

Criteria for the identification of deep-sea protected areas in the Mediterranean Sea: a lesson from IDEM Project



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- 210 meters

Cold-water corals (*Madrepora oculata*)

Implementation of the Marine Strategy for the Deep Mediterranean



IDEM in a nutshell

- 2 years project funded by DG-ENV, coordinated by UNIVPM
- 9 partners from Italy, France, Spain, Malta, Cyprus and Israel

Main objectives

Review of literature, identification of gaps and pressures

Definition of new criteria and indicators suitable for the deep sea

Definition of thresholds

Definition of guidelines for the protection of the deep sea

IDEM MSFD Deep Med

The project IDEM ("Implementation of the MSFD to the Deep Mediterranean Sea") aims to support the next phase of MSFD implementation for the Mediterranean deep Sea (below 200 m of depth).

The project is coordinated by Polytechnic University of Marche (Italy) with the involvement of institutional partners of the Mediterranean area from EU and non-EU countries (8 EU partners and the University of Tel Aviv -Israel).

The two-years project IDEM (started in April 2017) has been funded through the call "Implementation of the second cycle of the Marine Strategy Framework Directive: achieving coherent, coordinated and consistent updates of the determinations of Good Environmental Status, initial assessments and environmental targets" by the DG Environment of the European Commission.

Partners: UNIVERSITAT DE BARCELONA, Ifremer, Consiglio Nazionale delle Ricerche, UNIVERSITÀ POLITECNICA DELLE MARCHE, DEPARTMENT OF MARINE AND COASTAL SCIENCES, CSIC, ENEA, UNIVPM, UNIVERSITÀ DI NAPOLI, DEPARTMENT OF MARINE AND COASTAL SCIENCES.

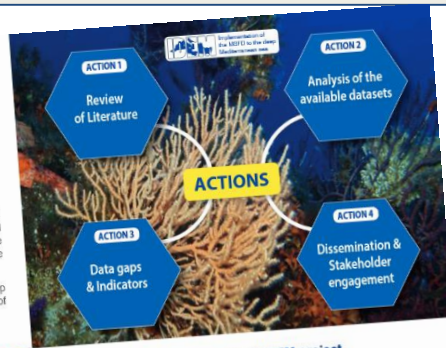
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Social Media: @idemproject, www.researchgate.net/project/IDEM-Project
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Project goals

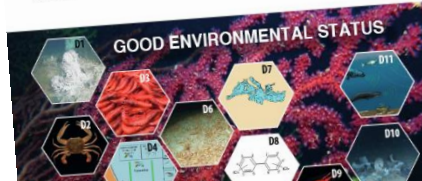
- to achieve a regionally coherent, coordinated and consistent initial environmental assessment and determination of Good Environmental Status (GES), as well as the definition of sets of environmental targets for the Mediterranean deep Sea;
- to focus on understanding, quantifying and mapping drivers, anthropogenic pressures and impacts, current knowledge and spatial coverage of data regarding the MSFD descriptors in the Mediterranean deep sea. These represent crucial steps towards developing a comprehensive set of environmental targets and associated indicators/criteria that can be used to extend the concept of GES to the deep sea;
- to review and update the determination of GES, environmental targets and criteria/indicators assessed so far for Mediterranean Sea coastal areas to be adapted to the Mediterranean deep-sea basin. Analysis of all indicators will be performed in order to establish key areas for monitoring;
- to provide information for the conservation and management of the deep Mediterranean sea, contributing to initiatives for the identification of Special Areas of Conservation and the design of Marine Protected Areas (MPA) networks.



The structure of IDEM project

Main Activities

- review of literature relevant for MSFD implementation in the Mediterranean deep sea;
- collection of existent and newly acquired databases in order to create GIS maps of the spatial extent of the descriptors/criteria/indicators as well as human pressures/impacts on the Mediterranean deep-sea ecosystems;
- adaptation of the MSFD descriptors/criteria/indicators to the Mediterranean deep sea;
- identification of threshold/baseline values for GES in the Mediterranean deep sea;
- identification of the gaps in knowledge concerning the 11 descriptors in the Mediterranean deep-sea basin;

