

# The role of Marine Science in implementing Marine Strategy Framework Directive (MSFD)

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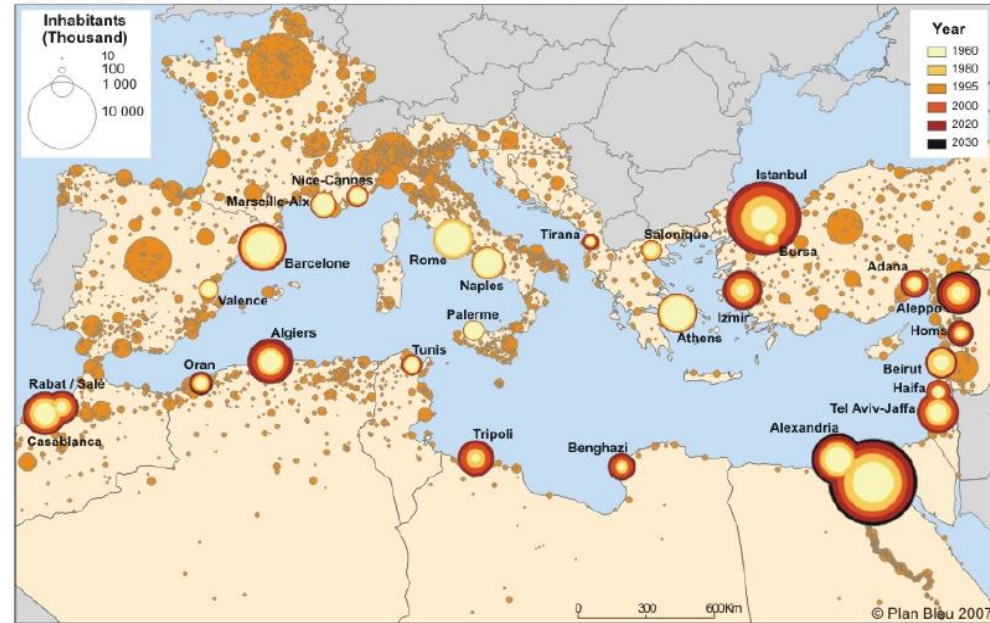
# Overview

- **Pressures, Ecosystem Approach (ECAP) and EU Legislation**
- **Principles of the MSFD in a “nutshell”**
- **PERSEUS Project**
- **Science-Policy and Economy actions**

# Pressures

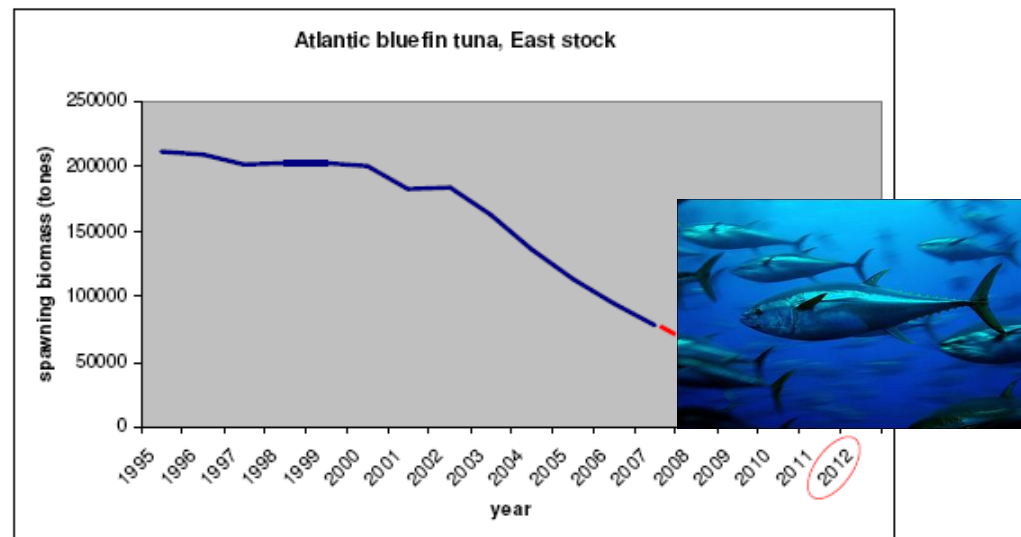
- Natural pressures: Mainly from climatic variability that impacts the physical dynamics and hydrological structure
- Anthropogenic pressures: From the fast population growth in coastal areas & increasing economic activities to marine pollution, overfishing.....etc.
- Management of pressures: Need to be dealt through shared policy and decision making based on scientific knowledge

