PORTODIMARE

geo**POR**tal of **TO**ols & **D**ata for sustaInable **M**anagement of co**A**stal and ma**R**ine **E**nvironment (ADRION205)

DT2.1.1. Report of the 1st training workshop (Split, 22-23 October 2019)

Ver. 1
11 2019

Author:
Paroject partner n. 4, PAP/RAC

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1 INTRODUCTION

The PORTODIMARE project has been designed to capitalize, valorise and give further impulse to the large amount of knowledge and analytic tools that have been developed during the last decade within various European projects in the Adriatic-Ionian Region. PORTODIMARE main objective is the development of the Geoportal of the Adriatic-Ionian-Region (GAIR), oriented to support transnational cooperation networks for the implementation of ICZM and MSP in the AIR and to support the Blue Growth in the area. The GAIR developed under WP T1 Geoportal Design and Development) is meant to become the reference for new projects on ICZM-MSP to be developed in the future in the area.

The second work package of PORTODIMARE project (WP T2 Geoportal testing and demonstration), is aimed at learning how to make the GAIR a concrete and efficient tool to support planning processes, by implementing 6 concrete case studies based on the use of the GAIR and its modules. The output of such concrete experiences will be 4 strategies and action plans, developed according to ICZM/MSP principles, that consider the transnational character of environment and of land/sea uses but that can respond to local needs; they will feed national maritime spatial plans. In particular, WP T2 activities are:

- AT2.1 Training: 2 events to show project partners, as well as stakeholders from local institutions / administration, how to use the GAIR and its modules in concrete case studies with real data;
- T2.2 Testing #1: Threats to coastal & marine biodiversity. Step-by-step towards ecosystem-based approach in Vrsar and Funtana island (responsible: partner 6)
- T2.3 Testing #2: Evaluating sea uses sustainability in Emilia-Romagna (responsible: lead partner)
- T2.4 Testing #3: Spatial conflicts among human activities as well as with conservation priority areas in Western Greek aters (responsible: partner 5)
- T2.5 Testing #4: Abruzzo coastal evolution mapping
- T2.6 Testing #5: Spatial conflicts among existing uses and legal regimes along the coastal strip in Slovenia and in Bosnia and Herzegovina (responsible: partner 3 and 8)
- T2.7: Testing #6: Oil spill coastal grounding response
- T2.8: Geoportal use, maintenance and transferability, that will focus on how project results will be shared with other regions/administrative units/target groups and how they can influence policies and behaviours. It will also include the responsible actors that will have to influence policy makers to replicate or demonstrate the use of the project outputs.

The 1st training workshop of PORTODIMARE project was organised by project partner n. 4, PAP/RAC, responsible for the implementation of WP T2 – Geoportal Testing and Demonstration, with assistance of CORILA (WPL of WP T1) and the Lead Partner (LP) Regione Emilia-Romagna. The training workshop was held on October the 22nd and 23rd at the Hotel Atrium in Split, Croatia.

The agenda (see Annex 01) foresaw two days of work:

- day 1 (October the 22nd) dedicated to the presentation and discussion of the project technical activities; presentation of Geoportal and modules, along with practical sessions on how to use these modules; and
- day 2 (October the 23rd) dedicated to practical area-based training, plenary discussion on gaps, difficulties, and needs for additional training.

The participation to the 1st training workshop was very satisfying: 39 participants from all PPs - each PP had at least one representative attending the meeting (see Annex 02).

All presentations are in Annex 03.

2 PORTODIMARE 1ST TRAINING WORKSHOP – DAY 1

2.1 Welcome and introduction

Ms. Olga Sedioli, on behalf of the project lead partner – RER, together with hosts from PAP/RAC - Mr Marko Prem and Ms Željka Škaričić (Director) and Mr Andrea Barbanti, on behalf of CORILA-ISMAR opened the workshop by welcoming all the participants. They emphasized the importance of the Project and development of the Geoportal in the Adriatic-Ionian Region, specifically in the context of transboundary cooperation to support the management and planning of coastal and marine areas. Contributions to the implementation of the ICZM Protocol and its Common Regional Framework including the Conceptual Framework for the MSP in the Mediterranean (to be adopted by the Contracting Parties at their next COP 21 in Naples, Italy in December 2019) and the EUSAIR process were underlined in particular. It is quite a challenge, therefore, put in front of PORTODIMARE project and its partnership, to fulfil such expectations that will be crucial for the Geoportal maintenance and sustainability of the project output sin the future.

The welcome continued with introduction of the workshop's objectives and its agenda. The workshop's aim was that all partners better understand the Geoportal and the Modules, and their relevance to the ICZM-MSP process. The main objectives of the training were to:

- Recall Geoportal and Modules use and relevance within the ICZM-MSP process
- Present the Geoportal and the seven Modules developed (e.g. features, functions, requirements, data available and data needs, operational issues,…)
- Assist implementation of pilot actions
- Teach how to use (general use/purpose) Geoportal and Modules through practical sessions
- Teach how to use (in selected testing sites) Geoportal and Modules through practical sessions
- Promote co-learning and coordinated improvement of the modules.

Ms Elisabetta Manea (CORILA-IUAV) then presented the Evaluation Questionnaires that aim towards the coordinated improvement of the Geoportal and the modules. The five questionnaires were directly related to specific components of the training and were handed over to participants after each of the sessions, in order to be answered “in situ”.

2.2 Session 1 - the Geoportal

2.2.1 Presentation of the Geoportal

Ms Luisa Perini (RER) and Mr Alessandro Sarretta (CORILA – ISMAR) presented the features, functions, data, and modules of the Geoportal for the Emilia-Romagna Region. Steps hat led to development of the Geoportal and pillars of its architecture were presented, along with its main functionality (i.e. access to spatial data; managing these data and combining them into maps; performing analysis through modules etc). Finally, the structure of Geoportal's spatial data and metadata was presented, together with maps as visualization tools (i.e. how to explore existing maps, creating new maps, adding layers, reusing existing maps etc.).

For the time being, the Geoportal of the PORTODIMARE features 285 layers of GIS (Geo-Information Systems), 19 Maps and 2 Documents that are freely accessible by everyone. Currently the Geoportal portal hosts 57 users in its platform.

2.2.2 Practical session: how to use the Geoportal

Practical sessions on how to use Geoportal ensued after the short break. Workshop participants were divided into four groups and guided through the Geoportal by the Lead Partner and the CORILA-ISMAR (each guiding two groups of trainees).

Participants were guided on how to improve search for specific data using different tools available (i.e. search by text, by topic categories and sub-categories, by domain area, by owner etc.). In addition they were familiarized with analyzing the content of layer previews and metadata. Finally, participants were thought on how to work with maps within the Geoportal: not only creating new maps, but also adding layers to existing maps and working with remote services (such as the WMS service).

2.3 Session 2 - the modules

Session 2 was dedicated to the presentation of each module of the GAIR by the partner responsible for its development.

2.3.1 Presentation of the Modules

The **Maritime Uses Conflict (MUC) module** was presented by Mr Stefano Menegon (CORILA-ISMAR), followed by the presentation on the **Cumulative Effects Assessment (CEA) module** by Mr Niccolò Bassan (CORILA-IUAV). The MUC module allows users to analyze potential conflicts of maritime uses allocation in the sea space, while the CEA module implements the cumulative effects assessment of anthropogenic activities on marine environmental components based on the Tools4MSP Modelling Framework.

After the lunch break, Ms Michol Ghezzo (CORILA-ISMAR) presented the **Particle Tracking (PARTRAC) module**. The PARTRAC allows users to simulate the transport of natural or antrophogenic substances and is being implemented at the Adriatic Sea. The PARTRAC considers: a hydrodynamic model (validated in the study area); particle tracking module (calibrated in the study area); specific substance module; and the post-processing routines to elaborate the outputs in useful way for other MSP tools or for other analysis.

The **Allocated Zone for Aquaculture (AZA) module** was presented by Ms Erika Porporato (CORILA-UNIVE). Identification of an AZA, i.e. marine area where the development of aquaculture has priority over other uses, results from zoning processes through participatory spatial planning, whereby administrative bodies legally establish that specific spatial areas within a region have priority for aquaculture development. Ms Porporato presented the concept of AZAs; study areas and selected species; Spatial Multi-Criteria Evaluation (SMCE); criteria; constraints, and aquaculture suitability.

The **Modules on Small and Medium-Scale Fisheries Footprints (SSF+MSF/SSF)** were presented by Mr Dimitris Politikos and Mr Stefanos Kavadas (HCMR). The main objective of the modules is to integrate the most influential components affecting Small and Medium-Scale Fisheries (i.e., bathymetry, distance from coast, chl-a concentration, fishing effort, vessel capacity of ports, marine traffic activity, etc.) to assess fishing footprint intensity. The area where the module is applied is around the Kephalonia Island.

The **Oil Spill Risk Module** was presented by Mr Antonio Lanza (Civil Protection of Apulia Region). This Module is a capitalization and further evolution of the tools developed by HAZADR project within the

Adriatic Atlas. In specific, it is focusing on the upgrading and/or ex-novo building of vulnerability maps (total, human and environmental) with respect to oil spill events, on importing hazard data described by COMADEX index and on importing response equipment displacement along the Adriatic coast. The scope of this Module is to mainstream the Adriatic Atlas-based data within the PORTODIMARE Geoportal. In his presentation Mr Lanza focused on the vulnerability map that will be upgraded or built ex-novo in order to include the Ionian Sea.

2.4 Practical session: how to use the modules

The participants were divided in four groups, and guided through using the following modules:

- MUC+CEA module, moderated by Corila-ISMAR (S. Menegon) and Corila-IUAV (N. Bassan)
- AZA module, moderated by Corila-UNIVE (E. Porporato) and Corila-ISMAR (G. Farella)
- PARTRAC module, moderated by Corila-ISMAR (M. Ghezzo, A. Mulazzani)
- SSF+MSF/SSF modules, moderated by HCMR (D. Politikos)

There were two rounds of practical sessions for each module, lasting for an hour each, in order to allow each project partner to test more than one module.

At the end of the practical session, the plenary discussion that followed highlighted the need to:

- Improve the Geoportal of PORTODIMARE in term of easy access;
- Create a manual step-by-step for the simplification of the process and function of the tool; and to
- Create and import more data in the Geoportal.

The closure of the Day 1 was at 18:00

3 PORTODIMARE 1ST TRAINING WORKSHOP – DAY 2

3.1 Session 3 - Area-based training

3.1.1 Practical session: use of the Geoportal and of selected modules in an ICZM-MSP framework in selected PDM Testing Areas

Participants were divided in three groups, each focusing on a specific testing area and moderated by the partner responsible for the related testing activity and by the Geoportal/module developers.

- Group 1: Emilia Romagna Region, moderated by L. Perini (RER), G. Farella, M. Ghezzo (Corila-ISMAR), and N. Bassan (Corila-IUAV);
- Group 2: Slovenian Coast, moderated by S. Mezek (RRC Koper), E. Porporato (Corila-UNIVE), and A. Sarretta (Corila – ISMAR); and
- Group 3: S. Kavadas (HCMR), M. Landini (RER) and E. Manea (Corila-ISMAR).

3.1.2 Plenary: presentation of group activities on testing areas

The summary of discussions (difficulties, gaps, needs for additional training, and issues alike) concerning each testing area was presented by the testing area responsible.

For the application of the CEA module in the Emilia Romagna Region, the need for a better-quality data for the analysis was brought up, despite the CEA module is considered as relatively easy to practice and understand the produced results. Also, there is a need for clear instructions for specifying the environmental components of the CEA model (not only specifically in Emilia Romagna Region, but also elsewhere). In case of Emilia Romagna region the main problem was in converting the data in the model for a study case. There had been a discussion from the PARTRAC perspective about how they are going to solve this issue.

As for the Slovenian Coast, there was a problem in gathering good quality information and data for the AZA module. In addition, the available data are rather dispersed among the institutions, and sometimes there is no willingness to share the data. In the discussion about the improvement of the AZA module, it was highlighted that the discussions between stakeholders about the use of this module are necessary. Finally, it was added that the land-based pollution should be added to the AZA module as a constraint.

For the Small-Scale Fisheries Module the main problems are related to the needs for an update of the existing data in the Ionian Islands area, and the improvement of data resolution as well. Moreover, the experts expressed that there is also a need in the creation of more data, maps and layers for the small fisheries. Finally, the gap between the discussions and transfer of data between the partners (Kefalonia-Romania) was also highlighted.

3.2 Session 4 - Wrap-up and final discussion: towards T2 testing sites activities

3.2.1 MSP process and the role of analytical work

The Marine Spatial Planning (MSP) process and the role of analytical work were presented by Ms Martina Bocci, an external expert from the European MSP Platform. The objective of this presentation was to give participants a broader picture on the MSP process in general, its steps and outputs; with examples to understand how the analytical work foreseen within PORTODIMARE fits into the overall approach of MSP (reflections on how to improve synergies between analytical work and MSP).

3.2.2 Final discussion and next steps

Mr Marko Prem (PAP/RAC) moderated the discussion on the next steps in the Project, focusing mainly on the main gaps, upcoming implementation of pilot activities, and finally who should do what until the next project training workshop, set for March 2019 in Pula, Croatia. In particular, he stressed how it is important:

- to finalise the Geoportal and modules and to provide manuals so to be used as the training material and to assist the implementation of the pilots/testing;
- to continue providing data to the Geoportal by the testing partners so to have the information ready for testing;
- to have close contacts and cooperation between the modules developers and the respective partners testing specific modules with a view to have the draft testing results ready for the next training in March 2020;
- to draft the outputs related to T2.8 namely:
    - the Strategy/Action Plan of Geoportal to be prepared by four PPs (Croatia, Greece, RER/Italy and Slovenia) with the assistance of PAP/RAC;
    - the Geoportal maintenance and transferability plan, and
    - the Geoportal practical guide in cooperation with the Geoportal/module developers.

3.2.3 Filling the Evaluation Questionnaire

Ms E. Manea (CORILA –IUAV) distributed the final evaluation that aims towards co-learning and coordinated improvement of the Geoportal and the modules. The questionnaire was distributed to all participants who were given around half an hour for filling it.

The training workshop was closed on 23 October 2019 at 12.30.

ANNEX 01 - Agenda of the training workshop

PORTODIMARE PROJECT: 1st Training Workshop

Split, Hotel Atrium; 22-23 October 2019

Main objectives

- Recall Geoportal and Modules use and relevance within the ICZM-MSP process
- Present the Geoportal and the seven Modules developed (e.g. features, functions, requirements, data available and data needs, operational issues,...)
- Assist implementation of pilot actions
- Teach how to use (general use/purpose) Geoportal and Modules through practical sessions
- Teach how to use (in selected testing sites) Geoportal and Modules through practical sessions
- Promote co-learning and coordinated improvement of the modules

Agenda

Day 1: 22nd October

9.00 – 9.40

Welcome and Introduction:

Recall project objectives and perspectives, the importance and the role of Geoportals and tools in the ICZM-MSP process, need for co-learning and coordinated improvement of the modules, resume of the work done, work to be done *(Olga Sedioli, Andrea Barbanti, Marko Prem)*

Introducing the Evaluation Questionnaire: towards co-learning and coordinated improvement of the Geoportal and the modules *(Corila-IUAV, E. Manea)*

9.40 – 10.20

Session 1 - The Geoportal

1.1 Presentation of the Geoportal (features, functions, data&modules, etc.):
LP (Emilia-Romagna Region (Luisa Perini & Marika Landini) + PP2 (Corila- CNR) (Alessandro Sarretta & Alessandro Mulazzani)

10.20 - 10.40 Coffee Break

10.40 – 12.30

1.2 Practical session: how to use the Geoportal:

Trainees shared in 4-5 groups, guided by LP and PP2 . Guided practical tour inside the Geoportal

Participants divided in 4 groups, guided by RER+Corila-Ismar

Moderator Group 1: RER
Moderator Group 2: RER
Moderator Group 3: Corila-Ismar
Moderator Group 4: Corila-Ismar

Session 2 - The Modules

12.30 – 13.00

2.1 Presentations of modules: MUC + CEA
Corila-Ismar (S. Menegon, G. Farella), Corila-IUAV (N. Bassan, E. Manea)

13.00 - 14.00 Lunch

14.00 - 14.20

2.1 Presentations of modules: PAD (Particle / Contaminants Tracking / Dispersion)
Corila-Ismar (M. Ghezzo)

14.20 - 14.40

2.1 Presentations of modules: AZA (Aquaculture)
Corila-UNIVE (E. Porporato, R. Pastres)

14.40 - 15.10

2.1 Presentations of modules: SSF+MSF/SSF (Fisheries)
HCMR (S. Kavadas, D. Politikos)

15.10 - 15.30

2.1 Presentations of modules: Oil Spill Risk
Apulia Region (L. Nardella, R. Matarrese)

15.30 - 16.00 Coffee Break

16.00-18.00

2.2 Practical session: how to use the modules

Participants divided in 4 groups (MUC+CEA, AZA, PAD, SSF+MSF/SSF). Two repeated sessions of one hour. Participants will rotate between sessions, i.e. each participant can attend to max 2 sessions.

Moderator Group MUC+CEA: Corila-Ismar (S. Menegon), Corila-IUAV (N. Bassan)
Moderator Group AZA: Corila-UNIVE (E. Porporato), Corila-Ismar (G. Farella)
Moderator Group PAD: Corila-Ismar (M. Ghezzo, A. Mulazzani)
Moderator Group SSF+MSF/SSF: HCMR (D. Politikos)

18.00

Closure Day 1

Day 2: 23rd October

8.30 – 10.10

Session 3 - Area-based training

3.1 Practical session: use of the Geoportal and of selected modules in an ICZM-MSP framework in selected PDM Testing Areas

Participants divided in 3 groups (Group1- RER, Group 2- Slovenian coast, Group 3- Ionian Islands). *Groups moderated by Testing Areas Responsibles + Geoportal/module developers*

Moderator Group 1 RER: RER (L. Perini), Corila-Ismar (G. Farella, M. Ghezzo), Corila-IUAV (N. Bassan)
Moderator Group 2 Slovenia: RRCK (S. Mezek), Corila-UNIVE (E. Porporato), Corila-Ismar (A. Sarretta)
Moderator Group 3 Ionian Islands: HCMR (S. Kavadas), RER (M. Landini), Corila-Ismar (E. Manea), Corila-UNIVE (R. Pastres)

10.10 – 10.30

3.2 Plenary: presentation of group activities on testing areas (difficulties, needs for additional training, gaps and alike):

Testing Areas Responsibles

10.30 - 10.50 Coffee Break

10.50 – 12.00

Session 4 - Wrap-up and final discussion: towards T2 Testing Sites activities

10.50 – 11.10

4.1 MSP process and the role of analytical work
(Martina Bocci, PAP/RAC external expert)

The objective of this presentation is to give participants a big picture about MSP process, steps, outputs, with some examples so they understand how their analytical work fits into this overall approach of MSP.