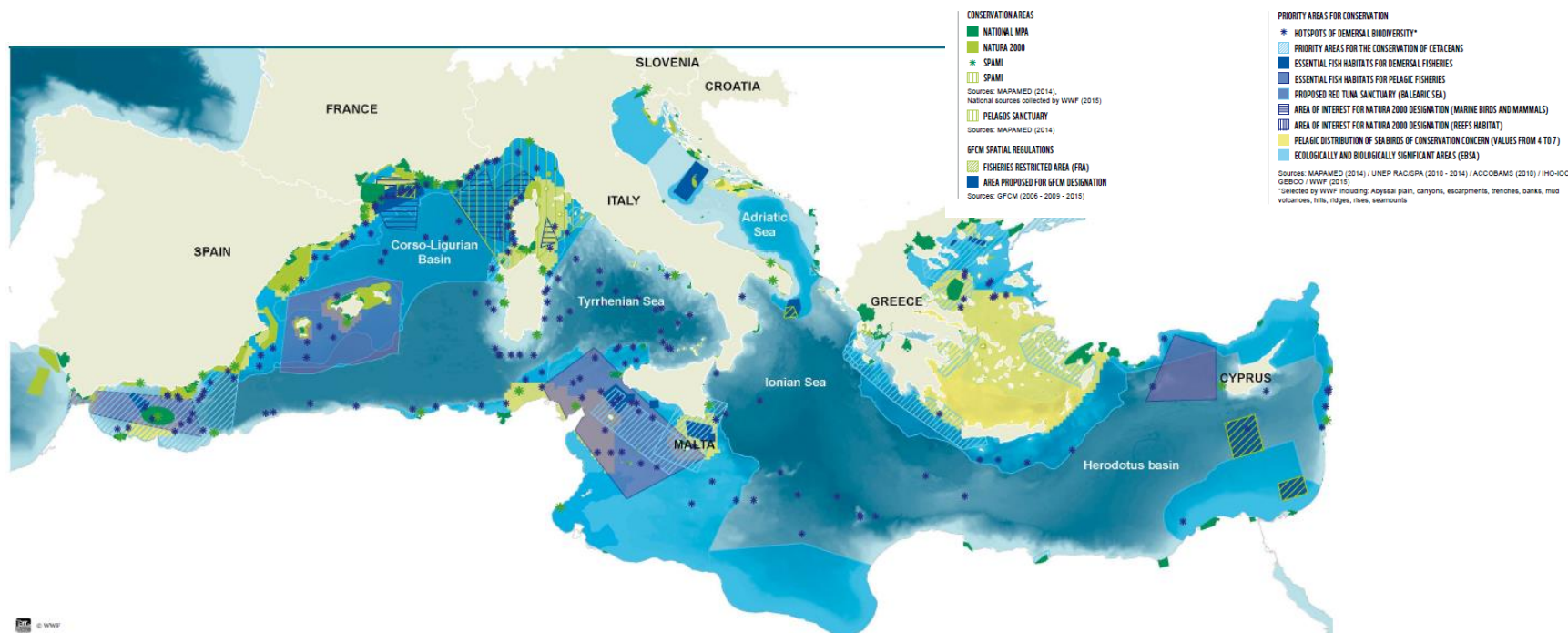


<http://www.msfd-idem.eu/>

Towards the protection of deep Med Sea



- Deep sea (>200 m) in the Mediterranean covers ca. 80% of the area (ca. 1.99 millions km², avg depth 1,500 m), but most are still largely unexplored
- MPAs and OECMs mostly cover shallow and EU waters...what about North African countries?



Only 5.31% of the area deeper than 200 m is covered by MPAs and Other Effective Area-Based Conservation Measures (OECM) (UNEP-MAP, 2016).

MPA distribution (cumulated % of MPAs in each basin, MedPAN UNEP/MAP RAC/SPA 2016):

- | | |
|-------------------------------------|-------------------------|
| 1. Alboran Sea: 7.93% | 5. Ionian Sea: 1.21% |
| 2. Algerian-Provencal Basin: 17.38% | 6. Levantine Sea: 5.13% |
| 3. Tyrrhenian Sea: 13.34% | 7. Aegean Sea: 3.95% |
| 4. Adriatic Sea: 5.17% | |

Towards the protection of deep Med Sea



The protection of the deep sea and the GFCM context

- ✓ FRAs were included in the last MPA status report
- ✓ Marine Environment protection is included in the GFCM Mid-Term strategy
- ✓ The protection of sensitive and vulnerable habitats is included in the commitment of the MedFish4Ever Declaration
- ✓ MoU between GFCM & UNEP-MAP (2012)



