

*Planeta Acqua - Venice - 12 March 2010*

# EU Strategy for Marine and Maritime Research

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# Structure of the presentation

1. The drivers of the strategy / policy context
2. Strategy content / key actions
3. Some considerations on maritime spatial planning

# A thriving EU maritime economy

"Traditional sectors"

<b>Maritime transport</b>	90% EU external trade 350 million passengers/year
<b>Shipbuilding</b>	0,8 million jobs; €90 billion/y turnover
<b>Tourism &amp; coastal zones</b>	3 million jobs €72 billions turnover in 2005
<b>Fisheries</b>	0,55 million jobs, €25 billion/y <b>(EU27+NO)</b>
<b>Aquaculture</b>	150,000 jobs, €7 billion/y <b>(EU27+NO)</b>
<b>Blue biotechnology</b>	Emerging sector with predicted growth of 10%/year and global market of € 2,4 billion
<b>Renewable Energy</b>	Offshore wind farms, tidal & wave power, € 121 millions in 2005 but huge growth

"New" sectors

# Pressure on marine environment / Climate change

<b>Sources of pressure</b>	<b>Political drivers</b>
<b>Marine environment</b> <ul style="list-style-type: none"><li>•Over and destructive fishing</li><li>•Agriculture (nutrients, pesticides)</li><li>•Industrial pollution, contaminants</li><li>•Maritime transport, oil spills, litter..</li><li>•Ocean acidification</li></ul>	<b>1. MSFD</b> <ul style="list-style-type: none"><li>•11 pressures (a big part related to biodiversity)</li></ul> <b>2. CBD, 2010 year of BD</b> <b>3. Common Fisheries Policy (CFP)</b>
<b>Climate Change</b> <ul style="list-style-type: none"><li>•Ocean acidification</li><li>•Sea level rise, coastal erosion</li><li>•Extreme events</li></ul>	<b>1. Prediction/mitigation of climate change impact - IPCC</b> <b>2. CO2 emissions, renewable energy objectives (20/20/2020)</b>

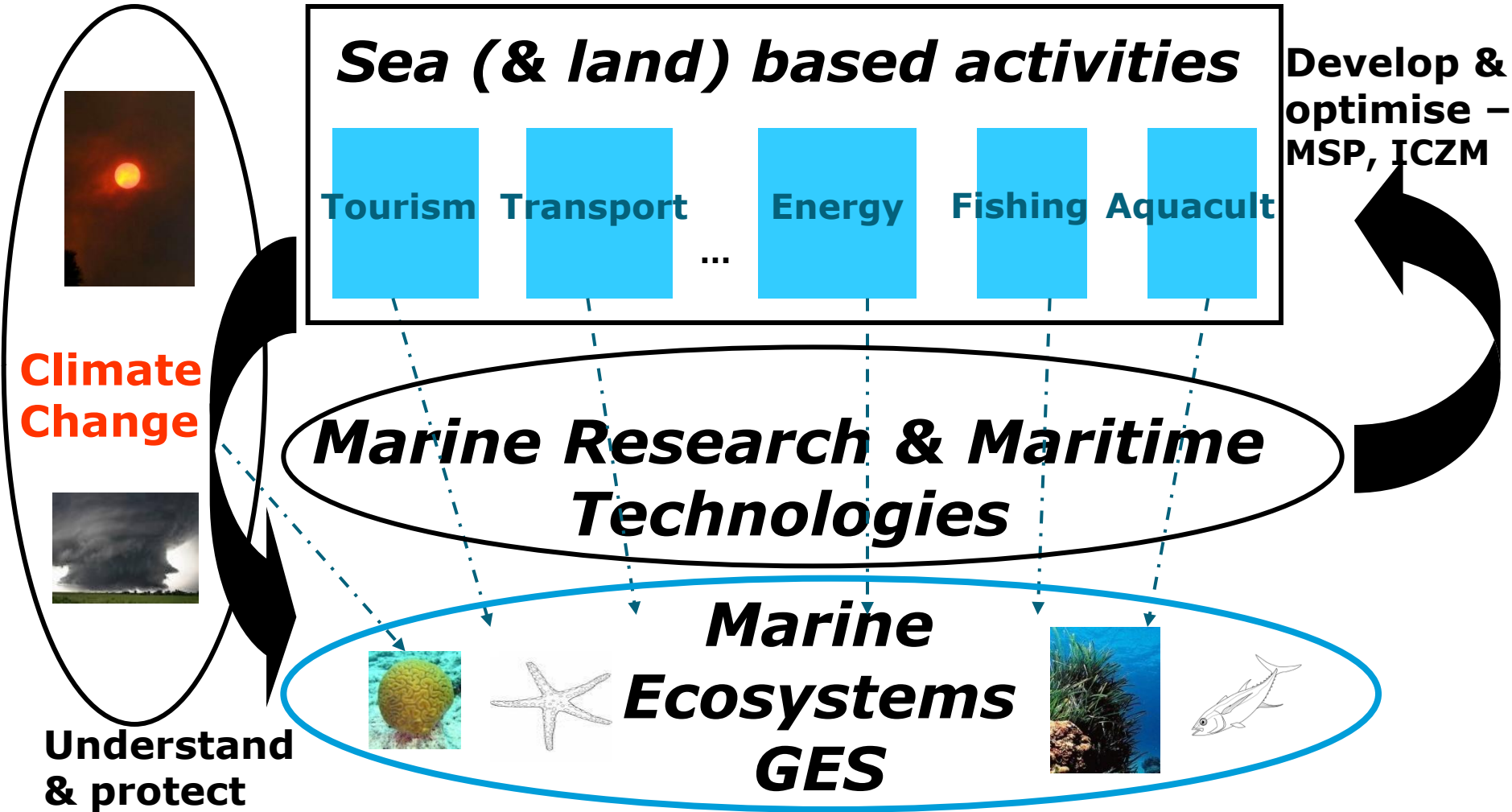
# Increasing competition for marine space

