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Abstract	This Trainers' Manual aims to provide a guide for trainers to perform a more effective REGINA-MSP capacity building process for local and regional staff. The manual is structured in 3 key Training Modules. Module 1 provides an in-depth understanding of the basic concepts and principles underlying MSP and the key challenges affecting policy-makers at regional and local levels. Module 2 explores how to implement a participatory planning process, and the role of relevant stakeholders. This module presents key tools, techniques, and data used across scales. Module 3 focuses on climate impacts on marine ecosystems and the integration of climate considerations in MSP. It discusses relevant theoretical regimes about the ecosystem approach in MSP and practical tools like Strategic Environmental Assessment, Cumulative Impact Assessment and Scenarios buildings.

FOREWORD

Summary and objectives of the REGINA-MSP project

REGINA-MSP (Regions to boost National Maritime Spatial Planning) is a two-year project (November 2022 – October 2024) aiming at improving the participation of regions as well as local authorities and stakeholders in the development and implementation of MSP, a process which is mainly driven at the national level.

Mapping the training needs of local and regional staff, on MSP

The identification of the topics for the REGINA-MSP Training was based on a special survey addressed to national/regional/local staff. The results of this survey are presented in the Appendix.

Why is this manual necessary?

The current training manual is a tool for organizing an effective capacity building on MSP, introducing a learning process across the REGINA-MSP partners' countries. Whilst not being compulsory, this manual provides a structured and comprehensive approach to learning on MSP, based on the topics prioritized by the REGINA-MSP survey conducted by Panteion University of Social and Political Sciences (Strategic and Maritime Spatial Planning Laboratory) as partner of the REGINA-MSP Project. It ensures **that all topics suggested by the participants are systematically covered.**

How to use this manual?

Trainers may use this manual as a reference tool for organising their training sessions, pick up any activity they wish to use for engaging their trainees, based on the specific territorial characteristics and key MSP priorities of their country, region or municipality. While not exhaustive, the manual provides a concise overview of the key MSP topics revealed from our initial survey, which are Key MSP principles and challenges, Stakeholders' analysis and engagement in the MSP process, Data and tools in MSP process, Participatory planning process, Mapping tools, and Climate-Smart MSP. Integrating diverse teaching methods - such as role-playing exercises, case studies, and quizzes - is essential for maximizing engagement, participation, and the overall effectiveness of the training programme for local and regional staff. These methods provide a structured approach in discussing topics and can help trainers to effectively deliver content. By incorporating various interactive elements, trainers can ensure that trainees retain information, apply their learning, and remain motivated throughout the learning process. This approach enhances the overall learning experience and promotes better outcomes for learners. The manual is organized into three modules (1-3), each containing multiple sessions, tailored for trainers starting the MSP learning process at the regional/local level. In each session there is a **guide for trainers**, to help trainers navigate topics, learning methods, and recommended resources like videos and training materials. Each Module and Session are designed to stand alone, giving trainers the flexibility to adapt the content based on their own knowledge on MSP and the specific needs of their participants. This approach allows for a tailor-made and effective training experience for both trainers and learners.

Trainers are advised to select a minimum of two Sessions from the 1st module and one from modules 2 and 3, as per their training needs. Additionally, partners are encouraged to offer feedback on the training process conducted in their country using the

template provided in Appendix B. This feedback is valuable for assessing the effectiveness of the training and making improvements for future sessions.

Part 1. The REGINA-MSP Training: Objectives, Methods and Structure of an interactive training

The objective of this Trainers' Manual is to provide a Guide for Trainers to perform a more effective REGINA-MSP training process for local and regional staff. The manual is structured in 3 key Training Modules**:**

Module 1. Maritime Spatial Planning, Concepts, Key Challenges and Policies.

Focus: The module includes sessions that are providing an in-depth understanding of the basic concepts and principles underlying MSP and the key challenges affecting policy makers at regional and local level.

Module 2. Understanding MSP across different scales and actors

Focus: The sessions of this module explore how to implement a participatory planning process, and the role of relevant stakeholders. The module presents key tools, techniques, and data used across scales.

Module 3. Climate -Smart MSP, Integrating Climate Resilience in MSP

Focus: This module emphasizes climate impacts on marine ecosystems and the integration of climate considerations in MSP. It discusses relevant theoretical regimes about the ecosystem approach in MSP and practical tools like Strategic Environmental Assessment, Cumulative Impact Assessment, Scenarios building etc.

SUMMARY

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

CBD	Convention on Biological Diversity
CC	Climate Change
CCVAF	Climate Change Vulnerability Assessment Framework
CIAT	Climate Impact Assessment Tool
CoP	Community of Practice
CRMSP	Climate Resilient Maritime Spatial Planning
CES	Cultural Ecosystem services
EC	European Commission
EMODnet	European Marine Observation and Data Network
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographic Information Systems
GWEC	Global Wind Energy Council
IMP	Integrated Maritime Policy
IOC	Intergovernmental Oceanographic Commission
JAP	Joint Action Plan
LSI	Land-sea Interactions
MCH	Marine Cultural Heritage
MSP	Maritime Spatial Planning
MEA	Millennium Ecosystem Assessment
MUS	Multi-use of the sea
NBS	Nature-based solutions
ORE	Offshore Renewable Energy
UNCLOS	United Nations Convention on the Law of the sea

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PART 1. The REGINA-MSP Training: Objectives, Methods and Structure of an interactive training

I. Module 1. Maritime Spatial Planning, Concepts, Key Challenges and Policies

A training workshop in Greece as part of the REGINA-MSP project.

A. Introduction to Module 1: MSP, Concepts, key Challenges and Policies

The training module entitled "Maritime Spatial Planning: Concepts, Key Challenges and Policies" is designed to provide a comprehensive understanding of maritime spatial planning (MSP) in the context of sustainable development and the blue economy. The module is structured into various sessions, each focusing on different aspects of MSP. Below is an overview of the module aim, its structure in sessions, and the key topics to be discussed in each session. The module aims to equip training participants with a thorough understanding of MSP, its concepts, principles, key challenges, current policies, and applications. It seeks to provide insights into the regulatory frameworks governing MSP, explore the challenges faced in implementing MSP, and discuss innovative approaches to integrate cultural and ecological aspects into MSP. The module is intended for professionals, policy makers, and stakeholders involved in the MSP process. It is structured into three sessions:

- **Session 1.1** Understanding the key drivers and principles of MSP - Regulatory frameworks related to MSP and Sustainable Blue Economy.
- **Session 1.2** Key Challenges of Maritime Spatial Planning, Experiences of MSP plans already in place.
- **Session 1.3** Soft and hard Multi-use of the sea (MUS) and MSP - Landscapes/Seascapes in MSP- Maritime/Underwater Cultural Heritage in MSP.

For each of the above sessions, the aim of the session and the learning objectives and outcomes are described alongside the structure of the organised topics discussed with key examples of participatory exercises whenever it is applicable.

B. Session 1.1. Understanding the key drivers and principles of MSP

Overview of the session

This session introduces the foundational concepts of MSP. It focuses on the drivers behind the need for effective maritime planning and the underlying principles guiding MSP processes. It should delve into the legal and policy framework that guide MSP, discussing its evolution through time. International conventions like the United Nations Convention on the Law of the Sea (UNCLOS), as well as regional and national laws that shape or impact MSP practices should also be investigated. Furthermore, the key steps of MSP strategy plan will be briefly discussed while the multi-scalar approach in MSP may be explained.

1.1.1. What is Maritime Spatial Planning?

You can start the session by defining MSP in a way that is accessible to newcomers but informative enough for more knowledgeable readers. You may use three perspectives: MSP as a process, MSP and ecosystem-based management, MSP and ecosystem services.

MSP as a process

A frequently used definition is provided by the Intergovernmental Oceanographic Commission (IOC) of UNESCO:

***"MSP is a step-by-step approach, a public process of analysing 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"* (Ehler and Douvere, 2009).**

Another basic definition was initially included in the 2014 MSP Directive:

"Maritime Spatial Planning is a process by which the relevant Member State's authorities analyse and organise human activities in marine areas to achieve ecological, economic and social objectives".

In its Roadmap for MSP, the European Commission considers MSP as a tool for improved decision-making, providing a framework for arbitrating between competing human activities and managing their impact on the marine environment. Its objective is to balance sectoral interests and achieve a sustainable use of marine resources in line with the EU Sustainable Development Strategy (European Commission, 2008).

Within these definitions, it is crucial to maintain the attractiveness of MSP even if its emphases are often diverse as conceived and understood by the different stakeholders (developers, ecologists etc.). This will allow stakeholder engagement to remain despite different views and perceptions. Firth (2013) suggests that to effectively manage MSP, it should be seen as a platform that follows standard political procedures while maintaining a strong emphasis on the sea. It should involve a diverse range of stakeholders and interested parties, with access to comprehensive data to support decision-making. This approach aims to promote innovation and ensure that licensing procedures are adhered to, with trust and transparency.

The spatial analysis aspect of MSP highlights the significant role of Geographic Information Systems (GIS) in coastal and marine management. GIS technology plays a crucial role in encouraging the collection and creation of high-quality spatial data. The identification of data gaps and weaknesses in marine data is driving efforts to acquire more data, leading to the availability of more compatible datasets. Geographical zoning, which differentiates between the surface, water column, and seabed, can be viewed as a vital spatial solution to address conflicts over the use of sea areas.

Highlights

- ✓ In contrast with land planning, which starts from a position of single-user exclusivity through landownership, MSP must address the principle of the sea as 'common', which means balancing priorities amongst multiple users, who all have a right of access and use over the same area.
- ✓ Another key attribute of the sea – surface, water column, and seabed – is that it is not homogenous; different places at sea have different attributes, making them attractive to different users.
- ✓ As the sea is not uniform, some areas are of very little interest to sea-users; but in contrast some areas are extremely important to several different users whose activities may not be compatible with each other or with sustaining future use.
- ✓ However, whichever human activities and interests are present in the sea, it can be considered as one vast interconnected ecosystem.

References

DIRECTIVE 2014/89/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 July 2014 establishing a framework for maritime spatial planning.
Roadmap for MSP : COM/2008/0791 final

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MSP and ecosystem-based management

The MSP Directive (MSPD) clearly addresses the ecosystem-based management approach. More specifically, Ecosystem-based management, or the Ecosystem Approach, was developed and codified in the 1992 Convention on Biological Diversity, where it is described as « a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way ». Like MSP, much of the Ecosystem Approach is process-oriented, with 12 principles, among which:

- emphasising the protection of ecosystem structure, functioning, and key processes;
- being place-based in focusing on a specific ecosystem and the range of activities affecting it;

- explicitly accounting for the interconnectedness within systems, recognising the importance of interactions between many target species or key services and other non-target species;
- acknowledging interconnectedness among systems, such as between air, land and sea;
- integrating ecological, social, economic, and institutional perspectives, recognising their strong interdependencies.

MSP and ecosystem services

Clearly, Ecosystem-based management is meant to overcome the prevailing nature-culture dichotomy, and this is further reflected in the ecosystem services approach. Ecosystem services have come to the fore through the Millennium Ecosystem Assessment (MEA), which was intended to help provide the knowledge base for improved decision-making. The MEA was published as a series of working group and synthesis reports in 2005 (Millennium Ecosystem Assessment, 2005). Its conceptual framework comprises four types of services, as follows:

- Provisioning Services: Products obtained from ecosystems.
- Regulating Services: Benefits obtained from regulating ecosystem processes.
- Cultural Services: Non-material benefits obtained from ecosystems.
- Supporting Services: Services necessary to produce all other ecosystem services.

Specifically, Cultural Ecosystem Services (CES) consist of ten sub-categories and are defined as the "non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences" (MEA, 2005). Compared to other ES, CES are arguably more directly experienced and appreciated by the public and are therefore seen as key to raising public awareness and support for protecting ecosystems (Daniel et al., 2012). It is, however, difficult to quantify them not only in monetary, but also in quantitative terms; both of which are essentially the purpose of ES.

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MSP and Integrated Coastal Zone Management (ICZM)

The link between MSP and Integrated Coastal Zone Management (ICZM) is most clearly stated in the Mediterranean marine region, thanks to the Barcelona Convention ICZM Protocol. Spatial planning of coastal zones is an essential component of the ICZM Protocol, as one of the main objectives of ICZM is to "facilitate, through the rational planning of activities, the sustainable development of coastal zones by ensuring that the environment and landscapes are taken into account in harmony with economic, social and cultural development" (ICZM Protocol, art. 5). According to the Mediterranean Action Plan (MAP) Strategy 2016–2021, during the 2013 Meeting of the Barcelona Convention held in Istanbul, the contracting parties recommended strengthening MAP activity on MSP as part of ICZM with the aim of ensuring Good Environmental Status in the Mediterranean. Moreover, the recommendation to apply MSP is referred to several times in the Mediterranean Strategy for Sustainable Development (MSSD) 2016–2025. On these grounds and following two years of work coordinated by the MAP Priority Actions Programme Regional Activity Centre (PAP/RAC), the Barcelona Convention's Contracting Parties adopted the "Conceptual Framework for Marine Spatial Planning" in the Mediterranean Sea (UNEP (DEPI)/MED IG.23/23). This is recognised as a guiding document to facilitate the introduction of MSP under the Barcelona Convention and link it to ICZM. It can also provide contracting parties with a common context for implementing MSP in the Mediterranean region (Ramieri et al., 2019).

References

Ramieri, E., Bocci, M., Markovic, M., 2019. Linking Integrated Coastal Zone Management to Maritime Spatial Planning: The Mediterranean Experience. In: Zaucha J., Gee K. (eds) Maritime Spatial Planning. Palgrave Macmillan. https://doi.org/10.1007/978-3-319-98696-8_12

Highlights

✓ The necessity for MSP arises from the increasing demands placed on the world's oceans and seas. As global populations grow and technological advancements open new opportunities, activities such as shipping, fishing, renewable energy generation, and tourism are expanding rapidly. **These activities not only compete for space but also have varying impacts on marine ecosystems.**

✓ MSP represents a forward-thinking, strategic process designed to guide decision-making in the marine environment. It serves as a key tool for managing the use of marine spaces in a way that **balances economic development with the need to protect marine ecosystems.**

✓ At its core, MSP is about ensuring that the allocation of marine spaces to various uses is done in an organized, efficient, and sustainable manner.

✓ Without a comprehensive planning framework like MSP, the potential for conflict among users increases, and the risk of significant environmental degradation becomes a reality.

✓ More and more uses demand a share of marine space

✓ The nature of marine resource use is changing

✓ Land uses have impact on sea and vice versa

✓ Not all impacts can be managed there, where they occur. Some of them, such as shippingwill demand a wider regional or even international approach.

Source: http://www.plancoast.eu/files/handbook_web.pdf

MSP and land-sea interaction

Land-Sea Interaction (LSI) is a complex phenomenon, involving the impact of both natural processes and human activities on the coastal ocean. When carrying out MSP, it is essential to consider the dynamics that occur between land and sea, thus ensuring it is conducted in an integrated manner across maritime and terrestrial areas. That is particularly relevant for sectors such as shipping or offshore wind energy that have an onshore component, but also for the management of environmental quality. In fact, the EU Directive on MSP requires Member States to take LSI into account when preparing maritime spatial plans.

LSI and how they should be addressed play a key part in the successful delivery of the Maritime Spatial Planning Directive (2014/89/EU). Articles 4, 6 and 7 explicitly require that LSI be taken into consideration either via formal or informal processes, for example ICZM and these should be reflected in member states maritime spatial plans. In order to inform planners, DG Environment commissioned a study which led to the production of a brochure entitled **"Land Sea Interactions in Maritime Spatial Planning"** designed to give an understanding of how LSI can be addressed when developing maritime spatial plans. The brochure examines the LSI of **eight key marine development sectors** and how these can be considered in the context of MSP development : Aquaculture, Desalination, Fisheries, Marine cables & pipelines, Minerals & mining, Ports & shipping, Tourism & coastal recreation, Offshore energy.

Key LSI's for each of the sectors above were then identified and described taking into consideration, a) the category of LSI being examined (environmental, socio-economic or technical) b) Sources of information to be considered c) existing policies and guidance d) assessment tool available e) potential mitigation measure that can be applied f) identify which stakeholders should be involved in discussions and g) management options which may be used to address a particular LSI throughout a 4 step process. For more info you can visit the European MSP Platform: https://maritime-spatial-planning.ec.europa.eu/practices/land-sea-interactions-maritime-spatial-planning.This topic is extremely meaningful when planning and managing the coastal zone at the regional and local scales.

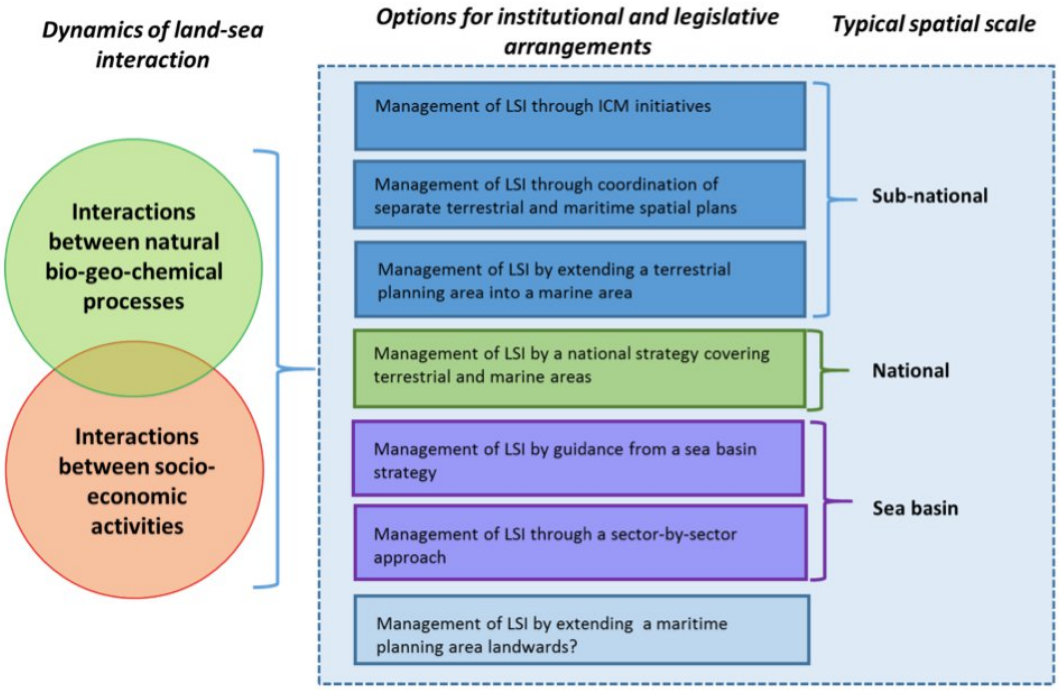

Figure 1. Dynamics of land-sea interactions. Source : European MSP Platform[1]

References

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Papageorgiou, M. & S. Kyvelou, 2021. Considering Land-Sea interaction (LSI) in MSP in Greece: updates and challenges. 17th International Conference on Environmental Science and Technology Athens, Greece, 1 to 4 September 2021

MSP and the Sustainable Development Goals

MSP is driven by the recognition that the ocean is a finite resource that requires careful management to sustain its health and productivity over the long term. It seeks to harmonize human activities with the preservation of marine biodiversity, making it an essential component of the sustainable blue economy. This approach ensures that economic growth does not come at the expense of marine health, but rather promotes a

[1] European MSP Platform, Maritime Spatial Planning: Addressing Land-Sea Interaction A briefing paper. https://maritime-spatial-planning.ec.europa.eu/sites/default/files/20170515_lsibriefingpaper_1.pdf

mutually beneficial relationship between human use and ocean conservation. Hence, it is important to discuss with the participants the benefits of MSP in ecological, economic and social terms, i.e., the relationship between MSP and Sustainable Development Goals (SDGs).

MSP is heralded as a rational, place-based solution to overcome the limitations of sectoral and fragmented marine management approaches. It is designed to facilitate sustainable use of marine resources, ensuring that the spatial and temporal distribution of human activities in marine areas aligns with defined ecological, economic, and social goals. **The process is inherently political**, requiring analysis, stakeholder engagement, and the allocation of marine space to balance various interests and objectives.

MSP is built upon a cohesive system, comprising plans, policies, and regulatory frameworks; it incorporates elements of environmental management systems such as defining objectives, conducting initial assessments, implementation, monitoring, auditing, and reviewing processes.

MSP utilizes a variety of tools traditionally applied to land use planning. The fundamental principle underpinning these components is their ability to transcend sectoral boundaries, providing a spatial framework for making informed decisions regarding resource utilization, development, conservation, and the oversight of activities within the marine context.

Further reading 1

Ehler, Charles, and Fanny Douvere (2009), Marine Spatial Planning: a step-by-step approach toward ecosystem-based management. Intergovernmental Oceanographic Commission and Man and the Biosphere Programme. iOC Manual and Guides no. 53, iCaM Dossier no. 6. Paris: UneSCO. 2009 (english).

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1.1.2. The evolution of MSP

MSP first made its mark in the mid-1980s, with Australia pioneering the initiative to regulate the use of its marine areas. This concept was not immediately adopted in Europe, but it laid the groundwork for future developments. The European Commission (EC), alongside UNESCO, became a driving force in advocating for MSP within the European context. The release of strategic documents such as the EU Green Book and the Blue Book on Integrated Maritime Policy (IMP) underscored the significance of MSP.

These publications brought to light the necessity of balancing various sector-based interests and ensuring sustainable utilization of marine resources. Later, EU documents such as the Territorial Agenda of the European Union (TA) and its accompanying report, The Territorial State and Perspectives of the European Union (TSP), recognized MSP as a crucial component for territorial cohesion and the sustainable development of maritime economic activities (Kyvelou, S., 2016 & Kyvelou, S., 2019).

The EU took a decisive step by adopting the Integrated Maritime Policy (IMP), which encouraged member states to implement MSP as a means of sustainably managing marine activities. In 2014, the EC passed the MSP Directive, making MSP compulsory in the 22 Member States with marine space of the European Union. Member States were required to incorporate the requirements of the MSP Directive into their national legislation and designate the relevant authorities by 2016. The establishment of maritime spatial plans in Member States' marine waters should have been completed by March 2021. The EC has also provided funding and support for cross-border planning projects and established the European Maritime Spatial Planning Platform to track the progress of MSP within EU Member States. Overall, MSP has become an integral part of marine management in Europe, with the aim of achieving sustainable development of marine resources and balancing the needs of different sectors (Ehler, C., 2021).

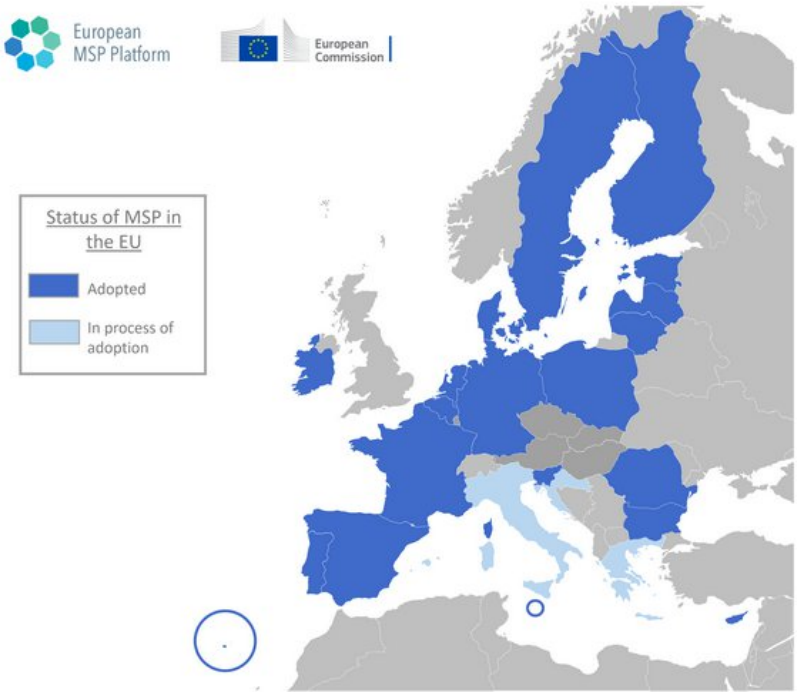

Figure 2: Adoption of MSP in the European Union. Source: https://maritime-spatial-planning.ec.europa.eu/msp-practice/countries

What are the boundaries of MSP?

Figure 3 below shows the maritime zones, as defined by UNCLOS. Notably, the sovereignty of a coastal State extends beyond its land territory and internal waters - in the case of an archipelagic State, its archipelagic waters - encompassing the territorial sea. Further at sea, the exclusive economic zone goes beyond 200 nautical miles and in the high seas, every State, whether coastal or land-locked, has the right to sail ships.

