MARINE PROTECTED AREAS EUROPE

MEDITERRANEAN SEA STAKEHOLDER WORKSHOP

28th January 2025

In collaboration with
MEDIGREEN Project

Co-funded by the European Union

UK Research and Innovation

EU MISSIONS
RESTORE OUR OCEAN & WATERS
Concrete solutions for our greatest challenges

CONTENTS

INTRODUCTION

On 28th January 2025 the MPA Europe project joined forces with the new European Maritime, Fisheries and Aquaculture Fund (EMFAF) project MEDIGREEN for a key collaborative stakeholder event at the Real Jardin Botanico, Consejo Superior de Investigaciones Científicas (RJB, CSIC) in Madrid, Spain. MPA Europe and MEDIGREEN presented their objectives and activities, fostering collaboration among stakeholders and began discussing shared areas of interest in supporting the European Green Deal (EGD) transition and science-based designation of marine protected area (MPA) networks in the Mediterranean through Maritime Spatial Planning (MSP).

During the MEDIGREEN Opening Conference, the recently closed EMFAF project MSP-GREEN main outcomes were presented and relevant regional initiatives supporting MSP were described by the Priority Actions Programme Regional Activity Centre (PAP/RAC), the Union for the Mediterranean (UfM), and the MSP Mediterranean Community of Practice (MSP MED CoP). Three working sessions then followed, with presentations focusing on how the blue economy sectors of offshore renewable energies, fisheries, and aquaculture can integrate and support the EGD, and the associated implications for MSP.

Finally, the day closed with a fourth working session on nature protection, the MPA Europe Mediterranean Sea Stakeholder Workshop. Five members of the MPA Europe team facilitated the workshop, presenting MPA Europe project's aims, approaches, and results to date and discussing with Mediterranean stakeholders how MPA Europe's work can support national, transboundary, and regional designation of MPAs and science-based MSP in a changing climate. The MEDIGREEN team participated in these discussions, sharing reflections on how MPAs can support the EGD and relevant aspects to be considered for climate-smart MSP.

This short report sets out the key discussion points from our workshop and has been shared with all Mediterranean Sea stakeholders who joined the workshop and other regional project stakeholders who were not present for the discussions.

CONTEXT

The Mediterranean Sea has an average depth of 1,500 m and reaches 5,109 m at its deepest recorded point in the Ionian Sea. It has numerous seabed features and divides naturally into western and eastern regions via the Malta Escarpment, which runs from Sicily to the African coast. Concentrations of chlorophyll and nutrients in the Mediterranean Sea are very low, with higher concentrations in the western part of the sea basin. The residence time of sea water in the Mediterranean Sea is approximately 100 years (Malanotte-Rizzoli P., 2014), making the sea basin especially sensitive to climate change. The Mediterranean Sea is a biodiversity hotspot with high levels of endemic species and one of the highest rates of endemism globally.

The Specially Protected Areas Regional Activity Centre (SPA/RAC) was created in 1985 to assist Contracting Parties to the Barcelona Convention in the implementation of the Protocol concerning Specially Protected Areas and Biodiversity in the Mediterranean (SPA/BD Protocol). One outcome of their post-2020 regional strategy for MPAs and Other Effective Conservation Measures (OECMs) is that MPAs coverage be increased through the expansion of soundly-designed, ecologically representative, and well-connected systems of MPAs. Specially Protected Areas of Mediterranean Importance (SPAMIs) aim to promote cooperation in the management and conservation of natural areas, and the protection of endangered species and their habitats.

Nine percent of Mediterranean waters are now contained in designated MPAs, according to the Marine Conservation Institute[1]. However, an assessment in 2020 by the Mediterranean Network of Marine Protected Areas Managers (MedPAN) and SPA/RAC found that the cumulative surface of the no-go, no-take, or no-fishing area of MPAs represents only 0.04% of the Mediterranean Sea.

[1] Article dated 31.10.24: Falling Short of Potential: Transforming Mediterranean MPAs

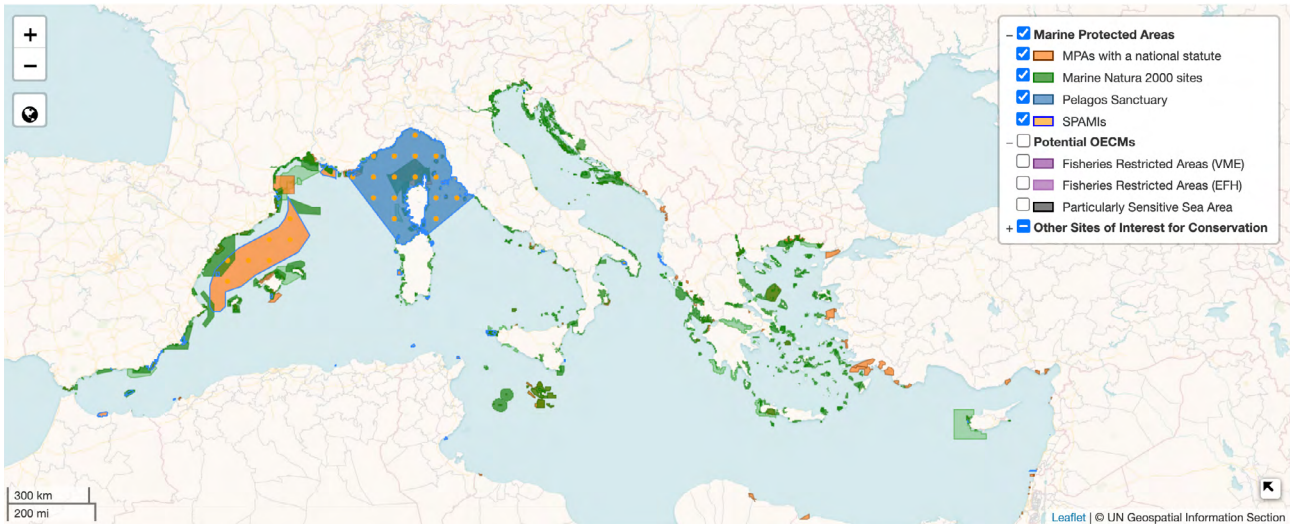


Figure 1. *Screenshot from MAPAMED Viewer showing Mediterranean MPAs, 12th February 2025. MAPAMED, the database of Marine Protected Areas in the Mediterranean. 2019 edition. © 2020 by SPA/RAC and MedPAN. Licensed under CC BY-NC-SA 4.0.*
Available at: https://www.mapamed.org/

Coherent networks of MPAs should be representative of Mediterranean biodiversity and cover adequately large areas for species to thrive, with replicate protection of habitats and species across individual MPAs in order to insure against local damage or die-offs caused by mounting pressures such as marine heatwaves or pollution.

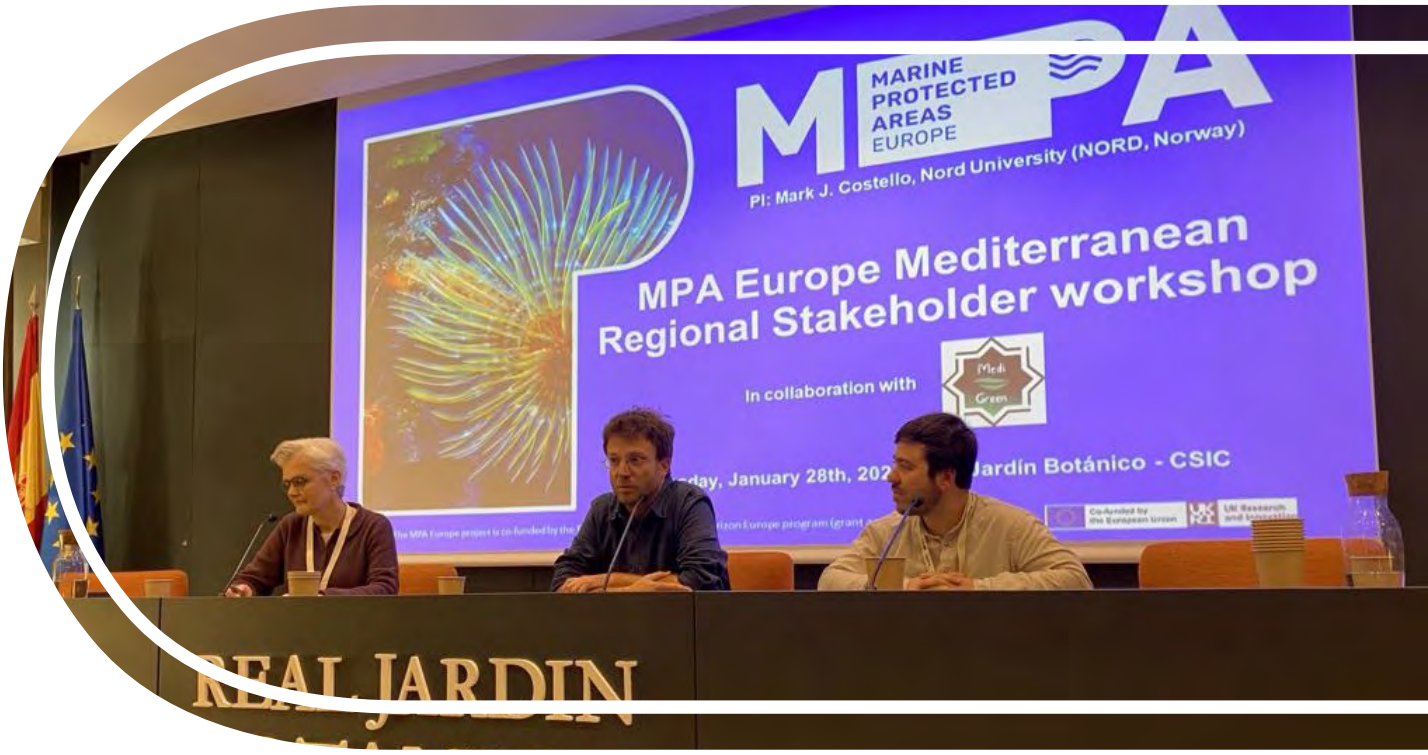
Networks of MPAs that are representative of biodiversity (including species and ecosystems) in the sea basin will help protect its unique biodiversity and accommodate climate-change effects, while supporting important blue economy sectors such as fisheries and tourism.

