

Marine Spatial Planning in Europe: Opportunities for Aquaculture

Authors: Lucy Greenhill & Paul Tett

Scottish Association for Marine Science

10 May 2018

Abstract

This text is part of a Masters-level course in 'Planning and Managing the Use of Space for Aquaculture' made by the AquaSpace project. It introduces the concept of Marine Spatial Planning, which is increasingly being implemented as an integrated framework for the planning and management of marine activities. The text describes MSP, the early stages of its implementation in Europe under the Maritime Spatial Planning Framework Directive, and discusses the opportunities offered by, and the challenges to, MSP in the specific context of aquaculture.

1	Unit Study Guide and Learning Outcomes	2
2	What is MSP?	2
3	The MSP Process	4
4	MSP in Europe – the EU Maritime Spatial Planning Framework Directive.....	5
5	Aquaculture in Europe	8
6	Planning Challenges and the potential role of MSP in Aquaculture.....	9
7	Limitations and Challenges in MSP and the MSPFD.....	11
8	Conclusions	15
9	Exercises and reading.....	16
10	Self-Assessment Questions	16
11	References.....	17

This document may be cited as: Greenhill, L. and Tett, P. (2018) Marine Spatial Planning in Europe: Opportunities for Aquaculture. AquaSpace project (H2020 no 633476) document and Laurence Mee Centre working paper, 18 pp. SAMS, Oban, Scotland.

1 Unit Study Guide and Learning Outcomes

This text was written during the H2020 Aquaspace project (2015-2018, contract no. 633476) for a Masters-level course in 'Planning and Managing the Use of Space for Aquaculture'. The course consists of a number of units; this unit provides an introduction to the principles of Marine Spatial Planning (MSP).

The unit comprises a text (this document), a set of slides, required further reading, and some exercises. The text provides an introduction to the slides, which can be used as the basis for a classroom lecture about MSP.

When you have completed the unit, you should be able to:

- explain what MSP is, describe the process for its implementation, and contrast its key features with those of traditional sectoral planning approaches
- describe the drivers for MSP in Europe, including policy and increasing demands on sea space
- describe the progress of MSP in at least one EU Member State and the context-specific factors which may influence its character
- explain and critically discuss how MSP could help to address the planning challenges faced by the aquaculture sector in Europe
- Critically discuss at least one challenge facing an EU Member State in implementing MSP

2 What is MSP?

"Marine spatial planning (MSP) is a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process."
(Ehler, 2014)

"'Maritime spatial planning' means 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;"

Directive 2014/89/EU, article 3.(2)

Marine (or Maritime) Spatial planning (MSP) is a spatially-oriented process that supports management of multiple and competing demands on marine resources, to address conflicts, while considering economic, social and ecological objectives. The character of MSP in specific regions varies widely according to factors such as the socio-political context, the emphasis placed on specific sectors and interests, the terminology used, whether it is legally binding, the institutional framework of planning and its relationship to other regulatory functions, the resources available for the planning process, and the extent to which marine planning has historically been used (Greenhill, 2018). An assessment of how different approaches to MSP have developed to achieve different aims in different contexts and how these relate to theoretical ideals and constructs of MSP are presented in Jones et al., (2016).

A key output of MSP is the allocation of space for different marine uses, to enable the development maritime sectors, optimising marine resource use while mitigating conflict. Focus on MSP has increased due to increasing demand for marine resources and space at sea, such as offshore wind, aquaculture, tourism etc. and the resulting potential for conflicts, and in order to manage human activities within social and ecological limits. By identifying of zones for development, along with policies on how activities should take place, MSP guides the licensing and decision making processes of specific projects, where these are applicable.

MSP is representative of the holistic approaches which are increasingly important in order to address competing demands of growing and diversifying maritime economies within interdependent socio-ecological systems. It emerged in response to the recognition that prevalent sector-specific and fragmented management approaches were largely ineffective, and that there needed to be progress towards ecosystem-based management (Ehler, 2018). It is seen as a tool to support delivery of the inter-dependent and diverse UN Sustainable Development Goals (SDGs) in relation to the marine environment.

The end result of an MSP process is a plan, which might include maps and policies. In addition to this outcome, the process itself is important. It should include public engagement. In this as well, as in the aim of ecosystem-based management, the key characteristics of MSP (Table 1) can be seen as implementation of the Ecosystem Approach (described in unit 2).

Table 1: Characteristics of MSP.

