

# In-situ data co-ordination for the GMES Marine Service



Deep Ocean Cabled Observatories:  
Workshop on underwater synergies with Astroparticle Physics , Amsterdam 24-25 May 2012



# The EEA mission

The European Environment Agency is the EU body dedicated to providing sound, independent information on all aspects of the environment



# What is our mandate?

To provide European decision makers and citizens with access to timely and relevant information and knowledge in order to

- provide a sound basis for environmental policies
- ensure that environmental thinking and education is brought into the mainstream of decision-making
- to measurably improve the environment and quality of life

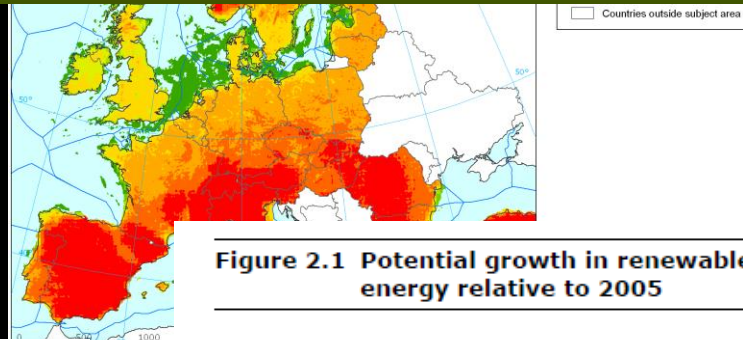


# Climate Change

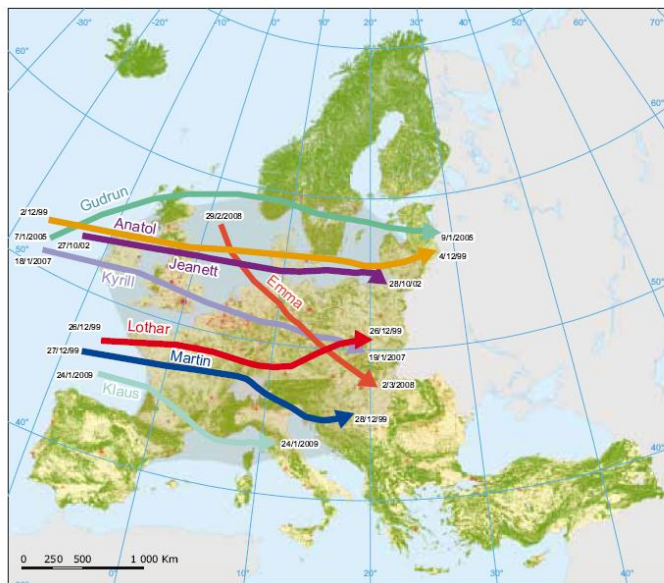
EEA Technical report | No 13/2010

## Mapping the impacts of natural hazards and technological accidents in Europe An overview of the last decade

ISSN 1725-2237

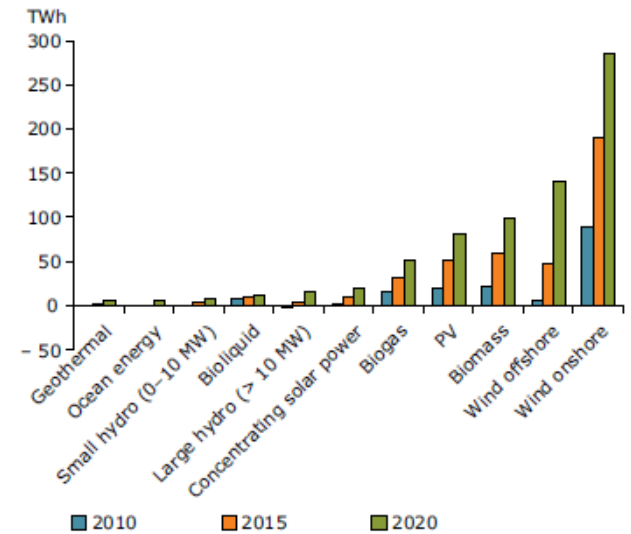


**Figure 2.1 Potential growth in renewable energy relative to 2005**



### Course of major storms in Europe in 1998–2009

- Agricultural areas
- Artificial surfaces
- Forest and semi natural areas
- Areas affected by winds stronger than 63 km (116 km/h)



Source: Beurskens et al., 2011.