WORKSHOP APPROACH

During the hybrid workshop, we presented MPA Europe's goals, scientific approaches and results to date (partially available in Zenodo MPA Europe).

We asked stakeholders for their questions about our approach and activities, inviting them to consider how our results can be used for supporting science-based MSP, at national, transboundary, or regional level and supporting strengthening and expanding the network of MPAs in the region. We also presented a live demonstration of our species distribution models app (https://shiny.obis.org/distmaps/) and invited stakeholders to propose possible use cases for the project's results. A discussion was held among the whole group and the fruits of these discussions are summarised below.

In total we welcomed 64 attendees (in person and online) from a range of key sectors and organisations, as noted in the Appendix.



MPA EUROPE APPROACH

We presented the goals and scope of the project (https://mpa-europe.eu/); the systematic approach to modelling that we have adopted; our results to date; the need for MSP to balance marine protection with other uses of the sea; and our stakeholder engagement goals and work to date. The full presentation is available here.

Overall, MPA Europe is mapping the optimal locations for MPAs in European seas to support science-based MSP. Conservation and restoration of marine ecosystems underpins sustainable use and the blue economy, and therefore the two concepts should be taken together as a single goal for MSP, rather than separated. For example, many studies show how MPAs rebuild fisheries and sustain tourism, whilst safeguarding biodiversity and helping to adapt to climate change (Costello, 2024). Areas with no or very few pressures are essential to understand what Good Environmental Status (GES) looks like, as defined by the Marine Strategy Framework Directive (MSFD), and to act as controls for comparison with similar areas under a range of human pressures.

Rather than bias our approach to particular species or habitats, we take a holistic, data-driven approach to map as far as possible the full range of marine biodiversity present in European seas, and the concentration of organic carbon in seabed sediment stores, so that protection of either or both can be optimised under a changing climate. Our results will be shown in an online atlas later in 2025 and available for use by marine spatial planners and any other stakeholders with an interest in optimising the designation of networks of protected areas. Our results can also support studies and sensitivity analyses for particular groups of species or habitats.

Whilst MPAs are ultimately a societal choice, decisions regarding the establishment of networks of MPAs should be informed by an understanding of how species are currently distributed and how this may be impacted by climate change. As the Intergovernmental Panel on Climate Change (IPCC) notes, protected areas are key elements of adaptation, but they need to be planned and managed in ways that take account of climate change, including shifting species distributions and changes in biological communities, and ecosystem structure and function (IPCC, 2022). Adaptation to protect ecosystem health and integrity is essential to maintain ecosystem services, including for climate change mitigation and the prevention of greenhouse gas emissions. Furthermore, protected and conserved areas are the most effective tool to address both biodiversity loss and climate change within a timeframe that reflects the required urgency (Young V. et al., 2024).

We do not constrain our analysis to particular habitats and species but consider all marine biodiversity groups, except for the Viruses, Protozoa, Fungi, Bacteria, and Archaea kingdoms. Modelling the ranges of species using spatially standardised data layers can remove the bias inherent in using sampling data alone.

This year we will run prioritisation scenarios at regional, country, and territorial seas levels, and we expect that regional prioritisations of networks of protected areas will be more efficient in maximising the range of biodiversity that is protected than the cumulative combination of national or sub-national prioritisation analyses. This type of analysis can support the incorporation or anticipation of future MPAs in MSP at regional, transboundary, and national scales.

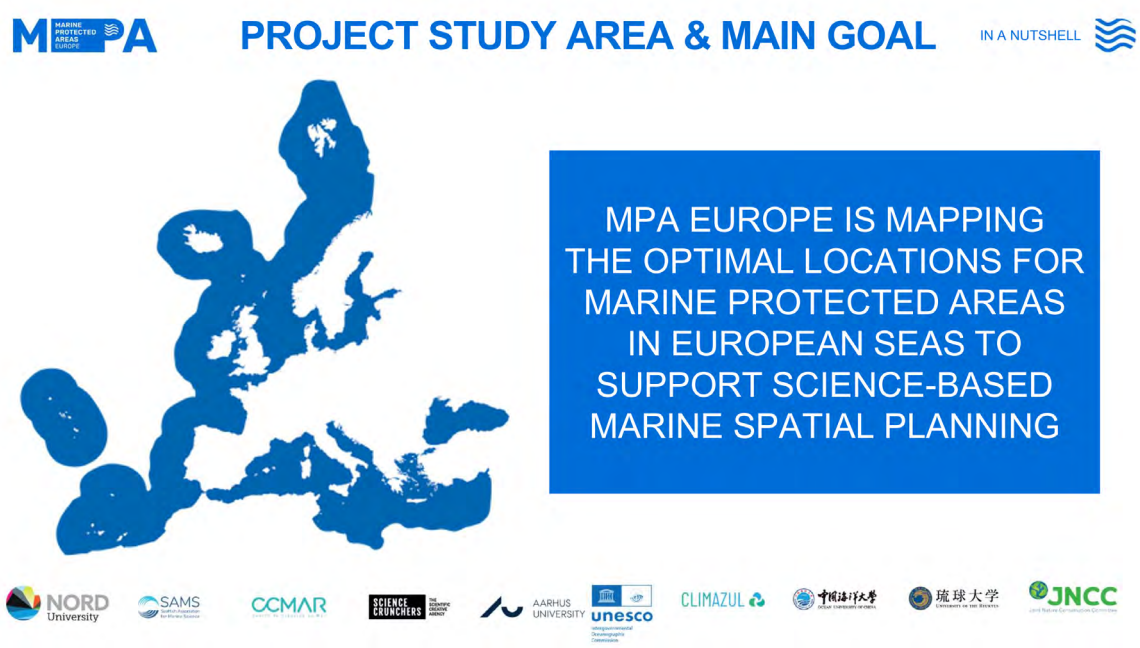


Figure 2. *Goal of MPA Europe*

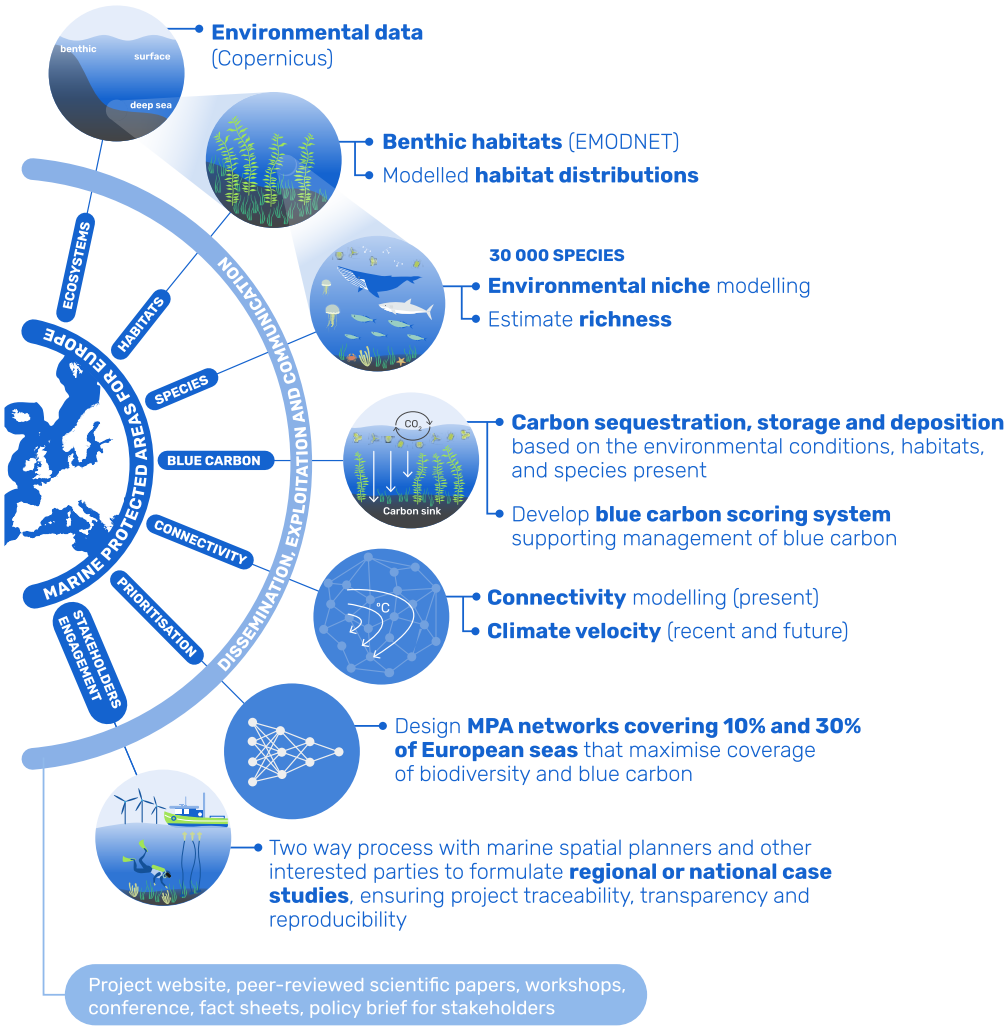


Figure 3. *MPA Europe Approach through Work Packages.*

MPA EUROPE RESULTS TO DATE

Our results so far include the following:

1. The first marine ecosystem classifications for Europe's seas

The term ecosystem is used very loosely but is imbedded in European and international policies. For data-driven systematic conservation planning we need a data-driven definition. Thus, we use the original "ecosystem function" concept as a region where energy flows are greater within the area than between adjacent areas, and we use ecologically relevant environmental variables to demarcate these areas.

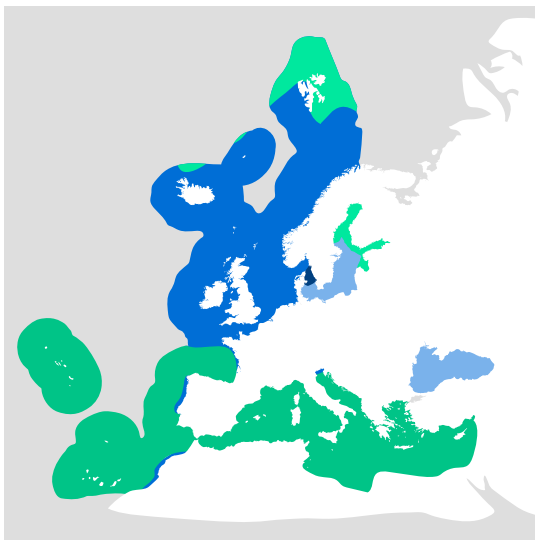
For the purposes of the MPA Europe project, "ecosystems" are defined as "enduring, spatially bounded environments where biological and energy interactions are greater within than with other ecosystems" (Zhao Q. et al., 2019). These classifications are driven by a wide range of spatially complete and standardised environmental data that reflect both ecosystem conditions and functioning. Our methodologies and data parameters may be found here.

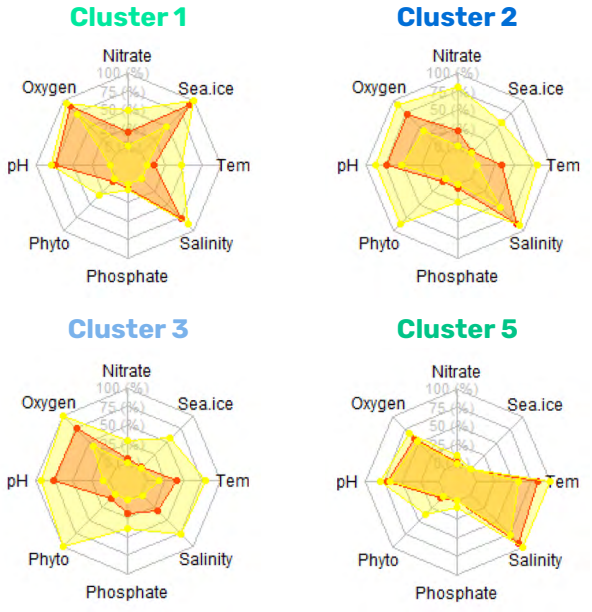
Using this basis, we created the first marine ecosystem classification for surface and near seabed waters of Europe and then created an additional depth-integrated marine ecosystem classification for Europe. Overall, our analysis yielded eight distinct clusters across the different depth ranges for the project area.

Three of the eight clusters we identify are relevant for the Mediterranean Sea:

1. *The surface layers to around 50 m-100 m depth in the Mediterranean Sea fall within cluster 5, which is characterised by moderate oxygen levels, minimal nitrate concentrations, high salinity, and high temperatures.*
2. *Most of the waters of the Mediterranean Sea fall within cluster 7, with moderate oxygen levels, low nitrate levels, consistently high salinity, and moderate to high temperatures.*
3. *Finally, cluster 6 manifests in the Western Mediterranean Sea, from 1000 m and deeper. This is characterised by moderate oxygen levels, relatively high and more variable nitrate concentrations, and moderate temperature ranges.*

Further details of the cluster analysis and methodology may be found here.





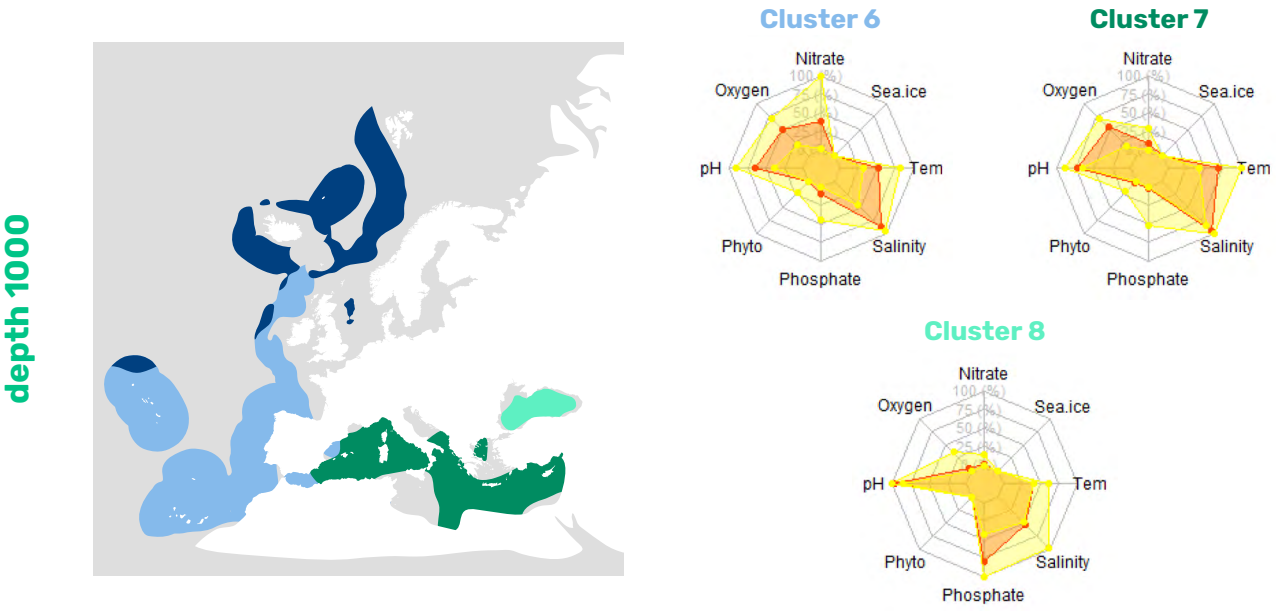


Figure 4. *Eight marine ecosystem clusters based on environmental data, by depth. Source: MPA Europe.*

This analysis highlights that the Mediterranean Sea's particular environmental conditions support distinctive assemblages of flora and fauna and hence the need for a self-contained, regionally coherent network of marine protected areas in the European context, which nonetheless incorporates connectivity to other marine ecosystems through the Straits of Gibraltar and the Sea of Marmara. Maintaining connectivity across transitional areas between different marine ecosystem clusters through MPAs is important in supporting climate-induced range shifts (Assis J. et al., 2021). Connectivity and climate change impacts on it should be factored into adaptive MSP (Abecasis D. et al., 2023).

2. Maps of species richness in European seas based on multiple indicators

Our species distribution models are based upon actual observations, statistical estimators, and modelled environmental range maps. There are over 30,000 marine species in European seas with available occurrence records in at least one of the data platforms we used, and 606 species were chosen for testing our framework and were modelled as part of this work. We have modelled the ranges of 12,000 species to date. Our methodology (Figure 5) may be found here and species distribution models may be explored in our new app here. A user tutorial is available here and we welcome feedback from stakeholders to improve the models and the user experience.