<b>Maritime activities</b>	<b>Key issues</b>
<p data-bbox="123 401 749 454"><b>"Traditional" activities</b></p> <ul data-bbox="123 482 954 911" style="list-style-type: none"><li data-bbox="123 482 316 535">•Fishing</li><li data-bbox="123 558 432 611">•Aquaculture</li><li data-bbox="123 634 954 686">•Dredging / constructions materials</li><li data-bbox="123 709 703 762">•Marine Protected Areas</li><li data-bbox="123 785 741 838">•Maritime transport / ports</li><li data-bbox="123 861 413 913">•Oil &amp; Gas...</li></ul> <p data-bbox="123 936 664 989"><b>Emerging activities</b></p> <ul data-bbox="123 1018 749 1289" style="list-style-type: none"><li data-bbox="123 1018 749 1139">•Marine renewable energy (offshore wind... )</li><li data-bbox="123 1162 645 1215">•Offshore aquaculture</li><li data-bbox="123 1238 741 1289">•CO<sub>2</sub> capture in seabed...</li></ul>	<p data-bbox="993 401 1785 596"><b>1. Sustainability ↔ combined impact on marine ecosystems</b></p> <p data-bbox="993 709 1765 832"><b>2. Optimising marine space allocation:</b></p> <ul data-bbox="993 861 1823 1153" style="list-style-type: none"><li data-bbox="993 861 1707 913">•managing conflicts of uses</li><li data-bbox="993 936 1823 1058">•finding space for new activities / needs</li><li data-bbox="993 1080 1649 1153">•predicting future needs?</li></ul>

# The drivers for the Marine / Maritime research strategy

1. The maritime economy is of crucial importance and we need to further develop it
2. There is an increasing environmental pressure from human activities and climate change, together with increasing competition for marine space
3. There is a need to better predict (and mitigate) impact of climate change through marine science

# The ideal vision of the Maritime Policy



# We need research for:

## Science ↔ Policy

- Understand impact of human activities on marine environment ↔ GES ↔ MSFD
- Understand impact of climate change on marine environment
- Understand climate / ocean interactions to better predict climate change and its impacts
- Tools to support ICZM / MSP