11.10 – 11.45

4.2 Final discussion and next steps

Conclusion on where we are (what are still the main gaps, what has to be done for the pilot activities to start implementation), what are the next steps (who should do what and when). *(moderated by Marko Prem)*

11.45 – 12.00

4.3 Filling the Evaluation Questionnaire: towards co-learning and coordinated improvement of the Geoportal and the modules; all participants

12.00

Closure of the Training

12.00 - 13.00 Lunch

13.00 - 15.00

Technical and Steering Committee Meeting

Moderated by RER- Lead Partner and at least one participant from each project partner should participate

15.00

End of the T&SC meeting and farewell Coffee

ANNEX 02 – List of participants

INSTITUTION	PARTICIPANTS
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ANNEX 03 – Presentations

Session 1:

The Geoportal for the Adriatic-Ionian Region GAIR

This project is co-financed by the European Union

1.1 Presentation of the Geoportal

LP Emilia-Romagna Region: Luisa Perini & Marica Landini

and PP2 CORILA (CNR-ISMAR): Alessandro Sarretta & Alessandro Mulazzani

This project is co-financed by the European Union

PORTODIMARE 1st Training Workshop – Split, Croatia 22-23 October 2019.

Content

PORTODIMARE 1st Training Workshop – Split, Croatia 22-23 October 2019.

1. Introduction to the GAIR (Geoportal of the Adriatic Ionian Region)

- GAIR has been designed to the purpose of creating a unique access for all users to the available **information and tools on the topics of MSP and ICZM in the AIR (Adriatic-Ionian Region)**
- the main goal was, indeed, **to capitalize existing data and tools**, starting from the two reference geoportals on these issues: **Shape/Hazadr** and **Adriplan**
- **integrate other existing databases**, portals and tools developed by previous EU projects, by local and national administrations and by other initiatives, using international standards for the description, access and exchange of data
- the **most important following steps** will be:
  - to disseminate the existence and knowledge of the GAIR and tools toward the EUSAIR communities, administrations, research institutions, etc. promoting the use and enhance of it's contains
  - to define a strategy and programme of future maintenance

PORTODIMARE 1st Training Workshop – Split, Croatia 22-23 October 2019.

1. Introduction to the GAIR (Geoportal of the Adriatic Ionian Region)

Concrete benefits

we are conscious that the development of PORTODIMARE Adriatic - Ionian Geoportal is already a precious opportunity to improve the data sharing and management at transnational level, increasing skills of scientific and institutional subjects, building the coordination capacity bodies

Indeed it can adequately support the construction of MSP plans according to the Directive 2014/89

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2. Steps toward the GAIR (actions T1.1 to T1.4)

➢T1.1 report, delivered on August 2018, provide the main geoportal requirements specifications
- general principles; spatial domain; main categories of data; data and access policy
- connection to other sources of information
- tools to be integrated
- etc.

➢T1.2 report delivered in November 2018: defines more details on the data needs
- categories and sub-categories
- data priority/optional for MSP and ICZM
- basic data needs for the different tools

➢T1.3 report delivered in September 2018 gives a detailed inventory of the most relevant national/international geoportals and/or sources of information on the topics to be connected to the GAI

➢T1.4 report delivered in February 2019: defines the Geoportal architecture

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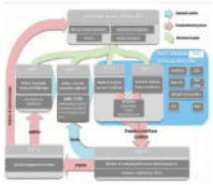
2. Pills of the GAIR architecture (T1.4)

➢Processed by PP2 it describes:
➢Gair is based on nine principles:



MSP-driven : the design of the Geoportal follows an archetypical MSP implementation
Modular approach : *seven modules integrated*
Multi-Objective*: each module can have single or multiple objectives*
Multi-functional *results linked to the more integrated cross-sectorial modules of CEA and MUSC.*
Case study-driven
Scalable
Open: *the GAIR is based on FOSS (Free and Open Source Software).*
Community-based *: the Geoportal capitalizes from a community-driven approach..*
Knowledge-driven *: the results of each module run will be available within the Geoportal,*

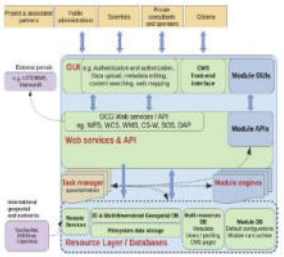
2. Pills of the GAIR architecture (T1.4)

➢the system architecture:
- ○basic and general functionalities
- ○resource types
- ○web services and API
- ○GUI
- ○user profiles
- ○integration of modules and their concept based on 'Case studies' driven approach

➢the Technological Stack to be used
- ○ei: software (Geonode; Geoserver;)
- ○access layer and web API

➢Portodimare extension applications
- ○e.i categories; metadata….

➢Description of Case Studies - module configuration
➢Graphical User Interface, main concepts



4. State of implementation of the GAIR

As from new GANT, the final implementation of the GAIR (https://www.portodimare.eu/) has to be delivered by December 2019
Looking to the T1.4 documents, we defined some steps of implementation, some of them to be developed in parallel:

- ●Database structure implementation on geonode - integration of the metadata with new fields (e.i subcategories, domain area, data portal,..)
- ●Data uploading from MSPKC, previously populated by the partners
- ●Development of the Module's integration based on the 'case studies' approach
- ●Module integration was differentiated as follows:

API-based integration: GAIR common API performs a machine-to-machine communication with an external module/tool web service

- ●T1.6 – Maritime Use Synergy and Conflict Analysis Tool (MUSC) - CNR ISMAR
- ●T1.7 – Cumulative Effects Assessment (CEA) - CNR ISMAR

4. State of implementation of the GAIR

Direct integration: GAIR common API directly communicate and execute the module engine

- ●T1.8– Supporting AZA identification - University of Venice
- ●T1.11. Module for Small Scale Fishery Footprint (SSF) - HCMR
- ●T1.12: Module on Medium Scale Fishery Footprint (MSF) & Cumulative Effects Assessment on SSF & MSF - HCMR

CURRENT SITUATION

functions available - that can be performed without authentication:

- ●explore layers navigation and data search
- ●navigation and data search by topic categories and subcategories or with search bar

4. State of implementation of the GAIR

Available main functions - with authentication

- ●create / uploading layer and document
- ●metadata editing (not all fields already working)
- ●layer editing and style editing
- ●maps creation

under revision

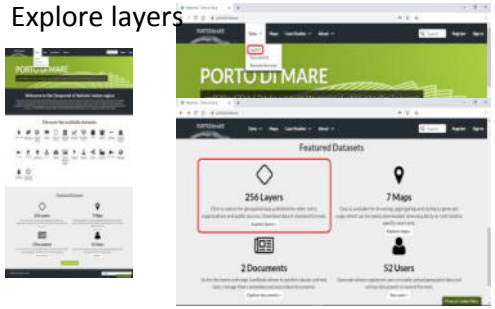
- ●complete editing functionalities
- ●Still under testing the API based integration: modules and case studies simulation is occasionally interrupted (T1.6-T1.7-T1.9)

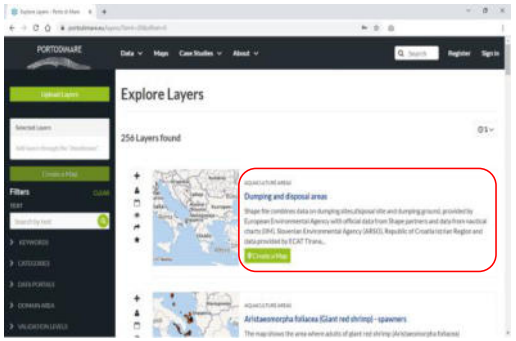
In advanced development the direct integration of other modules (T1.8 – T1.11 and T1.12

5. Introduction to the main functionality:

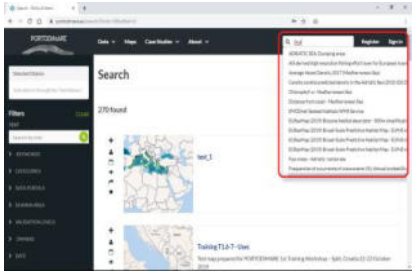
- explore layers
- search data / filter
- understand
- view
- access
- reuse

Explore layers

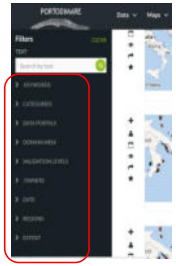




Find Data *(Search box in the navigation bar)*



Find Data *(Filtering layers)*

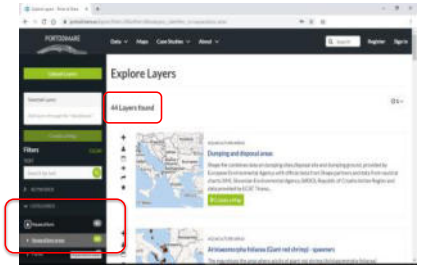


Several filters are present in the left area.

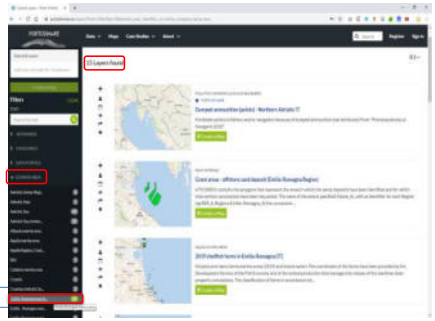
Each of them sub-select layers depending on some metadata describing the layer.

Find Data *(Filtering datasets by topic category - Home page)*

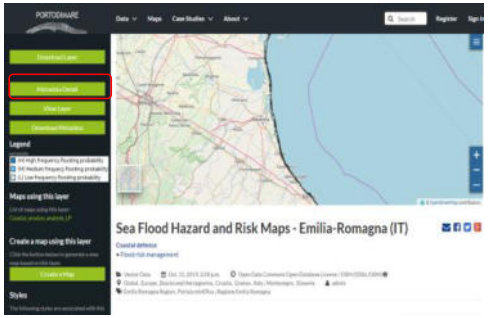
Find Data *(Filtering datasets by topic category)*



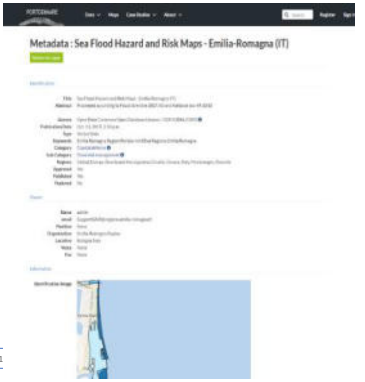
Find Data *(Filtering datasets by domain area)*



Understand data: layer info page



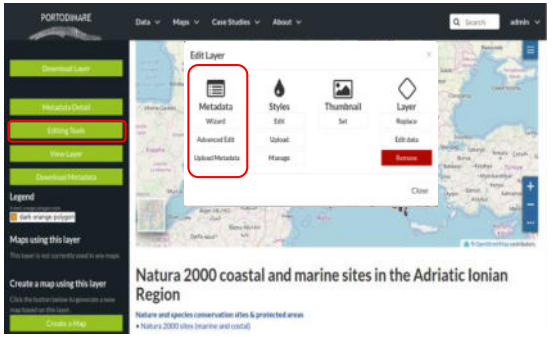
Metadata details



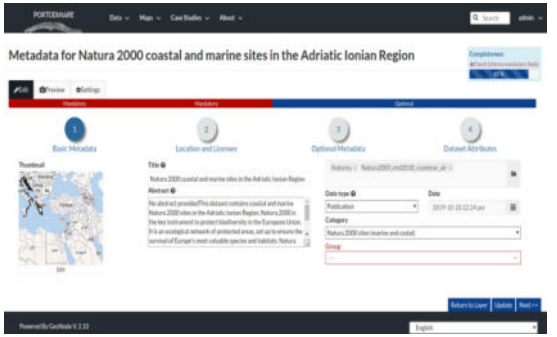
Manage spatial data

- existing data
  - modify/integrate metadata
  - edit/add styles
  - change permissions
  - download and reuse
  - share
- new data
  - upload
  - remote services