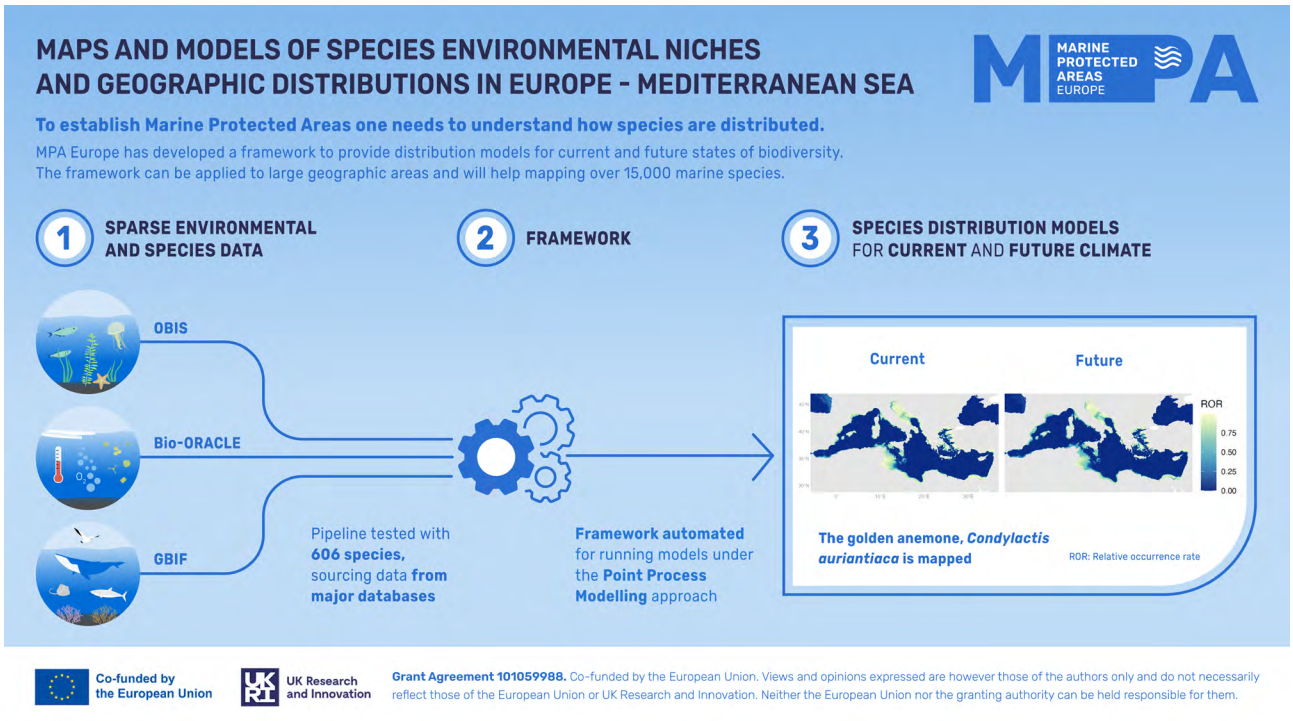


Figure 5. *Infographic on methodology framework used to produce species distribution maps. Source: MPA Europe.*

3. Potential geographic distributions of important biogenic habitats in European seas

Habitat-forming species significantly alter their environment by enhancing its structural complexity, thereby creating resources that support a richer diversity and abundance of species. We used Stacked Species Distribution Models to forecast the distribution of biogenic habitats across European seas, considering nine distinct groups of habitat-forming organisms (e.g., Figure 6). These groups include habitat forming algae; cold-water coral reefs; mollusc reefs (composed of Gastropoda and Bivalvia species); polychaete reefs (mainly Sabellaridae); seagrass meadows and maerl beds. Our methodology may be found here. We continue to refine our modelling framework, and we invite all stakeholders with relevant expertise to provide feedback to helpdesk@obis.org.

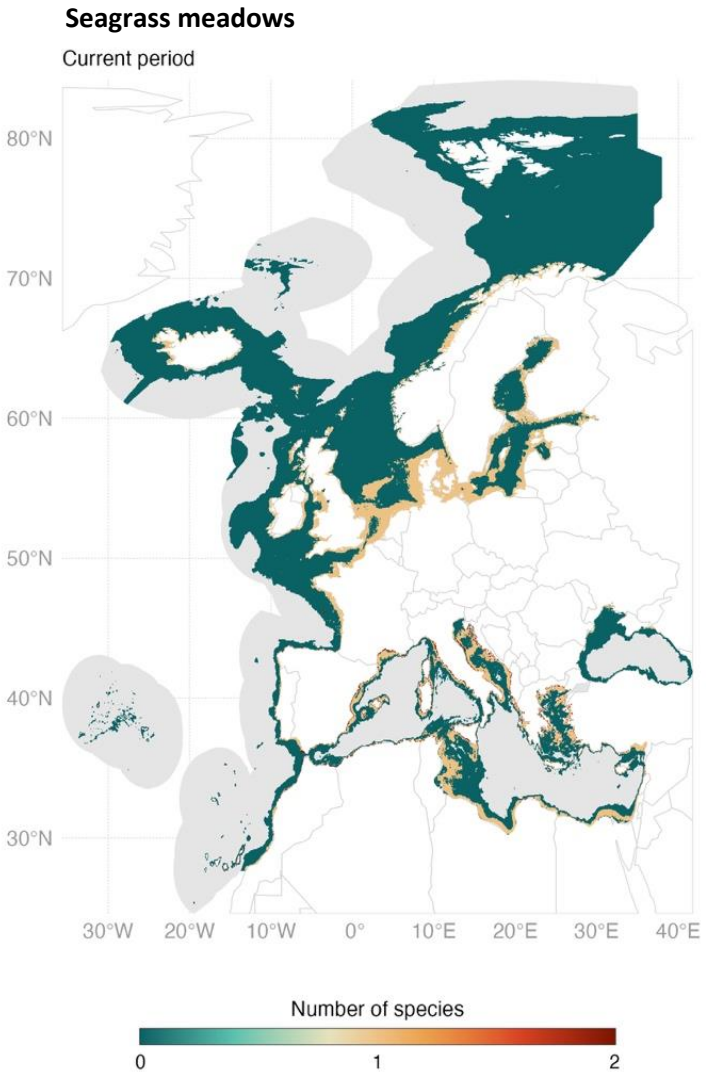


Figure 6. *Example of the distribution of species of seagrass. Source: Principe et al (2023)*

4. Sedimentary blue carbon database and maps

Marine sediments are one of the major organic carbon (OC) reservoirs on the planet and the efficiency of these sinks are important in regulating earth's climate. The protection of carbon sinks requires data on their location and size as well as knowledge on drivers. Blue carbon research has mainly focused on the management of vegetated coastal habitats to protect and increase their capacity to capture carbon dioxide and retain OC while also supporting biodiversity and other key ecological functions in marine ecosystems. The blue carbon concept is expanding, and marine sediments are categorised as "emerging blue carbon ecosystems" where human action to prevent disturbance may help to increase these sinks. In addition to further studies on how protection may affect marine sediment OC levels, there is a need for a robust understanding of the factors controlling these. However, despite decades of research into the factors controlling OC storage, relatively few larger scale studies have attempted to link OC levels across diverse seafloor habitats with variables regulating these standing stocks.

In April 2023 we invited the scientific community to contribute data to establish a Euro-Carbon database of Total Organic Carbon (TOC) stocks in marine sediments, i.e., blue carbon. Researchers were encouraged to submit both previously published and unpublished data. For this purpose, we created a template that all contributors used. Key information on sampling sites, methods, and analytical techniques were provided along with the data. The current version of the final EURO-CARBON database contains the data received from contributors, data from existing databases, and scientific literature. To date we have compiled around 61,000 entries (updated on 31st December 2024) and it is available in Zenodo (Lønborg, C et al., 2025; https://doi.org/10.5281/zenodo.14905489).

Our results show that the main environmental predictors of sediment OC levels were wave exposure (which also drives patterns of biodiversity), maximum temperature, distance from shore, and water depth, with highest OC content in sheltered, cool, shallow near-shore locations. The highest OC contents were generally found in muddy sediments, saltmarshes, seagrass meadows (in particular meadows of Posidonia oceanica), and in fine mud and coarse and mixed sediment substrata. These findings laid the foundation for developing an OC scoring system and related OC maps. The OC maps, together with the biodiversity maps for species and biogenic habitat distributions, serve as a basis for proposing a network of MPAs and OECMs that maximise protection of marine biodiversity and carbon stocks across European seas as part of a systematic conservation planning (SCP) approach and science-based, climate-smart MSP.

