Data The oceanographic data for NEAR-GOOS are temperature, salinity, currents, waves, sea-level, dissolved oxygen, nutrients, and other hydrographic elements. The data for NEAR-GOOS are of three different types : in situ, remotely sensed, and derived from models.

- Buoy data List (Format)
- Ships of opportunity data
  - Observation in China sea (Format)
  - Observation in bases FM 13-VII SHIP (Format)
- Station data
  - Station Temperature and Salinity Data Format
  - Station Wave and Wind Data Format
  - The Coastal Station Data List of China (Format)
  - The Coastal Station Data of Russia (Format)
- Meteorological Data list (Format)
- SST Data
  - The satellite remote-sensing SST data are in the gif image format.
- GTS Data
  - Radio sounding Data
  - Surface Meteorological
  - Ship Meteorological

Europe Ocean Observation System

MyOcean, a project

Mercator Ocean

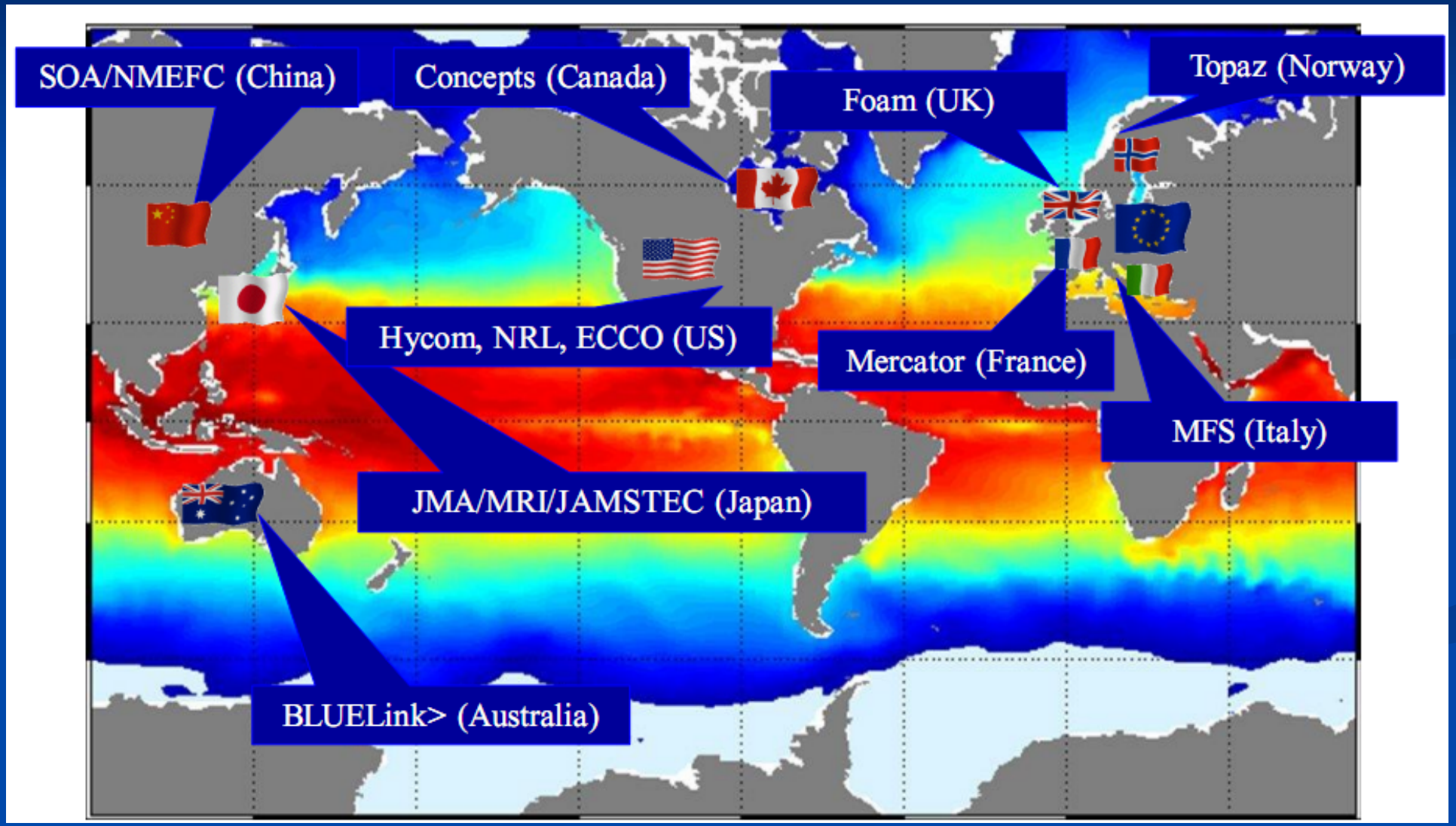
MyOcean project coordinator

for ocean monitoring and forecasting in Europe

Ocean Monitoring and Forecasting

Core services

Marine Core Service



The MyOcean team

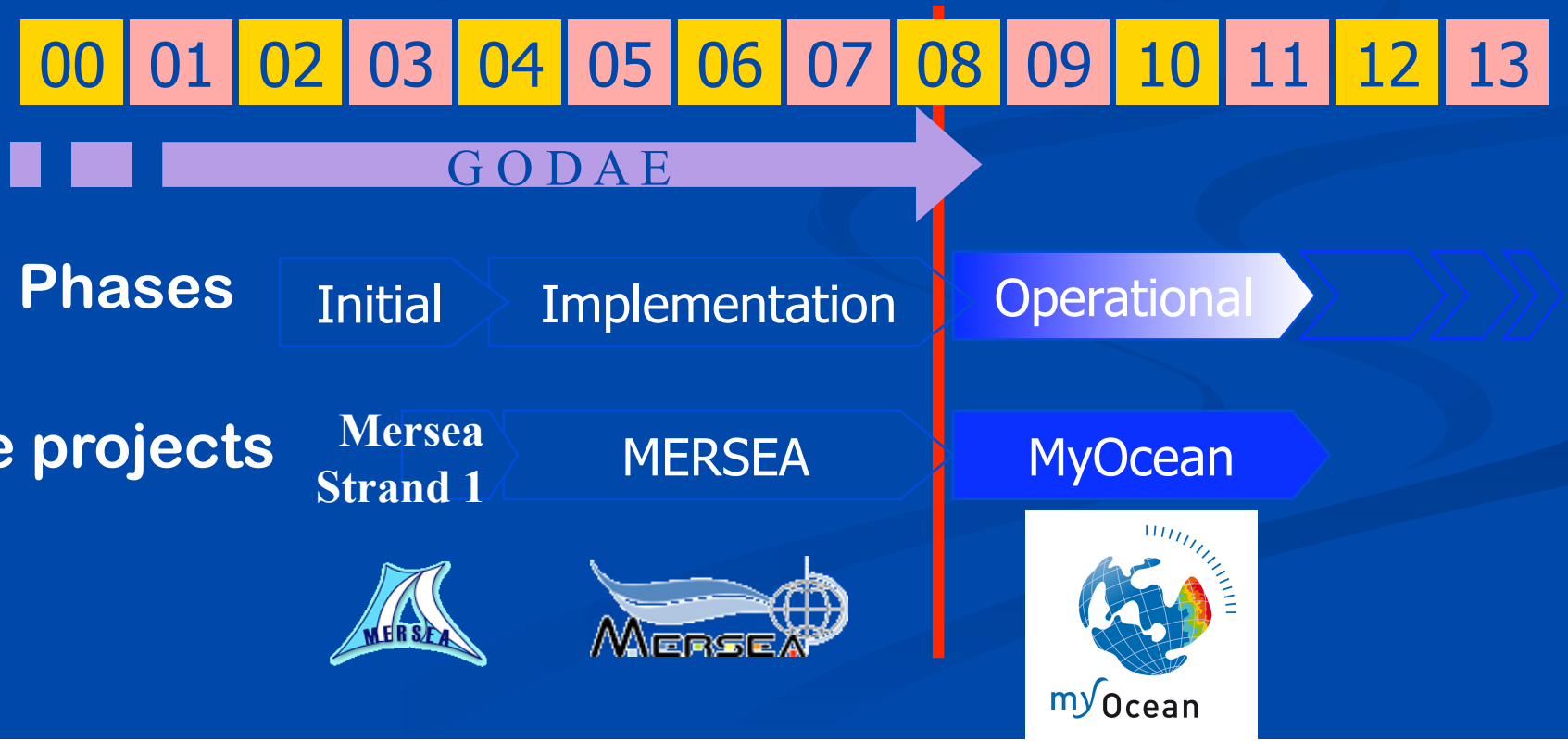