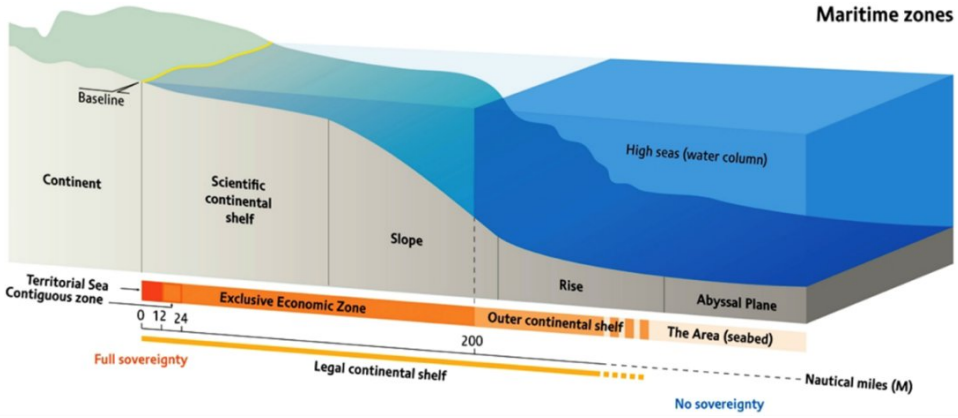

Figure 3: The maritime zones. Source: UNCLOS

Role-playing activity

The trainees would be assigned with different roles (e.g., policy-makers, fishermen, marine conservationists) and conduct a mock MSP boundary setting exercise, by using the image above, as a reference to negotiate and delineate marine spaces for various activities. It is a good idea to organise a visit to a coastal area to discuss about the issue of sectors and zoning.

Further reading 2

Bernhard Friess, Marie Grémaud-Colombier, (2021). Policy outlook: Recent evolutions of maritime spatial planning in the European Union, Marine Policy, Volume 132, 2021/103428,ISSN 0308-597X, https://doi.org/10.1016/j.marpol.2019.01.017

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1.1.3 Steps of the MSP process

MSP represents a holistic cycle, as mandated by the EU MSP Directive, encompassing: a. problem identification, b.information gathering, c. planning d. decision-making, e. implementation, f. monitoring, and g. iterative updates. **MSP is a collaborative and inclusive process that involves stakeholders from various sectors.** It begins with organizing the structure of MSP and engaging stakeholders to ensure diverse perspectives in decision-making. The development of a strategic vision and objectives guides ecological, economic, and social goals within marine territories. Analysing current conditions provides a baseline for understanding natural and human-made features, leading to forecasting future scenarios and identifying potential conflicts and resource demands. The next phase focuses on synthesizing solutions that address conflicts and support the overarching vision, fostering cooperation among marine space users.

Drafting an MSP plan involves integrating inputs from previous steps into a comprehensive document that serves as a blueprint for sustainable marine governance. Once refined and ratified, the plan moves into the implementation stage, where abstract planning transforms into concrete actions supported by regulatory frameworks. The success of MSP lies not only in execution but also in continuous evaluation against initial objectives. These evaluations are crucial for adapting the plan to the dynamic marine environment, considering new data, emerging challenges, and evolving stakeholder needs. Monitoring implementation ensures that MSP remains responsive to the complex interactions of marine life and human activities, making it a living document that evolves with changing circumstances.

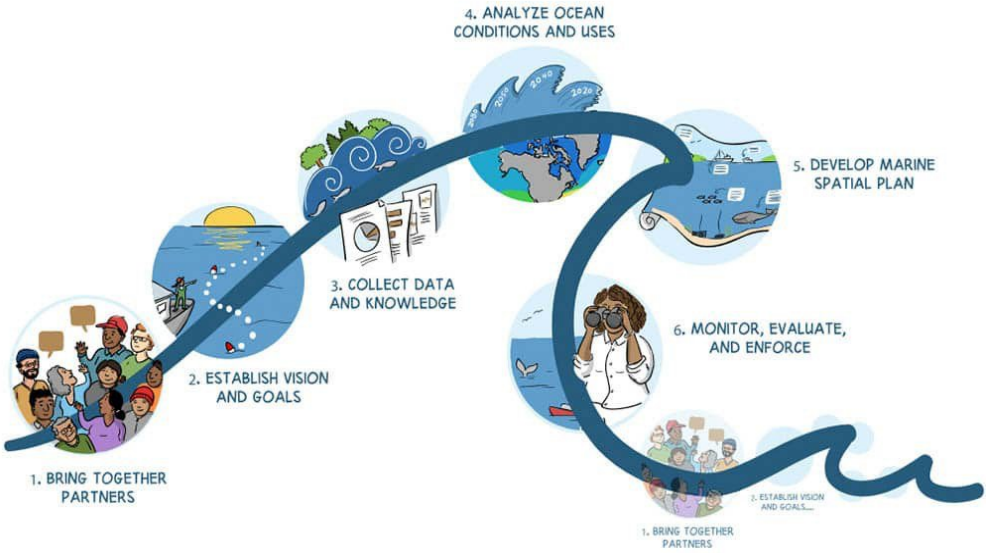

Figure 4: The MSP process. Source : https://thefuselight.com/wp-content/uploads/2020/09/Fuselight-Portfolio- Indigenous-Oceans-Image-4.jpg

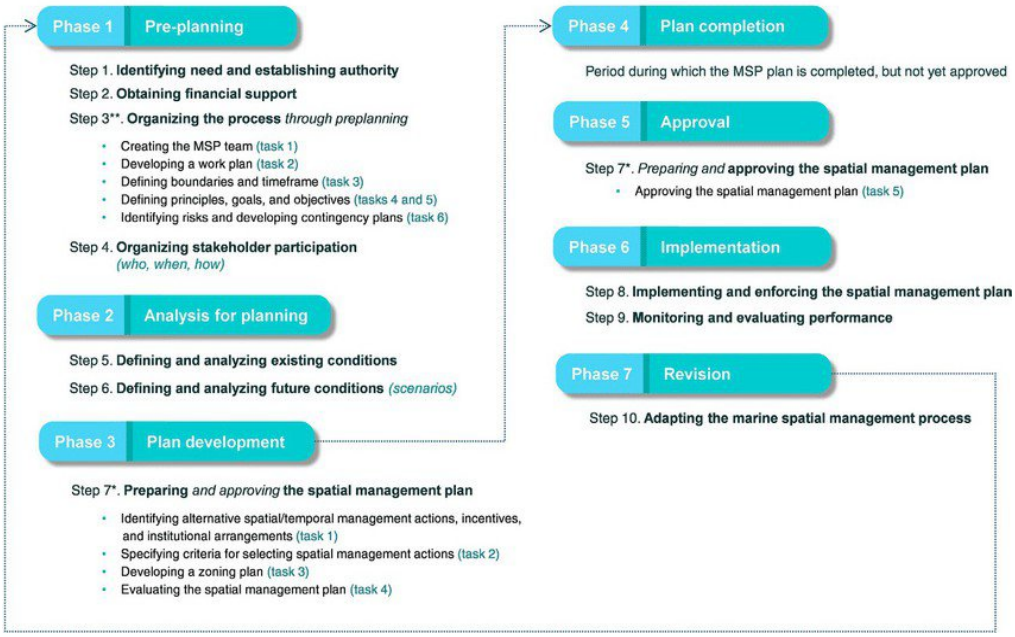

Figure 5: Main phases of MSP. Source: Catarina Frazão Santos, Charles N. Ehler, Tundi Agardy, Francisco Andrade, Michael K. Orbach ,Larry B.Crowder(2019),Marine Spatial Planning, World Seas: An Environmental Evaluation. https://doi.org/10.1016/B978-0-12-805052-1.00033-4

What should you be aware about, in MSP ?

- *Before embarking on any planning process, it is important to consider the following points:*

✓ Is MSP needed? If yes, at what spatial level (regional sea, macro-regional level, etc)? ✓ Understanding the complexity of the process ✓ Recognizing the importance of participation and the inclusion of diverse set of stakeholders during the entire MSP process ✓ Be ensured that you are aware of the process to draw up a vision

- *Useful tips:*

✓ Developing a vision is a stage where play is allowed ✓ Planning is not about what looks possible right now, but about a future vision ✓ Don't be limited in thinking by current problems and what appears possible, aim high instead!

- *Current State analysis and the relevance of data:*

✓ Stocktaking is important since it provides essential spatial data and a basis for regular spatial monitoring ✓ Maps showing current sea uses or patterns are not the same as a spatial plan. They represent the status quo, and not a future vision of the area.

References

C. Ehler, F. Douvere, Marine Spatial Planning (2009): a Step-by-step Approach toward Ecosystem- Based Management. Paris: Intergovernmental Oceanographic Commission, UNESCO, 2009, p. 99. IOC Manual & Guides No. 53, IOCAM Dossier No. 6.

IOC- Directorate General for Fisheries and Maritime Affairs (2021), UNESCO/EC, 2021 available at : MSPglobal: international guide on marine/maritime spatial planning

IOC-UNESCO. 2009. Marine Spatial Planning: A Step-by-Step Approach toward Ecosystem-Based Management. Paris, UNESCO. (IOC Manuals and Guides No. 53). https://unesdoc.unesco.org/ark:/48223/pf0000186559

1.1.4 The Multi-Scalar approach of MSP

A multi-level approach necessitates effective collaboration among all involved parties, both vertically (i.e., between entities focused on overarching strategies or frameworks and their sub-components) and horizontally (i.e., among entities engaged in planning for various sub-regions). Integrated governance plays a crucial role in resolving discrepancies across different scales. This approach is exemplified by various European countries, each adopting unique strategies to integrate and coordinate MSP processes

across scales. Examples include:

- Sweden's distinct plans for separate areas.
- Poland's comprehensive sea space plan alongside local plans for lagoons
- and ports, and
- Italy's development of national guidelines followed by plans for distinct marine areas. Achieving coherence and integration within this framework involves ensuring alignment of objectives, methods, and stakeholder engagement across all levels of planning.

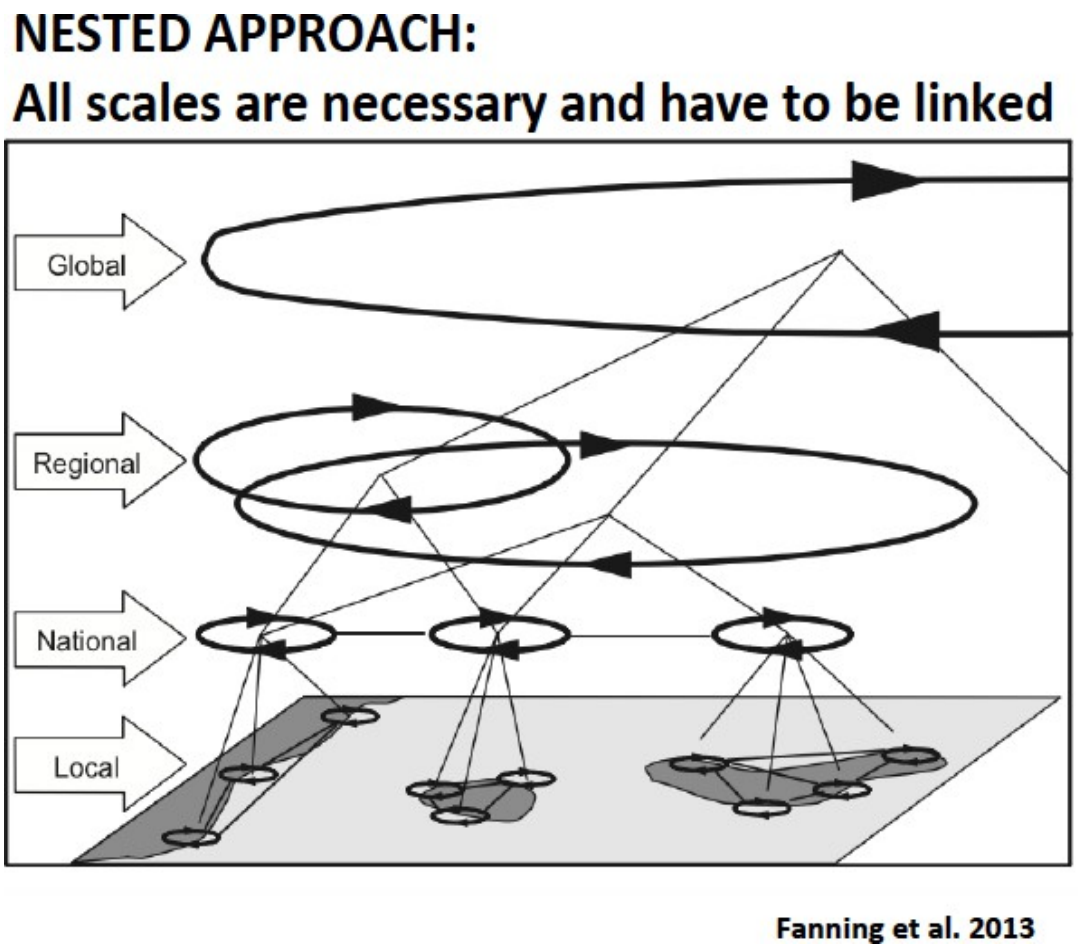

Figure 6: The nested approach of MSP by Fanning et al 2013

Developing a common vision and/or strategy, including identification of common values and strategic interests/objectives, for different planning areas can provide a base for coordination of plans under a multi-scalar approach. Another key issue is the engagement of the stakeholders from different scales, i.e. the multi-actor and multi-scale partnership process where different interests should compromise.

Further reading 3

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Zaucha J. 2014. The key to governing the fragile Baltic Sea, Riga: VASAB; available at https://vasab.org/wp-content/uploads/2018/06/BALTIC-SEA_web.pdf

Emiliano Ramieri, Martina Bocci, Daniele Brigolin, Pierpaolo Campostrini, Fabio Carella, Amedeo Fadini, Giulio Farella, Elena Gissi, Fabrizio Madeddu, Stefano Menegon, Micol Roversi Monaco, Francesco Musco, Folco Soffietti, Laura Barberi, Andrea Barbanti, (2024), *Designing and implementing a multi-scalar approach to Maritime Spatial Planning: The case study of Italy* in Marine Policy, Volume 159, 2024, 105911, ISSN 0308-597X.

Learning objectives and learning outcomes

Learning objectives	*Learning Outcomes*
Understand the basic principles of MSP, its purpose, and why it is a critical tool for sustainable marine management.	Describe the key benefits of MSP in promoting sustainable use of marine resources.
Learn about the role of MSP in balancing economic development with marine conservation to support sustainable growth in maritime sectors.	Being able to identify major milestones and the role of international bodies in its promotion of MSP, especially in EU territories.
Trace the historical development of MSP from its origins to its current application and understand the legislative and policy framework established by the EU to encourage MS to implement MSP	Explain the steps involved in the MSP process, from initial planning to implementation and monitoring.
Review the structured steps required to effectively plan and implement MSP.	Analyze the challenges and solutions in applying MSP across different scales and jurisdictions.
Understand the multi-scalar approach of MSP emphasizing the need for integrated governance and stakeholder engagement.	

Regions to boost National Maritime Spatial Planning
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Topics	Short Description	Learning Method	Duration	Link/File/Resources
What is MSP? How is it related to Sustainable Blue Economy?	- Ask the participants to define MSP; -Give them the official definitions of EU and UNESCO.	Presentation Brainstorming Creating word cloud with benefits of MSP	15 min	MSP in video: https://www.youtube.com/watch?v=cFn0buPVU6A Video about MSP in nutshell: https://vimeo.com/219515087 You can use this app for developing the word cloud: https://www.mentimeter.com/app/presentation/alvi3ujj6wduxq6c24yzb4sc5g1ss4z1/yxbmxkim7dwx/edit/Video about blue economy: https://bluecapacityhub.info/resources-post/sbe-identifying-pathways-for-progress/
The evolution of MSP	- Discuss the timeline of EU Maritime policy - Set the issue of sectors and the boundaries of MSP according to EU regulation - How many countries have adopted MSP in Europe ?	Q/A Role playing activity Field Visit	2 days	MSP in Europe video: https://www.youtube.com/watch?v=aAQeTCIXL14 Overview of MSP Directive, 2022 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022DC0185
Steps of MSP	-Present and discuss the different steps in MSP -Discuss if how this process is different for any other spatial plan -Discuss the importance of stakeholders in MSP -The data issue	Q/A Invited speakers	50'	https://maritime-spatial-planning.ec.europa.eu/media/12726
Multi-Scalar Approach	-Why a multi-scalar approach in MSP? -How can you achieve			https://www.youtube.com/watch?v=JDz4SfoT3AQ&feature=youtu.be

in MSP	integrated planning process and coherence of plans? -Which are the related challenges of this approach?			

C. Session 1.2. Key Challenges of Maritime Spatial Planning

Source: UNESCO-IOC/European Commission. 2021. MSPglobal International Guide on Marine/Maritime Spatial Planning. Paris, UNESCO. (IOC Manuals and Guides no 89).

Overview of the session

This session would be designed to equip participants with a comprehensive understanding of the challenges in MSP, the importance of balancing multiple objectives, and the critical role of an ecosystem-based approach in ensuring sustainable management of marine resources. It would also highlight the significance of stakeholder engagement and the utilization of technological tools in overcoming these challenges. Finally, this session will deal upon the need to include cultural assets in the MSP process.

1.2.1. Introduction to the MSP Challenges

Some of the **key challenges** that MSP faces include transboundary/cross-border Cooperation: MSP must navigate complex jurisdictional waters, requiring **cooperation across national and sub-national borders**. This involves harmonizing objectives and methods for a coherent approach to managing maritime activities and environmental status.

Policy/Sectoral Integration: MSP strategies must pre-emptively address potential conflicts between sectoral uses while also seeking synergistic interactions where mutual benefits are emphasized, rather than pursuing isolated sectoral interests.

Table 1: Cross-sectoral spatial conflicts considered

	Maritime tourism	Offshore wind	Cables and pipelines	Defence*	Maritime transport	Commercial fisheries	Aquaculture	Area-based marine conservation
Maritime tourism		x					x	
Offshore wind	x				x			x
Cables and pipelines					x	x		
Defence*								
Maritime transport		x	x					x
Commercial fisheries			x					x
Aquaculture	x							
Area-based marine conservation					x	x		

* Defence was considered at a general level and not specifically in relation to any other sector

Figure 7: Cross-sectoral conflicts considered. Source: https://maritime-spatial-planning.ec.europa.eu/sites/default/files/20190604_conflicts_study_published_0.pdf

Stakeholder Engagement: Developing legitimate and high-quality policy outcomes relies on effective stakeholder engagement processes. These must balance conflicting interests and input in a timely, deliberative manner.

Knowledge Integration: MSP decision-making hinges on integrating diverse forms of knowledge and ensuring multi-disciplinary, science-based approaches for sustainable marine governance. Added to the above category of challenges, Lucas (2017) suggests that are twelve challenges that any MSP process should come across.

Source : Lucas, El (2017), MSc Challenges and opportunities of Marine Spatial Planning

Enabling Conditions	Meaningful Participation	Jurisdictional Complexity
Bias Towards Science	Communication	Legal and Political Support
Data Limitations	Achieving Agreement	Managing Complexity
Mapping Boundaries	Balanced Outcomes	Setting the Stage for Implementation

To sum up, **MSP challenges** include balancing competing interests and uses of marine space, ensuring sustainable development while protecting the marine environment, coordinating across different sectors and stakeholders, dealing with data gaps and uncertainties, and addressing the impacts of climate change on marine ecosystems. These challenges require careful consideration and collaboration to effectively manage and plan for the sustainable use of marine resources.

Further reading 4

EC (2018), Addressing conflicting spatial demands in MSP, Considerations for MSP planners, Final Technical Study. Available at: https://maritime-spatial-planning.ec.europa.eu/sites/default/files/20190604_conflicts_study_published_0.pdf

Lucas, El (2017), MSc Challenges and opportunities of Marine Spatial Planning presented as a Master Thesis Degree in Master of Resource Management: Coastal and Marine Management, Ísafjörтur, February 2017

European MSP Platform, 2021a. Multi-Use in European Seas. Available at: https://www.msp-platform.eu/projects/multi-use-european-seas

1.2.2 The challenge of balancing ecological, economic, and socio-cultural objectives in MSP

The essence of MSP lies in its integrative framework, which seeks to harmonize ecological conservation efforts with economic development and social-cultural ones. This endeavour, however, is inherently **complex and challenging** due to the multifaceted nature of marine ecosystems and the broad spectrum of stakeholder interests involved. MSP aims to manage the spatial and temporal distribution of human activities in marine areas to ensure that environmental health, economic prosperity, and social and cultural well-being are pursued simultaneously and sustainably. Yet, achieving a harmonious balance among these objectives requires navigating a labyrinth of trade-offs, reflecting the inevitable tension between competing uses and values of the marine environment.

The Complexity of Marine Ecosystems

Marine ecosystems are dynamic, complex, and interconnected. They provide a multitude of services, including but not limited to, biodiversity, carbon sequestration, and supporting fisheries that are vital for economic and food security. The challenge within MSP lies in ensuring that these ecosystems continue to function and provide services while accommodating sustainable economic development. Activities such as renewable energy projects, shipping, and tourism need careful planning to mitigate impacts on sensitive habitats and species. Balancing ecological integrity with economic ambitions calls for a deep understanding of ecosystem dynamics and the adoption of **an ecosystem-based management approach** as the backbone of MSP. The **ecosystem-based approach** (and similar terms ecosystem-based management, or ecosystem approach) is highlighted as an important underlying principle within MSP. It has its origins in the UN Convention on Biological Diversity (CBD). According to the EU MSP Directive (hereinafter MSPD), MSP shall follow the ecosystem-based approach, which means – among other requirements – that MSP shall be based on the best available scientific knowledge about the ecosystem and its dynamics (cf. HELCOM & OSPAR, 2003). In practice this transposition has several challenges. Application of the ecosystem-based approach presupposes a holistic perspective, continual development of knowledge of the seas and their usage, application of the precautionary principle, and flexible management. In all MSP contexts one of the main challenges, related to this topic, is the evaluation of **cumulative effects** that may result from the combination of different projects and activities and the potential lack of a continuous series of data and related assessment tool. This aspect is linked to the need for evaluation and monitoring of conflicts among uses, in order to detect how these conflicts, evolve in the course of implementation of a MSP plan. A key component of this challenge is to recognise the trade-offs between land and sea interaction.

The recent addition of the EMODnet Human Activities data portal (www.emodnet-humanactivities.eu) is particularly relevant as it provides access to an expanding range of harmonised datasets covering human activities across all European Sea Basins. In the future, the EMODnet Human Activities data portal could also host national MSP data layers for visualization and download.

Social and Cultural objectives in MSP

Social and cultural objectives within MSP play a crucial role in ensuring that the management of marine spaces not only supports ecological and economic sustainability but also nurtures the **social fabric and cultural heritage of coastal and maritime communities**. These objectives aim to preserve and promote the cultural identities,

traditions, and values of communities that have historical ties to marine environments, while also ensuring equitable access to marine resources and benefits. Integrating social and cultural considerations into MSP involves recognizing the multifaceted relationships that people have with the sea, which are often deeply rooted in history, culture, and social practices. To date, **cultural assets are rarely included in MSP.** This is due to several challenges a planner faces when considering coastal and marine historic environments, i.e:

- **Data accessibility**- Databases and mapping tools are not standardized among the MCH/UCH and the MSP community and have often (if at all) very limited public access.
- **Definitions**- Normally, MCH/UCH is presented as dots on a map. The translation of a point-based into a polygon-based categorisation of archaeological sites requires a standardised definition based on a commonly agreed on and justified framework for MCH priority zoning.
- **Transnational cooperation**- Several MCH zones will intersect with different jurisdictions (e.g. historical anchorage sites in river mouths forming a national border), thus MCH zoning can be only carried out as transnational collaboration.
- **Legislation-** The statutory base for MCH protection requires a platform on which it could be implemented. Implementation so far has been inconsistent and some ratification processes of MCH legislation are still ongoing (e.g the UNESCO 2001 Convention). Consequences and responsibilities for implementation could be reviewed and put into practice within a transnational MSP process.
- **Cost-benefit misconception**-The prevailing misconception of MCH as a hindrance to economic development needs to be reviewed. Instead, its potential for Blue Economy initiatives, particularly within the tourism sector, could be further developed.

Concept	Definition and potential applications in MSP
Cultural ecosystem services (CES)	Defined as "*the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences*" (MA, 2003). This definition is widely contested. It has been explicitly used as a framing for MSP in a few examples.
Ocean literacy	Understanding of the impact of the sea on human life, and of people on the sea—a relatively recent term that has the potential to engender greater levels of public awareness, knowledge and capacity to support MSP implementation.
Marine citizenship	Understanding of the individual rights and responsibilities towards the marine environment, having an awareness and concern for themarine environment and the impacts of individual and collective behaviour, and supporting public capacity to have a role in ensuring ongoing sustainable management of the marine environment.
Attitudes and perceptions	Public perceptions of marine issues that explore broadscale and regionally distinct social perspectives of marine environments.
Well-being	Measures of the quality of life. Reflected in marine plan policies which are related to blue space and its increasingly recognised impact on human health and well-being, and potential criteria for evaluating the outcomes of marine planning.
Culturalheritage	Sets of buildings, monuments or sites, and also intangible heritage such as cultural knowledge or practice, which relate to the marine environment and resources. Built heritage is often highlighted in conservation and tourism aspects of marine plans.
Seascape	"An area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/or human factors." Occasionally developed as supporting evidence for marine planning through Seascape characterisation, Seascape assessments or Visual impact assessments.
Human activities	Overviews of sectoral activities in space and time. Cultural importance of these human activities to society. Often quantified and mapped in marine planning, challenging to assess cultural significance.
Social values (monetary and non-monetary)	Recognition and consideration of a diverse range of social values, including drawing on environmental economic valuation techniques but also broader social values.
Socio-demographics	Includes the traditional metrics considered within socio-demographics (e.g. gender, age, employment, income, education level) but also encompasses other more recent concepts including coastal typologies and population projections. Phenomena including mobility, migration, social justice and equity.

Source: Emma McKinley, Tim Acott, and Tim Stojanovic, Socio-cultural Dimensions of Marine Spatial Planning, in Zaucha, J., & Gee, K. (2019). Maritime Spatial Planning: Past, Present, Future. Palgrave Macmillan.

