

***The EuSeaMap project, for a large scale
cartography of European seabeds
Definition of the process to model habitat
distribution in the western Mediterranean***

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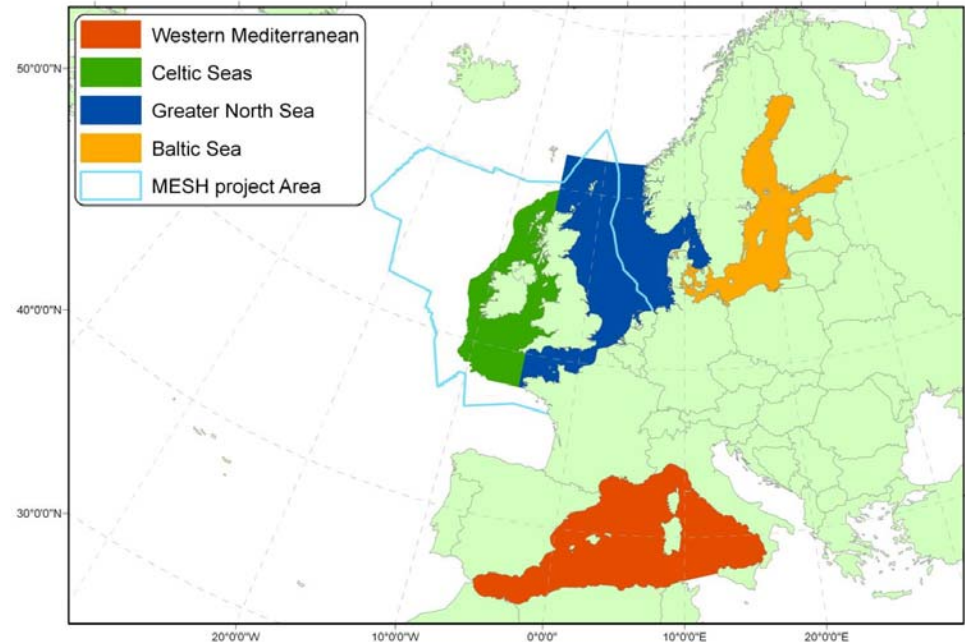
ISPRA