- Lead by Mercator Ocean
- 60 partners, 28 countries
- All European maritime countries
- A core group of ~ 15 partners: the European GODAE partners

A MyOcean network involving all European maritime countries
Partners networking 28 countries for user's requirements

In the consortium,
- 1/3 of « operators »,
- 1/3 of « expertise » (research & industry),
- 1/3 to market « users' » need

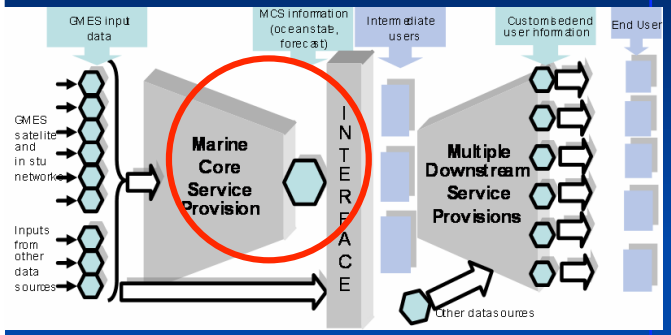
MyOcean,
a European Commission "GMES" project

- **GMES : the European Union program for « Global Monitoring for Environment and Security ».**
  - A joint program European Commission / ESA
  - Different themes ; the first 3 priorities are Marine, Land & Risk
  - Funded through the EC 7th Research Program



The challenge

- Set up and demonstrate operationality of a European Marine Core Service



- MERSEA Strand 1 (2003-2004) has shown the value of the European monitoring and forecasting systems
  - MERSEA (2004-2008) has worked on the design and development of a European integrated system
  - MyOcean (2008-2011) has to deliver a fully qualified service

