PERSEUS: Policy-oriented marine Environmental Research for the Southern European Seas

OCEAN.2011-3: Assessing and predicting the combined effects of natural and human-made pressures in the Mediterranean and the Black Sea in view of their better governance

PERSEUS

Objectives

- identify the interacting patterns of both natural and human-derived **pressures** on the SES and proceed with **assessing** their **impact** on the marine ecosystems.
- develop **tools to evaluate environmental status** using existing and upgraded monitoring and modeling capabilities
- Use developed tools to **implement** the principles and objectives put forward in the Marine Strategy Framework Directive (**MSFD**) and promote them across the SES
- Develop framework for future implementation of **adaptive policies** and management schemes

Pressures/ Impacts

WP1: Pressures and Impacts at Basin & Sub-basin Scale

WP2: Pressures and Impacts at coastal level

Development of Tools

WP3: Develop integrated tools for environmental status assessment

WP4: Upgrade-expand the existing observational systems and fill short term data gaps

WP5: New concept vessel

Case Studies and MSFD

WP6: Case Studies for MSFD implementation

WP7: Demonstration of MSFD implementation tools, networking, capacity building

WP8: Better Governance (Adaptive Policies and Scenarios).

Outreach Capacity Building

WP9: Information Management, Dissemination & Outreach

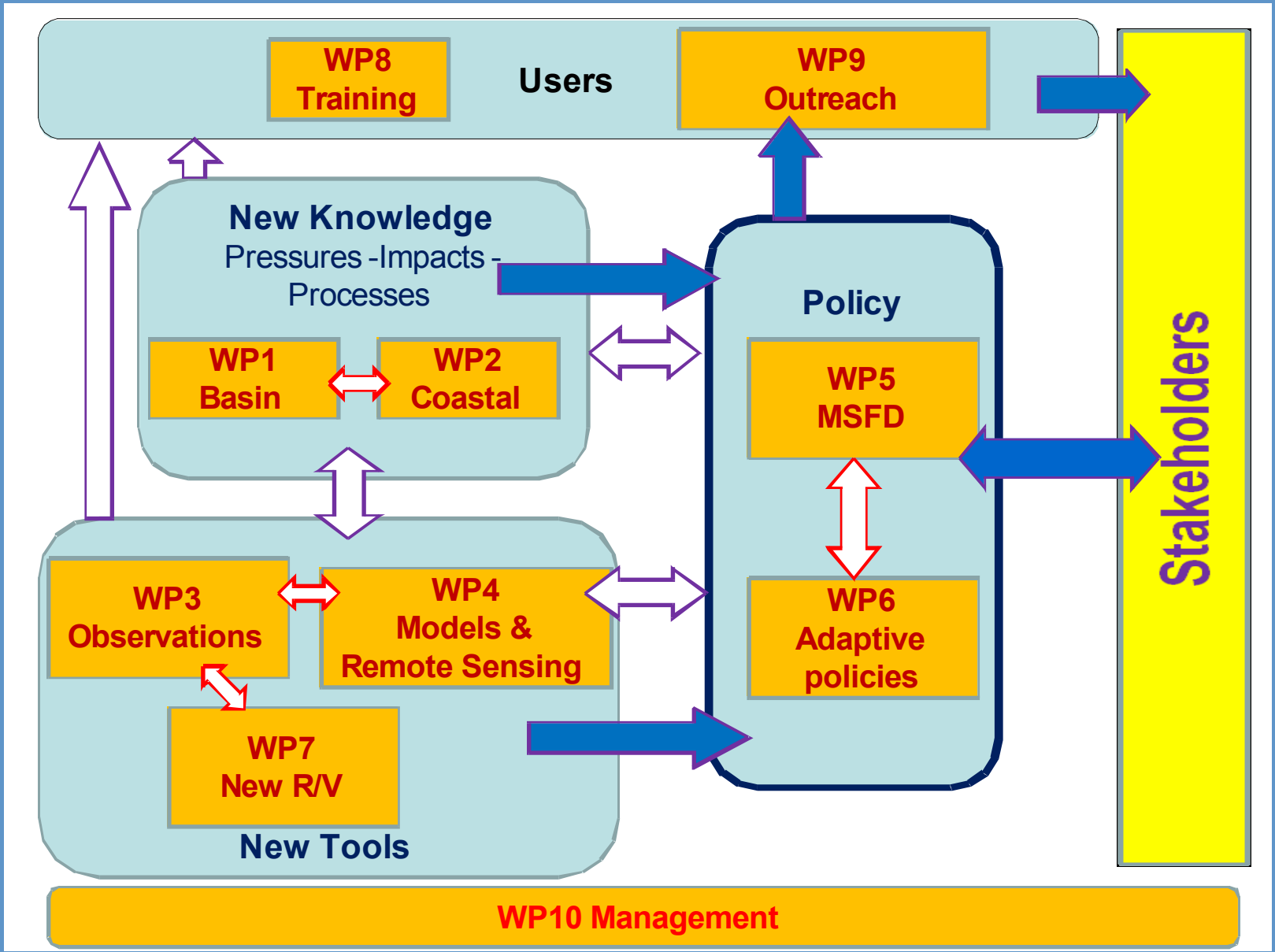
WP10: Training

WP11: Management

4 Regional Coordinators:

1. West Med, 2. Central Med, 3. East Med 4. Black Sea

Structure of PERSEUS

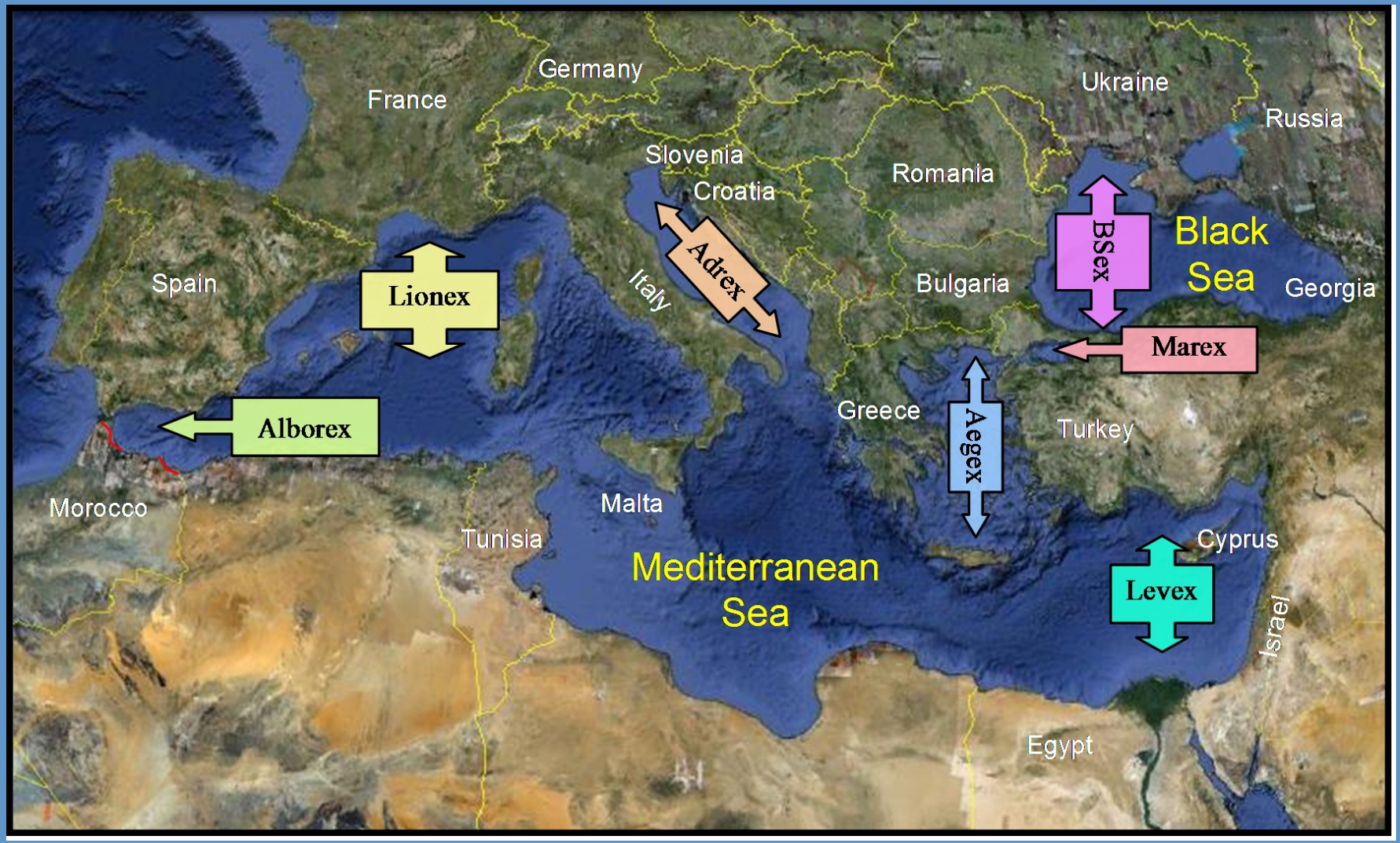


WP1: Pressures and Impacts at Basin Scale

Objectives

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

WP1: Open Sea processes



WP1: Process oriented studies

- -basin hydrology, water balance
