PERSEUS

POLICY-ORIENTED MARINE ENVIRONMENTAL RESEARCH IN THE SOUTHERN EUROPEAN SEAS

PERSEUS EU Project and the potential to the promotion of MSFD Principles

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SEVENTH FRAMEWORK PROGRAMME

Overview

- MSFD in a “nutshell”
- Principles of the MSFD
- Scientific Challenges Ahead
- The Role of PERSEUS
- Scientific Objectives
- Brief Overview of the Work to be done
- Impact

A New Framework Directive….
Why?

- Strategy needed for marine environment (including adaptive policies)
- Protection and conservation of the marine environment
- Design and implement coherent management plans in each region, and monitor their application
- The **"*Marine Strategy Framework Directive*"** (MSFD) adopted in 2008

Targets

- The **MSFD** claims for a "Good Environmental Status" (GES) of marine water bodies by 2020.
- "GES" will be shown by the synthesis of 11qualitative descriptors which describe what the environment will look like when GES has been achieved (Annex I of MSFD)

Initial Assessment

MS have to initially assess the ecological status of their waters and the impact of human activities

This Initial Assessment (IA) covers:

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, smothering or sealing of habitats by construction work, introduction of 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.

Descriptors

The MSFD sets out 11 qualitative descriptors to describe what the environment will look like when GES has been achieved…..

•Descriptor 1. Biodiversity is maintained
•Descriptor 2. Non-indigenous species do not adversely alter the ecosystem
•Descriptor 3. The population of commercial fish species is healthy
•Descriptor 4. Elements of food webs ensure long-term abundance and reproduction
•Descriptor 5. Eutrophication is minimised
•Descriptor 6. The sea floor integrity ensures functioning of the ecosystem
•Descriptor 7. Permanent alteration of hydrographical conditions does not adversely affect the ecosystem
•Descriptor 8. Concentrations of contaminants give no effects
•Descriptor 9. Contaminants in seafood are below safe levels
•Descriptor 10. Marine litter does not cause harm
•Descriptor 11. Introduction of energy (including underwater noise) does not adversely affect the ecosystem

What are the criteria and indicators?

Criteria and indicators are distinctive technical features, which help make the descriptors more concrete and quantifiable.

Example Descriptor 3: The population of commercial fish species is healthy

In the Commission Decision

- **Criterion 1:** the level of pressure of fishing activity
- **Indicator**: fishing mortality
- **Criterion 2:** the reproductive capacity of the stock
- **Indicator:** spawning stock biomass
- **Criterion 3:** the population age and size distribution
- **Indicator:** high proportion of old, large individuals

In practice

- Fishing, and other human activities affecting populations of commercially exploited fish and shellfish, should not push these populations beyond their maximum sustainable yield, defined by the EEA as "the largest yield that can be obtained"
- Does not deplete or damage natural resources irreparably and
- Leave the environment in good order for future generations

Key terms

- **Ecological status:** the overall state of the environment in marine waters, taking into account the structure, function and processes of the constituent marine ecosystems together with natural physiographic, geographic, biological, geological and climatic factors, as well as physical, acoustic and chemical conditions, including those resulting from human activities inside or outside the area concerned.
- **Good ecological status (GES):** the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations

Achieving the GES

- The main goal of the Marine Directive is to achieve **Good Environmental Status (GES) of EU marine waters by 2020.**
- The Directive defines GES as: "The environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive" and **interpreted as follows**:
  - structure, functions and processes of marine ecosystems have to be considered,
  - marine species and habitats must be protected and
  - human-induced decline of biodiversity must be prevented
- GES means that the different uses made of the marine resources are conducted at a sustainable level, ensuring their continuity for future generations

Ecosystem Functioning in GES…

- Structure, functions and processes of the constituent marine ecosystems, together with the associated physiographic, geographic, geological and climatic factors, allow them to function fully and to maintain their resilience to human-induced environmental change
- Hydro-morphological, physical and chemical properties of the ecosystems, including those properties which result from human activities in the area concerned, support the ecosystems
- Marine species and habitats are protected, human-induced decline of biodiversity is prevented and diverse biological components function in balance
- Anthropogenic inputs of substances and energy, including noise, into the marine environment do not cause pollution effects

Specific Measures to achieve Objectives

- Member States have to draw up a monitoring programme
- Measures must give due consideration to their economic and social consequences
- Member States must specify the reasons preventing successful completion of any of these measures (action or inaction of another State, etc.).
- Before they are implemented, the measures decided by the Member States must be the subject of impact assessments and cost/benefit analyses

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**

A common framework for cooperation exists

- The Commission is the **guarantor of the coherence of actions** by MS
- MS have to submit the details of the key elements of their strategies at each stage of their formulation (iteration process)
- **This iteration process** can give the MS guidance on how to ensure compliance with the strategy and coherence of the proposed measures
- MS in the same marine region are required to coordinate their action and use of the **cooperation mechanisms** set up by existing international conventions
- The international organisations, established by the conventions, **provide their scientific and technical know-how and allow cooperation to be extended to third countries that are parties**

MSFD Principles

- Member States have to **evaluate requirements in their marine areas**
- MS have to draw up and implement **coherent management plans** in each region, and then **monitor their application**
- **Common principles** on which MS have to draw up their strategies
- **GES must be determined at the level of marine regions or sub regions,** and on the basis of **11 qualitative descriptors** of the marine environment
- **Regional cooperation is required at each stage of the implementation of the Directive**; Cooperation with other Member States and third countries, to achieve a GES
- **Strategies aiming to protect and restore Europe's marine ecosystems** and to **ensure the ecological sustainability of economic activities** linked to the marine environment, have to be applied

