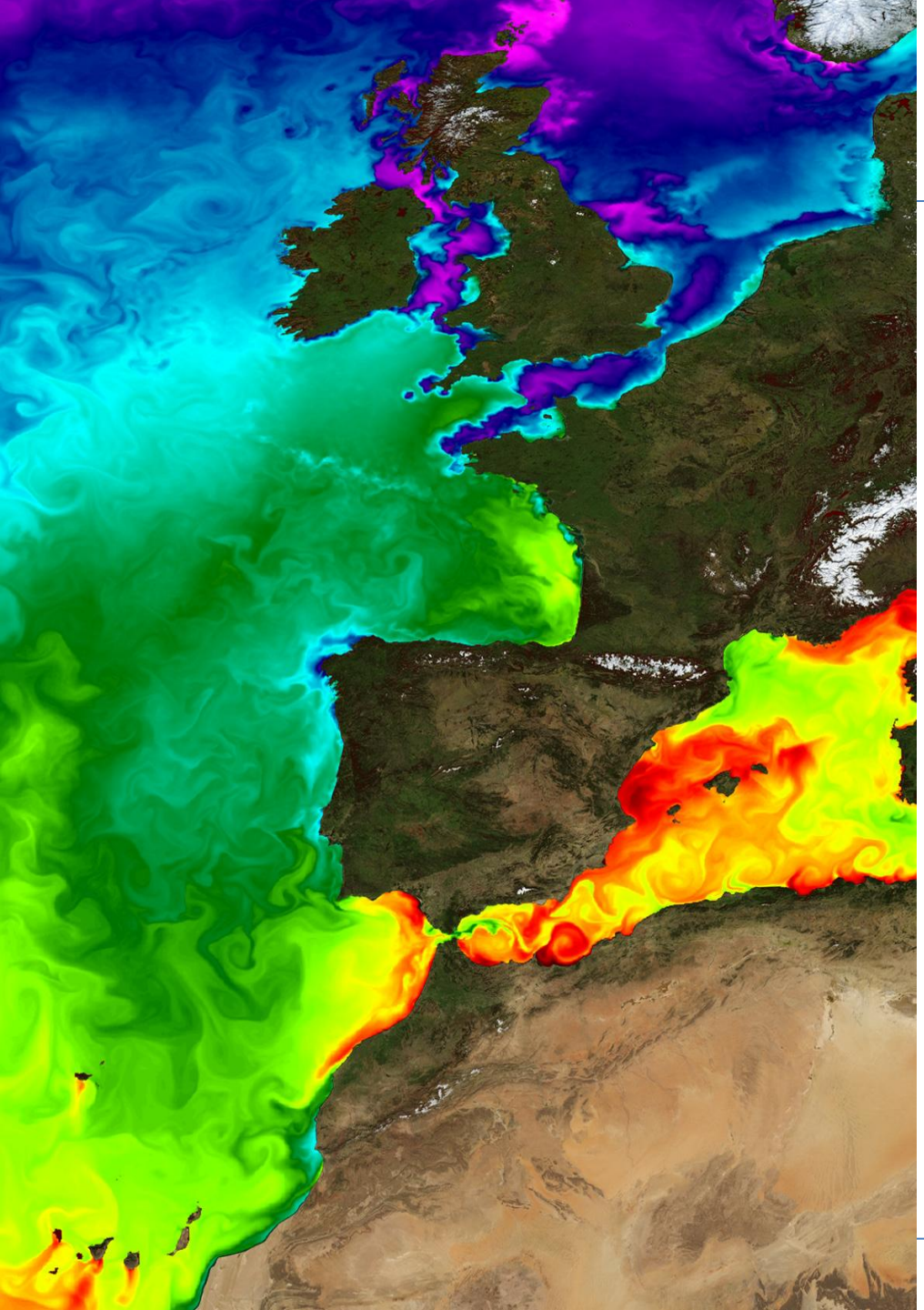


eu2013.ie

The Atlantic
A shared Resource
23-24 may 2013, Galway

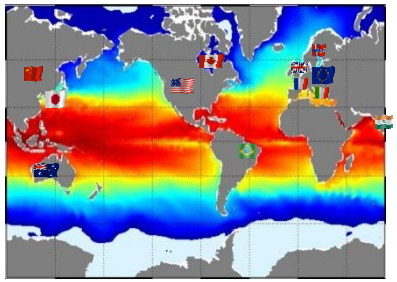
Current status of Operational Oceanography Forecasting
-
Europe

Pierre Bahurel, Mercator Ocean, France

(coordinator FP7 Project MyOcean)

Mercator Ocean Ocean Forecasters
Copernicus

Ocean Forecasting in Europe: **Framework**



At the international level, the JCOMM « **GODAE Ocean View** » program.