Istituto Superiore per la Protezione
e la Ricerca Ambientale

EuSeaMap project contract MARE/2008/07 **- Overall objective -**

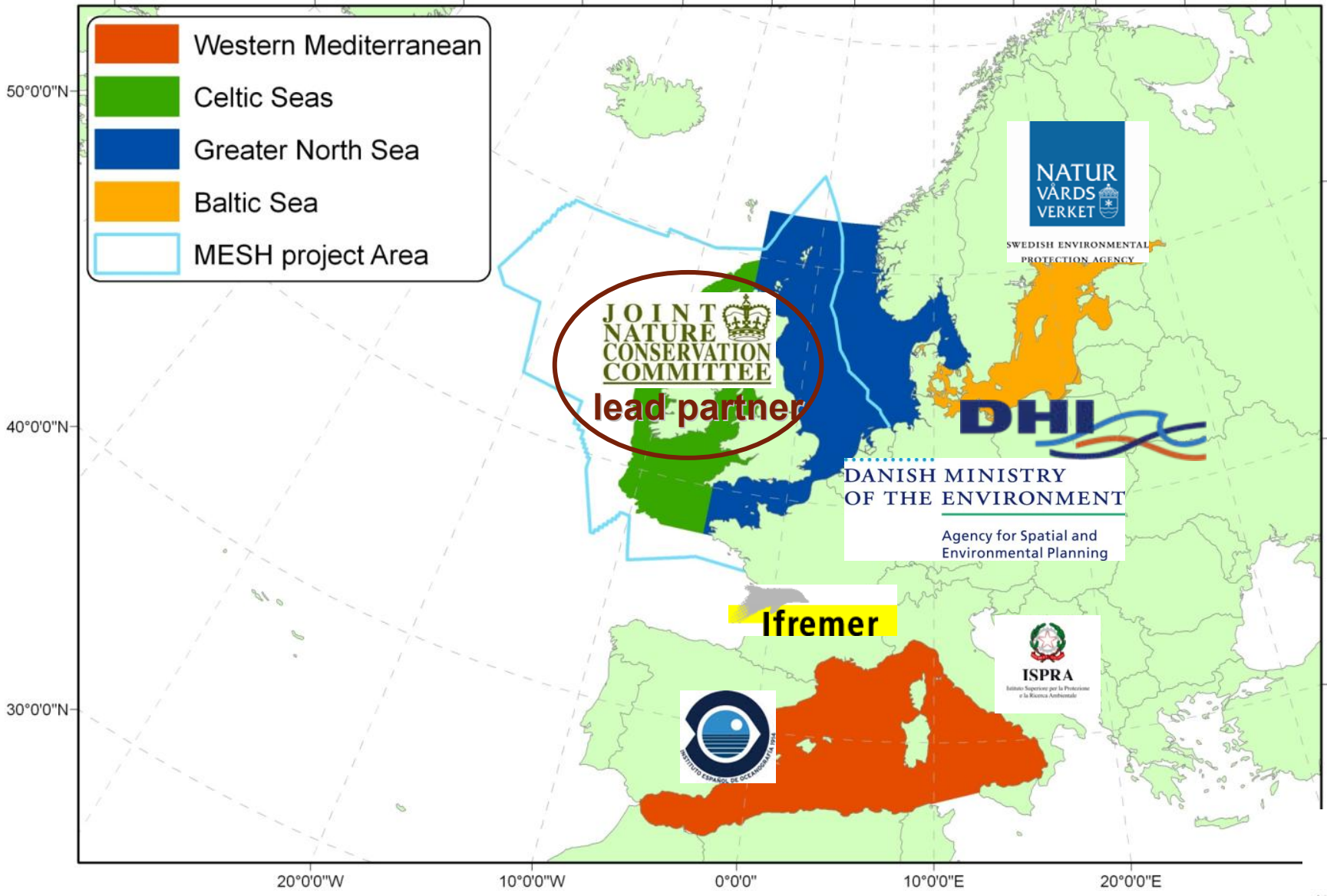
To provide **broad-scale maps of seabed habitats**, using common functional mapping methods, for the

- *Baltic Sea*
- *Greater North Sea*
- *Celtic Seas*
- *Western Mediterranean*



and to determine what further steps are required to improve their usefulness and coverage

