



MPA Europe: Goals and Results to date

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29th November 2024



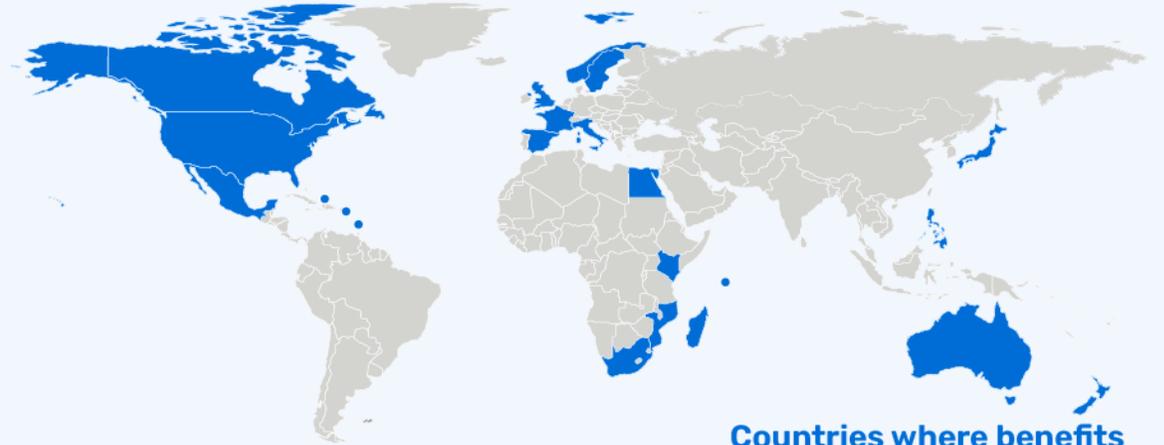


MPA EUROPE IS MAPPING THE OPTIMAL LOCATIONS FOR MARINE PROTECTED AREAS IN EUROPEAN SEAS TO SUPPORT SCIENCE-BASED MARINE SPATIAL PLANNING

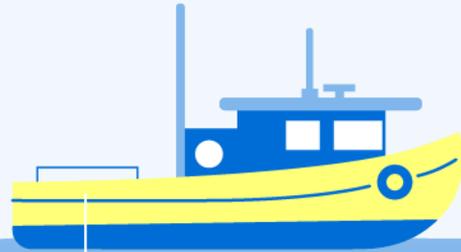
New review of science literature on MPA effects on fisheries found examples from 25 countries.

No indications of any fishery loss due to MPA anywhere.

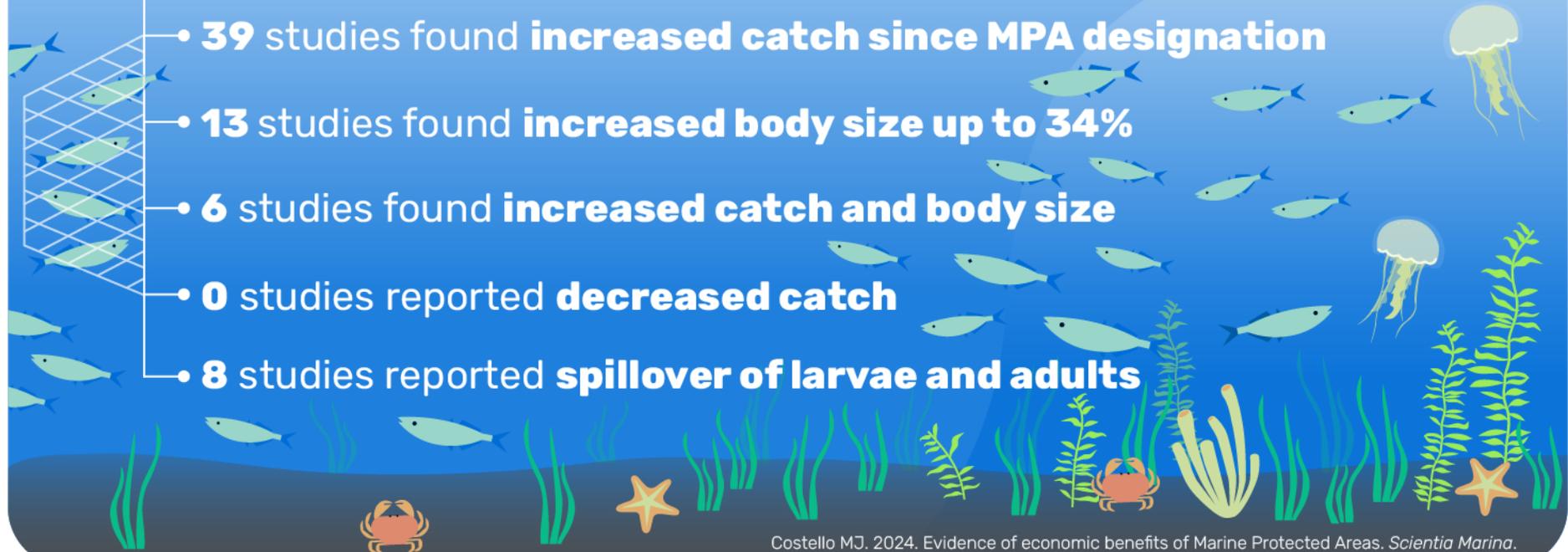
Economic benefits of MPAs for finfish, crustacean, and mollusc fisheries



Countries where benefits have been reported



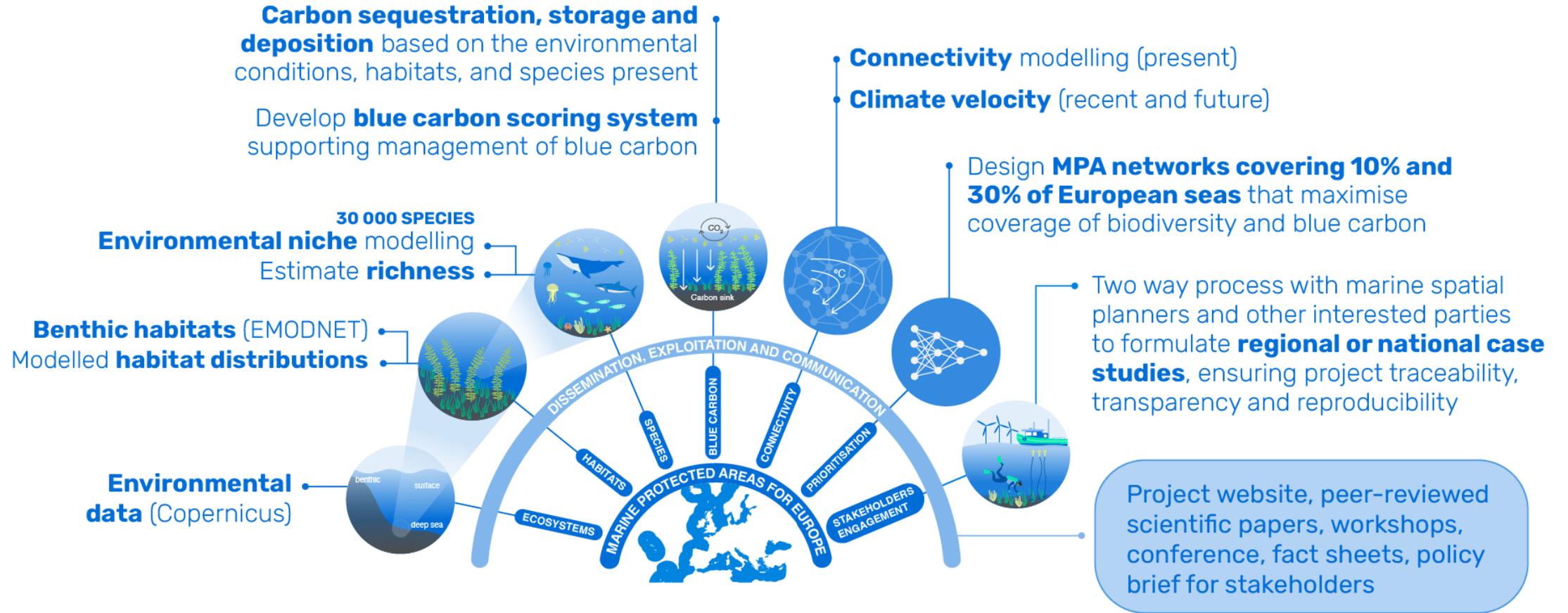
- 
- **39** studies found **increased catch since MPA designation**
 - **13** studies found **increased body size up to 34%**
 - **6** studies found **increased catch and body size**
 - **0** studies reported **decreased catch**
 - **8** studies reported **spillover of larvae and adults**





BIODIVERSITY

BLUE CARBON



Standardised and complete data layers

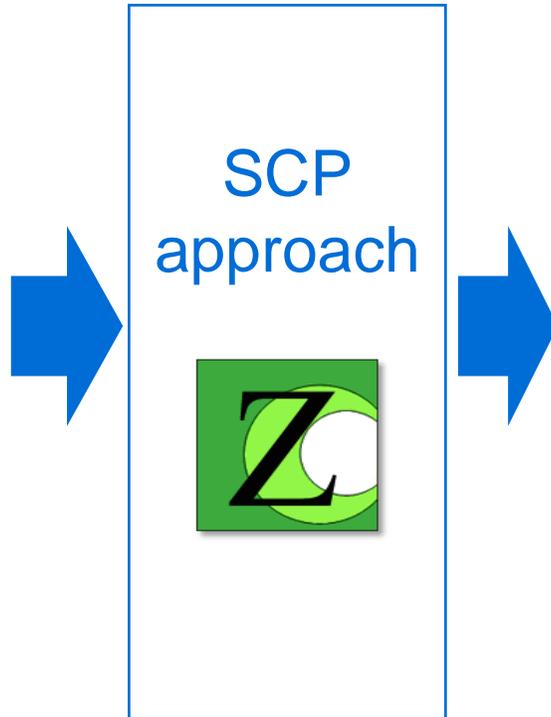
Environmental data (Copernicus)