Ocean monitoring and forecasting

The project

- A project initiated and co-funded by the **European Commission** (EC research program)
  - Involving **60 partners** from 28 different countries
- A **3-year** project
  - Should start before end of 2008, to end in 2011
- **60 M€** for 3 years, with 33 M€ funded by EC
- Currently ending the negotiation with EC
  - First call Dec 2006; First proposal June 2007

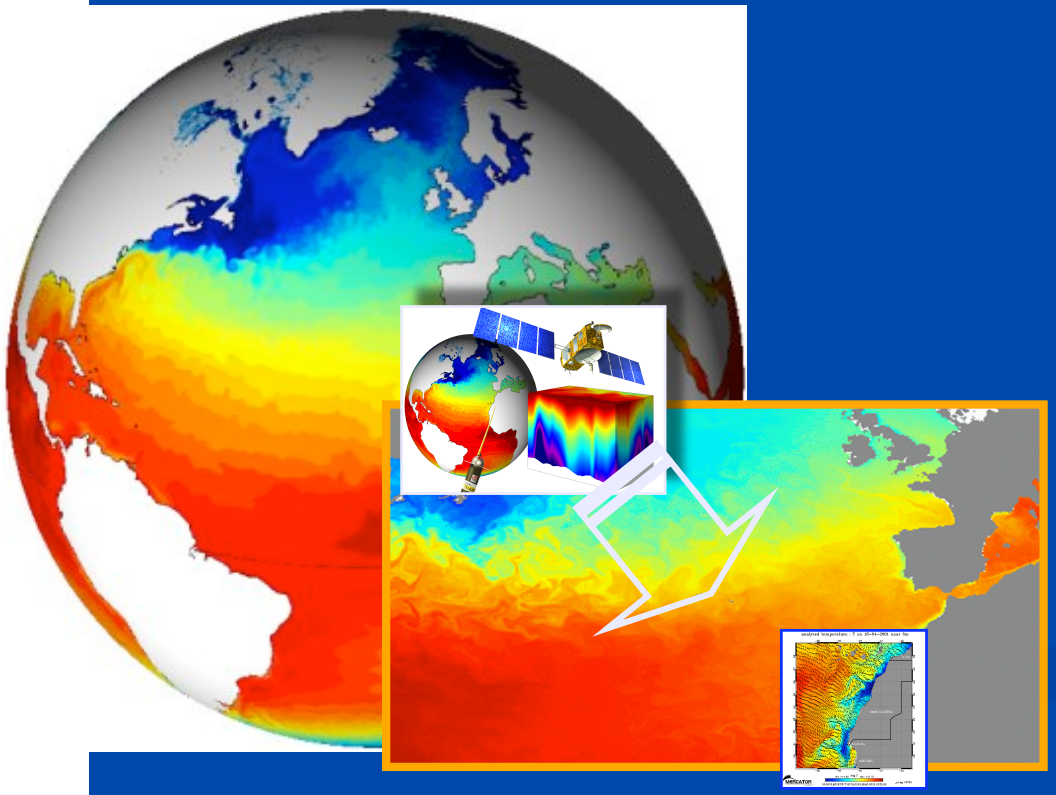
The "core" service