GFCM Mid-Term strategy target 4

TARGET 4: Minimize and mitigate unwanted interactions between fisheries and marine ecosystems and environment

Output 4.1: Reduced bycatch rates in Mediterranean and Black Sea fisheries

- implementation of a bycatch monitoring programme
- launch of a communication mechanism to educate on the negative impacts of bycatch
- implementation of effective management measures to improve the selectivity of fisheries
- proposal of measures to reduce catches of vulnerable species
- identification and implementation of mitigation measures to address the interaction between cetaceans and fishing gear

Output 4.2: Healthier marine ecosystems and more productive fisheries

- identification and promotion of the establishment of new fisheries restricted areas (FRAs)
- adoption of a comprehensive regional management plan for red coral
- creation of an adaptation strategy to cope with potential effects of invasive species and climate change on fisheries
- creation of an adaptation strategy to cope with the potential effect of marine litter on fisheries

MedFish4Ever Declaration

37. Ensure adequate protection of vulnerable species and sensitive habitats, with a specific attention to cetaceans, turtles, seabirds, seagrass habitats and coralligenous and maërl beds, including in marine protected areas without prejudice, if applicable, to the sovereign rights of States, designated for their conservation, through inter alia specific fisheries management measures embedded in multi-annual management plans;
38. Further develop fisheries restricted and marine protected areas ensuring an effective protection of at least 10% of the Mediterranean Sea by 2020, in line with the United Nations Sustainable Development goal 14.5 and Aichi Biodiversity Target 11 and by implementing the relevant actions under the Barcelona Convention's 'Roadmap for a comprehensive coherent network of well-managed marine protected areas (MPAs)'. We call upon GFCM contracting parties and the SAC to present to the GFCM annual session in 2018 proposals for the development of new fisheries restricted areas, without prejudice to the state's sovereign rights and in accordance with relevant international law, in particular to establish a consistent network of essential fish habitats, following a thorough consultation process. We invite the GFCM during this 2018 annual session to agree on a progressive calendar with quantified objectives to achieve this target;

Towards the protection of deep Med Sea: guidelines for the identification of deep MPAs



3 KEY ACTIONS:

- Establish effectively managed deep-sea protected areas, covering at least 10% of the Deep Mediterranean seafloor including representative and rare ecosystems (AICHI TARGET 11, CBD);*
- Extend FRA (GFCM) or FPA (EU adaptation of FRA) to protect from overfishing and habitat destruction;*
- Apply the precautionary principle to exploration and production (E&P) activities in the deep Mediterranean Sea*

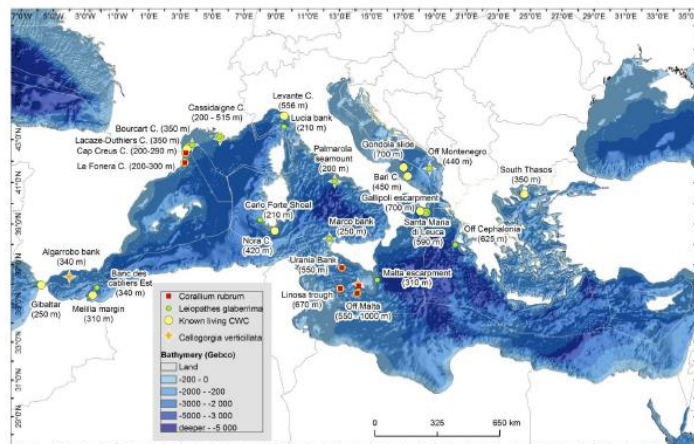


Figure 1.5: Distribution of several species of cnidarians living on rock outcrops in the deep (>200 m) Mediterranean Sea: Cold-Water Coral (*Lophelia pertusa* and/or *Madrepora oculata*) as yellow dots, *Callogorgia verticillata* as orange-white stars, *Leiopathes glaberrima* as green dots, *Corallium rubrum* as red squares, updated from Freiwald et al. (2009) and Taviani et al. (2016).