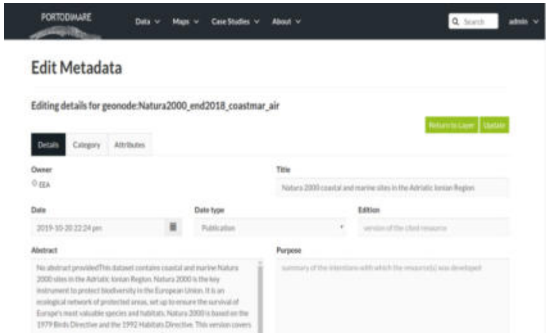
Editingmetadata



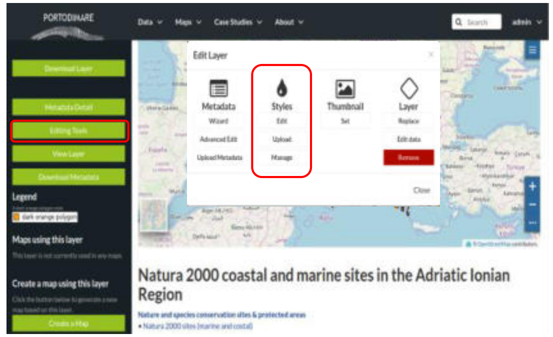
Editing metadata - Wizard



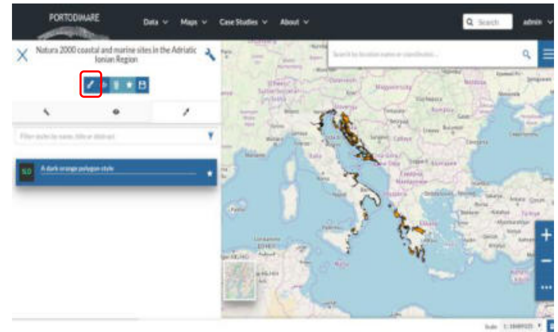
Editing metadata - Advanced editing



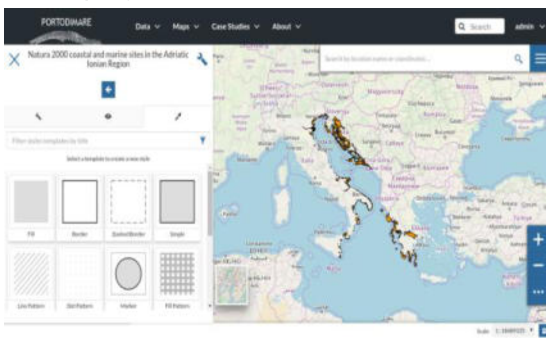
Editing styles



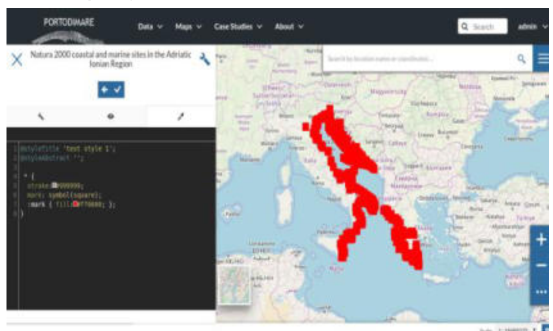
Editing styles



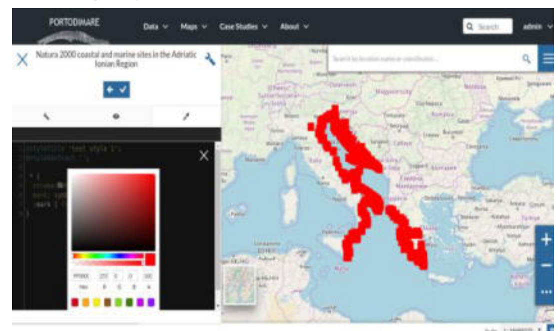
Editing styles



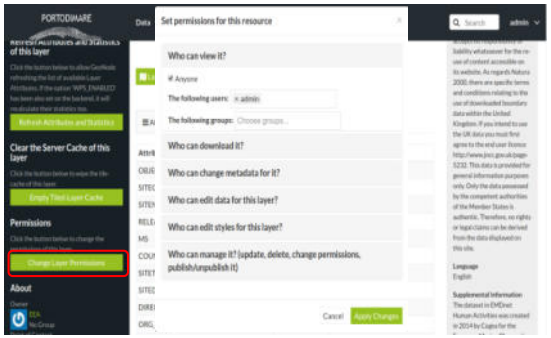
Editing styles



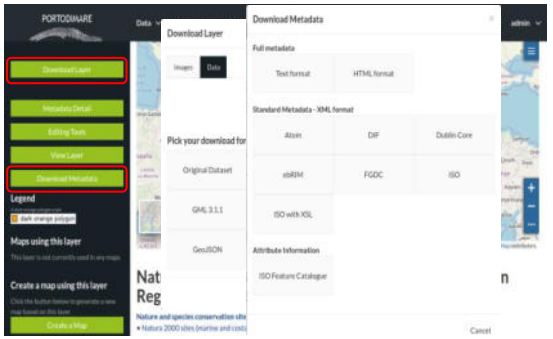
Editing styles



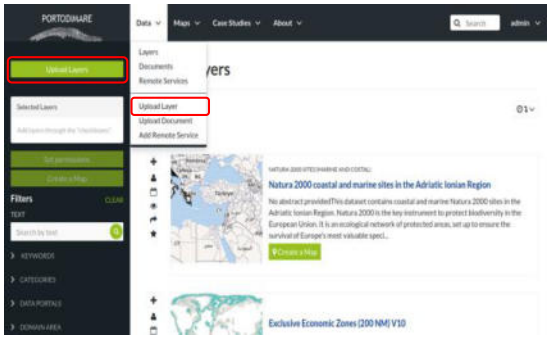
Editing permissions



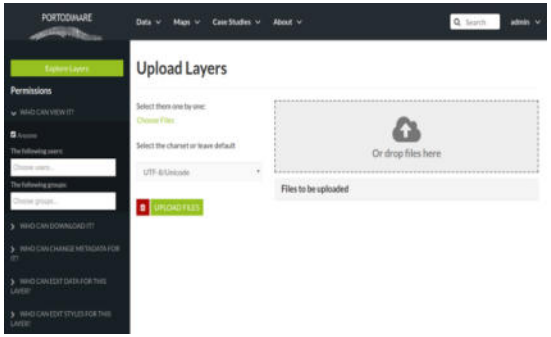
Download



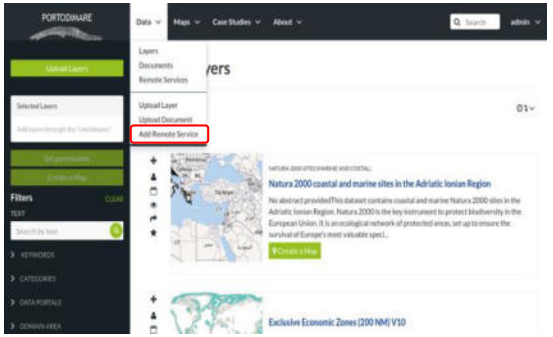
Upload new layer

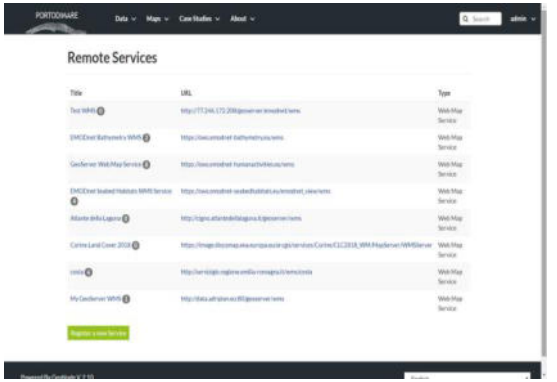


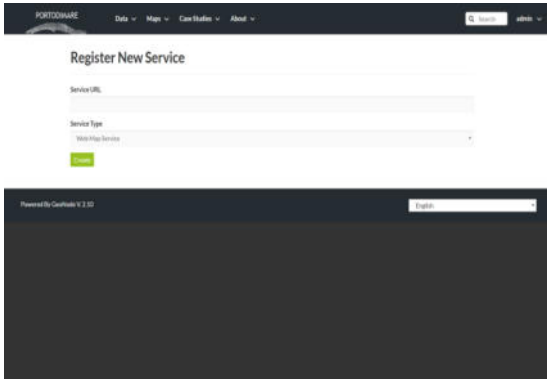
Upload new layer

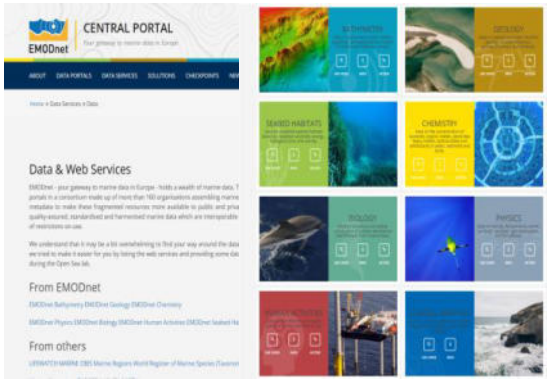


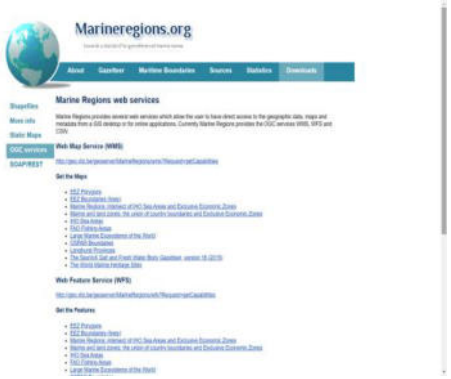
Add Remote Service





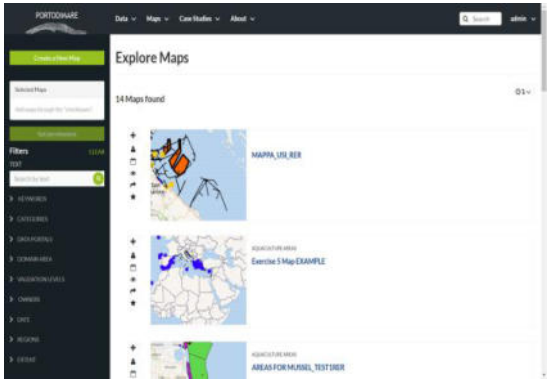


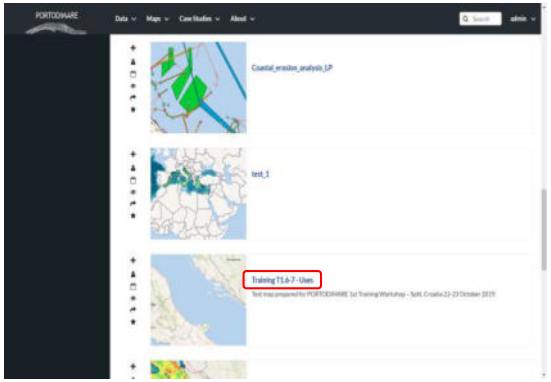


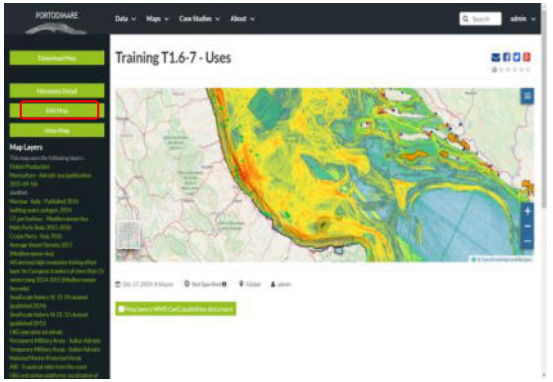


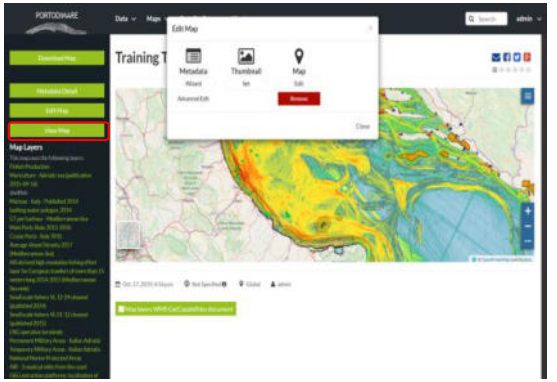
Combine spatial data in maps

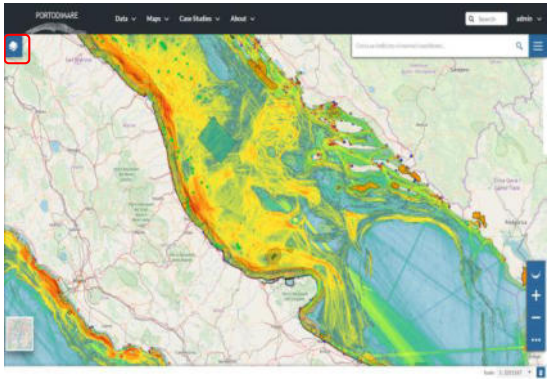
- explore existing maps
- understand
- create a new map
- view/navigate the map
- add layers
- reuse

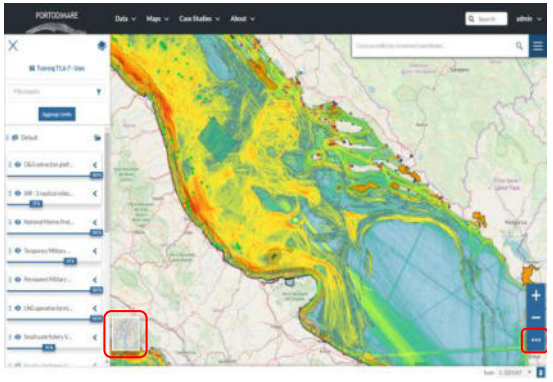


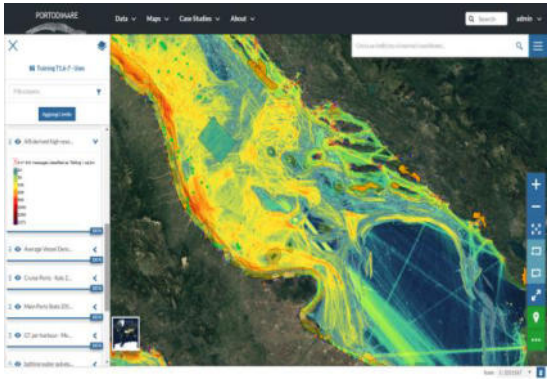

Coastal_erosion_analysis_LP
test_1
Training T1.6-7 - Uses

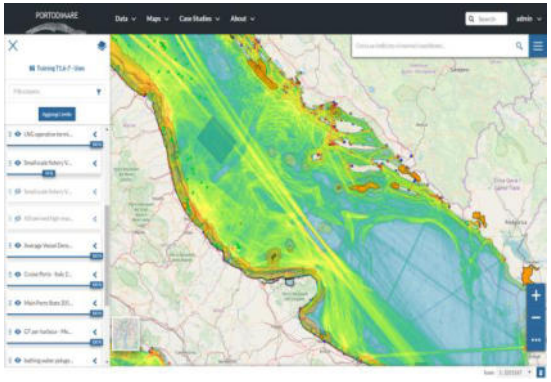

Training T1.6-7 - Uses
Map Layers

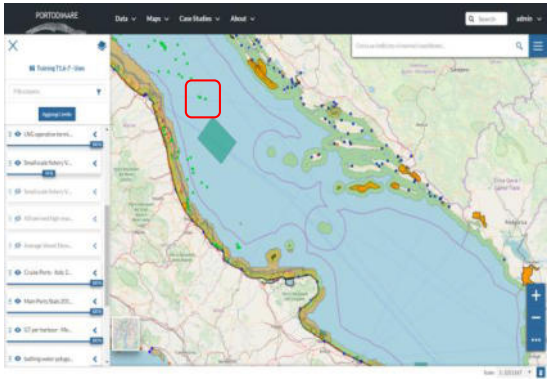

Edit Map
Metadata
Thumbnail
Map
Map Layers

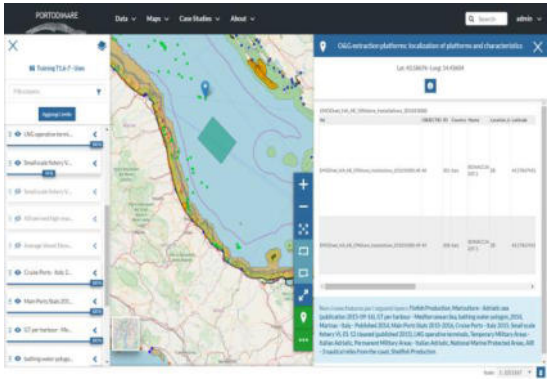


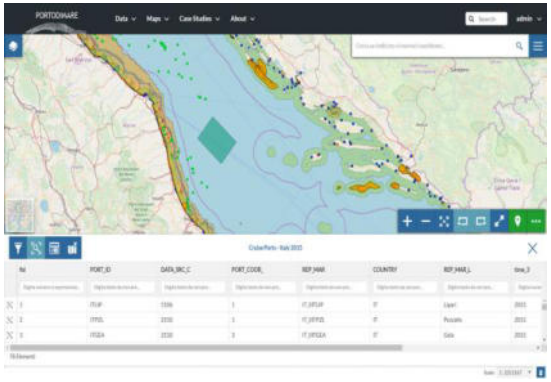


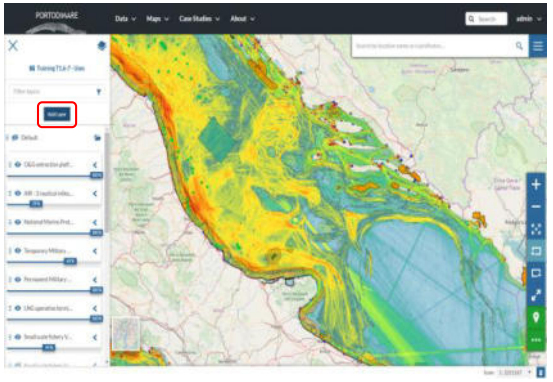


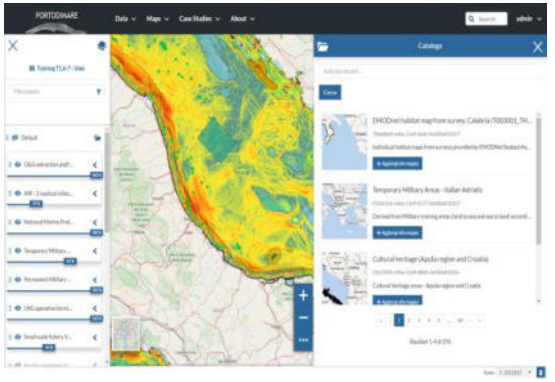


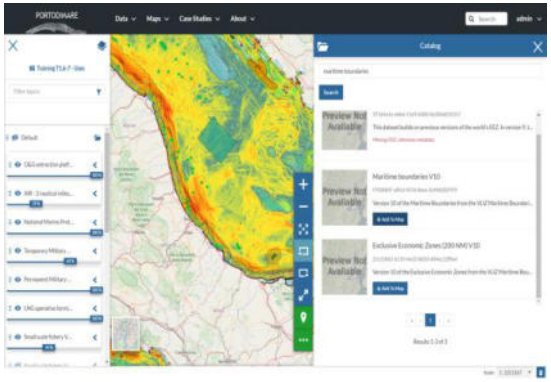


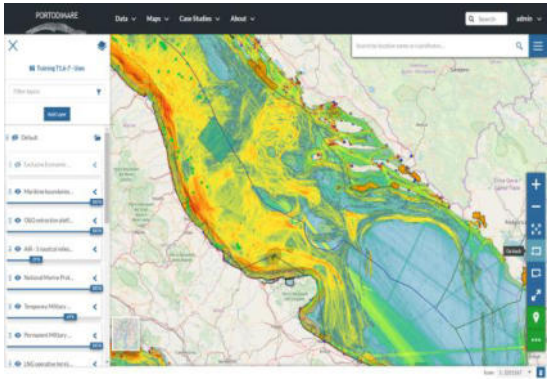


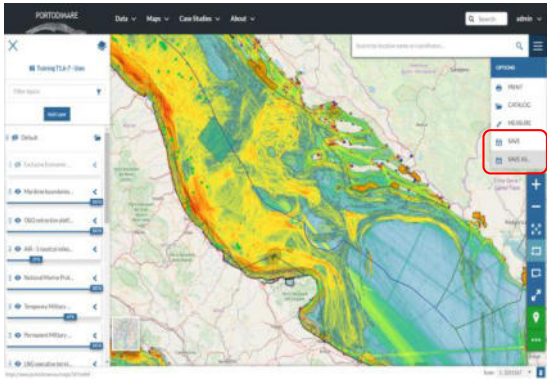


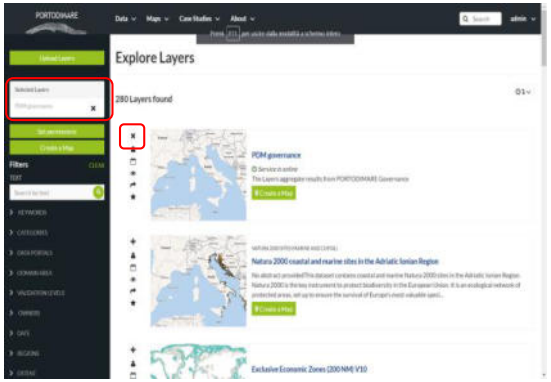


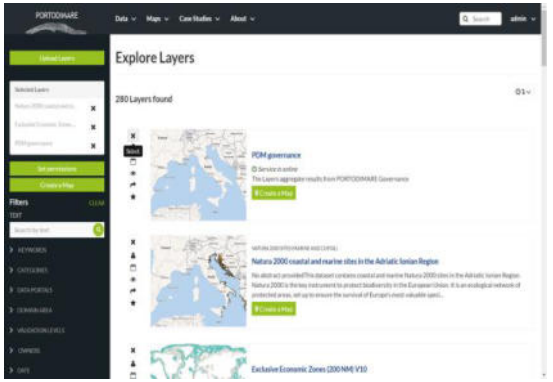









Explore Layers
280 Layers found
PDM governance
Natura 2000 coastal and marine sites in the Adriatic Ionian Region
Exclusive Economic Zones (200 NM) V10


Explore Layers
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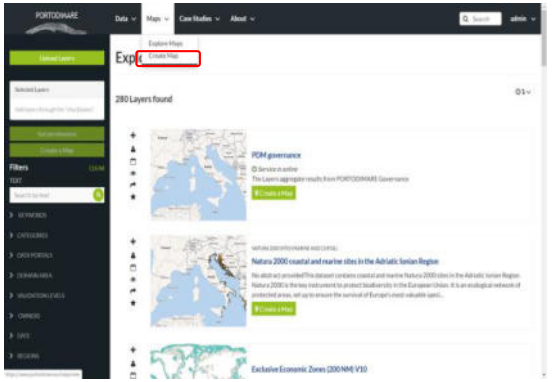
280 Layers found
PDM governance
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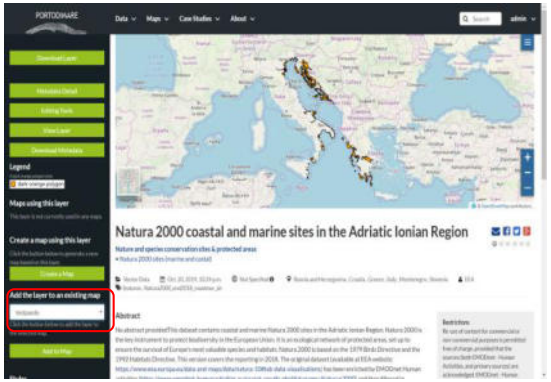
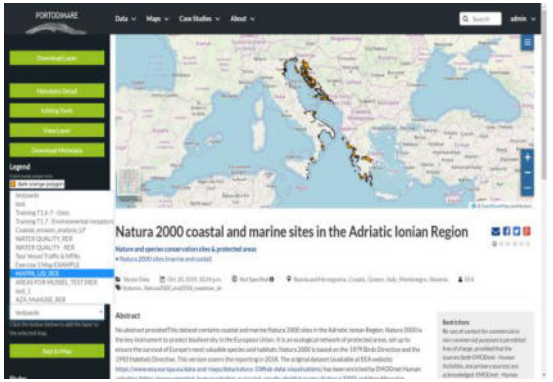
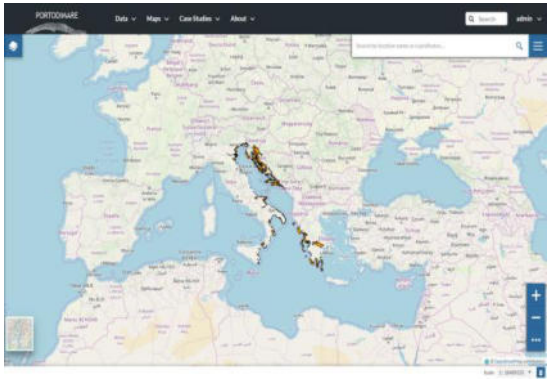
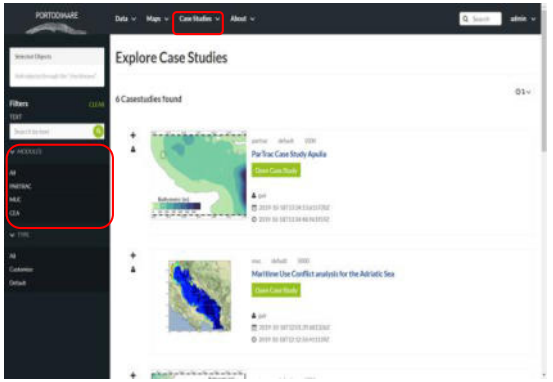






Perform analysis trough modules

T1.6 MUC
T1.7 CEA
T1.8 Aquaculture zoning
T1.9 Particle Tracking
T1.10 coastal vulnerability to oil spills
T1.11 SSF - Footprint
T1.12 MSF + SSF/MSF Cumulative effects



1.2 Practical session: how to use the Geoportal

LP Emilia-Romagna Region: Luisa Perini & Marica Landini
and PP2 CORILA (CNR-ISMAR): Alessandro Sarretta & Alessandro Mulazzani

This project is co-financed by the European Union

1.2 Practical session

Guided practical tour inside the Geoportal

Participants divided in 4 groups, guided by RER+CORILA-ISMAR

- Moderator Group 1: RER
- Moderator Group 2: RER
- Moderator Group 3: CORILA-ISMAR
- Moderator Group 4: CORILA-ISMAR

1.2 EXERCISE 1

DATA SEARCH

Participants search for specific data using the different tools available:

- search by text
- search (filter data) by topic categories and sub-categories
- search (filter data) by Domain area
- search by owner

in combination with the MSPKC, used as the reference of available data.