Integrated	MSP addresses the full range of sectors and interests of relevance in the marine area. This integrated and holistic approach is necessary in order to understand cumulative effects of multiple activities, and to enable balancing of different priorities in order to manage conflicts where there is competition.
Ecosystem-based	MSP must be ecosystem-based, meaning that there is fundamental understanding that the ecosystem, its structure and functioning, must be maintained in order to provide the numerous ‘goods and services’ utilized by humankind. This requires a systems approach to understand the interconnectedness of different elements of the ecosystem and between various human activities, and should ensure that environmental considerations are integrated into planning and decision making in relation to marine activities at the earliest stage.
Forward-looking	The MSP process involves understanding the various policies which are applicable to an area, the ambitions of key sectors, the ecological concerns, and looking ahead to how these can be developed and managed appropriately. This is different to current sector-specific planning which is often reactive to the drive of a particular sector or industry, and can result in conflicts arising later in the process where they are more difficult to address.
Participatory	A key principle of MSP is public participation, in order to enable public negotiation and decision making regarding resource use. It also enables interaction between actors, industry, governments, NGOs and others, which supports exploring the complexity of challenges that exist around conflicts, between users or in relation to social / ecological implications, and developing innovative solutions beyond traditional institutional approaches.

	The adaptive management cycle of MSP provides a framework for reflection based on participation throughout the process, providing crucial feedback to inform an increasingly refined process. Such participation should be more in-depth than more traditional stakeholder engagement, which tends to be through 'consultation' on developed plans and proposals, rather than on-going interaction which can inform and shape the planning process.
Adaptive	MSP is an iterative process, and based on a programme of monitoring, reflection and feedback, the plan and process should be amended. This key principle of adaptive management is critical in enabling approaches to management to evolve and adapt, and if implemented fully, represents a significant departure from current approaches whereby monitoring (e.g. of ecological effects) is undertaken, but often without sufficient review and influence of results on amending processes.

3 The MSP Process

MSP is undertaken in different ways in different jurisdictions, but includes the general steps in Table 2.

Table 2: Steps in a Marine Spatial Planning Process.

STEP	SUMMARY
Planning the process	Establishing authority, management structure, the financial resources for planning and other administrative details.
Assessing the baseline	Defining and analysing existing conditions; gathering data in order to assess the social and ecological concerns, and whether there are current conflicts to be addressed.
Analysing future conditions	Developing an understanding of how sectors intend to develop in an area, how the ecological and social conditions may change, including due to climate change. This may include visioning exercises to understand how different sectors plan to develop, how these interact and with what implications for the ecosystem.
Preparing the plan	Setting policies, spatial and otherwise, which provide a framework for guiding decision making that will lead to the implementation of the defined plan objectives. Producing a final version of the plan that is put out to consultation, and then adopted following any necessary refinements.
Implementing and enforcing	Ensuring that decisions on activities within the area addressed by the plan are made in accordance with it, and that activities are not proposed or undertaken in a manner that contravenes the policies set out in the plan.
Monitoring and adapting	Reviewing the success of the plan, ideally based on pre-defined criteria, and adapting the plan / process based on this analysis and reflection.

These steps form a planning cycle (Figure 1), with feedback loops to each stage, which is continually informed through the engagement of stakeholders in the process. It is therefore a dynamic process, with a fixed timeframe for publication of revised plans (defined by the responsible authority but usually between 3 and 5 years), and responsive to information and experience gathered throughout the planning process.