Challenges ahead:
The need for scientific knowledge/support

- 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 projects (e.g. PERSEUS, ODDEM, VECTORS MISIS etc.): can **provide the scientific support needed at regional level**

Grant agreement no: 287600

PERSEUS EU Project

Policy-oriented marine Environmental Research for the Southern EUropean Seas

FP7: 'Cooperation' Programme
Theme: Environment (including climate change)
[FP7-OCEAN-2011]

Key Figures

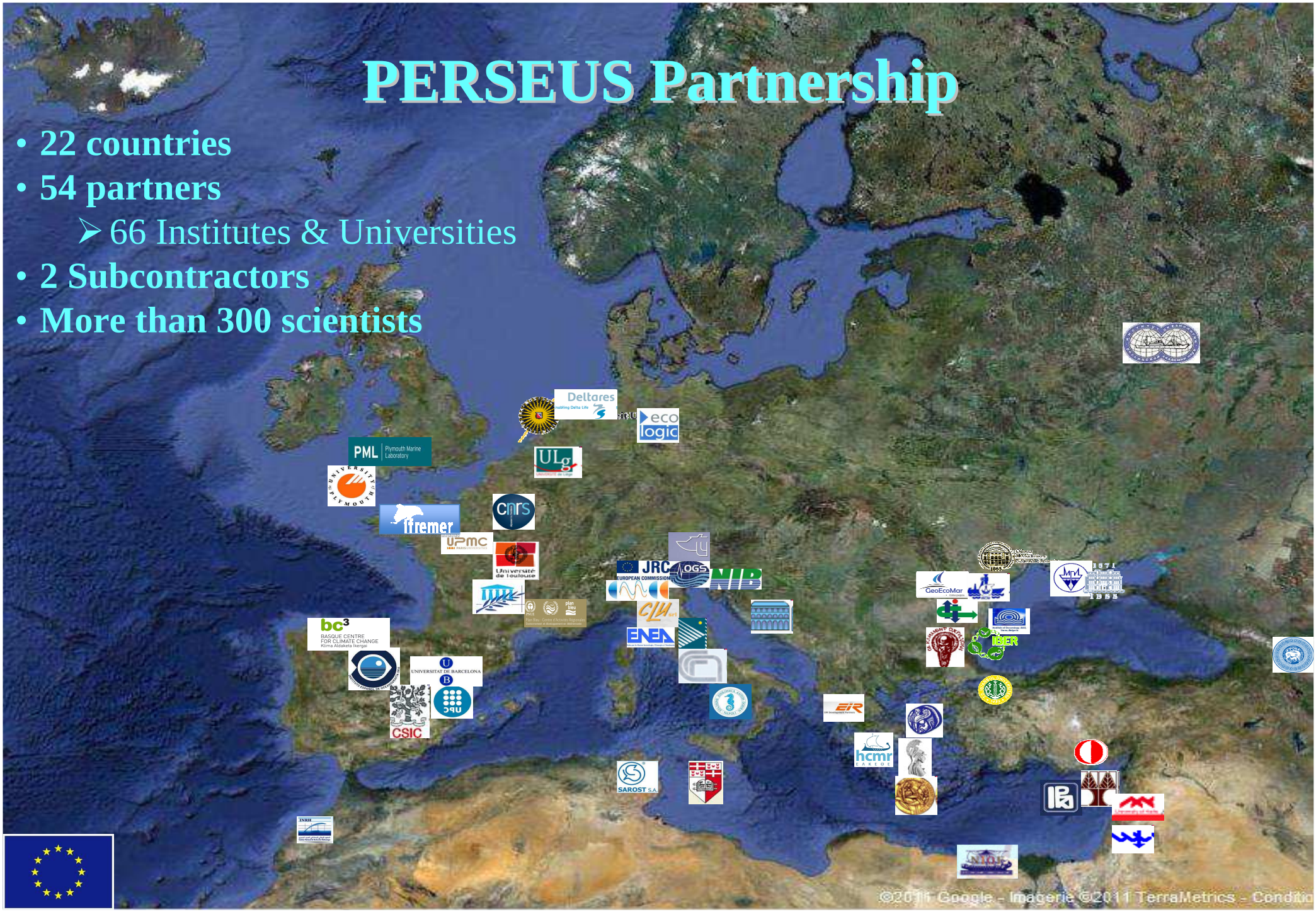
- **Project Duration: 48 months**
- **Start: 1st of January 2012**
- **10 Work Packages**
- **Budget 12,973,124.40 €**
- **2297 man/months**

Scientific objectives

- **Identify the interacting patterns of both natural and human-derived pressures on the SES and proceed with the assessment of their impact on the marine ecosystems**
- **Develop tools for the evaluation of the environmental status using existing and upgraded monitoring and modelling capabilities**
- **Implement the principles and objectives put forward in the MSFD and promote them across the SES**
- **Develop a framework for future implementation of adaptive policies and management schemes**