- MyOcean will *"provide the common denominator data for **all users in the marine sector**, in other words the information for existing & new downstream services."*

- **Climate**
- **Marine Environment**
- **Seasonal and weather forecasting**
- **Offshore**
- **Maritime transport and safety**
- **Fisheries**
- **Research**
- **General Public**

The MyOcean offer

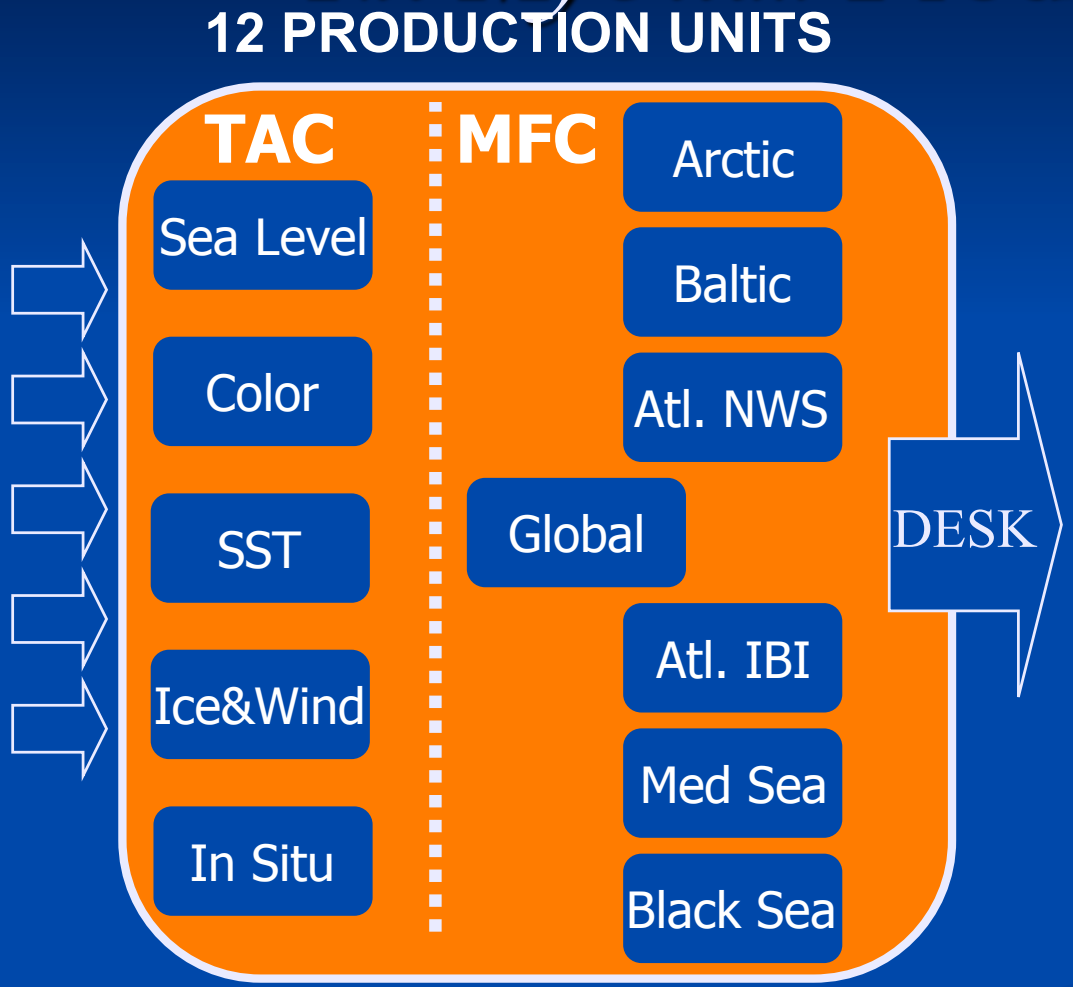
- MyOcean will deliver regular and systematic reference information on the state of the oceans