Figure 19 Population changes in some cities in the Mediterranean countries – Projections to 2030



Source : Blue Plan from Geopolis 1998 and United Nations Population Division, World Urbanization Prospects: The 2005 Revision

Breeding population cut by half in less than 5 years (2002-2007)  
Spawners might become virtually extinct by 2012



# Pressures, Hazards and Threats



The image shows a satellite view of the Mediterranean Sea region, with various environmental stressors labeled in white text. The labels are distributed across the sea and surrounding landmasses. The sea is highlighted in a darker blue color, indicating the focus of the study. The surrounding land is shown in shades of green, brown, and tan, representing different biomes and land uses.

tourism  
Industrial pollution  
Maritime transport  
Biodiversity & habitat loss  
coastal erosion

urban pollution  
global warming  
renewable energy

agricultural pollution  
harmful algal blooms  
aquaculture  
alien species  
exploration of resources  
Population growth

over-fishing

**Stresses in the SES are shown sooner than the world ocean**

© 2010 Cnes/Spot Image  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image IBCAO  
Image © 2010 TerraMetrics

Google

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# Ecosystem management= “house keeping” to maintain **useful outcomes**

## Which outcomes/values?

- The capacity to provide “goods and services” for this and the next generations (economic values)
- Aesthetic & cultural values
- Biodiversity (autonomous value)



# The scientific background: The Ecosystem Approach (ECAP)



- The concept of ECAP goes back to the beginning of the 90's or earlier.
- Viewed like a novel tool for the scientific study – analysis of various ecosystems
- Included a large number of theoretical issues and elements of modern biology, physics and chemistry:
  - *Ecosystem theory,*
  - *Theory of chaos,*
  - *Non-linear systems theory, etc.*
- Management issues were also discussed and included in the ECAP
- Today ECAP is considered mainly as a *management tool* and has incorporated and developed a large number of concepts regarding the management of human activities affecting the ecosystem

# EU Legislation and the concept of the ecological quality

- New approach in EU legislation started in 1994, with a Proposal for a Directive of the EU Commission (OJ 94/c222/06), in which the term “**ecological quality**” of surface waters is defined for the first time as a value which is autonomous and independent of any use, economic exploitation and aesthetic approach
- Scientists tried to gain trust from the policy makers and worked together to achieve the target
- This concept of the ecological quality was commonly developed by scientists and policy makers and integrated in the Water Framework Directive (WFD), adopted on 2000

# Creation of MSFD

- Protection and conservation **was not enough only through the WFD**
- **Design and implement coherent management plans** and monitor their application was most appropriate to be drawn in each region,
- A Strategy was needed for marine environment **(including adaptive policies)**. The “**Marine Strategy Framework Directive**” (**MSFD**) was adopted in 2008
  - The **MSFD** claims for a “Good Environmental Status” (GES) of marine water bodies by 2020
  - “GES” will be shown by the synthesis of 11 qualitative descriptors which describe what the environment will look like when GES has been achieved (Annex I of MSFD). An Initial Assessment (IA) of MS finished...



# MSFD Principles

- MS had to initially (2012) to assess the ecological status of their waters and the impact of human activities. **This IA had to cover:**
  1. An analysis of the essential characteristics of marine waters (physical and chemical, types of habitat, populations, etc.)
  2. An analysis of the main impacts and pressures, particularly as a result of human activities which affect the characteristics of these waters (contamination by toxic products, eutrophication, overfishing, smothering or sealing of habitats by construction work, non-indigenous species, physical damage caused by ship anchors, etc.)
  3. An economic and social analysis of the use of these waters and the cost of the degradation of the marine environment.
- **GES: “The environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive”**
- The main goal of MSFD is to achieve GES of EU marine waters by 2020



# Monitoring Programmes

- Member States must establish coordinated monitoring programmes in order to **evaluate on a regular basis the status** of the waters for which they are responsible and progress with regard to the objectives they have set.
- Key elements of **the strategies are reviewed every 6 years** and interim reports are **drawn up every 3 years**



