ICM and MSP: facilitating tools for solving conflicts and overcoming the science-policy gap

Blue Growth in the Mediterranean: Perspectives of Spain
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OUTLINE

1. INTRODUCTION
2. SCIENCE-POLICY GAP
3. MARINE INFORMATION
4. SCIENCE AND TECHNOLOGY
5. RESPONSE TO SOCIETY
6. CONCLUSIONS

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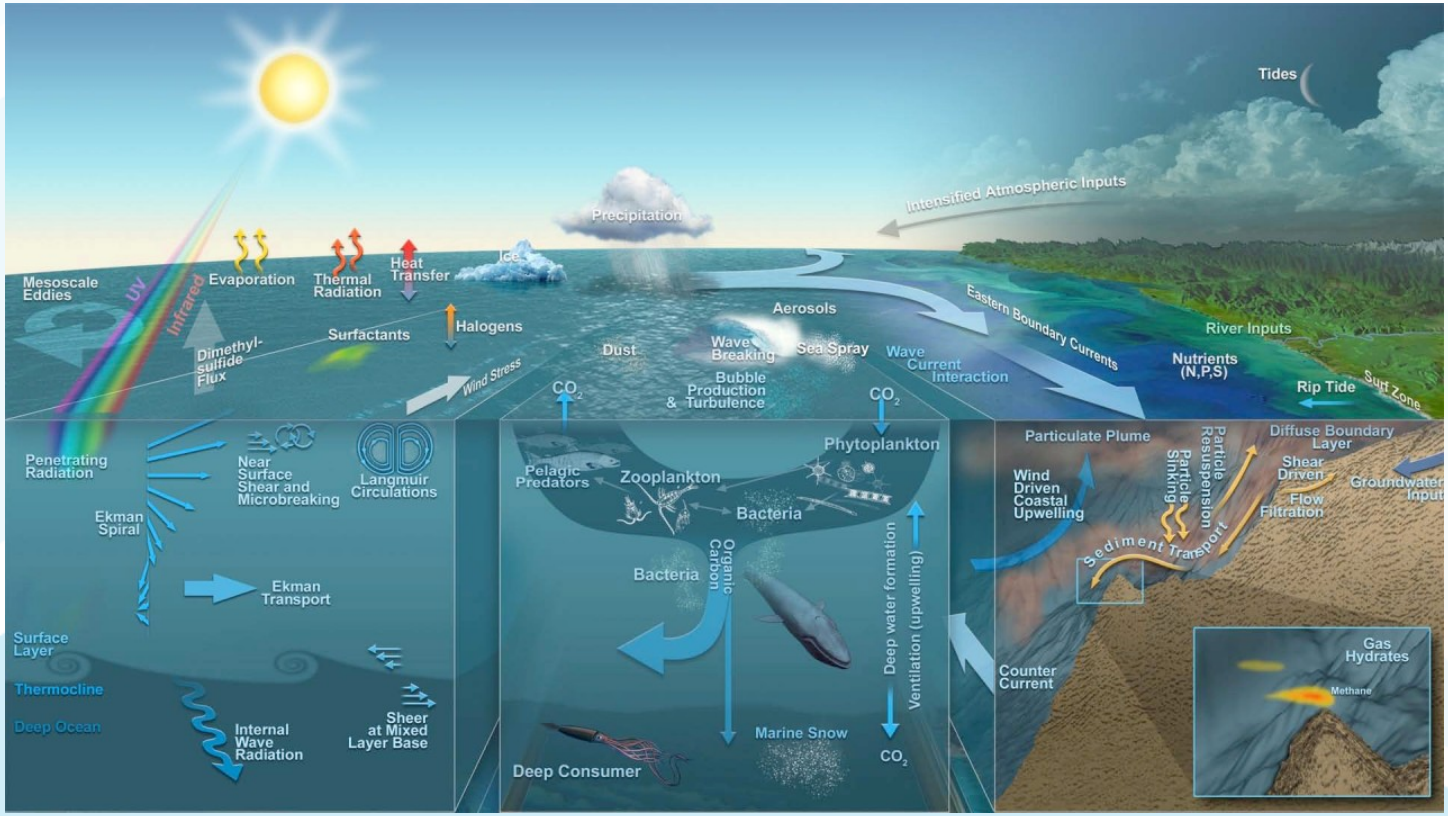
INTRODUCTION

- **Integrated Maritime Policy** (IMP) promotes the Blue Growth by a sustainable use of marine resources.
- **Blue economy** should need to consider the **interactions** between human activities and their potential effects on marine environment and biodiversity
- **MSP and ICM** provide useful tools to achieve such objectives, based on recent scientific and technological achievements, and following sustainability principles