- **State of the ocean, and primary ecosystem**
- **Global ocean, and main European basins and seas**
- **Large and basin scale ; mesoscale physics**
- **Hindcast, Nowcast, Forecast**
- **Data, Assimilation and Models**

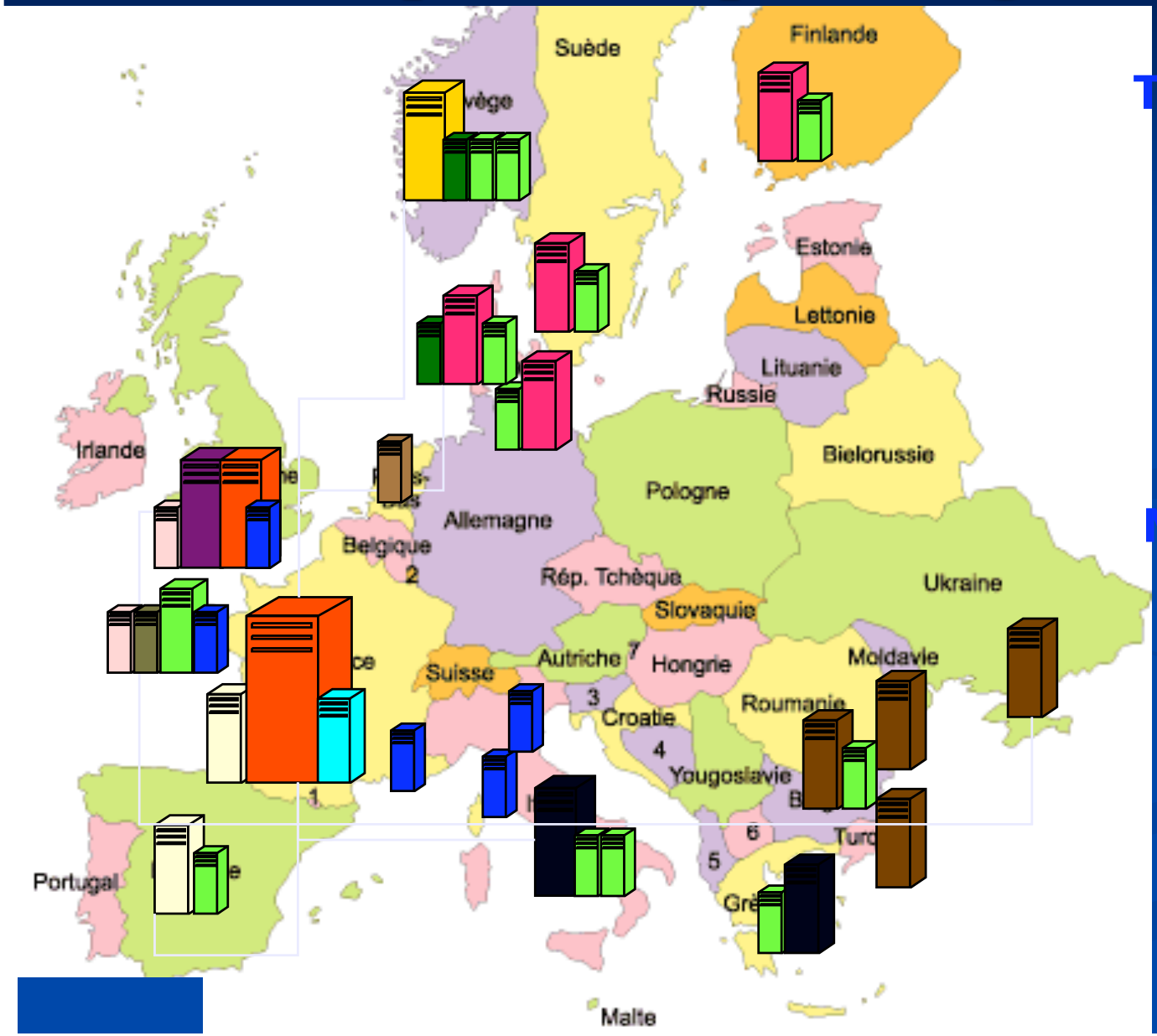
Organization

The MyOcean Production Units



- 5 **TAC** : Thematic Assembly Centers
  - "Observations"
- 7 **MFC** : 1 global and 6 regional Monitoring and Forecasting Centers
  - "Model / Assimilation"
- 1 single **DESK**
  - "Products to users"

A pan-european organization



TAC

- SL TAC
- OC TAC
- Sea Ice TAC
- In situ TAC
- SST TAC
- Wind TAC

MFC

- MFC Global
- Arctic MFC
- Baltic MFC
- NW Shelves MFC
- IBI MFC
- Med Sea MFC
- Black Sea MFC

Responsibilities

- A Board:
  - P.Bahurel (coord), M.Bell, PY. Le Traon, E.Buch, F.Jacq, J.Johannessen, N.Pinardi
- An Executive Committee
  - Partners: Mercator Ocean, CLS, CNRS, NERSC, DMI, Met Office, INGV, MHI, CNR, Ifremer, met.no, HCMR
  - Individuals: F.Adragna, E.Dombrowsky, J.Siddorn, C.Donlon, S.Pouliquen, P.Brasseur, G.Larnicol, L.Bertino, …

- Mercator Ocean FR
- Met Office UK
- INGV IT
- **NERSC NO**
- DMI DK
- PUERTO ES
- MHI-NASU UA
- CLS FR
- **IFREMER FR**
- MF FR
- KNMI NL
- CNR IT
- Met.No NO
- CNRS FR
- HCMR EL
- SMHI SE
- EDISOFT PT
- INRH MA
- IOBAS BG
- OC-UCY CY
- BSH DE
- BC DE
- DNSC DK
- CSIC ES
- STARLAB ES
- MSI EE
- JRC EU
- ACRI FR
- FIMR FIN
- ENEA IT
- OGS IT
- USAM IT
- APAT IT
- IOLR IL
- IMR NO
- Techworks IR
- UMT-IOI-POU MT
- IST PT
- NIMRD RO
- CMCC IT
- NERC (POL, NOC) UK
- PML UK
- UREAD UK
- HRW UK
- CEFAS UK
- RBINS/MUMM BE
- IFM-GEOMAR DE
- **NIVA NO**
- IASA-UAT EL
- NIB-MBS SI
- NERI DK
- DTU-DIFRES DK
- SYKE FIN
- UL LV
- CMR LT
- MIG PL
- DFO CA
- UOP UK
- BAS UK
- AARI RU
- NIERSC RU
- ECMWF