# Implementation Steps



# Challenges ahead:

## The need for scientific knowledge/support to implement MSFD



- A major challenge in implementation: **attain the necessary scientific knowledge of the elements** that define the state of the marine environment
- A substantial need: **develop additional scientific understanding to underpin the Decision and secure a successful revision**
- Criteria and indicators: **need to be further development; additional scientific information is needed**
- **Scientific** knowledge: **Needs to be increased on the marine environment; help to achieve the Directive's goal**
- The role of the projects (e.g. PERSEUS, ODDEM, VECTORS, MISIS, DEVOTES, STAGES, IRIS-SES etc.): can **provide the scientific support needed at regional level and should be used!**

**Grant agreement no: 287600**



## **Key Figures**

<http://www.perseus-net.eu/>

- **Project Duration: 48 months**
- **Start: 1st of January 2012**
- **10 Work Packages**
- **Budget 12,973,124.40 €**
- **2297 man/months**





# PERSEUS Partnership

- 21 countries
- 53 partners
  - 65 Institutes & Universities
- 2 Subcontractors
- More than 300 scientists



# Project Summary

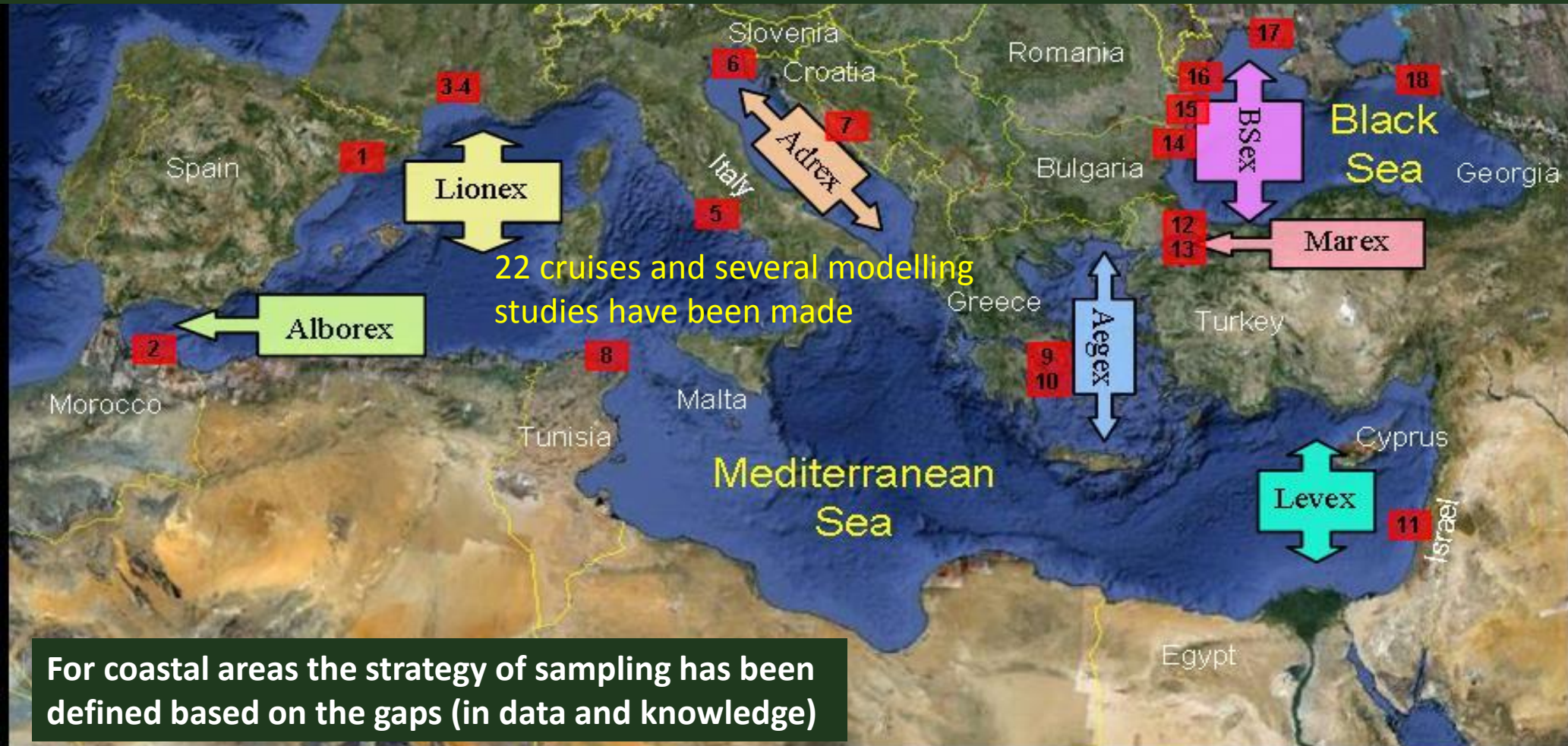
1. Identify the interacting patterns of natural and human-derived pressures, assess their impact on marine ecosystems and design an effective and innovative research framework based on sound scientific knowledge
2. Design an innovative, small research vessel to serve as a scientific survey tool in very shallow areas.
3. Use appropriate scenarios as tools to explore interactions between projected human-derived and natural pressures.
4. Develop a framework of scenario-based adaptive policies and management schemes to help in reaching GES. Help the selection and application of the appropriate descriptors and indicators of the MSFD in the SES.
5. Define and rank a feasible and realistic adaptation policy framework in order to design management schemes.
6. Promote the principles and objectives of MSFD across the SES.