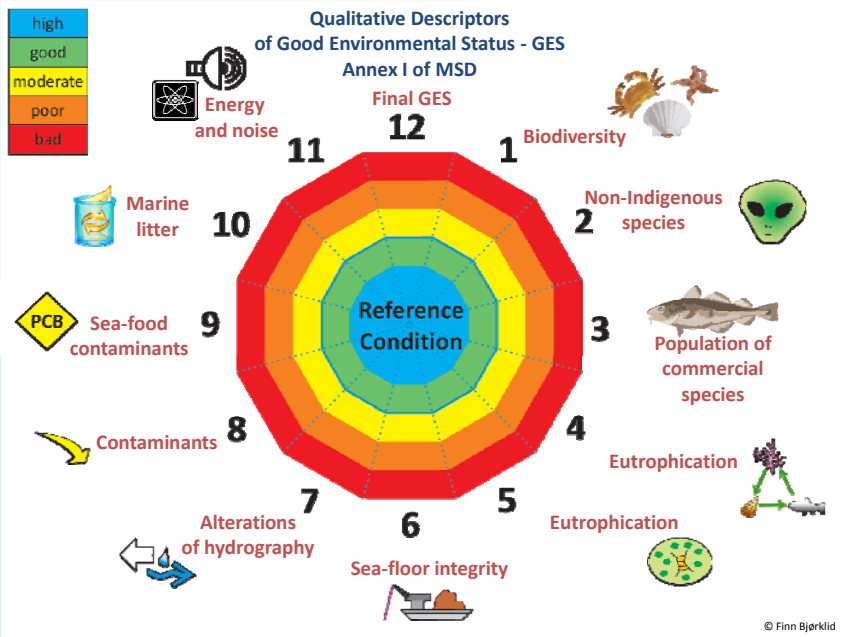
INTRODUCTION

- Marine and coastal environments are **complex ecological systems**.
- **Scientific** and **technological** achievements contribute to the understanding multidisciplinary processes and their interactions at different spatial and temporal scales
- Such knowledge constitutes the basis for achieving sound and real **sustainability** as a response to global change.



INTRODUCTION

- The **Marine Strategy Framework Directive** (MSFD) constitutes the environmental pillar of the Integrated Maritime Policy (IMP).
- MSFD seeks a comprehensive approach to delivering **protection of marine environment**, while at the same time recognising the **needs of society** to benefit from marine resources and allowing **sustainable use** of those resources.
- Taking **effective management** decisions to deliver these disparate objectives requires an integrated systems analysis provided by the Ecosystem Approach (EA).
- The **Ecosystem Approach** is "*a resource planning and management approach that integrates the connections between land, air and water and all living things, including people, their activities and institutions*." (Knowseas project)



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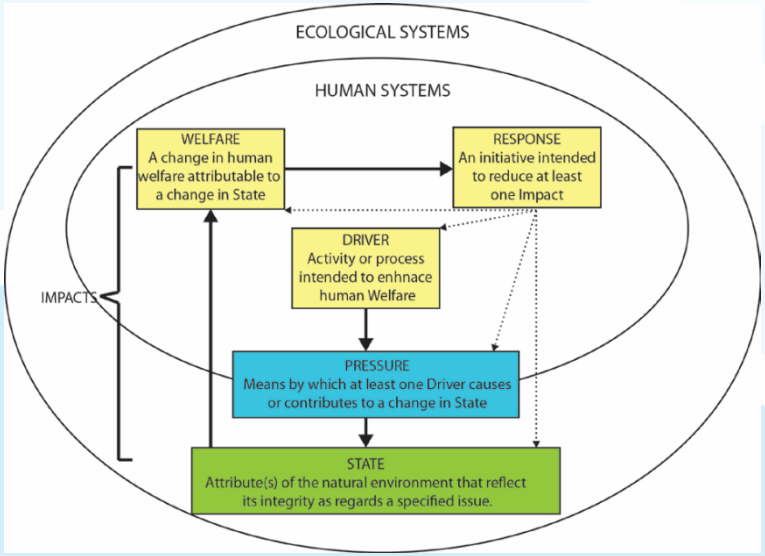
SCIENCE-POLICY GAP

- Limited understanding of ecosystems and of how to implement **ecosystem-based management**
- Limited **baseline data** (spatial and statistical)
- Limited understanding of **interactions** among the environmental, socio-economic-cultural, and governance systems.
- Lack of **communication** and **coordination** among scientists and decision-makers.
- Inefficient and insufficient **governance system** for managing natural resources and lack of sound, knowledge based, **decision making tools** in the coastal and marine areas.



SCIENCE-POLICY GAP

Advance sustainability science to support the implementation of European policies such as the IMP and the MSFD through conducting research at local, regional, and international scales.