PERSEUS Partnership

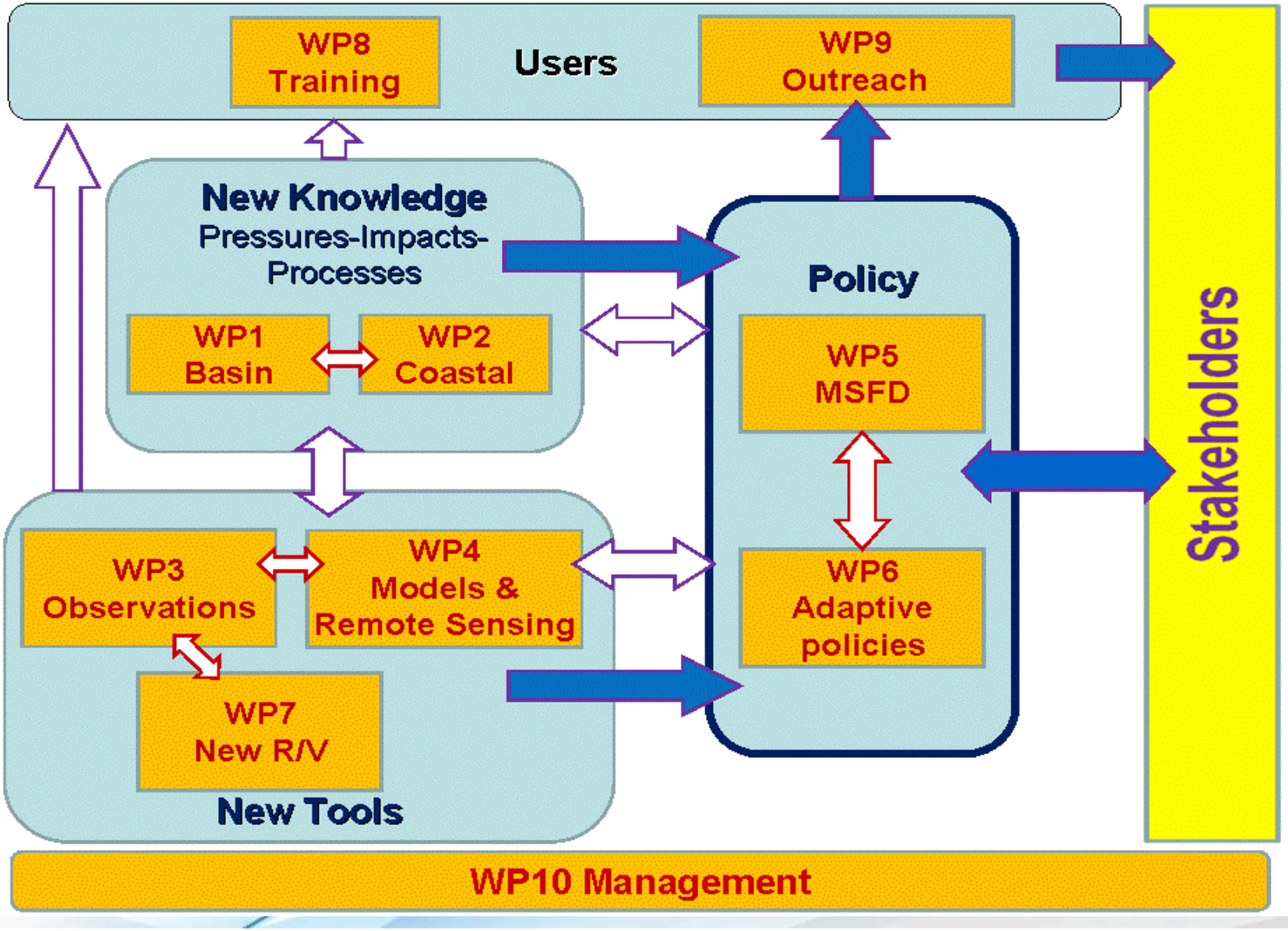
- 22 countries
- 54 partners
  - ➢ 66 Institutes & Universities
- 2 Subcontractors
- More than 300 scientists



Work Packages

	Work Packages Title	WP Leader
WP 1	Pressures and Impacts at Basin & Sub-basin Scale	……..
WP 2	Pressures and Impacts at coastal level	J-F Cadiou, IFREMER
WP 3	Upgrade-expand the existing observational systems and fill short term gaps	J. Tintore, CSIC
WP 4	Developing integrated tools for environmental assessment	M. Zavatarelli, CoNISMa
WP 5	Basin-wide promotion of MSFD principles	G. Oaie GeoEcoMar & C. Vassilopoulou, HCMR
WP 6	Adaptive policies and scenarios	D. Sauzade, Plan Bleu
WP 7	Concept of an innovative research vessel	C. Cosmidis, COSNAV
WP 8	Training and Capacity Building	Aldo Drago, UoM
WP 9	Communication, Outreach & Information Management	Emily Koulouvaris, EIR
WP 10	Project Management	E. Papathanassiou, HCMR

Work Flow


WP8
Training
Users
WP9
Outreach
New Knowledge
Pressures-Impacts-
Processes
WP1
Basin
WP2
Coastal
Policy
WP5
MSFD
WP6
Adaptive
policies
Stakeholders
WP3
Observations
WP4
Models &
Remote Sensing
WP7
New R/V
New Tools
WP10 Management

WP1 Objectives
(Pressures and Impacts at Basin & Sub-basin Scale)

- **Identify basin-scale and sub-basin-scale patterns of natural and human-made pressures on the Mediterranean & Black Seas' marine ecosystems**
- **Assess the effect of these pressures in socio economic terms**
- **Investigate processes transmitting pressures to the marine ecosystem**
- **Investigate interactions between natural and human-made pressures and assess their combined impacts on marine ecosystems**

Task 1: Analysis of pressures and processes & their impact on ecosystems

- Hydometeorology, Straits, maritime transport pollution, atmospheric inputs, biological pressures, eco-regionalization