Benthic habitats (EMODNET)
Modelled **habitat distributions**

Environmental niche modelling
Estimate **richness**

Carbon sequestration, storage and deposition based on the environmental conditions, habitats, and species present

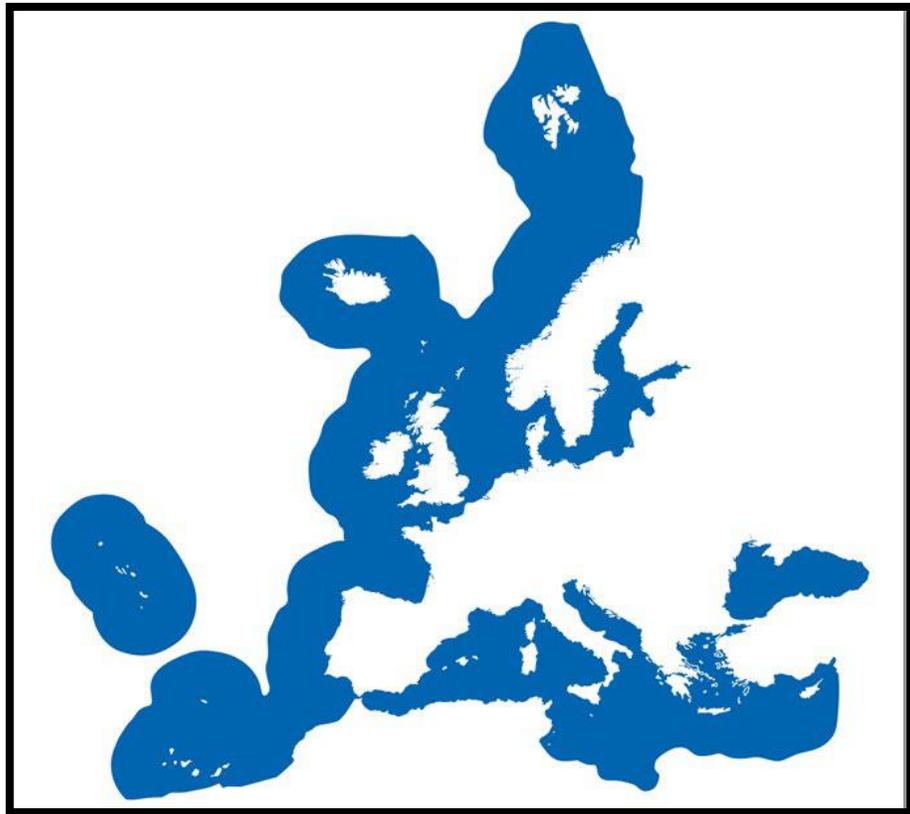
Develop **blue carbon scoring system** supporting management of blue carbon



MPA EUROPE PROPOSE PRIORITY AREAS TO PROTECT (A) BIODIVERSITY AND (B) BLUE CARBON

SYSTEMATIC CONSERVATION PLANNING

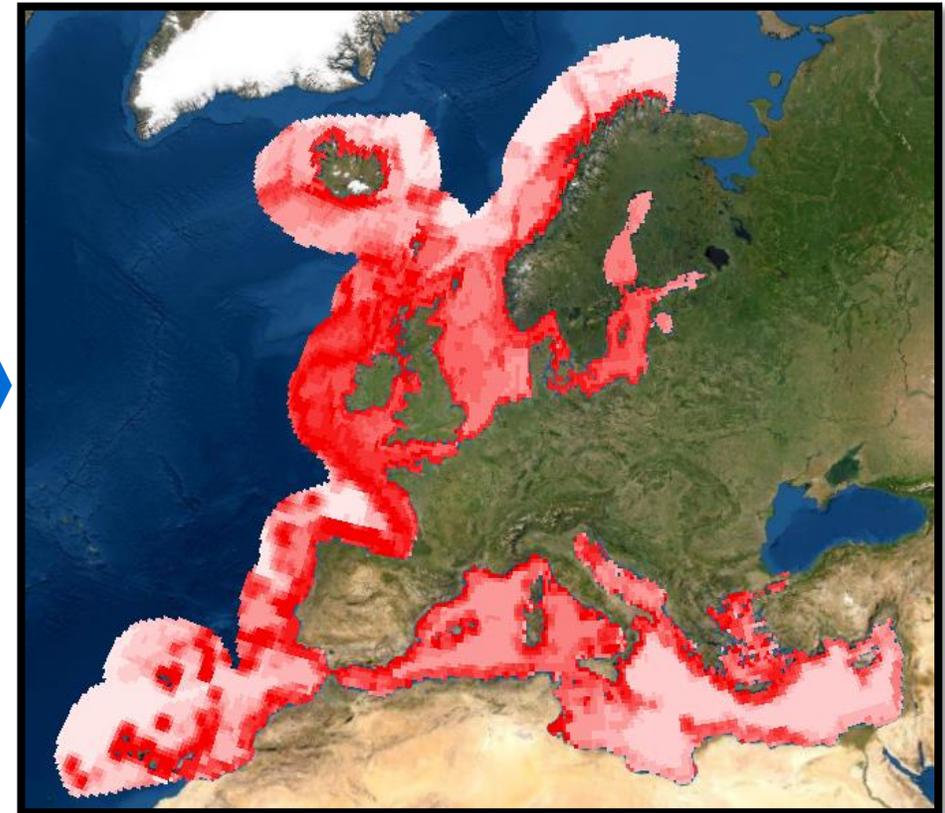
Standardised and complete data layers



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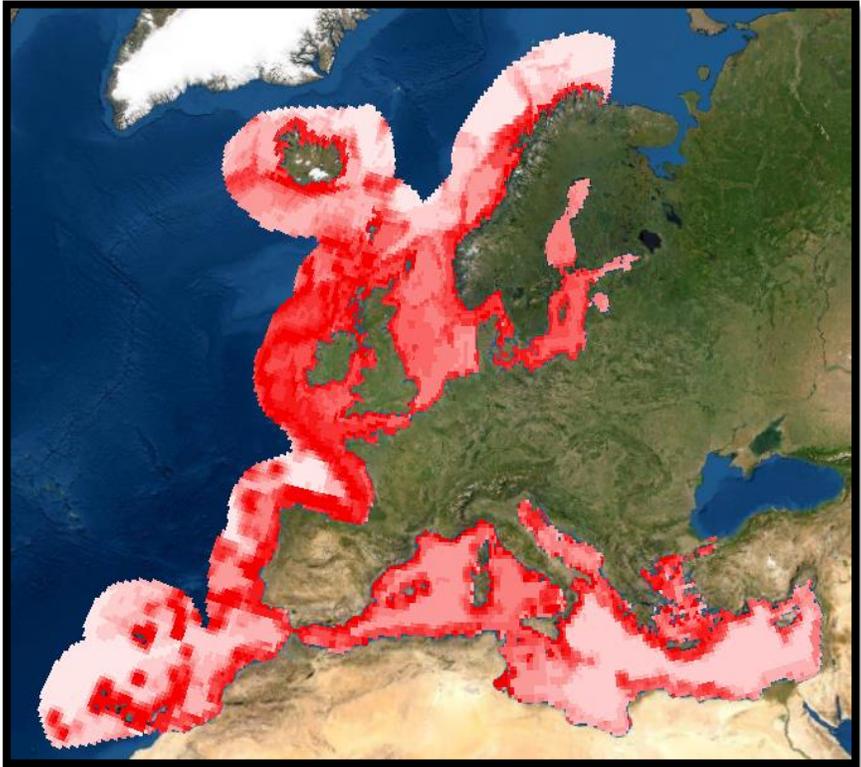


Example of prioritised areas
(**darker red** = **higher priority**)

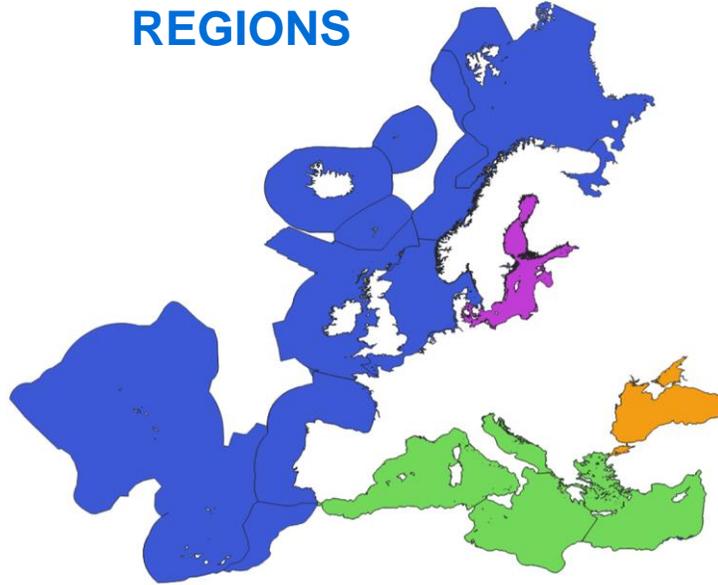


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PRIORITIZATION AT REGIONAL AND NATIONAL SCALES



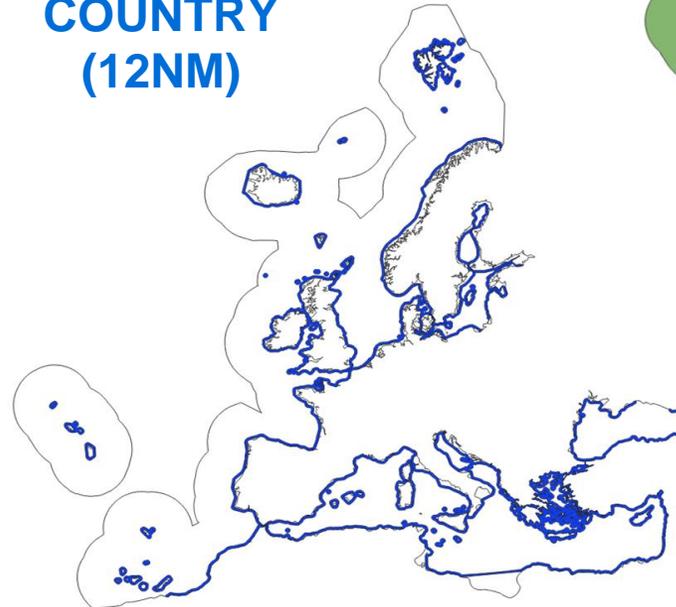
REGIONS



COUNTRY
(EEZ)