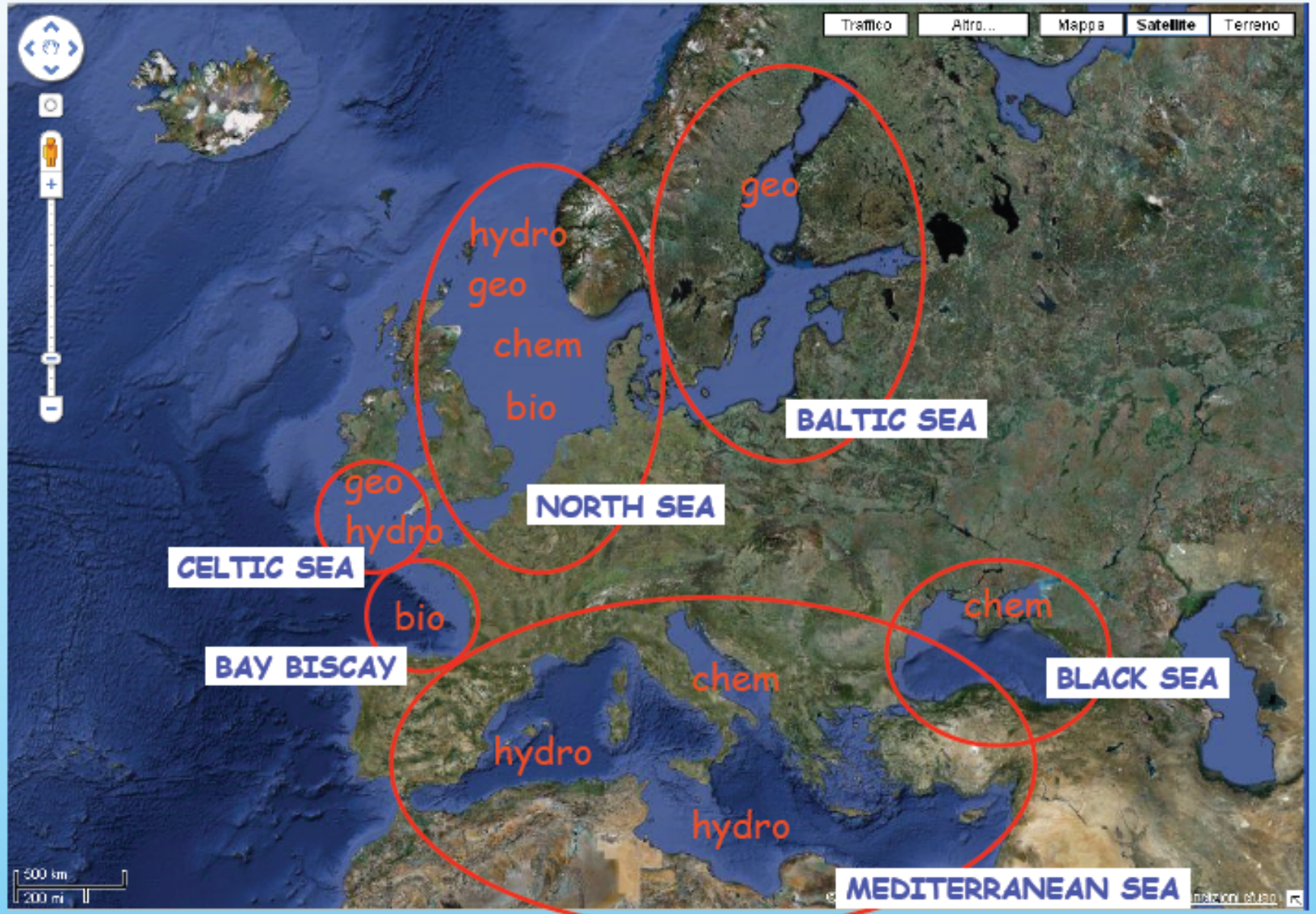
EMODNET

The European Marine Observation and Data Network

From: Marine Observation and Data Expert Group

EMODNET is essential for the EU to improve the quantity, quality and accessibility of marine observation and information for evidence-based ocean governance and to open up new economic opportunities in the marine and maritime sectors of Europe, for the ultimate benefit of the European citizen and the global community.

Geographic areas to be covered



What is EMODNET?

EMODNET will be a network of existing and developing European observation systems, linked by a data management structure covering all European **coastal waters, shelf seas and surrounding ocean basins,** accessible to everyone.

EMODNET will thus provide the link between observations in different European waters and European environmental information which can then be assessed by scientists and the general public. This will create a large number of marine services in the field of monitoring, forecasting and marine safety.

EMODNET will provide an end-end system linking the modules

1. Sensors and platforms
2. Surveys
3. Communication system
4. Data management system
5. Information tools

The main tasks in EMODNET will be to:

(1) build on and integrate the combined *in situ* and remote sensing of open ocean, shelf seas and coastal observation systems;

(2) harmonise different methodologies and strategies for data management under common protocols, data formats and quality control,

(3) ensure that data can be consistently distributed for user applications including regional data interpretation, environmental assessments and modelling.

The Vision

The EMODNET Vision is for an end-to-end, integrated and inter-operable network of European marine observations, data communications, management and delivery systems, supported by a comprehensive useroriented toolkit to enable implementation of the Integrated Maritime Policy for Europe.

It is essential to improve the quantity, quality and accessibility of marine information for decision making and to open up new economic opportunities in the marine and maritime sectors of Europe, for the benefit of the European citizen and the global community.

Jonathan Swift

Why EMODNET?

Good stewardship requires sound data, understanding and advice which is transparent and accessible to, and challengeable by stakeholders.

1. Some such data are existing, but inaccessible. These need to be unlocked and made easily accessible.
2. There are huge data gaps too either because the necessary measurements have not been made or because observing networks are inadequate. These gaps need to be filled.

What would it be made of ?

EMODNET will be a network of existing and future European observation systems, linked by a data management structure covering all European coastal waters, shelf seas and surrounding ocean basins, accessible to everyone.

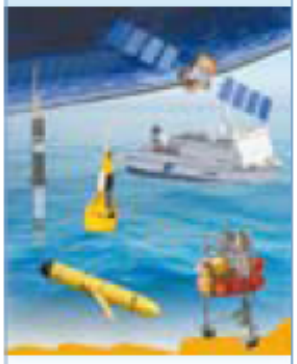
EMODNET will provide an end-to-end system linking the modules “Sensors & Platforms”, “Surveys”, “Communication Systems”, “Data Management “ and “Information Tools”. Depending on the specific tasks and problems in the different regions there may be differences in details on the application of strategies and methods.

Essential Components of an Observation Network

Sensors to measure continuously and automously physical, chemical and biological parameters

- salinity, temperature
- turbidity, oxygen
- chlorophyll, nutrients
- pH, alkalinity
- bathymetry
- primary production

Platforms or structures anchored on the seabed, floating in the water column or drifting at the sea surface, and remote sensing from satellites.