- -residence times for water masses, transport and mixing by general and meso-scale circulation, shelf and open-ocean convection, shelf- open sea interactions
- -atmospheric deposition, material and contaminant fluxes
- -biochemical interactions, productivity, food web structure
- -non-indigenous species (*e.g.* Lessepsian migrations), jelly-fish
- -feeding / spawning / inter-basin fish migrations

WP2: Pressures and Impacts at coastal scale

Objectives

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

WP2: Coastal processes

WP2: key interacting anthropogenic processes

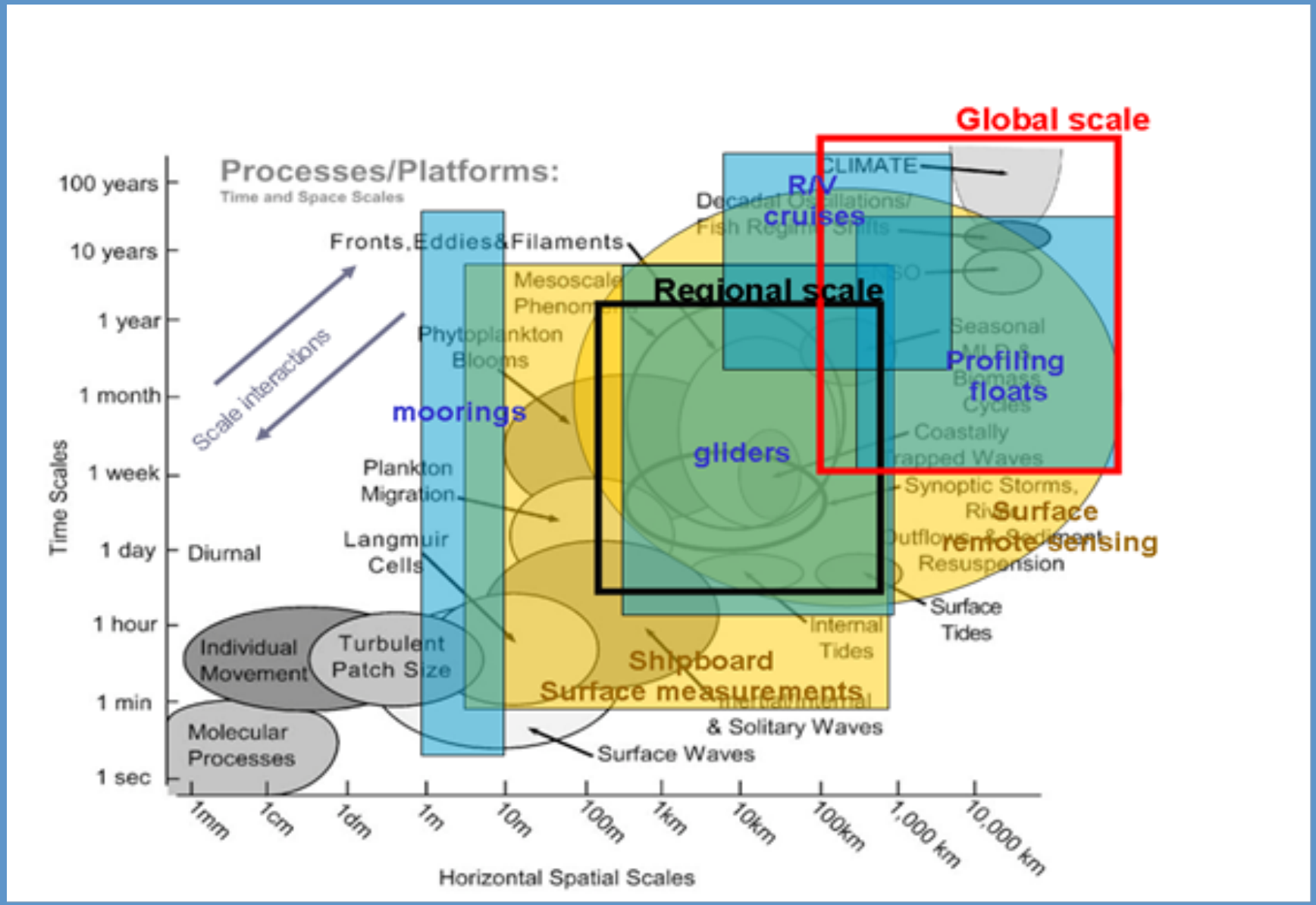
- change in fresh water and sediment riverine fluxes
- nutrients and organic enrichment
- contamination by hazardous substances
- physical damage and loss of habitats
- professional and recreational fishing & aquaculture
- introduction of non indigenous species
- marine litter
- noise