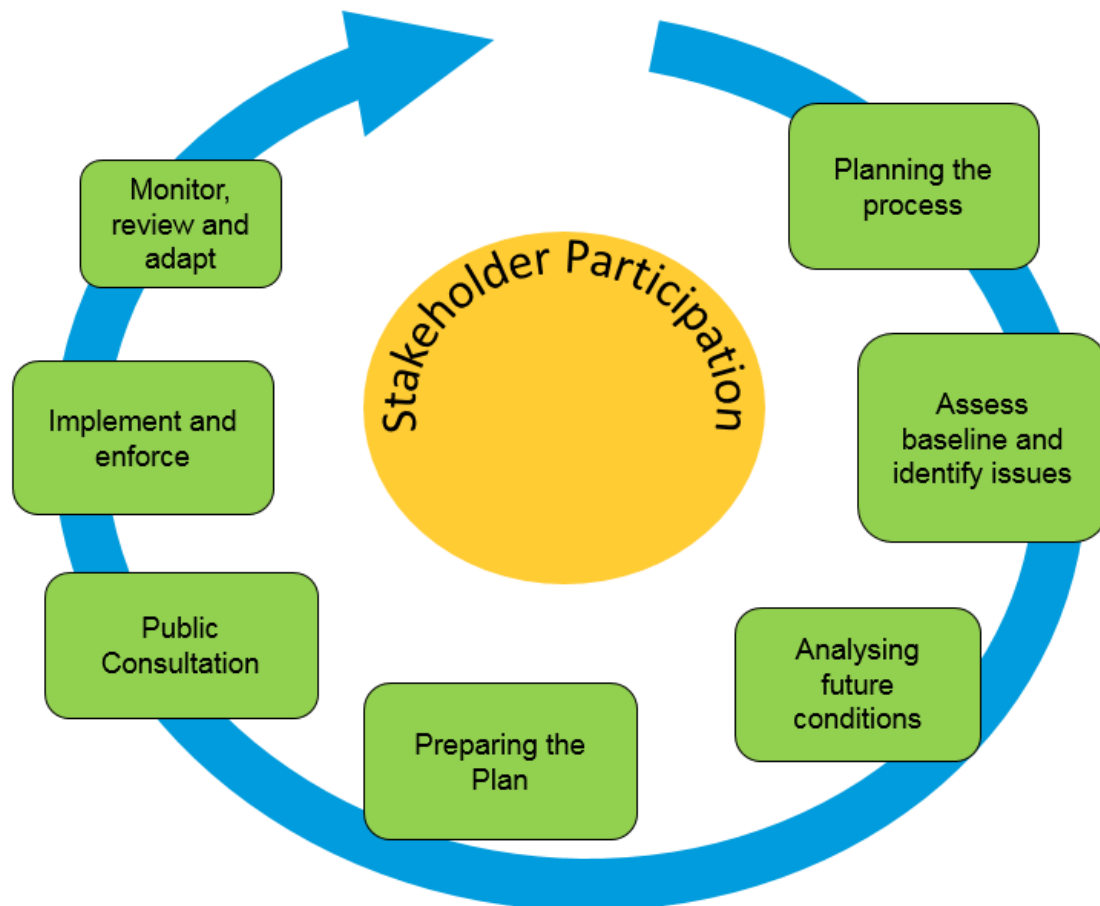


Figure 1. Overview of an MSP cycle.

4 MSP in Europe – the EU Maritime Spatial Planning Framework Directive

MSP, as described above, has been applied in some European waters for at least a decade. However, it was often ad hoc, small-scale, and focussed on single sectors (Jones et al., 2016). Since 2007, the EU has seen MSP and ICZM (Integrated Coastal Zone Management) as key components of its **Integrated Maritime Strategy** (IMP: ec.europa.eu/maritimeaffairs/policy_en), "guaranteeing [environmental] sustainability, providing legal predictability, and reduce costs for investors and operators" (European Commission, 2012). Introduced in 2014, the EU's **Maritime Spatial Planning Framework Directive** (2014/89/EU), develops this aspect of the IMP and aims (article 1) "at promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources." Box 2 provides some extracts from the Directives' *recitals* and *articles* (see Box

1 for explanation). As the recitals make clear, the Directive aims at a spatially and sectorally integrated application of the ecosystem(-based) approach.

The Directive requires Member States to implement national marine planning by 2021. Progress varies across Europe, but with extensive activity across all sea basins; the North Sea, Mediterranean, Baltic, Black Sea and Atlantic seas. MSP has advanced particularly in Germany, Netherlands and Belgium, driven by the intensity of use in these sea areas. Activity to inform MSP is progressing in the Baltic Sea, and with particular emphasis on transboundary working and collaboration, given the small sea area shared by a number of nations, including EU and non-EU states. The project BaltSeaPlan (<http://www.baltseaplan.eu/>) presents a wide range of activities undertaken in this area to inform MSP, including the “BaltSeaPlan Vision 2030”, which sets out a pan-Baltic vision of sustainable development of maritime activities in the Baltic Sea.

Current information on the status of MSP across EU Member States can be found on the European Maritime Spatial Planning Platform (<http://www.msp-platform.eu/>). This website provides an overview of marine planning in each country, along with links to other activities, projects and reports relating to MSP in these countries.

Box 1: Preliminary notes about the EU Maritime Spatial Planning Framework Directive

'A "directive" is a legislative act that sets out a goal that all EU countries must achieve. However, it is up to the individual countries to devise their own laws on how to reach these goals.' (europa.eu/european-union/eu-law/legal-acts_en). The process of doing this is called *transposition*, and it may not require new legislation in a member state if that state already has laws or regulations that satisfy the goals of the Directive.