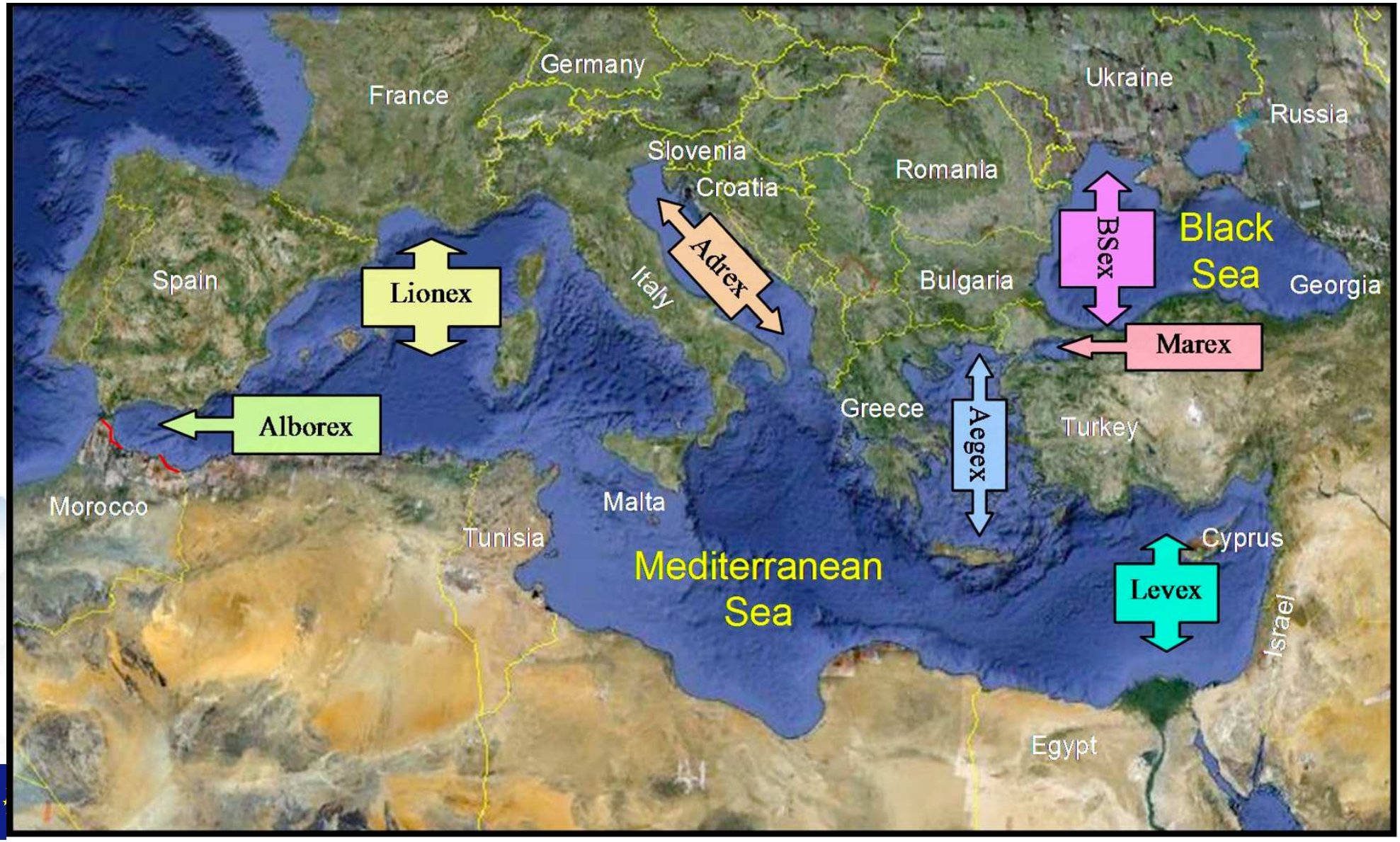
Task 2: Analysis of socio-economic activities in open sea areas

- Underwater pipelines and cables (power and communication), transport-recreational activities and tourism (ferries, cruise ships), "offshore" industry (oil, renewable marine energy)

Task 3: Process oriented studies (experiments and modeling)

- ALBOREX, LIONEX, ADREX, LEVEX, AEGEX, MAREX, BSEX

WP1 “Experiments”