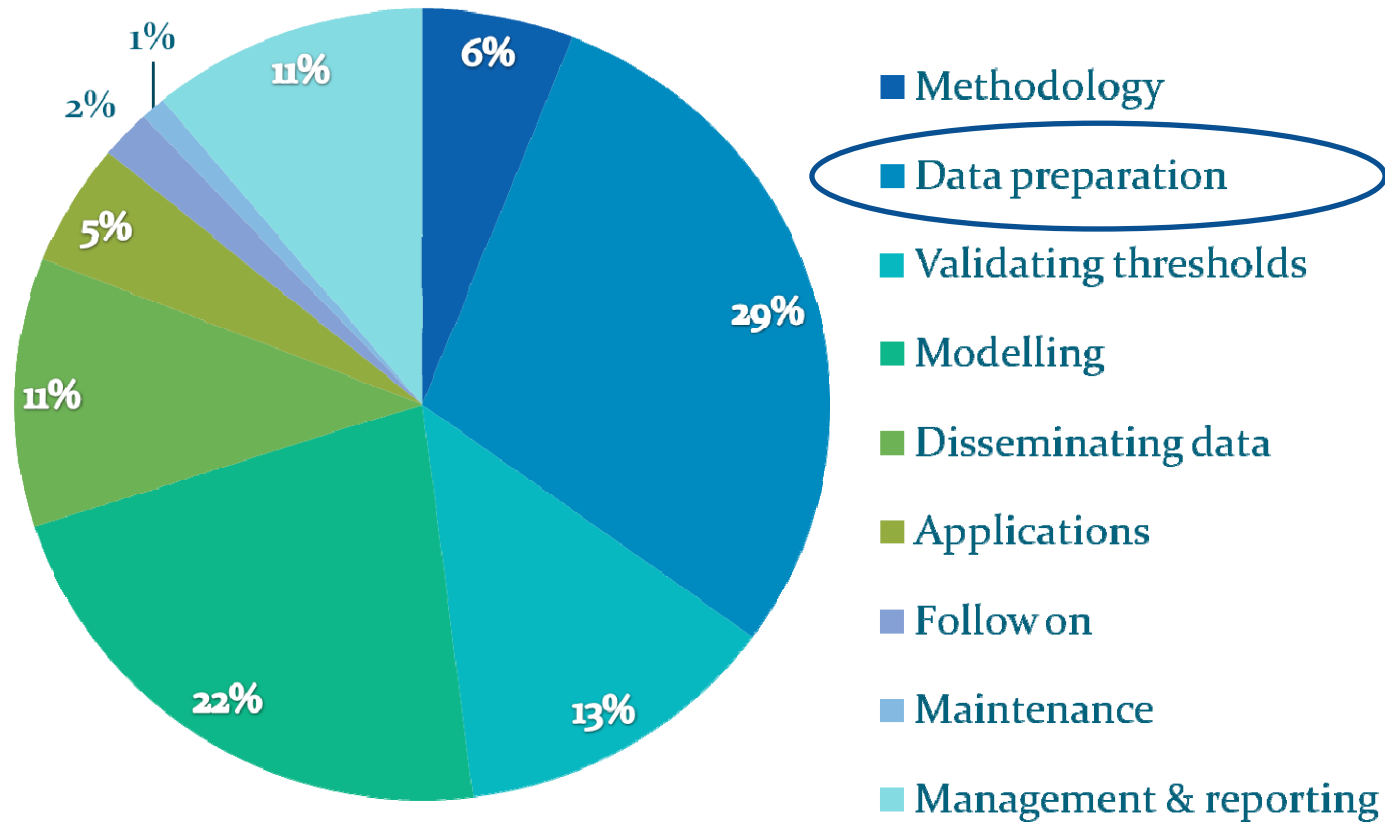
Partners of the project



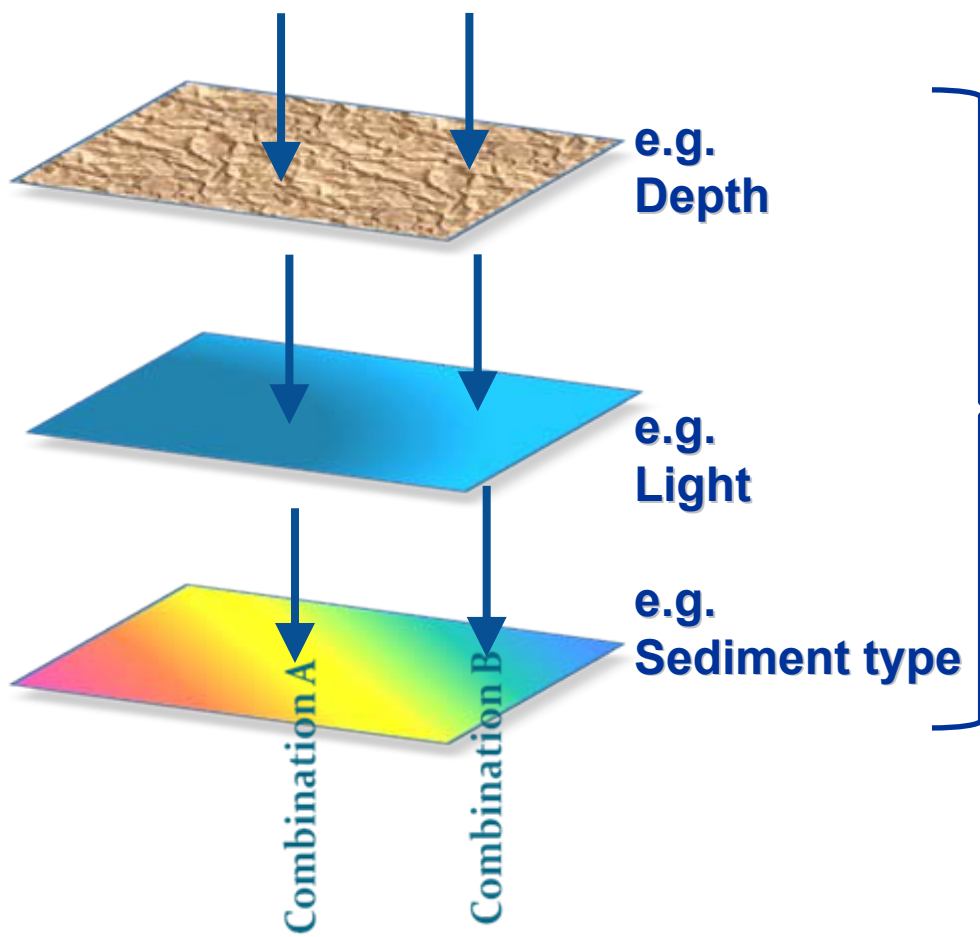
EuSeaMap project - Specific objectives

- 1. Review existing broad-scale marine habitat mapping efforts***
- 2. Prepare a broad-scale seabed habitat map***
- 3. Make data available online***
- 4. Assess benefits***
- 5. INSPIRE implementation***
- 6. Assess next steps***
- 7. Maintenance***

Work packages



Modelling approach



- Biologically relevant?
- Represented in **EUNIS**?

CELL SIZE = 250m

schematic example with 3 physical data layers

What is **EUNIS**?

The **EU**ropean **N**ature **I**nformation **S**ystem includes a habitat classification (<http://eunis.eea.eu.int/habitats-code-browser.jsp>)

- **Content:** to be a reservoir of information on environmentally important matters in Europe
- **Tools:** to facilitate use of data by promoting harmonisation of terminology and definitions

Aims

- provide a “common language” for reporting on habitats