### First Results (open seas)

Scientific Info: lack of data, time series, poorly constrained processes

Socio-economic Info (fisheries, maritime transport, submarine activities, hydrocarbons) : lack of data for the open sea as no distinction was made between coastal areas and open seas



# Policies, Management & New technologies

**A New Approach to Marine and Coastal Research to be used for Management purposes (example: WP3 in PERSEUS)**

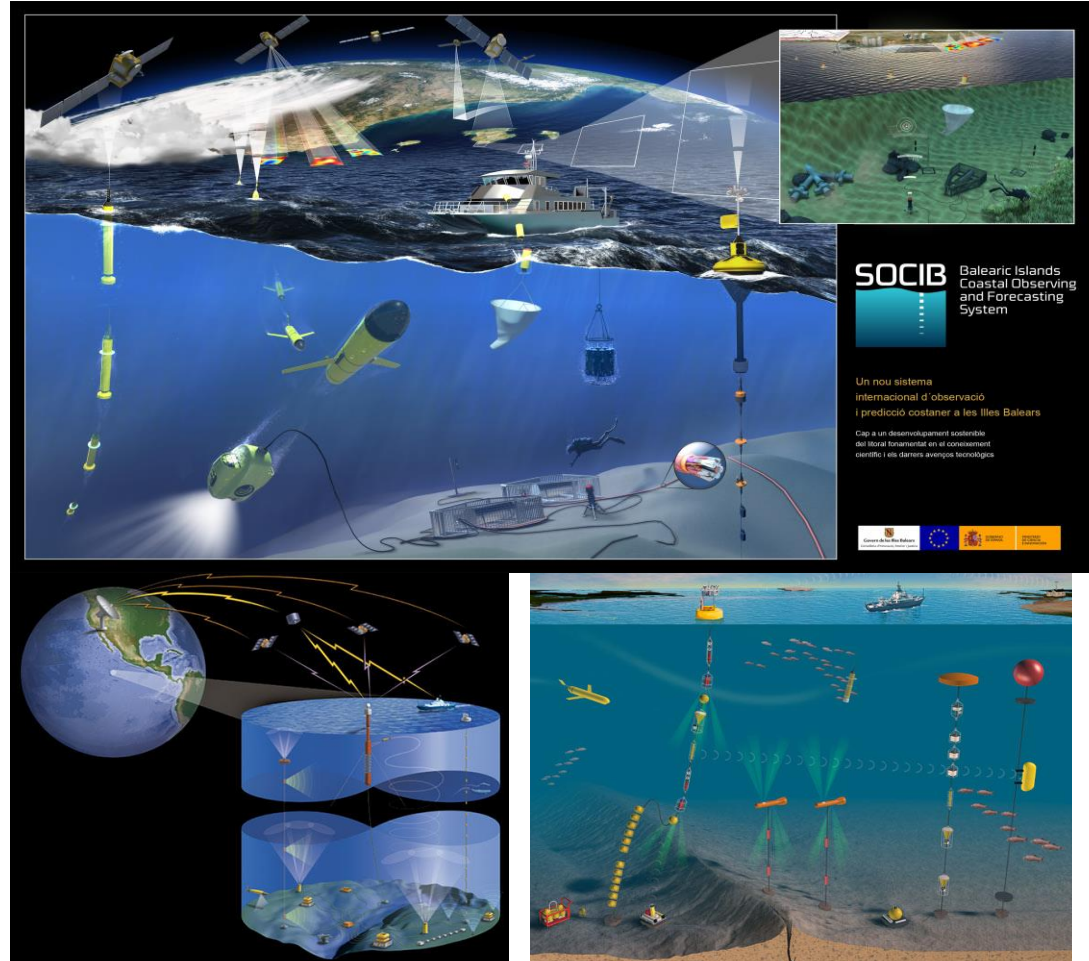
**New technologies allow three-dimensional real time observations, that combined with forecasting numerical models, and data assimilation ...**