## Science ↔ Innovation

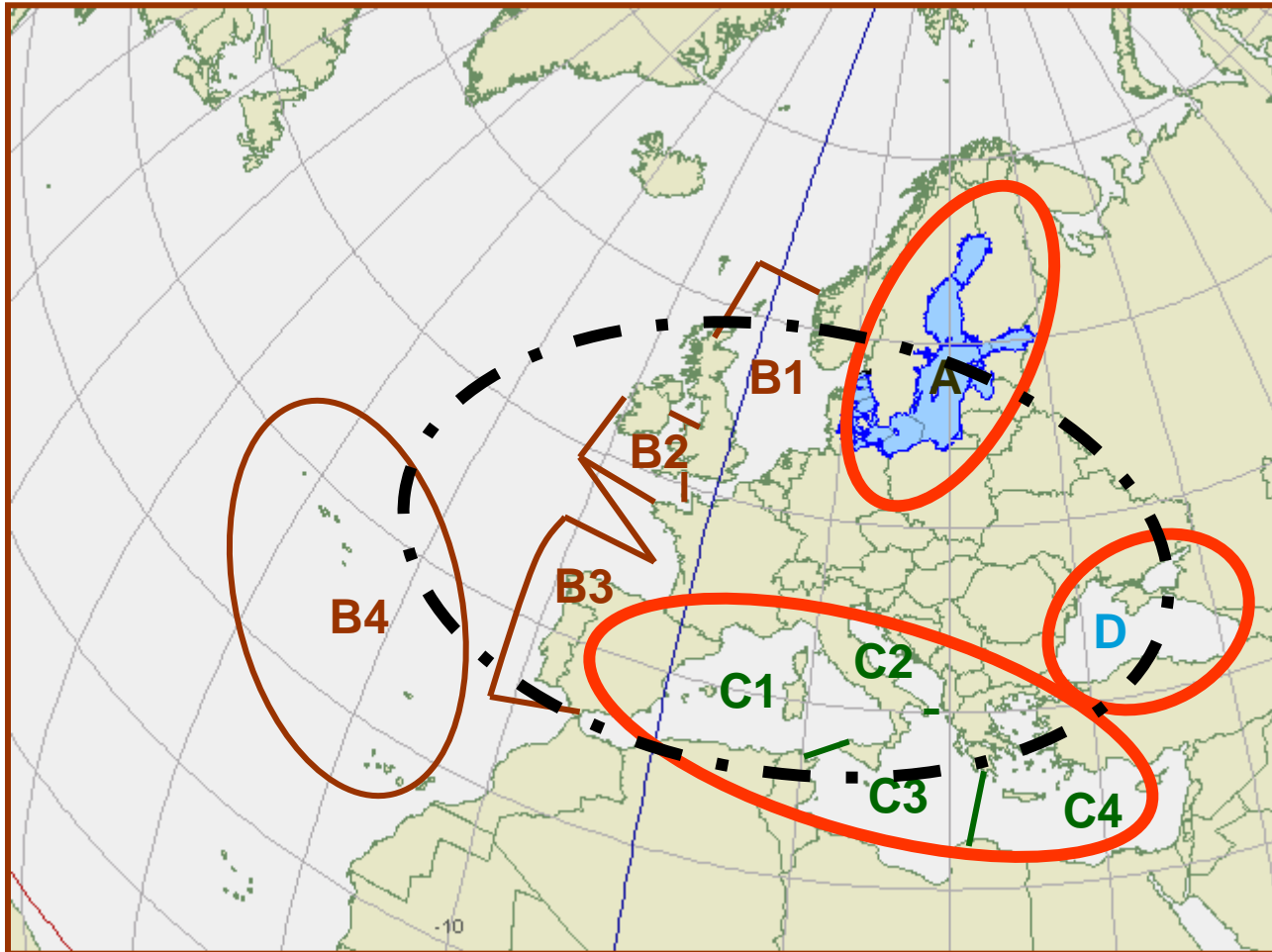
- Mitigate impact of "traditional" activities on marine envt ↔ green technologies, MSP... etc.
- Develop potential of new sea-based activities ↔ marine bio-economy, renewable energy...
- Optimise mitigation measures for climate change impacts (sea level rise, coastal erosion, extreme events...)