1.2 EXERCISE 2

LAYERS AND METADATA

Participants analyse the content of layer previews and metadata, familiarising with the tool:

- Metadata Detail
- View Layer
- Get feature info
- Attribute table
- Editing tool

1.2 EXERCISE 3

UPLOAD OF A NEW LAYER

group 1 RER	group 2 RER	group 3 CNR ISMAR	group 4 CNR ISMAR

1.2 EXERCISE 4

LAYER STYLES

Participants will learn the basic ways to modify/add **single symbol style** on layers:

group 1 RER	group 2 RER	group 3	group 4
shelfishfarm_RER2	.Pipeline_RER_prova	Natura 2000 AIR	Finfish Production
Grant_areas_offshore_sand_deposit_RER2_TEST	..Mussel harvesting area - Emilia-Romagna (IT)	Main Ports Stats	Blackmouth catshark recruits

1.2 EXERCISE 4.1

LAYER STYLES - ADVANCED LEVEL - SEPARATE GROUP

GIS-Expert participants will be trained on how to create/modify **categorized styles** on layers:

- Blackmouth catshark recruits
- EUSM2019_EUNIS_BroadscaleModel_EUSM_AIR forTRAINING

1.2 EXERCISE 5

CREATION OF MAPS

Participants will learn about possible ways to create a map:

- "Create a Map using this layer"
- "Add the layer to an existing map"
- Create a map using selected layers
- "Create a new map"

1.2 EXERCISE 5

CREATION OF A NEW MAP

Participants create a new map about **Nature conservation measures in relation to Aquaculture activity in the AIR**.

Layers to be considered:

- national MPAs, NATURA 2000 sites, …
- location of farms
- including remote layers

Maps will be named:

group 1	group 2	group 3	group 4
Exercise Map Group 1	**Exercise Map Group 2**	**Exercise Map Group 3**	**Exercise Map Group 4**

1.2 EXERCISE 5

CREATION OF A NEW MAP

During this exercise trainees will learn about:

- How to save the map including map's abstract editing
- Table of Contents (TOC)
- Layer visualisation (transparency, view order, alternative styles)
- How to add new layers from GAIR catalogue (using an extra GAIR window or with MSP KC) and from external sources
- Other map tools (zoom, query object on map)

1.2 EXERCISE 3

Remote services

Participants will learn how to use WMS remote services

- how to register a new remote service:

group 1	group 2	group 3	group 4
EMODNET HA	COSTA ER	EMODNET Seabed-habitat	ATLAS OF THE LAGOON

- how to add a new remote layer from the registered services

Session 2 - The modules

Maritime Use Conflict (MUC) Cumulative Effects Assessment (CEA)

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This project is co-financed by the European Union

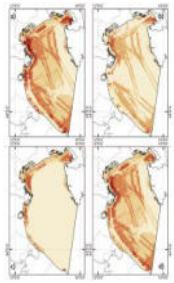
Outline

1. MUC and CEA overview
2. MUC and CEA Conceptual model
3. MSFD Alignment
4. Supporting MSP process
5. MUC & CEA Modules implementation
6. Governance

MUC: Maritime Use Conflict Analysis

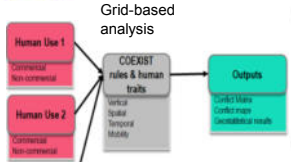
Aim
The Maritime Uses Conflict (MUC) allows to analyze potential conflicts of maritime uses allocation in the sea space.

- Conflict analysis is based on the methodology implemented within COEXIST Project (Gramolini et al., 2010) and applied for the Adriatic-Ionian Sea (Barbanti et al., 2015; Depellegrin et al., 2017) and Northern Adriatic Sea Menegon et al. (2018).



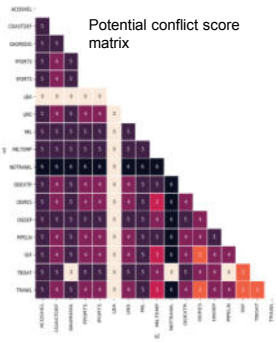
MUC: Tools4MSP Modelling framework

Grid-based analysis



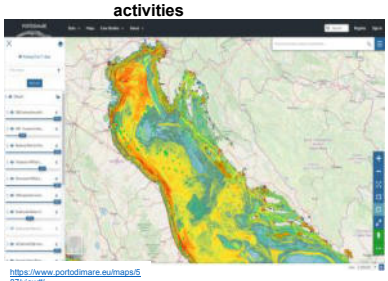
Potential conflict scores based on an expert elicitation process and literature review

Potential conflict score matrix



MUC: Maritime Use Conflict Analysis

Geospatial distribution of human activities



https://www.portodimare.eu/maps/587/view#/

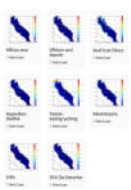
Considerations & challenges

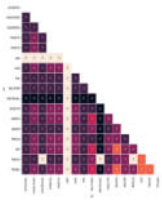
- relevance
- data extents (transboundary)
- geometry representation
- scale and resolutions
- currency & temporal resolution
- quality
- data gaps

MUC: Adriatic Sea Case Study

Case Study driven approach: default run Inputs

- Domain area
- Grid resolution (resolution of analysis)
- Gridded and harmonized distribution of human activities
- Potential score matrix

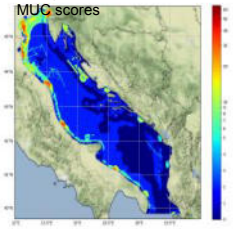




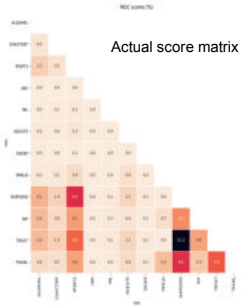
MUC: Adriatic Sea Case Study

Outputs

Geospatial distribution of MUC scores



Actual score matrix



MUC Supporting MSP

MSP Stages

1. Define goals and objectives
2. **Gather data and define current conditions**
3. **Identify issues, constraints, and future conditions**
4. Develop alternative management actions
5. **Evaluate alternative management actions**
6. Refine goals, objectives and management actions
7. Monitor and evaluate management actions

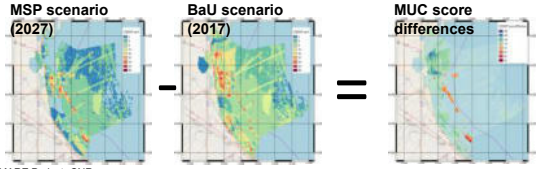
MSP Users

1. Planners
2. Scientists

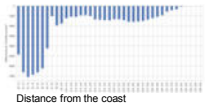
- **Identify and spatialize current/potential human uses and assesses their interaction in terms of conflicts (business as usual scenario).**
- Support MSP process testing hypotheses of reallocation of maritime uses
- Iterate the analysis over different time periods through integration of new conflict scores and geospatial datasets on sea uses
- Perform **scenario analysis** to test planning options

MUC Supporting MSP: scenario analysis

MSP scenario (2027) – **BaU scenario (2017)** = **MUC score differences**



RITMARE Project: CNR-ISMAR RER



Distance from the coast

CEA: Cumulative Effects Assessment

Aim

The CEA module implements cumulative effects assessment (CEA) of anthropogenic activities on marine environmental components based on the Tools4MSP Modelling Framework

- CEA (Cumulative Effects Assessment) is a systematic procedure for identifying and evaluating the significance of effects from multiple pressures and/or activities on single or multiple receptors

Journal of Marine Science and Engineering 2020, 8, 707; doi:10.3390/jmse8090707

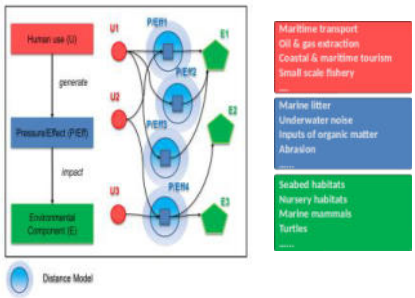
CEA: Tools4MSP modelling framework

Explicit geospatial impact chain

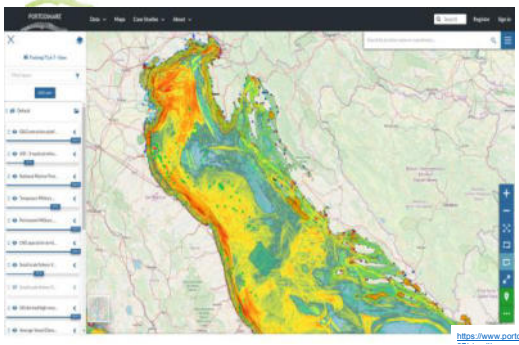
- **Identify and spatialize sources of human uses pressures** contributing to CEA score for a specific environmental component with a proper **source-pressure-pathway-receptor linkage**

2 steps:

- **From uses to Pressures**
- **from pressure to impact**

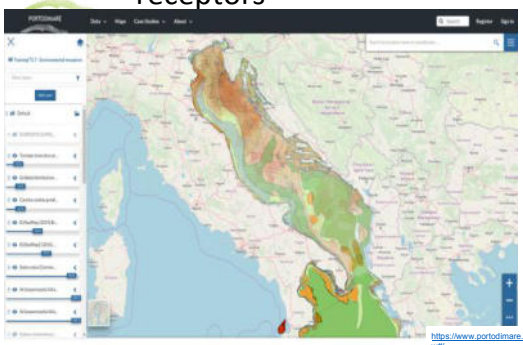


CEA inputs: Human activities



https://www.portodimare.eu/maps/5

CEA inputs: Environmental receptors



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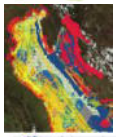
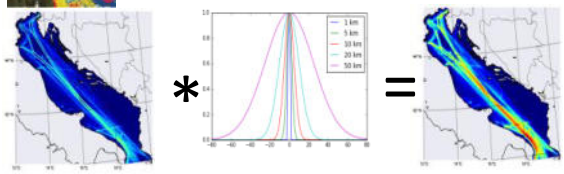
CEA first step: from Uses to Pressures



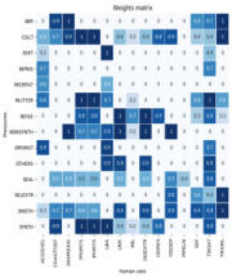
Distance model - isotropic propagation
2D spatial convolution with a Gaussian kernel function to assess the propagation of the pressure (P) generated by anthropogenic uses

Pressures maps

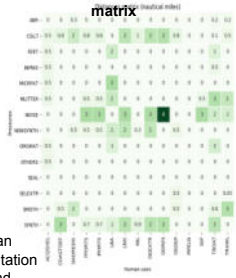


CEA first step: from Uses to Pressures

Weights



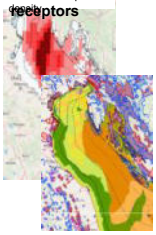
Distances matrix



based on an expert elicitation process and literature review

CEA second step: from Pressures to Impact

Geospatial distribution of Environmental receptors



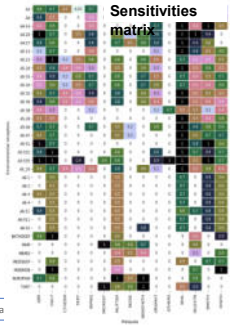
EUNIS seabed habitats + Natura2000

Characterization of the ecological/biological response
Sensitivities

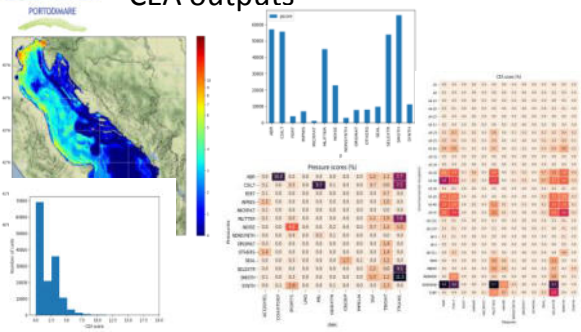
Expert-based survey, interviews, literature review

Impact extent: [0, 3]
Impact level: [0, 3]
Recovery time: [0, 4]
Confidence: [0, 1]

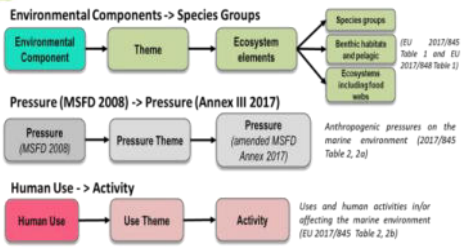
Sensitivities matrix



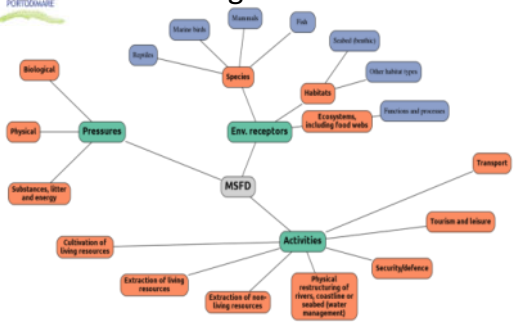
CEA outputs



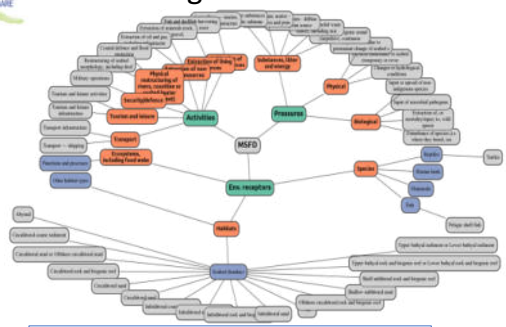
MSFD Alignment



MSFD Alignment

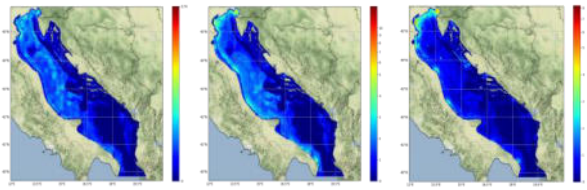


MSFD Alignment



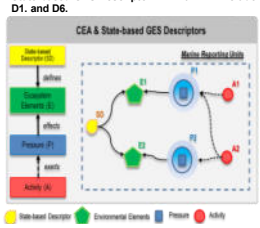
MSFD pressure-driven CEA

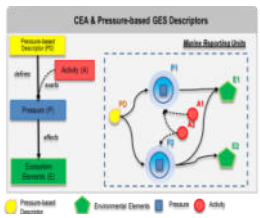
Biological pressures | **Physical pressures** | **Substances, litter and energy pressures**



MSFD Functional alignment (to be implemented)

State-based GES Descriptor CEA run will include D1. and D6.