# Nature & Biodiversity

EEA Report | No 2/2011

## Landscape fragmentation in Europe

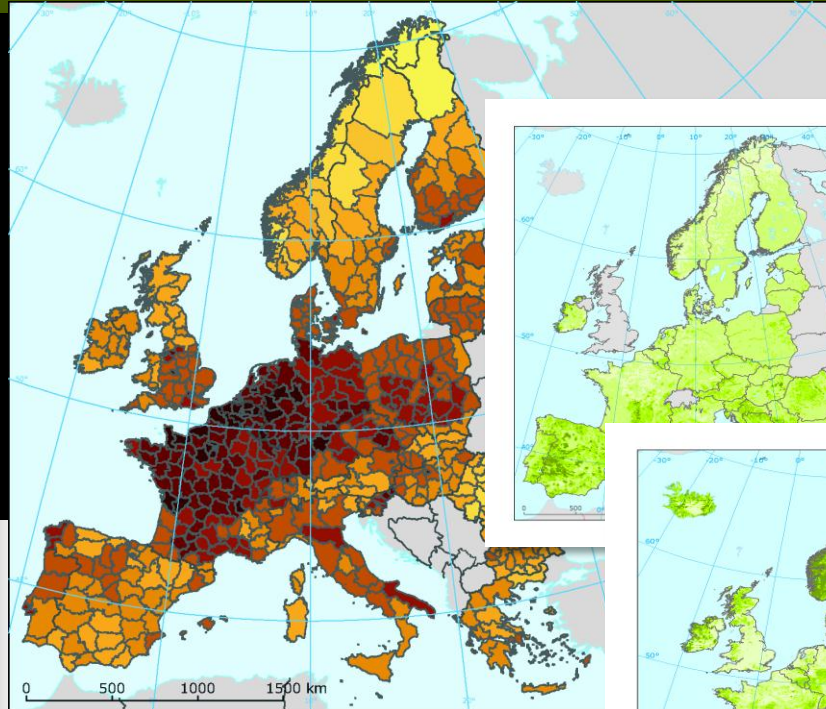
Joint EEA-FOEN report

ISSN 1725-9177



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra  
Swiss Confederation  
Federal Office for the Environment FOEN

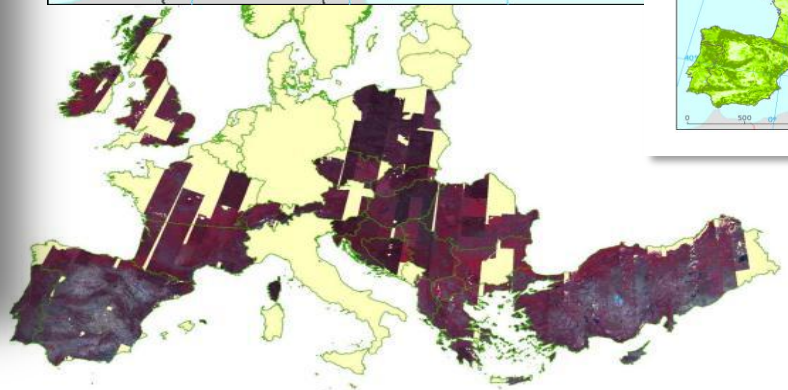
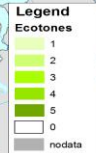
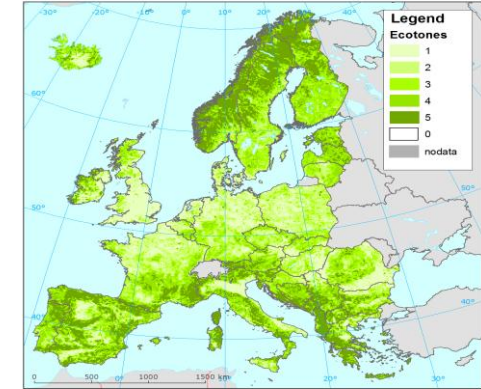
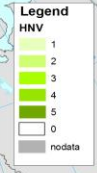
European Environment Agency



### Landscape fragmentation per NUTS-X region (2009)

Number of meshes per 10000 km<sup>2</sup> (S<sub>eff</sub>)