# How far are we from this ideal world?

1. We need more marine research infrastructure to observe & understand impact of human activities & climate change on the marine environment
  2. Issues are inter-disciplinary and our research programmes are thematic → need for integration of knowledge
  3. Seas are shared & major research infrastructure and programmes require funding beyond the capacity of single member states → need for improved synergy
  4. Improved interactions with and within an inter-disciplinary, multi-sector scientific & industrial communities → need for new governance mechanisms
- The 4 areas mentioned provide broadly the structure of the marine / maritime research strategy
  - Plus an over-arching international dimension

# EU and Regional approach



## Regional scale:

- \*Envt coherence
- \*Economic and social integration
- \*Regional conventions

## European scale:

- \*MSFD / EEA
- \*Big technological challenges (e.g. deep sea)
- \*Big infrastructure prog (ARGO, EMSO)
- \*Harmonised methods → services (GMES)

# MMRS / Knowledge integration

## Knowledge integration

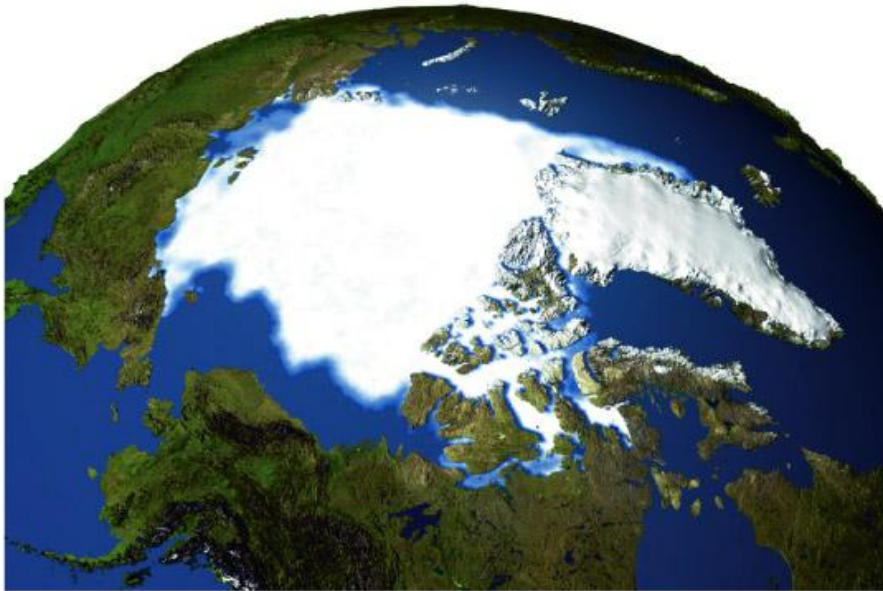
- ✓ Joint calls on cross-thematic marine / maritime topics
- ✓ Support action to strengthen cooperation between maritime industries and marine science
- ✓ Promote convergence between maritime technologies from different sectors

## Actions

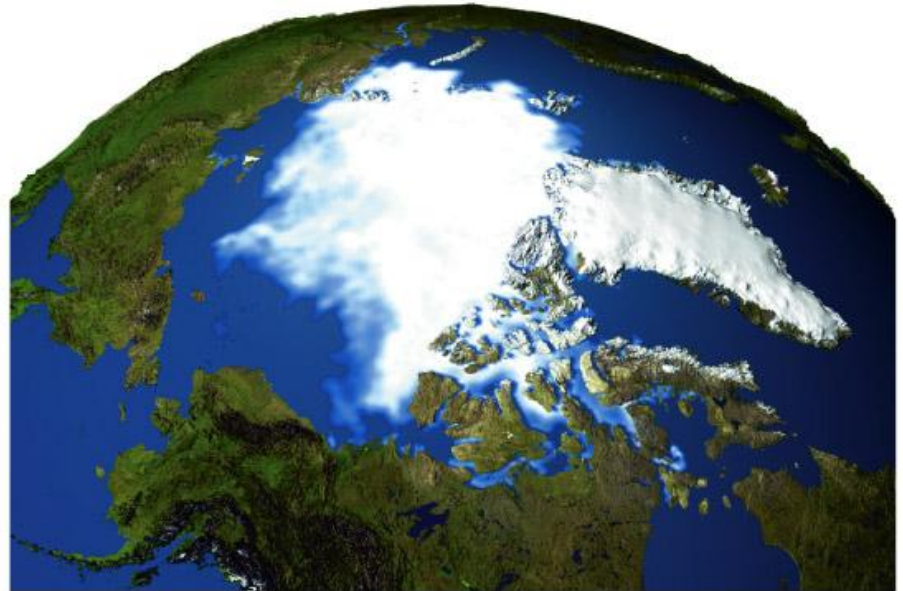
- Joint Call « Ocean of tomorrow » in 2009 (Arctic scenarii / Vectors of change in marine ecosystems / CO<sub>2</sub> capture in seabed)
- Joint Call « Ocean of tomorrow » in 2010