Further reading 5

Ansong, J., Gissi, E., Calado, H. 2017. An approach to ecosystem-based management in maritime spatial planning process. Ocean & Coastal Management, Vol. 141, pp. 65-81. https://doi.org/10.1016/j.ocecoaman.2017.03.005

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Learning Objectives and learning outcomes

Learning Objectives	*Learning outcomes*
Understand the fundamental challenges facing MSP, including transboundary cooperation, policy/sectoral integration, stakeholder engagement, and knowledge integration.	Identify and describe the key challenges in implementing MSP, including the need for cross- border cooperation and the integration of various policy sectors.
Explore the complexities of balancing ecological, economic, and social-cultural objectives within MSP frameworks.	Name challenges in balancing ecological conservation, economic development, and social-cultural values in marine spatial planning
Examine the principles of the ecosystem-based approach in MSP.	Describe the ecosystem-based approach to MSP
Appreciate the importance of integrating social and cultural objectives in MSP to support the sustainability of marine environments and the well-being of coastal communities.	Link the MSP with cultural values.

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Guide for trainers

Topic	Short Description	Learning Method	Duration	Link/File/Resrouces
Challenges of MSP	Discuss about the main challenges related to incorporating stakeholders, knowledge, different sectors and different governments into the MSP process.	Presentation, Video Discussion	15 min	https://www.baltspace.eu/ https://www.mspchallenge.info/use_cas es.html
The challenge of balancing ecological, economic, and social objectives in MSP	What is needed to better integrate ecological, social and economic aspects into MSP? What is the concept of ecosystem-based management approach? How to include cultural and social objectives in MSP? Can you define social values and how this is related to MSP?	Presentation and Role play activity "Stakeholders' Debate about the X challenge"	45 min	http://www.panbalticscope.eu/wp-content/uploads/2020/02/Economic_an d_Social_analysis_report.pdf https://www.mdpi.com/2071-1050/12/5/1860

Role Playing Activity

Identify and discuss the different sectoral interests of stakeholders on the hypothetical challenge of deciding where to locate offshore wind farms in a specific region.

How to do it?

1st step

Conduct a structured group discussion about different sectoral interests of such hypothesis and find the relevant stakeholders.

2nd step

Divide participants into small groups, each representing different interests (environmental protection, fishing industry, local government, and renewable energy developers) based on the list of stakeholders identified on step 1.

3rd step

Each group should find concerns and objectives regarding the placement of wind farms. Allow time for each group to discuss how this preferred location for the wind farms considers ecological, economic, and social factors. Can they propose how to come on shared vision about the location?

What are the key obstacles to do so?

4th step: Plenary Session

On a plenary session discuss how stakeholders should compromise and how participants consider multiple perspectives in MSP decision-making.

D. Session 1.3. Soft and Hard Multi-use in MSP

Overview of the Session

This session delves into the concept of Multi-use of the sea (MUS), exploring how different uses of maritime space can be integrated and managed. Considering that oceans and seas cover more than 70% of the world's surface and the Sustainable Development Goal (SDG) 14 is promoting the conservation and sustainable use of the oceans, seas and marine resources for sustainable development, **blue economy turns to an important development catalyst of our fast-moving world.** Among the traditional activities that are developing at the oceans such as transportation mainly of goods, fisheries and tourism, several new ones, such as renewable energy infrastructure, mining activities and aquaculture (ICSU, 2017), are demanding their share. Furthermore, the preservation of the natural environment is also crucial for the equilibrium of ecosystems and humans' well-being.

Therefore, large parts of the maritime space are being claimed by both traditional and new emerging maritime activities in the logic of exclusive zoning. Most of the times, exclusive zones are being designed through annoying and costly trade-offs. However, while competing claims for the allocation of marine space may cause significant conflicts, they may also lead to scale economies and brilliant solutions of non-conflicting co-location and

"assemblages of uses" (Kyvelou & Ierapetritis, 2019). Within this framework, the concept of Multi-use derives as the ultimate solution, also **in MSP. Multi-use is perceived an intentional joint use of resources in close geographic proximity.** It represents a radical change from the concept of exclusive resource rights to the inclusive sharing of resources by one or more uses. A secondary user refers to a user that intends to establish itself in a maritime zone in which a primary user already has a permit or is developed already.

Although the MSP Directive (EC, 2014) encourages Multi-use in the marine space, within national legislation and policy, it appears that despite progress at national level, the institutional framework usually lags behind, resulting to the non-consideration of similar solutions in MSP. There are, however, and gradually developing **relevant good practices throughout Europe and the world**. Pioneering solutions are met in the North Sea, but in the context of European projects, case-studies on all sea-basins within and outside the EU are also being developed. Recognizing the relevant benefits, several researchers and other stakeholders are constantly studying the development of Multiple uses in the marine space (MUS).

In addition to the economic and social benefits of Multi-use (capital intensity, labour intensity, complementarity, spatial justice, etc.) other issues arise such as environmental impacts, legal, safety and health issues, but also hidden costs and the overall governance of such projects. This training session is expected to highlight transferable good practices or tailored-made solutions. Certainly, when all stakeholders are involved in the planning process and the local community acquires knowledge of both principles, objectives, and best practices as well as the related benefits from the harmonious coexistence of uses, it is more likely that solutions beneficial to all will be prioritized. In this context, the objective of the training session is:

a. To present **good practices of harmonious coexistence of uses** (fishing, tourism, NATURA sites, marine protected areas (MPAs), offshore wind farms (OWFs), aquaculture units, underwater cultural heritage sites, diving parks, etc.).

b. To highlight the importance of **participatory planning** at regional/local level and the cooperation across different governance levels.

c. To discuss the topic of **Communities of Practice (CoPs)** promoted by the REGINA-MSP project (e.g. in Greece the potential establishment of a Regional Community of Practice and Innovation on OWFs driven Multi-use of the sea, as an initiative of Panteion University in the Region of Crete (WP3) will be analysed).

1.3.1. Definitions and examples of soft and hard multi-use in MSP

Multi-use of the sea (MUS) refers to the concept of combining different activities and uses in the marine space in a shared and coordinated manner. It involves the simultaneous or sequential use of resources by one or multiple users in close geographic proximity. Multi-use aims to optimize the utilization of marine space, promote synergies between different activities, and achieve spatial efficiency while considering environmental sustainability. It can involve both "hard" multi-use, which includes the sharing of common infrastructure or peripheral services, and "soft" multi-use, which refers to the co-location or coexistence of uses without major modifications to existing infrastructure. The goal of multi-use is to reduce conflicts between different uses, enhance the sustainable blue growth, and encourage the equitable and transparent development of maritime activities.

Hard multi-use refers to the sharing of a common infrastructure or peripheral

services and infrastructures in the same area, or users sharing the same space at the same time. It involves the incorporation of permanent infrastructural elements, such as multi-use platforms for wind farm connections or offshore wind farms.

Soft multi-use refers to the co- location or coexistence of different uses when an existing infrastructure is used without major modifications. It includes fleeting uses like small-scale fisheries, recreation, and tourism, and often involves the role of digitalization. Examples of soft multi-use in the Mediterranean include the combination of fisheries and tourism in Marine Protected Areas (MPAs) or the coexistence of aquaculture and diving tourism.

Further reading 6

Multi-use and coexistence Compendium, European MSP Platform, 2024 https://maritime-spatial-planning.ec.europa.eu/co-existance-activities-and-multi-use/multi-use-compendium

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MUSES Action Plan:
https://2020.submariner-network.eu/images/projects/MUSES/MUSES_Multi-Use_Action_Plan.pdf

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Kyvelou, S.S.; Ierapetritis, D. Discussing and Analyzing "Maritime Cohesion" in MSP, to Achieve Sustainability in the Marine Realm. Sustainability 2019, 11, 3444. https://doi.org/10.3390/su11123444

Nathalie A. Steins, Jeroen A. Veraart, Judith E.M. Klostermann, Marnix Poelman, Combining offshore wind farms, nature conservation and seafood: Lessons from a Dutch community of practice, Marine Policy,Volume 126,2021, 104371, https://doi.org/10.1016/j.marpol.2020.104371.

1.3.2. Harmonious co-existence of uses in sea.

Promoting coexistence and identifying synergies within MSP are critical for optimizing the use of sea spaces and resources. This approach not only aims at spatial

efficiency but also at fostering sustainable blue growth. Understanding various types of coexistence and synergies, along with the conditions necessary for their realization, is pivotal for the effectiveness of marine spatial planning. A comprehensive exploration of multi-use concepts, including terminologies such as multi-functional, co-existence, co-use, and multi-purpose, can be found in the research aimed at creating a common language and typology for current Multi-uses (i.e.MUSES project) that offers insights into the variety of multi-use combinations across European seas and provides a foundation for understanding the complexities and opportunities within MUS (MUSES, Analytical Framework, 2018). You may also discuss with the participants the following table.

Type	Dimensions				Description	Examples
	Spatial	Temporal	Provisioning	Functional		
Type 1: Multi-purpose/multi-functional	✓	✓	✓	✓	Takes place in the same area, at the same time, with shared services and core infrastructure	Marine renewable energy sources and desalination (Maniopoulou et al., 2017), Scottish Floating Power Plant Design (FPP) (Kafas, 2017)
Type 2: Symbiotic use	✓	✓	✓		Takes place in the same area, at the same time, and peripheral infrastructure or services on sea or land are shared	Proposed aquaculture in OWF in Germany (Buck et al., 2017), combination of Wave Energy generation and aquaculture (Onyango and Papaioannou, 2017)
Type 3: Co-existence/co-location	✓	✓			Takes place in the same place and at the same time	Fisheries in OWF proposed in the United Kingdom (Kafas, 2017) and Germany (Schupp and Buck, 2017)
Type 4: Subsequent use/repurposing	✓				Takes place in the same ocean space but subsequently	Repurposing of offshore structures for new uses like recreational fishing, tourism, aquaculture, or environmental conservation (e.g., Italy) (Ponti et al., 2002; Depellegrin et al., 2019)

Types are ordered by decreasing degree of connectivity between uses and users. Connectivity in any given dimension is symbolized by "✓" in the respective field for each type.

Source: https://www.frontiersin.org/files/Articles/441951/fmars-06-00165-HTML/image_m/fmars-06-00165-t001.jpg

"**Co-existence**" of activities designate uses which take place at the same time in the same space with limited interaction, **multi-use** encompasses a higher level of integration between activities. It is one of the tools available to improve the efficiency of the co-existence of different activities at sea and represents an advanced and efficient way to organise this co- existence by allowing infrastructure or areas to be shared efficiently by two or more different activities.

The EU and the European MSP Platform provides a tool for being used from decision- makers and practitioners for informed them about current initiatives, challenges and levers for developing multi-use between maritime activities at sea. A matrix providing information on the combination of maritime and coastal activities and their associated challenges and enablers is there where you can compile information and download a report via the "Download/Print report" button (https://maritime-spatial-planning.ec.europa.eu/msp-resources/co-existence-and-multi-use-activities).

Multi-use combinations at sea studied by European Projects	Energy production	Offshore wind energy	Solar energy	Tidal energy	Hydrogen generation	Aquaculture	Oyster farming	Mussel farming	Fish farming	Seaweed culture	Marine biomass production	Fisheries	Environment	Protection	Restoration	Monitoring	Underwater cultural heritage	Tourism	Scuba diving	Desalination	Refueling station	Floating shipping terminal
Energy production																						
Offshore wind energy			■	■			■	■		■	■	■			■			■		■	■	
Solar energy		■		■						■										■	■	
Tidal energy		■	■		■				■	■				■		■				■	■	■
Hydrogen generation				■																		
Aquaculture																						
Oyster farming		■								■					■							
Mussel farming		■								■												
Fish farming				■															■			■
Seaweed culture		■	■	■			■	■														
Marine biomass production		■																				
Fisheries		■																■				
Environment																						
Protection				■																		
Restoration		■					■															
Monitoring				■																		
Underwater cultural heritage																		■				
Tourism		■										■					■					
Scuba diving									■													
Desalination		■	■	■																	■	
Refueling station		■	■	■																■		
Floating shipping terminal				■					■													

Figure 8: Multi-Sea combinations at sea studied by EU projects

Source: EC (2021), BeBest Practice Guidance in Multi-Use Issues and Licensing Procedures Short Background Study available at https://maritime-spatial-planning.ec.europa.eu/media/document/12817

Further Reading 7

Zaucha J., Bocci M., Depellegrin D., Lukic I., Buck B., Schupp M., Caña Varona M., Buchanan B., Kovacheva A., Karachle P.K., et al. (2016) Analytical Framework (AF) – Analysing Multi-Use (MU) in the European Sea Basins. Edinburgh: MUSES project

European Commission (2020), DG Maritime Affaires and Fisheries, Recommendations for positive interactions between offshore wind farms and fisheries, Short Background Study, May 2020.

1.3.3. Maritime/Underwater Cultural Heritage in MSP

- The sea as a place of multiple meanings…
- The sea as a personal and social construct…
- … a setting for generating economic and intangible value…

Figure 9: Maritime cultural heritage. Source: ICES WKCES Report 2013

Maritime or Underwater Cultural Heritage (MCH or UCH) represents a significant yet often overlooked component in the planning and management of marine spaces. This heritage includes not just physical artefacts and structures submerged or situated near water, such as shipwrecks, harbours, and coastal settlements, but also encompasses the immaterial aspects such as traditions, practices, and narratives that connect people to the sea. The integration of MCH within MSP requires a holistic approach that respects and incorporates these diverse elements, acknowledging their importance for both local communities and broader cultural and historical understanding. The challenge of integrating MCH into MSP lies in the inherent difficulty of quantifying and spatially defining cultural values. Identifying "culturally significant areas" where the connections between people and the sea are particularly strong, involves **participative processes** that engage local communities, allowing for a more nuanced understanding of maritime cultural values and ensuring that these values are reflected in spatial planning decisions.

Incorporating MCH into MSP also means recognizing the economic, social, and environmental benefits that maritime cultural assets provide. This includes supporting sustainable tourism activities like scuba and wreck-diving, fostering educational and scientific research related to maritime history and archaeology, and promoting leisure and cultural activities that contribute to the well-being of coastal communities. By viewing cultural heritage as a product of human interaction with the natural environment, planners and policymakers can begin to appreciate the multifaceted contributions of MCH to societal

well-being and coastal economies.

Moreover, integrating MCH into MSP demands a consciousness of and sensitivity towards equity, precaution, and cultural diversity. Acknowledging the concept of "maritime cultural capital" underscores the value of these cultural assets and their role in fostering sustainable interactions between humans and marine environments. It also necessitates a consideration of the sociocultural and economic values relevant to regional and local populations, ensuring that management decisions support the long-term sustainability of cultural heritage resources.

In conclusion, **integrating MCH into MSP is a complex but crucial endeavour that requires a nuanced, participatory, and holistic approach**. By recognizing and valuing the tangible and intangible aspects of our maritime cultural heritage, we can ensure that marine spatial plans are not only sustainable and economically viable but also culturally rich and meaningful, **reflecting the deep connections between people, the sea, and their surroundings.**

Further Reading 8

Kyvelou, S.S.; Henocque, Y. How to Incorporate Underwater Cultural Heritage into Maritime Spatial Planning: Guidelines and Good Practices; European Commission, European Climate, Infrastructure and Environment Executive Agency Unit D.3—Sustainable Blue Economy: Brussels, Belgium, 2022; ISBN 978-92- 95225-51-0

Pennino, M.G.; Brodie, S.; Frainer, A.; Lopes, P.F.M.; Lopez, J.; Ortega-Cisneros, K.; Selim, S.; Vaidianu, N. The Missing Layers: Integrating Sociocultural Values into Marine Spatial Planning. Front. Mar. Sci. 2021, 8, 633198.

Barianaki, Eirini, Stella Sofia Kyvelou, and Dimitrios G. Ierapetritis. 2024. "How to Incorporate Cultural Values and Heritage in Maritime Spatial Planning: A Systematic Review" *Heritage* 7, no. 1: 380-411. https://doi.org/10.3390/heritage7010019

Gee, K.; Kannen, A.; Adlam, R.; Brooks, C.; Chapman, M.; Cormier, R.; Fischer, C.; Fletcher, S.; Gubbins, M.; Shucksmith, R.; et al. Identifying culturally significant areas for marine spatial planning. Ocean Coast. Manag. 2017, 136, 139–147

Banela, M.; Kyvelou, S.S.; Kitsiou, D. Mapping and Assessing Cultural Ecosystem Services to Inform Maritime Spatial Planning: A Systematic Review. *Heritage* 2024, 7, 697-736.https://doi.org/10.3390/heritage7020035

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Guide for Trainers

Topic	Short Description	Learning Method	Duration	Link/File/Resources
Definitions	Introduction to key concepts in MCH and MUS, focusing on the importance of SDGs, particularly SDG 14. Definitions of traditional and emerging maritime activities and the shift towards inclusive resource sharing will be discussed.	Lecture with PPT	30 min	https://maritime-spatial-planning.ec.europa.eu/projects/multi-use-european-seas https://muses-project.com/?page_id=468
Harmonious co-existence of uses in sea	What are the different multi-uses? What activities can be combined? How can assess this? What is the DABI process?	Q/A Participatory Activity of the co-existence of uses		https://maritime-spatial-planning.ec.europa.eu/projects/multi-use-european-seas https://maritime-spatial-planning.ec.europa.eu/msp-resources/co-existence-and-multi-use-activities https://maritime-spatial-planning.ec.europa.eu/msp-resources/co-existence-and-multi-use-activities#matrix
Maritime/Underwater Cultural Heritage and Multi-Use in MSP	Discussion on the significance of protecting maritime/underwater cultural heritage within the framework of MUS. How cultural heritage sites can coexist with other maritime uses in order to contribute to blue economy?	Seminar with guest speaker	1 hour	https://www.sciencedirect.com/science/article/pii/S0308597X1400133X

Quiz: Check your knowledge

1. What is the primary purpose of MSP?

A) To maximize the economic exploitation of marine resources without regard for environmental impacts.

B) To harmonize human activities with the preservation of marine biodiversity and support sustainable economic growth.

C) To restrict all human activities in marine areas to protect marine biodiversity.

D) To exclusively promote recreational activities in marine spaces.

2. How does Knowledge Integration contribute to MSP decision-making?

A) By using only traditional knowledge and disregarding scientific research.

B) By integrating diverse forms of knowledge and ensuring multi-disciplinary, science-based approaches for sustainable marine governance.

C) By focusing exclusively on economic data and ignoring environmental science.

D) By considering only the most recent studies and ignoring historical data and trends.

3. Choose examples of soft Multi-use in MSP

A) Construction of multi-use platforms for windfarm connections.

B) Exclusive zoning for industrial maritime activities.

C) The combination of fishing tourism in Marine Protected Areas (MPAs).

D) The coexistence of UCH and diving tourism within an MPA.

E) The use of marine spaces for single-use industrial purposes.

4. What is the primary goal of Multi-use in MSP?

A) To restrict the usage of marine spaces to a single activity.

B) To optimize the utilization of marine space, promote synergies between different activities, and achieve spatial efficiency.

C) To prioritize industrial activities over environmental sustainability.

D) To eliminate traditional uses of marine space, such as fishing and tourism.

5. Why are social and cultural objectives important in MSP?

A) They ensure the management of marine spaces supports only ecological and economic sustainability.

B) They play a crucial role in nurturing the social fabric and cultural heritage of coastal and maritime communities, in addition to supporting ecological and economic sustainability.

C) They prioritize economic development over the preservation of cultural identities and traditions.

D) They are focused solely on maximizing public access to marine resources without considering cultural heritage.

6. Which type of multi-use is characterized by activities taking place in the same area, at the same time, and with shared peripheral infrastructure or services on sea or on land?

A) Multi-purpose/multi-functional use

B) Symbiotic use

C) Co-existence/co-location

D) Subsequent use/repurposing

7. By what primary feature is Co-existence/co-location distinguished?

A) Shared core infrastructure and services.

B) Activities taking place in the same space but at different times.

C) Activities taking place in the same space and at the same time without shared infrastructure.

D) The repurposing of an area for new uses after the original activity has cease

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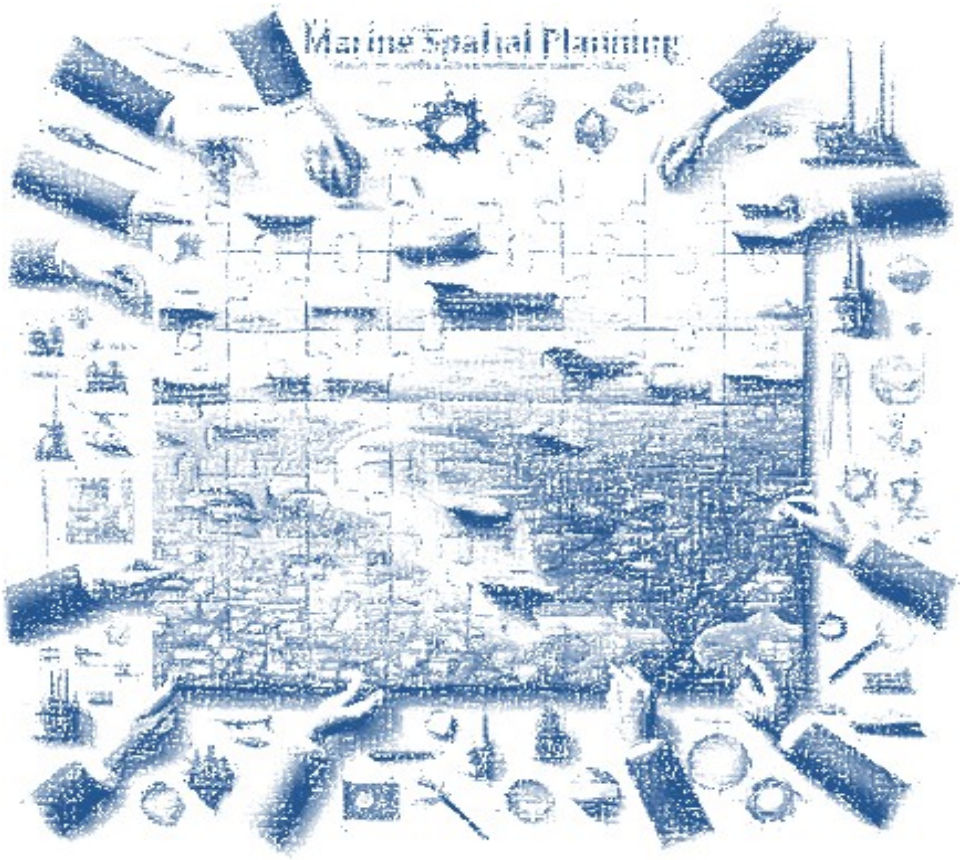

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II. Module 2: Understanding MSP across different scales and actors

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A. Introduction to Module 2: Understanding MSP across scales and actors

The participatory process in MSP is indeed crucial for ensuring inclusive, equitable, and effective management of marine resources. By engaging stakeholders, MSP can benefit from diverse perspectives, leading to more legitimate and accepted planning outcomes. This approach also promotes conflict resolution, integrates local knowledge, and enhances transparency and trust among all involved parties, ultimately contributing to the long-term success and sustainability of MSP policies.

Indeed, the participatory approach in MSP does come with challenges and limitations. It can be time-consuming and resource-intensive, necessitating substantial investment in stakeholder engagement and capacity-building efforts. Additionally, balancing power dynamics among stakeholders can be a hurdle, as dominant groups may overshadow the voices of less influential participants and potentially exclude stakeholders with vested interests. These challenges highlight the importance of addressing issues of inclusivity and equity in the participatory process to ensure that all voices are heard and considered in MSP decision-making (Flannery, W., Nealy, N., and Luna, L.; 2018).

For inclusive and place-based participatory processes, policy makers should also acknowledge the complexities of spatial governance, defining actions in terms of spatial configurations (e.g., 'inside', 'outside', 'cross', 'liminal' spaces) and highlighting how these spaces facilitate or hinder connections among actors, actions, and events. This long history of spatial fragmentation and the social connections inscribed within marine spaces present challenges to MSP's place-based participatory process.

Added to this, is the need to adapt to changing environmental conditions and socio-economic contexts, while maintaining the flexibility and resilience of participatory processes.

In conclusion, while participatory MSP presents a promising pathway toward a more sustainable and accepted maritime spatial planning, it requires careful design, implementation, and ongoing evaluation to navigate its complexities and realize its full potential.

The module 2 is structured in three different sessions:

Session 2.1 Stakeholders' Analysis and Engagement in MSP
Session 2.2 How to implement a participatory MS planning process ?
Session 2.3 MSP Data and Tools across scales.

References

Flannery W, Healy N, Luna M. Exclusion and non-participation in Marine Spatial Planning [Internet]. MarXiv; 2017. Available from: osf.io/preprints/marxiv/nfbs3

B. Session 2.1 Stakeholders' Analysis and Engagement in MSP

Overview of the Session

This session is designed to provide participants with strategies for engaging and managing diverse stakeholder groups within complex MSP environments. It emphasizes tailored engagement and conflict resolution. Stakeholder engagement in MSP is a complex process because of the great number and diversity of maritime stakeholders in different levels (horizontal and vertically). Furthermore, MSP is a relatively recent process and, as such, many actors are still unfamiliar with it. Also, the identification of relevant stakeholders is not always a simple task. Eventually the transboundary dimension can represent an additional challenge to the engagement.

Again, the structure for this session is organised into key topics, each one designed to equip participants with the knowledge, skills, and strategies necessary for effective stakeholder analysis and engagement in MSP contexts.