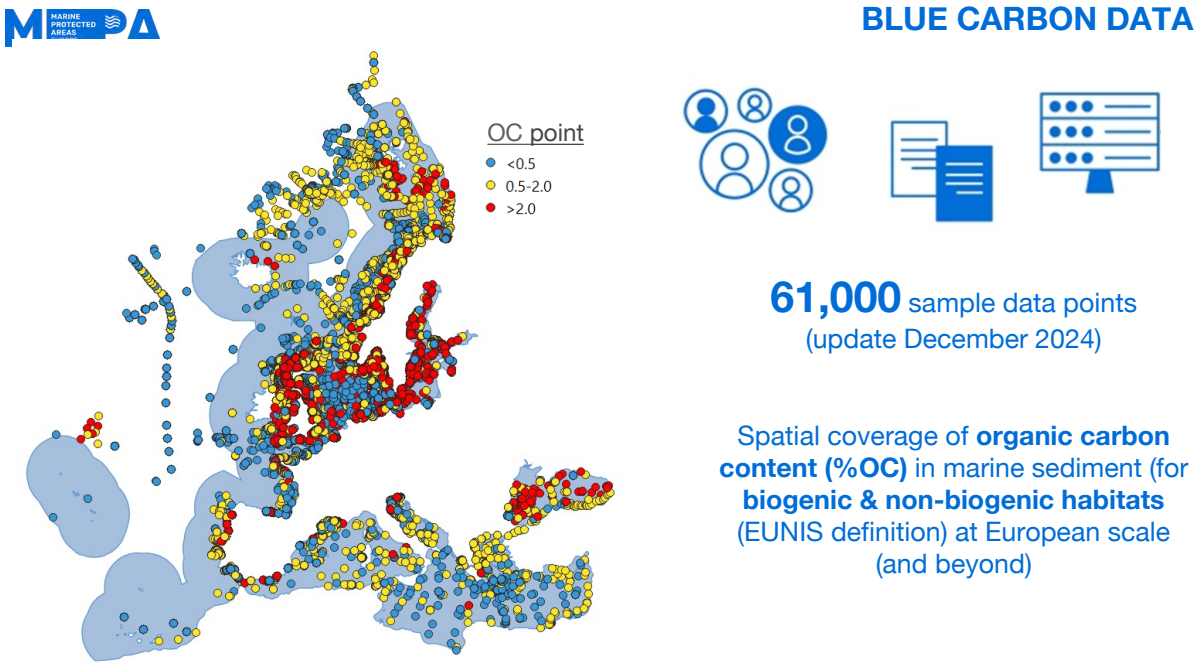


Figure 7. *Infographic on the MPA Europe Euro-Carbon database. Overview of the data received to date. Please note that this does not represent the final version of the project output.*

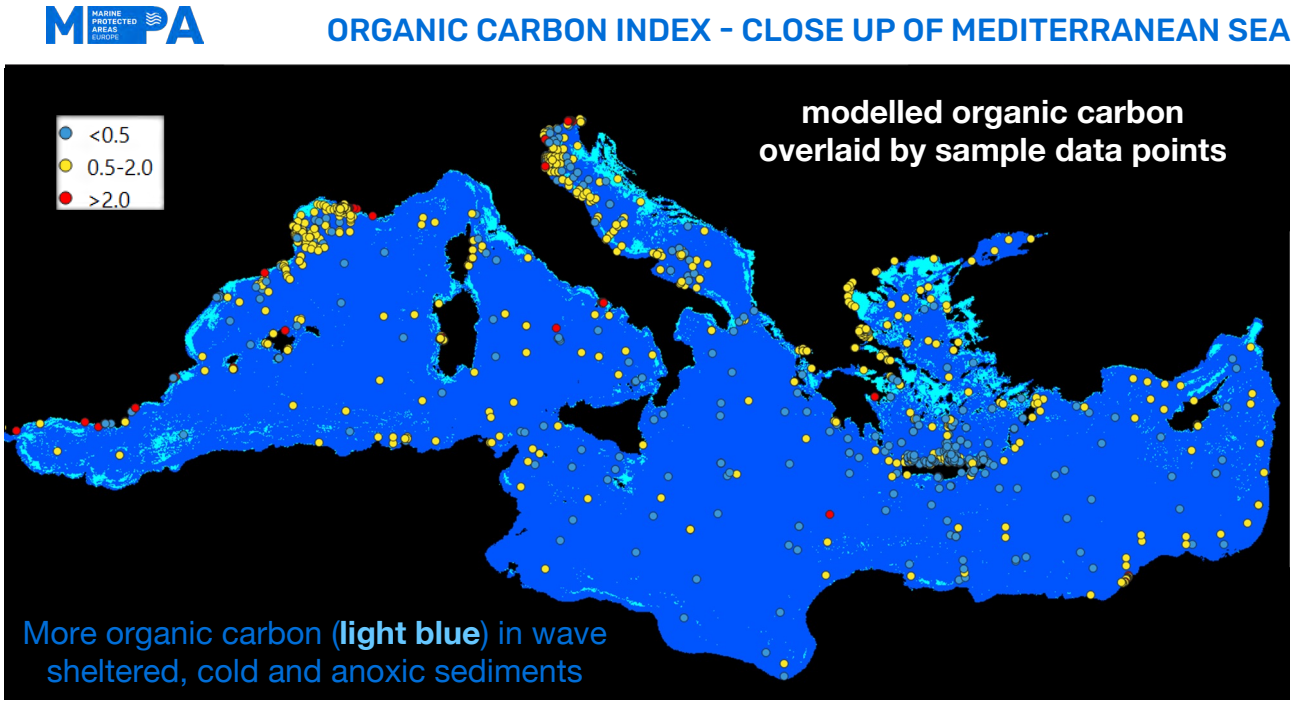


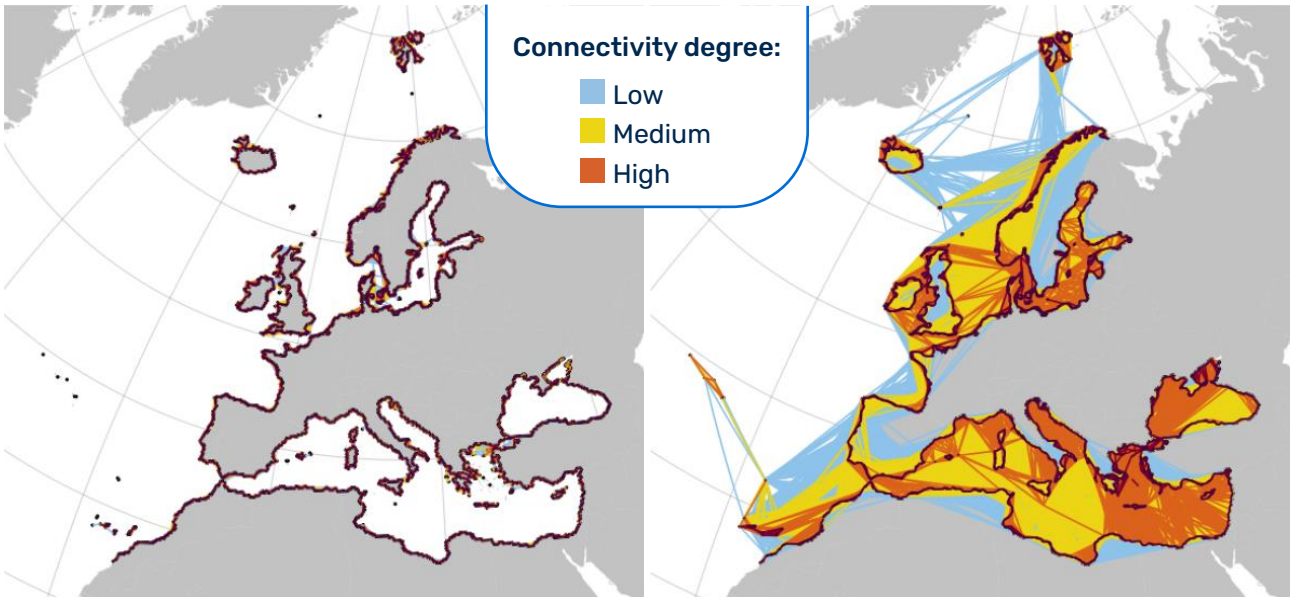
Figure 8. *Map showing the spatial distribution of the sediment organic carbon concentration (CC in %) observations for the Mediterranean Sea included in the MPA Europe Euro-Carbon Database.*

5. Connectivity and climate velocity

We have mapped oceanographic connectivity centrality for different species and propagule durations. When overlaid with maps of existing and potential future MPAs, this helps us understand which MPAs within the network are highly connected and which are more isolated, and hence where new MPAs can improve connectivity for species.