# INTEGRATION - THE ARCTIC OCEAN

Observed sea ice September 1979



Observed sea ice September 2003

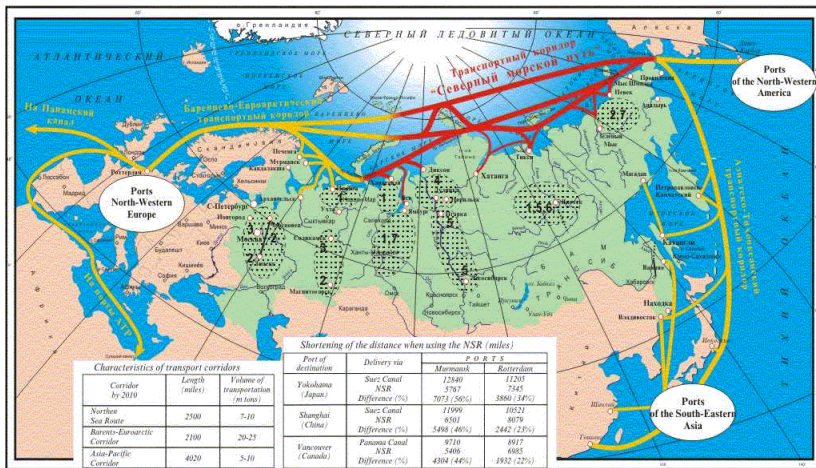


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# Integration – Climate change and the Arctic



RUSSIAN TRANSPORT CORRIDOR “NORTHERN SEA ROUTE”  
within the system of international transport corridors West-East-West



**Symbols:** Export: 1- hydrocarbons, 2- metals, 3- mineral fertilizers, 4- products of the Norilsk Mining and Metallurgical Integrated Works, 5- timber, 6- coal. Import: 7- products (goods).

— Sea transport corridor  
— Railways.  
..... Railways to be constructed.

..... River shipping lines.  
Area of the formation of cargo.  
Sources for the Northern Sea Route.



From [www.arcop.fi](http://www.arcop.fi)

- An environmental risk for a largely unexploited zone
- Economic opportunities:
  - shorter maritime route between Europe and East-Asia
  - Fishing opportunities
  - Oil reserves
- Can we define conditions for a sustainable exploitation of these opportunities, protecting the environment?
- We need inter-disciplinary cooperation between marine scientists, maritime - oil & gas industries... etc., to:
  - Define conditions and limits for environmental sustainability
  - Develop technologies that can ensure sustainable development of these new activities



# MMRS / Synergies

## Synergies / ERA-NETs

- ✓ BONUS 169 in Baltic
  - ✓ SEAS-ERA
- } Need to articulate the 2 levels

## Synergies / Joint Programming Initiative on "Healthy and Productive Seas"

- ✓ Pillar 1: The marine system
- ✓ Pillar 2: The marine resources
- ✓ Pillar 3: Support to policy