Obviously, a mix of theoretical insights, practical training activities, and real-world examples to ensure comprehensive learning and applicability will be a pro to the delivery of this session.

2.1.1. Identifying Stakeholders and Understanding Stakeholders' Analysis

Stakeholders Analysis is an important preliminary step in the MSP process. It offers a valuable tool to assess whether the conditions are appropriate for stakeholder engagement and what challenges need to be addressed to increase the likelihood of success (Gunton, Rutherford, & Dickinson, 2010). It can be organised in different steps regarding **identification, prioritisation or categorization** based on key characteristics of stakeholders and research of understanding their attributes prior to the start of the planning process.

Identifying stakeholders based on their interest, sectoral involvement, or acting spatial level, as well as categorizing them by type (individuals, groups, organizations, SMEs, etc.), is crucial in MSP. Once identified, mapping stakeholders according to defined criteria—such as influence, interest, or involvement level—facilitates visualizing their relationships and engagement in MSP processes and as such give hints when it is needed to participate and how they should embower. Stakeholder involvement is not a 'one-off' exercise within an MSP process but serves one or more specific purposes depending on the stage of the MSP process - ranging from 'issue identification', evidence gathering, consensus building up to monitoring and evaluation. It is therefore a horizontal issue, which relates to all other topics covered under this paper.

Tools for mapping stakeholders in MSP include **stakeholder matrices**, where stakeholders are categorized based on their interest and influence; **social network analysis**[2], to visualize relationships and communication flows between stakeholders; and **GIS mapping**, which spatially represents stakeholders' locations and areas of concern. These tools help in visualizing the complex web of interactions and interests in MSP, enabling more effective engagement and management strategies.

References

Thomas Gunton, Murray Rutherford and Megan Dickinson, Stakeholder Analysis in *Marine Planning, Environments Journal Volume 37(3)* 2010.

Further Reading 9

MSP GLOBAL, Engaging stakeholders
https://www.mspglobal2030.org/resources/key-msp-references/step-by-step-approach/engaging-stakeholders/

Herman Brouwer & Jan Brouwers, The MSP Tool Guide.
https://mspguideorg.files.wordpress.com/2021/12/msp-tool-guide-wur-wcdi.pdf

2.1.2. Stakeholders' engagement and empowerment strategies

Maintaining stakeholder interest and engagement throughout the MSP process is indeed a significant challenge. The issue often arises from stakeholders' scepticism about the process's legitimacy and effectiveness, leading to disengagement or passive participation. This scepticism can stem from traditional engagement practices that rely heavily on public hearings and written comments, which may not facilitate meaningful interaction among stakeholders. These conventional methods can inadvertently position stakeholders as adversaries, lacking a mechanism for constructive conflict resolution and collaboration (Innes & Booher, 2004).

Engaging stakeholders in Marine Spatial Planning (MSP) or any decision-making process requires a strategic, inclusive, and adaptive approach. Having identify, mapping and research your stakeholders you should draw upon an **engagement plan** for how to involve them, i.e. draft an engagement strategy where you can define and communicate the specific objectives of stakeholder involvement and the expected outcomes clearly. This includes clarifying the type of involvement (consultative, collaborative, etc.), the scope of decision-making, and the role stakeholders will play in the process.

Key issues are the selection of the type of strategies (information, consultation, etc.) and the methods endorsed (it will be further discussed in section 2) but also how you communicate the results of the process with the stakeholders. Giving feedback about the process to the stakeholders and informed about their role is crucial to build their trust in the

[2] If you wish, you can use special software to present the social network data you have gathered, or to do further analysis of your data, through Social Network Analysis (SNA). There are many packages available, which are often free. Without recommending any of them, we should say that we have a good experience with Social Network Visualizer that is basic but free (http://socnetv.sourceforge.net/).

process. Silva et al (2019) proposed a Stakeholder Participation Assessment Framework that can help policy makers to plan a meaningful participatory process in two different phases (see diagramme on task 2.1 below).

References

Silva-Quesada, M, Campos-Iglesias, Al., Turra, Al. & Vivero- Suarez De, J.(2019). Stakeholder Participation Assessment Framework (SPAF): A theory-based strategy to plan and evaluate marine spatial planning participatory processes in Marine Policy, 108, 103619, ISSN 0308-597X, https://doi.org/10.1016/j.marpol.2019.103619

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E. Innes, D.E. Booher, (2004), Reframing public participation: strategies for the 21st century, plan, Theory Pract. 5 (2004) 419–436, https://doi.org/10.1080/1464935042000293170.

2.1.3 Communities of Practice in MSP

A Community of Practice (CoP) is essentially **a collaborative group or platform where individuals, specifically professionals and practitioners, engage in a collective process of learning, sharing, and developing through social interactions**. The core purpose of such a community is to enhance and innovate within their respective fields by exchanging knowledge, experiences, and expertise. Unlike formal project teams, task forces, or networks, CoPs are characterized by their informal, non-hierarchical structure, which encourages free exchange and mutual support among members who are driven by a genuine interest in their shared domain (Wenger & Snyder, 2000; Hildreth & Kimble, 2004).

The key dimensions of a CoP are decribed below. They interact with each other and are essential for the functioning of a CoP in maritime spatial planning.

1. *Community and Process:* This dimension focuses on the social relations and social learning within the community. It includes aspects such as building trust, fostering a safe working environment, and promoting constructive input and listening.
2. *Learning and Results*: This dimension emphasizes the learning outcomes and results achieved through the CoP. It includes both tangible outputs, such as reports and policy briefs, as well as intangible outcomes, such as collective learning, sense-making, and the development of new practices.
3. *Context:* The CoP is embedded within a specific context, which can be a sea basin, a project, a planning process, or any other social-environmental setting. The context influences how the CoP operates and how results and learning are shared and acquired.
4. *Support:* A CoP requires a supporting function to make it work efficiently and effectively. This support function creates a safe space, provides organizational support, and ensures an open and equal learning environment. It may include facilitation skills, mentoring, and knowledge support.

5. *Participants:* The participants of a CoP are professionals and practitioners who share analyses, inform and advise each other, and develop new practices. They are intrinsically motivated and work in a non-hierarchical way. The participants contribute their diverse knowledge and experience to the community.

6. *Work Mode:* The work mode of a CoP is characterized by an open and free-form process. Roles can be taken on by different participants at different times. Equality is a central principle, and the community is led by the needs and questions put forward by the participants. The work mode also involves co- developing products and being flexible in the approach.

References

Hildreth, P. M., & Kimble, C. (Eds.). (2004). *Knowledge networks: Innovation through communities of practice*. Igi Global.

Wenger, E. C., & Snyder, W. M. (2000). Communities of practice: The organizational frontier. *Harvard business review*, *78*(1), 139-146.

Further Reading 11

Morf, A., Bly Joyce, K., Matthiesen, H., Elin Cedergren, E., Cuadrado, A., Andringa, J., Oelen, J.P., Gee, K., Varjopuro, R., Annica Brink, A., Matczak, M., Zaucha, J. (2023). Policy Brief Communities of Practice in marine spatial planning across sea basins - making it work. Policy brief of the eMSP NSBR project, download from https://www.emspproject.eu/results/

Learning Objectives and Outcomes of Session 2.1

Learning objectives	***Learning outcomes***
Equip participants with the ability to identify and map stakeholders within the MSP framework, recognizing their interests and influences at various levels.	Participants will be able to conduct comprehensive stakeholder analysis, mapping their roles and interests in MSP projects.
Provide skills to design effective stakeholder engagement strategies, utilizing various tools to ensure long-term involvement and commitment in the MSP process.	Participants will develop strategies for engaging stakeholders in a meaningful way, ensuring their active and ongoing participation in the MSP process.
Foster an understanding of the role and formation of communities of practice within MSP, highlighting their importance in facilitating knowledge sharing and collaborative problem-solving among stakeholders.	Participants will understand how to establish and nurture communities of practice.

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Guide for trainers

Title/Presentation Topic	Short Description	Learning Method	Duration	Link/File/Resources
Topic 1: Identifying and Understanding Stakeholders	Start with the definition of stakeholder in MSP -key questions answered who, when, and how? What is stakeholders' analysis? Criteria for assessing the relevance of stakeholders	Presentation, Group Discussion about how to start in a stakeholders' analysis in MSP, Brainstorming about the list of stakeholders in your national settings Brainwriting about how you can categorize your identified stakeholders	45 min	https://vasab.org/wp-content/uploads/2021/12/Integrated-Report-on- Stakeholder-Involvement-2021.pdf https://maritime-spatial-planning.ec.europa.eu/media/12728 https://maritime-spatial-planning.ec.europa.eu/media/12728 Tool for an online stakeholder map: https://lucid.app/lucidspark/bd56daa7-1413-4683- bd70-cf4840431382/view?anonId=0.aa29362918dcae60b86 &sessionDate=2024-02-21T09%3A03%3A03.256Z&sessionId=0.e4003d3c18dcae60b86&fromMarketing=true&page=0_0#
Topic 2: Engagement Strategies and how to maintain interest of stakeholders	How to engage stakeholders? Why stakeholders are passive in the process? Can you describe any key tool for facilitating engagement of stakeholders?	Brainstorming Training exercise for understanding the criteria of phase 1 of SPAF	45 min	https://maritime-spatial-planning.ec.europa.eu/practices/stakeholder-participation-assessment-framework-spaf-theory- based-strategy-plan-and

	What are types of engagement strategies?			
Topic 3: The Communities of Practice (CoP)	What is a CoP? How CoP is different from a project group ? Ground rules of a CoP. What are the key dimensions of a CoP?	Brainstorming about CoP in MSP Brainwriting about the ground rules of a CoP Reflection and application exercise	45 min	https://westmed-initiative.ec.europa.eu/the-community-of-practice-on-maritime-spatial-planning-msp-for-the-mediterranean-has-been- launched/ https://www.emspproject.eu/wp-content/uploads/2024/01/Communities-of-Practice- Policy-Brief-eMSP-NBSR-January-2024.pdf

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Training Resources per Topic

Task 1.1: Please, can you name different type of stakeholders in MSP ?

You can provide some suggestions when the dialogue opens, such as:

- Commercial Fishing and Aquaculture
- Shipping and Port Authorities
- Tourism Operators
- Marine Conservation Organizations (i.e NGOs, Social entities)
- Research Institutions and Academia.
- Local and National Government Agencies
- International Bodies
- Local Communities
- Indigenous Peoples
- Renewable Energy Providers
- Oil and Gas Companies

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Task 1.2: Who should be engaged in MSP?

WHO	WHEN	HOW
is/will being/be affected by MSP decisions?	Designing the planning process	Consultations (public hearing and/or written public comments)
is dependent on the resources of the planning area?	Conducting the assessments for planning (including data collection, which can come from stakeholders)	Questionnaires/Interviews
has/makes legal claims or obligations over areas, or resources within the planning area?	Developing the marine spatial plan	Seminars
conducts activities that impact on areas or resources of the planning area?	Implementing the marine spatial plan	Meetings
has special seasonal or geographic interests in the planning area?	Monitoring and evaluating the marine spatial plan and process	Hands-on workshops (e.g. participatory mapping)
has a special interest in or connection with the planning area?		Forums Working/Advisory groups Deliberative committees
		(Regular) E-mails providing feedback on the status of the MSP progress

Task 1.3: How can we categorise our stakeholders? What criteria could be used? Please discuss about it.

For example, in the Latvian Case Study there is a categorisation of stakeholders based on their legitimacy to act.

Figure 10: Categories of stakeholders based on their legitimacy to act. Source: Caune, Arturs; Kirkovalds, Janis; Armands, Pužulis; Rijkure, Astrida; Ungure, Ilze (2019): Stakeholder Involvement in Long-term Maritime Spatial Planning: Latvian Case, https://vasab.org/project/balticlines/connecting-seas-conference/stakeholder-involvement

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Task 1.4 You are free to develop more, and different sets of criteria based on the needs of the stakeholders' involvement process, in your planning exercise. Can you name such criteria?

Criteria for the selection of stakeholders	Stakeholder	Importance	Relevance
Existing rights to the resources in the management area		Highly / Medium / Low	
Continuity of relationship to the resources (e.g., resident resource users versus migratory users) in the management area			
Unique knowledge and skills for the spatial management of the resources in the management area			
Level of losses and damage incurred during or after the MSP process			
Historical and cultural relations to the resources in the management area			
Degree of economic and social reliance on the resources of the management area			
Degree of effort and interest in the management area.			
Equity in the access to resources of the management area and the distribution of benefits from their use.			
Compatibility of the interests and activities of the stakeholders			
Present or potential future impact of activities of stakeholders on the management area			

Source: https://www.mspglobal2030.org/resources/key-msp-references/step-by-step-approach/engaging-stakeholders/

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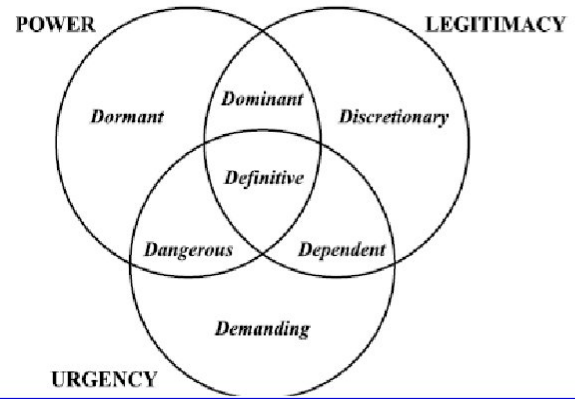
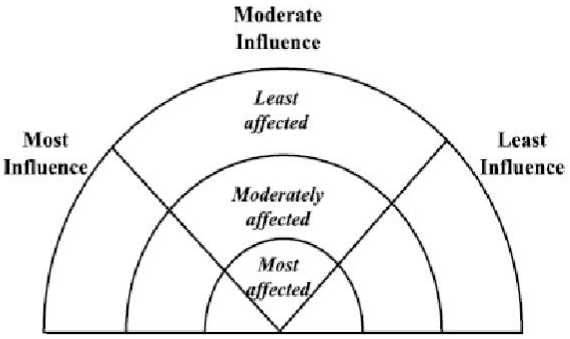
Task 1.5. Discussing the different approaches (below, Figure 11) to map stakeholders

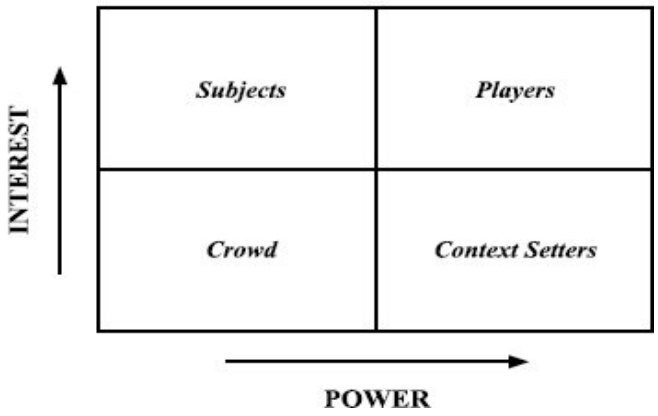
(a) Stakeholder Typology



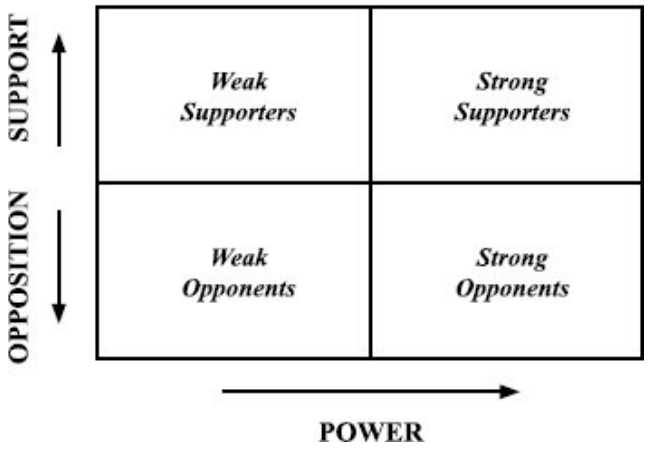
(b) Rainbow Diagram



(c) Power *vs.* Interest Grid



(d) Problem-Frame Stakeholder Map



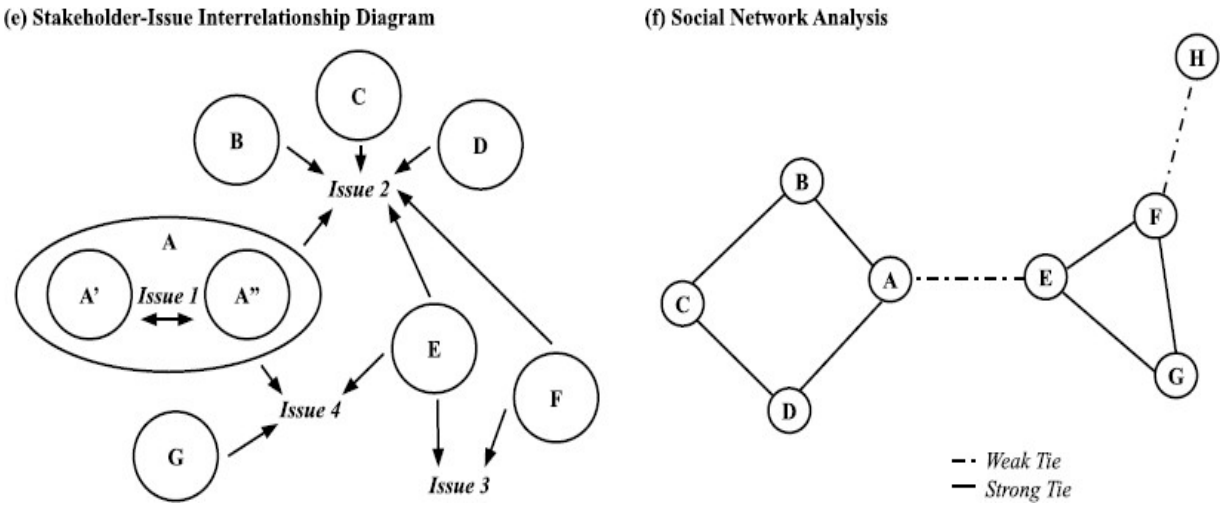


Figure 11: Diagramme with different approaches to map stakeholders
Source: Silva et al (2019)

Task 2.1. SPAF for Marine Spatial Planning (Silva et al, 2019)

Discuss the following scheme and express your views:

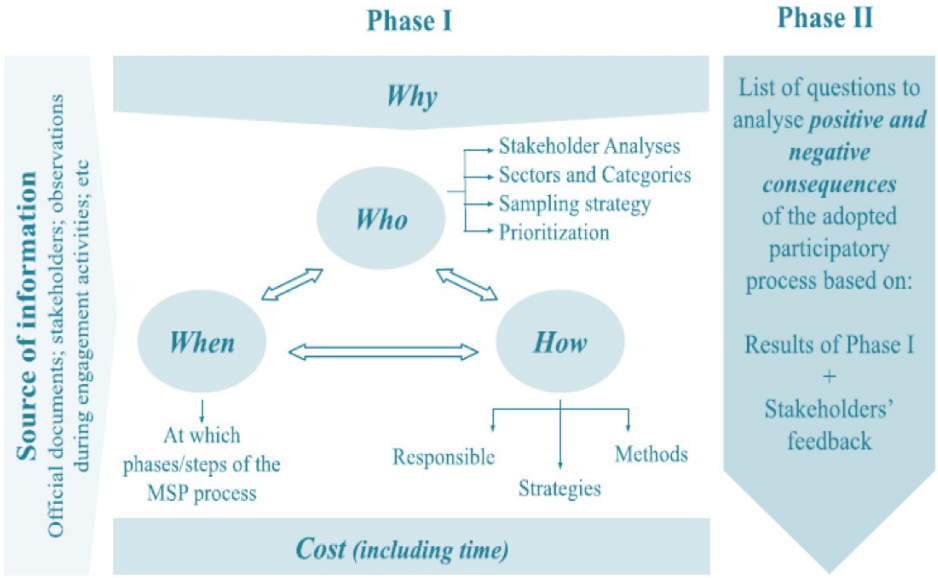


Fig. 1. Scheme of the strategy to develop the Stakeholder Participation Assessment Framework (SPAF) for Marine Spatial Planning, which is divided in Phases I and II, and considers different sources of information to be implemented.

Task 2.2. Reflection and Application of CoP in MSP

- Having discussed what a CoP is and its key dimensions, please reflect how relevant is the CoP approach in MSP and share your thoughts with the group.
- Applying a CoP within your MSPlan or MSP Process.

Having in mind the flower of a CoP formation, describe how it can be related to an actual MSP process in your settings.

Please present your ideas in the class. What are the key challenges of applying the CoP process?

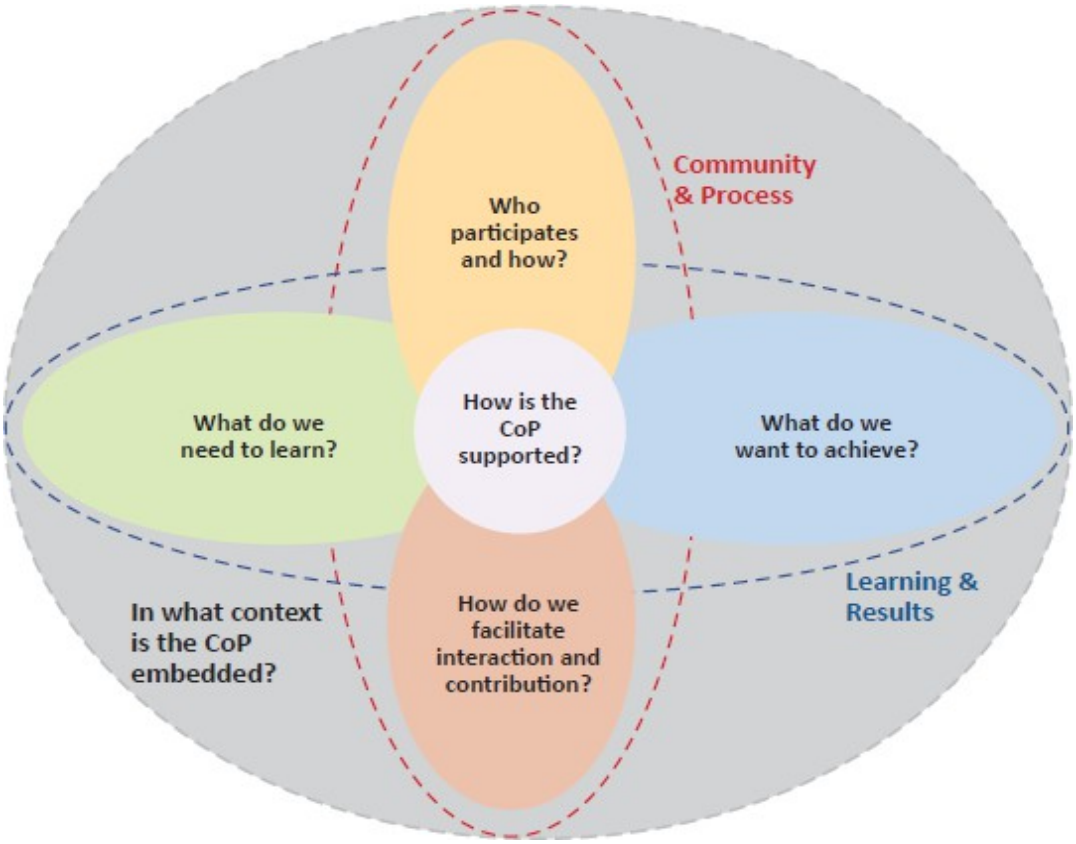


Figure 12: The flower of CoP. Source: Morf A., et al, 2023

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C. Session 2.2 How to implement a participatory MS planning process ?

Overview of the session

Having discussed how to analyse and engage stakeholders in the previous session, this session (Session 2.2) delves into the practical aspects for effectively designing and organising a participatory maritime spatial planning process. Based on the "how-to" aspect of participatory MSP implementation, trainees will be able to learn the role of a facilitator, the steps and considerations of the participatory process, **how to use different participatory techniques with their pros and cons, the importance of feedback and the importance of giving reviews to participants.**

2.2.1. Organising a participatory process

Organizing a participatory process involves several crucial stages that ensure the engagement is meaningful, effective, and capable of adapting to changing circumstances and feedback. This process is underpinned by three core components: adaptive planning, collaborative action, and reflective monitoring. Additionally, the role of a facilitator is central to navigating this process, requiring a specific set of competencies to guide and manage participatory engagement successfully. The Facilitator should know how to use different techniques for establishing a dialogue. Read more here about tools that can used by a facilitator: https://edepot.wur.nl/222693.

2.2.2. Participatory tools in MSP

Participatory tools and techniques in MSP vary widely, each serving different purposes from information gathering to decision-making.