COUNTRY
(12NM)



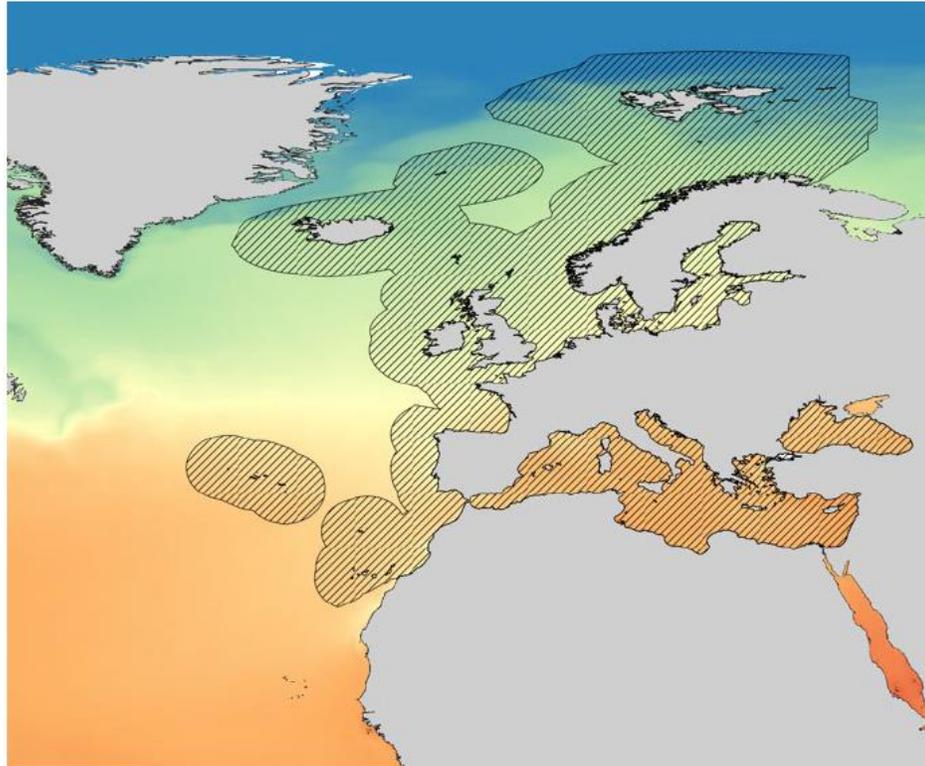
PROJECT MAIN OUTPUTS



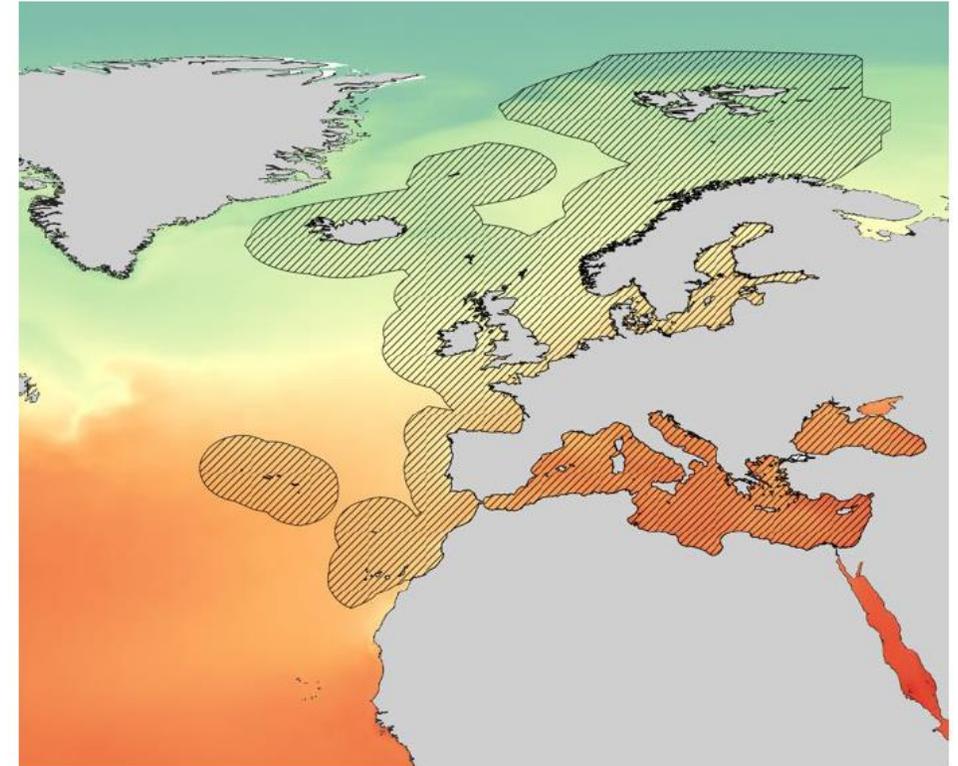
- 🌊 The **first data-driven classification of ecosystems** in shallow and deep European seas based on a new comprehensive dataset of high-resolution environmental layers for bioclimatic modelling
- 🌊 Maps of **species richness** in European seas **based on multiple indicators**, including actual observed data, statistical estimators, and modelled geographic range maps
- 🌊 **Potential geographic distributions of important biogenic habitats** in European seas
- 🌊 Maps of an optimal MPA network in European seas **prioritised for biodiversity protection and blue carbon benefits**
- 🌊 An **online European marine biodiversity atlas** for use by researchers, students, teachers, and in Marine Spatial Planning by policy makers, industry and NGOs

ENVIRONMENTAL DATA

Variable
Temperature
Salinity
Sea Ice Cover
Sea Ice Thickness
Sea Water Velocity
Mixed Layer Depth
Diffuse Attenuation Coefficient
PAR
PAR at bottom
Oxygen
pH
Iron
Phosphate
Nitrate
Silicate
Total phytoplankton
Chlorophyll
Topographic (slope)
Topographic (roughness)
EMODnet Bathymetry
Sedimentation Rates
Seabed Substrates
Distance to coast
Distance to closest port