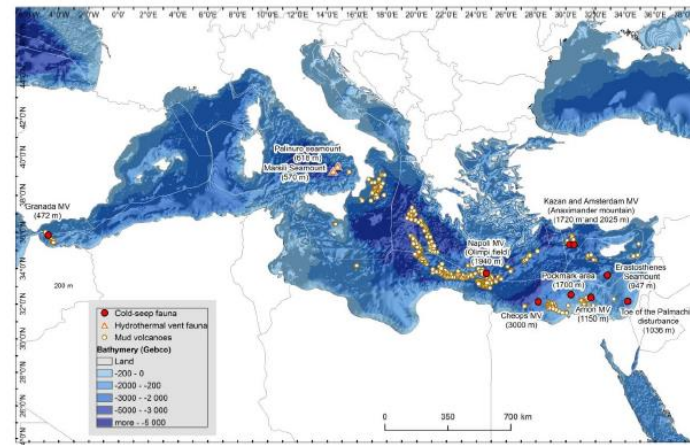



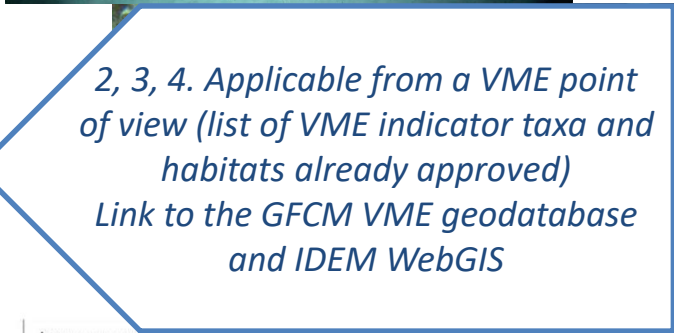
Figure 1.7: Distribution of mud volcanoes (white-brown dots) and known chemosynthetic fauna on hydrothermal vents (white-red triangles) or cold-seeps (red dots) in the Mediterranean Sea, adapted from Mascle et al. (2014).

a) Establish effectively managed deep-sea protected areas, covering at least 10% of the Deep Mediterranean seafloor, including representative and rare ecosystems

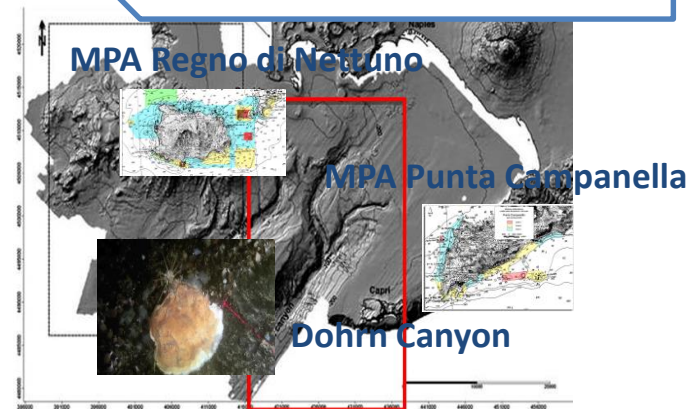
1. Provide a comprehensive list of Mediterranean deep-sea habitats and threatened species;
2. Identify biodiversity “hot-spots” (e.g., canyons, seamounts) for strict protection ;
3. Identify unique habitats (e.g., chemosynthetic habitats) for strict protection ;
4. Identify areas with representative soft-bottom habitats for strict protection ;
5. Identify protected coastal areas that are worth extending to include adjacent deep-sea habitats, including soft-bottom and trawlable grounds.



1. Ongoing at Barcelona Convention level. The Habitat Reference List will be adopted at the next COP



2, 3, 4. Applicable from a VME point of view (list of VME indicator taxa and habitats already approved)
Link to the GFCM VME geodatabase and IDEM WebGIS



Towards the protection of deep Med Sea

Different deep-sea benthic habitats are already listed in the MSFD and some overlap with OCEANA list

A. BATHYAL ROCKS AND BIOGENIC REEFS

1. Head of canyons (rocky canyons)
2. Large cnidarians on outcropping hard rocks
 - Structure forming white corals (*Lophelia pertusa* and *Madrepora oculata*)
 - The alcyonacean *Corallium rubrum*
 - The antipatharian *Leiopathes glaberrima* and other black corals
 - Forests of *Callogorgia verticillata*
3. Bivalves on outcropping hard rocks
 - Large deep-sea oyster *Neopycnodonte zibrowii* banks