The MSP Framework Directive was issued by the EU Council (consisting of ministers from each member state) and the elected Parliament, which are deliberative bodies at the *constitutional level* of governance. As an EU Directive it does not apply to EEA members such as Norway, in contrast for example to the MSFD - the Marine Strategy Framework Directive (2008/56/EC) which is headed 'with EEA relevance'.

Directives commence with numbered paragraphs called *recitals*. These explain the background to the legislation and the legislation's aims and objectives. The *substantive provisions* of legislation itself are contained in numbered *articles*, and in some cases, in Annexes. The MSP Framework Directive has only one short Annex; the MSFD has 8 Annexes, several of great importance.

The Directive's references to '*third*' countries are to states that are not members of the EU but which share marine waters with EU member states.

The Maritime Spatial Planning Framework Directive is often abbreviated to MSPD. However, to avoid confusion with the MSFD, we will use the acronym **MSPFD** in this document. The official version of a Directive is that published in the *Official Journal* (OJ) of the EU, and a complete reference should include OJ details. For many purposes however, a unique reference in the format year/number/organisation is sufficient, exemplified by 2014/89/EU for the MSPFD.

Box 1: extracts from

**DIRECTIVE 2014/89/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 23 July 2014
establishing a framework for maritime spatial planning**

Published in Official Journal of the European Union L 257 (28.8.2014): 135-146

(recital 2) ... an approach to ocean management and maritime governance has been developed in the Integrated Maritime Policy for the European Union ('IMP'), including, as its environmental pillar, Directive 2008/56/EC ... (recital 3) The IMP identifies maritime spatial planning as a cross-cutting policy tool enabling public authorities and stakeholders to apply a coordinated, integrated and trans-boundary approach. The application of an ecosystem-based approach will contribute to promoting the sustainable development and growth of the maritime and coastal economies and the sustainable use of marine and coastal resources. (recital 19) The main purpose of maritime spatial planning is to promote sustainable development and to identify the utilisation of maritime space for different sea uses as well as to manage spatial uses and conflicts in marine areas ...

Article 2. Scope

2.1. This Directive shall apply to marine waters of Member States, ... It shall not apply to coastal waters or parts thereof falling under a Member State's town and country planning ...

Article 5. Objectives of maritime spatial planning

5.1. When establishing and implementing maritime spatial planning, Member States shall consider economic, social and environmental aspects to support sustainable development and growth in the maritime sector, applying an ecosystem-based approach, and to promote the coexistence of relevant activities and uses.

5.2. Through their maritime spatial plans, Member States shall aim to contribute to the sustainable development of energy sectors at sea, of maritime transport, and of the fisheries and aquaculture sectors, and to the preservation, protection and improvement of the environment, including resilience to climate change impacts. In addition, Member States may pursue other objectives such as the promotion of sustainable tourism and the sustainable extraction of raw materials.

Article 6. Minimum requirements for maritime spatial planning ...

6.2 ... Member States shall:

- (a) take into account land-sea interactions;
- (b) take into account environmental, economic and social aspects, as well as safety aspects;
- (c) aim to promote coherence between maritime spatial planning and the resulting plan or plans and other processes, such as integrated coastal management or equivalent formal or informal practices;
- (d) ensure the involvement of stakeholders ...
- (e) organise the use of the best available data ...
- (f) ensure trans-boundary cooperation between Member States ...
- (g) promote cooperation with third countries ...

5 Aquaculture in Europe

The EU IMP includes a Blue Growth Strategy, within which aquaculture is a priority sector. The policy of expanding aquaculture, first mentioned in unit 1 of this module, is driven by economic interest due to the value of seafood to domestic markets of Member States as well as through export, particularly to Asian markets, however it is also influenced by concerns regarding food security, as well as increasing interest in seaweed cultivation for a range of purposes.

Drivers for growth in aquaculture include:

- Increasing demand through consumption (partly related to increasing populations and increasing focus on the health benefits of fish products)
- Higher sea food prices
- Improvements in the efficiency of aquaculture processes
- Increasing demand for seafood exports to Asia
- To reduce pressure on wild fisheries
- To provide socio-economic benefits including employment for coastal communities
- Technological advancements enabling larger sites to be developed in more exposed sites further offshore

Fisheries are also part of the IMP. The most recent reform of the Common Fisheries Policy (2013) refers specifically to the aquaculture sector, and the European Commission published Strategic Guidelines for the Sustainable Development of EU Aquaculture (European Commission, 2013). These guidelines identified priority actions needed in order for the sector to develop, including simplifying administrative procedures to minimise regulatory burden, especially for small-scale developers and co-ordinated spatial planning to designate suitable areas for aquaculture.