- Provide adequate **marine information** through observations and modelling products to respond to science, technology and society needs
- Increase **knowledge** and understanding of **human-environment interactions** in coastal and marine zones and provide practical solutions to solving sustainability problems
- Develop and evaluate **science-based decision-making tools** and methods to support MSP and ICM and related frameworks, with particular emphasis on the integration of **social and ecological dimensions**

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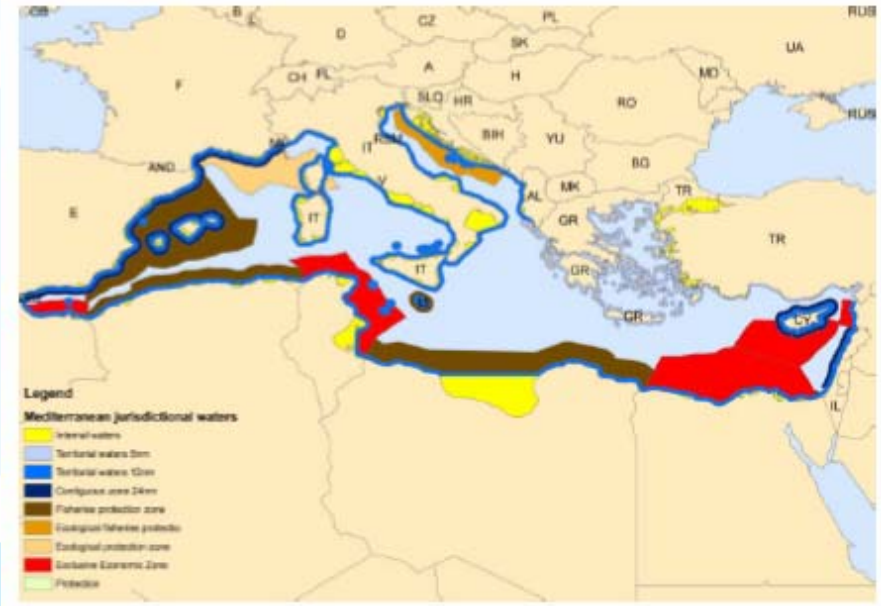
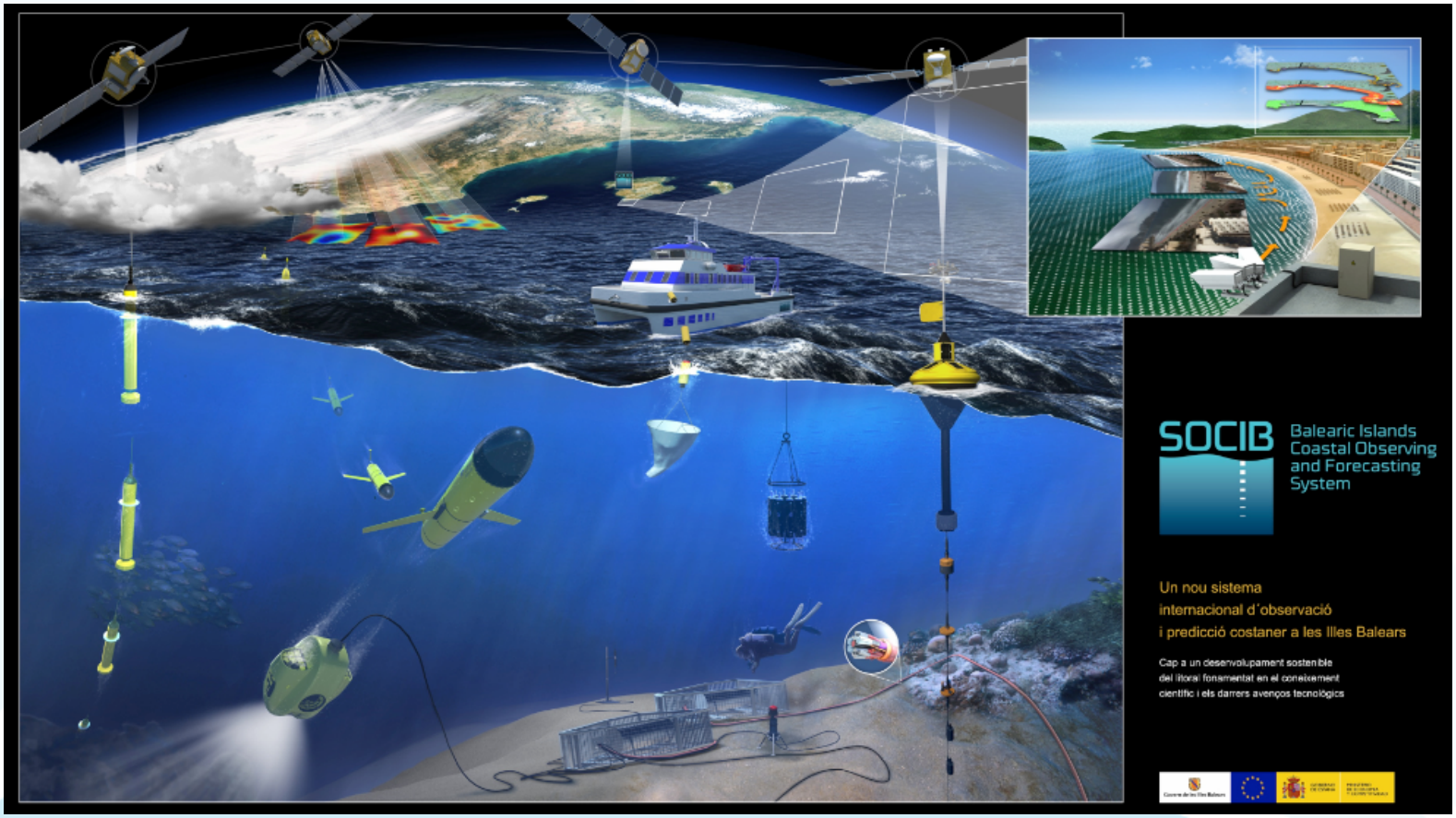
MARINE INFORMATION