- buoys, floats
- gliders
- mooring
- AUVs, lander
- FerryBox
- cabled networks
- remote sensing
- living Argo

Sampling and consecutive laboratory analyses from research ships, or shore, including water, sediments and biota (phytoplankton, bacteria, zooplankton, fish)

- inorganic trace compounds
- gases, e.g. CO_2, CH_4, DMS
- organic micropolluants
- abundance & function of biota
- food web
- HABs

Communication systems to transfer in real-time data from sensors to the network and to the land stations

- satcom
- GSM, GPRS
- fibre optics
- acoustics

Data collection and management system for direct control of data quality, and data storage systems to enable data analysis and use for model applications

- data bases
- quality control
- data standards

Software and web based information tools to analyse data for trends, compliance to EU directives, to distribute and disseminate data to end users

- analysis
- Presentation
- web
- GIS

Ocean observing systems

EMODNET scales

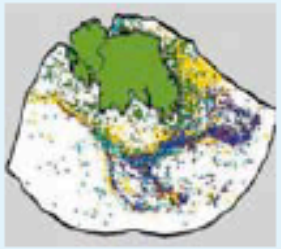
• **GLOBAL:** European Seas and Oceans are an integral part of the Earth Ecosystem. They are influenced by the Global Oceans, particularly through internal transport between them but also indirectly through interactions between the atmosphere and Oceans.

• **REGIONAL**: Europe's Regional Oceans and seas comprising the Arctic and Atlantic Oceans and the Baltic, Mediterranean and Black Seas and Sub-Regional seas such as the North and Adriatic Seas have specific, distinct characteristics.

• **LOCAL**: The coastal zone, because it is an area of great physical and biological diversity and the area of greatest interaction between nature and anthropological forces, represents one of the greatest challenges for observation, monitoring and assessment.

Regional Scale

Example: **Fishing efforts near Ireland**



Regional Scale

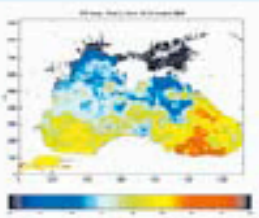
Example: **Invasion of new species and community shift**

Regional Scale

Example: **Cyanobacteria Bloom**

Regional Scale

Example: **Sea Surface Temperature Maps**



Global Scale

Examples:

Global currents:

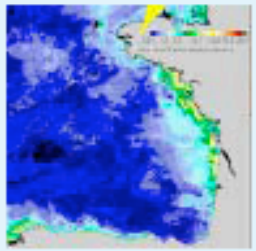
Gulf Stream (Observed by ARGO floats)

Meteorology:

North Atlantic Oscillation

Regional Scale

Example: **Chlorophyll Distribution**

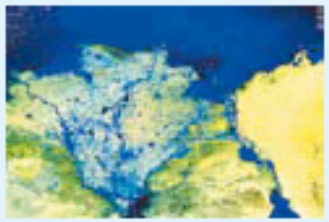


Local Scale

Example: **Discharge of nutrients and polluants from river into the sea**

Local Scale

Example: **Sedimentation and erosion**



Data Management

- Data Management
- Great Wealth of Data
  - For a wide range of disciplines, from in situ and remote sensing observations, in real-time, near-real-time, and delayed mode
- Key challenges is to organize a common data management approach to be adopted by all actors
- EMODNET must engage and build upon existing initiatives to harmonise data management practices overall
- Key elements of the harmonisation are:
  - A common data policy enabling free and open access to data
  - Common standards and protocols for quality control procedures, metadata formats and descriptions, and data exchange formats
- Technically, EMODNET to be established as a system of systems. Interoperability between systems will be achieved by adopting the EU (INSPIRE) principles under development.

How to implement

- Discover existing holdings of relevant marine data
- Remove impediments to exchange & access to data

 better harmonisation & management

- Conduct a gap analyses to determine shortcomings in existing data lie (both coastal and open oceans)
- Coordinate joint investment in sustainable, efficient observing systems that exploit:

– The complementary strengths of remote sensing and in situ methods
– Platforms of opportunity (e.g. ships in transit, research and fishing vessels)
– National networks (e.g. FWD, EMS, DCR)
– Autonomous, adaptive vehicles
– Highly capable observatories in key locations.

- Implement collaboration & governance arrangements to sustain the EMODNET in the long term. Towards a system of systems.

Several Suggestion for Developing Ocean Observation System in China

1、The ocean community of China should organize and coordinate a project or program

2, The Scattered Administration Should Be Changed

3、China Should propose a large international marine observation Program and Contribute to World Ocean Community

4、3-D marine environment monitoring technology:

5、Develop Gliders in China

6、 Long-term, Real-time Observation Means of Far-reaching Ocean

7、 Long-term Deep-sea Observatories Based On Lander Technology

8、 Communication, positioning and other Common Technology

1、The ocean community of China should organize and coordinate a project or program that will be similar to MyOcean EMOSNET.

In ocean science and technology, China have some key projects, such as 973 project, 863 project, but these projects are mainly for researches of ocean science and technology, not for “service core” .

All the results of these projects reported back an expert panel, that's all, then scientists will apply new project for their **research life !**

The People's Republic of China State Council On behalf of the State Council, Premier Wen Jiabao gave government work reports to the National People's Congress

We formulated and implemented a series of industrial policies and special planning, in order to optimize and upgrade the industrial structure, accelerating information, biology, aerospace, new energy, new materials, ocean technology and other high-tech industries development.