Under the guidelines, all Member States produced a (non-binding) Multiannual National Strategic Plan that should include measures to support the development of aquaculture, including:

- “Integrating aquaculture activities into maritime, coastal and inland spatial planning”¹, and;
- Providing “reasonable certainty for aquaculture operators in relation to access to waters and space.”

The Strategic Guidelines highlight the difficulties of taking a sector-specific approach, distinct from other maritime activities, and under new management approaches such as MSP. The Strategic Plan for each Member State is recorded and summarised online by the European Commission here: https://ec.europa.eu/fisheries/cfp/aquaculture/multiannual-national-plans_en.

The amount of space needed for current levels of marine aquaculture production is small relative to the space available (Hofherr et al. 2015), however the projected increases in aquaculture across the 27 Member States from published multiannual strategic plans equates to a 57.3% growth in aquaculture production by 2030, substantially increasing demand for space in EU waters. The development and spatial demand of aquaculture varies across Europe, according to the target species,

¹ Article 34(1)(e) of Regulation No. 1380/2013 on the Common Fisheries Policy. Online at: eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1380&from=EN.

ecological and social conditions, relative importance compared to other sectors and socio-political context. There is increasing emphasis on developing aquaculture further offshore, to move away from congested inshore areas where social and ecological concerns, as well as interaction with other sea users, limits installation. These new demands for space for aquaculture need to be considered in developing MSP processes.

6 Planning Challenges and the potential role of MSP in Aquaculture

While there is an acknowledgement at EU level that aquaculture production needs to increase, it faces a number of constraints at a national level, and expansion of the sector has not progressed as anticipated. Production by states that were EU members in 2013 decreased by around 9% between 2000 and 2013, with notable decline of nearly 26% in aquaculture output from Spain, Italy and France. In 2013, Spain and then France remained the two largest producers, followed by the United Kingdom and then Italy. However, while the overall trend of aquaculture production in the EU28 production is stagnant or declining, countries associated through the EEA (Norway and Iceland) or other collaborating nations (Turkey and the Faroe Islands) have increased growth (FAO 2017).

Planning challenges and constraints in relation to aquaculture have been assessed by the AQUASPACE project (www.aquaspace-h2020.eu), as synthesized by O'Hagan et al (2017) and Galparsoro et al (2018). Constraints vary and include competition for space, which, coupled with a lack of prioritisation, inefficient and ineffective licensing regimes; and difficulties in complying with environmental requirements, limits aquaculture development.

Other planning challenges exist in relation to public perception, since objections made in relation to applications for the installation of aquaculture facilities can prevent developments from occurring. Social acceptability of aquaculture is influenced by a number of factors, including concerns regarding environmental issues (such as impacts on wild fish populations and concern regarding discharges from aquaculture facilities), visual impacts and conflicts with other uses. The perceptions held by the public are strongly influenced by the availability of accurate information and engagement in the development of planning for aquaculture facilities, and need to be addressed through a range of education, outreach and participatory activities.

Over-complicated licensing regimes are referred to in most member states as an issue that constrains sector development. This includes unclear remits, overlapping remits and excessive bureaucracy leading to unpredictability and uncertainty in taking forward applications. In many cases there is a need to simplify administrative procedures and make them more efficient.

MSP presents a new framing for the planning and management of marine resources. As an integrated framework, marine planning presents an opportunity to review, evaluate and rationalise current approaches to the governance of marine activities, and provides a focus for making the transition away from fragmented sector-specific approaches to more co-ordinated, efficient and cost-effective resource management. MSP could provide several benefits to the development of aquaculture as described below.

6.1 Improving public perception and facilitating social license

By bringing the sector into a multi-stakeholder debate, with civil society, MSP could provide the basis for improving the public perception of aquaculture, and ultimately its social acceptability.

Dialogue through engagement and participation in planning processes can educate and inform the public regarding potential ecological and social impacts, setting out how planning decisions have been made in relation to key environmental concerns. As a two way interactive process, this also enables planners to more accurately understand the perspectives of local communities and to incorporate their concerns.

While a complex challenge requiring addressing at a range of levels, the emphasis on early and effective participation of the public in MSP processes, particularly as it takes a multi-sector and long-term view, may provide a fundamental step in developing social license to develop within a particular area.