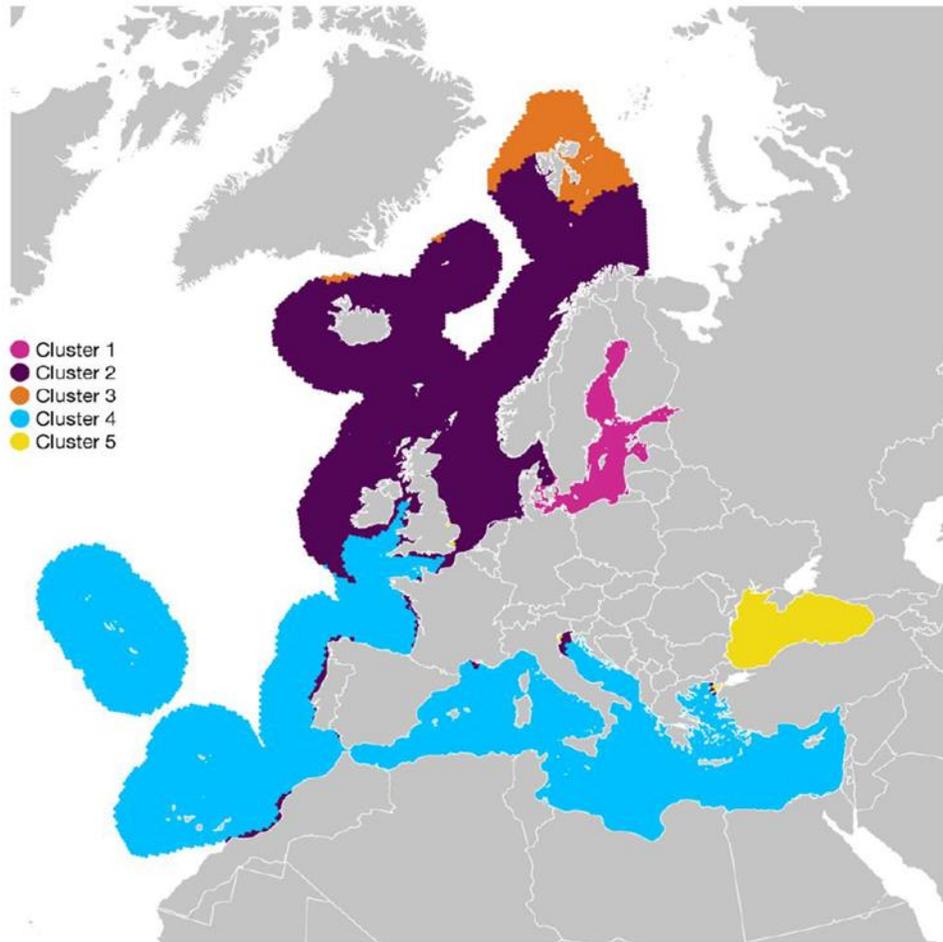


Present-day sea surface temperature

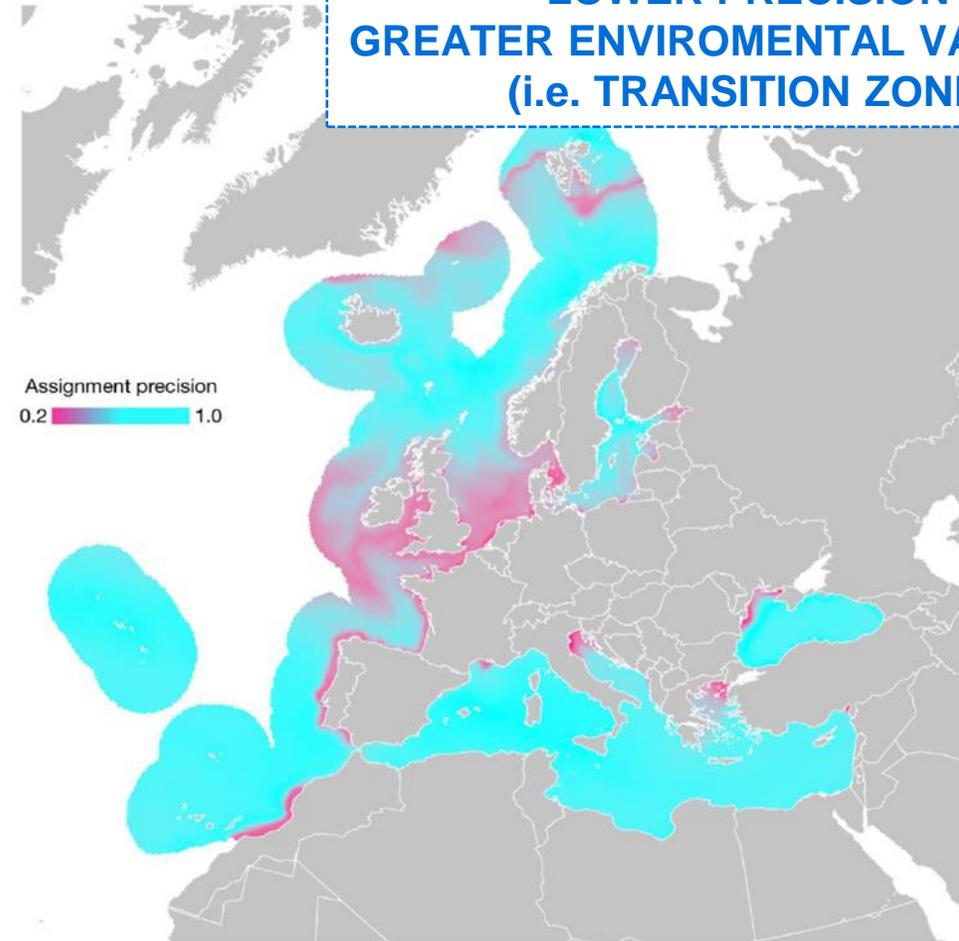


Future (decade 2090) sea surface temperature

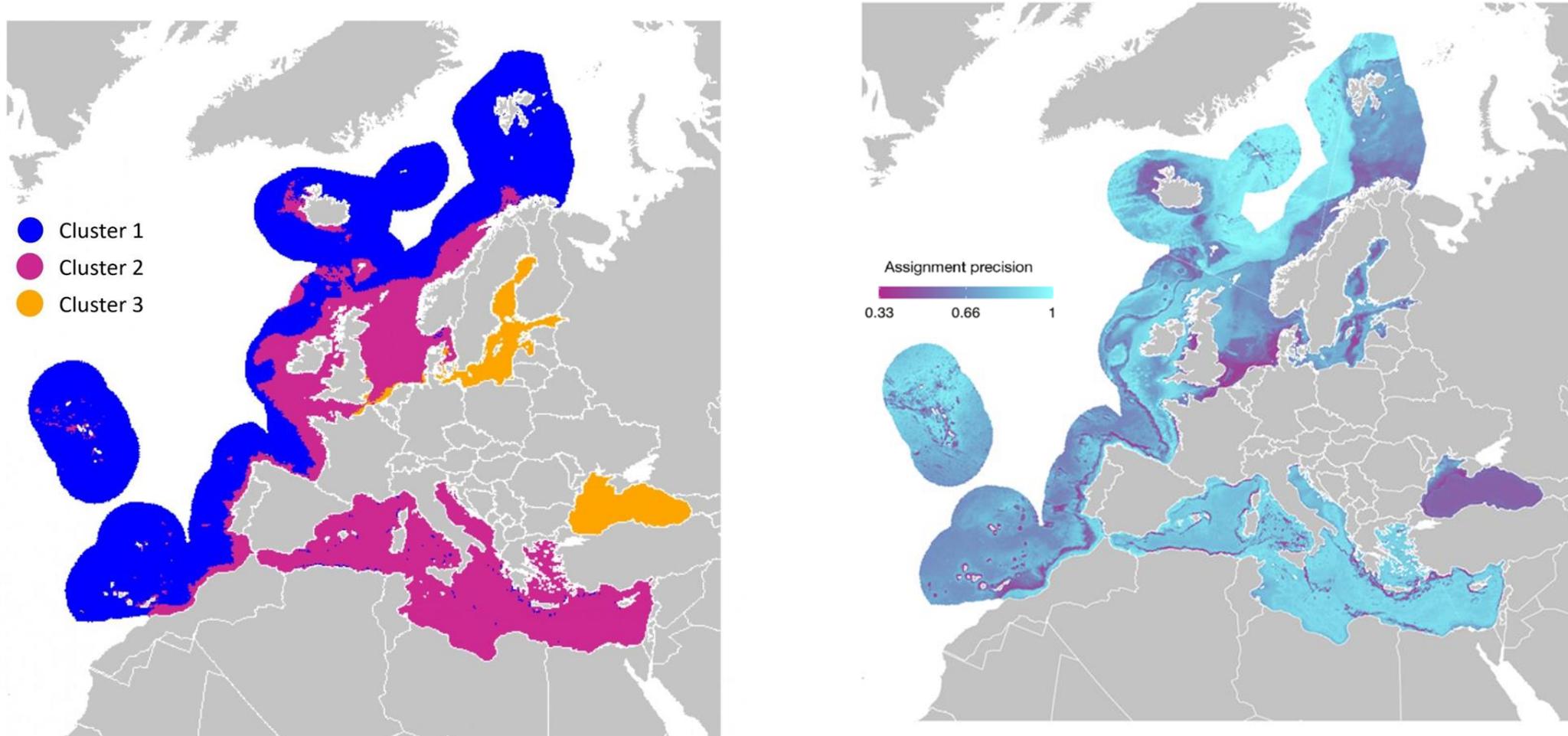
Example of data layer produced for the European Seas from **BioOracle**.
 Colour gradients reflect spatial differences in °C from today (left) to 2090 (right)



LOWER PRECISION =
GREATER ENVIRONMENTAL VARIABILITY
(i.e. TRANSITION ZONES)