- 0.10
- 1-0.25
- 6-0.50
- 1-1.00
- 1-5.00
- 1-10.00
- 01-25.00
- 01-50.00
- 01-100.00
- 100




# Natural resources and waste

EEA Report | No 1/2012

## Towards efficient use of water resources in Europe

ISSN 1725-9177



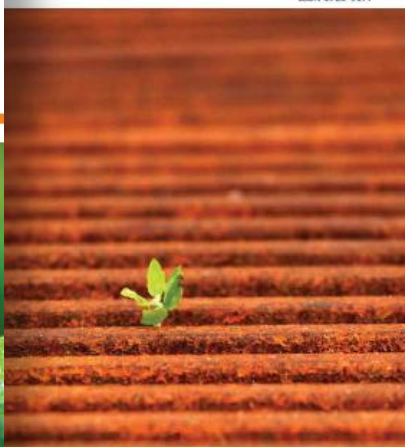
European Environment Agency

EEA Report | No 5/2011

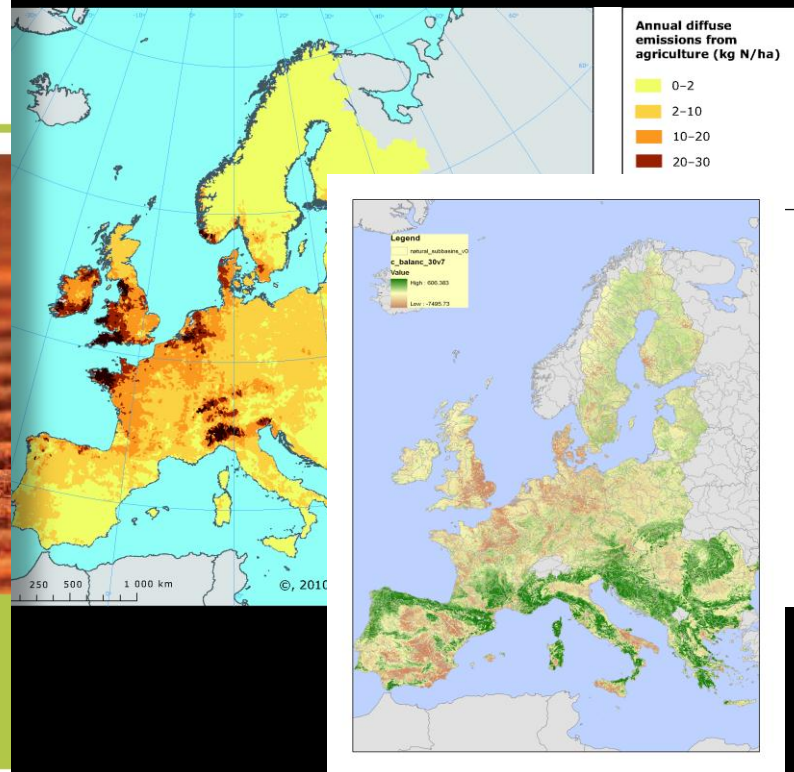
## Resource efficiency in Europe

Approaches in 31 EEA member and cooperating countries

ISSN 1725-9177



European Environment Agency



# Environment and health

## FORESTS, HEALTH AND CLIMATE CHANGE

URBAN GREEN SPACES, FORESTS FOR COOLER CITIES AND HEALTHIER PEOPLE



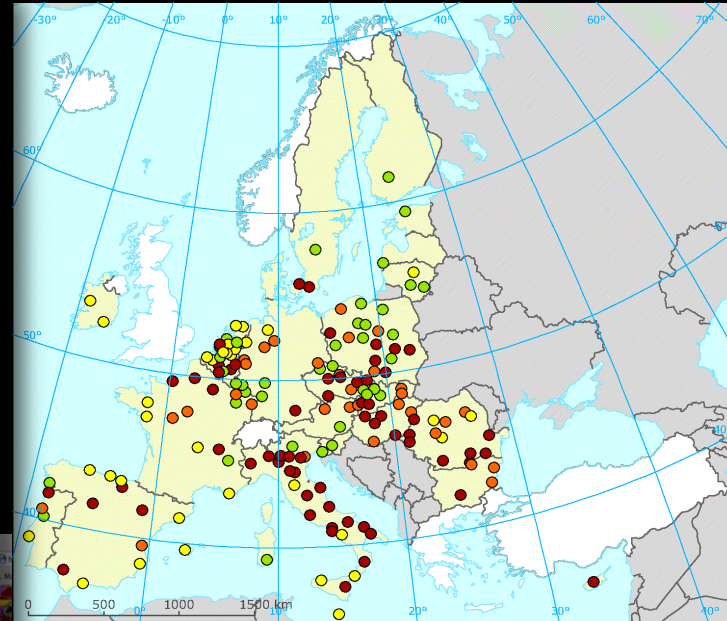
Forests are essential to our survival and well-being. Forests clean our air, our water, our soil and they regulate our climate, amongst many other things. Trees and forests are not always associated with urban landscapes. However, there too they provide invaluable, often invisible, services. Simply by acting as 'green oasis' in our concrete jungles, they offer recreation and health services for many European citizens.

