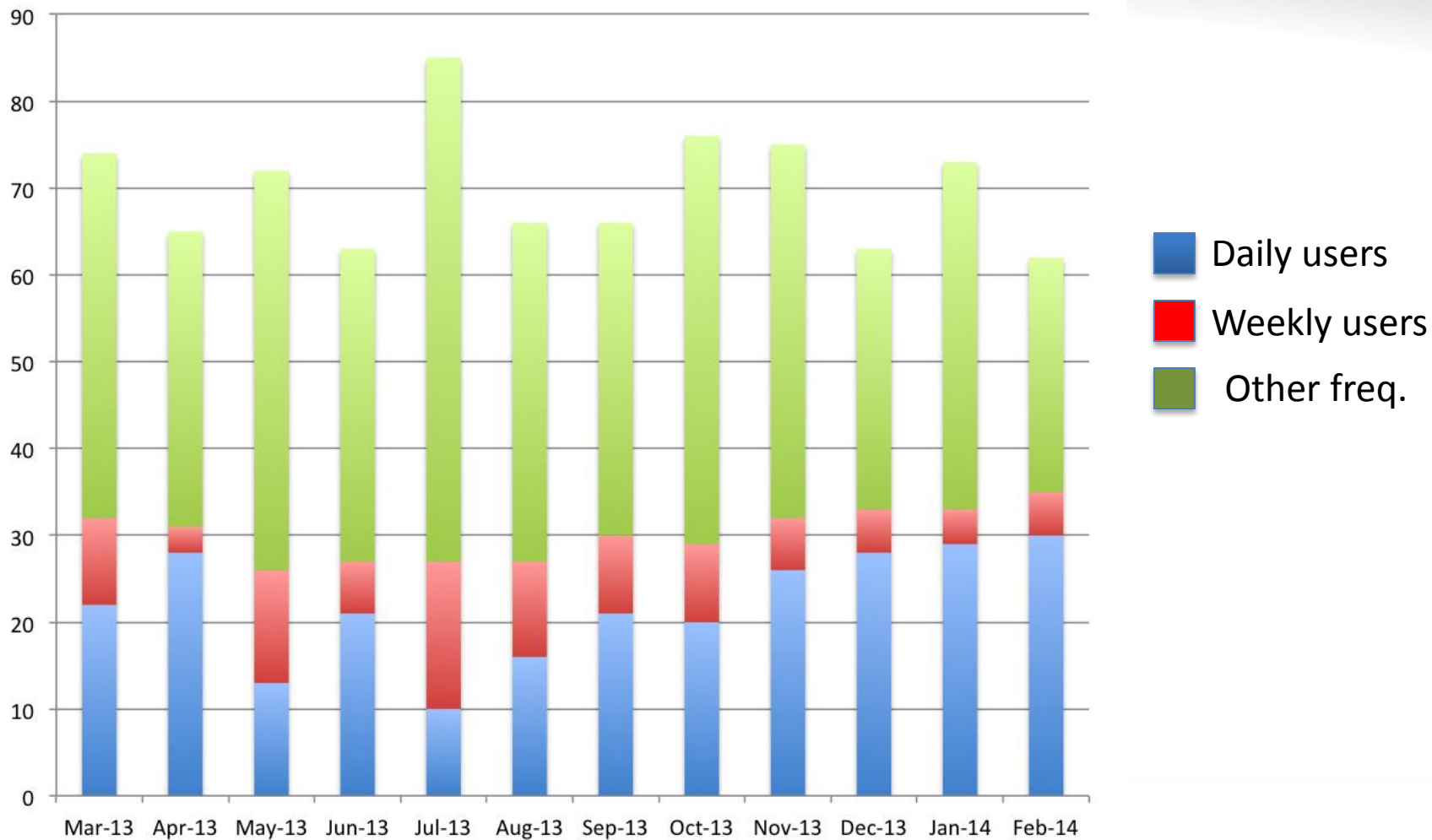
Products downloaded by users averaged over the year

MyOcean 2013, number of users per product family





The specific Med-MFC users in 2013-14



Uptake of MyOcean products: oil spill emergency service

- Daily scenario forecasts of the possible oil spill drift and spreading during emergencies