WP3: Upgrade-expand the existing observational systems and fill short term gaps

Upgrade and expand the present observing capacity in SES towards fulfilment of the scientific and society needs addressed by PERSEUS

- Identification of needs (from local to sub-basin and basin scale variability), existing observing capacities and gaps to be filled.
- Delivery of targeted short term observations linked to the needs of the project(short term gaps)
- Upgrade and development of new observing systems in response to policy and science needs
- Development of a long term monitoring strategy based identified on needs as well as existing capacities
- Establishment of a Near Real Time data delivery flow with agreed quality assurance procedures / standards and under an open access data policy.

WP3 Systems /scales



WP3 activities

- Review existing capacities
- Upgrade existing systems towards fulfilling MSFD needs (buoys, Argo, sections)
- New observing components (CPR, Gliders, VMS fishing fleet)
- Data availability – coordination
- A long term observing strategy

WP4: Integrated tools for environmental assessment

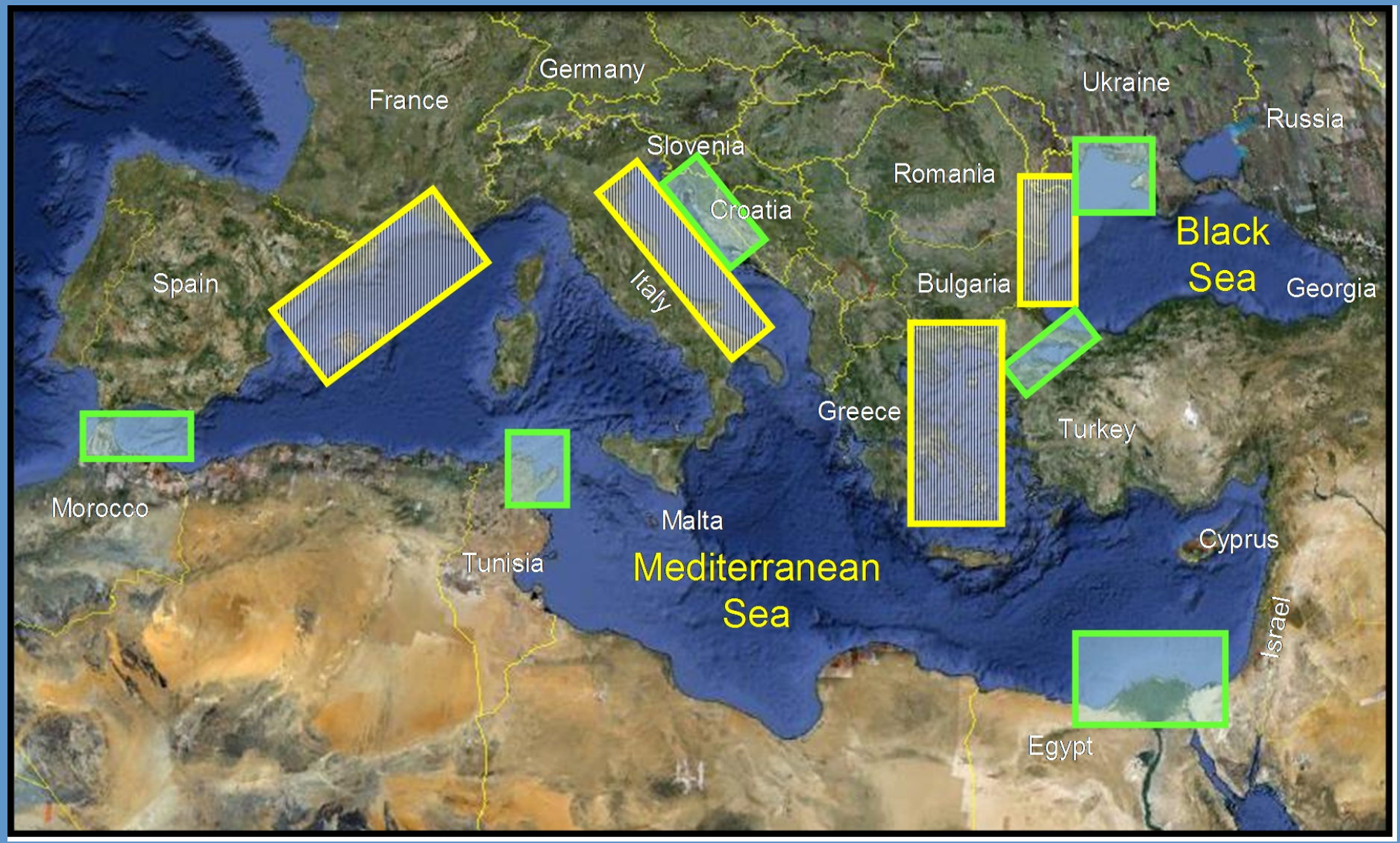
- Develop scientific tools to evaluate SES environmental status engaging existing and upgraded remotely operated monitoring and modeling capabilities
- use End to End (E2E) modelling and remote sensing techniques on a time scale (as suggested by MFSD) encompassing the first two decades of the 21st century to:
  - Provide **synthetic indices** that can indicate the "state" of the environment
  - Provide an **integrated analysis of ecosystem attributes** (vigor, organization, resilience) that will contribute to the criteria relevant to the MFSD descriptors as indicated in the EU directive on "Good Environmental Status".