How many of us love strolling through parks and green spaces in cities, tending our gardens and filling our homes with green plants? Access to green environments makes us happier and our bodies healthier. Scientific studies show that urban forests and green spaces help improve physical health and mental well-being. With more than three quarters of Europeans living in urban areas, trees, forests and green spaces mean more than ever before.



World Health Organization

European Environment Agency



### The level of green areas inside and around cities, 2006

#### Classification

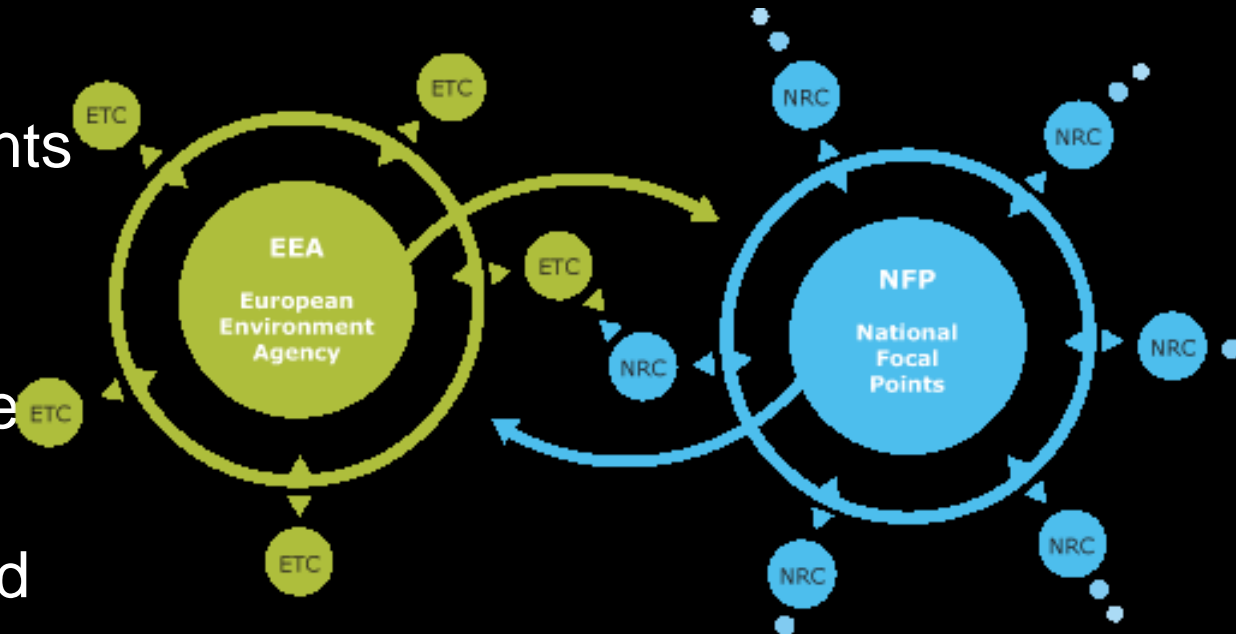
- Brown city in a brown background
- Green city in a brown background
- Brown city in a green background
- Green city in a green background
- No data
- Outside data coverage



# European environment information and observation network (Eionet)

About 350 national institutions

- National focal points
- European topic centres
- National reference centres
- And European and international organisations such as JRC, Eurostat, UNEP..