- Information is required both for **scientific use** and for supporting decision making **tools**
- **European initiatives** promote the transfer and availability of marine information (eg. Marine Knowledge 2020, Emodnet, GMET, INSPIRE)
- Following **main principles**, public marine information need to be:
  - Discoverable
  - Accessible
  - Freely available
  - Quality assured
  - Interoperable
  - Standardized
- Marine data main issues:
  - **Multidimensional**
  - **Cross-border**
  - **Cross-sector**



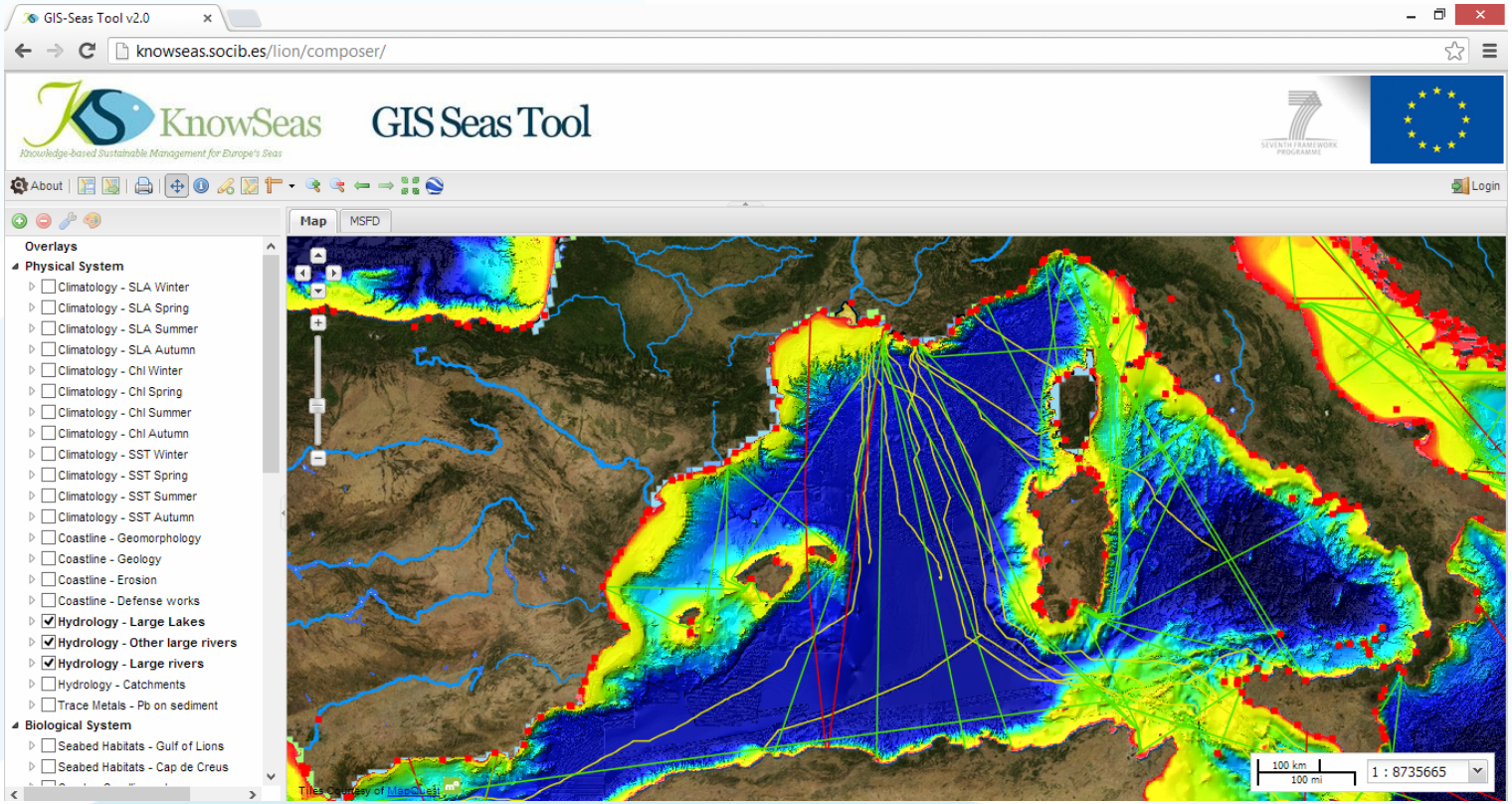
MARINE INFORMATION

- **Observing systems** and **monitoring programs** (including those related to the implementation of the MSFD) are required to provide observations and modelling products to respond to science, technology and society needs.



MARINE INFORMATION

- Development of **Marine Spatial Data Infrastructures (MSDI)** using open source components to support the implementation of the MSFD



http://knowseas.socib.es/lion

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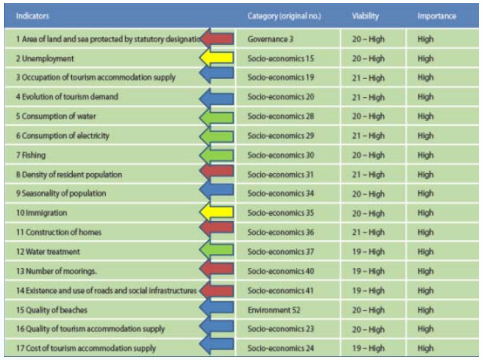
SCIENCE AND TECHNOLOGY

IMEDEA/SOCIB, in cooperation with the Government of Balearic Islands, coordinated the Integrated Coastal Zone Management project UGIZC. The main **scientific outcomes** derived from this project include:

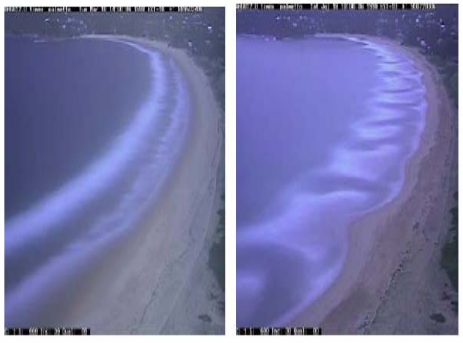
Boating zonation

Environmental sensitivity of the coastline

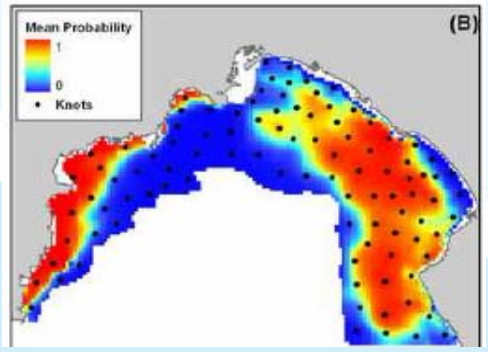


Indicators	Category (original no.)	Viability	Importance
1 Area of land and sea protected by statutory designatio	Governance 3	20 – High	High
2 Unemployment	Socio-economics 15	20 – High	High
3 Occupation of tourism accommodation supply	Socio-economics 19	21 – High	High
4 Evolution of tourism demand	Socio-economics 20	21 – High	High
5 Consumption of water	Socio-economics 28	20 – High	High
6 Consumption of electricity	Socio-economics 29	21 – High	High
7 Fishing	Socio-economics 30	20 – High	High
8 Density of resident population	Socio-economics 31	21 – High	High
9 Seasonality of population	Socio-economics 34	20 – High	High
10 Immigration	Socio-economics 35	20 – High	High
11 Construction of homes	Socio-economics 36	21 – High	High
12 Water treatment	Socio-economics 37	19 – High	High
13 Number of moorings.	Socio-economics 40	19 – High	High
14 Existence and use of roads and social infrastructures	Socio-economics 41	19 – High	High
15 Quality of beaches	Environment 52	20 – High	High
16 Quality of tourism accommodation supply	Socio-economics 23	20 – High	High
17 Cost of tourism accommodation supply	Socio-economics 24	19 – High	High