- enable mapping of units at a regional level by encompassing habitats from all biomes (terrestrial, freshwater, marine)
- comprehensive and applicable at different levels of complexity
- allow aggregation, evaluation and monitoring of habitat units
- provide a common framework: new information and links to other classifications

Principles of the EUNIS classification

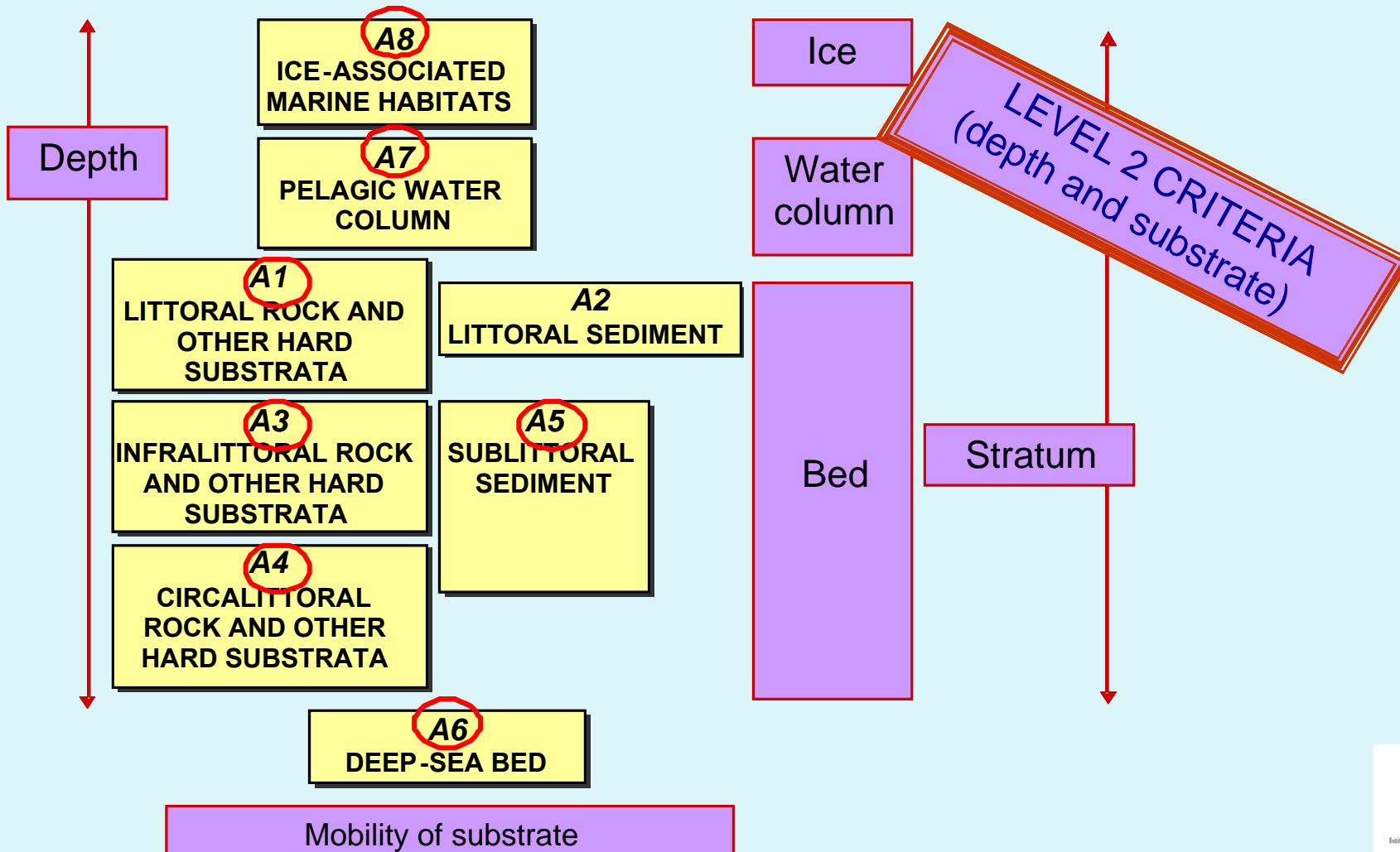
- **Hierarchical (currently goes up to 6 levels of hierarchy)**
- **Units at a given hierarchical level to be of similar importance**
- **Clear criteria for each division to level 3**
- **Units at level 4 and below follow criteria of higher levels**
- **Logical sequence of units**
- **Use clearly defined non-technical language**
- **Ecologically distinct habitat types supporting different plant and animal communities should be separated**
- **Habitats from different locations differing on the basis of geographical range only should not be separated**
- **Habitat units and habitat complexes are separated**