# GMES In-Situ Coordination

FP7 funded - Coordination action

Running from 2010 to 2012

Preparing for the GMES operational phase

Activities:

1. Analysing in-situ requirements for the GMES services (land, emergency, marine, atmosphere)
2. Concluding partnerships with in situ data providers;
3. Exploring approaches to long-term sustainable solutions;
4. Showcasing selected approaches (case studies).

*The objective is to develop an **initial framework for sustainable provision of in-situ data** needed by GMES services according to end user requirements*



# Main output of GISC

## The initial framework:

A set of tools and methods necessary to construct an efficient and sustainable interface between in-situ data providers and GMES service and space element

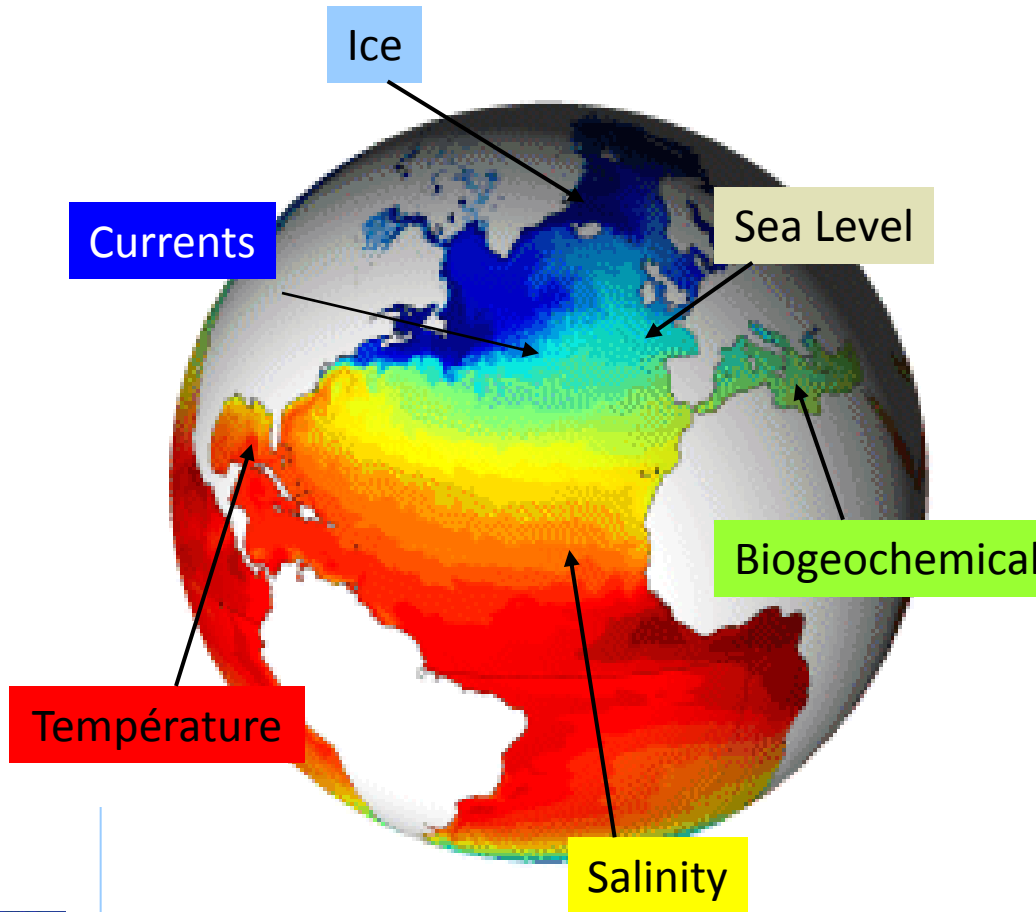


<http://mdia4010.blogspot.com>



# Ocean Monitoring and Forecasting

Marine Core Service



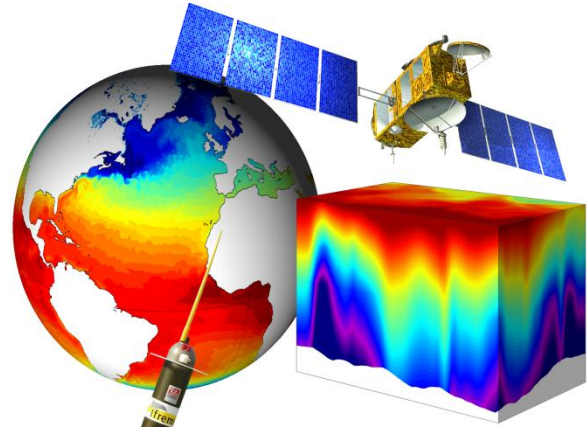
- Currents,
- Temperature,
- Salinity,
- Sea Level,
- Ice,
- Biogeochemistry