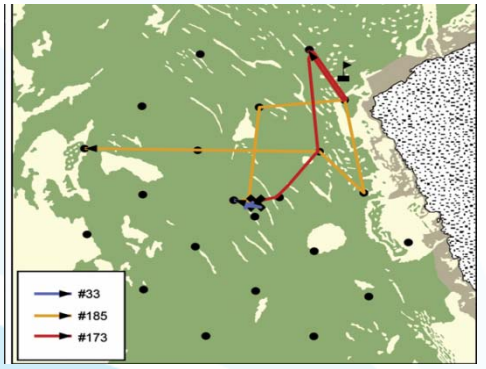
Indicators of sustainability



Beach morphodynamics



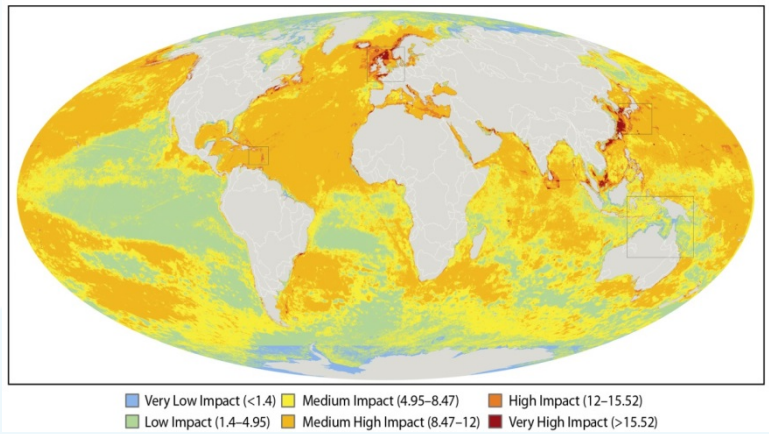
Benthic habitat mapping

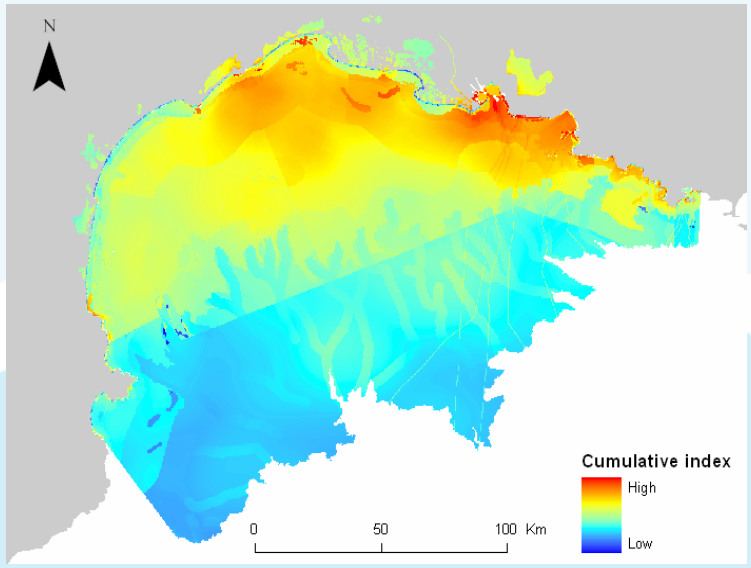


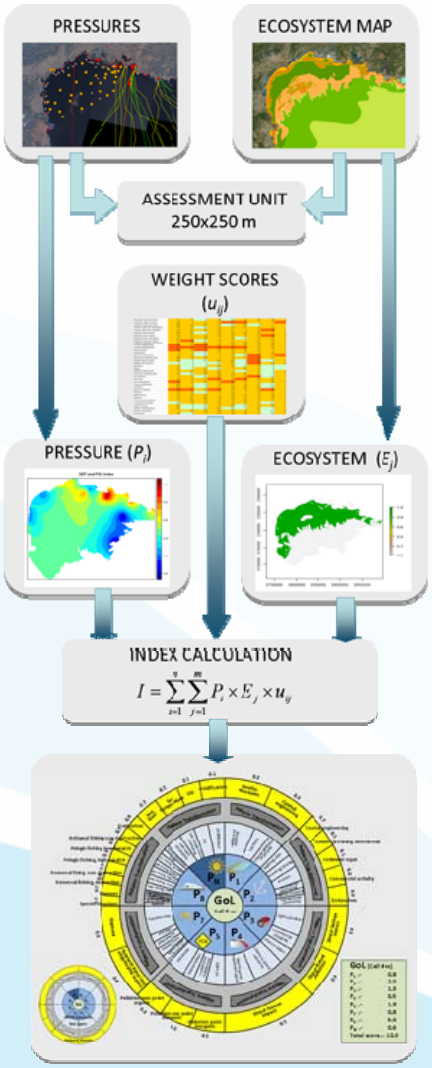
Fish movement within MPA

SCIENCE AND TECHNOLOGY

Application of the **cumulative pressure mapping** (Halpern et al. 2008) as an assessment tool within the context of the Marine Strategy Framework Directive (MSFD)