**A quantitative major jump, in scientific knowledge and technology development, thus**



**The development of a new form of Integrated Coastal and Ocean Management in response to society needs**

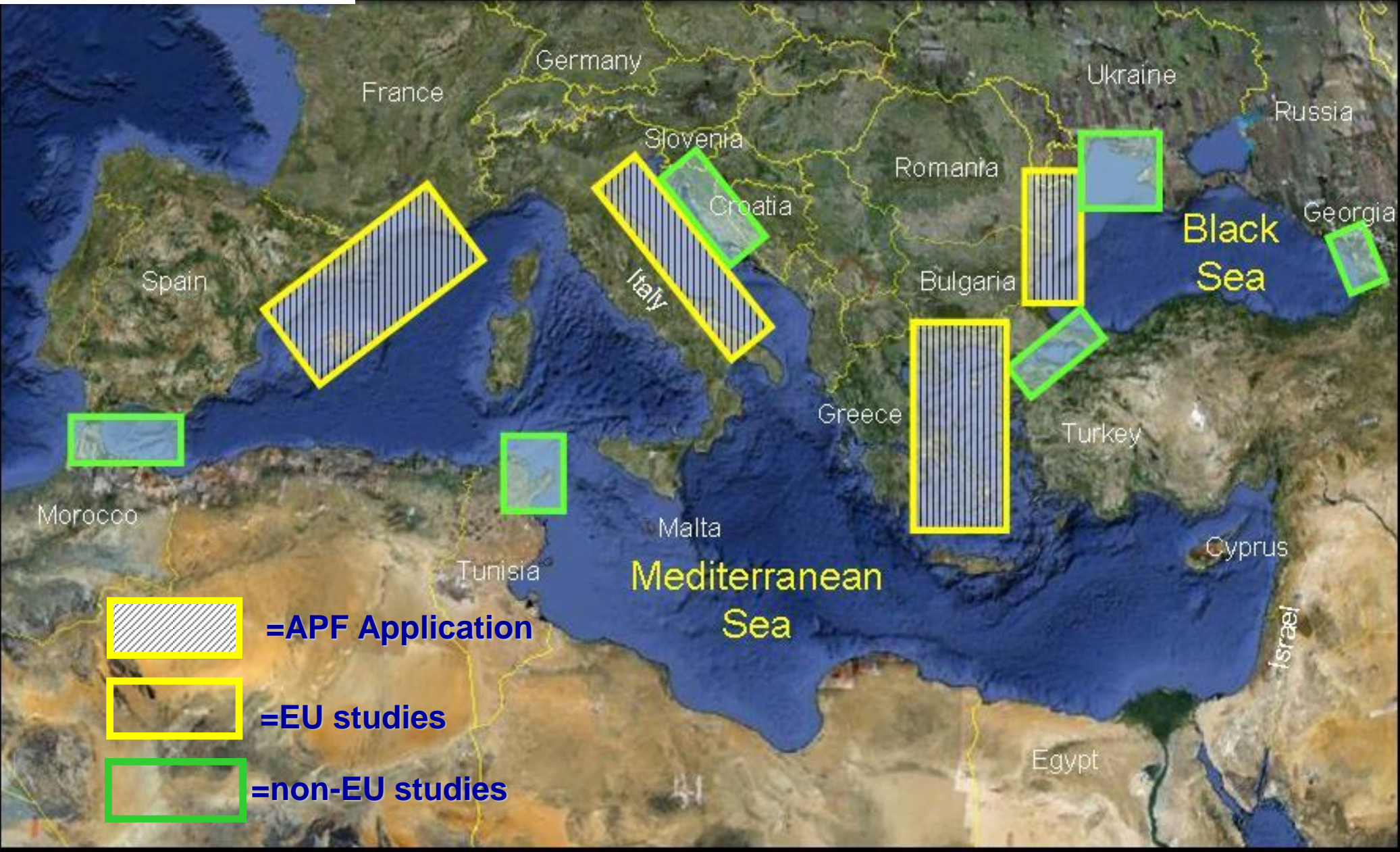






- **Develop scientific tools to evaluate the SES environmental status**
- **Use of modelling and remote sensing techniques for the first two decades of the 21C (2020)**





# Science, Policy and Economy



## “Start to walk” side by side on common ground.....

- Lack of integration of science, policy and economy results in substantial financial and environmental loss
- Thresholds concept is the cornerstone of sustainability and they are regional specific (e.g. response to P differs right across Med.)
- Threshold values are needed and have to be defined to formulate sustainable development policies (especially for coastal areas)
- Policy on the marine and coastal environment is still sectorial at national level, so decision-making remains very fragmented. Needs to be restructured!
- Need to define economic costs & value of goods and services



# Improve public awareness of environmental problems

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## EU Declares War on Plastic Litter in Mediterranean

AFP



ATHENS — EU Environment Commissioner Janez Potocnik on Friday declared war on marine litter fouling the Mediterranean, calling for continental mobilization including a possible ban on plastic bags.

"Marine litter is a big, big problem. I am determined to address it," he told an Athens conference attended by environmentalists and representatives

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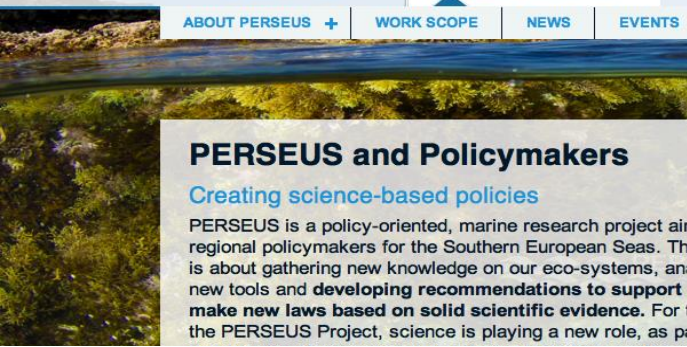
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## PERSEUS and Policymakers

### Creating science-based policies

PERSEUS is a policy-oriented, marine research project aim regional policymakers for the Southern European Seas. The is about gathering new knowledge on our eco-systems, ana new tools and **developing recommendations to support ; make new laws based on solid scientific evidence.** For tl the PERSEUS Project, science is playing a new role, as pa