D1. Biodiversity: Biological diversity is maintained. The quality and occurrence of habitats and the distribution and abundance of species are in line with prevailing physiographic, geographic and climate conditions.
D6. Sea-floor integrity: is at a level that ensures that the structure and functions of the ecosystems are safeguarded and benthic ecosystems, in particular, are

D5. Eutrophication: Nutrients, chlorophylla
D8. Contaminants: Concentrations of contaminants are at levels not giving rise to pollution effects.
D10. Litter: Properties and quantities of marine litter do not cause harm to the coastal and marine environment.
D11. Energy: - Introduction of energy, including underwater noise, is at levels that do not adversely affect

CEA Supporting M

MSP Stages

1. Define goals and objectives
2. **Gather data and define current conditions**
3. **Identify issues, constraints, and future conditions**
4. Develop alternative management actions
5. **Evaluate alternative management actions**
6. Monitor and evaluate management actions
7. Refine goals, objectives and management actions

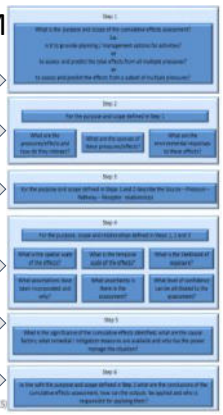
MSP Users

1. Planners
2. Scientists

Privileged tool to incorporate ecosystem based approach into the MSP process

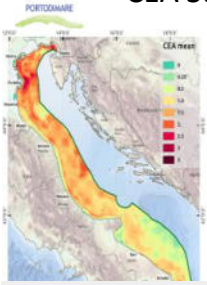
Practical application of CEA

- Scope of the assessment
- Identify pressure/effects, sources, environmental responses
- Understand and describe relationships among pressure/effects, sources, responses
- Scales, assumptions, uncertainty
- Significance of identified effects, causal factors and remedial/mitigation measures
- Conclusions and inputs to the MSP plan



(Judd et al., 2015)

CEA Supporting MSP

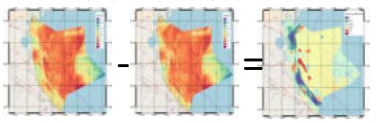


Menegon et al., 2018. A modelling framework for MSP-oriented cumulative effects assessment. Ecological Indicators. https://doi.org/10.1016/j.ecolind.2018.03.060

Spatially and temporally awareness

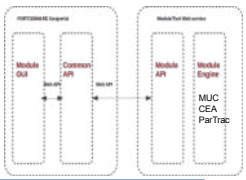
- **Area of influence of the pressure:** distinguish among local, short and long range CE
- Identify and **localize transboundary dimension** of CE
- Performing **scenario analysis** to test planning options

MSP scenario (2027) | **BaU scenario (2017)** | **MUC score difference**

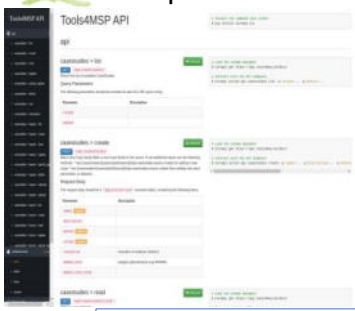


Modules implementation

- Web API-based architecture for Tools4MSP (MUC, CEA, ParTrac) integration into PORTODIMARE Geoportal
- API implements the Case Study driven approach
- Case study: a pre-configured, complete and consistent set of input data. Spatial domain, time reference, resolution.
- https://api.tools4msp.eu



Modules implementation

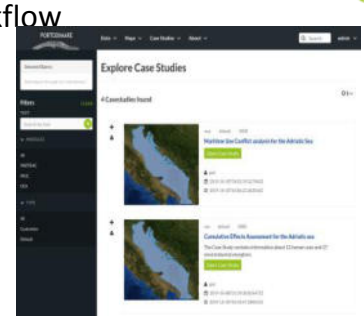


Tools4MSP API specification
CaseStudy-driven
- listing
- visualization
- customization
- running

Support multiple **anthropic and environmental context**
- for regional and multi-scape variability and specificity (eg. different weights, distances and sensitivities matrix)

CEA, MUC: end-user workflow

1. Case Study selection
2. Configuration
3. Results



https://www.portodimare.eu/casestudies/

CEA, MUC: end-user workflow

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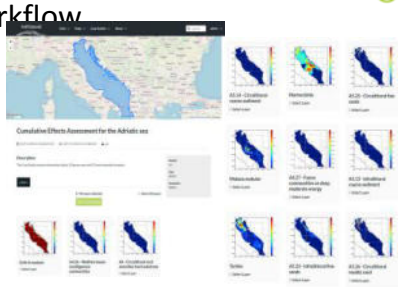

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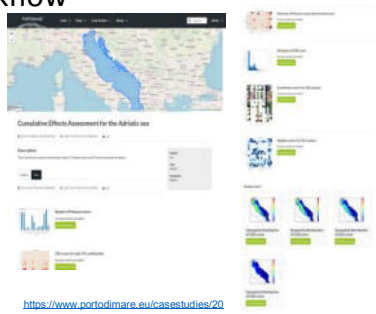
CEA, MUC: end-user workflow

1. Case Study selection
2. Configuration
3. Results



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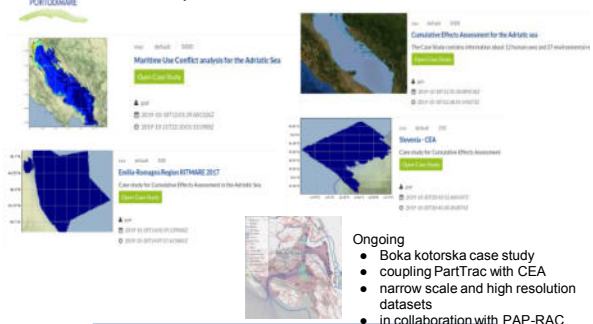
CEA, MUC Case Studies



Ongoing
- Boka kotorska case study
- coupling PartTrac with CEA
- narrow scale and high resolution datasets
- in collaboration with PAP-RAC

Governance

Governance

Sector	Type of Planning Instrument	Planning Instrument	Planning Instrument (Translation in English)
Please select the sector from the drop-down menu	Please select the planning instrument from the drop-down menu	Other	Please indicate the full name of the planning instrument [in the original language]	Please indicate the full name of the planning instrument in English
Aquaculture	Strategic Plan		Piano Strategico per l'Aquacoltura (2014-2020)	Strategic Plan for Aquaculture
C&M Tourism	Strategic Plan		Piano Strategico del Turismo (PST)	Strategic Plan for Tourism
Climate Change	Guidelines		Piano Nazionale di Adattamento ai Cambiament	Climate Change Adaptation National Plan
Coastal Defence	Guidelines		Tavolo Nazionale sull'Erosione Costiera (TNEC)	National Table on Coastal Erosion
Cultural heritage	Management Plan		UNESCO Piano di Gestione (2012-2018)	UNESCO Management Plan
Energy	Strategic Plan		Piano Energetico Regionale (PER)	Regional Energy Plan
Energy	Strategic Plan		Strategia Energetica Nazionale (SEN)	National Energy Strategy
Environment	Management Plan		Piano Territoriale Parco Regionale Veneto del D	Veneto Territorial Plan of Po Delta Park
Environment	Strategic Plan		Strategia Nazionale per la Biodiversità	National Strategy for Biodiversity
Environment	Monitoring Plan		Piano di Monitoraggio e Controllo (PMC) genera	General Monitoring and Control Plan
Environment	Monitoring Plan		Piano di Tutela delle Acque (PTA)	Water Protection Plan

Governance

Level/Scale	Authority	Geographical scope of the Instrument	
Please select the planning instrument level	Please indicate the competent authority	Please indicate and describe verbally the geographical scope of the planning instrument, mentioning also if it is terrestrial or marine	
National	MIPAAF - Region	National	Marine
Sub National	Veneto Region	Veneto Region	Both
National	MATTM - Region - Municipalities	National	Both
National	MATTM - Region	National	Both
Sub National	MiBAC - Region - Municipalities	Venice and the Lagoon	Other
Sub National	Veneto Region	Veneto Region	Both
National	MISE	National	Both
Sub National	Veneto Region	Delta del Po Park	Terrestrial
National	MATTM	National	Both
Sub National	ARPAV	Veneto Region	Both
Sub National	Regione Veneto	Veneto Region	Terrestrial
Sub National	Autorità di Bacino Alpi Orientali	Authority Area insisting on the wa	Terrestrial
National	MIPAAF	National	Marine
Local	Province of Venice	Province of Venice - administrativ	Marine

Governance

Spatial-Geographical Data			Shapefile	Link
Please indicate from the list on the right the the spatial extension of the planning instrument. In case of other please specify. MA-Marine	Other	Abruzzo MA; Abruzzo TA; Adriatic Sea; Aegean Sea; Albania MA; Albania TA; Apulia MA; Apulia TA; Bosnia and Herzegovina MA; Bosnia and Herzegovina TA; Croatia MA; Croatia TA; Cyprus MA; Cyprus TA; Dubrovnik-Neretva TA;	In case you indicated other in the spatial extension please provide a shapefile of the area of competence.	Please include the relevant link to the shapefiles and data provided
Italian Seas				https://www.politicheagricole.it/flex/cm/pages/Ser
Italian TA				https://www.veneto.eu/resource/resolver?resourc
Italian Seas and Italian TA				https://www.minambiente.it/sites/default/files/arc
Italian TA				http://www.erosionecostiera.isprambiente.it/linee
Other	Venice and the lagoon			http://www.veniceandlagoon.net/web/piano_di_g
Veneto TA and Veneto MA				https://www.regione.veneto.it/web/energia/piano
Italian Seas and Italian TA				https://www.mise.gov.it/images/stories/document
Other	Delta del Po Park			https://parcodeltapo.org/index.php/it/piano-del-pa
Italian Seas and Italian TA				https://www.minambiente.it/pagina/strategia-nazi
Veneto TA and Veneto MA				http://www.arpa.veneto.it/servizi-ambientali/ppc
Veneto TA				https://bur.regione.veneto.it/BurServices/pubblic
Other	Authority Area insisting on the watersheds of the Eastern Alps			http://www.alpconfalti.it
Italian Seas				https://www.politicheagricole.it/flex/cm/pages/Ser
Other	Province of Venice - administrative subdivision			http://www.fipsavenezia.com/2013/it/Document

2.2 Practical session: how to use the modules

Practical session outline

CEA
- total impact
- sectorial (eg. traffic and fishery)
- MSFD environmental themes
- sectorial + environmental themes (eg. trawling and nursery habitats)

MUC
- MUC analysis
- Governance integration

Scope of the assessment

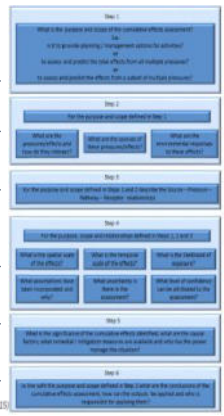
Pressure/effects, sources, responses

Understand and describe relationships among pressure/effects, sources, responses

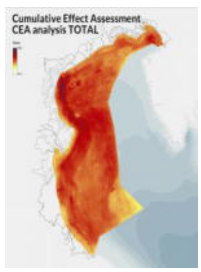
Scales, assumptions, uncertainty

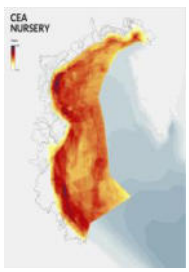
Significance of effects and remedial/mitigation measures

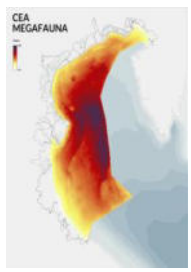
Conclusions and inputs to the MSP plan



(Judd et al., 2015)







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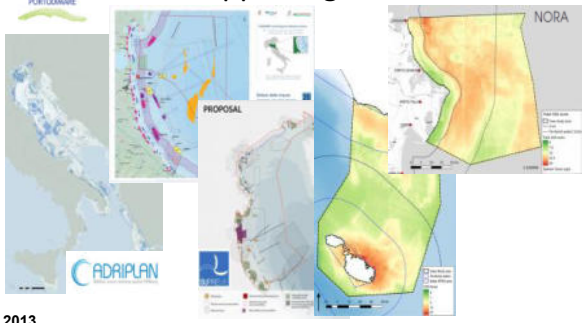
CEA Supporting MSP



2013

Session 2 - The modules

2.1 Presentation of modules: PARTRAC Particle Tracking Module

Michol Ghezzo, Christian Ferrarin, Stefano Menegon, Amedeo Fadini
CNR – National Research Council of Italy, ISMAR – Institute of Marine Sciences, Venice, Italy

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Outline

1. PARTRAC overview
2. PARTRAC Conceptual model
3. PARTRAC Implementation
4. Use in practice
5. Relevance in ICZM-MSP process

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PARTRACK : Particle Tracking Module

The PARTRAC module allows to simulate the transport of natural or antrophogenic substances.

Recipes - ingredients

1. Hydrodynamic model, validated in the study area
2. Particle tracking module, calibrated in the study area
3. Specific substance module
4. Post-processing routines to elaborate the outputs in useful way for other MSP tools or for other analysis

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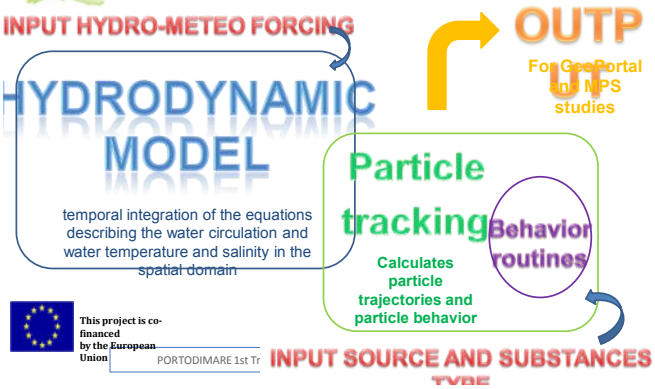
PARTRAC: conceptual model



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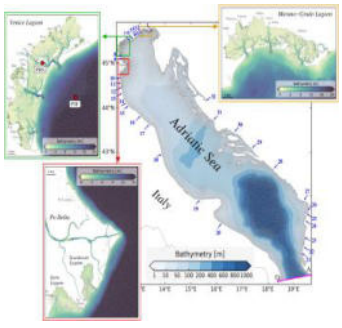
PARTRAC: SHYFEM implementation in the Adriatic Sea

How the model is implemented:

The Adriatic Sea domain includes the most important North Adriatic **lagoons and river systems**. It is divided in small areas (elements) building a spatial grid. In each area all variables are calculated. In this application are 110000 elements with variable spatial resolution **from 7 Km in open sea to few hundred meters in lagoons channels**.

.

Bathymetry data are interpolated in each element. The vertical dimension is divided in **34 layers with variable thickness from 1 m in the topmost 10 m, to 100 m** in the deepest layer of the Adriatic Sea.



Ferrarin et al. 20

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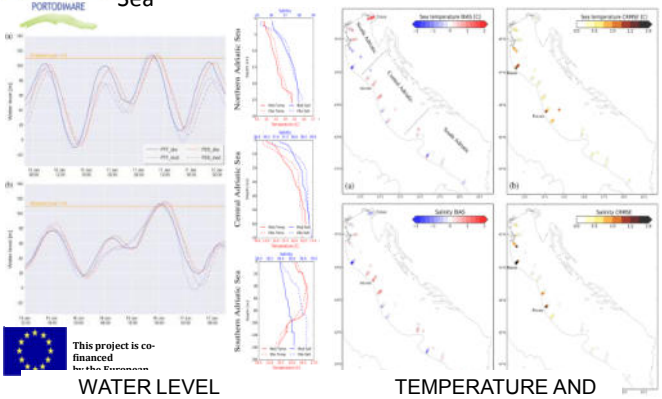
PARTRAC: SHYFEM validation in the Adriatic Sea



WATER LEVEL

TEMPERATURE AND SALINITY

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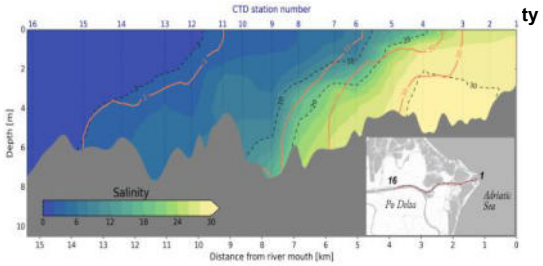
PARTRAC:SHYFEM validation in the Adriatic Sea



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COMPARISON WITH DATA : SALT INTRUSION

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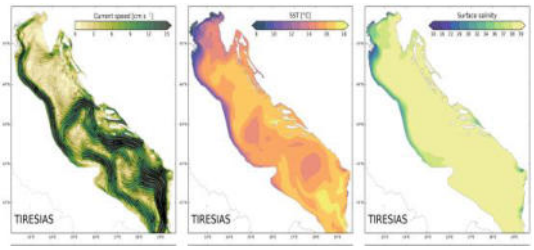
PARTRAC :SHYFEM HYDRODYNAMIC RESULTS USED IN THE MODULE

IN THE PARTRAC ARE AVAILABLE NOW AVERAGE CIRCULATION , TEMPERATURE AND SALINITY CONDITIONS



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PRTRAC: PARTICLE TRACKING MODULE implementation in the Adriatic Area

The particle tracking module needs to define:

1. The sources of particle
2. The characteristic of the substance
3. The number of particles

Considering the output we have to take in mind **some limitations :**

- **Spatial resolution**: the numerical grid resolution define our spatial confidence, no more detail than the minimum resolution at the location.
- **Number of particles**: it has to be sufficent to represent statistically the substance dispersion
- **Duration of the run**: it has to be suffcient to represent the dynamic of the process

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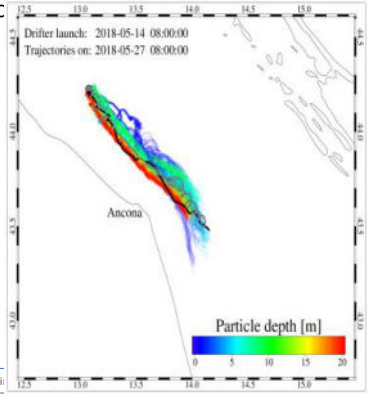
PARTRAC: tracking model validation in the Adriatic

The particle are released on different depth and their trajectories (rainbow lines) are compared with drifter data (black line) . The average trajectory (grey line) has good fit with the field data.



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PARTRAC: PARTICLE TRACKING MODULE implementation in the PORTODIMARE Geoportal

To have fast online web-service the PARTRAC model is running on a pre-simulated configuration. It means :

1. we calculated the annual average circulation of the Adriatic Sea.
2. the whole domain area was seeded with 100000 particles at the beginning on the surface
3. the run is 5 days long.

The geoportal work on the pre-configured output. The user can define:

1. the hydroynamic scenario
2. the kind of substance
3. the sources

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PARTRAC: in practice. WORK FLOW

EFINE THE HYDRODYNAMIC

Time	Meteo	Tide	River	Circulation
Year	Real	Real	Real	AVERAGE
Seasonal	Real	Real	Real	SEASONAL
Week	Bora	Event	Event	BORA event
3 days	Real	Real	Flood	FLOOD event

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PARTRAC: in practice. WORK FLOW

DEFINE THE SUBSTANCE

Description	Sinking	Decay	Growth
Floating litter	--	--	--
Fine sediment	0.01 m/s	--	--
Faecal bacteria	none	UV, T, S	--
Larval /infective organisms	specific	Specific	Specific

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PARTRAC: in practice. WORK FLOW

DEFINE THE SOURCE

Description	Geometry	Frequency	Depth
Aquaculture area	Area	Initial or 1 day	Surface
River	Line/area	Every 15 min	Whole column
Seawage	Point	Every 30 min	Bottom
Ship	Point /area	Initial	Surface

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PARTRAC: in practice. WORK FLOW

DEFINE THE OUTPUT

Description	shape	meaning	unit
Particle Density	Cells	Area of influence	Part / cell or , %
Particle trajectory	Points	Confidence band	Averaged Lines

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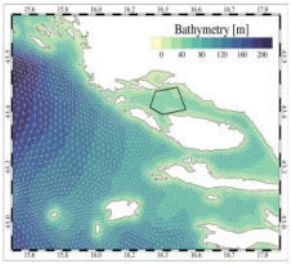
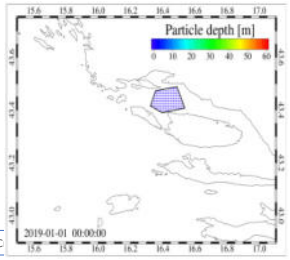
Example: SPLIT



- Average circulation
- Substance : floating litter
- Source: one events inputs
- Source: Seeding area
- Duration: 5 days run



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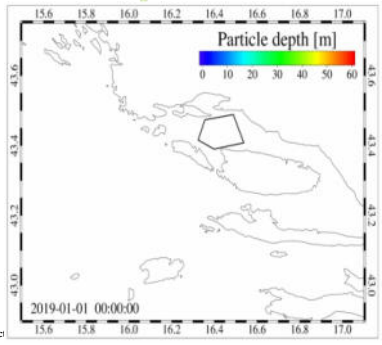
Example: SPLIT



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PARTRAC: in practice.