B. BATHYAL SEDIMENTS

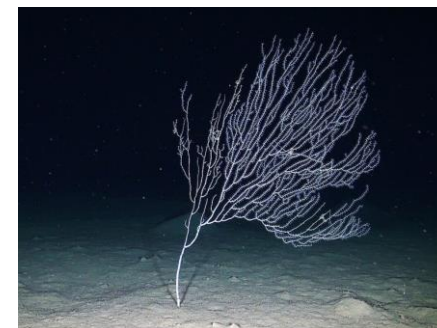
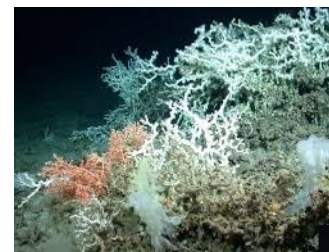
1. Head of canyons (sedimented canyons)
2. Large cnidarians on open slopes
 - Meadows of *Funiculina quadrangularis* and meadows of *Isidella elongata*
3. Bathyal muds and sands

C. BATHYAL CHEMOSYNTHETIC HABITATS

1. Soft substrata (Mud Volcanoes)
2. Hard substrata (Hydrothermal Vents)

D. SEAMOUNTS AND OTHER TOPOGRAPHIC ELEVATIONS (BATHYAL AND ABYSSAL DOMAIN)

E. ABYSSAL

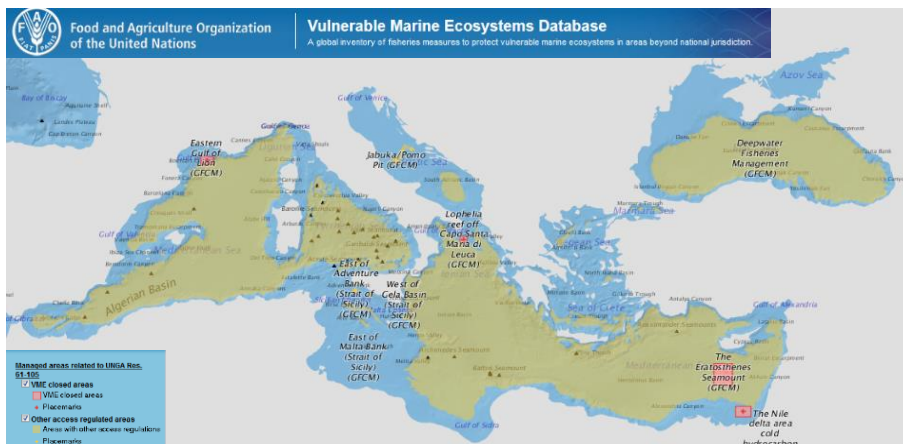


Towards the protection of deep Med Sea



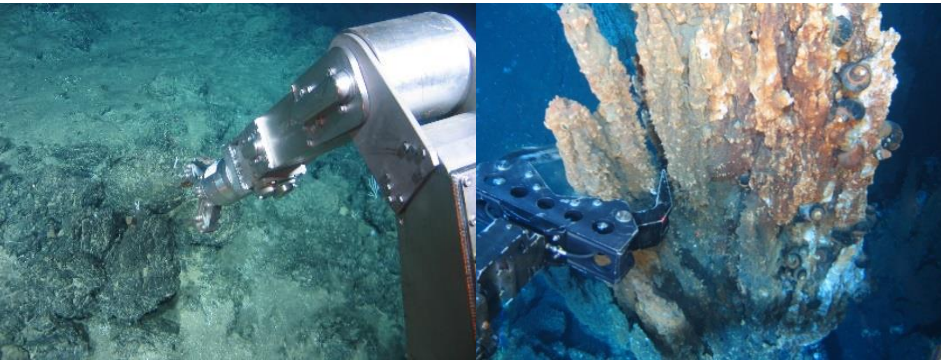
b) Extend fisheries restricted areas and enhance their management

1. Use the list of ecosystems provided in Key Actions A to propose the establishment of FRAs;
2. Create adequate buffer zones around VMEs and critical habitats at depths <600 m where trawling is banned;
3. Propose impact assessment for exploratory fishing;
4. Facilitate the accessibility of VMS and AIS data;
5. Propose the extension of the ban on trawling to below 600 m.