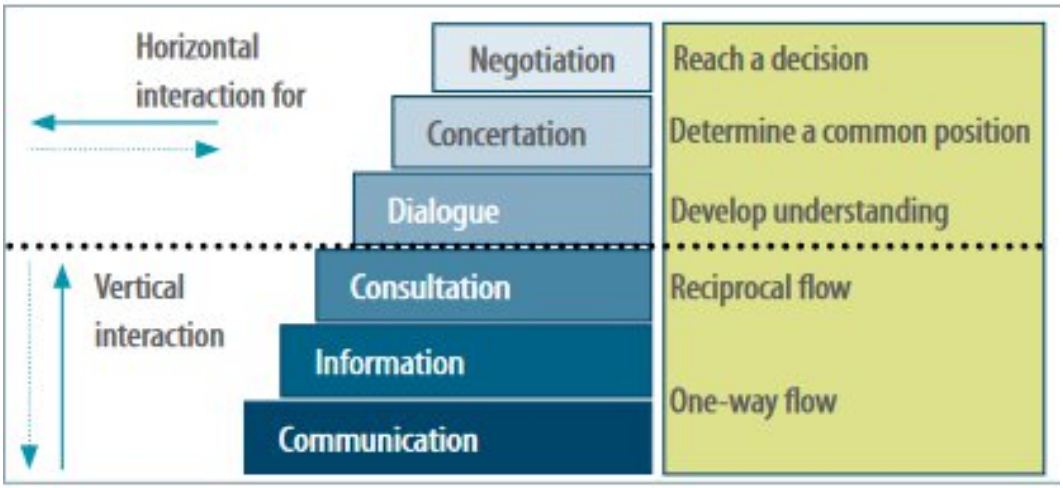

Figure 13: Different types of stakeholder participation. Adapted from Bouamrame (2006).
Source: Ehler, Charles, Douvere, Fanny, Marine spatial planning: a step-by-step approach toward ecosystem-based management, Intergovernmental Oceanographic Commission https://unesdoc.unesco.org/ark:/48223/pf0000186559

Based on the scope of participation, there are:

Information Sharing tools, consultative tools (i.e. survey and questionnaires, forums, focus groups,), collaborative tools (i.e., workshops and seminars, participatory mapping, stakeholders' forums) and empowerment tools (i.e. Delphi method, advisory boards). Each of the one the above tools present different advantages and drawbacks. An emphasis is given to the **Delphi method.** The Delphi technique, mainly developed by Dalkey and Helmer (1963), is a method for achieving convergence of opinions from a panel of experts on a certain topic. The method is designed as a group communication process aiming at conducting detailed examinations and discussions of a specific issue as input for goal-setting, policy investigation, or predicting the occurrence of future events (C. Hsu et al (2007)). As such, the tool can be useful in the early stages of an MSP, or in the last stage, when a decision needs to be made.

Further Reading 12

Delphi Technique a Step-by-Step Guide: https://www.projectsmart.co.uk/tools/delphi-technique-a-step-by-step-guide.php
IOC-UNESCO, Maritime Spatial Planning Challenge, #MSPglobal Edition, MSP Challenge/MSPglobal training network on Marine Spatial Planning, 2022 Handbook https://www.mspglobal2030.org/wp-content/uploads/2022/10/MSPChallenge_MSPglobal_2022Handbook_20221007.pdf

2.2.3 Conflict issues in participatory MSP

Conflict arises when two or more parties have incompatible goals, needs, or interests. It's a natural part of human interaction and can occur on various levels, from personal disputes to organizational or sectoral disagreements. Spatial conflict in MSP refers to disputes over the use of marine space and resources. These conflicts often involve multiple stakeholders, including fishermen, conservationists, recreational users, and commercial entities, each with their own interests and priorities on how marine areas should be used and managed. There are a lot of different causes of conflict and different solutions of how to address them.

On the EC report (2019) it was stressed that all blue economy sectors can come into conflict with another sector, and conflicts can arise between traditional sectors, traditional sectors and newcomers, and between newcomers. Still, offshore wind farming almost inevitably leads to spatial conflicts and has acted as a trigger for MSP in North Sea countries, as an example. Additionally, conflicts involving tourism, defence, and area-based marine conservation are also mentioned as being conflict-prone. It is important to note that conflicts can arise due to various factors such as locational choices, impacts on the environment, and differing levels of risk and urgency associated with conflicting issues. The compatibility matrix, developed in the report is a tool used to analyse the spatial compatibility of activities in maritime space. It helps to determine the scope for two sectors to conflict with each other. The matrix categorizes activities as spatially incompatible, compatible under certain conditions, or compatible. This analysis provides a first indication of the kind of conflict management that may be needed. The matrix helps to identify conflicting issues and can guide the development of solutions to address spatial conflicts.

Further Reading 13

EC (2019); Addressing conflicting spatial demands in MSP; Considerations for MSP planners, Final Technical Study. Accessible at : https://maritime-spatial-planning.ec.europa.eu/media/document/12474

Learning Objectives and learning Outcomes

Learning objectives	*Learning outcomes*
To comprehend the facilitator's responsibilities in guiding the participatory process, ensuring inclusivity, and managing dynamics among stakeholders.	Demonstrate the ability to guide discussions, encourage stakeholder participation, and manage group dynamics to foster a constructive and inclusive MSP environment.
To gain knowledge about various participatory techniques and tools, understanding their advantages and limitations within the MSP context.	Outline a clear, step-by-step approach to organizing a participatory MSP process.
To understand potential challenges in participatory MSP, such as power imbalances, resource constraints, and the need for balancing spatial governance considerations.	Select and apply suitable participatory techniques and tools based on the specific context and needs of the MSP process, maximizing engagement and input from stakeholders.

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Guide for Trainers

Title/Presentation Topic	Short Description	Learning Method	Duration	Link/File/Resources/Activity
Topic 1: Organising a participatory process	For this topic, participants will understand the steps of a participatory workshop, how to draft a structure of an agenda of a participatory workshop and how to recognize the role in the process of good facilitator.	Ice-breaking activity Presentation Brainwriting about the roadmap of organising a participatory process and its challenges Round brainstorming	30 min	Ice-breaking activity about the role of feedback of participatory process (Ask the participants if they have participated in any participatory activity and if they have received feedback. The ones with the feedback form one group that they are going to present to the plenary, who they are and what feedback have received for any of such process). Develop a timeline of a hypothetical MSP over a year Word cloud about key characteristic of a facilitator Key resource: https://mspguideorg.files.wordpress.com/2021/12/the_msp_guide_3rd_ed_2019_wcdi_brouwer_woodhill.pdf

Topic 2: Participatory Tools and Techniques	How to engage stakeholders? Address the topic answering the how to process but also refers to tools used for participation in different stages.	Interactive Workshop Brainwriting about the pros and cons of participatory tools	120 min	Training activity about participatory tools How to implement a Delphi Method for adaptation pathways in marine planning i

Title/Presentation Topic	**Short Description**	**Learning Method**	**Duration**	**Link/File/Resources/Activity**
Topic 3: Conflict issues	What is a conflict in MSP? How does conflict arise? How can you handle this? The Compatibility Matrix Tool. Coming to a solution Facilitating dialogue	Presentation Video Brainstorming	60 min	Watch video about conflict: https://www.youtube.com/watch?v=QJiJ95mHftE Identifying conflict and discuss with trainees how to handle it. Create a compatibility matrix
Topic 4: Any topic that trainees are willing to discuss.				

2 https://https://maritime-spatial-planning.ec.europa.eu/media/document/12474mspguideorg.:iles.wordpress.com/2021/12/the_msp_guide_3rd_ed_2019_wcdi_brouwer_woodhill.pdf
3 https://maritime-spatial-planning.ec.europa.eu/media/document/12474

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Training Activities

Training Activity 2.2.1

Drafting an agenda for a participatory workshop dedicated to incorporating climate change challenges into a Maritime Spatial Plan (MSP).

What is needed for the activity? Large posters or whiteboards, Markers Sticky notes, Voting stickers or dots

Steps of the activity

Step 1: Introduction (10 minutes)

Briefly explain the purpose of the activity and the importance of including climate change considerations in MSP. Link this activity with the multi-stakeholders' analysis and engagement process.

Step 2: Brainstorming Session (30 minutes)

- Divide participants into mixed groups to ensure a diversity of perspectives.
- Each group discusses and notes down key topics and themes that should be addressed in the workshop to effectively incorporate climate change challenges into MSP.
- Encourage participants to consider scientific research, policy implications, stakeholder engagement, adaptation strategies, and any other relevant areas.

Step 3: Sharing & Clustering (20 minutes)

- Invite groups to present their identified topics and themes.

As topics are shared, cluster similar ideas on the posters or whiteboards to form broader agenda categories.

Step 4: Prioritization (15 minutes)

- Provide each participant with a set number of voting stickers or dots.
- Participants vote on the topics and themes they believe are most crucial to address during the workshop.

This helps to prioritize the agenda items based on collective input.

Step 5: Drafting the Agenda and presenting it to the participants for feedback

Based on the prioritization, facilitators draft a preliminary agenda of a participatory workshop and send it back to participants for feedback and reviews. This could be done after the end of the training session.

Training Activity 2.2.2

Give the participants the table below without the mentioned pros and cons. Then, ask them to fill in the table.

Participatory Tool	Key Examples	Pros	Cons
Information Sharing Tools	- Websites, Newsletters - Public displays	- Enhances transparency and trust - Easy to distribute information widely.	- Limited interaction with stakeholders. Passive engagement.
Consultative Tools	- Surveys and Questionnaires - Public forums - Focus groups	- Allows for broad stakeholder input. - Can gather specific feedback on issues.	- May not lead to consensus. - Results can be influenced by how questions are phrased.
Collaborative Tools	- Workshops and Seminars - Participatory Mapping - Stakeholder Forums	- Encourages active stakeholder participation. - Can lead to innovative solutions through collaboration.	- Requires more time and resources. Potential for conflict among stakeholders.
Empowerment Tools	- Delphi Method - Advisory Boards	- Gives stakeholders a significant role in decision-making. - Can lead to higher satisfaction and acceptance of outcomes.	- May require a high level of commitment and expertise. - Risk of dominating voices.

References

Caune, Arturs; Kirkovalds, Janis; Armands, Pužulis; Rijkure, Astrida; Ungure, Ilze (2019): Stakeholder Involvement in Long-term Maritime Spatial Planning: Latvian Case, https://vasab.org/project/balticlines/connecting-seas-conference/stakeholder-involvement

Kyvelou, S. (Ed.) From Spatial Planning to Territorial Management: The Notions of Strategic Spatial Planning and Territorial Cohesion in Europe; KRITIKI: Athens, Greece, 2010; p. 344. (In Greek)

Kyvelou, S. S. I., & Ierapetritis, D. G. (2020). Fisheries Sustainability through soft multi-use maritime spatial planning and local development co-management: Potentials and challenges in Greece. Sustainability, 12(5), MDPI, 2026.

Kyvelou, S., Ierapetritis, D. (2019), How to make blue growth operational? A local and regional stakeholders perspective in Greece. WMU Journal of Maritime Affairs, Springer DOI: 10.1007/s13437-019- 00171-

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Yates, K. L. (2018), Meaningful stakeholder participation in marine spatial planning with offshore energy, "In Offshore Energy and Marine Spatial Planning", pp. 169–188. Ed. by K. Yatesand and C. Bradshaw. Routledge, London, United Kingdom.

Sharlene L. Gomes, Leon M. Hermans, Carsten Butsch, Partha Sarathi Banerjee, Sarah Luft, Shreya Chakraborty, (2023), A Delphi-based methodology for participatory adaptation pathways building with local stakeholders: Methodological considerations and an illustrative application in peri-urban India, Environmental Development, Volume 46, 2023, 100822, ISSN 2211-4645, https://doi.org/10.1016/j.envdev.2023.100822.

Vitória M. Scrich, Carla Elliff, Mariana M. de Andrade, Natalia M. Grilli, Alexander Turra (2024), "Stakeholder Analysis as a strategic tool in framing collaborative governance arenas for marine litter monitoring" in Marine Pollution Bulletin, Volume 198, 115799, ISSN 0025-326X, https://doi.org/10.1016/j.marpolbul.2023.115799.

D. Session 2.3: MSP Data & Tools across scales

Overview of the session

Member States around all European marine areas face similar challenges regarding MSP data requirements. These challenges arise due to variances in the range of activities, maritime uses, sea basins, and the specific types of planning undertaken in these states. Key data shortages include socio-economic information for various uses and socio-cultural data. Generally, the issue is less about the absence of data and more about the difficulty in compiling and interpreting data to fulfil planners' needs. Moreover, the data needs for transnational MSP differ from national requirements.

Although the data required at the international level is often less complex, ensuring that this information is consistent and harmonized across borders presents a challenge. Pan-European efforts like the EMODnet data portal and sea basin checkpoints could aid in addressing the needs for cross-border MSP data by offering access to harmonized data sets across European Sea Basins and evaluating the sufficiency and relevance of existing data sets to address commercial and policy issues.

The new EU approach in Sustainable Blue Economy emphasizes the role of effective Maritime Spatial Planning that should overcome data challenges. Initiatives like the Inspire Directive[3] and EMODnet[4] that had enhancing collaboration among Member States, standardizing data collection and sharing practices, and addressing gaps in socio-economic and socio-cultural data should further increased. These efforts should evolve, take into consideration both land and sea interactions, protecting marine and coastal habitats, supporting a more sustainable blue economy, and mitigating and adapting to climate change (discuss more about the European Digital Twin of the Ocean and EDITO projects.)

2.3.1. Data collection, categories, and data gaps in MSP process across scales

[3] https://inspire-geoportal.ec.europa.eu/srv/eng/catalog.search#/home
[4] https://emodnet.ec.europa.eu/en

The MSP process relies on a comprehensive collection of data and information to inform decision-making and ensure sustainable management of marine areas. The MSP Data Study highlights that despite the specific planning needs of different maritime jurisdictions, there is a notable similarity in the types and categories of data used by MSP planners across countries.

These data are structured around four broad categories, reflecting both the diversity and commonality of requirements in MSP processes worldwide. According to the MSP platform, **four general categories of MSP data are described below:**

Data about Administrative Boundaries: This includes basic geographical and administrative information such as Exclusive Economic Zones (EEZ), country and county boundaries, and depth contours. Such data provide the foundational framework for MSP by delineating the spatial extent within which planning and management activities occur.

Data about Geophysical Environment and Biological/Ecological Features: data that describe the physical characteristics of the marine environment (e.g., bathymetry, hydrography) and biological/ecological aspects (e.g., habitats, species distribution). This information is crucial for understanding the marine ecosystem's structure and functioning.

Data about Human Activities and Sectors such as data on various maritime sectors such as fishing, shipping, tourism, renewable energy (e.g., offshore wind, wave energy), and oil and gas exploration. The emphasis here is on understanding the spatial distribution and intensity of human uses and their potential impacts on the marine environment.

Data about Socio-economic values and policy-related ones: This includes information on the economic value of maritime activities, social and cultural values, and relevant policies and regulations. While historically less emphasized, there is a growing recognition of the importance of integrating socio-economic and policy-related data into MSP to ensure balanced decision-making that accounts for human dimensions.

Further Reading 14

Range of themes and categories of data and information used by MSP planners.
https://maritime-spatial-planning.ec.europa.eu/sites/default/files/table_1_data_categories_.pdf

There are several challenges related to data management in MSP at European, sea basin, and regional levels such as the notable lack of uniformly available data sets, especially in formats that are compatible across different sea basins and regions. There's a significant difficulty in separating information pertinent to land from that of the sea, which complicates efforts to understand and manage land-sea interactions effectively. Although there has been some improvement, access to social, economic, and governance-related data remains limited. This restricts the ability to fully integrate human dimensions into MSP. There are notable gaps and weaknesses in historical data series, alongside challenges in ensuring the

quality of data. This affects the reliability of analyses and long-term planning efforts in MSP.

Further Reading 15

Michail Vaitis, Vasilis Kopsachilis, Georgios Tataris, Vyron-Ignatios Michalakis, Gerasimos Pavlogeorgatos,The development of a spatial data infrastructure to support marine spatial planning in Greece, Ocean & Coastal Management, Volume 218,2022,106025, https://doi.org/10.1016/j.ocecoaman.2022.106025.

2.3.2. Databases and tools

Having a MSP database is useful for better informed planning process but not only. Any MSP database gives you insights of the state of art of marine environment either related to health conditions, distribution of human activities, sensitivities and pressures from human activities, or even the economic, social or cultural value of the marine environment.
Therefore, the MSP database can serve as a valuable tool for integrated management and decision-making processes. However, as we discussed previously, there are a lot of key issues related to data! Another key issue is that we are not aware of all datasets available, at least in the EU level. Providing comprehensive and up-to-date information on the marine environment and human activities would support the development of effective and sustainable management strategies and policies.
The **European Marine Observation and Data Network** (EMODnet) is a network of organisations supported by the EU's integrated maritime policy. These organisations work together in observing the sea, processing the data according to international standards and making that information freely available as interoperable data layers and data products.
This "collect once and use many times" philosophy, benefits all marine data users, including policy makers, scientists, private industry and the general public. It has been estimated that such an integrated marine data policy will save at least one billion Euros per year, as well as opening up new opportunities for innovation and growth.
The data provided refers to different disciplines from bathymetry to human activities and physics. A list of different datasets is available through the link below:
https://maritime-spatial-planning.ec.europa.eu/faq/msp-data-and-assessment-tools.

2.3.3 New approaches on Data and tools for MSP

The integration of new data sources and innovative tools into MSP processes is essential for addressing the multifaceted challenges posed by climate change and its impact on coastal communities. Nowadays, planners and policymakers should enhance their understanding of the complex interactions between maritime sectors and coastal communities, leading to more informed, resilient, and adaptive maritime spatial planning strategies. For example, data or information that specifically addresses the connections between coastal communities and adjacent seas is scarce. These limits understanding of how these communities relate to and can benefit from maritime sectors. Employing predictive models and scenario analysis tools that integrate land and sea interactions and/or climate change projections with socio-economic data, forecasting the future impacts of

maritime activities under different climate scenarios, is aiding in the development of adaptive MSP strategies.

Moreover, creating Digital Twins of coastal and marine environments that simulate real-world conditions, including climate change effects is of paramount importance. These digital models can provide a dynamic platform for testing different MSP strategies and their impacts on coastal communities and ecosystems.

Further Reading 16

EDITO (about the Digital Twin of the Ocean): https://edito-modellab.eu/about

Learning approach of Session: In this session, it is recommended to have invited speakers to speak about tools such as Marxan or GIS related applications and explain to the policy makers the importance of mapping data across scales. These guest lecturers or practitioners in the field will share key insights and experiences but also key tips of datasets/tools and their usage. A pool to identify relevant experts is the "Technical Expert Group on Data on MSP". You can find more info on the TEG on the following link : https://maritime-spatial-planning.ec.europa.eu/msp-resources/technical-expert- group-teg-data-msp

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Learning objectives and learning outcome

Learning objectives	*Learning outcomes*
Understand the Challenges in MSP Data Management.	MSP Data Management Challenges, i.e. those that participants could effectively analyse so as to articulate the complexities of managing MSP data across European marine areas.
Explore European Initiatives for MSP Data Management: Trainees should be able to discuss the role of initiatives such as EMODnet, the Inspire Directive, and the European Digital Twin of the Ocean (EDITO) in addressing data challenges, enhancing collaboration among Member States, and supporting sustainable blue economy goals.	Being able to name and understand how to use different data categories in MSP.
Identify New Approaches and Tools for MSP: Trainees should explore and understand the significance of integrating new data sources, predictive models, scenario analysis tools, especially in the context of climate change adaptation.	Being able to download data and find useful information in different datasets and tools like EMODNET and EDITO.

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Guide for Trainers

Title	Short Description	Learning Method	Duration	Link/File/Resrouces
MSP Data	What themes or categories are useful for MSP purposes? What are key challenges concerning MSP data ?	Silent Brainstorming (activity 2.3.1) Brainwriting about challenges and gaps in different scales	50 min	Watch a video of the use of data: https://www.youtube.com/watch?v=EEjoSgFBOOA https://maritime-spatial-planning.ec.europa.eu/sites/default/files/table_1_dat a_categories_.pdf
Databases and tools for MSP	Why is it useful to develop MSP databases? List the different MSP databases and tools existing in your country or on a European level.	Video Invited Speaker - Lecture QA	50 min	https://www.youtube.com/watch?v=SCILTxDrMzE https://emodnet.ec.europa.eu/en/about_emodnet https://www.youtube.com/watch?v=p3vwngxyXuo

New approaches on Data and tools for MSP.	What kind of tools and databases are needed for addressing future challenges and twin transition challenges? Is the European Atlas of Seas a useful tool for MSP process?	Video Invited Speaker QA	50 min	▪ https://www.youtube.com/watch?v=_swuKrTW5x0& t=1s ▪ https://edito-infra.eu/european-digital-twin-ocean- introducing-edito-infra/ ▪ https://ec.europa.eu/maritimeaffairs/atlas/maritime_ atlas/#lang=EN;p=w;bkgd=1;theme=2:0.75;c=1224514.3987259883,6446275.841017013;z=4

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Quiz

1. What is the primary purpose of stakeholder analysis in MSP ?
A. To identify individuals and groups affected by maritime spatial plans.
B. To prioritize stakeholders based on their influence and interest.
C. To exclude stakeholders with minimal impact on the planning process.
D. A and B are correct.

2. Which of the following tools is NOT typically used for mapping stakeholders in MSP?
A. Stakeholder matrices
B. Social network analysis
C. GIS mapping
D. Auditing tools

3. Effective stakeholder engagement in MSP requires:
A. Engaging stakeholders only at the beginning of the MSP process.
B. Assuming all stakeholders have the same level of interest and influence.
C. Developing a strategic, inclusive, and adaptive approach and have a plan.
D. Avoiding feedback to stakeholders about the process and outcomes.

4. Which statement best describes the role of Communities of Practice (CoP) in MSP?
A. They are formal project teams with a specific hierarchy.
B. They serve as a platform for shared learning and innovation among MSP professionals.
C. They are based on the formal exchange of knowledge and experiences.
D. They are primarily focused on individual learning rather than collective problem-solving.

5. Stakeholder engagement in MSP is considered a 'one-off' exercise.
A. True
B. False

6. In the context of MSP, empowering stakeholders is important for:
A. Ensuring compliance with regulatory requirements only.
B. Building trust and ensuring meaningful participation in the planning process.
C. Limiting the involvement of certain stakeholder groups.
D. Simplifying the MSP process by reducing the number of participants.

7. Which approach is least effective for maintaining stakeholders' interest in MSP?
A. Regular updates and feedback on the process
B. Inclusive and adaptive engagement strategies
C. Exclusive decision-making with limited stakeholder input
D. Utilizing various tools for effective communication

8. In the context of MSP, what is the major challenge associated with ensuring data consistency and harmonization across borders?
A. The varying environmental laws between countries
B. Different data collection and reporting standards
C. The exclusive use of local languages in data documentation
D. The reluctance of countries to share maritime data

Correct Answer: B. Different data collection and reporting standards

9. Which of the following best describes the primary purpose of the European Marine Observation and Data Network (EMODnet)?

A. To enforce maritime laws across European waters
B. To provide a platform for the exchange of maritime professionals
C. To observe the sea and make information freely available as interoperable data layers
D. To exclusively monitor fishing and shipping activities in European waters
Correct Answer: C. To observe the sea and make information freely available as interoperable data layers

10. What distinguishes the data needs for transnational MSP from national MSP requirements?

A. Transnational MSP requires more detailed socio-economic data
B. National MSP focuses more on biological/ecological data than transnational MSP
C. Transnational MSP often requires fewer complex data but needs more harmonization
D. National MSP does not require data on administrative boundaries

Correct Answer: C. Transnational MSP often requires fewer complex data but needs more harmonization.

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III. Module 3. Climate-Smart MSP- Integrating Climate Resilience in Maritime Spatial Planning

"YOU CANNOT PROTECT THE OCEANS WITHOUT SOLVING CLIMATE CHANGE, AND YOU CAN'T SOLVE CLIMATE CHANGE WITHOUT PROTECTING THE OCEANS"
Hon. John Kerry, US Special Presidential Envoy on Climate

Figure 14. Coral reefs, seagrasses and mangroves as marine nature-based solutions. Source: Riisager-Simonsen et al. (2022)

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A. Introduction to Module 3. Climate-Smart MSP- Integrating Climate Resilience in MSP

The European Green Deal includes several actions to enhance the efficient use of resources by moving to a clean, circular economy and stop climate change, regress biodiversity loss, and minimize pollution. To contribute to these European and International efforts to tackle the climate crisis, it is necessary to incorporate **climate change considerations into MSP objectives and assessments**, although this is still at an embryonic stage.

The adoption of climate-smart MSP is related to the integration of adaptation and mitigation measures into MSP to limit the global temperature increase to 1.5°C above pre-industrial levels as well as to build the resilience of marine ecosystems and reduce exposure and vulnerability of coastal communities and maritime activities to climate change impacts.

This includes the identification and allocation of spaces for specific uses and ecosystem protection as well as designing **adaptive planning processes** that are flexible enough to incorporate emerging climate knowledge and actions. MSP can embrace and foster ocean- based solutions as Nationally Determined Contributions (NDCs) such as the promotion of offshore renewable energy, the protection and restoration of blue carbon ecosystems, etc. Therefore, a priority area is to promote and support the development of climate-smart MSP.

Hence, maritime spatial planning that addresses marine climate-driven change (climate-smart MSP) is a global aspiration to support economic growth, food security and ecosystem sustainability.

Today, increasing intensity and establishment of new sea uses, such as offshore wind farming, can be observed in coastal and marine waters. This development increases the pressure on coastal and marine ecosystems.

To deal with the resulting conflicts and cumulative impacts, new planning tools and integrated approaches to planning and management are being developed worldwide. Strongly pushed by the European Commission, MSP is currently evolving as one of the major tools for integration of different demands for marine space and resources.

Based on current developments in maritime planning practice and research, the community focuses on knowledge gaps in MSP and risk analysis. It also looks at quality assurance of both, advice for MSP and processes in coastal and marine planning, socio-cultural dimensions of ecosystem services and the use of biotic and abiotic data in planning decision-making processes (Fig.1 FutureMARES objective).