Currents
forecasted in
the area



Oil spill
scenario
derived locally



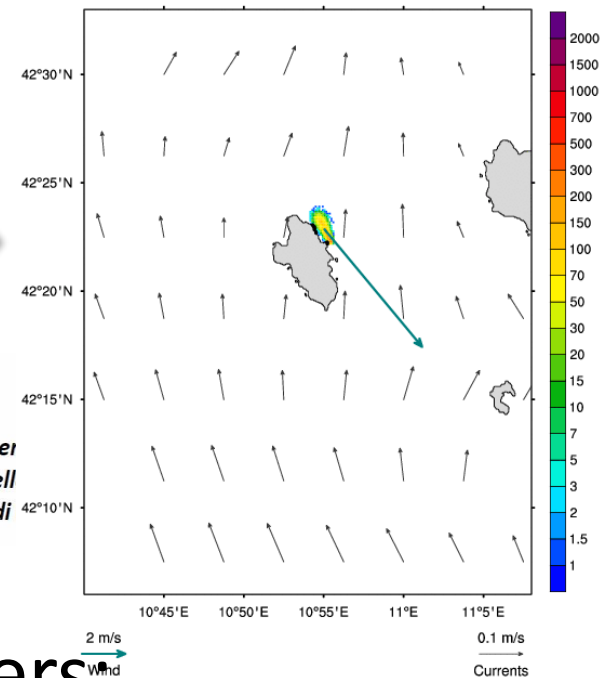
Decision
support for
operations

ITALIAN COAST GUARD HEADQUARTERS



Comando Gener
Corpo dell
Capitanerie di

Surface oil concentration, ton/km²
22/01/2012 12:00 UTC +0006 hours



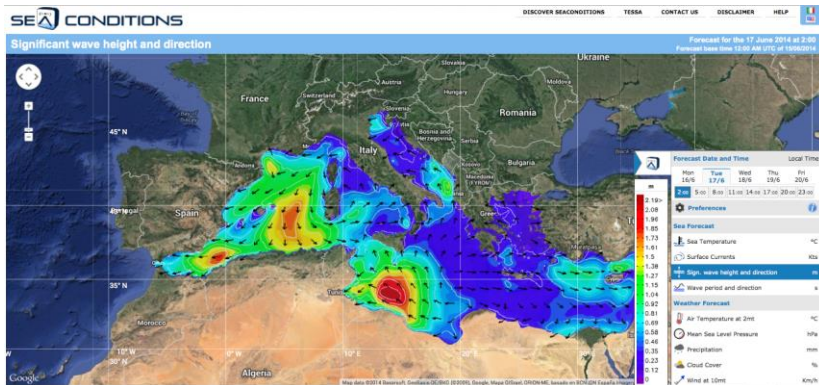
Intermediate Users:
Coast Guards, Civil protection



Uptake of MyOcean products: situational sea awareness services

- Situational Sea Awareness integrated multi-channel services, customized for general public and special users

Web Portal...



Tablet...



Smartphone...