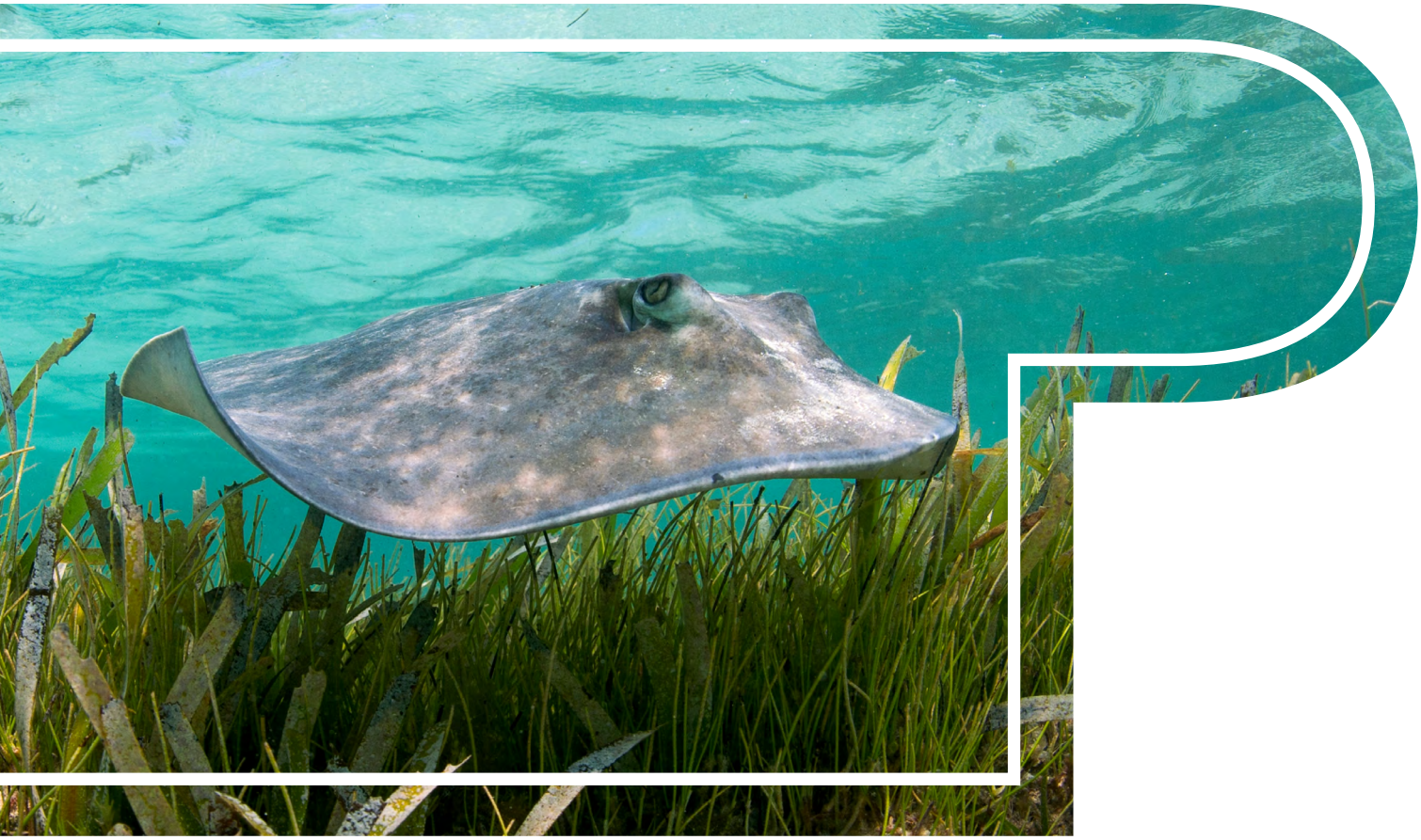
We have also developed a map showing the velocity of projected climate change for sea surface temperature across European seas. The Mediterranean Sea exhibits high levels of climate velocity.

OCEANOGRAPHIC CONNECTIVITY



Connectivity and centrality (data not shown) for species with **5-day (left)**, 10-day, 20-day, 40-day, 60-day, 120-day and **180-day (right)** propagule duration

Figure 9. *MPA Europe map showing the degree of oceanographic connectivity across the Mediterranean Sea.*



MPA Europe and MEDIGREEN SYNERGIES

The MPA Europe and MEDIGREEN projects share an interest in how MSP can support nature protection and restoration. During the workshop we discussed how MPA Europe' results can potentially support the natural protection component of MEDIGREEN, and these points are summarised below.

MEDIGREEN initial reflection	MPA Europe contribution
The MEDIGREEN project will evaluate maritime spatial plans in the context of the EGD, nationally and at a Mediterranean scale. As part of this, the project will look at the range of species considered by MSP processes.	MPA Europe models species ranges for around 12,000 marine species in Europe under all IPCC scenarios, to 2050 and 2100, helping identify future climate refugia. Our models are openly available, to be adapted and re-run in the future as more information becomes available. Our connectivity mapping can also inform the ecological coherency of MSP processes.
The MEDIGREEN project will be interested to see the shape of MPA Europe's results, by way of an optimal MPA network for the Mediterranean Sea. We can look at scenarios together when thinking about planning protection.	MPA Europe highlights that taking a national approach to protecting 30% of the sea for each country will not protect as much biodiversity as a regional 30by30 approach, so better outcomes and more efficient use of regional sea space can be delivered if countries cooperate on designating MPAs. Coherent and coordinated MSP within sea basins can support both EGD implementation and more efficient and effective design of coherent MPA networks.
The MEDIGREEN team noted that marine protection could support the EGD progression of MSP, since MPAs support sustainability; provide coastal protection benefits; help mitigate climate change impacts and species sequester and store carbon.	The MPA Europe team agreed and noted a recent study from the project lead, which found MPAs across the world had no dis-benefits for fishers and generated significant economic benefits for fisheries and tourism, even when not originally designated to benefit fisheries (Costello, 2024). Implementing effective management of MPAs can support climate mitigation and adaptation. Many countries internationally are including MPAs along with MSP as adaptation components in their Nationally Determined Contributions to the Paris Agreement (Lecerf M. et al., 2023).

STAKEHOLDER FEEDBACK

After presenting our approach and results to date, we asked stakeholders for their questions, inviting them to consider how our results can be used for supporting science-based MSP, at national, transboundary, or regional level, and for strengthening and expanding the network of MPAs in the region.

During the discussion, we provided a demonstration of the new species distribution models, using our new app available here. This included demonstrating the modelled results for a few species found in the Mediterranean Sea; highlighting information on the species' thermal range (estimated from its occurrence range); demonstrating how species' suitability ranges change according to different climate change scenarios; and showing the model performance information. We highlighted there are also options for stakeholders to download the data files and access the model code. The OBIS team, part of the MPA Europe consortium, can support stakeholders to upload national data to this global marine biodiversity repository, and welcome new datasets to improve modelled results.

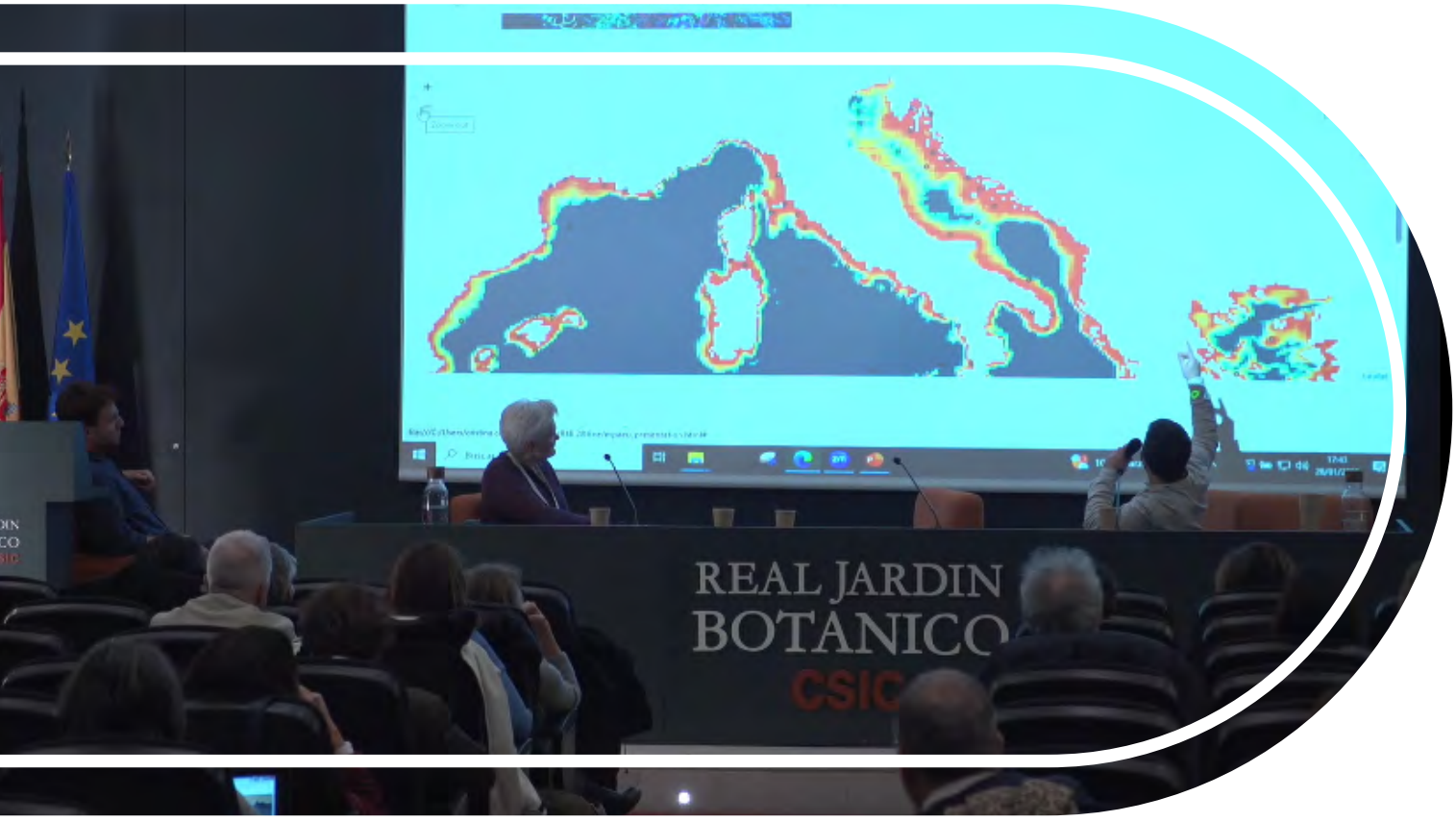


Figure 10. *Screenshot from Mediterranean Sea Stakeholder workshop with Silas Principe (MPA Europe and OBIS) presenting a new online species distribution model.*

A discussion was held among the whole group and the fruits of these discussions are summarised below. We invite stakeholders to propose possible case studies based on the project's results.