SeaWiFS Project, NASA/Goddard Space Flight Center and ORBIMAGE



## HELCOM Baltic Sea Action Plan



**Helsinki Commission**  
Baltic Marine Environment Protection Commission



# The Baltic Sea Drainage Basin

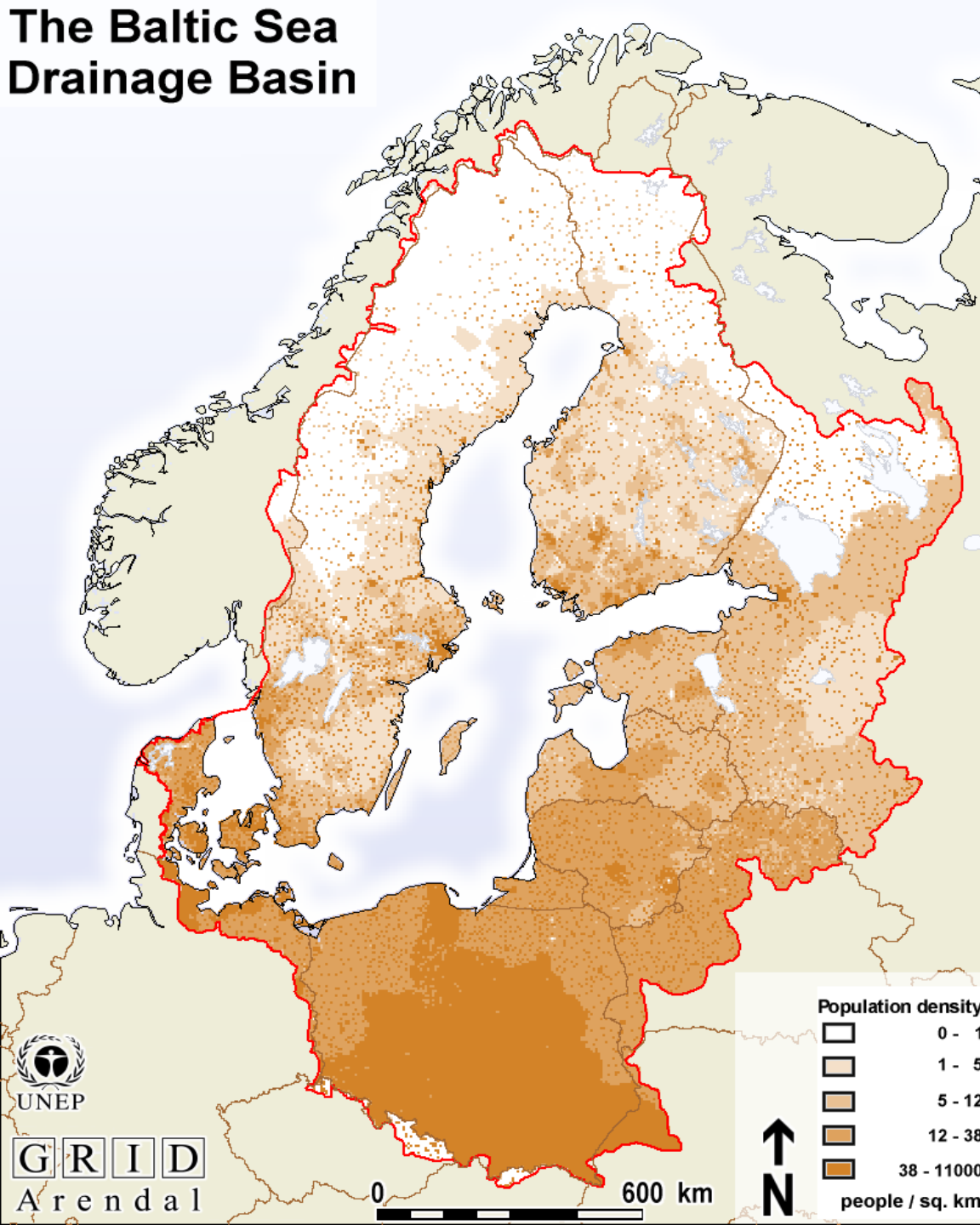


## Baltic Sea System:

0.4 million sq. km of  
sea surface  
+ 1.7 million sq. km  
of drainage

14 countries

95 million inhabitants



Population density	
□	0 - 1
□	1 - 5
□	5 - 12
□	12 - 38
□	38 - 11000

people / sq. km



0 600 km



GRID  
Arendal



# Synergies - the Baltic example

- A model regional cooperation supported by the Commission
  - BONUS → ERANET → ERANET (+) → Art 169
- Modelisation of main environmental risk → eutrophication because of excess nutrients in the sea
- Scientific determination of maximum acceptable limit of nutrients in the whole sea basin →
- Political action plan by all coastal states to reduce nutrients accordingly

We want a similar initiative in the Mediterranean!

# MMRS / Infrastructure

## I. Marine Environment / Climate Change

- ✓ Observation of the sea column
- ✓ Observation of the sea beds
- ✓ IT systems
- ✓ Satellites (left out of this exercise) ...