Intermediate Users: software companies



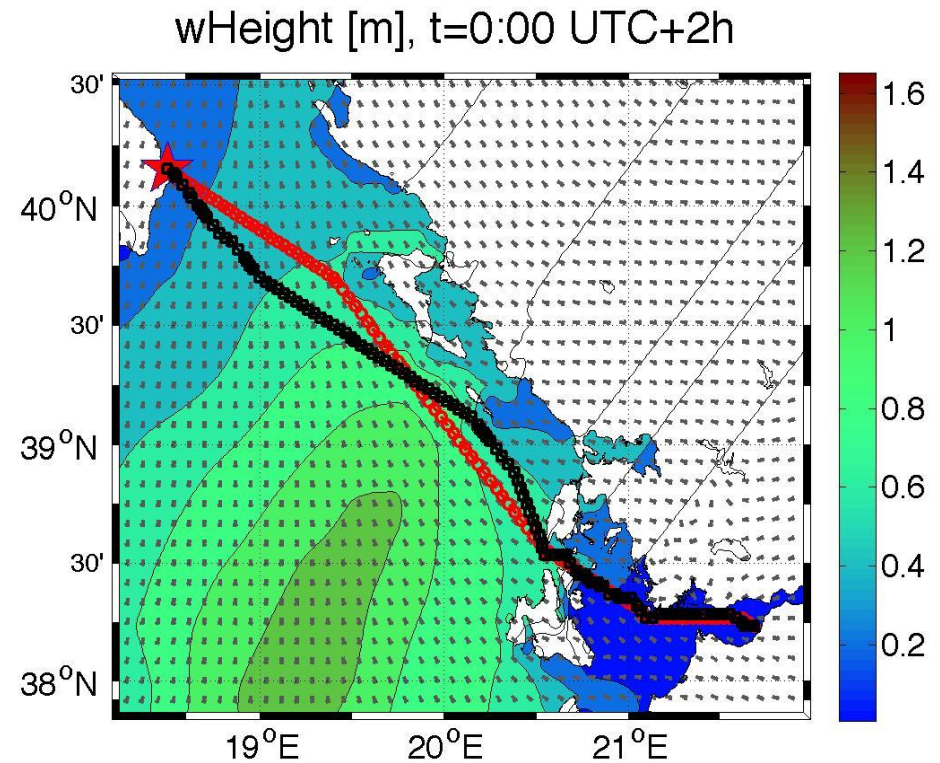
Uptake of MyOcean products: maritime safety services