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## • Ambitious marine litter targets should be set by EU Ministers

Published on Tuesday, 3, July, 2012 at 15:18 in Malta News | No Comments

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Marking International Bag Free Day, Nature Trust (Malta) is one of more than 30 NGOs that are making a final call to EU Environment ministers ahead of the 15th July deadline for setting marine litter targets, as required under EU law.

In an open letter sent to all 27 ministers, the NGOs are calling for ambitious and significant reduction targets for 2020.

Under the Marine Strategy Framework Directive (MSFD), Member States have to disclose their initial assessments of their own waters, define what they consider to be 'Good Environmental Status' and set targets for several marine environmental challenges, including marine litter, for 2020.

- Connecting the scientific world and the policy makers, stakeholders and the general public is not easy, but....
- **A bridge is being built**
- Scientists are to be taught how to communicate their findings, especially to decision makers
- Reverse the approach and make it participatory: Decision Makers have to involve Scientists to solve problems and support decisions. Success examples in US



# Connecting Science and Policy

- Connecting Science and Policy is still needed but an improvement has been made (WFD, MSFD, Marine & Maritime Strategy etc.) It is a two way street.....
- Different time horizon for scientific knowledge and perform policy

**Prerequisite: COMMON LANGUAGE and POLITICAL WILL!**

- Compromises on understanding the issues from both sides have to be made and quality should be maintained
- Alterations due to pressures are evident but policies (national and EU) on marine environment must be based on scientific results



**Actions and Plans have to made in Local level**

**Thank you for your attention**