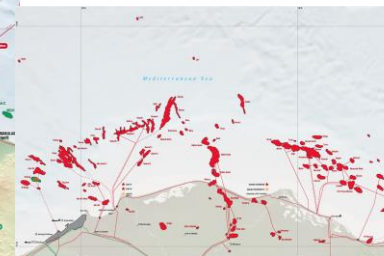


c) *Apply the precautionary principle to E&P activities*

1. Propose the assessment of the state of the environment of target areas previous to exploration activities;
2. Propose measures for reducing the detrimental impacts on benthic ecosystems;
3. Monitoring of target areas before, during and after activities;
4. Revise and harmonize Directive 2013/30/EU and the protocol against pollution resulting from exploration and exploitation of the continental shelf and the sea bed and sub soil of the Barcelona Convention in the light of current scientific knowledge.



Three main areas for offshore oil & gas in the Mediterranean Sea



Off Egypt (>200 m)



The IDEM geoportal for the deep Med sea



Identify areas subjected to multiple impacts where threatened species and VMEs occur

Legend

Sea Regions

IDEM area of interest

D1 - Biodiversity is maintained

Species occurrence (CoCoNet+UNEP)

- Alcyonacea
- Antipatharia
- Scleractinia
- Pennantulacea
- Porifera
- Neopycnodonte zibrowii
- Pachylasma giganteum

Habitat type (CoCoNet+IDEM)

- Bathyal mud
- Bathyal mud with facies of [Aporrhais serresianus]
- Chemosynthetic ecosystem
- Coralligenous
- Deep water cnidarians
- Deep water oysters
- Deep water rocks
- Maerl beds

Punctual geomorphological feature

- ▲ Knoll (UNEP)
- ▲ Mud volcano (UNEP)
- ▲ Seamount (IDEM)
- ▲ Seamount (UNEP)

Linear geomorphological feature

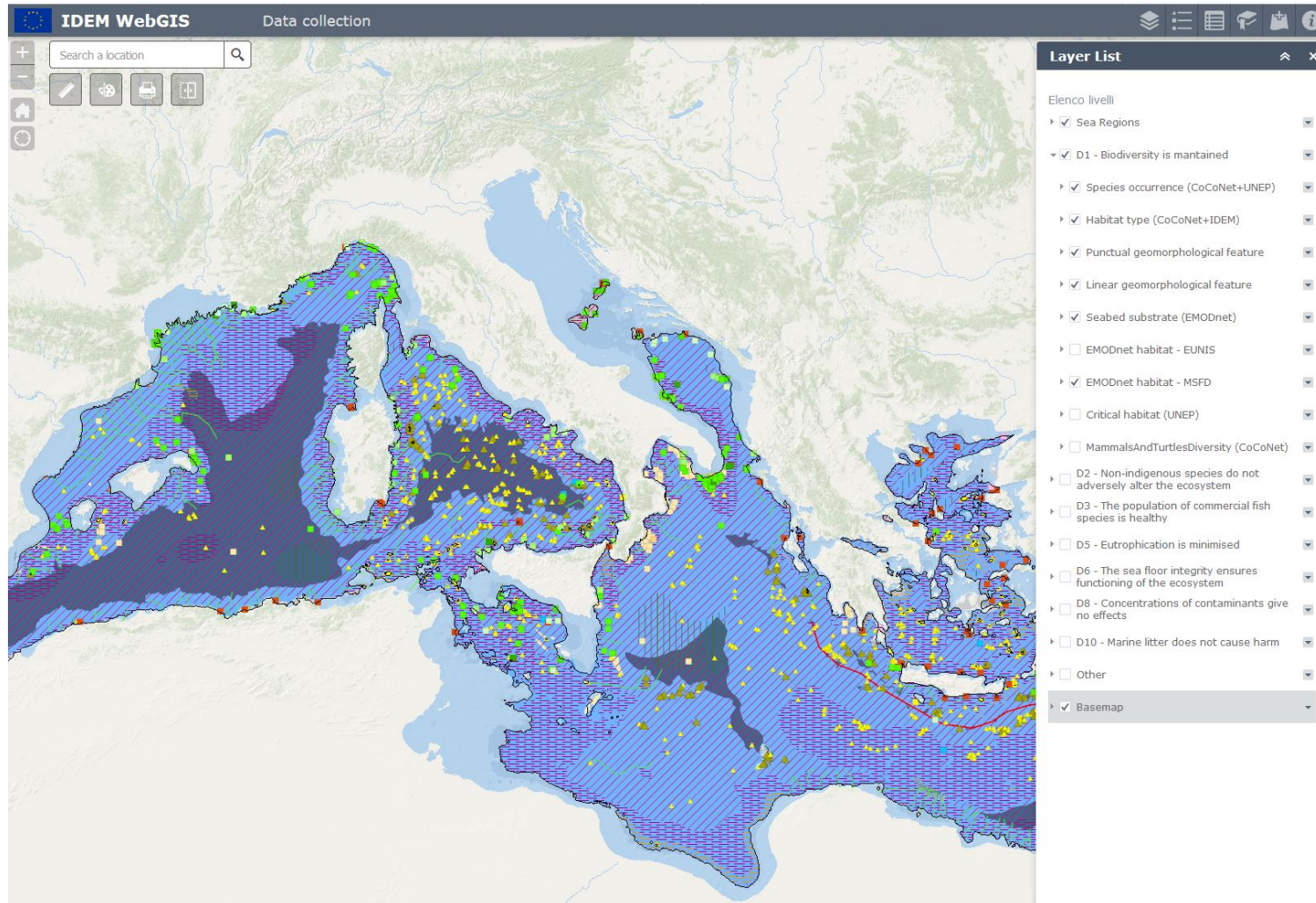
- Canyon (IDEM)
- Trench (IDEM)