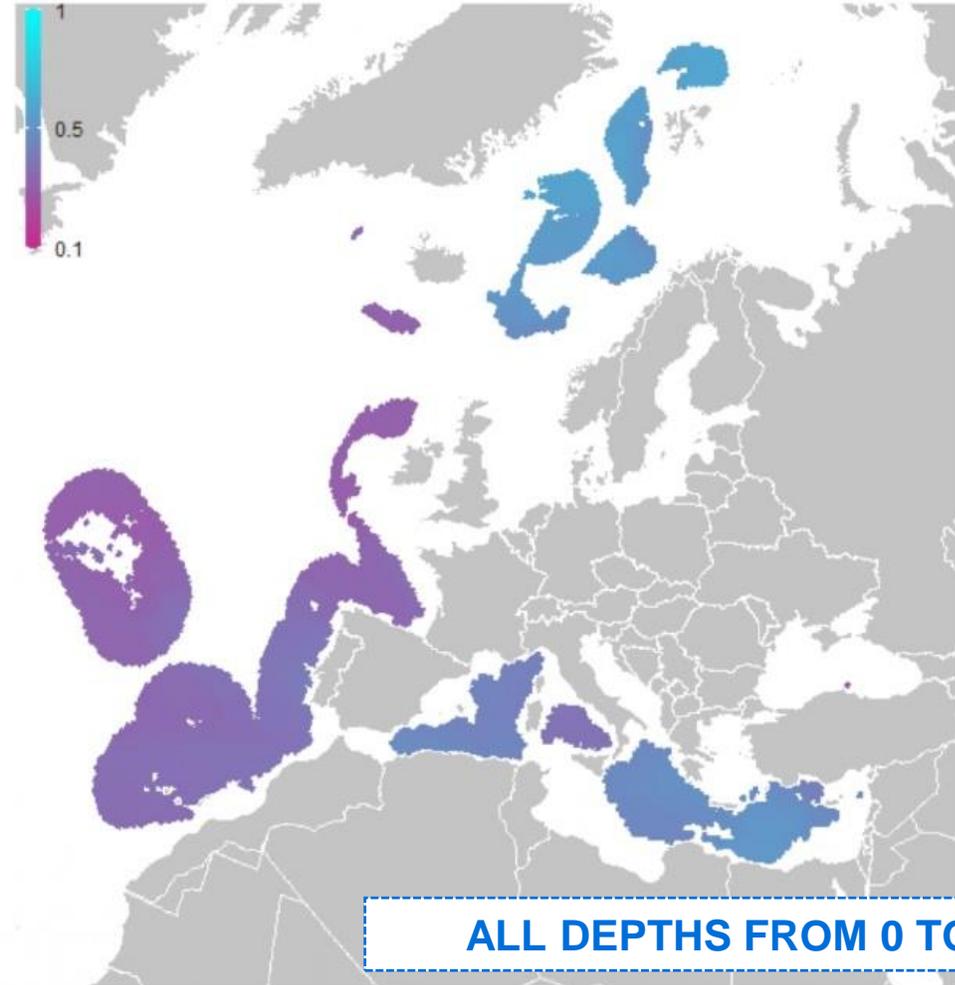
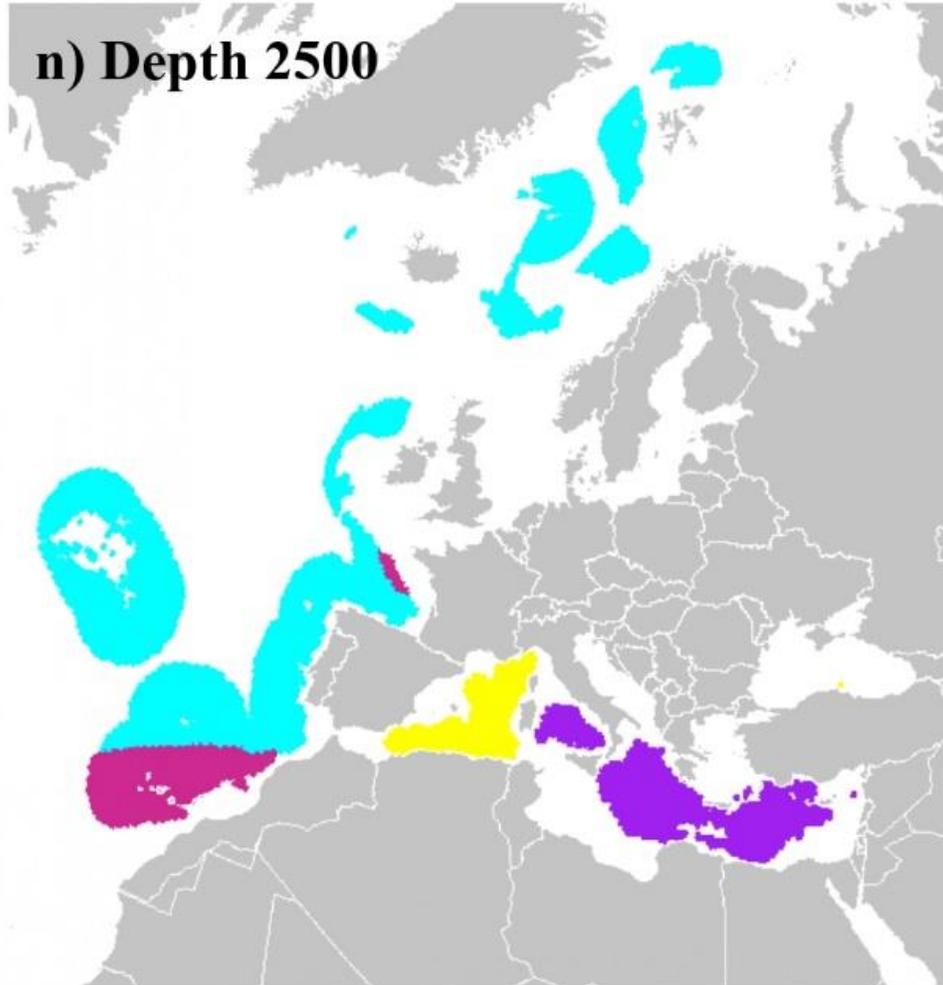
European marine ecosystems of **surface waters** estimated by k-means clustering analysis of environmental data (left) AND clustering assignment precision based on fuzzy logic (right)



European marine ecosystems of **near seabed** estimated by k-means clustering analysis of environmental data (left) AND clustering assignment precision based on fuzzy logic (right)

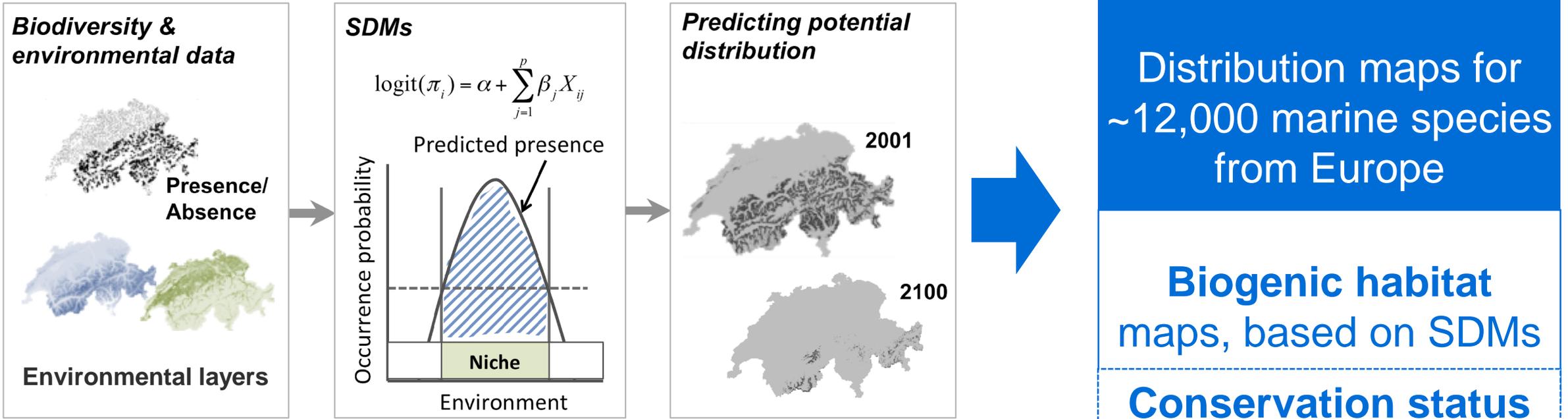
ECOSYSTEM CLASSIFICATION – 3D

- Cluster 1
- Cluster 2
- Cluster 3
- Cluster 4
- Cluster 5
- Cluster 6
- Cluster 7
- Cluster 8



ALL DEPTHS FROM 0 TO 2,500 m

European **depth-integrated** marine ecosystems classification estimated by k-means clustering analysis of environmental data (left) AND their assignment precision based on fuzzy logic (right)



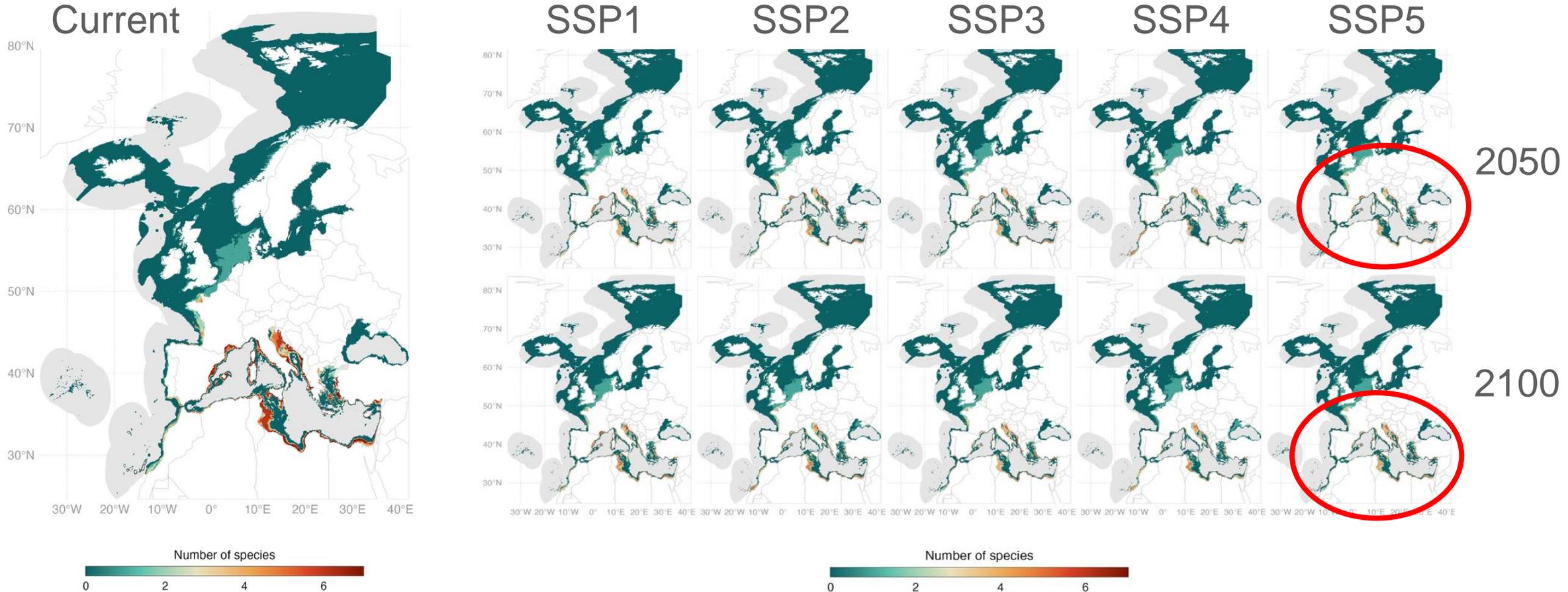
→ Occurrence information from OBIS and GBIF (new pipelines for seamless data integration between both providers)

→ Environmental data from Bio-ORACLE v3 (high-resolution ~5 km)