- Shortest time Ship routing with realistic sea conditions

Ferry Boat & Yacht ship routing: shortest time with IMO safety constraints

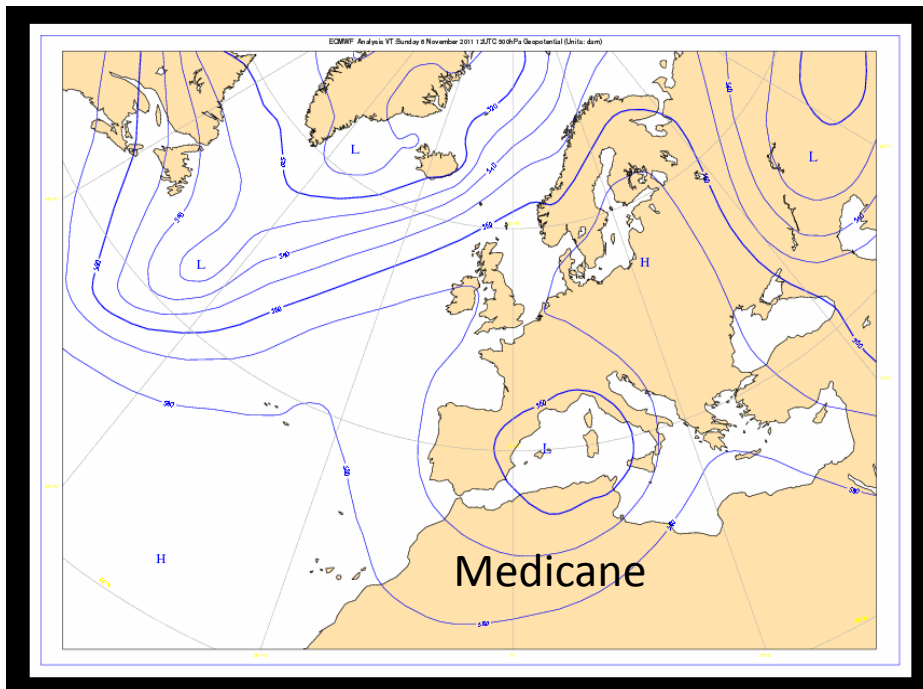


Intermediate Users:
Research and companies

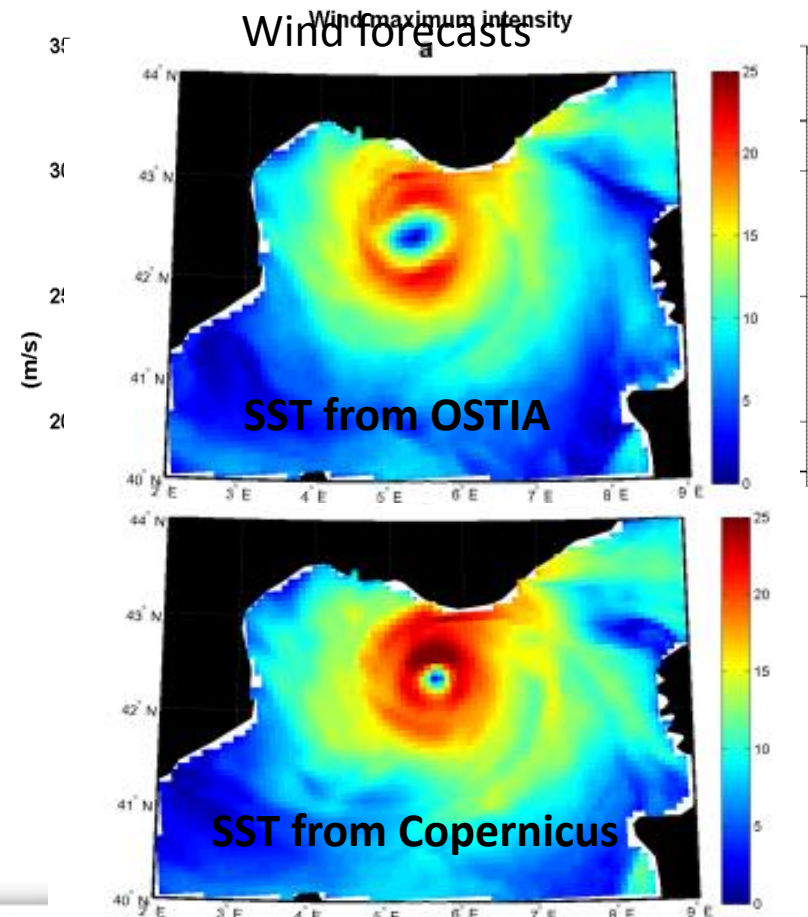


Uptake of MyOcean products: better weather forecasts

- Medicane forecast improved with MyOcean forecast SST
(in collaboration with Italian Met Office)



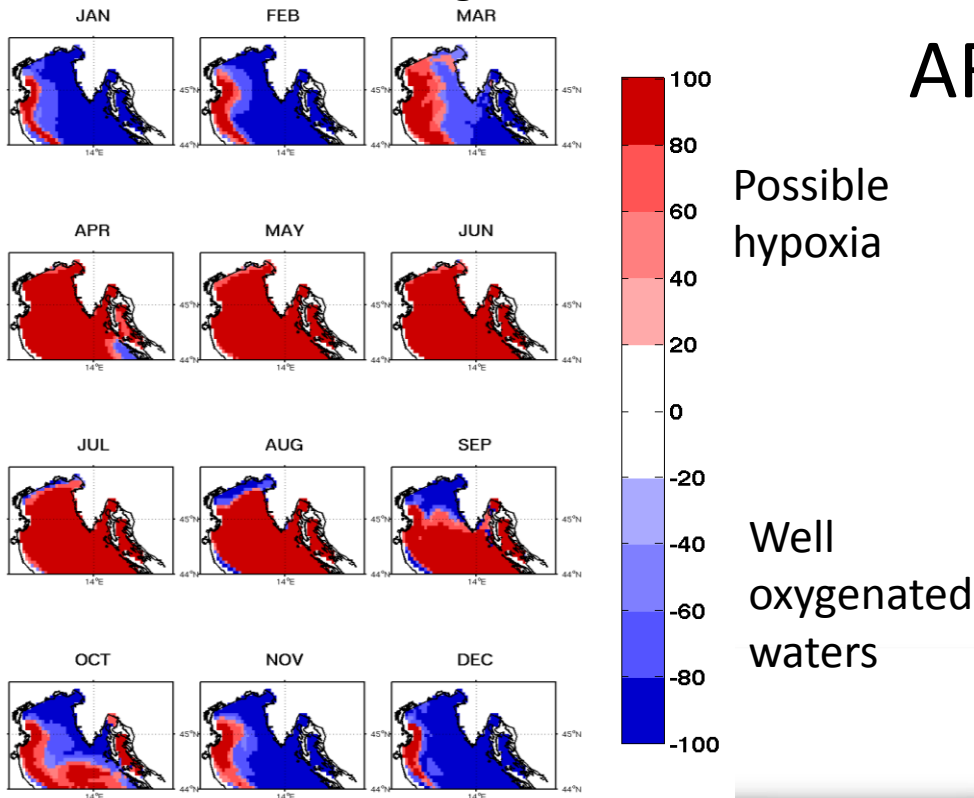
Intermediate Users:
ARPA, Met Office, etc.