6.2 Allocating space for aquaculture and mitigating conflict

Through identification of areas with high potential for aquaculture development, MSP can support aquaculture, guiding siting for new projects alongside other marine uses and with consideration for social and ecological constraints. Depending on the policy requirements promoting aquaculture within the region of interest, MSP could be used to identify areas for expansion of aquaculture including areas suitable for new species, new practices such as seaweed cultivation or specific areas for research and development, such as on technologies for advancement offshore, to support innovation in the sector.

As an integrated framework and with its emphasis on achieving a wide range of policy objectives, and optimising the benefits obtained from marine resources, MSP, including that implemented through the MSPFD,² is intended to support managing conflict in order to balance the interests of different sectors. The tools that could be employed to undertake MSP, such as visioning and scenario analysis can enable actors to collectively look to the future, anticipate issues and conflicts to find synergies and compromises. It could even support the development of co-location opportunities, where infrastructure is shared between multiple industries, such as the installation of aquaculture facilities around wind turbines.

6.3 Reduce uncertainty in planning processes

An overarching intention of MSP in a European context is to improve the certainty of developing and encouraging investment in maritime activities. It is therefore intended to simplify the planning and management of different activities, although this depends to what extent it interacts with existing processes. Identifying areas for aquaculture development within MSP provides a level of certainty for investors. And in framing discussion on the planning of respective sectors, MSP could provide an opportunity for proactively reviewing and integrating different layers of management, highlight overlap and redundancies, enabling simplification / rationalisation of the use of resources for cost-effective and fair planning, regulatory and licensing practices.

6.4 Adaptive management and review of processes and practice

Adaptive management is a key principle of MSP, and on-going monitoring and evaluation of planning processes enables monitoring feedback from the system, enabling collective learning and improvement as understanding increases. The adaptive cycle and review of planning could enable response, in terms of changes in management approaches, to issues that may arise, such as the emergences of diseases and potential changes in environmental parameters due to climate change (temperature, ocean acidification, etc.). Such a framework also provides an opportunity to reflect on

² See for example recital 19, exerted in Box 2.

the adequacy of institutional arrangements, as well as less quantifiable aspects such as the building of trust between actors.

Different interpretations of adaptive management exist, differing primarily according to the level of structure applied to the process. The interpretations range from 'learn by doing' without the definition of specific and measurable responses, to explicit parameters identifying goals, hypotheses of causation and procedures for review, adaptation and alternatives (Allen, 2011). This complexity can be simplified if understood in relation to the three levels of the governance hierarchy of Ostrom (2005), as introduced in unit 2. At the *operational* level, adaptive management is a tool for maintaining economic, environmental and social licences at a farm site. At the *collective choice* level, it's about regional or national marine spatial plans, which should be dynamic and responsive to changes in use and public attitudes. The task of reviewing and revising MSP itself is a task at the *constitutional* level. A guide for the evaluation of MSP processes at the collective-choice level was produced by UNESCO (Ehler, 2014).

6.5 Dealing with cumulative impacts

Marine planning aims to address trade-offs between sectors and implicit in this is the need to integrate existing sector-specific approaches, and compare and contrast different development options to evaluate and negotiate preferred scenarios. Understanding the cumulative effects of multiple activities is required by existing regulatory mechanisms (such as those associated with Environmental Impact Assessment processes applied to projects and sectors). However, difficulties in rigorously assessing cumulative effects are wide ranging and include ambiguities in regulatory frameworks, inconsistencies in scientific approaches to the assessment of impacts, risk and significance, different authorities and their approach to decision making, difference in the political significance and public opinion / awareness of particular sectors, among others (Maclean, et al., 2014). Such inconsistencies make it difficult to compare 'like with like' when evaluating the relative benefits / dis-benefits of multi-sector development options in marine planning. Review of different requirements for predicting cumulative effects across sectors and regions through marine planning, using cross-sector scenario analysis through MSP, could be a way to investigate these differences and progress towards a common and consistent language and approach to impact assessment and decision making, and ensure fairness in governance of individual sectors. The AquaSpace Tool (Gimpel et al., 2018, and see unit 5) provides a means of investigating trade-offs.

7 Limitations and Challenges in MSP and the MSPFD

The MSPFD and its transpositions into Member State law is the EU's main vehicle for implementing MSP. However, the Directive is open to three sorts of critique:

- That it is a vehicle for imposing "neoliberal logics of managerialism and economic maximisation of marine resources" on society (Tafon, 2017);
- That it is weak in some of its provisions;
- That its implementation is, or is likely to be, unsatisfactory.