Species range shifts

→ New CMIP6 scenarios SSP1, SSP2, SSP3, SSP4 and SSP5

→ Two periods: 2050 / 2100



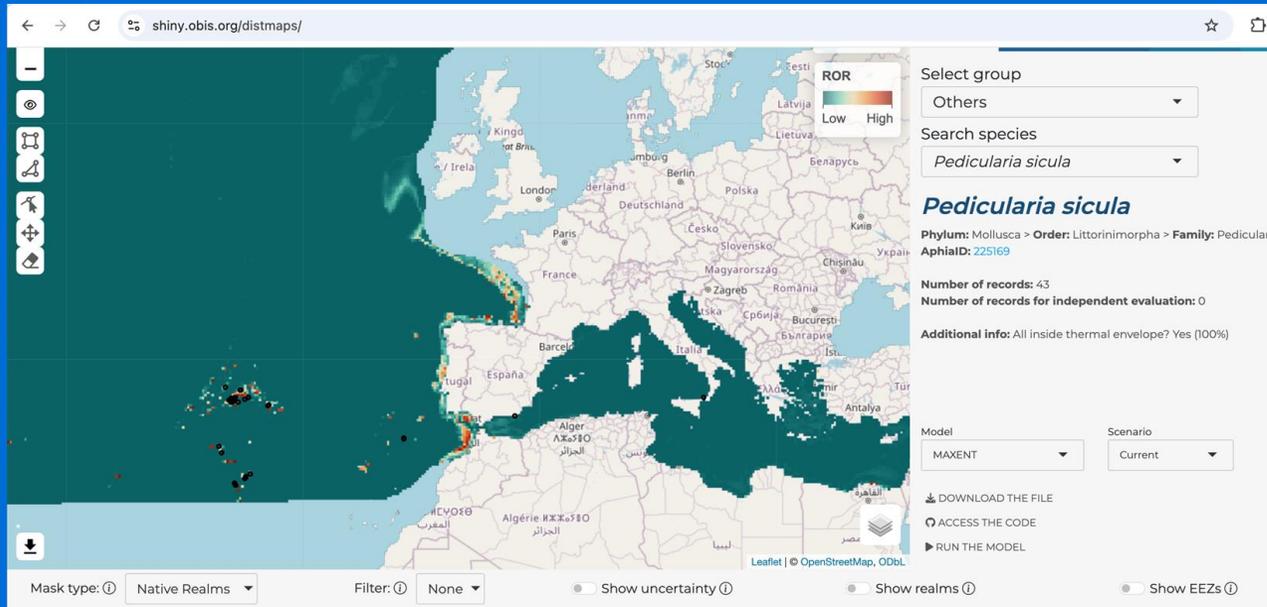
Predicted distribution of habitat-forming macroalgae in the **current** period (left) AND in the **future** period (right) according to species distribution models, considering **five climate scenarios** (SSP1, SSP2, SSP3, SSP4 and SSP5) and two time periods (2050 and 2100)

12,000 species distribution models for all five IPCC climate change scenarios to 2050 and 2100

<https://shiny.obis.org/distmaps/>

https://iobis.github.io/mpaeu_docs/

Video tutorial: <https://www.youtube.com/watch?v=o0DwqXiZVe8&t=2s>



MPA Map Platform Tutorial

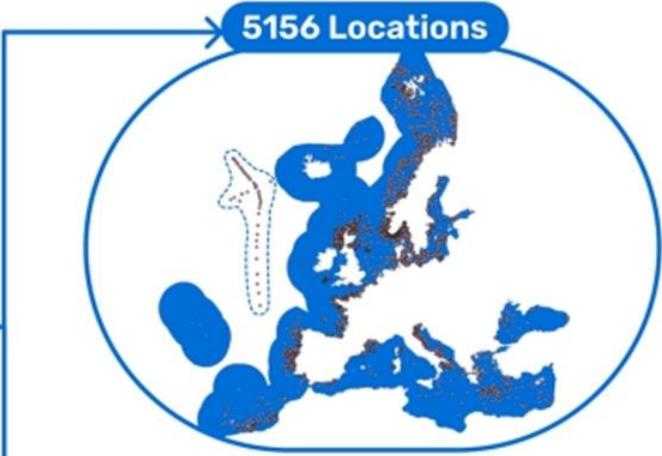
BLUE CARBON DATA

80 CONTRIBUTORS

33 DATASETS



33,650 ENTRIES



- 19 EU countries
- 11 Non-EU countries
- High Seas

SOURCES OF ADDITIONAL BLUE CARBON DATASETS

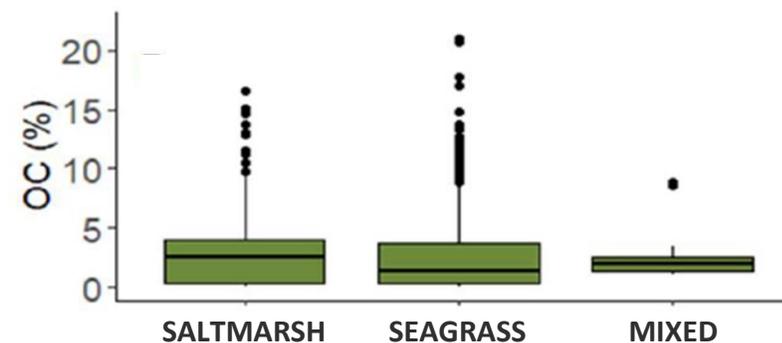
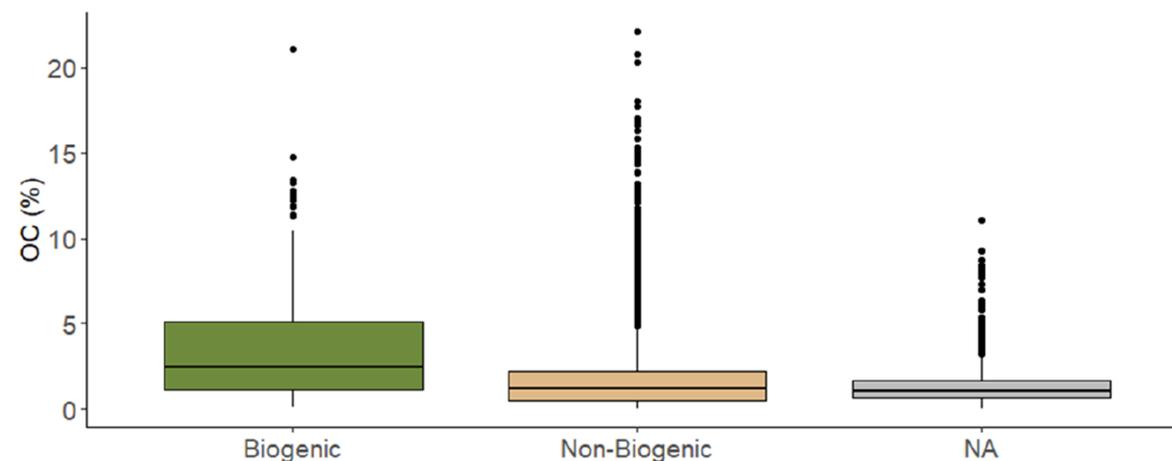
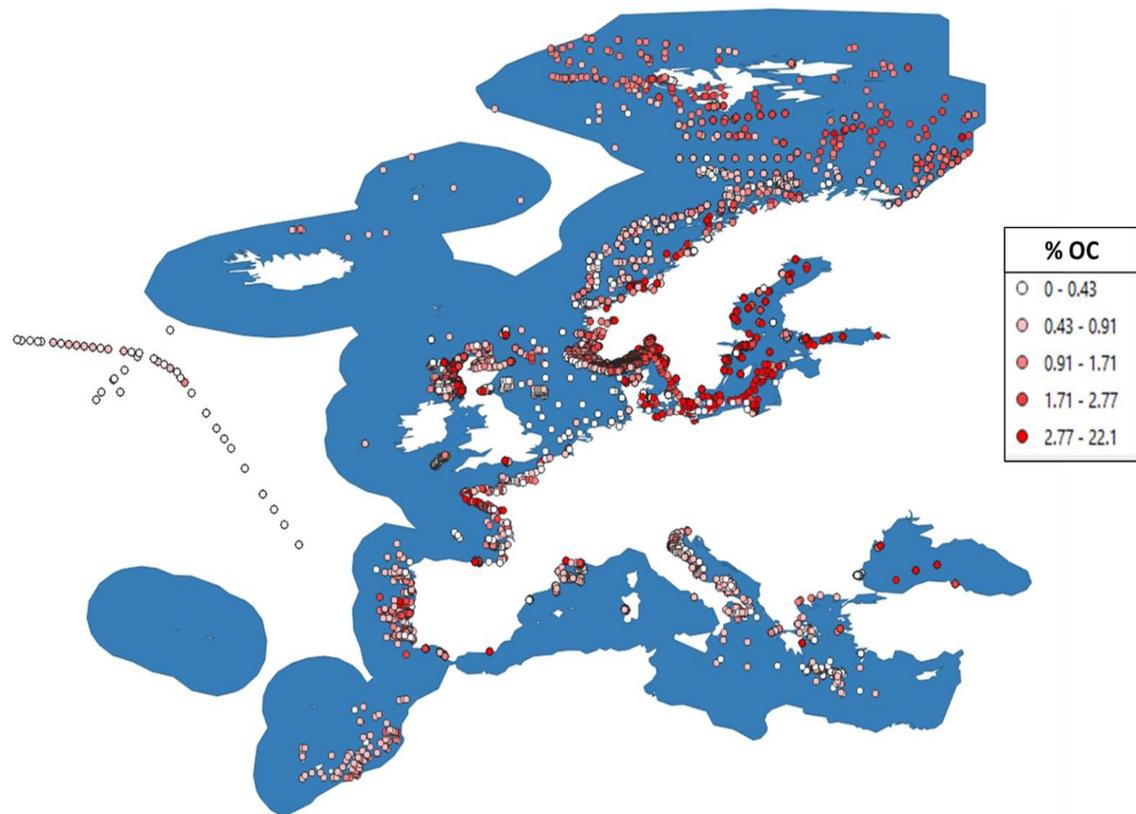


PERSPECTIVE
The future of Blue Carbon science
View: J. Marandini et al.