(6 ESFRI projects: AURORA, BOREALIS, EURO-ARGO, EMSO, SIAOS, ICOS, LIFEWATCH )

## II. Support to Innovation / the new maritime economy

### Marine bio-economy

- ✓ Marine biotechnologies
- ✓ Aquaculture

### Marine renewable energy

- ✓ Wind, wave, tidal, thermal

(2 ESFRI projects: EMBRC, ECCSEL)

Data infrastructures - Sensors – IT Systems

# MMRS - Key initiatives

## Marine Research Infrastructures

- ✓ EMODNET
- ✓ Funding opportunities in structural funds for MRI
- ✓ Expert group on marine research infrastructure
- ✓ A mobile marine observation system for the Mediterranean

## Challenges:

How can we move from a project based approach to ocean observation to a permanent observation?

How can we ensure that a disparate set of European marine observation initiatives converge to respond better to policy needs (MSFD, Climate change...)?

# MMRS / Governance

## Governance

- ✓ Forum of scientific and industrial stakeholders: promote consensus on priorities, integrate knowledge, disseminate results...
- ✓ Science / industry / policy dialogue started at the European Maritime Day in Rome – in May 2010 in Gijon - Spain
- ✓ Structured scientific support to the implementation of the MFSD to:
  - review regularly existing research results relevant to GES
  - synthesise them in reports usable by policy makers
  - get consensus of MS representatives and pass the knowledge to policy makers
- ✓ Knowledge and tools to support Marine Spatial Planning

# International dimension

## **Scope:**

- International scientific cooperation with neighbours in shared seas
- International scientific cooperation and global ocean perspective in large international programmes and infrastructure projects

## **In 2009-2010 focus on:**

- ✓ The Mediterranean and Black Sea (long term framework for regional cooperation)
- ✓ The Arctic

## **In the longer term:**

- ✓ Commission to take more global perspective (IOC / GOOS)
- ✓ Take a leading role in the global assessment of Oceans

# Marine Spatial Planning: research

- FP7 MESMA project
  - 8.5 M€ project / 6.5 M€ support from EU
  - Provide inventory of state of the art MSP approaches
  - Collect and integrate information related to seabed habitats / marine ecosystems → GIS
  - Develop a framework for evaluating spatially managed areas
  - Develop innovative methods / tools / strategies for MSP...

Participation by CNR - Italy

# OCEAN.2011-1. MULTI-USE OFFSHORE PLATFORMS



## Objective:

to develop several innovative designs for multi-use offshore platforms and to assess the technical, economical and environmental feasibility of constructing, installing, servicing and maintaining these platforms together with the transport aspects.

## Funding scheme:

EC contribution: 14 M€

Collaborative Project - large scale integrating projects  
several proposals funded



## Directorates concerned:

H (Transport)

K (Energy)

E (Food, Fisheries and Biotechnology)

I (Environment)

Lead: Dir H (Transport)



# TOWARDS A SUSTAINABLE MANAGEMENT OF THE MEDITERRANEAN AND THE BLACK SEA





# OCEAN.2011-3

## Assessing and predicting the combined effects of natural and human-made pressures in the Med and Black Sea in view of their better governance

### **Objective:**

to promote a sustainable well-coordinated research effort in order to characterise patterns of pressure, in environmental and socio-economic terms in Mediterranean and Black Sea, with a view to assess, predict and manage these pressures and to contribute to the development of basin wide environmental Policies (reaching Good Environmental Status of EU marine waters by 2020).

- **Funding scheme:**

EC contribution: 13 M€

Collaborative Project - large scale integrating project - SICA

2 proposals funded (one for each basin)

- **Directorates concerned:**

I (Environment)

E (Food, Fisheries and Biotechnology)

H (Transport)

- **Lead:** Dir I (Environment)