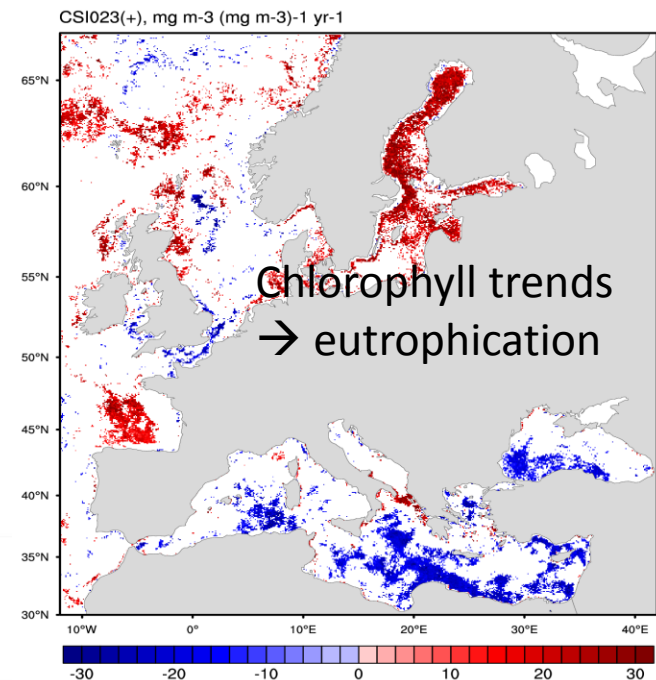
Uptake of MyOcean products: environmental assessments

- MSFD indicators are extracted from MyOcean reanalyses/reprocessed satellite data

Northern Adriatic Mixing index



Intermediate Users: ARPA, ISPRA, etc.



Considerazioni finali

- Il Servizio Ambientale Marino del Copernicus e' un esempio di sistema innovativo e allo stato dell'arte per il monitoraggio e lo sfruttamento sostenibile delle risorse marine.
- E' un esempio di sistema distribuito che capitalizza sulle conoscenze e strutture dei Paesi Membri
- **L'Italia partecipa a diverse componenti del Servizio Marino:**
 - 1) coordina il Monitoring and Forecasting Center del Mare Mediterraneo realizzando la maggior parte dei prodotti del Servizio (INGV con il supporto dell' Aeronautica Militare)
 - 2) coordina il Thematic Assembly Center per Ocean Color realizzando una parte dei prodotti del Servizio (CNR-ISAC)
 - 3) produce le previsioni biochimiche del Mare Mediterraneo come parte del Med-MFC (OGS)
 - 4) contribuisce alle ri-analisi dell'oceano globale (CMCC)
 - 5) contribuisce alla fornitura di dati osservativi per il servizio (OGS, ISPRA, CNR)

Considerazioni finali

- Per realizzare cio' l'Italia ha costituito negli scorsi 10 anni un Gruppo Nazionale di Oceanografia Operativa all'INGV che ha coordinato le attivita' nazionali per partecipare a Copernicus e connettersi agli utenti nazionali
- Utenti nazionali del Servizio Marino sono:
 - 1) la Guardia Costiera
 - 2) L'Istituto Idrografico della Marina
 - 3) L'Aeronautica militare e il Centro Meteorologico Nazionale
 - 4) Le ARPA, in particolare EMR, Liguria, FVG, Toscana, Puglia
 - 5) Il Ministero Ambiente e I suoi programmi internazionali
 - 6) L'Universita' e la ricerca
 - 7) Il settore privato, in particolare quello delle tecnologie informatiche