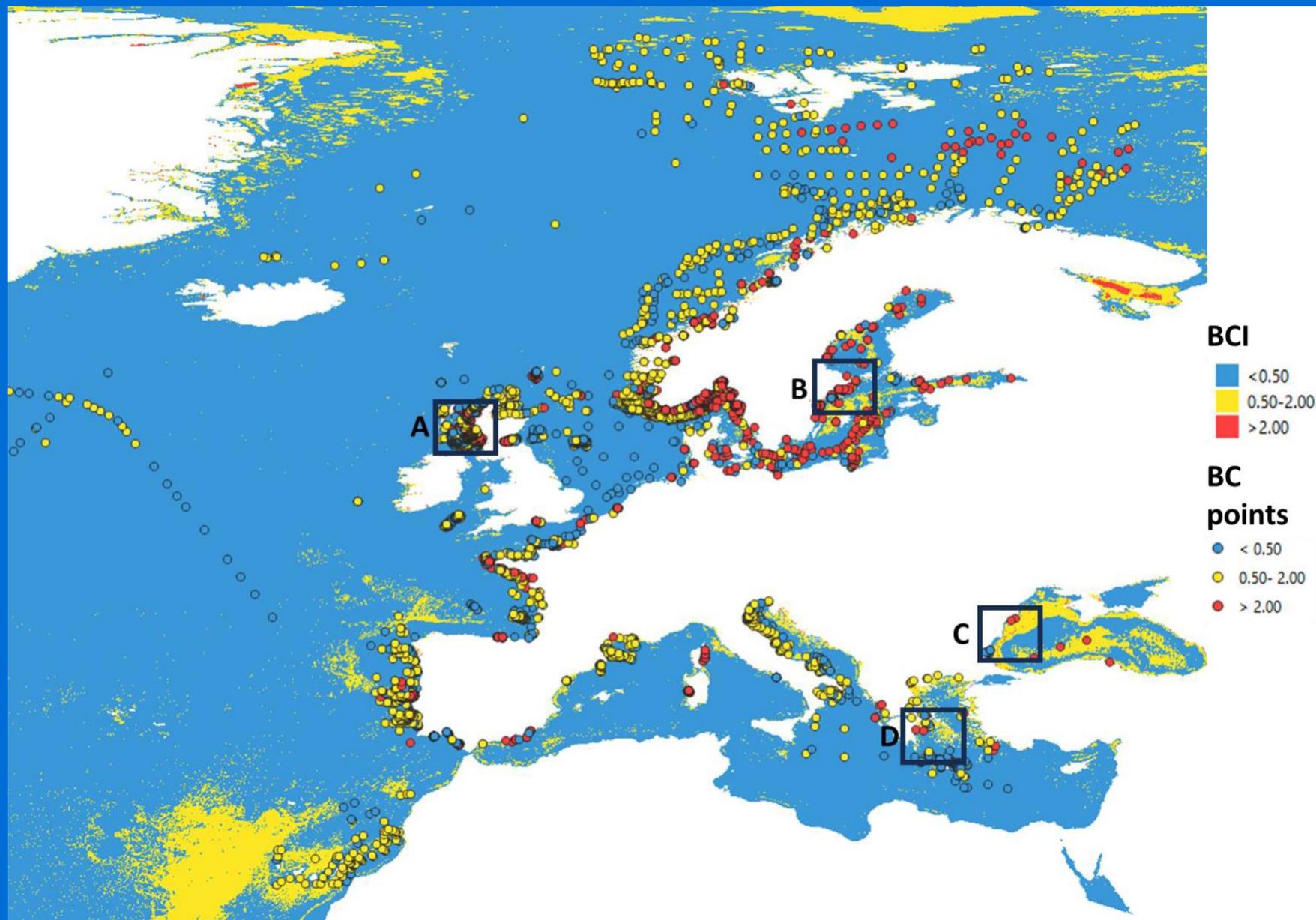
The term Blue Carbon (BC) was first coined in 2005 to describe the disproportionately large contribution of coastal vegetated ecosystems to global carbon sequestration. The role of BC in climate change mitigation and adaptation has been increasingly recognized. The European Blue Carbon research and monitoring network (EBN) was established in 2010 to coordinate BC research and monitoring across the EU region and to provide a platform for BC research and monitoring across the EU region. The network includes scientists from 19 EU countries and 11 non-EU countries. The network has been instrumental in the development of the European Blue Carbon Strategy (EBCS) and the European Blue Carbon Action Plan (EBCAP). The EBNS is a multi-disciplinary network of scientists, practitioners, and policy-makers working together to advance the science of BC and its management across the EU. The network is currently the largest and most active BC network in the world.

By October 2023, the network has produced and published the first EBNS report, which provides a comprehensive overview of the current state of BC science and management in Europe. The report highlights the need for continued research and monitoring of BC ecosystems and the importance of integrating BC into climate change mitigation and adaptation strategies. The network is currently working on a number of projects, including the development of a European Blue Carbon Atlas and the implementation of a European Blue Carbon Monitoring Network. The network is also working on the development of a European Blue Carbon Policy and the implementation of a European Blue Carbon Action Plan.

ORGANIC CARBON CONTENT



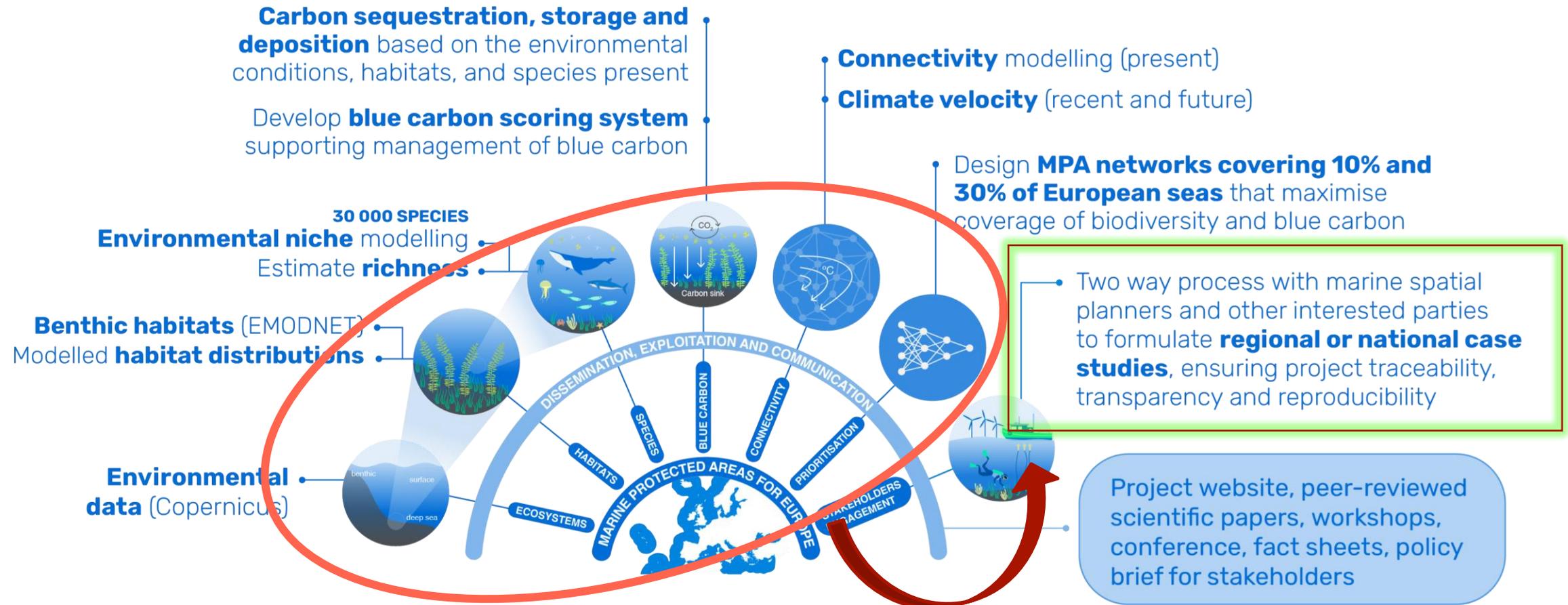
Spatial coverage of **organic carbon content (%OC)** in marine sediment (left) AND in the top 10cm of the sediment for **biogenic & non-biogenic habitats** (EUNIS definition) (top right)



**Modelled
organic carbon
overlaid by
sample data
points
in the
MPA Europe
organic carbon
database.**

PROJECT WP6 - OTHER WPs CONNECTION

Enable regional and national authorities to adopt biodiversity-inclusive and climate-smart MSP, as most countries are at revision phase, and to designate optimal, coherent MPA networks and strengthen existing marine protected areas.



STAKEHOLDERS

Open engagement approach

>165 Stakeholders

No Pilots or Test Sites

Co-design case studies (UN Ocean Decade)



STAKEHOLDER ENGAGEMENT PROCESS

<p>Engage</p> <p><i>Share project & seek feedback; answer FAQs</i></p>		<p>Introduce MPA Europe: May – September 2023</p>
<p>Involve</p> <p><i>Stakeholders participate & validate approaches and outputs</i></p>		<p>Regional in person workshops in synergy with relevant events: February 2024 – February 2025</p>
<p>Partner</p> <p><i>Stakeholders propose use cases</i></p>		<p>Regional case uses co-identified with stakeholders: Present – April 2025</p>
<p>Share learnings</p>	<p>INTERNATIONAL CONFERENCE Marine Protected Areas Marine Spatial Planning 9-12 July 2025 Bodo, Norway</p>	<p>International conference: July 2025, Bodo Policy brief: December 2025</p>

PROJECT SCOPE AND OUTCOMES

+ How I

DATA ACCESS AND RESOLUTION

+ I unde

to eac

CASE STUDIES

+ What is t

+ Will yo

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EXISTING ACTIVITIES AT SEA

+ Does the

+ Anoth

exper

DATA SOURCES

+ How are

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THE BL

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occurs, w

+ Will map

+ I noticed we are talking about estimating species richness, is that based on temperature and existing species, or temperature and conservation/active restoration?