## OCEAN.2011-4

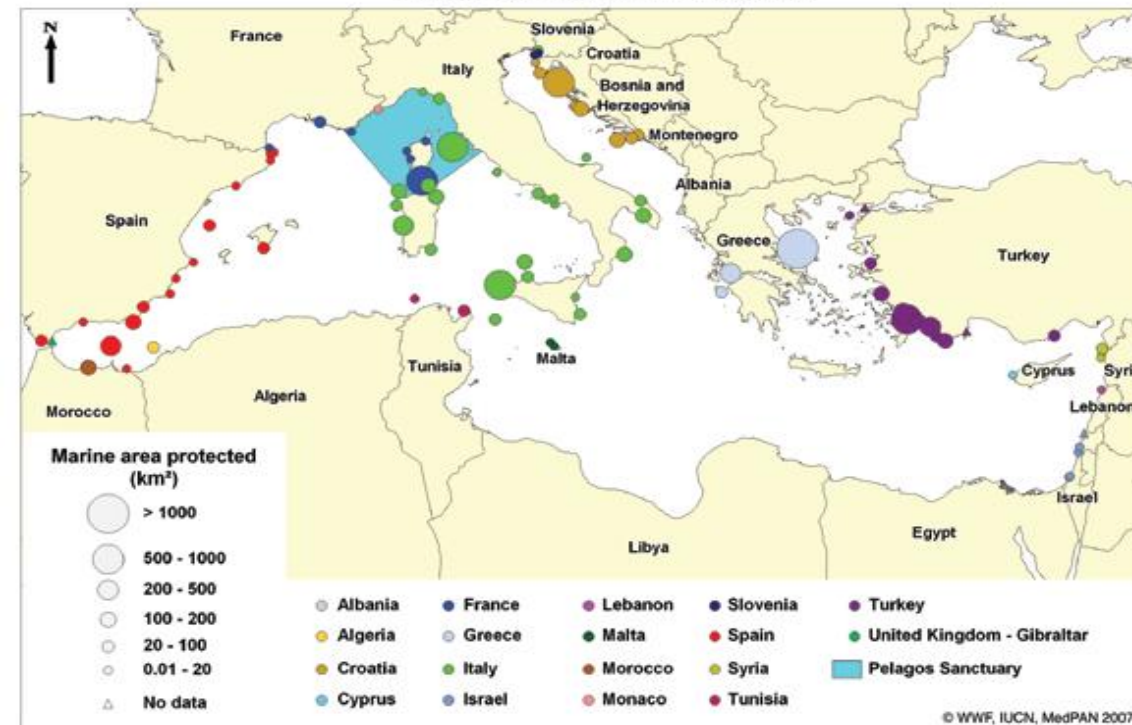
# Knowledge-base and tools for an integrated management of the Mediterranean and the Black Sea marine and maritime activities

- **Objective:** to develop knowledge base and tools for
  - (i) establishing regional or sub-regional wide networks of marine protected areas aiming at conservation of marine biodiversity and management of marine living resources in order to fulfil EU legislations and international agreements
  - (ii) assessing off-shore wind energy potential in the Mediterranean and the Black Sea.
- **Funding scheme:**
  - EC contribution: 9 M€
  - Collaborative Project – large scale integrating project
  - 1 proposal funded with at least one pilot project for each basin
- **Directorates concerned:**
  - E (Food, Fisheries and Biotechnology),
  - I (Environment),
  - K (Energy),
  - H (Transport)
- **Lead:** Dir E (E4 – Fisheries and Aquaculture sector)



# Marine Protected Areas (MPAs) in Med and Black Sea

Mediterranean Marine Protected Areas



# Marine Spatial Planning: issues and challenges

Policy / Economy and legislation is ahead of science:

- We do not have a good mapping of seabed (habitats)
- We can legally do CO<sub>2</sub> capture in sea beds but we do not know what are the suitable areas and conditions
- We must develop offshore wind to reach renewable energy objectives and licences are granted without scientific optimisation
- Science must catch up quickly

How do we apply the precautionary principle?

# Conclusion

We can conceptualise the objectives of the marine and maritime research strategy as:

- Understanding the Marine System
- Maximising the value we extract from our seas in a way that is compatible with the Good Environmental Status
- Providing policy makers with knowledge and tools for an integrated and sustainable management of sea basins

We need in particular research on maritime spatial planning to:

- Understand combined impact of maritime activities on ecosystems
- Optimise space allocation: manage competing uses / find appropriate space for new activities
- It is urgent because economy and policy are ahead of science

The EU can help gather the general knowledge and tools to better implement MSFD / MSP but only national and local authorities can ensure their actual implementation