National long- and medium-term Scientific and Technological Development Program（2006-2020）

（Ministry of Science and Technology of China）

National long- and medium-term ST Development Program（2006-2020）

4. Establishing the sharing mechanisms on the science and technology infrastructure platform.

Establishment of efficient sharing systems and mechanisms is the key and premise of obtaining achievement on science and technology platform construction. According to **"integration, sharing advancing and improving" principle, learning from the overseas advanced experiences,**

根据"整合、共享、完善、提高"的原则

we would make the standards or regulations of various technical resources and construct the sharing policies and regulations of science and technology resources. We will adopt flexible sharing mode to **break the previous fragmentation, repeated dispersion and mutual isolation pattern.**

针对不同类型科技条件资源的特点，采用灵活多样的共享模式，打破当前条块分割、相互封闭、重复分散的格局。

From the National long- and medium-term Scientific and Technological Development Program（2006-2020）of China, we see the related thoughts:

Establishing the **sharing mechanisms** on the science and technology infrastructure platform.

Establishment of **efficient sharing systems** and mechanisms is the key and premise of obtaining achievement on science and technology platform construction.

principle

1), According to “integration, sharing advancing and improving” principle (“整合、共享、完善、提高”),

2), **learning from the overseas advanced experiences**,

3),we would make the **standards or regulations** of various technical resources and construct the sharing policies and regulations of science and technology **resources**.

We will adopt flexible sharing mode to break the previous fragmentation, repeated dispersion and mutual isolation pattern (条块分割、相互封闭、重复分散).

2, The Scattered Administration Should Be Changed

- At present, China's marine research-engaged institutions belong to different departments or administrations, of which some focus on basic scientific research, some on applied scientific research, and still some on the both.
- **It is urgent for the State Council to establish a specialized leadership to coordinate major domestic marine agencies (it could be a national marine science and technology coordinating committee) leading** and **regulating** national marine development strategy, **planning** major ocean-related project, **coordinating** and **managing** complex marine affairs involved in the diplomatic, economic, legal, scientific and other cross-sectoral issues.

61 partners from 29 countries

- **Mercator Ocean** FR
- **Met Office** UK
- **INGV** IT
- **NERSC** NO
- **DMI** DK
- **PUERTO** ES
- **MHI-NASU** UA
- **CLS** FR
- **IFREMER** FR
- **MF** FR
- **KNMI** NL
- **CNR** IT
- **Met.No** NO
- **CNRS** FR
- **HCMR** EL
- **SMHI** SE
- **EDISOFT** PT
- **INRH** MA
- **IOBAS** BG
- **OC-UCY** CY
- **BSH** DE
- **BC** DE
- **DNSC** DK
- **CSIC** ES
- **STARLAB** ES
- **MSI** EE
- **JRC** EU
- **ACRI** FR
- **FIMR** FIN
- **ENEA** IT
- **OGS** IT
- **USAM** IT
- **APAT** IT
- **IOLR** IL
- **IMR** NO
- **Techworks** IR
- **UMT-IOI-POU** MT
- **IST** PT
- **NIMRD** RO
- **CMCC** IT
- **NERC (POL, NOC)** UK
- **PML** UK
- **UREAD** UK
- **HRW** UK
- **CEFAS** UK
- **RBINS/MUMM** BE
- **IFM-GEOMAR** DE
- **NIVA** NO
- **IASA-UAT** EL
- **NIB-MBS** SI
- **NERI** DK
- **DTU-DIFRES** DK
- **SYKE** FIN
- **UL** LV
- **CMR** LT
- **MIG** PL
- **DFO** CA
- **UOP** UK
- **BAS** UK
- **NIERSC** RU
- **ECMWF**

MyOcean includes 29 countries, in China, this kind of program should operate easily in one country-China! 55 million EU = 550 million RMB

- **61 Partners – representing 29 countries**
  - Met' Offices
  - Marine / Hydrographic / Oceanographic centers
  - Research centers, …
- **6 Private companies**
  - CLS : Central Engineering and Altimetry
  - ACRI : Ocean Color TAC
  - StarLab : Users management (URD, SLA, …)
  - Brockmann Consult : Users management (URD, SLA, …)
  - HR Wallingford : Central Desk (reviewing activities)
  - Techworks : Central desk (web based technical work)
- **Budget**
  - 55 M€ (33,8 M€ EC-Grant)
  - 84% : personnel cost
  - 7% travel cost
  - ~ 200 FTE (> 500 persons directly involved in the project)

- China have some key projects, such as 973 project, 863 project, but these projects are mainly for researches of ocean science and technology, not “service core” .
- The ocean community of China should organize and coordinate a project or program that will be similar to MyOcean and EMODNET. MyOcean costs 55 million EU, which is about 500 million RMB. MyOcean includes 61 partners from 29 countries. In China, this kind of program should operate easily in one country-China!

3、China Should propose a large international marine observation Program and Contribute to World Ocean Community

2, MyOcean Goals

- set up a concerted and integrated pan-European capacity for ocean monitoring and forecasting, using nationally-available skills and resources.
- demonstrate the operationality of the system, based on a « service oriented » organization, according to the European quality standards, and to achieve operational qualification and eventually qualification of Service.
- bring a new pan-european value for the benefit of the marine service providers on duty at national or european levels.
- contribute to the long-term sustainability of this pan-European capacity. (contributes to a decade of innovation and societal benefits)