Seabed substrate (EMODnet)

- Sand
- Silty sand
- Muddy sand
- Clayey sand
- Sandy silt
- Sandy mud
- Sandy clay
- Silt
- Mud
- Clay
- Muddy sand or Sandy mud
- Clayey sand or Sandy silt
- Volcanic
- Island or No data

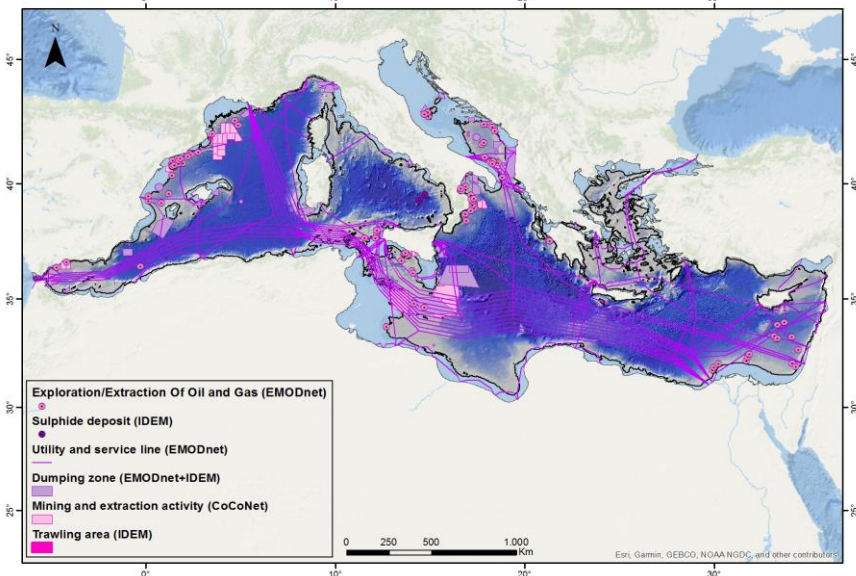
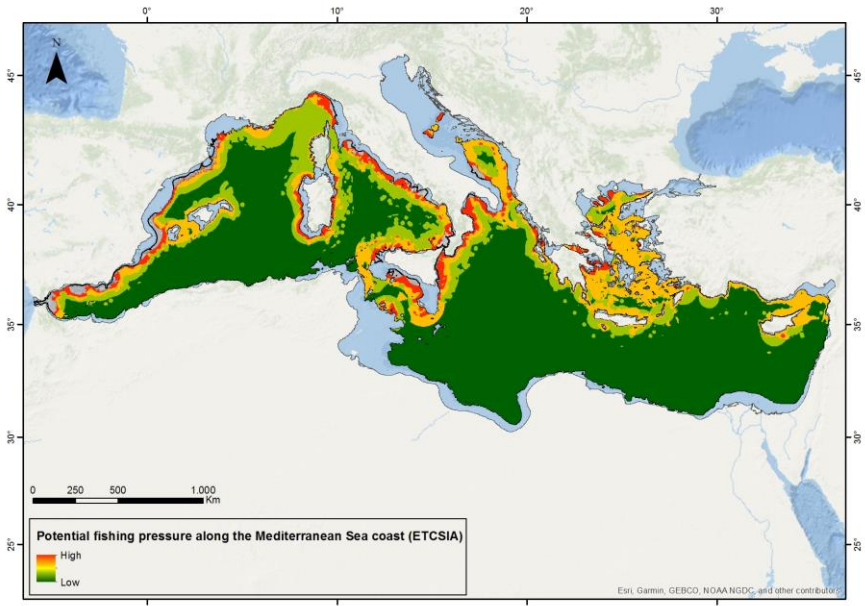
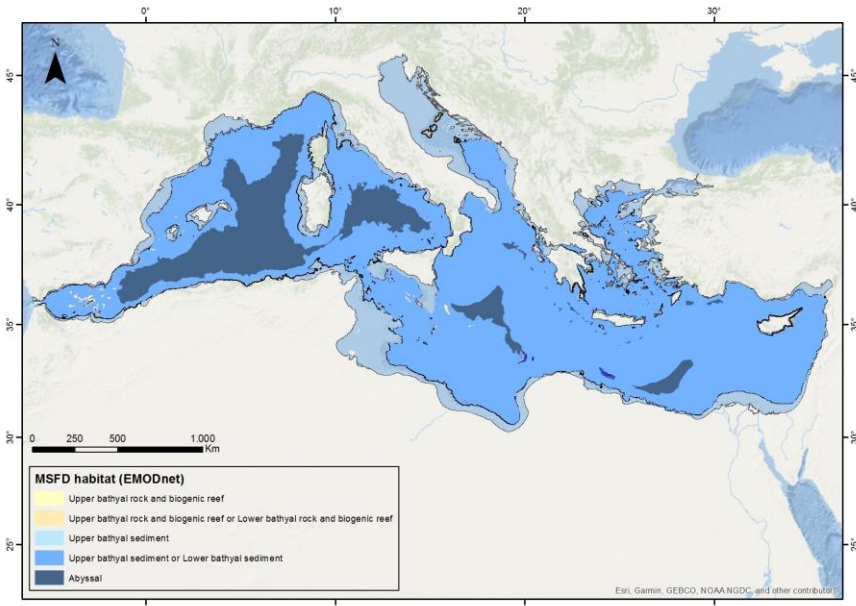
EMODnet habitat - MSFD