- Anywhere (global & 3D)
- At any time (past, present, future)
- Real time & long period

A **3D** and **dynamic**  
vision of the ocean

Courtesy of Pierre Bahurel, MyOcean

# (c) We process Satellite and In Situ Observations



## ■ From Space

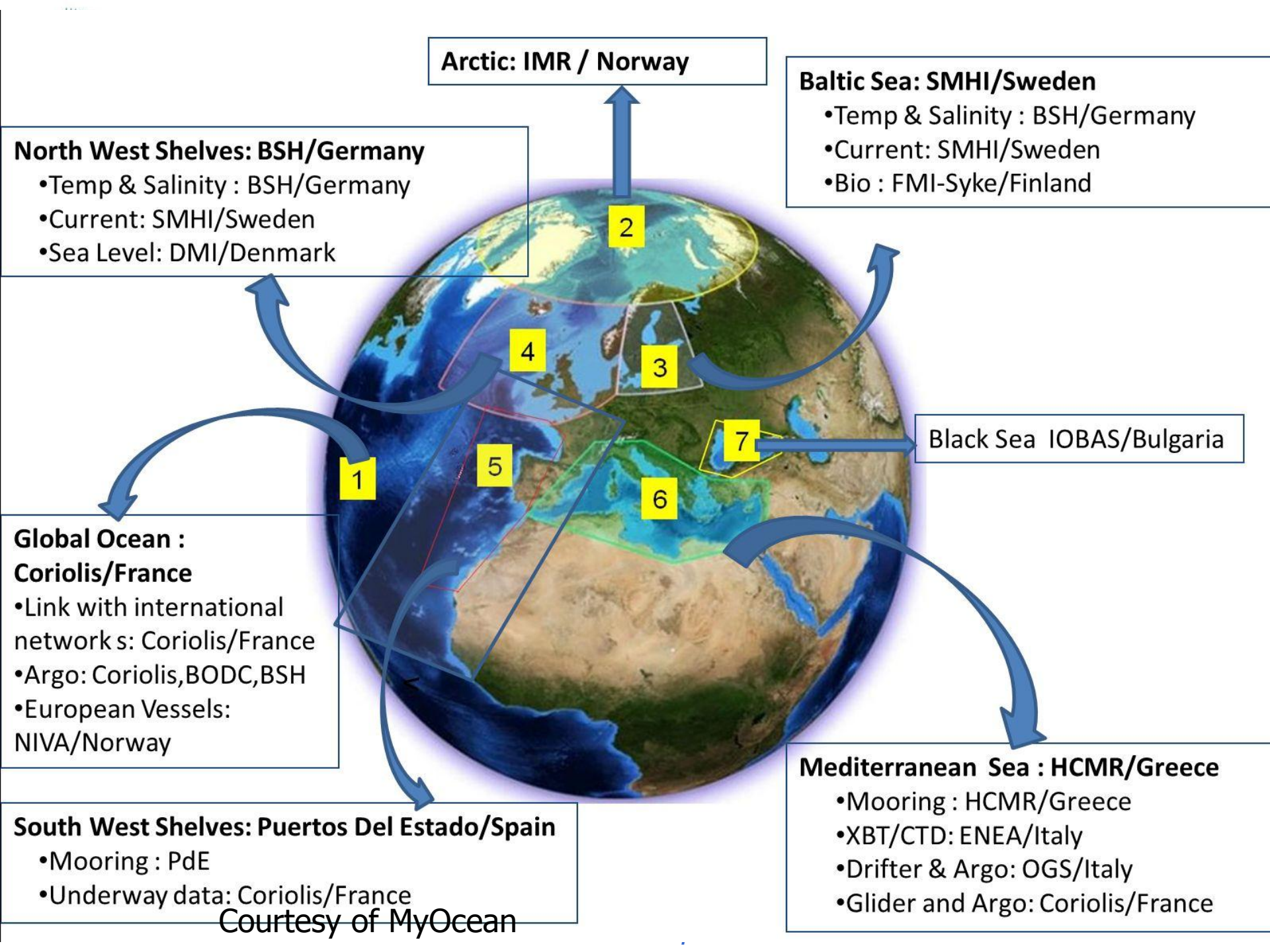
- Sea Surface Topography, Sea Surface Temperature, Ice, Ocean Color
- *Altimetry, Temperature, Color, SAR data, ...*