All the key discussion points are set out below:

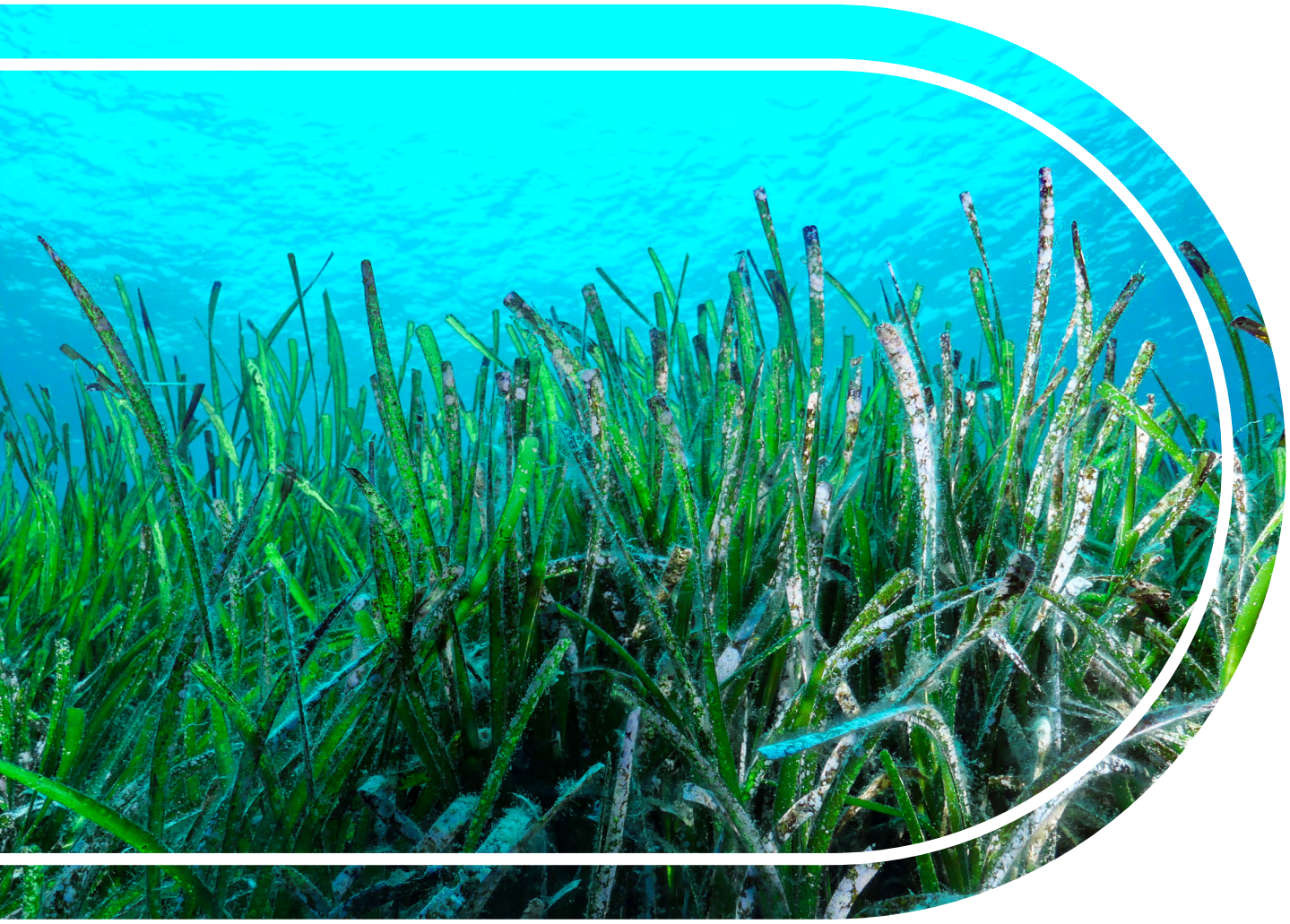
KEY POINT	STAKEHOLDER FEEDBACK IN DETAIL
Improving modelling for species and habitats distribution	
Participants identified and discussed anomalies in certain species' range model results. **Stakeholder recommendations:** Perform ground truthing with experts and consider what additional filters could improve results. Include depth ranges for species, as their range is influenced by the thermocline.	One participant identified an error in our modelled occurrence of *Paramuricea clavata* (violescent sea-whip) along the northern and central Adriatic coasts of Italy, where the species is absent. He noted the importance of checking a model's results before considering it as a reference for further processing. Using EMODnet Geology for substrate mapping would help. He noted we presented figures of (theoretically) very important marine protected areas to ensure connectivity for coastal fish fauna, but these species are all along the coast, even in unprotected areas. Ensuring connectivity is very important for some sessile and low-mobility benthic species, less so for highly mobile/migratory species. So, these products, which are very important, could be refined in order to increase their value. Another stakeholder commented that the model which we thought was not performing well, for *Parapenaeus longirostris* (deep-water rose shrimp) actually seems a better model than those we presented for *Paramuricea clavata* and for *Paracentrosus lividus*. This highlights that ground truthing is much needed. A third participant had checked our maps for cetaceans in the Mediterranean Sea and offered to provide feedback to improve them. **Our response:** Our models correlate the presence of the species with environmental conditions, including rugosity. These maps show the potential range of species, according to suitable environmental conditions. However other conditions such as seabed substratum and ecological interactions may also be relevant for species to occur. To address this, our results can be combined with substratum information, e.g. from EMODnet Geology, to refine species' predicted ranges. Regarding the connectivity, it is important to make the distinction between MPA Europe products (e.g. Figure 9) and the key connectivity hubs for Pisces, Crustacea and Echinodermata in the Mediterranean marine reserve network that we presented as a result from a relevant study (Abecasis D. et al., 2023). The latter is not a product of MPA Europe and it is based on different datasets. However, we presented it as an example of potential results that could be obtained from our connectivity data, paying attention, as suggested by the participant, to the difference between sessile and free-living organisms.

KEY POINT	STAKEHOLDER FEEDBACK IN DETAIL
Improving modelling for species and habitats distribution	
Participants identified and discussed anomalies in certain species' range model results. **Stakeholder recommendations:** Perform ground truthing with experts and consider what additional filters could improve results. Include depth ranges for species, as their range is influenced by the thermocline.	We can apply other filters to refine maps, for example by including only areas near to species occurrence records. Models are not perfect but they are useful when we don't have a complete view, to reduce bias from the use of observation data alone. These models were only very recently completed (December). We accept more improvements can be made to the tools and are currently ground truthing the models with help from taxonomic experts. We invite any stakeholder interested in supporting this process to contact us through helpdesk@obis.org.
Communicating model results	
Stakeholder recommendation: It is important to always disclose uncertainty levels alongside modelled results. It was suggested to add a clear disclaimer in the app, which could clarify that the distribution/range showed are still "potential habitat suitability."	One participant suggested that when presenting modelled results, uncertainty levels should always be presented alongside the data so that users are aware of limitations. To help ensure the new tool is fit for user needs, feedback should be collected for further enhancements in modelling or communicating results. **Our response:** We welcome this helpful feedback. We are also considering how we can collect user feedback as part of the OBIS tool. Uncertainty layers are attached to each map in the app. We believe it is key to be completely transparent about any result limitations. A disclaimer note was added to the app but we will improve it.

KEY POINT	STAKEHOLDER FEEDBACK IN DETAIL
How can MPA Europe's results be made more usable?	
These results are very powerful and comprehensive, but not ready to be used by MSP planners.	One participant commented that the science presented is very powerful but the results are not readily usable by the community. For example, ecological knowledge is much needed to use there results constructively together with local knowledge and data that countries have developed over decades. **Our response:** All data are usable to some extent. It depends on what use the user is looking for. Our science complements ecological knowledge and data. Our area of interest is all of Europe's seas, so the prioritisation results will be of most value for considering regional networks of MPAs from a top-down point of view. Our spatial resolution reflects this. At national level our results and models can complement existing information. We understand that some technical expertise is necessary to use our models, but we have strived to make both the underlying data and models findable, accessible, interoperable and reusable (FAIR principles). Both the original data and code are openly available online and can be downloaded and modified to meet user needs, such as running scenarios with different variables. In addition a video tutorial is available for a quick overview of the SDMs. This is a significant advance for marine species modelling. Prior to this there were two sources for marine species range maps; the IUCN Red List assessment, based on expert-derived polygons, where the underlying data are unavailable; and AquaMaps, which uses FAO boundaries, fewer environmental variables, outdated climate change scenarios, and so is not easy to apply for regional seas. OBIS on the other hand is developed continuously and hosted permanently by IOC-UNESCO.
Uneven data coverage	
We highlighted that data is very lacking for the Southern Mediterranean, which may lead to bias.	**Our suggestion:** MPA Europe has added millions of new records into OBIS from GBIF and other sources. We recommend national institutes and all stakeholders make their research data openly accessible by uploading it to European and global repositories (eg, EMODnet, OBIS and BioOracle) to support accessibility, reproducibility and replication. As noted above the OBIS team, part of the MPA Europe consortium, can support stakeholders to upload national data to this global marine biodiversity repository. This would not only improve our modelled results over time but would also enable all stakeholders to view species at a regional and pan-European context, which is important for biodiversity-inclusive MSP and identifying optimal MPA networks within and between marine regions.