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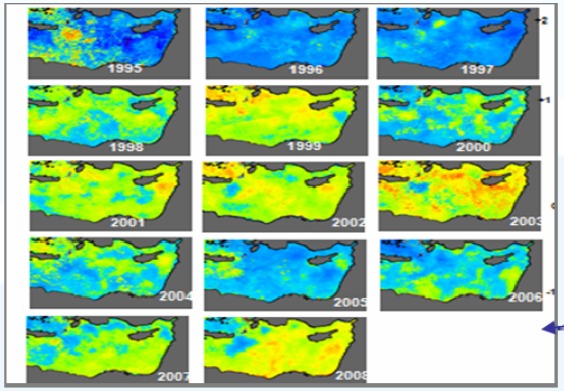
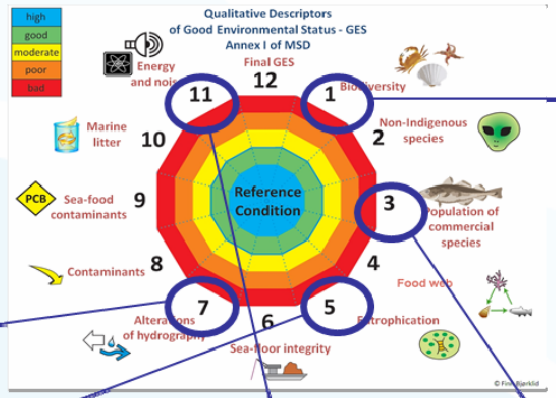
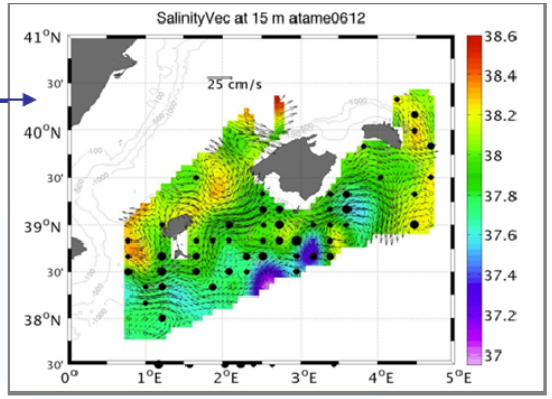
RESPONSE TO SOCIETY

The new observing systems, by integrating different types of monitoring platforms at different scales, and by this, providing data and tools, contribute to **MSFD pressures and states indicators** as shown in the examples provided in the figure bellow.

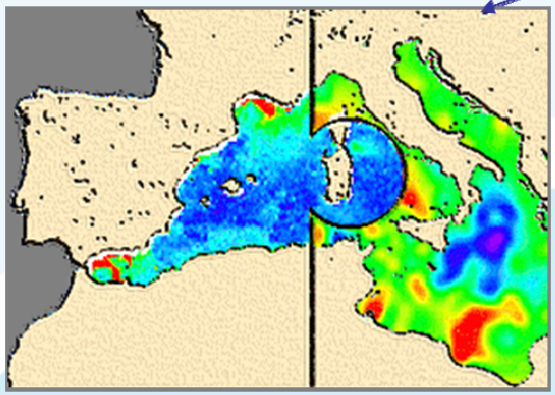


SST to assess hydrography

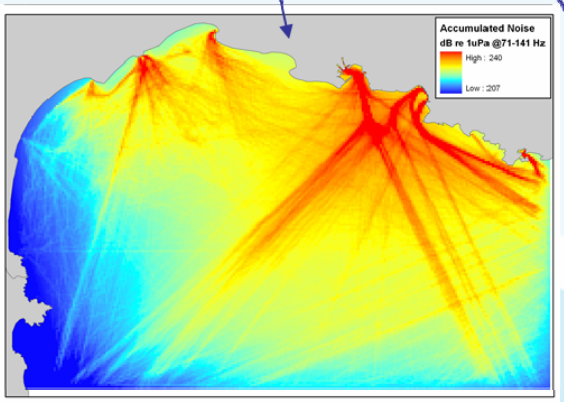




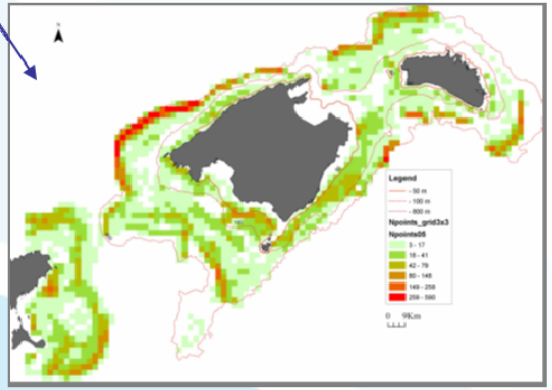
Biological models to assess biodiversity