The classification has an hierarchical structure. There are 10 Level 1 units. X units are habitat complexes comprising components of several habitat types operating as a connected ecosystem.

LEVEL 1: ENVIRONMENT TYPE (A-J, X)

A MARINE	B COASTAL HABITATS	C INLAND SURFACE WATERS	D MIRES, BOGS AND FENS	E GRASSLANDS AND LANDS DOMINATED BY FORBS, MOSSES OR LICHENS
F HEATHLAND, SCRUB AND TUNDRA	G WOODLAND, FOREST AND OTHER WOODED LAND	H INLAND UNVEGETATED OR SPARSELY VEGETATED HABITATS	I REGULARLY OR RECENTLY CULTIVATED AGRICULTURAL, HORTICULTURAL AND DOMESTIC HABITATS	J CONSTRUCTED, INDUSTRIAL AND OTHER ARTIFICIAL HABITATS
X HABITAT COMPLEXES				

LEVEL 2 : MARINE HABITAT UNITS (1 -8)



EUNIS

LEVEL 3: MARINE HABITAT UNITS (156)

Examples:

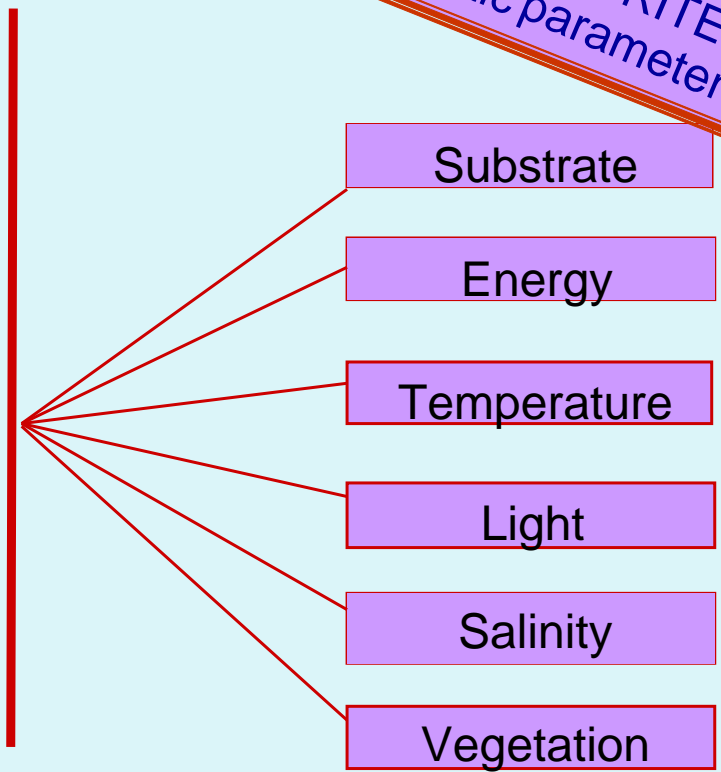
A1
 ØA1.1 High energy littoral rock
 ØA1.2 Moderate energy littoral rock
 ØA1.3 Moderate energy littoral rock