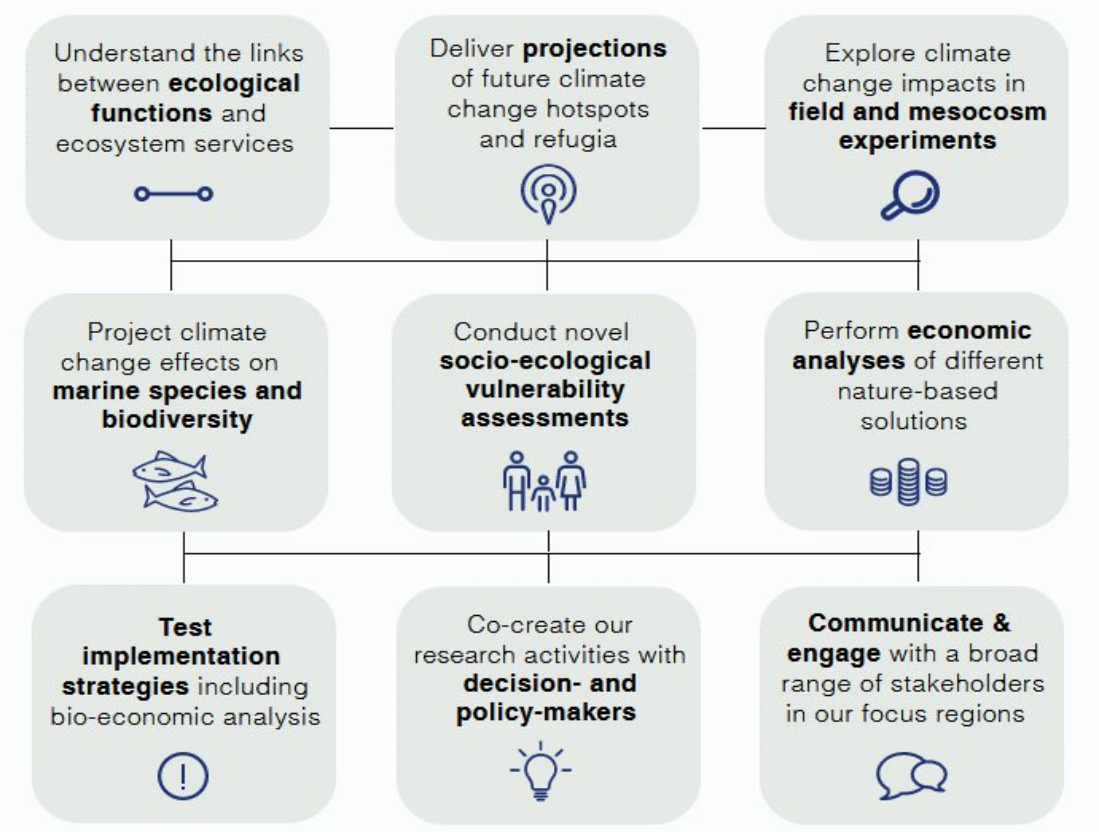

Figure 15: FutureMARES objectives, focusing to safeguard future biodiversity and ecosystem functions to maximise natural capital and its delivery of services from marine and transitional ecosystems. Source: https://www.futuremares.eu/about

To this effort, marine ecosystem-based strategies need to be more participatory and responsive to marine governance by leveraging "smart" digital services. MSP, being a dynamic tool, should process with planning cycles that incorporate continuous data gathering of spatial–temporal natural phenomena and human activities in coastal and marine areas, with ongoing data mining to locate key patterns and trends, to strive for periodic refinement of the MSP output. To this end, a climate-smart MSP aims to adopt an ecosystem-based approach, considering both, living and non-living aspects of the marine environment, and making use of all available spatial data at various scales and resolutions.

Climate change considerations apply at all phases of MSP and horizontally across all sectors; therefore, discussions and efficient collaborations among policy-makers and decision-makers are key to find appropriate MSP actions to address climate impacts. Besides, climate change affects people in different ways; therefore, a mechanism is needed to share concerns, experiences and solutions and to collaborate on ways to mitigate and adapt to upcoming climate changes. Hence, participation of beneficiaries—mainly coastal communities—throughout the MSP process is critical.

On the other hand, private sector actors usually have a better understanding of how climate change can impact their sector. They also need certainty to access marine resources in the face of climate change, and to take part in climate change mitigation and adaptation efforts.

Module 3 is structured in three different sessions:

Session 3.1 Understanding Climate Impacts on Marine Ecosystems and predicting future impacts.
Session 3.2 Climate Resilient Maritime Spatial Planning
Session 3.3 Ocean-climate mitigation and adaptation solutions

Learning objectives and learning outcomes

Learning Objectives	*Learning outcomes*
Gain a comprehensive understanding of the specific impacts of climate change on marine environments, including sea-level rise, ocean acidification, extreme weather events, and changes in marine biodiversity.	Participants will gain a comprehensive understanding of the specific impacts of climate change on marine ecosystems and the significance of integrating climate resilience into maritime spatial planning processes.
Learn how to integrate climate resilience considerations into MSP processes, including the incorporation of adaptive management strategies and ecosystem-based approaches.	Participants will develop the ability to integrate climate resilience considerations into maritime spatial planning, including adaptive management strategies and ecosystem-based approaches to address climate impacts effectively.
Understand the significance of involving stakeholders, local communities, and Indigenous groups in the planning process to ensure that their perspectives and traditional ecological knowledge are considered in climate-smart MSP initiatives.	Participants will enhance their skills in stakeholder engagement, collaboration, and interactive problem-solving, ensuring that diverse perspectives and local knowledge are incorporated into climate-smart MSP initiatives.
Policy and Regulatory Frameworks: Familiarize with existing policies and regulations related to climate-resilient maritime spatial planning and understand the need for adaptive governance structures and legal frameworks to support resilience efforts.	Policy and Regulatory Knowledge: Participants will acquire knowledge of existing policies and regulations related to climate-resilient maritime spatial planning, enabling them to contribute to the development of adaptive governance structures and legal frameworks.
Acquire knowledge of methodologies, data sources, and decision-support tools that can be utilized to assess climate impacts, vulnerability, and adaptation options in MSP.	Participants may develop the skills to utilize methodologies, data sources, and decision-support tools to assess climate impacts, vulnerability, and adaptation options in MSP, enabling effective data-driven decision-making.

Explore successful climate-resilient MSP initiatives through case studies from different regions, highlighting key strategies, lessons learned, and the application of innovative approaches.	Participants will be able to apply lessons learned from successful climate-resilient MSP case studies, gaining insights into key strategies, innovative approaches, and the practical application of climate-smart spatial planning.
Collaborative Problem-Solving: Develop skills in collaborative problem solving, knowledge sharing, and interactive discussions to facilitate effective climate-smart MSP decision-making processes.	Participants will be empowered to contribute to the development and implementation of climate-smart MSP initiatives, ensuring the resilience and sustainability of marine ecosystems in the face of climate change
Integrate Blue Economy Index Development	Assess the Blue Economy's contribution to national GDP.
	Incorporate to the possible extent, data and insights to track the impact of climate change on the various aspects of the Blue Economy, from methodologies such as Natural Capital Accounting.
	Methodologies for regular monitoring, and for measuring the evolution of variables or indicators related to the development of the Blue Economy.
	Map existing, emerging, and potential economic activity and related stakeholders in the Blue Economy.
	Assess the regulatory landscape and governance structures to minimize conflicts and optimize economic growth, as well as social and environmental outcomes.
	Explore how the implementation of the MSPD can be improved to better integrate biodiversity conservation.
	Explore the main solutions to improve the coherence of biodiversity conservation and MSP policies.

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B. Session 3.1. Understanding Climate Impacts on Marine Ecosystems and predicting future impacts.

Overview of the session

Understanding climate impacts on marine ecosystems is crucial for predicting future impacts. Climate changes affect the physical and chemical characteristics of the ocean, leading to significant impacts on marine ecosystems. Climate change is associated with shifts in temperature, circulation, stratification, and nutrient availability, impacting marine life. Climate change leads also to the redistribution of marine biodiversity and human activities in different ways around the globe. This directly affects the MSP process by posing policy and legal challenges relating to the spatial management of maritime sectors and their interactions. It also leads to impacts on the associated economy and local communities.

This session should provide an in-depth understanding of how climate change affects marine ecosystems and discuss the impacts of those changes on the development and implementation of maritime spatial planning. It is crucial for participants to grasp these impacts to effectively integrate climate considerations into MSP.

3.1.1. Climate Change and Marine Ecosystems

On this topic you can discuss the exploration of the direct and indirect effects of climate change on marine biodiversity and habitats; The idea is to discuss that climate change leads to the redistribution of marine biodiversity and human activities, creating future scenarios. Discuss the specific impacts of climate change on marine environments, including sea-level rise, ocean acidification, extreme weather events, and changes in marine biodiversity. Understand how climate change adaptation and mitigation are being captured by MSP.

Maritime Spatial Plans around Europe and the globe present an opportunity to address the causes of climate change (mitigation) as well as its impacts (adaptation), and this is being capitalised upon in different ways at national and regional levels. A stocktake of practical examples of relevant approaches and frameworks, for example decision support tools, participatory methods, science-policy will be discussed.

Here you can present the reports about the intergovernmental panel on climate change (https://www.ipcc.ch/), the ones related to coastal communities (https://www.ipcc.ch/srocc/) or fisheries (https://www.fisheries.noaa.gov/national/climate/climate-vulnerability-assessments).

Further reading 17

IPCC, 2019: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)].
https://www.ipcc.ch/site/assets/uploads/sites/3/2019/12/SROCC_FullReport_FINAL.pdf

3.1.2 Data and Tools for Decision-Making about climate impacts and predictive modelling related to MSP

In this topic, trainers should be introduced to methodologies, data sources, and decision-support tools that can be utilized to assess climate impacts, vulnerability, and adaptation options in maritime spatial planning.
The following documents can be of help:

- the **Climate Impact Assessment Tool (CIAT)** which is designed for local governments and planners to assess the vulnerability of municipal infrastructure, ecosystems, and communities to climate change. It supports the integration of climate change considerations into planning and decision-making processes (https://netzero.im/media/5nsd4xtv/climate-impact-assessments-user-guide-livev1.pdf; https://sdgintegration.undp.org/climate-action-impact-tool;)

- a more advanced one such as the Climate Change Vulnerability Assessment Framework – CCVAF. **(**https://arxiv.org/ftp/arxiv/papers/2108/2108.09762.pdf)
- or even predictive modelling tools or knowledge platforms.

- especially, when discussing tools and models used to predict future climate impacts on marine ecosystems, it's important to note that such tools often involve a combination of satellite data, in-situ observations, and computer models. A key knowledge platform is the **European Marine Observation and Data Network (EMODnet),** which provides a wealth of information about marine conditions.

Source: hts://emodnet.ec.europa.eu/en

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Guide for Trainers

Topic 1	Short Description	Method	Duration	Link/File/Resources
Climate Change and Marine Ecosystems	Examination of climate change's direct and indirect impacts on marine biodiversity and habitats, including adaptation and mitigation strategies in Maritime Spatial Plans (MSP).	Presentation Brainwriting activity	50 minutes	https://www.ipcc.ch/ https://www.ipcc.ch/srocc/ https://www.fisheries.noaa.gov/national/climate/climate-vulnerability-assessments) https://maritime-spatial-planning.ec.europa.eu/faq/climate-change
Data and Tools for Decision-Making	Introduction to methodologies, data sources, and decision-support tools for assessing climate impacts in MSP with emphasis on the knowledge platform of EMODnet. Starting with the question of how familiar are trainees with CIAT tools: - Give them examples of how to use this guide and what is its relevance to MSP. - Ask them if they know the EMODnet platform! - Let them understand how useful is this platform.	Presentation Brainwriting activity		https://netzero.im/media/5nsd4xtv/climate-impact-assessments-user-guide-livev1.pdf https://emodnet.ec.europa.eu/en/emodnet-centralization-explainer-video-2023

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Training Activity 3.1.

***Step 1_Preparation**:*
Provide participants with brief information on the impacts of climate change on marine ecosystems, including sea-level rise, ocean acidification, and biodiversity shifts. Use resources from the IPCC, NOAA, and EMODnet to prepare key indicative ppt.

Step 2_Brain-writing Phase:
Divide participants into small groups. The task is to write down ideas on how to address the impacts of climate change on marine ecosystems within 5 minutes. Ideas can range from mitigation strategies, adaptation approaches, to public awareness campaigns.

Step 3_Idea Exchange:
After the initial 5 minutes, each group passes their sheet to another group. The new group builds upon the ideas received, either by adding new ideas or expanding on the existing ones.

Step 4_Discussion and Sharing:
Bring all participants together and have each group present their most innovative or feasible ideas. Facilitate a discussion on how these ideas can be implemented in real-world maritime spatial planning. Summarize the key ideas and write them down!

Well done !

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C. Session 3.2. Climate Resilient MSP-Climate Smart MSP

Overview of the session

Despite the acceleration of blue growth potential (due to aquaculture, wind energy, marine biotechnology and other maritime industries), environmental concerns such as overfishing, and climate change threaten established and emerging sectors. Despite these challenges, there is an opportunity to foster Sustainable Blue Economy while building resilience to climate change, creating jobs, and encouraging private sector involvement. To achieve these goals, Member States are focusing on enhancing institutional coordination mechanisms and integrating planning across sectors. There is a push **to devolve more decision-making authority to local authorities,** with the implementation of blue economy strategies for coordinated planning and regulatory oversight. But how these strategies and methodologies integrate climate resilience?

Why is this necessary? This session aims to equip participants with **the skills to develop adaptive, resilient, and flexible maritime spatial plans.**

3.2.1 Blue Economy and Climate Resilience

Recently, either globally or in the EU level, the embracing of the concept of a Blue Economy referred as a promising path for the win of the war against climate change and towards a more sustainable and resilient future. Ocean-based sectors and activities contribute around USD 2.5 trillion to the global economy and provide livelihoods for over 3 billion people[5].

Europe's blue economy is responsible for providing direct employment to 4.5 million individuals, often in areas with limited alternative job opportunities. This broad economic category includes all industries and sectors associated with the oceans, seas, and coastal areas. It covers activities that take place in the marine setting, such as shipping, fisheries, and energy production, as well as onshore sectors like ports, shipbuilding, terrestrial aquaculture and algae cultivation, and coastal tourism.

In addition to the conventional or traditional maritime sectors such as fisheries, aquaculture, ports and shipping, and coastal and maritime tourism, countries are beginning to explore new avenues for growth, including ocean-based renewable energy, deep-sea exploration, and marine biotechnology. The EU Sustainable Blue Economy Initiative promotes the sustainable management of marine resources, ensuring that fishing, aquaculture, and other resource extraction activities are conducted in a manner that does not deplete these resources. By maintaining healthy marine ecosystems, the Blue Economy supports their role in sequestering carbon (e.g., through blue carbon ecosystems like mangroves, salt marshes, and seagrasses), thus contributing to climate change mitigation.

[5] https://www.undp.org/india/blog/pursuing-blue-economy-sustainable-and-resilient-future

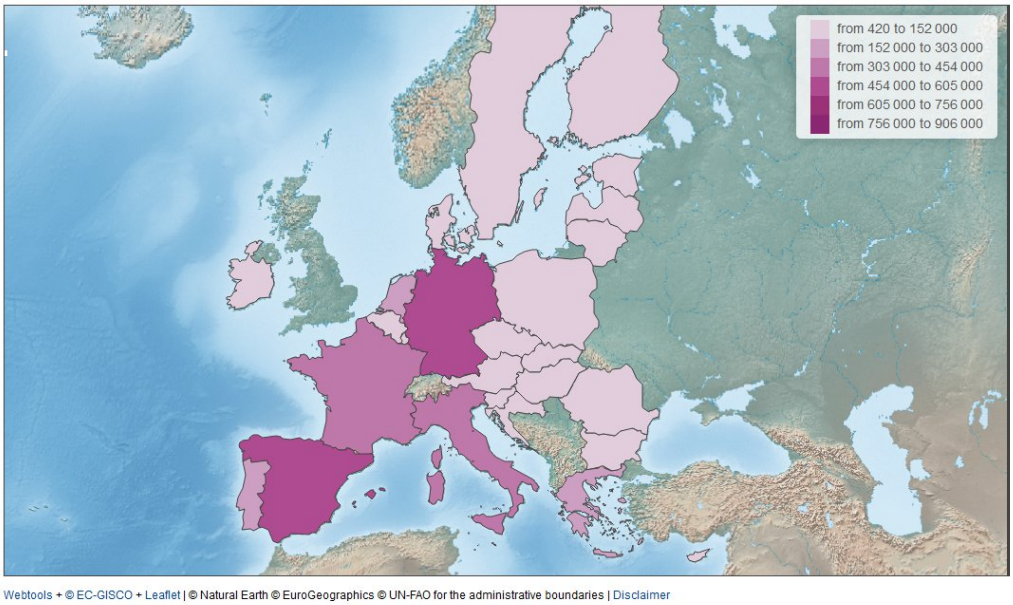

Figure 16: Employment in the Blue Economy in 2020 in the European Union. Source: https://blue-economy-observatory.ec.europa.eu/distribution-employment-blue-economy-2020_en

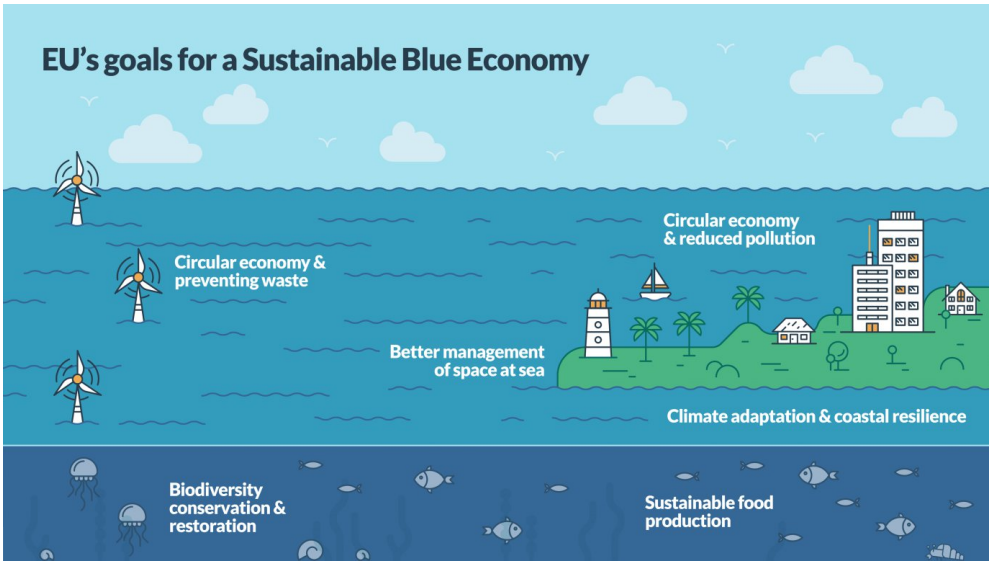

Figure 17: EU Goals for a Sustainable Blue Economy. Source: https://marine.copernicus.eu/explainers/why-ocean-important/sustainable-blue-economy

The ocean protects us by stabilising the climate.

The ocean is incredibly effective at absorbing CO2 and heat, and has warmed unabated for the last 50 years—but as a result, it has absorbed more than 90% of excess heat caused by human activity globally and around 25% of carbon dioxide (CO2) emissions.

Source: https://oceanpanel.org/the-oceans-importance/

Further Reading 18

- ✓ UNEP: Sustainable Blue Economy Finance Initiative
- ✓ UN Conference on Trade and Development: Five pillars of the ocean's economy
- ✓ OECD Topic: Ocean economy
- ✓ OECD Report: The ocean economy in 2030 (2016)
- ✓ World Bank Report: The Potential of the Blue Economy (2017)
- ✓ EU Commission: Sustainable blue economy in the EU
- ✓ EU Commission: EU Blue Economy Observatory Reports
- ✓ Copernicus Marine Service: Blue Markets
- ✓ Copernicus Marine Service: Supporting Blue Growth
- ✓ The Blue Book: Copernicus for a sustainable ocean (2019)
- ✓ Hoegh-Guldberg. O., et al. 2019. ''The Ocean as a Solution to Climate Change: Five Opportunities for Action.'' Report. Washington, DC: World Resources Institute. Available online at http://www.oceanpanel.org/climate.

3.2.2 Climate Resilient Maritime Spatial Planning

Climate Resilient Maritime Spatial Planning (CRMSP) represents a forward-thinking approach to managing and using marine spaces. It integrates the principles of sustainability, resilience to climate change, and strategic spatial planning to ensure that maritime areas can thrive economically, socially, and environmentally, despite the challenges posed by climate change. MSP implementation is a process that guides where and when human activities occur in marine areas, to reduce conflicts among sectors, promote sustainable use of marine resources, and protect the marine environment. It's true that this process comes with challenges such as data gaps, climate projection uncertainties, and the need to balance various sector interests. Ensuring inclusive stakeholder participation is also key for a successful implementation. Despite these challenges, the goal of MSP is to create a harmonious balance between human activities and marine conservation.

There are some key examples of plans taking climate change mitigation /adaptation into consideration either at national level or regional/local levels[6]. For example in the MED

[6] A pilot marine plan was developed for the Firth of Clyde in Scotland, as part of a number of pilots to inform the development of marine planning in Scotland. It considers climate change both in terms of how actions under the

area, the Macro-Project of the Bologna Charter and its Joint Action Plan (JAP) represent a coordinated effort of the Mediterranean coastal Administrations (sub-national level) to face concretely the challenges of the coastal natural risk, by adaptation policies contributing to develop conditions for the Blue Growth in the Mediterranean. The JAP identifies concrete actions for implementation of adaptation policies to the risks driven by climate change. Structural works and management solutions are identified. Works include coastal defences and closely related infrastructures and actions, like waterfronts, port arrangements, touristic assets, natural protected areas, etc.

You can ask the trainees: Can you suggest any other existing policies or regulations related to climate-resilient maritime spatial planning, particularly in your region, if any ?

Can you name the benefits of Climate Resilient MSP such as prevent life loss, enhanced climate resilience or adaptive plans ?

Further Reading 19

- ✓ https://maritime-spatial-planning.ec.europa.eu/faq/climate-change
- ✓ Hoegh-Guldberg. O., et al. 2019. ''The Ocean as a Solution to Climate Change: Five Opportunities for Action.'' Report. Washington, DC: World Resources Institute. Available online at http://www.oceanpanel.org/climate.
- ✓ UNESCO-IOC. 2021. MSPglobal Policy Brief: Climate Change and Marine Spatial Planning. Paris, UNESCO. (IOC Policy Brief no 3)
- ✓ https://thedocs.worldbank.org/en/doc/d58e097fa6a589fbca42678ff4e05cd1-0320012021/original/World-Bank-PROBLUE-2021-Climate-Informed-MSP-Factsheet-Nov-4-2021.pdf

3.2.3 Climate-Smart Maritime Spatial Planning

Plan might help mitigate the degree of anthropogenic induced climate change and also how the Plan need to be adapted to take into account the effects of climate change. Climate Change Mitigation and Adaptation Measures in the general principles and also specifically referring to measures specifically oriented to different maritime sectors.

The Pilot Draft Plan for the West Part of the Gulf of Gdańsk (PL) points out the need for adequate technical solutions for infrastructures, coping with climate change (sea level rise) is stressed. Specific technical solutions are envisaged in order to respect the restriction that the height of above-water structures, built for scientific, environmental and nature conservation needs, should not exceed 5.5 m above sea level. At the same time, the pilot plan points out the lack of knowledge on how climate change will affect the protection of marine areas in long term, and how, in turn, the protection will influence the development of coastal communities is pointed out.

Source: https://ungc-communications-assets.s3.amazonaws.com/docs/publications/Roadmap-to-Integrate-Clean-Offshore-Renewable-Energy-into-Climate-smart-Marine-Spatial-Planning.pdf

Highlights

- ✓ "Climate-smart MSP" refers to planning initiatives in the marine space which integrate and may adapt to the effects of a changing climate.
- ✓ For MSP to become "climate-smart", data and knowledge on the pathways through which climate change impacts marine ecosystems and human uses are needed at appropriate spatial scales.
- ✓ These should address the inherent uncertainties in planning scenarios themselves about climate change, particularly in relation to their ability to adapt to changing ocean conditions"

Climate-smart MSP would ideally be supported by evidence analyses, that consider how the whole ecosystem supporting each maritime sector, affected by a plan, is changing over time; that are well aligned with the implementation time-frame of each plan; and that consider how maritime sectors interact spatially. If co-designed with practitioners, such analyses could significantly improve our ability to identify where, when and how resources and natural capital changes are driven by climate change. Indeed, the requirement for MSP to be harmonized with national and sectorial Climate Change (CC) adaptation strategies is now common place. So ideally, CC analysis supporting MSP development should offer guidance about how such CC driven changes can be managed and capitalized upon, and not simply identify what will be lost.

The result would be evidence-based CC adaptation and mitigation strategies for MSP that could be supported by secondary policy mechanisms, such as climate adaptation and mitigation plans. By adopting climate-smart policies and governance structures, maritime spatial planning can effectively address the challenges posed by climate change and contribute to the sustainable management of marine resources.