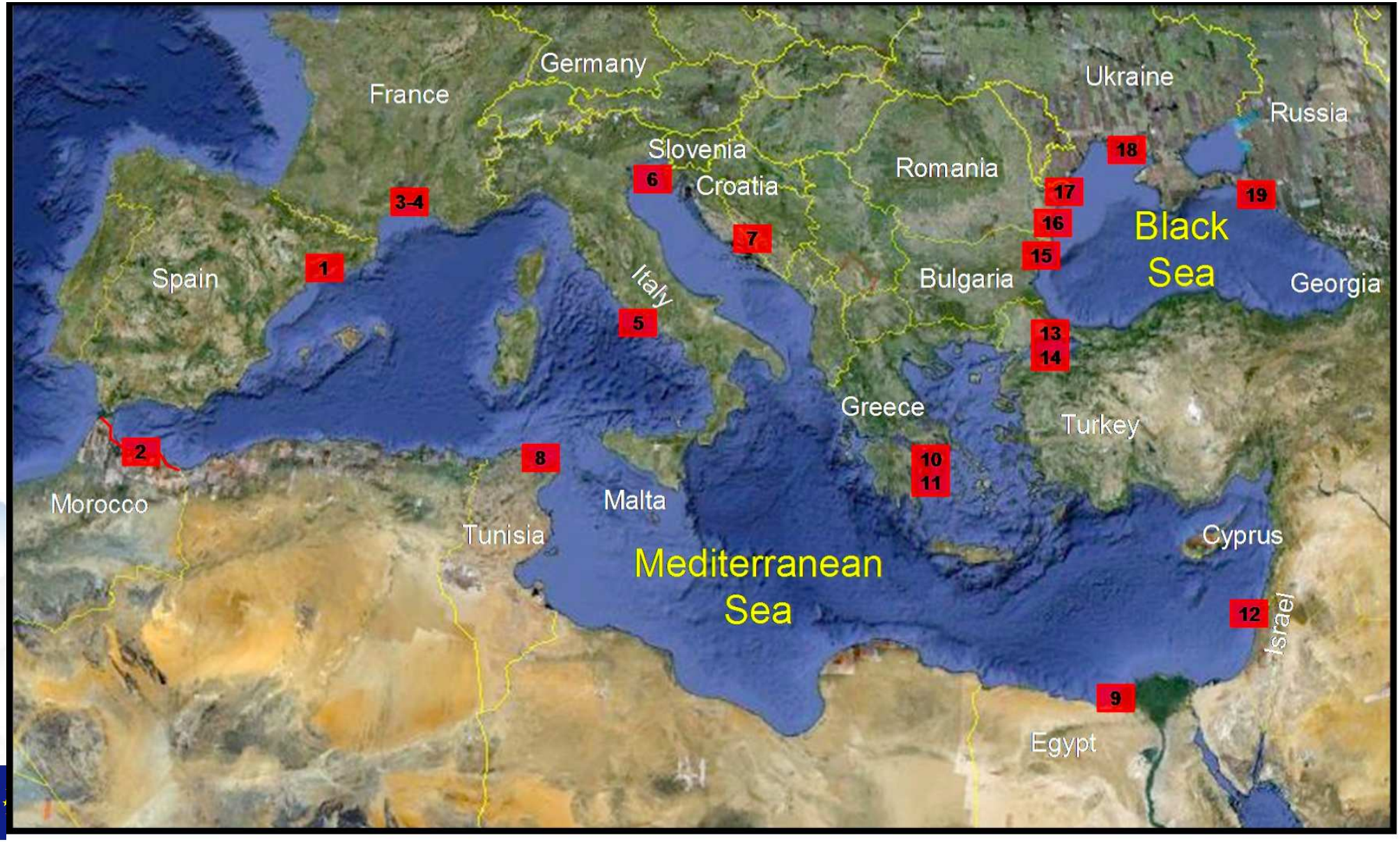
WP2 Objectives
(Pressures and Impacts at coastal level)

- **Characterise/evaluate the past and current pressures resulting from land–sea interactions and from human activities in the coastal areas and to analyse their patterns and impact across the SES activities in the coastal seas**
- **Analyse socio-economic activities interacting with coastal marine ecosystems**
- **Better understand the response of Mediterranean and Black Seas coastal ecosystems to natural and anthropogenic pressures**

WP2 Tasks

- **Task 2.1 : Identification of pressures and their impacts on coastal ecosystems and gap analysis**
- **Task 2.2 : Analysis of socio economic activities in the coastal areas**
- **Task 2.3 : Filling the knowledge gaps: dedicated field studies of the effects of pressures exerted on coastal ecosystems - Process oriented experiments**
  - **Subtask 2.3.1 – Study of pressures and impacts on pelagic ecosystems**
  - **Subtask 2.3.2 – Study of pressures and impacts on benthic ecosystems**
    - a. Mapping habitat types with emphasis on sea grass meadows
    - b. Impact of coastal development and urbanization on shallow water habitats
    - c. Demersal fish aggregations; analysing functional community changes
  - **Subtask 2.3.3. Non-indigenous Species**
  - **Subtask 2.3.4 Pollution (persistent organic pollutants – POPs and toxic metals)**
  - **Subtask 2.3.5 Other Physical Disturbances**
    - a. Litter
    - b. Noise

WP2 Working sites



WP3 Objectives

Upgrade-expand the existing observational systems and fill short term gaps

- Upgrade and expand the present observing capacity in the SES and increase the forecasting capabilities
- Identify the needs (local, sub-basin and basin scale), the existing observing capacities and the gaps to be filled
- Deliver targeted short term observations linked to the needs of specific case studies
- Upgrade and develop new observing systems in response to policy and science needs identified by other WPs
- Develop a long-term monitoring strategy based on identified needs, existing capacities and national commitments
- Establish a Near Real Time data delivery flow (open access data policy)

WP4 Objectives
(Developing integrated tools for environmental assessment)

- **Development of scientific tools to evaluate the SES environmental status by engaging existing and upgraded remotely operated monitoring and modelling capabilities**
- **Use of modelling and remote sensing techniques for the first two decades of the 21st century (2020) to:**