+ Think

recom

+ Are you

+ So you are taking species data to which you add a further list of environmental data, and then overlay it with temperature modelling. Is that right?

CLIMAT

STAKEH

+ Does the

OTHER

+ What exa

+ Are you

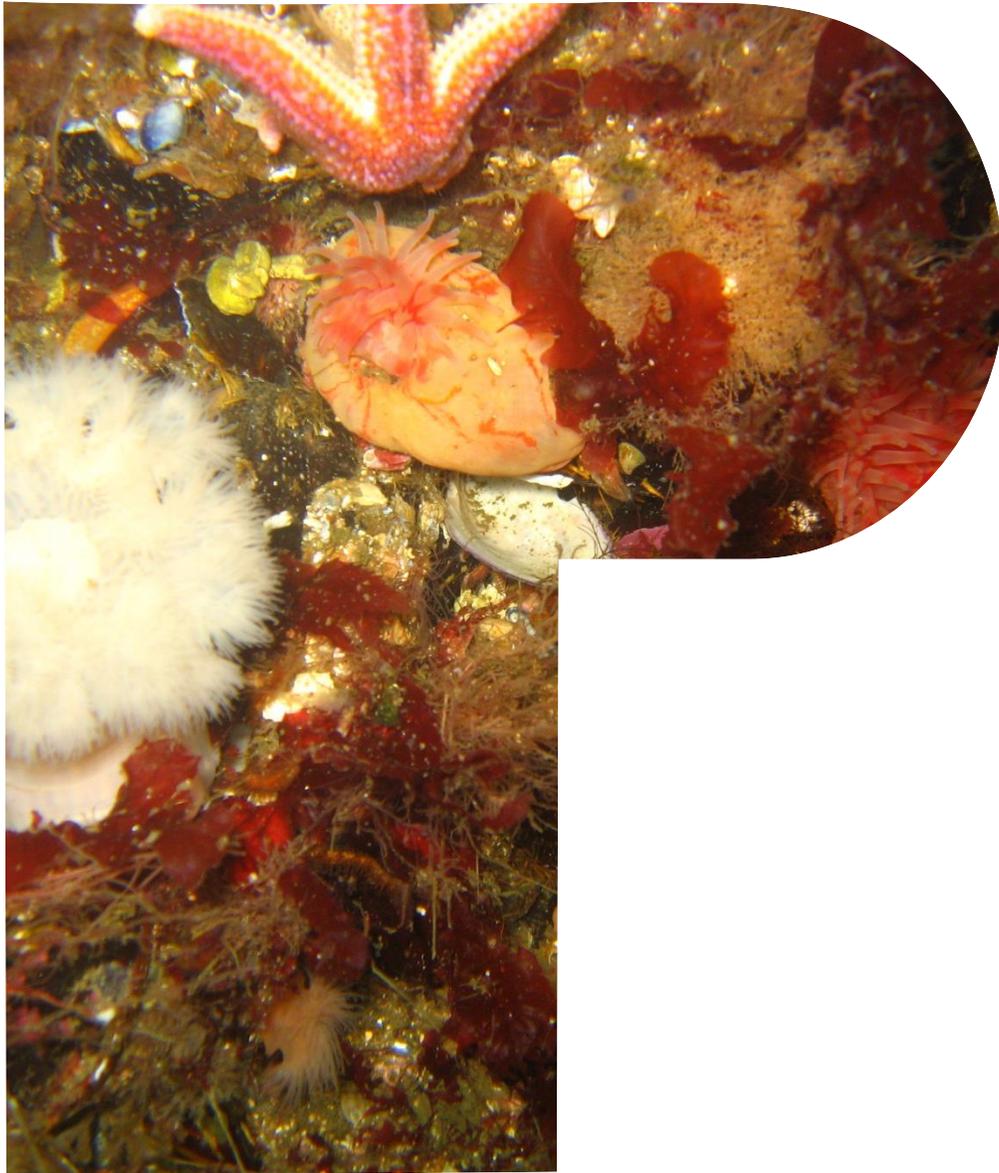
some of

The data sources you are using are the global data aggregators. From my previous experience I have seen a lot of data is held in national institutions and scientific organisations and they do not share it with the aggregators. Do you have the capacity or plan to consider national databases, which often do not often conform to FAIR principles, so you have to standardise the data?

+ For seabirds will the maps be built based on Important Bird Areas data, or what other data?

+ It seems you are taking into account the changing ranges of species. Does this mean that once the MPAs are designated, there is the possibility of changing the boundaries or are these set in stone?

+ You mentioned you will produce Species Distribution Models. What is the difference between EMODnet Biology and EMODnet Seabed Habitats? Do you plan to acquire new data?



- ❖ How would you like to see our results used for **national, transboundary or regional marine spatial planning**?
- ❖ How would you like to see our results used for **strengthening existing marine protected areas**?
- ❖ How would you like to see our results used for **extending the network of existing marine protected areas in the region**?
- ❖ Would you like to **co-identify a use case** with us based on any of the project's results?

STAKEHOLDER FEEDBACK

BALTIC SEA REGION



Good spatial maps and species distribution models can support stakeholder consultations, when justifying new MPA boundaries, and support countries to update their marine spatial plans.

MPA Europe's approach could be improved by the inclusion of absence and abundance data, and important areas for key species groups such as seabirds or mammals.

**BALTIC SEA
STAKEHOLDER
WORKSHOP**
29th February 2024
In collaboration with
PROTECT BALTIC



STAKEHOLDER FEEDBACK



BLACK SEA REGION



BLACK SEA STAKEHOLDER WORKSHOP

20th June 2024

In collaboration with
MSP-GREEN and **MSP4BIO**

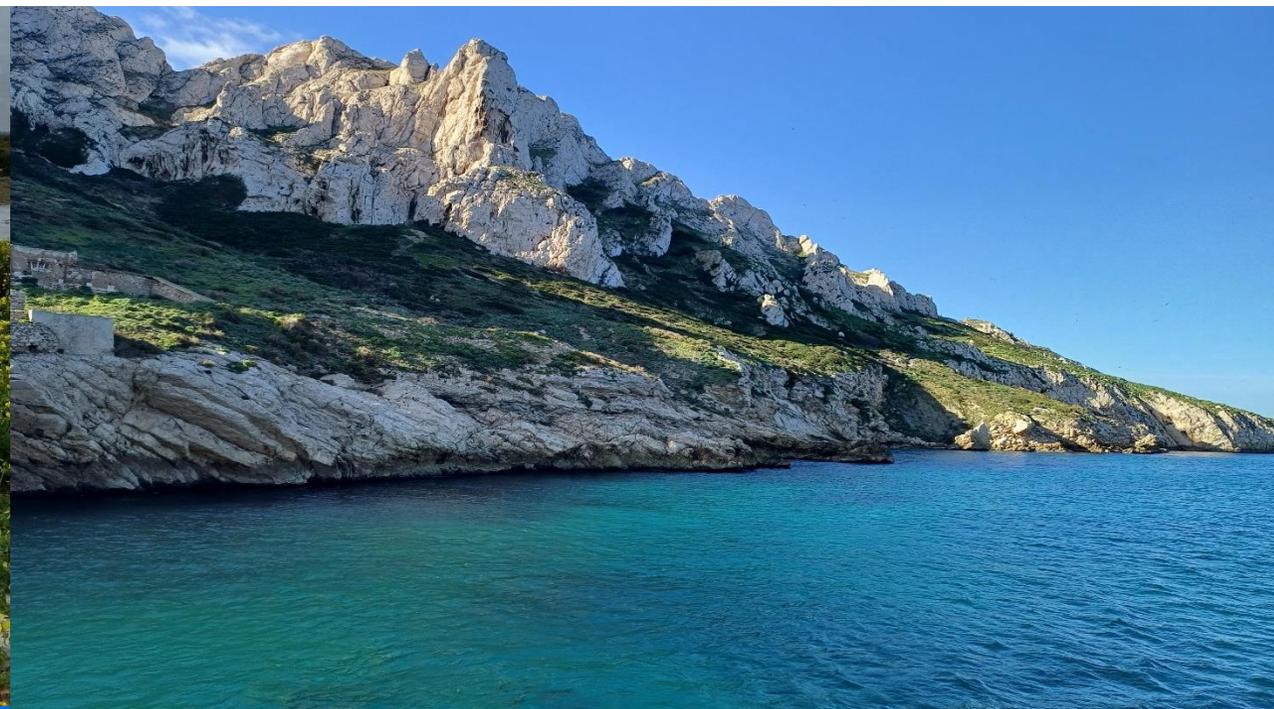
This work is very helpful for all the current processes in Bulgaria and Romania for MPAs. **Would it be possible to request modelling for a certain area, and if so when?**

We think your support is **most valuable at regional level**, for example in helping Bulgaria and Romania reach a common approach on the identification and designations of their Protected Areas and, within those, the 10% strictly protected cores.

STAKEHOLDER WORKSHOPS IN 2025



MEDITERRANEAN WORKSHOP
28th January 2025, Madrid,
with newly awarded EMFAF project
MEDIGREEN and Med MSP CoP



NORTH ATLANTIC SYMPOSIUM & WORKSHOP
18th February 2025, Copenhagen, with EEA

The MPA Europe project is co-funded by the European Union under the Horizon Europe program (grant agreement no. 101059988)



CASE STUDIES



**European
Environment
Agency**

**Blue carbon habitats
in MPA networks
(underway)**



**Optimal expansion of
MPAs and ORE
(proposed)**



**MPA network
adequacy
(underway)**



**Species app & video
tutorial for MSP
community (underway)**



Others TBD



INTERNATIONAL CONFERENCE

Marine Protected Areas IN Marine Spatial Planning

9-12 July 2025
Bodø, Norway



Call for abstracts is now open

WE ARE WAITING FOR YOU IN BODØ!



THANK YOU

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