Output Elaboration for MSP

Description	meaning	MSP implications
Particle density	Area of influence	Risk around the source: pressure for cumulative impacts, idoneity for some uses
Particle trajectory	Confidence band	Corridors involved : if and how different pressure/activity can influence the same areas

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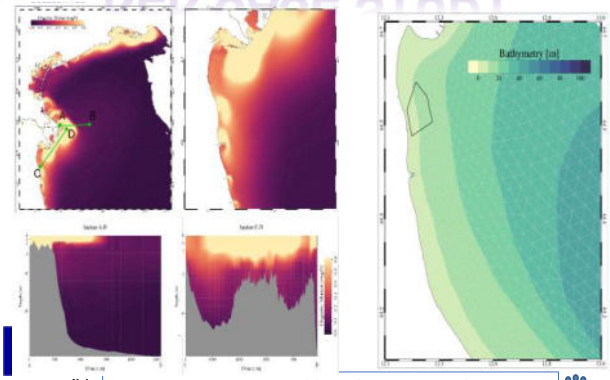
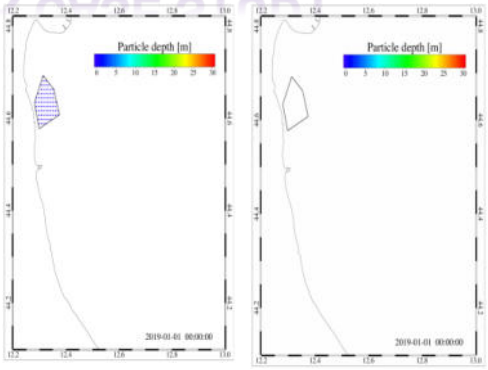
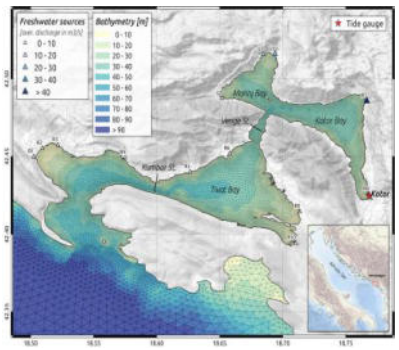
RER CASE STUDY

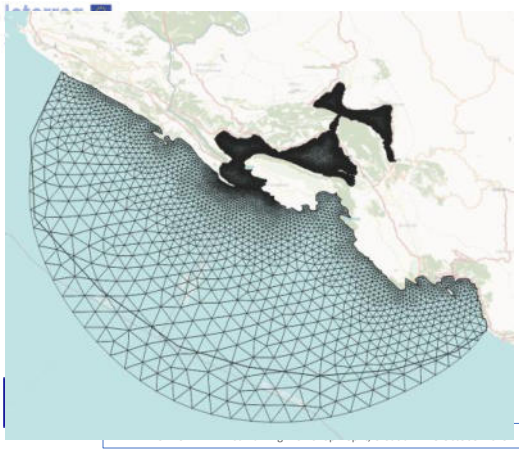


RER CASE STUDY



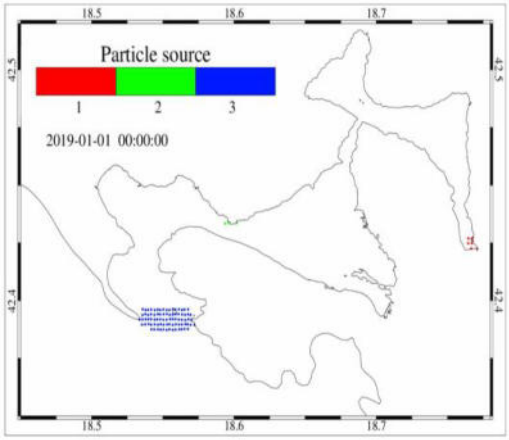
KOTOR CASE STUDY





ONLY ASTRONOMICAL TIDE

STRONGLY ONLY FOR TEST!!!



Thank you for your attention

Allocated Zone for Aquaculture (AZA)

Porporato E.M.D.[1], Brigolin D.[1],
Barbanti A. [2], Pastres R.[1]

[1] Ca' Foscari University of Venice, Italy
[2] CNR – National Research Council of Italy, ISMAR – Institute of Marine Sciences, Venice, Italy
[3] CORILA – Consortium for coordination of research activities concerning the Venice lagoon system, Venice, Italy

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Outline

- AZA
- Study area and selected species
- Spatial Multi-Criteria Evaluation (SMCE)
- Criteria
- Constraints
- Aquaculture Suitability

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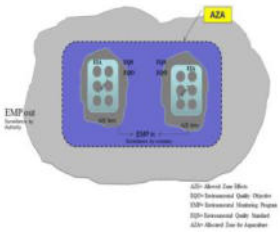
Allocated Zones for Aquaculture (AZAs)

*A marine **area** where the development of **aquaculture has priority** over other uses, and therefore will be primarily dedicated to aquaculture. Identification of an AZA will result from **zoning processes** through **participatory spatial planning**, whereby administrative bodies legally establish that specific spatial areas within a region have priority for aquaculture development* (Sanchez et al., 2016)



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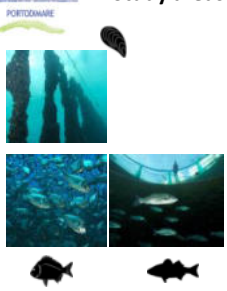
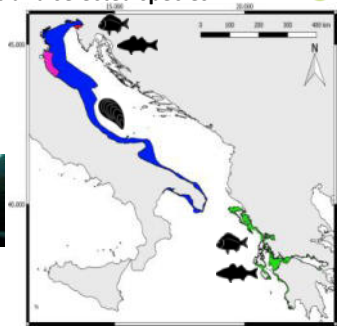
Study areas and selected species





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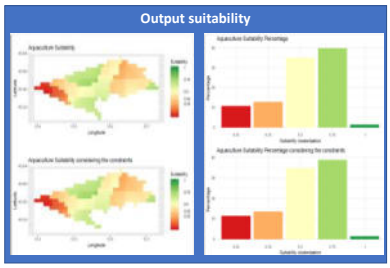
Output layers

Prompt command line



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Methodology: Spatial Multi-Criteria Evaluation (SMCE)

Basic SMCE theory:

- "Investigate a number of choice possibilities in the light o multiple criteria and conflicting objectives" (Voogd, 1983);
- Generate rankings of choice alternatives.

Two basic input data:

1. **Criteria**
2. **Constraints**

$$SI = \sum w_i x_i * \prod c_j$$

SI: Suitability Index **w: weights** **x: factor scores** **Product of constraints (c)** **1 – available, 0 – unavailable**

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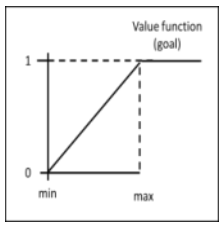
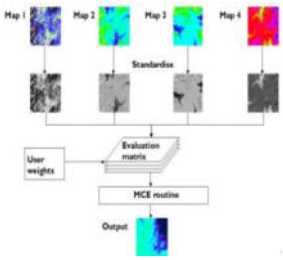
Methodology: Spatial Multi-Criteria Evaluation (SMCE)





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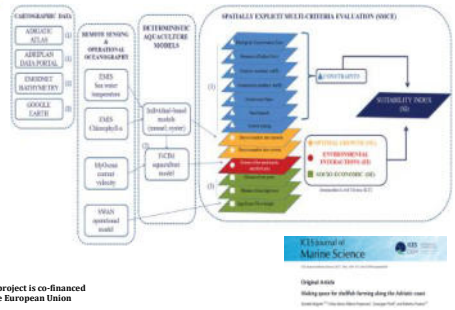
Methodology: Spatial Multi-Criteria Evaluation (SMCE)



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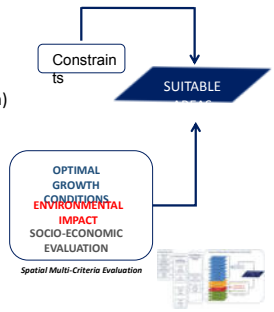
SMCE allows to take into account two types of factors:

- CONSTRAINTS
- CRITERIA

Criteria were combined using WLC (Weighted Linear Combination)

In this application, we used input layers for:

- Constraints
- Optimal Growth
- Environmental Impacts
- Socio-economic



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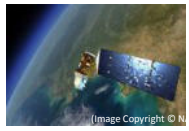
Satellite-based observations

- ❖ Site selection and AZA identification
- ❖ Support planning and management
- ❖ Tracking hazard events
- ❖ Assess environmental change
- ❖ Input data to mathematical model



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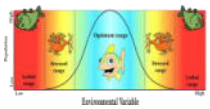
Finfish and Shellfish growth models

Rearing cycle of:

1. **European seabass** (*Dicentrarchus lab*
2. **Gilthead seabream** (*Sparus au*
3. **Mediterranean mussel** (*Mytilus galloprovi alis*)



- Bioenergetic models allow one to gain useful insights concerning the dynamic of the growth and, besides being more flexible, they are also more robust and have a higher predictive capability.
- Scope for Growth concept (see Ursin,1967)
- Dynamic Energy Budget models, (Kooijmann, 1993) (http://www.bio.vu.nl/thb/deb).

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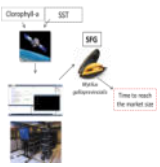
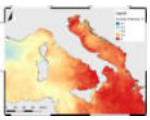
Finfish and Shellfish growth models

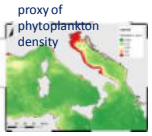


Feed

Sea Surface Temperature



Chlorophyll-a proxy of phytoplankton density



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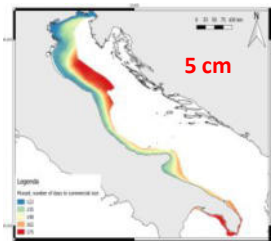
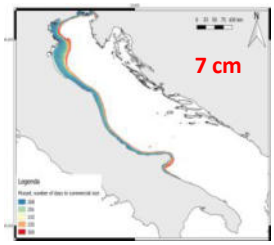
Shellfish growth models outputs





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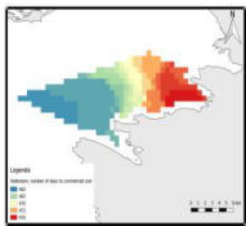
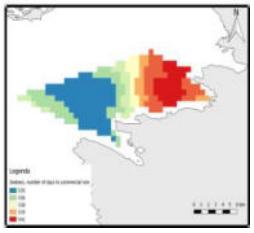
Finfish growth models outputs





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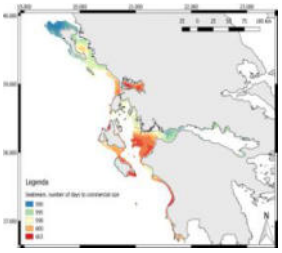
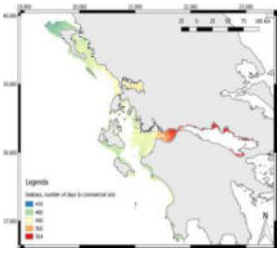
Finfish growth models outputs





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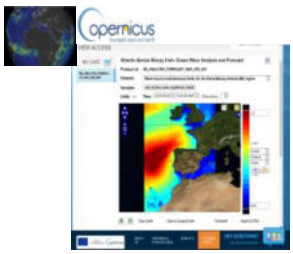
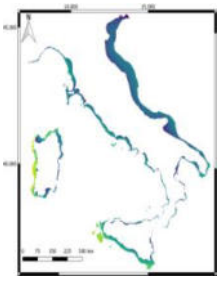
Significant Wave Height





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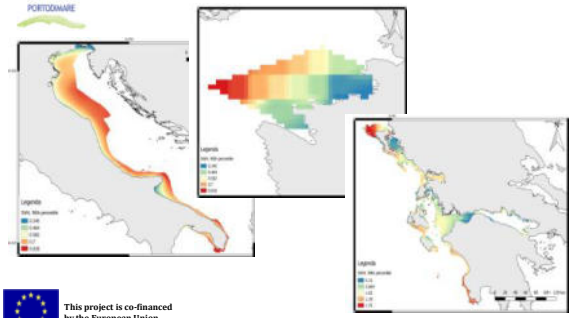
Significant Wave Height



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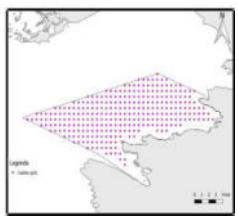
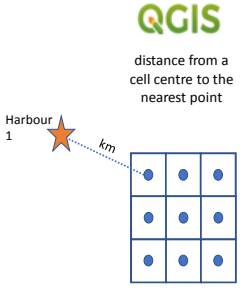
Distance to harbour





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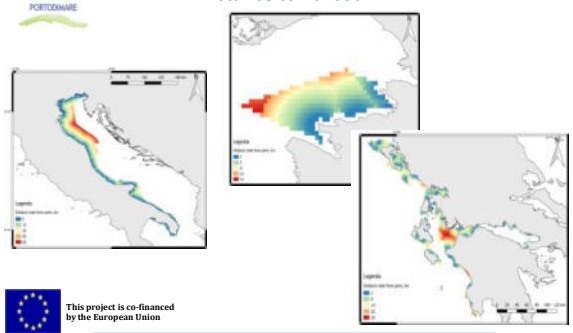
Distance to harbour



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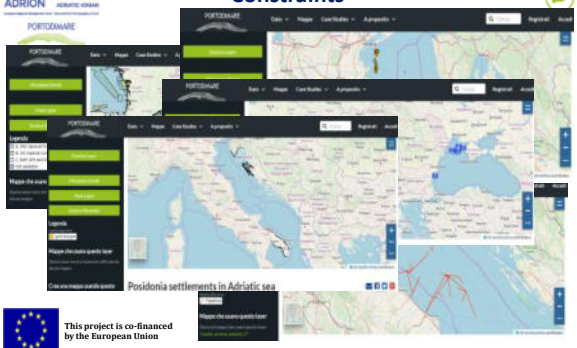
Constraints



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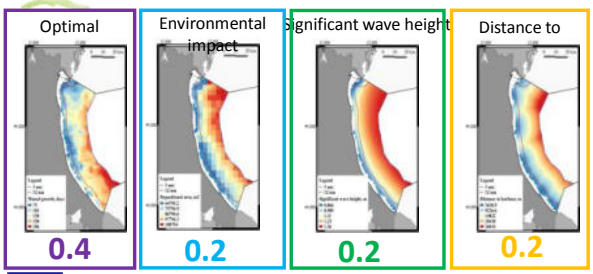
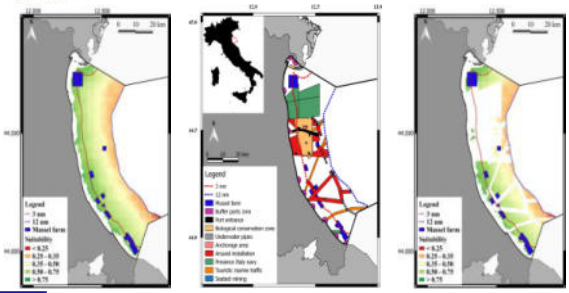
Criteria weights



This project is co-financed by the European Union

Suitability maps



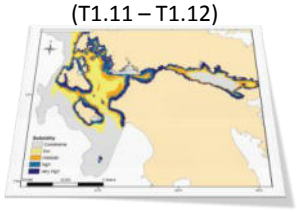
This project is co-financed by the European Union

Thank you for your attention!

erika.porporato@unive.it

This project is co-financed by the European Union

Modules on Small and Medium-Scale Fisheries Footprints
(T1.11 – T1.12)



Dimitris Politikos, Irida Maina, Stefanos Kavadas

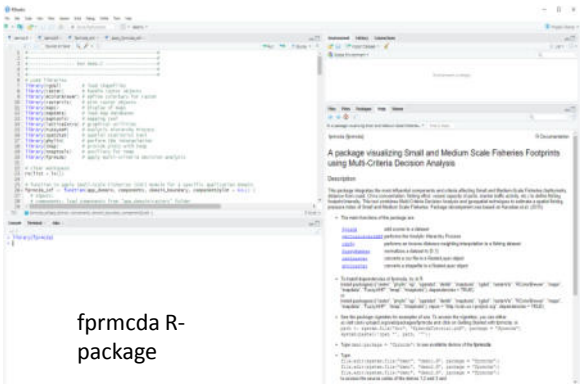
PORTODIMARE, 22-23 October 2019, Split, Croatia

Overview

OBJECTIVE: Integrate the most influential components affecting Small and Medium-Scale Fisheries (i.e., bathymetry, distance from coast, Chl-a concentration, fishing effort, vessel capacity of ports, marine traffic activity, etc.) to assess fishing footprint intensity.