The post-structuralist approach of Tafon will likely be opaque to most users of this module. His claim that the practices of MSP "marginalise particular groups of people and 'herd' their participation and ways of knowing towards achieving limited policy outcomes" can be understood as diagnosing one of the ways in which power operates in society, a topic we will return to when discussing stakeholder engagement. Next, however, we will explore the second and third critiques.

7.1 Weaknesses of the MSPFD

Although the recitals of the MSPFD cover most aspects of MSP, the provisions for applying them by way of the Directive's articles show a number of weaknesses:

- the provisions lack detail; this is especially obvious when the MSPFD is compared with the environmental directives, the MSFD and the Water Framework Directive (WFD, 2000/60/EC);
- the exclusion of matters and waters covered by Town and Country Planning;
- the exclusion of Integrated Coastal Zone Management as a means of managing land-sea interactions

All are relevant to marine aquaculture, most of which currently occurs in near-shore waters where environmental quality is protected by the WFD and where in many EU member states, Town and Country planning controls aquacultural development.

Of course, these weaknesses do not prevent any EU member state, or indeed any third party, implementing MSP more fully. For example, EU and third party states around the Mediterranean Sea have strengthened control over land-sea interactions by adopting (in 2008) a *Protocol on Integrated Coastal Zone Management in the Mediterranean*.³

7.2 Implementation of MSP

Figure 2 summarises information about the implementation of MSP in the waters that formed part of the AquaSpace project's case studies (Galparsoro et al., 2017). It was reported as fully implemented in three case study areas (Germany and, in China, Sangou and Zhangzidao island) and one pilot plan implemented in Algarve Coast (PT). In addition, another eleven case study locations report partial or sub-national implementations of MSP: Emilia-Romagna, Adriatic Sea (IT); Basque Country (SP); Carlingford Lough (UK); Normandy/Cancale (FR); Argyll, Scotland (UK); Great Bay, Piscataqua (USA); Houtman Abrolhos Islands (AU); Long Island Sound (USA); Norwegian Coast; Nova Scotia Bays (CA); and Pelorus Sound (NZ). The Mediterranean Sea Multinational case study reported the existence of zoning system for aquaculture activity.

National law enforcing MSP in China, USA, Canada, Australia and New Zealand is obviously independent of the MSPFD. The Directive does not apply to Norway, although Norway, as a third party sharing common seas with EU members, and a signatory to the OSPAR regional convention, might well be influenced by the MSPFD. But even the implementations within the EU, whether full or partial, may well have been based in national law or regional conventions in existence before the MSPFD. So it is probably too early to determine the operational influence of the Directive. Instead, we use the remainder of this section to consider the main challenges to the effective operation of MSP in the wider sense described in sections 2 and 3.

³ The Protocol was published in the EU OJ 4.2.2009 L34, pp. 19-28; it is an agreement amongst the parties to the 1976/1995 *Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean*. It defines ICZM as "a dynamic process for the sustainable management and use of coastal zones, taking into account at the same time the fragility of coastal ecosystems and landscapes, the diversity of activities and uses, their interactions, the maritime orientation of certain activities and uses and their impact on both the marine and land parts."

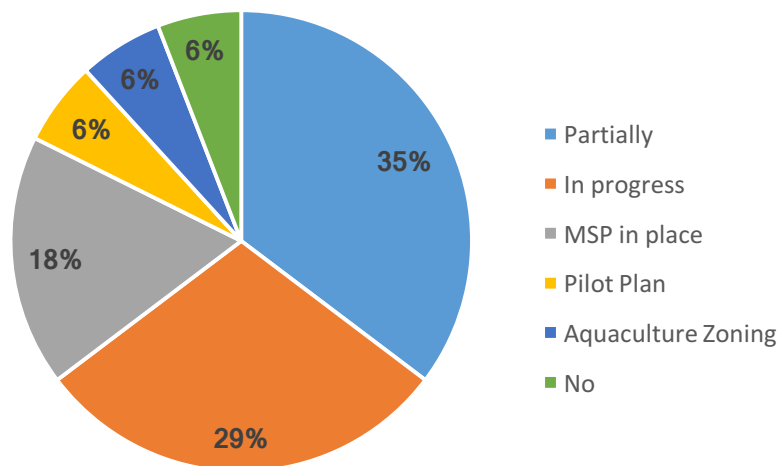


Figure 2. Maritime spatial planning or spatial management measures implemented in AquaSpace case studies (from Galparsoro et al., 2017)

7.3 Resourcing

A critical factor in the design and effectiveness of governance through marine planning is the long-term availability of resources - human, technical and financial, including the training and skills of planning ‘practitioners’, computational ability as well as the capacity of stakeholders and civil society to engage effectively in the process. National economic pressures mean that many regions face increasingly constrained public resources and assigning public funds to MSP may be difficult to justify, particularly as the economic benefit of MSP may not yet be clear. Effort to evaluate and quantify the manner in which it benefits particular sectors, particularly in economic terms, is therefore essential to encourage political support, and to ensure buy-in and involvement of primary stakeholders and civil society.