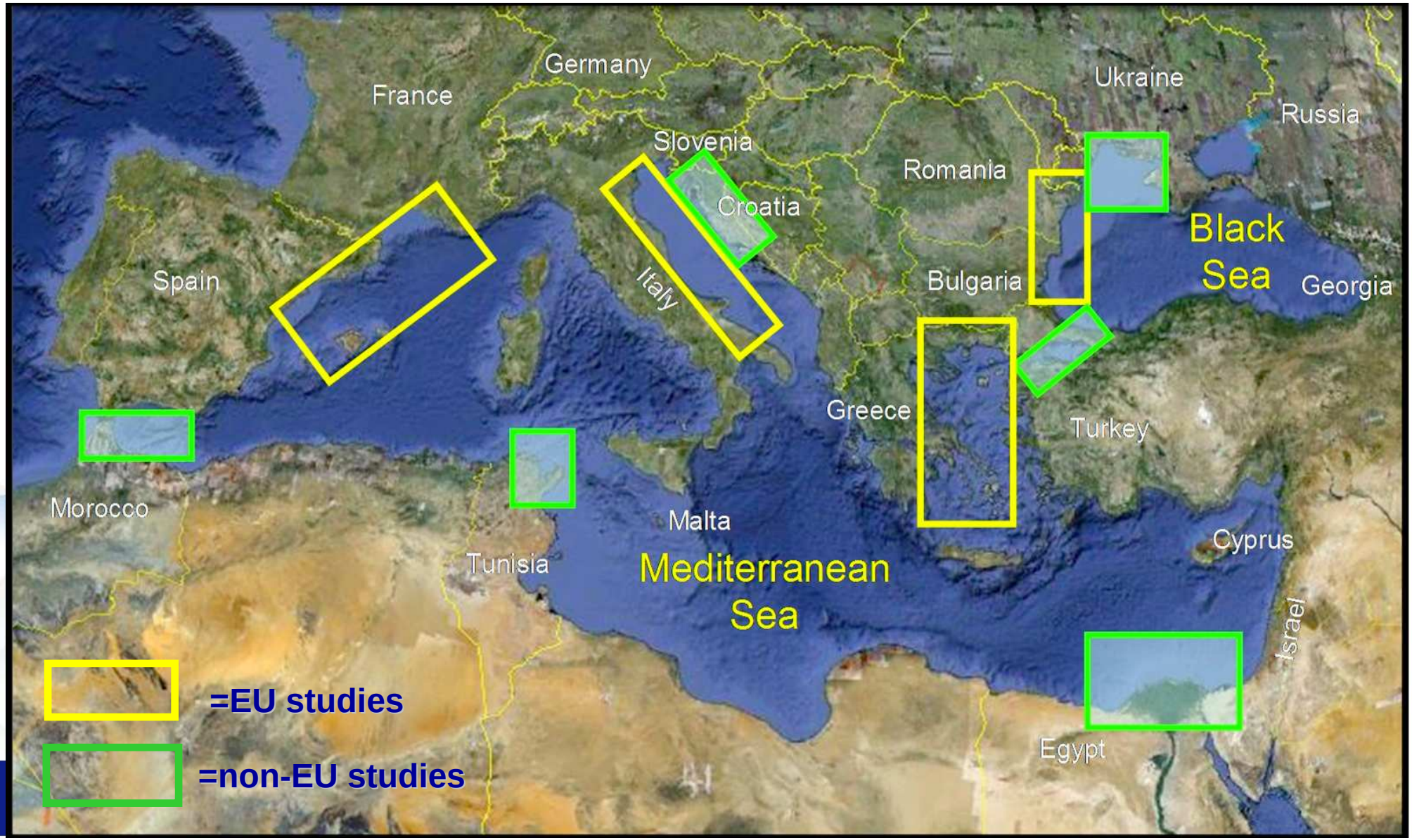
1. Assess models skill through validation procedures against available reference observations
2. Provide synthetic indices that can indicate the "state" of the environment
3. Provide an integrated analysis of ecosystem attributes (vigor, organisation, resilience) that will contribute to the criteria relevant to the MSFD descriptors as indicated in MSFD on "GES"

- **Hindcast and prediction (for 2020-2030) mode under "Business as Usual" or policy-based scenarios (defined in WP6)**

WP5 Objectives
(Basin-wide promotion of MSFD principles)

- **Identify, develop and promote tools and methods to assess environmental status across the SES basins with emphasis on non-EU countries**
- **Enhance scientific cooperation & networking between scientists from EU and non-EU member countries**
- **Create a platform for human capacity building in interdisciplinary science and science-based management towards achievement of GES**
- **Contribute to the improvement of marine research and monitoring infrastructure in the region, to enhance the involvement of researchers in policy-related science and broader application of advanced monitoring strategies**