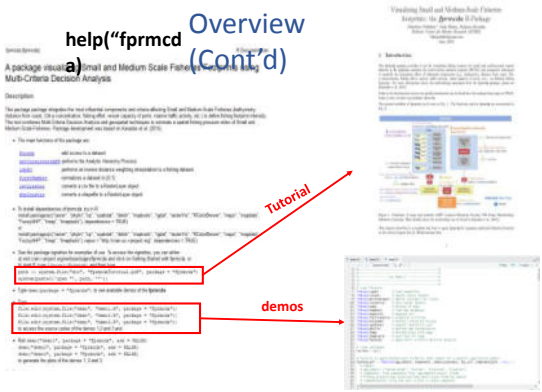
APPLICATION DOMAIN: around Kephalonia island

NAME OF R-PACKAGE: **fprmcda**



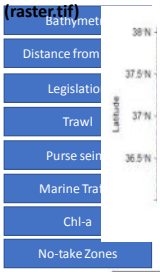
fprmcda R-package

help("fprmcda") Overview (Cont'd)

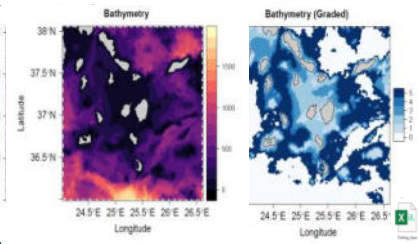


DATA + PARAMETERISATION

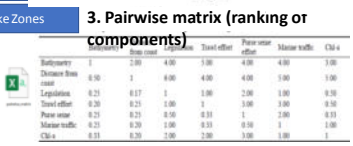
1. Components (raster.tif)

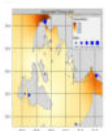


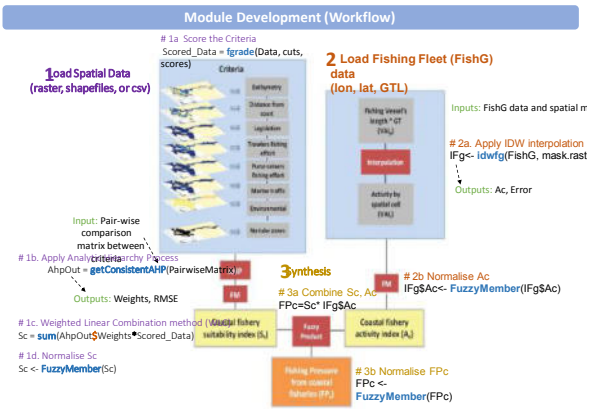
2. Grading of Components



3. Pairwise matrix (ranking of components)





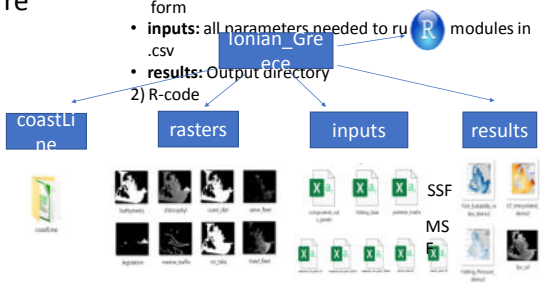


Structure

For each application domain directory, we have

1) **FOUR** sub-folders:
- **coastLine:** shapefile with the coastline of the app_domain
- **rasters:** Components affecting fisheries in raster form
- **inputs:** all parameters needed to ru modules in .csv
- **results:** Output directory

2) R-code

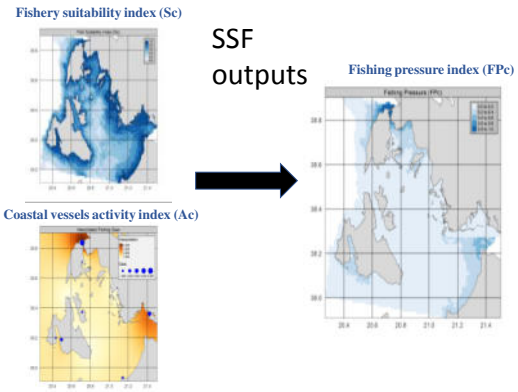



```
fprmcda_ssf <- function(app_domain, components, domain_boundary, component2plot = NULL) {
  # Inputs:
  # components: load components from "app_domain/rasters" folder
  # component2plot: allow the user to plot a single component
  # intp = 0 (default); set to if testing of interpolation of fishing gear is needed.
  # Outputs:
  # Plots of Fish Suitability Index, Fishing Pressure, GT_Interpolated per harbour
  # Output directory: "app_domain/results"
  # Example:
  # components = c("bathymetry", "coast_dist", "chlorophyl")
  # fprmcda_ssf("Ionian_Greece", components , "bathymetry")
```

```
# Application example-1
app_domain = "Ionian_Greece"
domain_boundary <- c(20.26, 21.5, 37.9, 38.9)
components = c("bathymetry", "coast_dist", "ch
fprmcda_ssf(app_domain, components, "bathy
```

SEE demo2.r in fprmcda

```
# Application example-2
app_domain = "Ionian_Greece"
domain_boundary <- c(20.26, 21.5, 37.9, 38.9)
components = c("bathymetry", "coast_dist", "legislation", "trawl_fleet",
"seine_fleet","marine_traffic", "chlorophyl")
fprmcda_ssf(app_domain, components, domain_boundary)
```

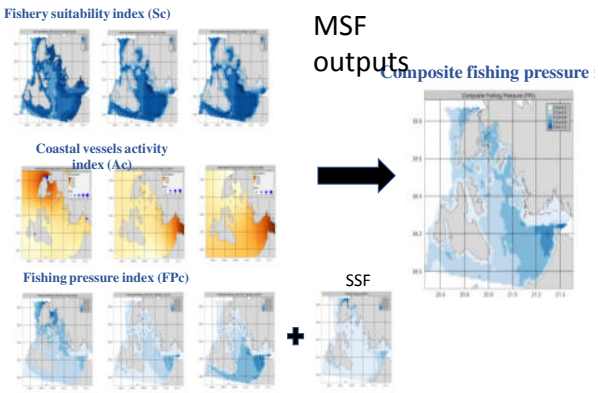



```
fprmcda_msf <- function(app_domain, components, domain_boundary, fpc_ssf, component2plot = NULL) {
  # Inputs:
  # app_domain: ["Ionian-Greek", "Italian", "Slovenian", "Croatian"]
  # components: load components from "app_domain/rasters" folder
  # fishing pressure map extarcted from Small-scale Fisheries module
  # component2plot: allow the user to plot a single component
  #
  # Outputs:
  # Plots of Fish Suitability Index,GT per harbour and Fishing Pressure
  # Output directory: "app_domain/results"
  # Example:
  # components = c("bathymetry", "coast_dist", "legislation_TR", "legislation_PS", "chlorophyl")
  # fprmcda_msf("Ionian_Greece", components)
```

```
# Application example-1
app_domain = "Ionian_Greece"
domain_boundary <- c(20.26, 21.5, 37.9, 38.9)
fpr_ssf = "fpc_ssf.tif" # fishing pressure index extrac
module
components = c("bathymetry", "coast_dist", "chlorophyl")
fprmcda_msf(app_domain, components, "bathymetry", domain_boundary, fpr_ssf)
```

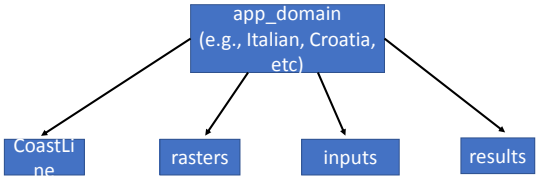
SEE demo3.r in fprmcda

```
# Application example-2
app_domain = "Ionian_Greece"
domain_boundary <- c(20.26, 21.5, 37.9, 38.9)
fpr_ssf = "fpc_ssf.tif" # fishing pressure index extracted after running Small-Scale Fisheries
module
```

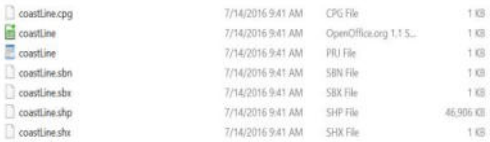


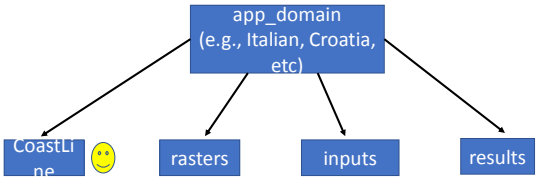
HOW TO RUN YOUR **SSF -** CASE STUDY THROUGH 5 BABY STEPS

1. Create Your (empty) Directory

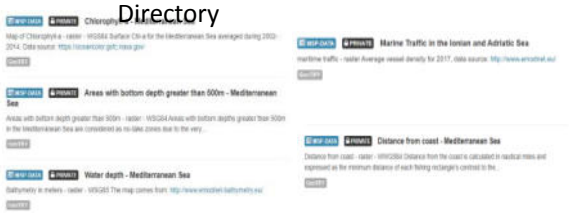


2. Add coast shapefile in **CoastLine** Directoı

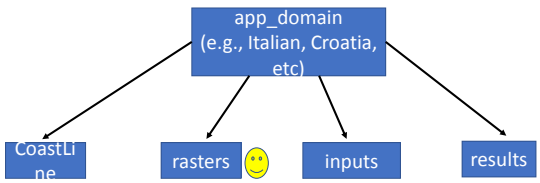




3. Add components in **rasters** Directory



- Crop existing rasters from catalogue to your model domain
- Add Purse seine & Trawl fishing effort rasters
- Add No_Take zones raster
- Add Legislation raster



4. Adjust input files (1)

Grading of components

bathymetry_cuts	bathymetry_grades	coast_dist	coast_dist_legislation	legislation	trawl_flee	trawl_flee	seine_flee	seine_flee	marine_tr	marine_tr	chlorophyl	chlorophyl_grades
-999		-999		-999		-999		-999		-999	-999	0
0	4	0	4	0	4	0	1	0	1	0	0.1	1
50	3	1.5	3	3	3	0.2	2	0.2	2	1	1	0.23	2
100	2	3	2	6	2	0.4	3	0.4	3	2	2	0.46	3
200	1	6	1	11	0	0.8	4	0.8	4	3	3	0.79	4
500	0												

Bathymetry (meters)	Grade	Marine traffic activity	Grade
0 - 50 m	4	Absence of Marine traffic	4
50 m - 100 m	3	High coast distance from marine traffic	3
100 m - 200 m	2	Medium coast distance from marine traffic	2
200 m - 500 m	1	Low coast distance from marine traffic	1
>500 m	0		
Distance from coast (nautical miles)	**Grade**	**Bottom trawl fleet effort**	**Grade**
< 1.5 nm	4	Absence of effort	4
1.5 nm - 3 nm	3	Low	3
3 nm - 6 nm	2	Medium	2
>6 nm	1	High	1
Sea Surface Chlorophyll (Chl a) (mg/m³)	**Grade**	**Purse seine fleet effort**	**Grade**
Eutrophic waters: > 0.79 mg/m3	4	Absence of effort	4
Upper mesotrophic waters: 0.46mg/m3 - 0.79mg/m3	3	Low	3
Medium mesotrophic waters: 0.23mg/m3 - 0.46mg/m3	2	Medium	2
Lower mesotrophic waters: 0.1mg/m3 - 0.23mg/m3	1	High	1
Legislation	**Grade**	**No-take Zones (Boolean value 0=yes, 1=no)**	**Grade**
available zone	4	Aquaculture Zones	0
less for 6 months	3	Natural zone (vast zones)	0
less for 6 months	2	depth >500m	0
less for 12 months	0	available zone	1

4. Adjust input files (2)

Ranking of components

	bathymetry	coast_dist	legislation	trawl_fleet	seine_fleet	marine_traffic	chlorophyl
bathymetry	1.00E+00	2.00E+00	4.00E+00	5.00E+00	4.00E+00	4.00E+00	3.00E+00
coast_dist	5.00E-01	1.00E+00	6.00E+00	4.00E+00	4.00E+00	5.00E+00	5.00E+00
legislation	2.50E-01	1.67E-01	1.00E+00	1.00E+00	2.00E+00	1.00E+00	5.00E-01
trawl_fleet	2.00E-01	2.50E-01	1.00E+00	1.00E+00	3.00E+00	3.00E+00	5.00E-01
seine_fleet	2.50E-01	2.50E-01	5.00E-01	3.33E-01	1.00E+00	2.00E+00	3.33E-01
marine_traffic	2.50E-01	2.00E-01	1.00E+00	3.33E-01	5.00E-01	1.00E+00	1.00E+00
chlorophyl	3.33E-01	2.00E-01	2.00E+00	2.00E+00	3.00E+00	1.00E+00	1.00E+00

	Bathymetry	Distance from coast	Legislation	Trawl effort	Purse seine effort	Marine traffic	Chl-a
Bathymetry	1	2.00	4.00	5.00	4.00	4.00	3.00
Distance from coast	0.50	1	6.00	4.00	4.00	5.00	5.00
Legislation	0.25	0.17	1	1.00	2.00	1.00	0.50
Trawl effort	0.20	0.25	1.00	1	3.00	3.00	0.50
Purse seine	0.25	0.25	0.50	0.33	1	2.00	0.33
Marine traffic	0.25	0.20	1.00	0.33	0.50	1	1.00
Chl-a	0.33	0.20	2.00	2.00	3.00	1.00	1

4. Adjust input files (3)

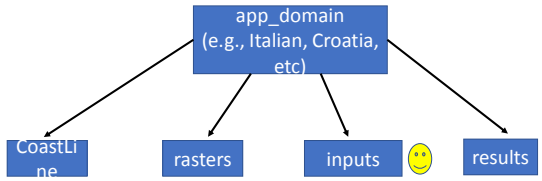
GT per harbour - Mediterranean Sea

Gross Tonnage per harbor - shapefile An activity index for the small-scale fishing fleet by registration port for all vessels of each port (p) by the summed product GT(p) × ...

Crop existing GT Med-Sea shapefile to your domain

GT of ports

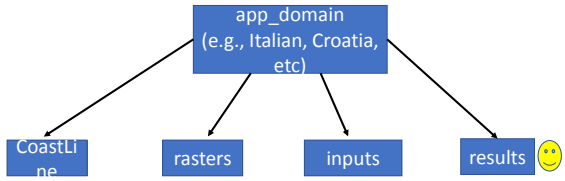
Longitude	Latitude	GT
22.63	38.38	958.0146
21.1709	38.8608	615.6442
20.4967	38.1883	1903.414
21.0833	38.5333	296.3412
22.963	38.2304	9.0413
22.0826	38.2498	923.2636
20.57	38.46	116.4807
20.19	39.1967	337.1445
22.3806	38.3796	356.6802
20.2627	39.4998	504.3625
22.425	38.43	616.2621
20.7142	38.3727	649.1902
21.3183	37.6414	694.1276
19.91	39.62	6699.954
22.7484	38.008	196.6491
21.1426	37.9334	981.5888



5. Add fprmcda_ssf to **app_domain** Director

T1.11

```
app_domain = "Ionian_Greece"
domain_boundary <- c(20.26, 21.5, 37.9, 38.9)
components = c("bathymetry", "coast_dist", "legislation", "trawl_fleet",
"seine_fleet",
"marine_traffic", "chlorophyl")
fprmcda_ssf(app_domain, components, domain_boundary)
```



HOW TO RUN YOUR **MSF -** CASE STUDY
THROUGH 5 BABY STEPS

1. Create Your (empty) Directory (same with SSF)
2. Add coast shapefile in **CoastLine** Directory (same with SSF)
3. Add components in **rasters** Directory (same with SSF)
4. Adjust input files (More files here, per fishing gear)

5. Add fprmcda_msf to **app_domain** Directory

T1.12

```
app_domain = "Ionian_Greece"
domain_boundary <- c(20.26, 21.5, 37.9, 38.9)
fpr_ssf = "fpc_ssf.tif" # fishing pressure index extracted after running T1.11
components = c("bathymetry", "coast_dist", "legislation", "trawl_fleet",
"seine_fleet",
"marine_traffic", "chlorophyl")
```

Required consistencies (1)

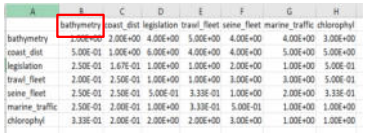
- For each component in *rasters* folder (e.g., raster file bathymetry.tif), the name of the raster and the layer name in the raster should be the same,

```
> r <- raster("bathymetry.tif")
> r
class      : RasterLayer
dimensions : 99, 122, 12078  (nrow, ncol, ncell)
resolution : 0.01014747, 0.01014747  (x, y)
extent     : 20.26699, 21.50498, 37.9079, 38.9125  (xmin, xmax, ymin, ymax)
coord. ref. : +proj=longlat +datum=WGS84 +no_defs +ellps=WGS84 +towgs84=0,0,0
data source : /Ionian_Greece/rasters/bathymetry.grd
names      : bathymetry
values     : 0, 1009  (min, max)
```

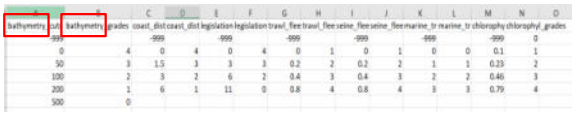
- The names in the pairwise matrix (*inputs*/pairwise_matrix.csv) should be also the same as in the *rasters folder,* bathymetry
- Additionally, the *name* in _cuts & _grades (see input_parameters.r in *inputs* sub-folder) should be the same, i.e., bathymetry_cuts, bathymetry_grades

Required consistencies (2)

Schematically… if the raster name of the component is bathymetry.tif,



	bathymetry	coast_dist	legislation	trawl_fleet	seine_fleet	marine_traffic	chlorophyl
bathymetry	2.00E+00	4.00E+00	5.00E+00	4.00E+00	4.00E+00	3.00E+00	
coast_dist	5.00E-01	1.00E+00	6.00E+00	4.00E+00	4.00E+00	5.00E+00	5.00E+00
legislation	2.50E-01	1.67E-01	1.00E+00	1.00E+00	2.00E+00	1.00E+00	5.00E-01
trawl_fleet	2.00E-01	2.50E-01	1.00E+00	1.00E+00	3.00E+00	3.00E+00	5.00E-01
seine_fleet	2.50E-01	2.50E-01	5.00E-01	3.33E-01	1.00E+00	2.00E+00	3.33E-01
marine_traffic	2.50E-01	2.00E-01	1.00E+00	3.33E-01	5.00E-01	1.00E+00	1.00E+00
chlorophyl	3.33E-01	2.00E-01	2.00E+00	2.00E+00	3.00E+00	1.00E+00	1.00E+00



bathymetry_cuts	bathymetry_grades	coast_dist	coast_dist	legislation	legislation	trawl_flee	trawl_flee	seine_flee	seine_flee	marine_tr	marine_tr	chlorophy	chlorophyl_grades
-999		-999		-999		-999		-999		-999		-999	0
0	4	0	4	0	4	0	1	0	1	0	0	0.1	1
50	3	1.5	3	3	3	0.2	2	0.2	2	1	1	0.23	2
100	2	3	2	6	2	0.4	3	0.4	3	2	2	0.46	3
200	1	6	1	11	0	0.8	4	0.8	4	3	3	0.79	4
500	0												

Oil Spill Risk Module A.T1.10

Apulia Region

Dr. Antonio Lanza – Civil Protection Apulia Region
Dr. Lorenzo Natrella – Civil Protection Apulia Region
Dr. Raffaella Matarrese – CNR IRSA
Eng. Michele Vurro – CNR IRSA

PORTODIMARE PROJECT: 1st Training Workshop
Split, Hotel Atrium; 22-23 October 2019

This project is co-financed by the European Union

A.T1.10 is a capitalization and further evolution of the tools developed by HAZADR project within the Adriatic Atlas.