United States, Canada and Europe major partners. North Atlantic a key area.

At the European level, **EuroGOOS**.

→ The **European Union** priority for marine environment monitoring.

The Copernicus « marine service » and its pilot FP7 project **MyOcean.**

Ocean Forecasting in Europe: **Status**

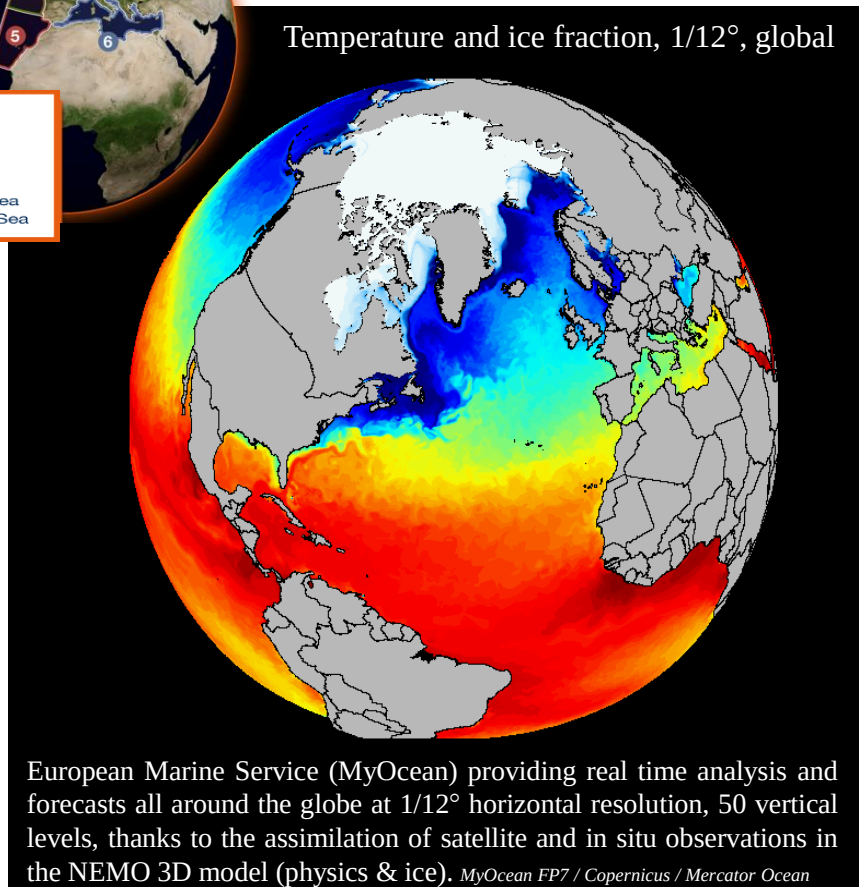
Challenge 0: SUSTAINABILITY

A successful European service for the mesoscale

- **All European seas and the global ocean equipped today with *ocean monitoring and forecasting systems*.**
- Single, simple, open and free access point to users: **www.myocean.eu**. More than 2000 users so far.