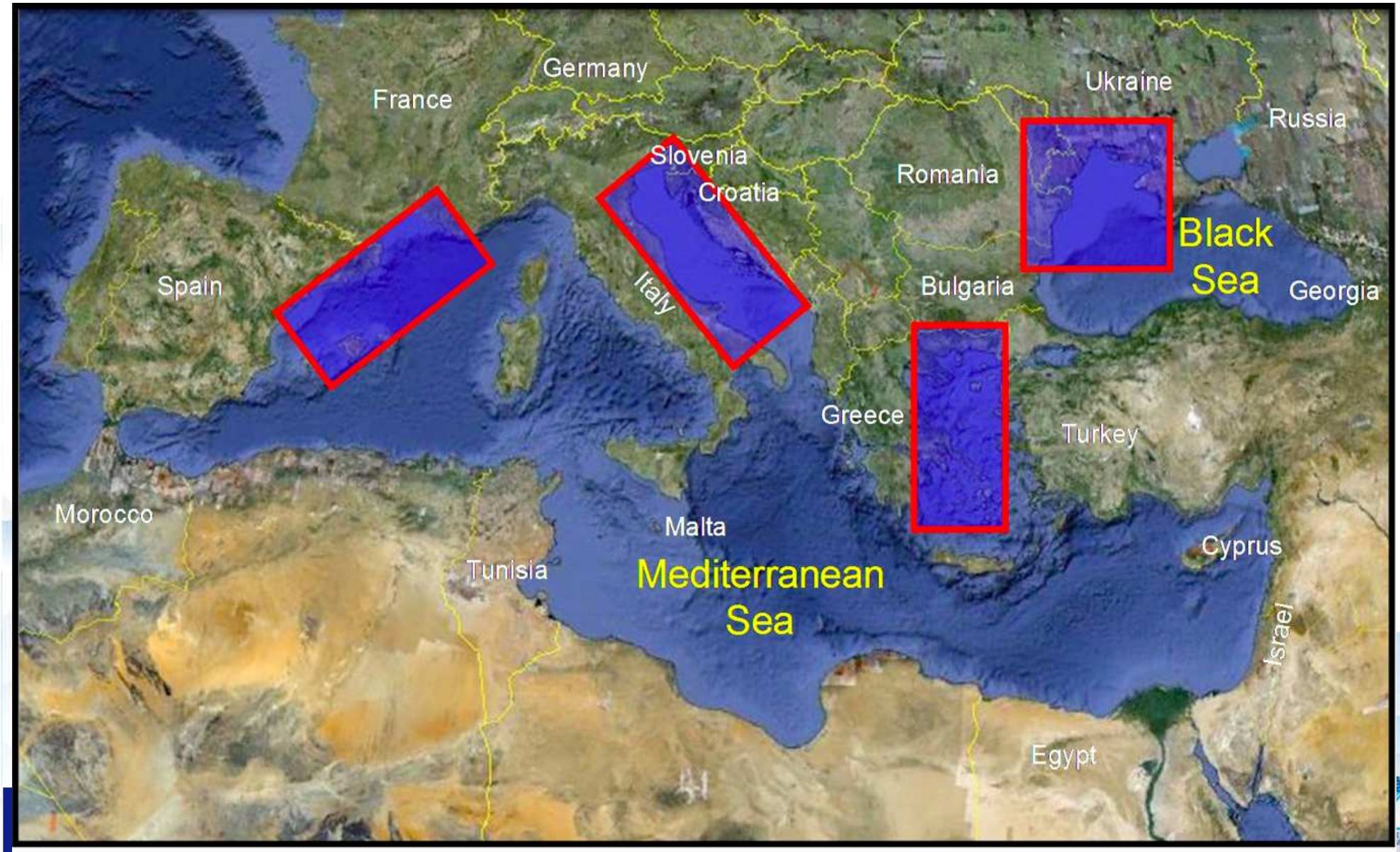
Areas for demonstration of the MSFD principles



WP6 Objectives
(Adaptive policies and scenarios)

- **Develop a framework for the future implementation of adaptive policies and management schemes and promote better governance across the SES**
- **Implementation of Adaptive Policy Framework (APF). It will provide a set of multi-scale management schemes and adaptive policies aiming at reaching GES**
- **Develop a specific decision support system based on a scenario planning approach to support management schemes**
- **Develop Stakeholder platforms with relevant experts and decision-makers**
- **Synthesise results for communication & integration among the main actors and infrastructures**

Areas for development of APF



WP7 Objectives
(Concept of an innovative research vessel)

- **Develop the concept of an innovative small research and survey vessel to be used for the coastal areas of the Mediterranean and the Black Sea, estuaries, as well as port areas and shallow navigation channels**
- **Identify its scientific and operational and evaluate the process (participation of the consortium members)**
- **Design novel propulsion and positioning systems**
- **Deliver blue print and 3-D drawings of the new vessel**

Task 7.1: Identification of scientific and operational needs and evaluation process

Task 7.2: Design of novel propulsion system and innovative positioning system

Task 7.3: Design of a new vessel concept

WP8 Objectives
(Training and Capacity Building)

- **Create training opportunities and strengthen the existing RTD network in the SES in principles such as ecosystem modelling, monitoring and environmental assessment** (e.g. BSEC Training Course)
- **Training scientists and technicians through the transfer of knowledge and skills in order to allow them to best apply the MSFD principles**
- **Increase capacity building of scientific personnel using a "training visits" scheme among partners**

8.1 – Summer schools: Romania (Constanta) 2013 & Egypt (Alexandria) 2014

8.2 – Training Courses: 3 training courses for PERSEUS and non-PERSEUS partners on: 1) Continuous Plankton Recorder (Med-CPR)(Cyprus 2012-2013), 2) Coastal issues, (Russia 2013) & 3) National stakeholders, (Malta 2015)