- Upper bathyal rock and biogenic reef
- Upper bathyal rock and biogenic reef or Lower bathyal rock and biogenic reef
- Upper bathyal sediment
- Upper bathyal sediment or Lower bathyal sediment
- Abyssal
- Na



Towards the protection of deep Med Sea

Which approach?



Production and overlap of maps by WebGis IDEM

Towards a multi-criteria analysis (in progress)

This could be also integrated/linked to GFCM VME geodatabase

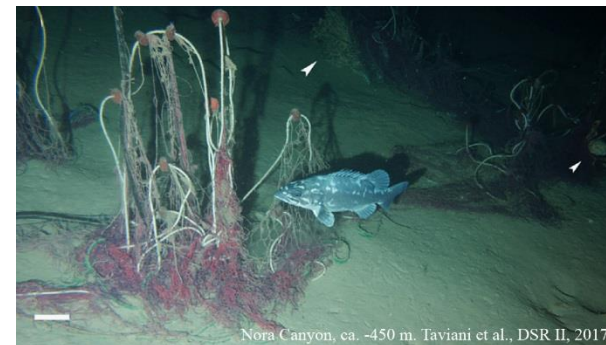
CONCLUSIONS & RECOMMENDATIONS

CONCLUSIONS

IDEM Project has identified actions which may be useful to support/integrate GFCM actions for VME protection (Actions a and b)

RECOMMENDATIONS

- *Extend FRA coverage to protect from overfishing and habitat destruction (in line with MSFD GES D1, D3 and D6, MedFish4Ever commitment and GFCM Mid-term strategy).*
 - Use available information (VME list)
 - Create adequate buffer zones around VMEs and critical habitats at depths <600 m where trawling is banned.
 - Propose the extension of the ban on trawling to below 600 m.
 - Facilitate the accessibility of VMS and AIS data, to increase transparency and control
- *Prioritize protection of threatened species also included in the VME list of indicator taxa (e.g. endangered coral species), in order to establish effectively managed deep-sea protected areas*
- *Launch the GFCM VME database as an essential tool for managers (integrated with other GIS database, such as IDEM WebGIS)*



SAVE THE DATE!

**IDEM Final Workshop, Rome 14th March,
At Italian Ministry for Environment, Land and Sea
Protection**



*For details or further information, please refer to
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