KEY POINT	STAKEHOLDER FEEDBACK IN DETAIL
Do you have suggestions for potential case uses?	
Will you consider challenging the current MPA network with your results?	One participant suggested that it could be interesting to see how effective it is and to provide advice. **Our response:** We have already discussed this further analysis within the MPA Europe team, and we plan to perform this study as an additional outcome of the project. In addition, limited to a specific list of species, one of our ongoing case studies is supporting WWF to produce a report which will consider how coherent the current network is, in terms of species representation, replication and connectivity. Finally, we could also run a prioritisation scenario which includes the current network of MPAs and compare that with an optimal network.
Other questions and comments	
It is very important to designate MPAs top down and bottom up using local information, and to co-design them.	**Our response:** We agree; there are multiple factors applicable in how to designate MPAs. Our project focus is what would be ideal to maximise protection of biodiversity richness – from ecosystems, through to habitats and species. Factors such as species conservation status can also be weighted in our prioritisation analyses.
What is the reason for the high connectivity and species richness in the Aegean Sea?	One participant noted that from our presentation that the Western Mediterranean region and the Aegean Sea has high species richness and high connectivity, and asked us to explain this. **Our response:** The species richness map that we presented shows high number of species along some coastal areas of the Aegean Sea. The map refers to the original data available in the biodiversity platforms (i.e. OBIS and GBIF) where we recognise the presence of sampling bias. We apply models to overcome or reduce the bias and produce spatially complete and standardised layers for use in the prioritisation analyses. We have not shown the modelled species richness but the map is available in the MPA Europe map platform https://shiny.obis.org/distmaps/. Our connectivity map only considers oceanographic conditions (currents) and represents the connectivity for species with between 5 and 180-day (plot on the right) propagule durations. So this is what is influencing the high connectivity shown for this region. When applying MPA networks, many factors need to be considered, including where species are now, where suitable conditions for them to exist in the future will be and the degree to which connectivity can support them to move to these places. A further aspect to consider is abundance, and whether populations can be ecologically sustainable. We hope to incorporate abundance data for a few species using data from LifeWatch ERIC.

KEY POINT	STAKEHOLDER FEEDBACK IN DETAIL
Other questions and comments	
Can you explain what the blue carbon repository is for? Does it take into account time, long-term storage, pressure?	One participant asked if the blue carbon repository takes into account time, long-term storage and pressure. **Our response:** The EURO-CARBON dataset compiles data gathered on organic carbon in the seabed across Europe, from which we can produce models and maps that can provide information about the spatial distribution of marine sediments with high potential carbon storage capacity. It does include several parameters, such as location information (e.g., geographical coordinates, sampling year), field measurements (e.g., temperature, salinity), core sample (e.g., core depth), sediment measurements (e.g., dry bulk density), core dating, sediment fractions, etc, but does not include other variables, e.g. pressure. The EURO-CARBON full dataset is available in Zenodo: https://doi.org/10.5281/zenodo.14905489 (Lønborg, C et al., 2025)



NEXT STEPS

We would like to thank the MEDIGREEN team for supporting a joint approach to convening stakeholders and identifying cross-project synergies, and all stakeholders who were able to join us for sharing their feedback. We invite stakeholders to contact us with any further suggestions for improving the usability of our information, or to discuss possible case studies.

MPA Europe will co-host one further regional workshop this year, for the Atlantic and North Sea region, in order to seek stakeholder feedback following the same approach as for the Mediterranean Sea, Black Sea and Baltic Sea regions (our previous Stakeholder Workshop reports are available here). The outcomes of all of these regional discussions will inform our Policy Brief in December 2025.

MPA Europe is also hosting an international conference on MPAs in MSP in July 2025 in Bodo, Norway. We encourage all stakeholders to join us for the discussions and register here.

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APPENDIX - Workshop Participants

Organisation	Sector represented	Country of organisation	Attending
Centre National de Recherche et de Developpement de la Peche et de l'Aquaculture (CNRDPA)	Scientific and research institute	Algeria	In presence
CNTPP	Scientific and research institute	Algeria	Online
DG MARE (EC)	European Commission	Belgium	In presence
DG MARE (EC)	European Commission	Belgium	In presence
European Aquaculture Technology & Innovation Platform	Regional organisation	Belgium	In presence
Ministry of Physical Planning, Construction and state Assests (Croatia)	National authority or ministry	Croatia	In presence
PAP-RAC	Regional organisation	Croatia	In presence
PAP-RAC	Regional organisation	Croatia	In presence
IEO	Scientific and research institute	España	In presence
CSIC (Spanish Research Council)	Scientific and research institute	España	In presence
CEREMA	Scientific and research institute	France	In presence
CEREMA	Scientific and research institute	France	In presence
French Directorate General for Maritime Affairs, Fisheries and Aquaculture	National authority or ministry	France	In presence
MedPAN	NGO	France	In presence
SHOM	Scientific and research institute	France	In presence
SHOM	Scientific and research institute	France	In presence
EcoOcéan Institut	Scientific and research institute	France	Online
French Ministry of Environment	National authority or ministry	France	Online
WWF MMI	NGO	France	Online
Renewables Grid Initiative	Trade body	Germany	In presence
Aristotle University of Thessaloniki	Scientific and research institute	Greece	In presence
Aristotle University of Thessaloniki	Scientific and research institute	Greece	In presence
PUSPS	Scientific and research institute	Greece	In presence
Ministry of Environment and Energy (Greece)	National authority or ministry	Greece	Online
Ministry of Environment and Energy (Greece)	National authority or ministry	Greece	Online
Independent	Consultant	Italy	Online
CNR-ISMAR	Scientific and research institute	Italy	In presence
CNR-ISMAR	Scientific and research institute	Italy	In presence
CORILA	Scientific and research institute	Italy	In presence
CORILA	Scientific and research institute	Italy	In presence
CORILA	Scientific and research institute	Italy	In presence
IUAV	Scientific and research institute	Italy	In presence

APPENDIX - Workshop Participants

Organisation	Sector represented	Country of organisation	Attending
Iuav University of Venice	Scientific and research institute	Italy	In presence
Medac (wwf/coordinator GL3)	Regional organisation	Italy	In presence
MEDREACT	NGO	Italy	In presence
Università Iuav di Venezia	Scientific and research institute	Italy	In presence
CORILA	Scientific and research institute	Italy	Online
ISPRA - Italian Institute for Environmental Protection and Research	Scientific and research institute	Italy	Online
Università degli studi Milano Bicocca	Scientific and research institute	Italy	Online
WWF Mediterranean	NGO	Italy	Online
MARE-ARNET/University of Lisbon	Scientific and research institute	Portugal	In presence
AEE (Asociación Empresarial Eólica)	Scientific and research institute	Spain	In presence
ASOCIACION CHELONIA	NGO	Spain	In presence
CSIC (Spanish Research Council)	Scientific and research institute	Spain	In presence
CSIC (Spanish Research Council)	Scientific and research institute	Spain	In presence
CSIC (Spanish Research Council)	Scientific and research institute	Spain	In presence
Eco-union	NGO	Spain	In presence
EU MSP Platform	Assistance mechanism	Spain	In presence
European Topic Center-Universidad de Malaga	Scientific and research institute	Spain	In presence
European Topic Centre University of Malaga	Scientific and research institute	Spain	In presence
General Secretariat of Fisheries - Ministry of Agriculture, Fisheries and Food (Spain)	National authority or ministry	Spain	In presence
GFCM/FAO	Regional organisation	Spain	In presence
IEO(CSIC)	Scientific and research institute	Spain	In presence
IEO(CSIC)	Scientific and research institute	Spain	In presence
IEO(CSIC)	Scientific and research institute	Spain	In presence
IEO(CSIC)	Scientific and research institute	Spain	In presence
IEO(CSIC)	Scientific and research institute	Spain	In presence
MITECO	National authority or ministry	Spain	In presence
WWF Spain	NGO	Spain	In presence
IEO(CSIC)	Scientific and research institute	Spain	Online
Institut de Ciències del Mar (ICM-CSIC)	Scientific and research institute	Spain	Online
Netherlands Enterprise Agency (RVO)	National authority or ministry	The Netherlands	In presence
University of Sfax	Scientific and research institute	Tunisia	In presence
University of Sfax	Scientific and research institute	Tunisia	In presence

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