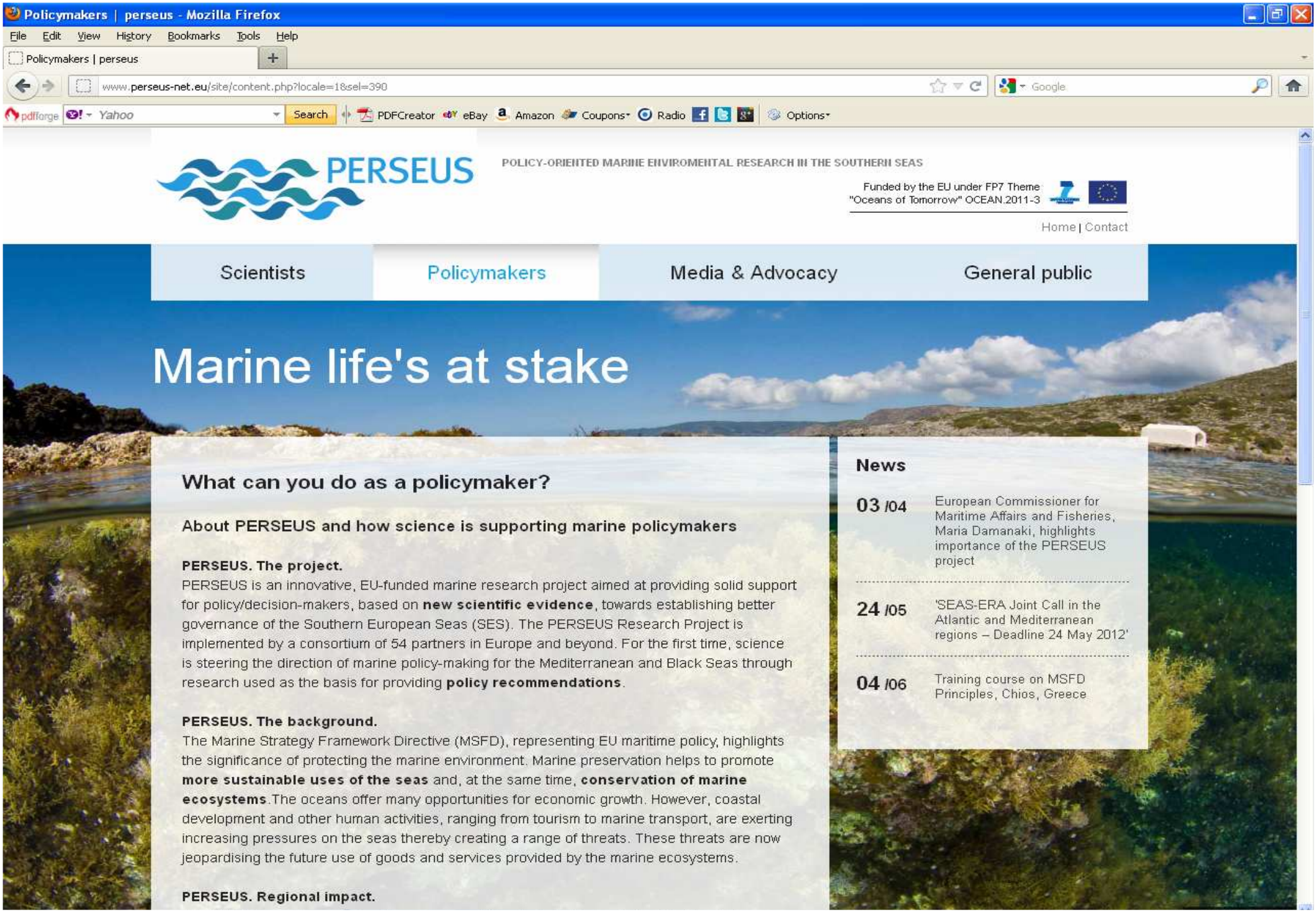
8.3 – Training visits scheme: short training visits of scientists, students and technicians to selected Institutes. Emphasis on non-EU countries

WP9 Objectives
(Communication, Outreach & Information Management)

- Communicate the project's purpose, work scope and results to all stakeholders (policy and decision-makers, the scientific community, media, general public etc.)
- Engage policy and decision-makers and the scientific community in dialogue on how PERSEUS can help in providing a scientific basis needed to introduce a new policy and management framework
- Bridge the communication gap between scientists and the public on GES issues and develop a "Clean Seas" framework across SES of outreach activities
- Develop and maintain the PERSEUS' information system, to implement common standards and effective mechanisms for the collection, quality control and availability of data and information

Impact

- **Support Regional initiatives in the Med and/or the Black Sea on MSFD/ECAP**
- Support the Commission's needs and achieve a mutual understanding and informed decision-making based on sound scientific knowledge with particular reference to MSFD
- **Cooperation of actions of PERSEUS with other projects working on subjects related to MSFD (e.g. ODDEM, VECTORS, COCONET, MISIS, CLEANSEA etc.)**
- Provide opportunities for scientific cooperation and networking between scientists from EU and non-EU countries
- **Have training courses and workshops also open to scientists beyond the existing Consortium, hence achieving the maximum cooperation between the different regions and countries**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Funded by the EU under FP7 Theme "Oceans of Tomorrow" OCEAN.2011-3
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Marine life's at stake
What can you do as a policymaker?
About PERSEUS and how science is supporting marine policymakers
PERSEUS. The project.
PERSEUS is an innovative, EU-funded marine research project aimed at providing solid support for policy/decision-makers, based on new scientific evidence, towards establishing better governance of the Southern European Seas (SES). The PERSEUS Research Project is implemented by a consortium of 54 partners in Europe and beyond. For the first time, science is steering the direction of marine policy-making for the Mediterranean and Black Seas through research used as the basis for providing policy recommendations.
PERSEUS. The background.
The Marine Strategy Framework Directive (MSFD), representing EU maritime policy, highlights the significance of protecting the marine environment. Marine preservation helps to promote more sustainable uses of the seas and, at the same time, conservation of marine ecosystems.The oceans offer many opportunities for economic growth. However, coastal development and other human activities, ranging from tourism to marine transport, are exerting increasing pressures on the seas thereby creating a range of threats. These threats are now jeopardising the future use of goods and services provided by the marine ecosystems.
PERSEUS. Regional impact.
News
03 /04
European Commissioner for Maritime Affairs and Fisheries, Maria Damanaki, highlights importance of the PERSEUS project
24 /05
'SEAS-ERA Joint Call in the Atlantic and Mediterranean regions – Deadline 24 May 2012'
04 /06
Training course on MSFD Principles, Chios, Greece

Thank you!

More Information on

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