A2
 ØA2.1 Littoral coarse sediment
 ØA2.2 Littoral sand and muddy sand
 ØA2.3 Littoral mud

A3
 ØA3.1 Atlantic and Mediterranean high energy infralittoral rock
 ØA3.2 Atlantic and Mediterranean moderate energy infralittoral rock

A4
 ØA4.1 Atlantic and Mediterranean high energy infralittoral rock

**LEVEL 3 CRITERIA
(abiotic parameters)**



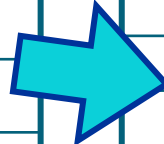
Mediterranean benthic habitats have been incorporated into EUNIS (ISPRA activity within ETC/BD consortium)

Mediterranean



UNEP (OCA)/MED WG 149/5
Rev.1

Zone	Tot. # of Bioceonosis	Tot. # facies/ assemblages
Supralittoral	4	7
Mesolittoral	6	19
Infralittoral	9	65
Circalittoral	8	34
Bathyal	4	5
Abyssal	1	
Total	32	130



EUNIS LEVEL	TOTAL n. habitats
A1	22
A2	9
A3	37
A4	23
A5	59
A6	9
B2	1
B3	2
TOTAL	162

Habitats / Biological communities considered for the Mediterranean

1. Identification of relevant habitats / communities to be modeled for the Mediterranean

- Mediterranean benthic habitats present in EUNIS were screened based on their representativity in a 250m cell size
- Results of screening: ≈ 20 habitats that may be mapped through modeling in EUSeaMap

2. Threshold identification

- Identify (through published data) the physical thresholds (light, energy, bathymetry, substrate) for each of the above in order to attempt mapping.
OR,
- Identify (through existing cartographies) the respective light and energy threshold values obtained from modeled light and energy layers.
- If thresholds are not identifiable, revert to broader scale EUNIS categories

Habitats that may be mapped through modeling in EUSeaMap

EUNIS Habitat code	EUNIS Lev.	Eunis name
A3	2	Infralittoral rock and other hard substrata
A5.23	4	Infralittoral fine sand
A5.51	4	Maerl beds (Infralittoral and Circalittoral)
A4	2	Circalittoral rock and other hard substrata
A4.26D	5	Coralligenous platforms
A4.27	4	Faunal communities on deep moderate energy circalittoral rock
A5.39	4	Mediterranean biocoenosis of coastal terrigenous muds
A5.38	4	Mediterranean biocoenosis of muddy detritic bottoms
A5.46	4	Mediterranean biocoenosis of coastal detritic bottoms
A5.47	4	Mediterranean communities of shelf-edge detritic bottoms
A5.471	5	Facies with [Neolampas rostellata]
A5.472	5	Facies with [Leptometra phalangium]
A5.14	4	Circalittoral coarse sediment
A6.51	4	Mediterranean communities of bathyal muds
A6.511	5	Facies of sandy muds with [Thenea muricata]
A6.512	5	Facies of fluid muds with [Brissopsis lyrifera]
A6.513	5	Facies of soft muds with [Funiculina quadrangularis] and [Apporhais seressianus]
A6.514	5	Facies of compact muds with [Isidella elongata]
A6.31	4	Communities of bathyal detritic sands with [Grypheus vitreus]
A6.52	4	Communities of abyssal muds

Seagrass meadows distribution present in the geomorphologic layer

Data types needed

Data type	Baltic	North	Celtic	W Med
<i>Sediment</i>	✓	✓	✓	✓
<i>Bathymetry</i>	✓	✓	✓	✓
<i>Light</i>	✓	✓	✓	✓
<i>Wave energy at seabed</i>	✓	✓	✓	✓
<i>Tidal energy at seabed</i>	✓	✓	✓	✓
<i>Salinity at seabed</i>	✓	✓	✓	
<i>Temperature at seabed</i>	✓	✓	✓	✓
<i>O2/POC/Chl</i>	✓	✓		
<i>Ice cover</i>	✓			
<i>Stratification</i>	✓	✓		