Data-driven	■ It is based on the best up-to-date data and knowledge and regularly incorporates new knowledge on climate change.
Dynamic and adaptive	■ Adaptive MSP is iterative and can be modified to consider additional evidence that becomes available in the context of a changing ocean. It is flexible and open to innovation, i.e. it foresees the space for new ocean-climate technologies, e.g. charging buoys or hydrogen storage. ■ It is dynamic in the sense that it allows for a more spatially and temporally dynamic approach to planning and management — because ocean physio-chemical conditions change and marine ecosystems move and interact. ■ It interacts with and integrates systematic conservation planning — for example in designing dynamic MPAs or completely new approaches to conservation such as dynamic temporal designations.
Considers climate change scenarios	■ It considers different climate scenarios and accordingly adjusts planning decisions.
Promotes ocean-climate literacy in stakeholder engagement	■ The stakeholder engagement process as part of climate-smart MSP seeks to improve and build on climate literacy, fostering societal support and understanding for climate mitigation solutions such as ORE.
Uses an integrated approach to prioritize space for ocean-climate solutions	■ Climate-smart MSP recognises the need for climate action and prioritizes adequate space for ocean-climate mitigation and adaption solutions and innovation, especially in terms of renewable energies, green shipping, blue bio-economy (low-trophic aquaculture), sand extraction and coastal protection solutions. It does so in an integrated manner by balancing the needs of other sectors, socioeconomics, and environmental/ biodiversity objectives.
Gives priority to nature-based solutions and smart combinations	■ It prioritizes adequate space for marine protected areas — including climate refugia (areas that are relatively buffered from climate impacts), seagrass meadows and kelp forests[12] as key carbon sinks — but also nature-inclusive design of renewable energy installations and nature restoration within wind farms.
Ensures socioeconomic benefits in conjunction with coastal management	■ It considers how planning decisions that support the transition to a net zero ocean economy will affect society and coastal communities, striving to ensure equitable development, positive ripple effects and socioeconomic benefits, particularly to disadvantaged communities, e.g. new jobs and opportunities from ORE development

12. United Nations Global Compact, Seaweed as a Nature-based Climate Vision Statement (2021), available at https://unglobalcompact.org/library/5974.

Figure 18: Key features of Climate Smart MSP

Further Reading 20

✓ Varjopuro, R., Rekola, A.and K. Gee (2023). Policy Brief on Climate-smart MSP. Download from https://www.ems : https://www.emspproject.eu/wp-content/uploads/2024/01/Climate-smart-MSP-Policy-Brief-eMSP-NBSR-January-2024.pdf

✓ About the results of a global survey on MSP and climate change: https://octogroup.org/results-of-a-global-survey-on-marine-spatial-planning-and-climate-change-interview-with-catarina-frazao-santos/

Figure 19: A Climate Smart Planning Process. From Saywer et al. 2017.

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Guide for trainers

Topic	Short Description	Method	Duration	Link/File/Resources
Blue Economy and Climate Resilience	How do you think that the blue economy relates to the goal of climate resilience? Did you know about the key priorities of EU sustainable Economy?	Lecture/Discussion Q/A	1 hour	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0240 https://blue-economy-observatory.ec.europa.eu/eu-blue-economy-sectors_en
Climate Resilient MSP	What is climate informed MSP? Can you name the benefits of Climate Resilient MSP? Who needs to be informed about CRMSP?	Invited Speaker	1 hour	UNESCO-IOC. 2021. MSPglobal Policy Brief: Climate Change and Marine Spatial Planning. Paris, UNESCO. (IOC Policy Brief no 3) https://thedocs.worldbank.org/en/doc/d58e097fa6a589fbca42678ff4e05cd1-0320012021/original/World-Bank-PROBLUE-2021-Climate-Informed-MSP-Factsheet-Nov-4-2021.pdf
Climate-Smart MSP	What is climate -smart MSP? Strategies and methodologies for flexible MSP Climate Change and future scenarios Comprehensive framework for climate smart MSP	Q/A	1 hour	https://thedocs.worldbank.org/en/doc/d58e097fa6a589fbca42678ff4e05cd1-0320012021/original/World-Bank-PROBLUE-2021-Climate-Informed-MSP-Factsheet-Nov-4-2021.pdf https://ungc-communications-assets.s3.amazonaws.com/docs/publications/_Blueprint%20for%20a%20Climate-Smart%20Ocean%20to%20Meet%201.5%C2%B0C.pdf

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D. Session 3.3. Ocean-climate mitigation and adaptation solutions

Overview of the session

The Session will highlight several Ocean-climate mitigation and adaptation solutions, such as the nature-based solutions, the sustainable seafood, the offshore wind parks, the zero carbon shipping and the climate-resilient ports. Ocean nature-based solutions are essential for tackling biodiversity and climate challenges. Key practices include preserving coastal ecosystems like seagrass, tidal marshes, and mangroves, potentially reducing emissions by up to 1.4 billion tons CO2 equivalent annually by 2050. Seaweed cultivation emerges as a scalable solution, with products aiding in decarbonization and carbon sequestration, offering benefits for developing countries. Ocean ecosystems also enhance coastal resilience, acting as natural barriers against flooding and erosion, while providing diverse ecosystem services.

Sustainable seafood is vital for global nutrition and food security, with responsibly managed fisheries and aquaculture offering low-carbon protein sources. Offshore Renewable Energy (ORE) represents a future clean energy source, with offshore wind, solar, wave, tide, and thermal energy offering reliable options for coastal areas. Zero-carbon shipping is crucial for reducing global greenhouse gases emissions, necessitating technological advancements for decarbonization. Lastly, climate-resilient ports are imperative for maintaining global trade, requiring strategic planning to mitigate climate-related risks.

3.3.1. Marine nature-based solutions

Marine nature-based solutions offer a crucial avenue for addressing both biodiversity and climate challenges, encompassing mitigation, adaptation, and resilience objectives. The preservation and rehabilitation of three key coastal blue carbon ecosystems - seagrass, tidal marshes, and mangroves - have the potential to slash emissions by up to 1.4 billion tons of carbon dioxide equivalent per year by 2050 (Hoegh-Guldberg et al., 2019). Furthermore, seaweed cultivation stands out as a highly scalable and promising approach within the realm of ocean solutions.

The relationship between ocean NBS and MSP is synergistic. MSP serves as an essential tool for planning and implementing ocean NBS effectively, ensuring that marine and coastal ecosystems are utilized sustainably and contribute to global efforts to combat climate change, protect biodiversity, and support sustainable development. Through careful planning and management, MSP helps in maximizing the benefits of ocean NBS, ensuring they are integrated with other maritime activities in a way that supports ecosystem health, resilience, and human well-being.

Seaweed-derived products have the potential to make a substantial contribution to decarbonizing the economy and carbon sequestration efforts, as highlighted by Cai et al. (2021). These products also offer notable advantages for developing nations, as emphasized by the 2021 UN Global Compact. Marine ecosystems play a crucial role in enhancing coastal and social resilience by serving as cost-effective seawalls that combat coastal flooding and shoreline erosion, as outlined by UNEP (2020). Additionally, these ecosystems provide a wide array of ecosystem services and opportunities for transitioning livelihoods in the face of climate change.

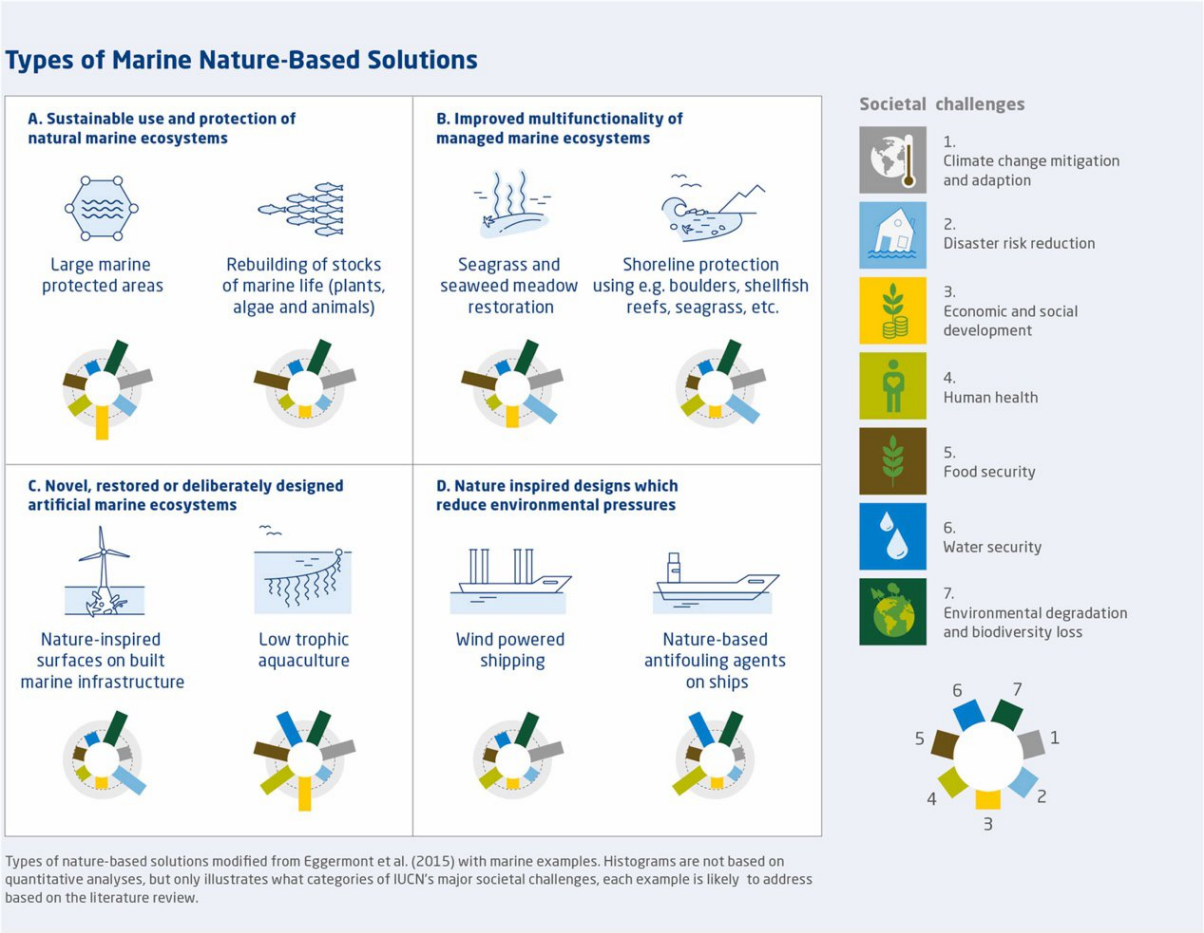
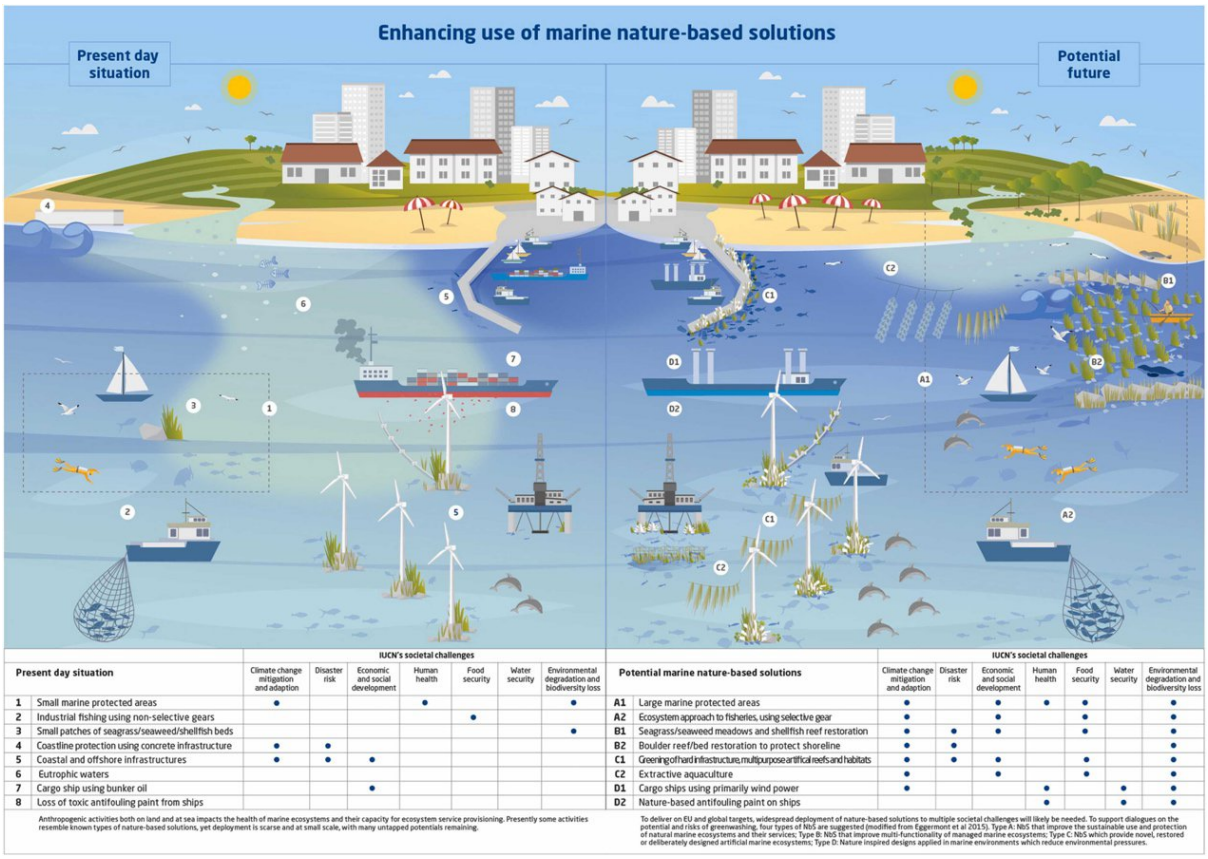


Figure 20: Types of marine nature-based solutions. Source: Riisager-Simonsen et al. (2022)



Present day situation		IUCN's societal challenges: Climate change mitigation and adaption	Disaster risk	Economic and social development	Human health	Food security	Water security	Environmental degradation and biodiversity loss
1	Small marine protected areas	•			•			•
2	Industrial fishing using non-selective gears					•		
3	Small patches of seagrass/seaweed/shellfish beds							•
4	Coastline protection using concrete infrastructure	•	•					
5	Coastal and offshore infrastructures	•	•	•				
6	Eutrophic waters							
7	Cargo ship using bunker oil			•				
8	Loss of toxic antifouling paint from ships							

Anthropogenic activities both on land and at sea impacts the health of marine ecosystems and their capacity for ecosystem service provisioning. Presently some activities resemble known types of nature-based solutions, yet deployment is scarse and at small scale, with many untapped potentials remaining.

Potential marine nature-based solutions		IUCN's societal challenges: Climate change mitigation and adaption	Disaster risk	Economic and social development	Human health	Food security	Water security	Environmental degradation and biodiversity loss
A1	Large marine protected areas	•		•	•	•		•
A2	Ecosystem approach to fisheries, using selective gear	•		•		•		•
B1	Seagrass/seaweed meadows and shellfish reef restoration	•	•	•		•		•
B2	Boulder reef/bed restoration to protect shoreline	•	•					•
C1	Greening of hard infrastructure, multipurpose artificial reefs and habitats	•	•	•		•		•
C2	Extractive aquaculture	•		•		•		•
D1	Cargo ships using primarily wind power	•			•		•	•
D2	Nature-based antifouling paint on ships				•		•	•

To deliver on EU and global targets, widespread deployment of nature-based solutions to multiple societal challenges will likely be needed. To support dialogues on the potential and risks of greenwashing, four types of NbS are suggested (modified from Eggermont et al 2015). Type A: NbS that improve the sustainable use and protection of natural marine ecosystems and their services; Type B: NbS that improve multi-functionality of managed marine ecosystems; Type C: NbS which provide novel, restored or deliberately designed artificial marine ecosystems; Type D: Nature inspired designs applied in marine environments which reduce environmental pressures.

Figure 21: Enhancing use of marine nature-based solutions, Source : Riisager-Simonsen et al. (2022)

Further reading 21

Christian Riisager-Simonsen, Gianna Fabi, Luc van Hoof, Noél Holmgren, Giovanna Marino, Dennis Lisbjerg, (2022), Marine nature-based solutions: Where societal challenges and ecosystem requirements meet the potential of our oceans, Marine Policy, Volume 144, 105198, ISSN 0308-597X, https://doi.org/10.1016/j.marpol.2022.105198

O. Hoegh-Guldberg et al., The human imperative of stabilizing global climate change at 1.5°C. Science 365,eaaw6974 (2019). DOI:10.1126/science.aaw6974

Cai, J., Lovatelli, S., Stankus, A. & Zhou, X. 2021. Seaweed revolution: where is the next milestone? FAO Aquaculture Newsletter, 63. pp. 13–16. www.fao.org/3/cb4850en/cb4850en.pdf#page=13

3.3.2. Sustainable seafood

Food sourced from the sea and the oceans plays a crucial role in nourishing a growing global population and ensuring food security, given its high nutritional value and growth potential, as highlighted by Costello et al. (2020). Fish obtained from sustainably managed fisheries and aquaculture is recognized for having one of the lowest carbon footprints among animal-based products, as noted by Barange et al. (2018). Seafood serves as a significant source of animal protein for over 3.3 billion individuals, constituting at least 20% of their average per capita intake, according to FAO (2020).

The greenhouse gases emissions from fisheries and aquaculture globally are estimated to be approximately 7% of those from agriculture, with fishing vessels accounting for a significant portion (around 0.5% of total global CO2 emissions in 2012). Small-scale fisheries are believed to supply nearly half of the world's seafood, playing a critical role in ensuring food security and nutrition, especially in coastal communities within low-income, food-deficit countries, as highlighted by Hicks (2019)

Further reading 22

Costello, C., Cao, L., Gelcich, S. *et al.* The future of food from the sea. *Nature* 588, 95–100 (2020). https://doi.org/10.1038/s41586-020-2616-y

Barange, M., Bahri, T., Beveridge, M.C.M., Cochrane, K.L., Funge-Smith, S. &Poulain, F., eds. 2018. Impacts of climate change on fisheries and aquaculture: synthesis of current knowledge,adaptation and mitigation options.FAO Fisheries and Aquaculture Technical Paper No. 627. Rome, FAO. 628 pp.(16), Available at: https://www.researchgate.net/publication/325871167_Impacts_of_Climate_Change_on_Fisheries_and_Aquaculture_Synthesis_of_Current_Knowledge_Adaptation_and_Mitigation_Options#fullTextFileContent [accessed Mar 01 2024].

Hicks (2019) Hicks, C.C., Cohen, P.J., Graham, N.A.J. *et al.* Harnessing global fisheries to tackle micronutrient deficiencies. *Nature* 574, 95–98 (2019). https://doi.org/10.1038/s41586-019-1592-6

3.3.3. Offshore renewable energy (ORE)

Offshore Renewable Energy (ORE) is poised to play a significant role in the future clean energy landscape, as indicated by Hoegh-Guldberg et al. (2019). The potential for growth in offshore wind energy production alone is vast, as highlighted by GWEC (2021). Emerging ORE sources like offshore solar, wave, tide, and thermal energy offer reliable and flexible energy solutions for coastal regions. Scaling up capacity for energy efficiency and renewable energy generation can yield substantial co-benefits in terms of climate change mitigation and adaptation, as well as reducing reliance on energy imports and associated costs. This is particularly crucial for countries experiencing prolonged disruptions in their supply chains. Strategic planning and risk assessment are essential to ensure that ORE projects are sited in areas that minimize impacts on biodiversity hotspots.

Further Reading 23

O. Hoegh-Guldberg *et al.*,The human imperative of stabilizing global climate change at 1.5°C.Science365,eaaw6974(2019). DOI:10.1126/science.aaw6974

3.3.4. Zero-carbon shipping

Maritime transport serves as a vital enabler of international trade and economic development on a global scale. Despite being one of the most energy-efficient modes of transport, shipping is responsible for roughly 3% of global greenhouse gas emissions, as reported by the IMO in 2020. Additionally, it emits approximately 15% of some of the world's key air pollutants annually. While advancements in technology aimed at decarbonizing maritime transport are underway, it is imperative to scale up these efforts to maintain connectivity and bolster economic growth.

3.3.5. Climate Resilient ports

Ports play a vital role in facilitating global trade-driven development by providing access to worldwide markets and supply chains. They are essential for maritime transport and support various economic activities in coastal areas, such as fisheries. However, ports face a range of climate-related risks, including heatwaves, extreme winds, and precipitation, with rising sea levels and associated extreme sea levels presenting a significant and escalating threat, as highlighted by the IPCC (2019). Given the pivotal function of ports in the global trade system and their susceptibility to climate-related damage, disruptions, and delays, bolstering their climate resilience is a matter of strategic socio-economic significance.

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Guide for trainers				
Topic	**Short Description**	**Method**	**Duration**	**Link/File/Resources**
Marine Nature-Based Solutions	What are nature-based solutions at sea? Protecting coastlines and communities with nature-based solutions How NBSs are linked with Marine Protected areas? Focus on seagrasses, tidal marshes, mangroves, and seaweed cultivation.	Q/A Presentation	15 minutes	https://aquadocs.org/bitstream/handle/1834/42245/375721eng.pdf?sequence=1 https://www.arup.com/perspectives/protecting-coastlines-and-communities-with-nature-based-solutions
Sustainable Seafood	Discussion on the role of sustainably sourced seafood in global nutrition and food security. Insights into the carbon footprint of fisheries and aquaculture.	Q/A	15 minutes	The State of World Fisheries and Aquaculture 2020
Offshore Renewable Energy (ORE)	Exploration of ORE as a future clean energy source. Discussion on offshore wind, solar, wave, tide, and thermal energy.	Presentation	20 minutes	Global Wind Energy Council - GWEC 2021 Report
Zero-Carbon Shipping	Examination of the significance of maritime transport and its impact on global emissions. Discussion on the advancements in technology for decarbonization.	Q/A	15 minutes	International Maritime Organization - IMO 2020 GHG Emissions Report
Climate-Resilient Ports	Understanding the climate-related risks faced by ports and the importance of enhancing their climate resilience for global trade.	Presentation	20 minutes	IPCC Special Report on the Ocean and Cryosphere in a Changing Climate

Quiz

1.Which of the following is NOT considered a coastal blue carbon ecosystem?
A.Coral Reefs
B.Mangroves
C.Seagrass
D.Tidal Marshes

2.What are ocean nature-based solutions (NBS) primarily aiming at?
A. Increasing maritime traffic efficiency
B. Addressing biodiversity and climate challenges
C. Enhancing deep-sea mining techniques
D. Promoting international maritime trade

3. Sustainable seafood contributes to food security by providing:
A. A high potential for job creation in coastal communities.
B. Low-carbon protein sources from responsibly managed fisheries.
C. The primary source of vitamins and minerals for human diets.
D. An alternative to freshwater resources.

4.Climate-resilient ports are essential for:
A. Decreasing the operational costs of shipping companies
B. Maintaining global trade and mitigating climate-related risks
C. Expanding the recreational use of port areas
D. Increasing the speed of cargo handling operations

5. What is the primary goal of Climate Resilient Maritime Spatial Planning (CRMSP)?
A.To increase the profitability of marine industries
B.To ensure maritime areas thrive economically, socially, and environmentally despite climate change
C.To limit human activities in marine areas
D.To promote the use of marine resources for industrial purposes only

6. Climate-informed MSP aims to:
A. Disregard climate change impacts on marine ecosystems
B. Only focus on immediate economic gains
C. Adapt to changing ocean conditions and manage CC driven changes
D. Avoid stakeholder participation in planning processes

7. An effective CRMSP process should ideally include:
A. Only top-down decision-making
B. Exclusive focus on short-term economic benefits
C. Stakeholder participation and multi-sectoral integration
D. Ignoring climate change adaptation and mitigation strategies

8. How to promote a climate informed MSP during the planning phase ?

A. Using climate and disaster risk assessments to identify potential areas where people, built assets, and ecosystems (and fisheries) are more vulnerable to climate impacts
B. Mainstream practices such as nature-based solutions, blue ports and zoning for climate mitigation and adaptation actions
C. Include local stakeholders and communities to evaluate and validate CC impacts, and propose climate change adaptation and mitigation actions.
D. Consider the synergistic impacts of a warming ocean, acidification and lower oxygen levels where possible.
E. All the above
F. None of the above

1. Link actions and phase of MSP (Choose among : a. Planning, b.Implementation, c. Monitoring and Evaluation)

Action	Phase
Consider potential economic opportunities arising from decarbonized blue investments, including offshore wind	
Consider potential economic opportunities arising from decarbonized blue investments as drivers of revenue through international carbon markets.	
Include climate indicators along with tracking climate co-benefits	
Monitor indicators	
Include local stakeholders and communities to evaluate and validate historical climate change	
Vulnerability assessment of places, built assets and ecosystems	

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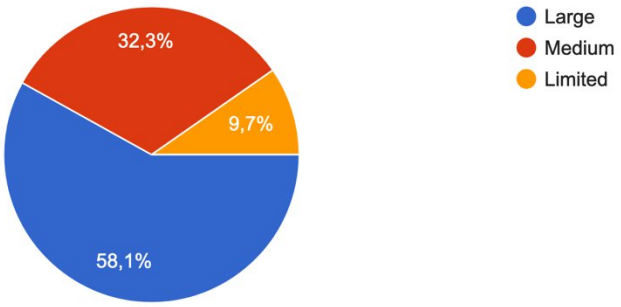
Part 2. Appendices

Appendix A presents the results of the survey used to identify knowledge gaps and training requirements on MSP of national/regional/local staff. Appendix B presents the reporting requirements from the REGINA-MSP partners after the realization of their national training on MSP.