A strong national uptake for expert services

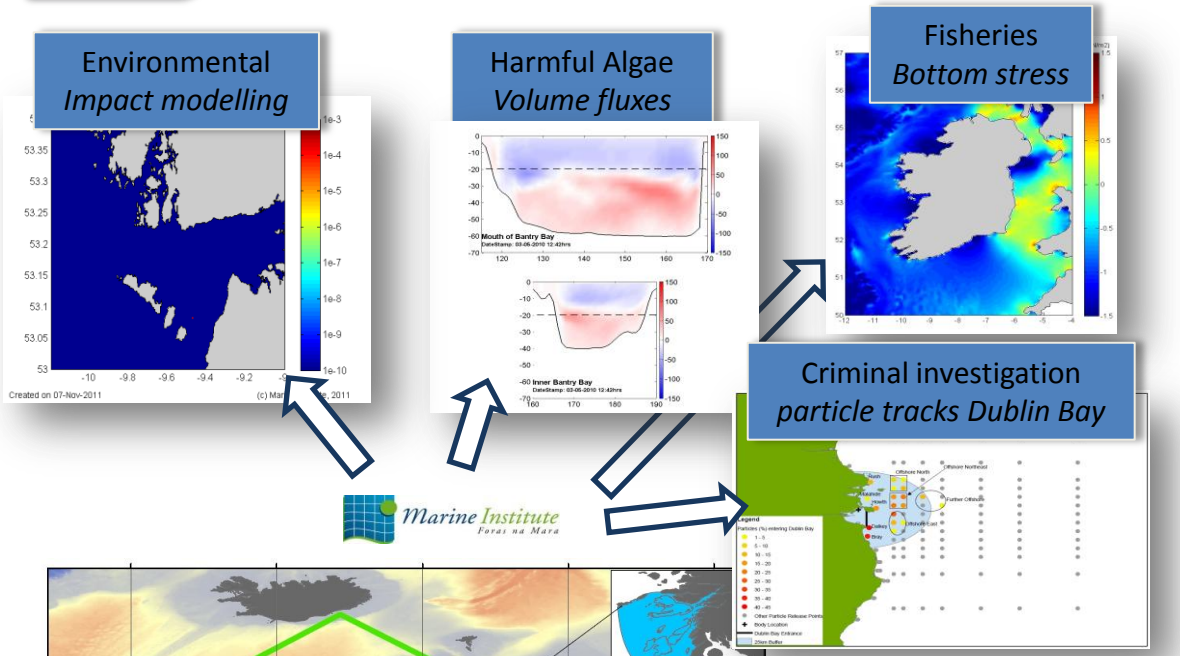
- Constant development of expert information services (environmental monitoring, marine operations, …).
- Coastal areas are key areas;
- Marine centres in EU member states are key players.

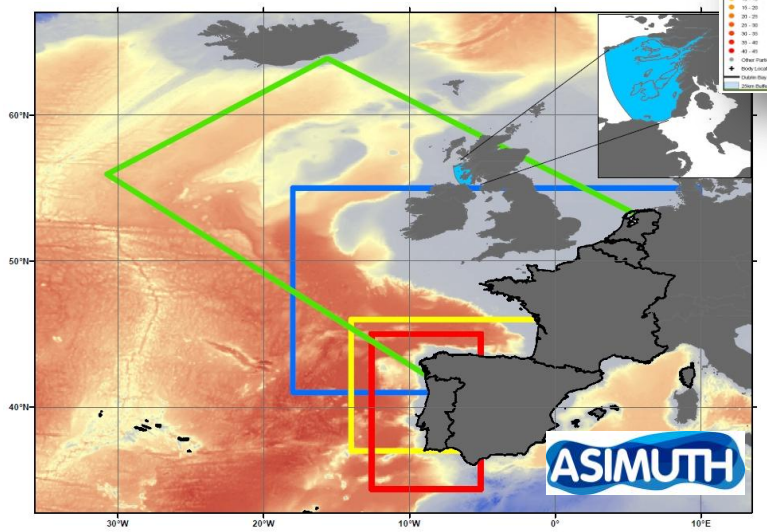


European Marine Service (MyOcean) providing real time analysis and forecasts all around the globe at 1/12° horizontal resolution, 50 vertical levels, thanks to the assimilation of satellite and in situ observations in the NEMO 3D model (physics & ice). *MyOcean FP7 / Copernicus / Mercator Ocean*