Ocean color to assess eutrophication



AIS to assess underwater noise

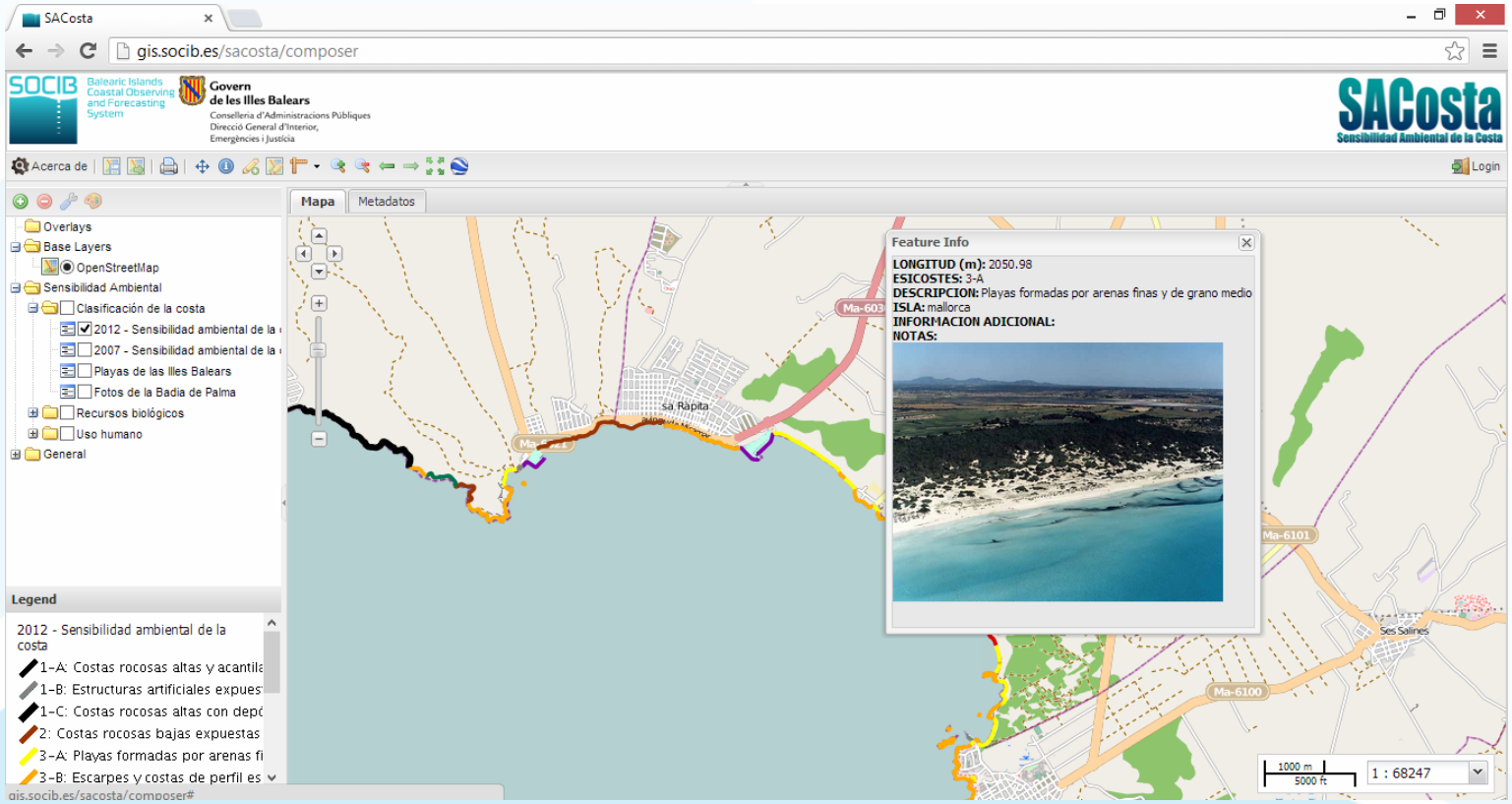


VMS to monitor fishing pressure

RESPONSE TO SOCIETY

SACOSTA (Environmental Sensitivity of the Coastline) provides:

- geomorphological classification of the coast
- biological resources (coastal protected areas)
- human use (i.e. infrastructures, services, cultural and historic resources).



http://gis.socib.es/sacosta

RESPONSE TO SOCIETY

- **Knowledge transfer** from science to society
- Provide **science-based tools** to support decision making
- Support **stakeholder platforms** within the context of the MSFD

www.msfd.eu

Adaptive Policy Framework Toolbox

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CONCLUSIONS

- **Scientific information** through the ecosystem based approach can be incorporated into MSP and ICM
- Promote research, technological innovation and development for **monitoring** coastal habitats and open ocean
- Development of **tools** that convert scientific information into readable formats by stakeholders can aid in the decision-making processes
- The real challenge is piecing together all of the elements through the process of ICM and MSP to support **policy-based research**

SOCIB Balearic Islands Coastal Observing and Forecasting System

GIZC

KnowSeas
Knowledge-based Sustainable Management for Europe's Seas

PERSEUS
POLICY-ORIENTED MARINE ENVIRONMENTAL RESEARCH IN THE SOUTHERN EUROPEAN SEAS

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¡MUCHAS GRACIAS!

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