Appendix A. Key results of the survey addressing to regional and local staff

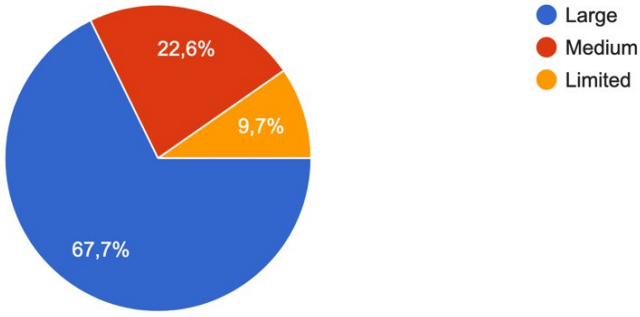
3. To what extent do you think training in MSP could help you in your day-to-day work ?This question is required.

31 απαντήσεις



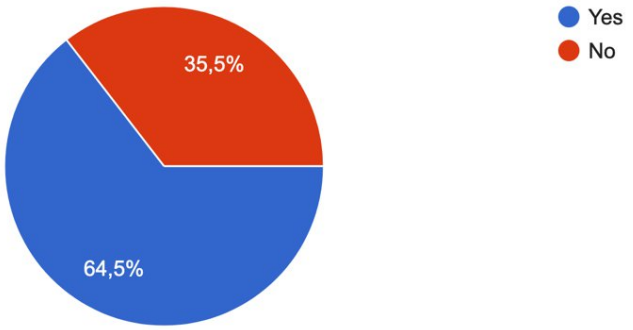
4. To what extent do you think training in MSP could help you collaborate more effectively with other stakeholders in your region/municipality/locality?

31 απαντήσεις



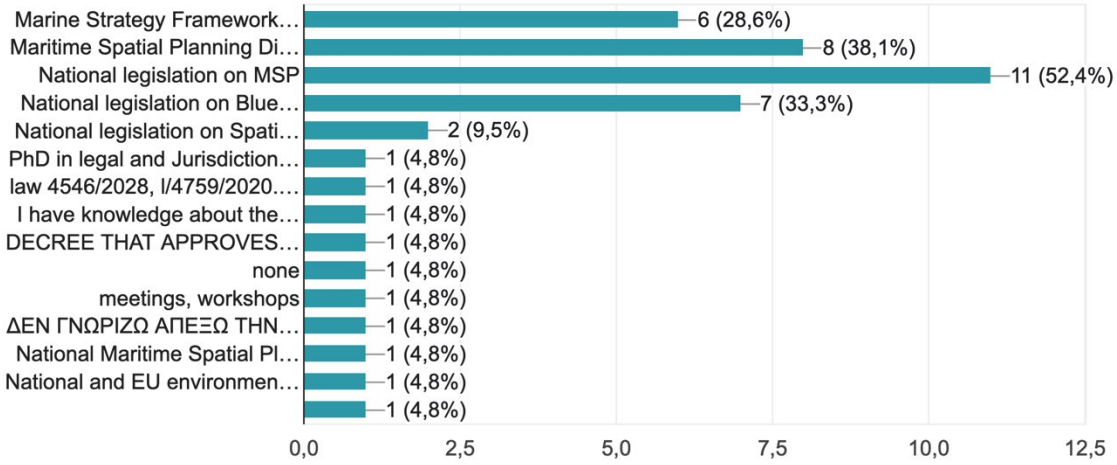
5. Are you familiar with concepts and legal framework (European, national, regional..) regarding Maritime Spatial Planning ?

31 απαντήσεις



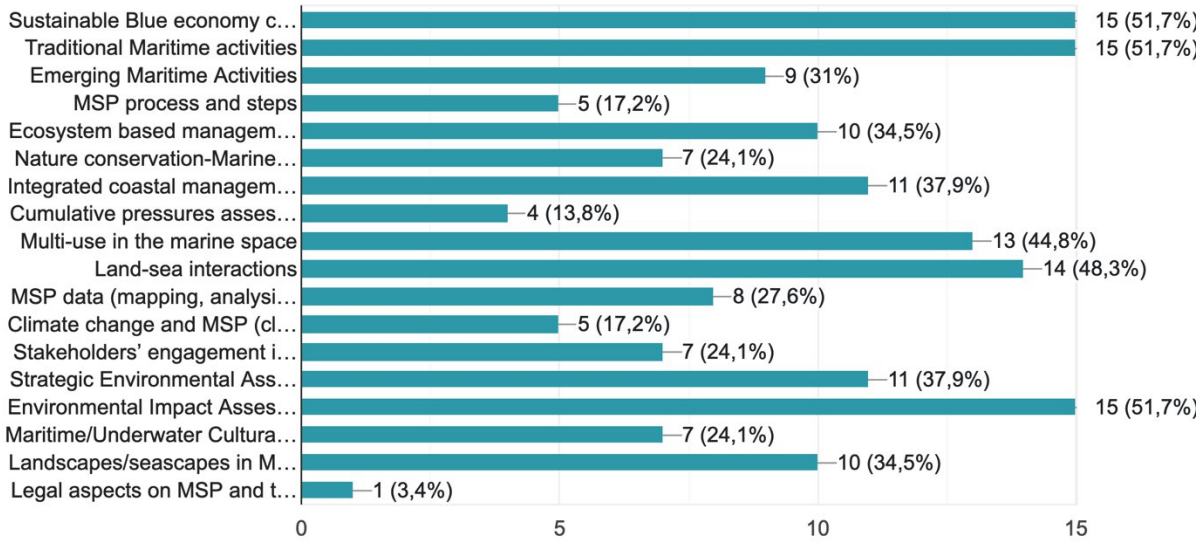
6. If you answered "yes" to the previous question, could you provide some examples?

21 απαντήσεις



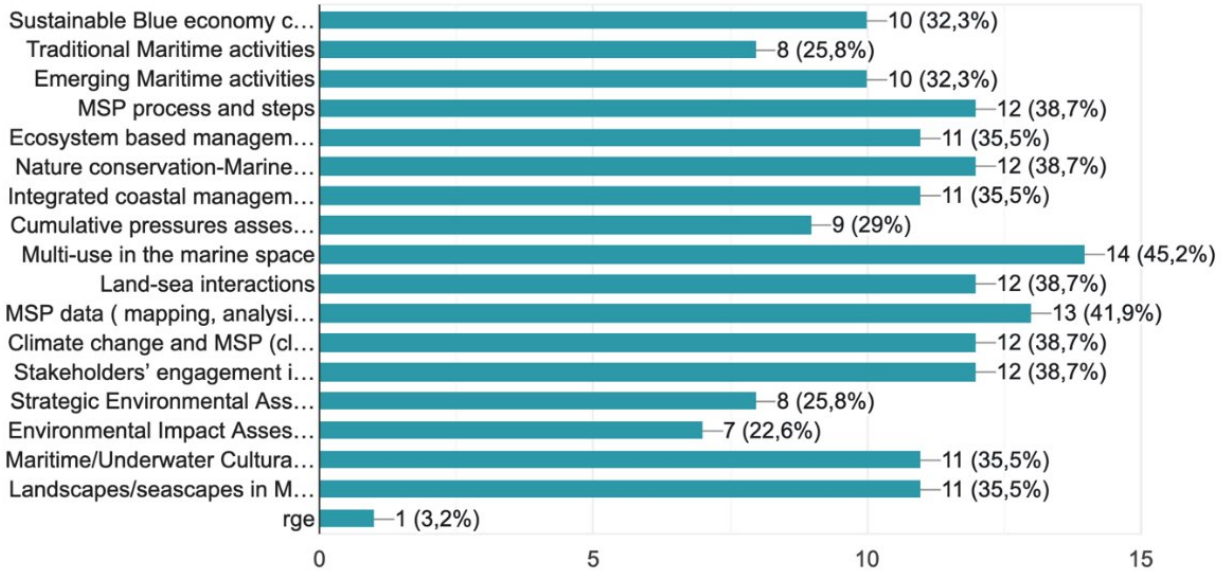
7. What are your current knowledge and skills in marine planning and management and blue economy? What areas (topics e.g EBM) do you feel confident in?

29 απαντήσεις



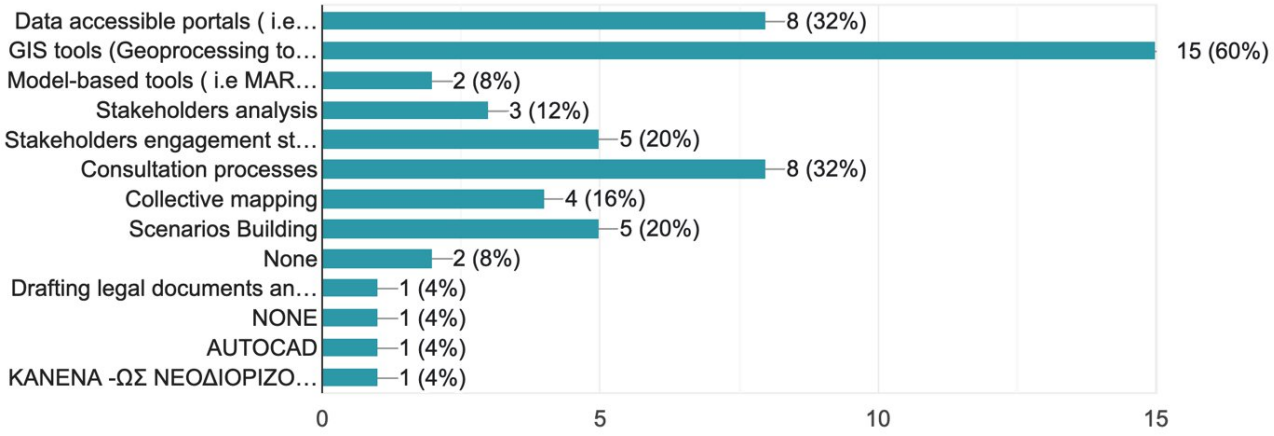
8. What specific topics or areas of maritime spatial planning do you feel you need more training in?

31 απαντήσεις



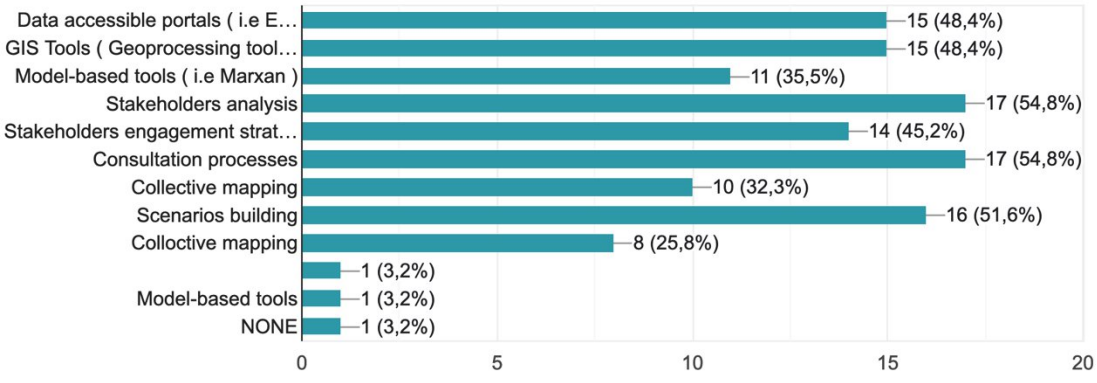
9. What approaches, tools and techniques do you currently use in your work related to maritime spatial planning?

25 απαντήσεις



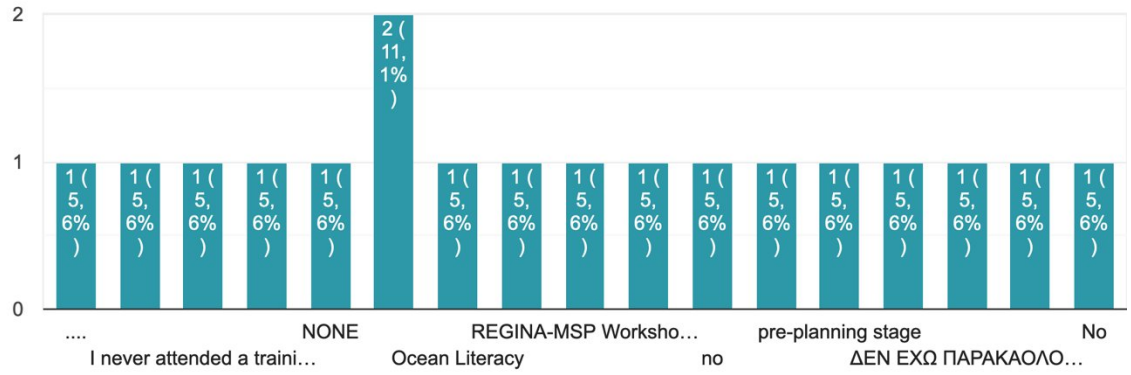
10. What are the approaches, tools or techniques that you would like to learn more about ?

31 απαντήσεις



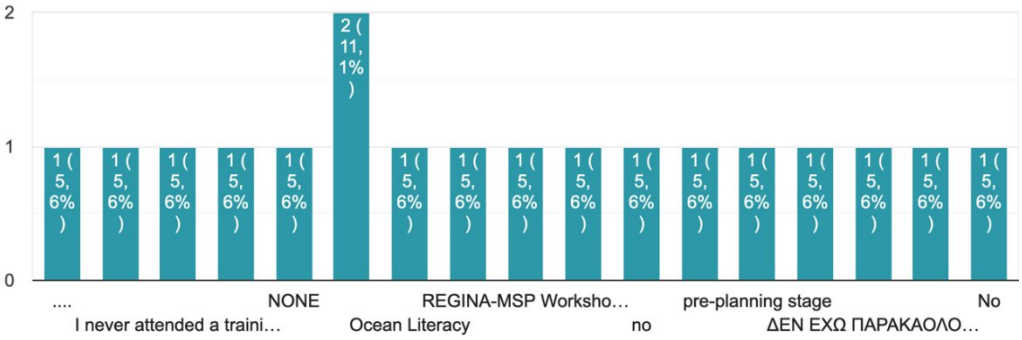
11a. If you have already attended a training programme or workshop(s) related to MSP, what did you find most useful ?

18 απαντήσεις



11a. If you have already attended a training programme or workshop(s) related to MSP, what did you find most useful ?

18 απαντήσεις



11b. If you have already attended a training programme or workshop(s) related to MSP, what areas (topics) do you feel you need more training in?

11 responses:

1. Emerging OWFs allocation methodology.
2. Financial and economic resources to implement measures, c.innovative and technological new activities
3. Best practices
4. Good practices, CoP
5. Good practices, CoP
6. REGINA-MSP workshop on Ocean Literacy / REGINA-MSP Workshop on GIS and Geoportals

7. to relate and adjust the MSP process -unclear understanding on the role of various stakeholders
8. none
9. GIS, stakeholder engagement
10. Stakeholders analysis
11. MSP on the paper

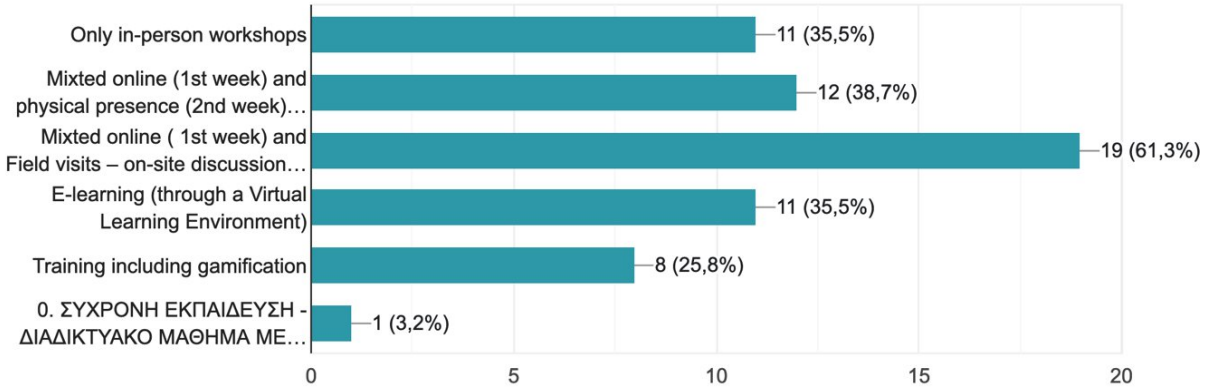
Please refer to specific challenges or issues related to MSP in your region/municipality/locality that you would like to see addressed in a training course. e.g interactions between maritime uses or coexistence of maritime uses etc.:

22 responses

1. Conflicts management and specific solutions β.Desalination c. OWF and its impact d. Underwater noise e.prospective mapping of SEABED and Its potentiality
2. Database 2. How landscape is included/protected/affected
3. None
4. Conflicts between protected areas and commercial / industrial uses
5. new emerging uses; coexistence of maritime uses; conflicts between maritime uses.
6. WASTE WATER 2. ANCHORING 3.INTERACTION COAST-MARITIME USES
7. Interactions between professionals of the sea
8. development of entrepreneurship and MSP, new investments 2. MSP and MCH/UCH 3. Land spatial planning completed before MSP 4.Monitoring of coasts and sea and maritime data
9. Relationship with the (over-) development of touristic uses and relationship with energy uses in the coastal and marine area (offshore wind farms, pipeline crossings, cables etc.)
10. Coastal area (land) use, overtourism
11. MPS in Natura 2000 areas and also MSP in densely built-up tourist areas
12. communities' goals and gains
13. I don't know
14. Noise control, Quiet Areas
15. managing conflicts,
16. multi uses,
17. coexistence of maritime uses,
18. Coexistence and government issues
19. Interactions between MSP and offshore wind and solar farms allocation, protection of habitats of protected species (eg seals), interactions between maritime uses
20. Knowledge of adequate policies to be adopted and followed for a more efficient response to the challenges met during our every-day tasks.

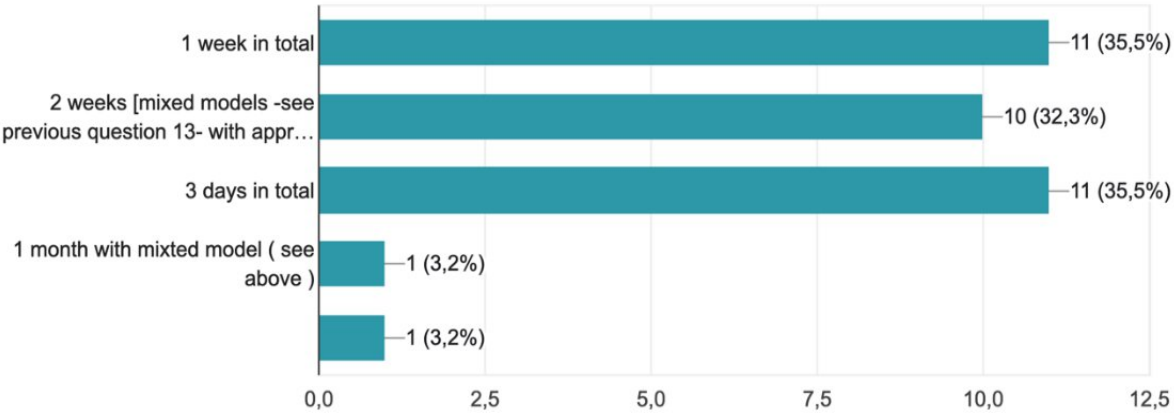
13. What format or delivery method do you think would be most effective for a training programme on MSP?

31 απαντήσεις



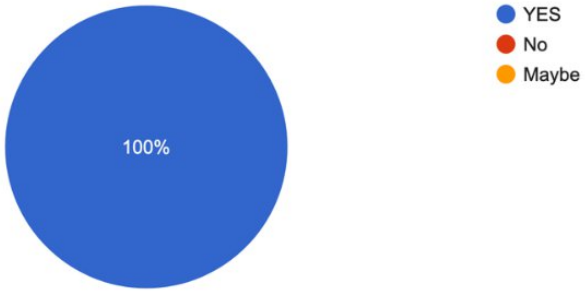
14. What would be the most suitable duration of the MSP training programme?

31 απαντήσεις



15. Would you be interested in participating in the REGINA-MSP training programme on MSP and blue economy ?

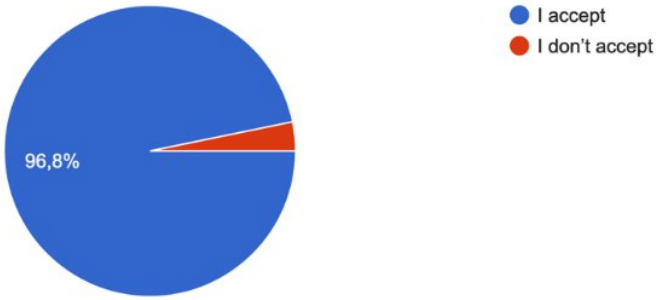
5 απαντήσεις



CONSENT

By participating in this survey, you are aware that, within the framework of the REGINA-MSP project, partners entities will process the data in complian...f personal data and on the free movement of data.

31 απαντήσεις



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Appendix B. Reporting requirements from the REGINA-MSP partners, after the realisation of their proper national training on MSP.

Organising training

Please refer to details about different tasks for organizing the training cycle (invitation letters sent, invited speakers, field-visits organized).

Welcome Letter (if any)
Training Calendar
A snapshot of the training
Lecturers:
Number of participants enrolled:
Number of participants in total :

Module	**SESSION**	**Trainer/s**	**NUMBER OF Participants**
Module 1 Maritime Spatial Planning, Policies, Concepts and Key Challenges.	SESSION 1		
	SESSION 2		
	SESSION 3		
	SESSION 4		
Module 2 Understanding MSP across different scales and actors	SESSION 1		
	SESSION 2		
	SESSION 3		
	SESSION 4		
Module 3 Climate Smart MSP	SESSION 1		
	SESSION 2		
	SESSION 3		
	SESSION 4		

Synopsis of training activities

In this section you should :

1. summarize the key activities for delivering the training modules
2. submit the list of participants
3. provide relevant documentation (photos, videos etc.).

Module 1 : Maritime Spatial Planning Policies, Concepts and Key Challenges

For all sessions, key information must be collected and reported to have a synopsis of the Training activities

Module	SESSION	Trainer /Invited Speaker	New topics added to the presentation	Number of Trainees
Maritime Spatial Planning Policies, Concepts and Key Challenges	Ice-breaking activity			
	1. Understanding the key drivers and principles of MSP			
	2. Key Challenges of Maritime Spatial Planning Experiences of MSPlans already in place			
	3. Soft and hard Multi-use of the sea (MUS) and MSP - Landscapes/Seascapes in MSP- Maritime/Underwater Cultural Heritage in MSP.			

Module 2. Understanding MSP across different scales and actors
For all sessions, key information will be collected and reported to have a synopsis of Training activities

Module	SESSION	Trainer	New topics added to the presentation	Number of Trainees
Module 2. Understanding MSP across different scales and actors	Ice-breaking activity			
	Session 2.1 Stakeholders' Analysis and Engagement in MSP			
	Session 2.2 How to implement a participatory MS planning process			
	Session 2.3 MSP Data and Tools across scales			

Module 3. Climate-Smart MSP, Integrating Climate Resilience in MSP
For all sessions, key information must be collected and reported so as to have a synopsis of the Training activities.

Module	SESSION	Trainer /Invited Speaker	New topics added to the presentation	Number of Trainees
Climate-Smart MSP Integrating Climate Resilience in MSP				
	Understanding Climate Impacts on Marine Ecosystems and predicting future impacts.			
	Climate Resilient MSP-Climate Smart MSP			
	Ocean-climate mitigation and adaptation solutions			

SCREENSHOTS OF SESSIONS

Please add recorded data or screenshots per training session delivered online. At least one screenshot at the beginning of the training session and another during it. Be careful so as the number of the participating trainees be visible.

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LIST OF PARTICIPANTS TO FILL IN (exemple below)

Name	Surname	Organisation	E-mail address

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Feedback from the Regina-MSP trainees

Please ask participants, if you wish, to evaluate the process by filling the following assessment questionnaire.

	ASSESSMENT QUESTIONNAIRE	STRONGLY AGREE	AGREE	DON'T KNOW	DISAGREE	STRONGLY DISAGREE
	Assessment of the COURSE					
1	The training was well structured					
2	The training topics were interesting					
3	The training was too demanding					
4	The material provided is well structured, interesting and helpful					
5	The field visits were interesting and well planned					
6	The invited guests were appropriately chosen					
7	I have learned a lot during this course					
8	I found Module 1 interesting					
9	I found Module 2 interesting					
10	I found Module 3 interesting					
		VERY POSITIVE	POSITIVE	NEUTRAL	NEGATIVE	VERY NEGATIVE
	If you wish, please add here any comment for this course related to its structure and organisation					
	Assessment of the TOPICS of the course					
10	All topics of the course were useful					
11	All topics of the course presented in an easy and comprehensible way					
12	All topics of the course had been too complicated for me					
13	All topics of the course stimulated my intellectual curiosity					
14	All topics included activities and case studies helped me to better understand the subject					

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15	Please refer to the topic you are more inspired by					
16	Please refer to the topic you found less interesting					
17	My general evaluation of the topics discussed is:	VERY POSITIVE	POSITIVE	NEUTRAL	NEGATIVE	VERY NEGATIVE

Additional Remarks and feedback from the REGINA partners

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For more info please contact:

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Technopôle Brest Iroise
155 rue Pierre Bouguer
29 280 Plouzané, France

B. REGINA-MSP PROJECT PARTNER CONTACT

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