WP4 Models considered

Area	Partner	Physical model	LTL model	HTL model
Mediterranean Sea	CoNISMa/OGS	OPA/NEMO	BFM	EwE BFM-Benthic
Black Sea	METU/MHI	POM	BIMS-ECO	EwE

Area	Partner(s)	Physical model	LTL model	HTL model
Alboran Sea	CSIC	ROMS	BFM	FLC-IBM
Catalan Sea	CSIC	ROMS/OPA	BFM	FLC-IBM
Gulf of Lions	UNIVMED-COM/OGS	OPA	BFM	EwE
Gulf of Lions	UPS-LA	SYMPHONIE	ECO-NWMED	OSMOSE
N. Adriatic Sea	OGS	OPA	BFM	EwE
N. Adriatic Sea	CoNISMa/ IFREMER	POM	BFM	OSMOSE
N. Aegean Sea (including Saronikos Gulf)	HCMR/ OGS	OPA	BFM	EwE
W. Black Sea	ULG/IBER-BAS	GHER	GHERECO	ICHTIOP EwE
E. Black Sea	DMG-SU/IBER-BAS	NEMO	BIOGEN	EwE

WP5: Areas of MSFD demonstrations



WP6: Areas of APF development

WP7: Concept of innovative R/V

- Develop the concept of an innovative small research and survey vessel which can be evolved to a **scientific survey tool** 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 the **scientific and operational needs** of a new vessel and evaluate process through the participation of the members of the consortium
- Design novel **propulsion and positioning** systems
- Deliver **blue print** and 3-D drawings of the new vessel

WP8:Training & CB

- 1. To create training opportunities which will strengthen the existing RTD network in the Mediterranean and Black Seas in principles such as **ecosystem modeling, monitoring and environmental assessment**.
- 2. To train scientists and technicians though transfer knowledge and skills in order to allow them to best apply the **MFSD principles**.
- 3. To increase capacity building of **scientific personnel** using an exchange scheme among partners.

WP9: Communication - outreach

- **Communicate the project's purpose, work scope and results** to all stakeholders,
- Undertake targeted communication actions to **engage policy and decision-makers and the scientific community in dialogue** on how the PERSEUS help provide the scientific basis for introducing a new framework of adaptive policies and management schemes.
- **Bridge the communication gap between scientists and the public** on issues of GES, by undertaking media activities on the basis of PERSEUS findings as well as developing a "Clean Seas" framework of outreach activities including the JellyWatch, LitterWatch, specific outreach for youth and children.
- **To develop and maintain the PERSEUS' oceanographic information system**

WP leaders

- Coordinator: HCMR - V.Papathanasiou
- WP1: IMS/METU – E.Ozsoy
- WP2: IFREMER – J.F.Cadiou
- WP3: IMEDEA – J.Tintore
- WP4: CONISMA – M.Zavatarelli
- WP5: GeoEcoMar – G.Ruzsa
- WP6: PlanBleu – S.Didier
- WP7: COSNAV – C.Cosmidis
- WP8: UoM – A.Drago
- WP9: EIR – E.Koulouvaris

Regional Coordinators

W.Med: CSIC-J.Ruiz

C.Med: OGS – A.Crise

E.Med: HCMR – E.Kaberi

B.Sea: SIO-RAS A.Zatsepin