In specific, A.T1.10 is focusing on the upgrading and/or ex-novo building of vulnerability maps (total, human and environmental) with respect to oil spill events, on importing hazard data described by COMADEX index and on importing responce equipment displacement along the Adriatic coast.

The scope of A.T1.10 is to mainstream the Adriatic Atlas-based data within the PORTODIMARE Geoportal.

In this presentation we will focus on the vulnerability map that will be upgraded or built ex-novo in order to include Jonian Sea.

This project is co-financed by the European Union

Description of Hazadr Project

JUST TO RESUME!!!!

The ambition of HAZADR project is that with a common ATLAS, the highest number of emergency corps in different Adriatic countries and regions could access the same early warning system anytime and be informed over the risk evolution in Adriatic.

This project is co-financed by the European Union

Description of the ATLAS

The ATLAS zooms simultaneously over the vulnerability areas, the dangerous vessels risky score, the oceanographic model to predict oil spill dynamic and the first costal zones/marine areas affected in case of hazard.

The ATLAS provides also information about which are the response equipment available for that kind of hazard and environmental system (both for open sea incidents or coastal zones' hazards) and where they are located in Adriatic.

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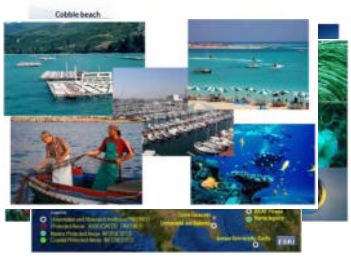
Description of A.T1.10 products

The ATLAS includes two different main layers that will be implemented in Portodimare:

ATLAS → Vulnerability of Coastal areas defined considering:

- Shoreline features
- Plants and Animals
- Protected areas
- Economic, Culture & Heritage, Social, Amenity & Recreational



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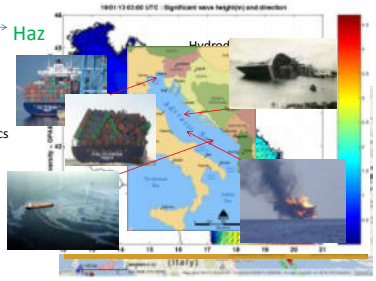
Description of A.T1.10 products

The ATLAS includes two different main layers that will be implemented in Portodimare:

ATLAS → Vulnerability
→ Haz

- Maritime traffic
- Oil and gas platform
- Adriatic sea characteristics
- Analysis of historical accidents in the Adriatic sea



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Vulnerability map

Vulnerability maps will provide indications on the priorities of the most vulnerable areas to preserve or to clean up in case of maritime accidents.
The accuracy of the this kind of vulnerability will depend on the availability input data.

Based on the New Zealand approach described by Stevens et al. in 2005, vulnerability has been computed considering environmental and anthropic features of the coast.

VULNERABILITY	ENVIRONMENT	1	Shoreline Character
		2	Plants & Animals
		3	Protected Sites
	HUMAN	4	Economic
		5	Cultural
		6	Social, Amenity & Recreation

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Environment: Shoreline character

Type	Rank
Exposed rocky headlands	1
Eroding wave-cut platforms	2
Fine-grained sand beaches	3
Course-grained beaches	4
Exposed compacted tidal flats	5
Mixed sand & gravel beaches	6
Gravel beaches	7
Sheltered rocky coasts	8
Sheltered tidal flats	9
Salt marshes	10

Each type of coast has a rank of vulnerability. The greater the rank, the higher the impact on the coast.

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Environment: Plants & Animals

For example, Posidonia meadow has rank 10.

Type	rank
Plants	1-10
Birds	1-10
Fish	1-10
Invertebrates	1-10
Reptiles	1-10
Mammals	1-10

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Environment: Protected Sites

Type	rank
International	10
Marine Protected Areas	9
Marine Reserves	8
Wildlife Sanctuaries	8
Scientific/Nature Reserve	7
Wildlife Refuge	6
Wildlife Management Reserves	4
Scenic Reserves	2

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Human: Economic

Categories	Rank
Shipping/Ports	3
Aquaculture	10
Tourism	8
Fishing	5
Infrastructure/coastal	7
other	...

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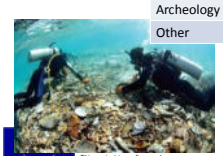
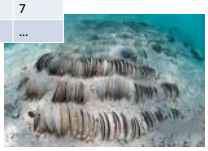
Human: Cultural



Category	Rank
Cultural, traditional, spiritual	7
Archeology	7
Other	...

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Weighting

VULNERABILITY	ENVIRONMENT	1.5	Shoreline Character
		1.75	Plants & Animals
		1.5	Protected Sites
	HUMAN	2	Commercial fisheries
		2	Human use

Each information layer, with its own rank, is combined with all the other information layers weighted as shown in the table, according to New Zealand Oil Spill Risk Assessment.

Total vulnerability will be the sum of all of them.

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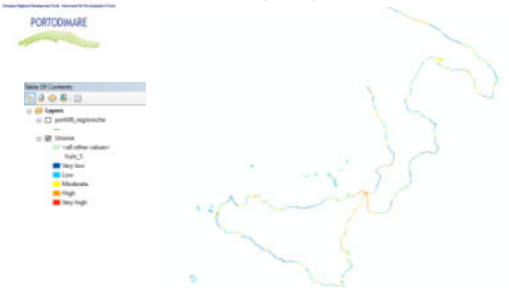
Vulnerability map in Portodimare



For this first training of Portodimare Project, we built ex-novo the vulnerability map for the oil spill risk on the Jonian region of Italy based on ISPRA data.

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ISPRA data: Morfology

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ISPRA data: PORTS

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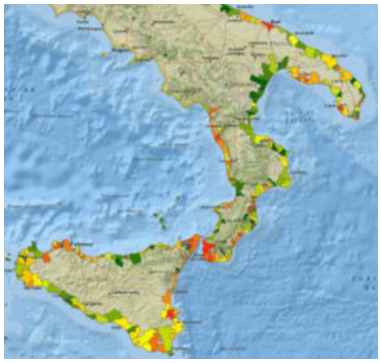
ISPRA data: Urbanization

Urbanization percentage of the first 300m from the coast for each administration.

(0 green – 1 red)



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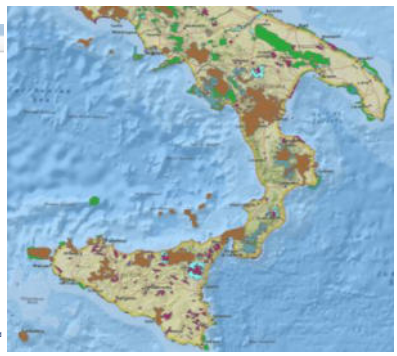
Protected areas



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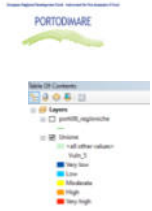
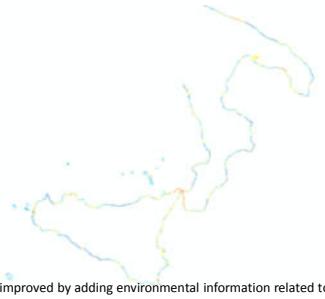
Vulnerability map in Portodimare





This map can be improved by adding environmental information related to plants & animal, as well as touristic & cultural data.

Next step will be build vulnerability map for the rest of the Jonian sea

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geoPORtal of TOols & Data for sustaInable Management of coAstal and maRine Environment

MSP process and the role of analytical work

Martina Bocci

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- **The MSP process**
- **Examples of input from analytical work to MSP process**
- **Reflections on how to improve synergies between analytical work and MSP**

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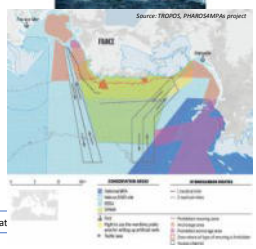
What is MSP?

→ Various definitions...

"a ***public process*** *of analyzing and allocating the* ***spatial and temporal distribution*** *of human activities in marine areas* ***to achieve ecological, economic, and social objectives*** *that are usually specified through a political process " (UNESCO-IOC)*

"a practical way to create and establish a more ***rational organization*** *of the use of marine space and the* ***interactions*** *between its uses, to* ***balance demands*** *for development with the need* ***to*** *protect marine ecosystems, and to achieve social and economic objectives* ***in an open*** *and planned* ***way****" (Ehler and Douvere 2009)*

a process by which the relevant Member State's authorities ***analyze and organize human activities*** *in marine areas* ***to achieve ecological, economic and social objectives****" (art. 3 of Directive 2014/89/EU)*



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Methodologies for MSP

→ ... and different guidelines

NO-ONE-FITS-ALL!

MSP should be shaped and based on the specificities of individual marine areas

MSP process has to be tailored to specific geographic scope, objectives and expected results

COMMON STEPS

- Data collection and analysis
- Stakeholder consultation
- Plan development
- Implementation, enforcement, evaluation
- Revision

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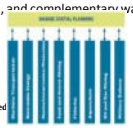
Outputs of MSP

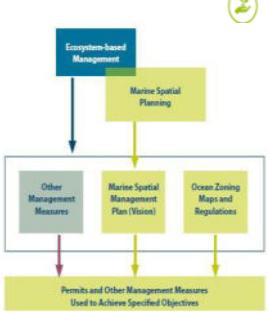
The principal output of MSP is a comprehensive spatial management Plan for a marine area.

It sets out priorities for the area and defines what these priorities mean in time and space.

A comprehensive spatial management plan is general in nature, has a 10-20 year horizon.

MSP does not replace single-sector planning. It provides guidance for particular sectors to allow decision makers to take decisions in a more comprehensive, integrated, and complementary way.





Source: Ehler and Douvere, 2009

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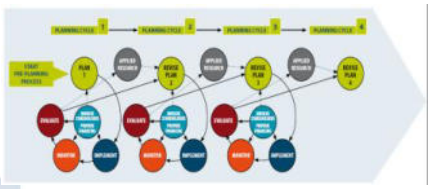
MSP is an iterative process



Source: Ehler and Douvere, 2009; Ehler, 2014

MSP is a continuing, iterative process that adapts over time.

Monitoring and evaluation of performance are key aspects of the process.

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Conceptual Framework for MSP in the Me

Objectives
–To introduce MSP in the framework of the Barcelona convention
–To link MSP to ICZM
–To plan and manage maritime human activities according to EcAp goals
–To provide a common context for the implementation of MSP in the Mediterranean Region

Contents
–Short, easy-to-use document
–Includes common principles, contents and steps

Developed
–Building (also) on methodologies and experiences developed in the MED (SHAPE, ADRIPLAN, THAL-CHOR, PawProject, TOMSP in the MED)

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MSP process

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Analytical work feeds the MSP process

STEPS IN MSP PROCESS	CONTRIBUTION FROM ANALYTICAL WORK
STEP 1 – Start the process & organization	Organization of data collection and management
STEP 2 – Context & Vision	Analysis and evaluation of policy and planning documents
STEP 3 – Analysis of Existing Conditions	Identification of relevant information, data gathering, mapping, analysis
STEP 4 – Analysis of Future Conditions	Analysis of trends, modelling, analysis of development scenarios
STEP 5 – Identification of Key Issues	-
STEP 6a – Elaborating the MSP Plan	Localization of measures and zoning of marine areas
STEP 6b – Strategic Environmental Assessment	Assessment of impacts on sea and land
STEP 7 – Implementing, monitoring & evaluation	Evaluate the effectiveness of the plan: data collection, analysis, application of indicators
CROSS-STEP ACTIVITY – Stakeholder consultation	Prepare means (e.g. maps) to be used in consultation activities

Different types of analytical work

WORK ON:	ABOUT:	RELATIVE TO:	RESULTS:
DOCUMENTS	Legal documents Policies Strategies Plans	Current conditions	Definition of the context
DATA	Environmental conditions Sea uses	Current conditions Trends	Description of current conditions Description of future conditions Feeding the tools
TOOLS	Mapping Analysis	Current conditions Future conditions	Identification of: a. Conflicts/compatibilities, coexistence, synergies b. Vulnerability and (cumulative) impacts c. Land-sea interactions d. Hot spot areas (for a, b, c)

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STEP 1 – Start the process & organization

→ Data Portals for data collection and management

Ireland's Digital Ocean https://www.digitalocean.ie/ | http://data.marine.ie

The Integrated Digital Ocean is a platform to access a diverse range of services including online maps, data dashboards, data access, data search and publications.

The **National Marine Data Centre** consists of hosted online data services including descriptive metadata to find data, maps and graphs to view data; and services to download data.

It is linked to the **Digital ocean online map interface** about data collected in and around Ireland's maritime

NATIONAL DATA PLATFORM
USED IN FORMAL MSP PROCESSES

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STEP 3 – Analysis of Existing Conditions

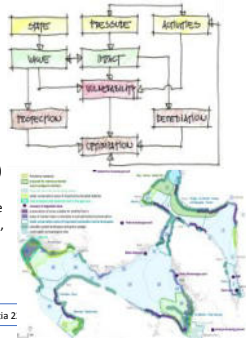
→ Tools for analysis and mapping

EcAp-based marine vulnerability assessment

➢Applied in Bokakotorska Bay (Montenegro)
➢Makesure of EcAp indicators
➢Identification and mapping of data related to EcAp indicators, including indicators of environmental state and indicators of pressures

→ Attribution of values to the current state (i.e. value index) and pressures to the marine areas (i.e. impact index)

→ Assessment of vulnerability as potential magnitude of negative impacts (degree, extent and significance) of future activities, which depends on the current state (value index), intensity of pressures (impact index), characteristics of the future activities and resilience of the marine environment (risk expert option)



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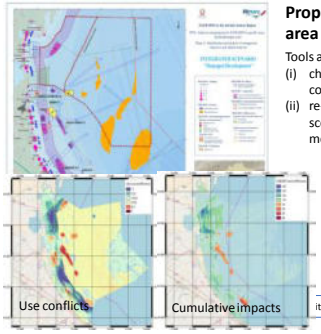
STEP 4 – Analysis of Future Conditions

→ Analysis of developed scenarios



Proposals for ICZM-MSP for the marine area of Emilia Romagna Region – Italy

Tools are used to:

(i) characterize the study area under the present conditions and

(ii) re-analyze the integrated "managed development scenario" considering a combination of 9 measures

1. Coastal defense against flooding and coastal erosion
2. Decommissioning and reuse of gas platform
3. Identification of areas to promote for renewable energy at sea
4. Regulation of artisanal and trawling fishery
5. Selection of areas suitable for aquaculture expansion
6. Extension of the marine protected

STEP 6a – Elaborating the MSP Plan

→ Localization of measures and zoning the marine are

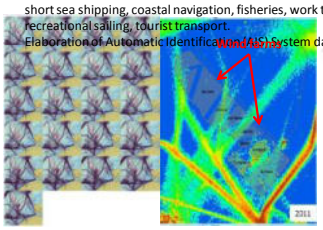
Marine Spatial Plan for the Belgian part of the North Sea

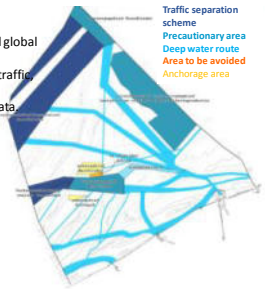
e.g. SHIPPING

Analysis of the various types of shipping: international global traffic, ferries,

short sea shipping, coastal navigation, fisheries, work traffic, recreational sailing, tourist transport.

Elaboration of Automatic Identification System data





STEP 6b – Strategic Environmental Assessment

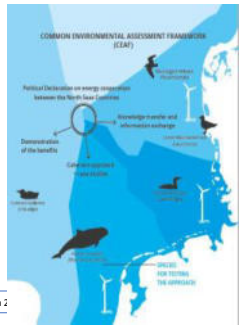
→ Use of integrated analysis tools

Towards a common environmental assessment framework (CEAF) to SEA

The SEANSE project is developing a coherent approach to SEAs, with a focus on renewable energy and testing it in practice through case studies

Assessing cumulative ecological

Stressors SEA offshore wind	The Netherlands	Belgium	Germany	England	Scotland
Introduction of non-native species				x	x
Physical presence of structure	x	x	x	x	x
Collision risk	x	x	x	x	x
Barrier effect	x	x	x	x	x
Noise disturbance	x	x	x	x	x
Sedimentation (alteration)		x	x	x	x
Chemical and other inputs	x	x		x	x
(avoided) Atmospheric emissions		x		x	x
Electromagnetic fields / heat		x	x	x	x
Waste disposal onshore				x	
Climatic factors		x			x
Accidental events	x	x		x	x



STEP 7 – Implementing, monitoring, evaluating

→ Validate and analyse indicators

Performance monitoring and evaluation is a key need for every MSP plan in order to check the effectiveness of measures and adapt to changes in environmental conditions and uses of the sea and to asses if the plans are "successful".

Quantitative evaluation requires that MSP object

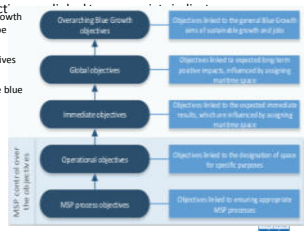
Overarching Blue Growth indicators. In line with the Blue Growth Communication, jobs, added value, and GHG reduction can be used as overarching indicators.

Impact indicators measure the achievement of global objectives and observe the evolution of Blue economy sectors.

Outcome indicators are linked to the different sectors of the blue economy and reflect socio-economic and ecological aspects.

Output indicators are a direct product of MSP processes and measure progress towards operational objectives.

Additional Ecological indicators monitor include specific ecological objectives included in MSP.



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Conclusive reflections

Analytical work in MSP

- Is needed across the overall process
- Is fundamental for the analytical steps of the proce
- Provides relevant input to stakeholder engagement

Source: PHAROS4MPA2 project

- Close coordination is needed between planners and experts/scientists
- Space and effort to Science-Planning-Stakeholder dialogue should be ensured
- Identification of essential data/information/knowledge is crucial to optimize time and effort of analytical work
- It is crucial for experts/scientist should consider the importance of a clear communication of their results to a wide arena of stakeholders

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THANK YOU!

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