[1] Ocean forecasting … mesoscale to coastal

Scientific Challenge #1





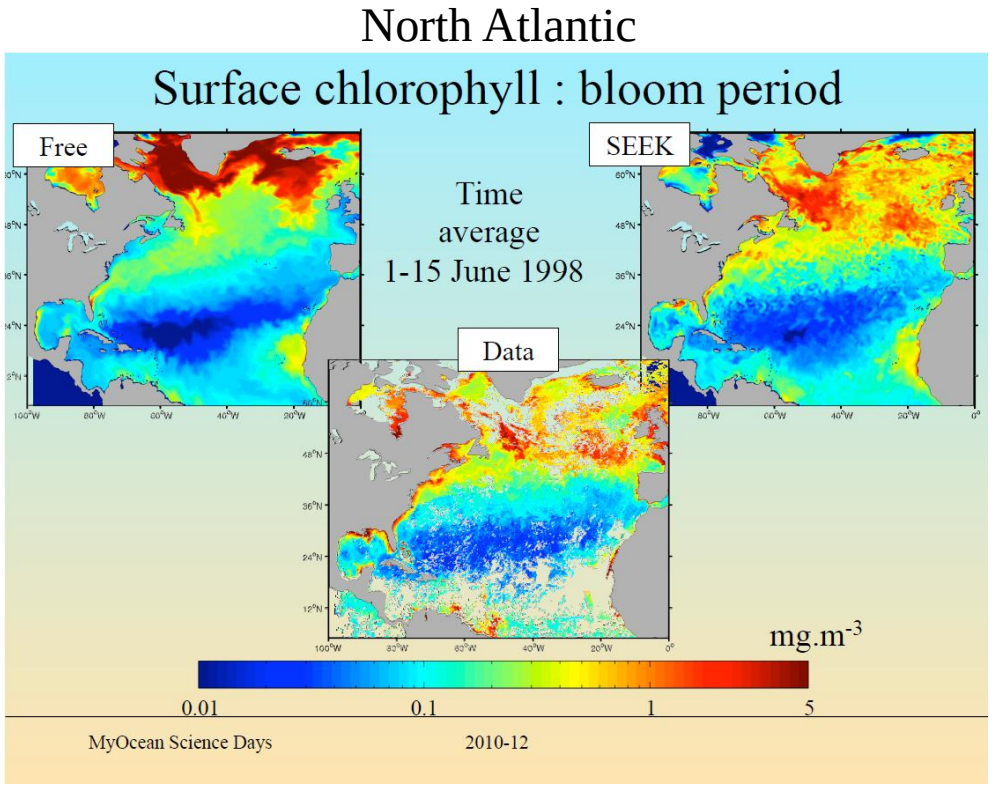
Courtesy Glenn Nolan
Irish Marine Institute
FP7 Asimuth project

- **European coastal areas are mapped with a series of coastal systems**
- Wide variety of applications.
- Major achievements made to **connect large ocean and coastal waters** systems

- *Lack of observations, biogeochemistry modelling, accurracy and adequacy of information …*

[2] Ocean forecasting … physics to **biogeochemistry**

Scientific Challenge #2



Ocean color data assimilation experiment into a 3D coupled physics / biogeochemistry model of the North Atlantic, presented during the MyOcean Science Days, by C.Fontana (CNRS).

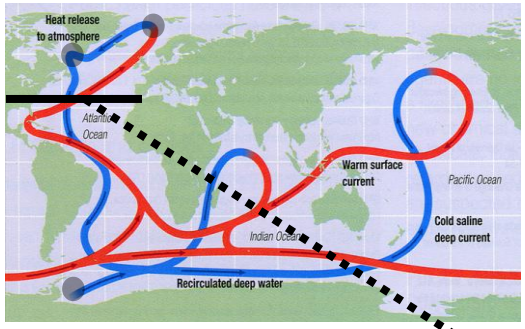
See also e.g. SANGOMA, OSS2015, OPEC FP7 projects

- Major objective for CO2 cycle and primary production
- Strong research efforts
- Some pilot services (e.g. algae blooms)
- *Still a long route to go from current op. oceanography to ecosystem management*