## ■ And In Situ

- Temperature, Salinity, Sea Level, Currents, ...
- *ARGO floats, vessels' data, drifting buoys, moorings, ...*





# GISC deliverables (*examples*)

- Report on in situ data requirements for the GMES marine service ('MyOcean') and cost assessment
- List of potential data providers (stakeholders list for the marine service)
- Agreements with European and Global coordinating bodies e.g. EuroGOOS, JCOMM
- Identification of priority observation and data management networks and systems e.g. deep ocean observatories, EuroARGO, FerryBoxes, drifting buoys and floats, moored buoys, gliders, national tidal gauge and coastal observatories, MyOcean Thematic Archiving Centre for in-situ data
- Developing an approach with stakeholders to secure sustainable access to in situ data for GMES marine service



# Main gaps

## Sustained funding

- lack of financial resources, and appropriate funding mechanisms, to maintain essential marine in situ infrastructures,

## Co-ordination

- regional seas - EuroGOOS / ROOSs
- international coordination bodies - JCOMM, GOOS

## Governance

- lacking for some observation networks - European Research Infrastructure Consortium model

## Data gaps - improvements of the observation systems

- Sampling (e.g. under ice), new parameters, new instrumentation



# Deep ocean observatories provide essential for GMES

**EuroSITES (- > I3 FixO3)** - Network of deep ocean observatories provide essential data for the GMES marine service

- important data sets for production and near real time validation of MyOcean products
- calibration data sets for EuroArgo
- Sustainability into the future?

**EMSO** - will create the organisational backbone for a deep sea observatory research infrastructure

- The establishment of an EMSO – ERIC will address governance issues
- For marine ESFRI projects, such as EuroArgo, EMSO, EMBRC, depending on national contributions , uncertainties remain on funding for construction and maintenance





- *‘A long term, stable and integrated network of strategic marine observatories installed and operated through multinational support, providing consistent in-situ data from the seas and oceans in support of the EU Integrated Maritime Policy and as a driver for smart, sustainable and inclusive growth in Europe’.*
- 2<sup>nd</sup> ESF Marine Board Meeting, September 2010



- *A key priority is a truly integrated and sustainably funded European Ocean Observing System to respond to societal needs..and supporting European contributions to global observing systems. This could be achieved through better co-ordination of national capabilities with appropriate new investments, in co-ordination with relevant initiatives (e.g. ESFRI, EMODNET, GMES) and engagement with end users*
- Ostend declaration, October 2010



# Shared European vision

There is political recognition of the vital necessity for sustainable observation infrastructures, and the value of the data generated.

The EU Integrated Maritime Policy vision statement

- *'A dynamic maritime economy, in harmony with the environment, supported by sound science and technology, which allows..to reap the rich harvest from the ocean in a sustainable manner'*.
- Research pillar
  - The co-ordinated development of marine research infrastructures at European level, in relation to societal needs should be pursued by the Commission in co-operation with Member States.*
- Marine Research priorities
- European Research Area
- Joint Programming Initiative (JPI) Oceans
- Marine Knowledge 2020, EMODNET
- Horizon 2020...