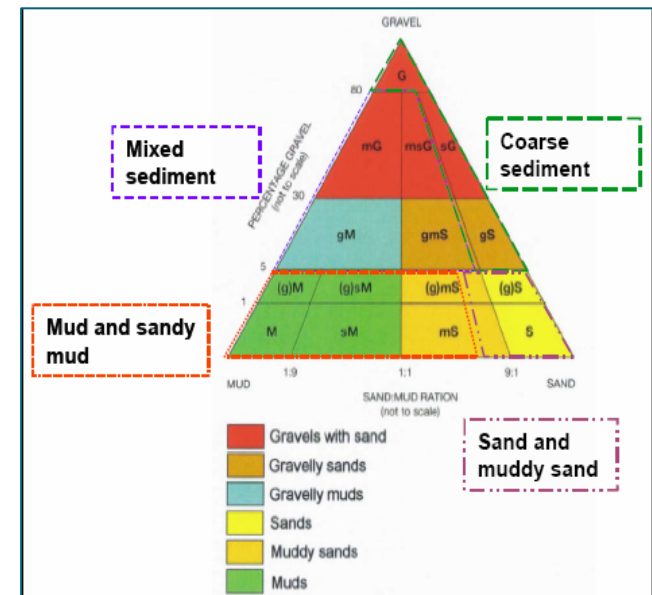
✓ = data to be delivered by the preparatory action of EMODNET project

Data preparation in which ISPRA is involved

Sediments:

- collection of cartographic sediment data on national scale
- harmonization of sediment categories to fit into unique matrix

area	source	original classification
Liguria	Quaderno Icram Liguria	Folk e ward semplificata
Toscana	GIS natura	non segue classificazione standard
Lazio	GIS natura	Nota
Campania	CARG	Folk e ward semplificata
Calabria	GIS natura	
Sardegna	carta posidonia sardegna	derivata da carta biocenotica



Bathymetry:

- Conversion of IIMM bathymetric maps into raster format

ISPRA collaborators to the project

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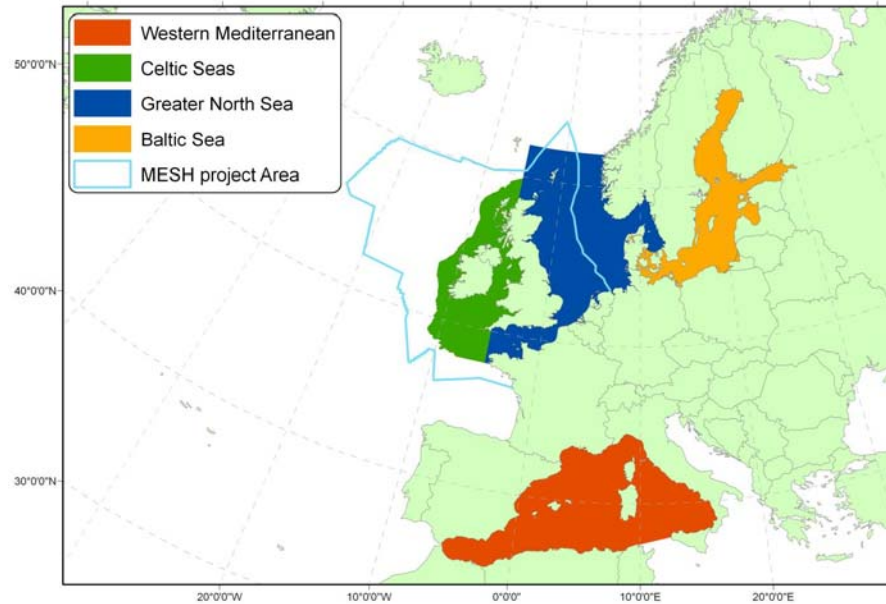
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Aldo Annunziatellis

ISPRA

Possible next steps



- *To complete the mapping of the EU seas*
- *To increase the detail of the maps and their usefulness for new management purposes*

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- Thank you -