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
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
WP1: Pressures and Impacts at Basin & Sub-basin Scale
WP2: Pressures and Impacts at coastal level

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

WP6: Case Studies for MSFD implementation
WP7: Demonstration of MSFD implementation tools, networking, capacity building

WP9: Information Management, Dissemination & Outreach
WP10: Training
WP11: Management
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

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<th>Partner(s)</th>
<th>Physical model</th>
<th>LTL model</th>
<th>HTL model</th>
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<td>NEMO</td>
<td>BIOGEN</td>
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WP5: Areas of MSFD demonstrations

Map showing areas of MSFD demonstrations in the Mediterranean Sea and Black Sea regions, including countries like Spain, Italy, Croatia, Greece, Bulgaria, and Turkey.
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

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- WP3: IMEDEA – J.Tintore
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- WP6: PlanBleu – S.Didier
- WP7: COSNAV – C.Cosmidis
- WP8: UoM – A.Drago
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