# Secure sustainable access to essential marine data for GMES

- Secure and co-ordinate observing system implementation at European level, nesting into global scales
- A co-funding mechanism (EU and member states) could be set up for the pan-European components of the in-situ observing systems and to address common issues as well as to evolve the technologies
- It would be beneficial to clarify and streamline the EU funding approach, especially regarding the transition between initial funding through EU research infrastructure mechanisms ensuring the long-term maintenance and continuity of observations
- Marine observation systems respond to a variety of societal needs and therefore funding needs to be multipurpose and coherent with EU perspectives and initiatives



# For more information...



The screenshot shows the GISC website in Microsoft Internet Explorer. The browser title is "GISC - GMES in-situ coordination - Microsoft Internet Explorer provided by EEA". The address bar shows "http://gisc.ew.eea.europa.eu/". The website header includes the GMES logo with the tagline "We care for a safer world", the GISC logo, and the text "GMES in-situ coordination". There are logos for the Seventh Framework Programme and EEA. A navigation menu includes "CATALOGUE OF DATA PROVIDERS", "CATALOGUE", "CALENDAR", "MEETINGS", "DELIVERABLES", "FORUMS", "ABOUT GISC", and "CONTACT". The main content area features a "GISC PROJECT" section with a description: "This web forum supports the European Environment Agency in its coordination role for in-situ component of GMES services." Below this is a "NEWS" section with "UPCOMING EVENTS" listed, including "GMES in-situ cost assessment workshop 7/9/2010", "FORESTSAT Conference 7/9/2010", "6th European Congress on Civil Protection and Disaster Management 8/9/2010", and "2nd Symposium on Earth Observation Business 9/9/2010". A calendar for September 2010 is displayed, and there is a "LATEST UPLOADS" section at the bottom.

<http://gisc.ew.eea.europa.eu>

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Ačiū!

Danke schön!

Obrigado!

Gracias!

Paldies!

Благодаря!

Thank you!

Так!



## Cost valuation – (2014 – 2020 total: 2.3 Billion)

In-situ Costs (carried by all GMES partners)	Set-up	Operational	Coordination and data access	Total annual
Land	571	32.000	48.000	78.000
Emergency	857	1.500	6.250	8.500
Atmosphere	36.000	133.000	4.000	173.000
Marine	40.000	102.000	5.000	148.000
<b>Total annual</b>	<b>78.000</b>	<b>268.000</b>	<b>63.000</b>	<b>410.000</b>

Robustness of the cost assessment depends on:

- accuracy of requirements
- methodology and assumptions
- availability of accurate cost figures



# Preliminary propositions for European mid-term funding

If a direct EU funding is set up through GMES, it should be used to co-fund transnational (pan-european) systems for the most important priorities. The following list provides a series of preliminary propositions:

- Short-term (from 2011)
  - Euro-Argo: 3.4 Meuros/year (40% of the total cost).
  - Euro-Sites: 1 to 3 Meuros/year depending on national commitments.
  - Support for new or improvement (new parameters incl. CPR) of Ferrybox transnational lines (co-funding): 1 to 2 Meuros/year depending on national commitments.
  - MCS in-situ TACs (co-funding of 50%): 2 Meuros/years
- Mid-term (from 2013)
  - Euro-Argo, Euro-Sites, FerryBox and in-situ TAC (see above)
  - Contribution to E-Surfmar (drifters)
  - 10 to 20 glider transnational lines (co-funding)





# GISC – GMES - GEOSS

## EEA/GISC: TARGETING AN IMPORTANT ELEMENT OF GMES

SERVICES – SPACE - IN SITU

## GMES: A MAJOR EUROPEAN ELEMENT OF GEOSS

## GEO WORK PLAN – INFRASTRUCTURE:

- Development/coordination of surface-based observing networks (IN-01-C1)



*A project under this topic should integrate and improve access to the key infrastructures in Europe which make sustained time series observations in the open seas and ocean at fixed critical locations. These infrastructures should support fully multidisciplinary research on the entire oceanic environment, from sea floor to the air-sea interface, including carbon fluxes. The project should build on the investments and expertise developed by **EuroSITES**, **ESONET** and **CARBOOCEAN** projects and could consider expanding geographic coverage. It should also link to planned **ESFRI infrastructures**, such as **EMSO** and **ICOS**, as well as to other relevant initiatives. Data management should be addressed by ensuring compliance with **SeaDataNet** standards and contribution to the **GMES** initiative. Links with international initiatives including compliance with **GEOSS** principles and requirements (data sharing, compatibility) should also be reinforced. Particular attention should be paid to the involvement of European SMEs for the application of innovative technologies for in situ measurements and scientific services (this will be assessed under "Impact" criterion).*