[3] Ocean forecasting

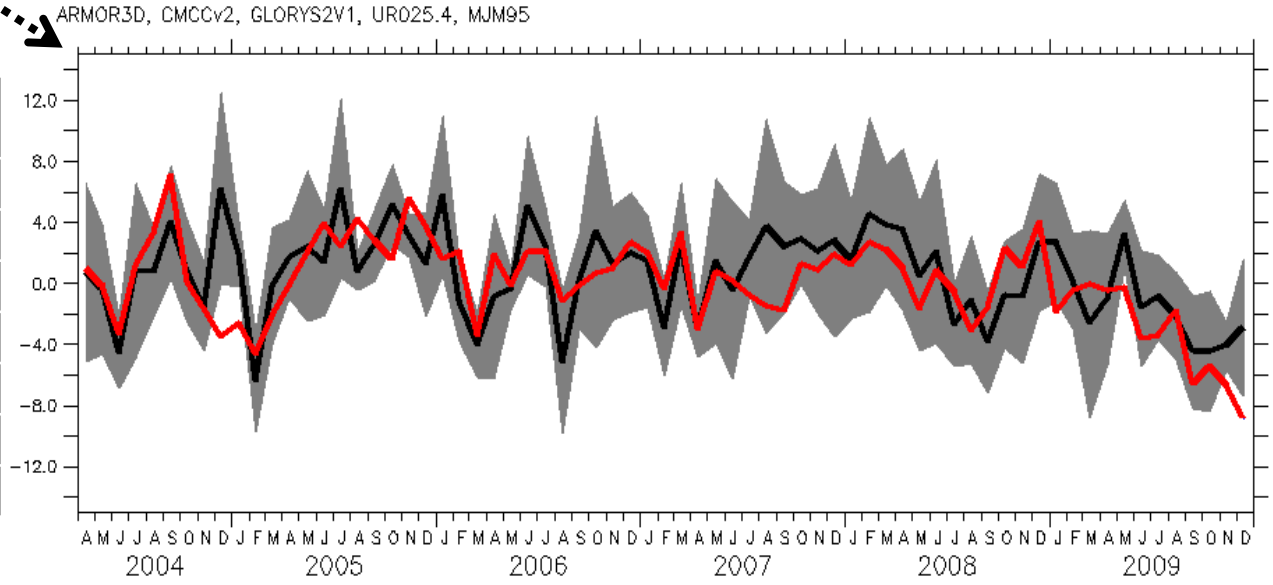
Scientific Challenge #3

… real time to ocean climate



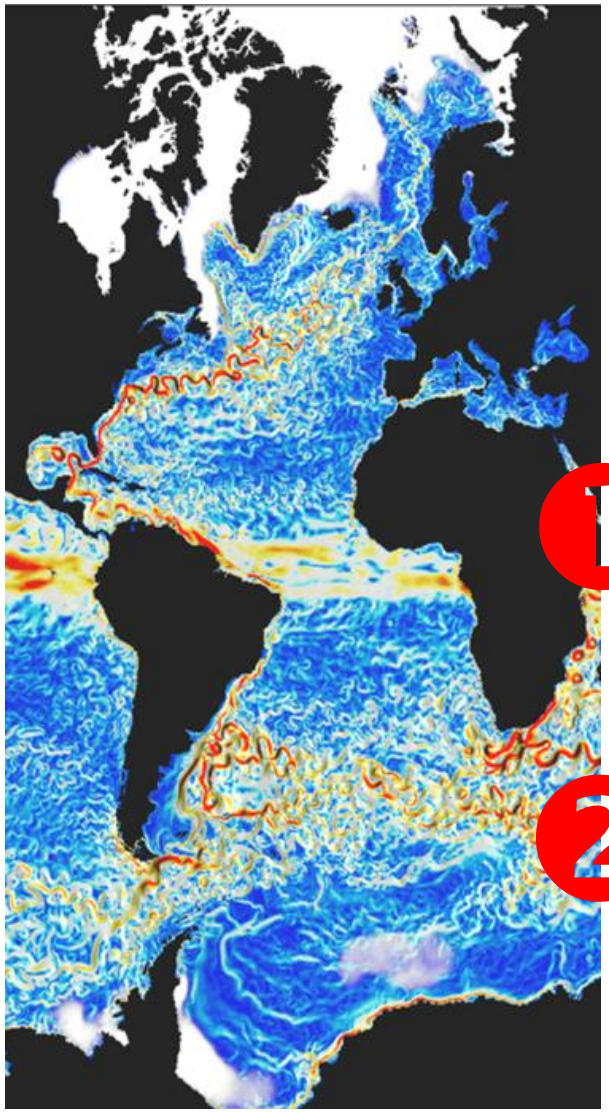
- Operational oceanography systems enable multi-year assesment of ocean climate variations (sea level, heat content, transports, …).
- Demands the use of high quality data sets, advanced data assimilation methods and fine tuning of models.
- Co-operative efforts on **Ocean reanalyses**, incl. **ensemble** approaches, prove their value

Reanalysis	Correlation
Reanalysis 1: Mercator	**0.39**
Reanalysis 2: CMCC	**0.42**
Reanalysis 3: Univ. Reading	**0.36**
Combined obs: CLS	*0.25*
Control Run MJM95 (LEGI)	*0.63*
REA ENSEMBLE	0.57
REA ENSEMBLE no MJM95	**0.53**



North Atlantic Meridional Overturning Circulation at 26.5 N (anomaly, in Sv)

Conclusion & Recommendations



- In Europe, a common « core service » (Copernicus, www.myocean.eu) fed by research and feeding expert services.

Lessons learned, key factors

- Openness and international cooperation (e.g. GODAE)
- **Free** access to ocean observations, **free** access to « core information » products, use of **common** modelling tools, **common** formats, **common** quality metrics and methods, ...

Recommendations for EU-CAN-US cooperation

1

Decide on joint commitments for operations and sustainability of the Atlantic observing & forecasting « core » infrastructures

Action plan on : obs & modelling systems, data & product sharing, quality check, co-operation and co-production

2

Share a common plan for research & innovation for the ocean

Research Plan on: on modelling & data assimilation, coastal areas, reanalyses and multi-year assessments, biogeochemical modelling, quantification and reduction of uncertainties.