Appropriate resources are needed particularly to ensure sufficient data and research to inform the process, whether collating and analysing existing information, or planning data gathering programmes on social and ecological status, and for ensuring adequate stakeholder engagement. Effective participation requires careful design and resources in identifying appropriate groups and individuals, and implementing effective engagement strategies appropriate to their needs, whether facilitated workshops, interviews, multi-lingual exchanges, etc. Such resources need to be established over the long term, to ensure a rigorous programme of on-going monitoring and reflection and enable an informed adaptive cycle.

Where resources are constrained or limited, the quality of the MSP process and the likelihood of achieving advancements in approaches to planning of maritime activities, including aquaculture, would be compromised.

7.4 Relationship to sector planning and management

The extent to which MSP influences the undertaking of marine activities depends on its relationship with the broader marine management framework, as applied in each country or region. It is important to note that MSP is not directly equivalent to ‘management’ of marine activities, i.e. the granting of

permits, licenses, economic incentives, etc., which are mostly undertaken on a sector-specific basis, in accordance with separate regulatory requirements. The extent to which planning (as in the allocation of space and access to resources) affects these processes may not be clear, particularly where these processes are managed by separate authorities.

Therefore while MSP has many benefits in addressing planning challenges, particularly as it raises issues at an early stage in development processes and at a broader scale, the influence of MSP in addressing specific challenges is limited to the extent that MSP processes relate to the sector-specific planning and management processes. MSP is undertaken at a national or regional level, and often at this scale, there is insufficient detail / data available to predict accurately what the likely ecological or social impacts will be of specific aquaculture installations.

Strategic planning of individual sectors may also be undertaken separately (and at different scales). In some cases, different authorities will lead marine planning, sectoral planning and undertake regulatory functions, leading to complexity in the exercise of authority through marine planning.

7.5 Power and stakeholders

The first principle of the Ecosystem Approach (described in unit 2) states that the "objectives of management of land, water and living resources are a matter of societal choice" and SCBD (2004) comments that they "should be determined through negotiations and trade-offs among stakeholders having different perceptions, interests and intentions." Thus, as considered in section 2 and 3 of this text, MSP should involve stakeholders. In the present context, a **stakeholder** is a person or organisation that has a stake in a relevant planning issue, meaning a moral right to have their voice heard in participatory decision making. Stakeholder engagement is a complex topic; it includes identification of those who have the moral right, the method by which they are engaged, and other issues discussed by Mette (2011). The topic is also examined in unit 9 in relation to an aquacultural enterprise's gaining of 'Social Licence to Operate' (Prno, 2014; Tett et al., 2015) through working with communities. The issue here is that some stakeholders are more powerful than others.

At the regional, national and supra-national levels at which marine spatial plans are most often drawn up, the stakeholders are, typically, mandated representatives of interest groups. Evidence about problems in such mandates comes from recent reforms of the EU's Common Fisheries Policy, wherein "democratic ideals that emphasise including stakeholders in environmental governance such as fisheries become constrained – or even reversed – by the realities of stakeholder representation procedures" (Linke & Jentoft, 2016). It seems likely that such problems could afflict national and regional marine spatial plans.

In the terms introduced in unit 2, such difficulties would be consequent on the hierarchical, or power-steered (Habermas, 1987) nature of the MSP process as presently envisaged. Thus there is a need to design into the process, "diverse private-for-profit, governmental, and community institutional arrangements that operate at multiple scales to generate productive and innovative as well as destructive and perverse outcomes" (Ostrom, 2009). What these should be, is as yet unclear.

8 Conclusions

Aquaculture is a critical sector in delivering the Blue Growth Agenda in the EU, driven by a range of factors including increasing consumption and export potential. However, it faces constraints in its expansion, due to the competition for space with other marine uses, concerns regarding ecological impacts, difficulties in obtaining 'social license', complicated planning regimes, along with other challenges. The implementation of MSP in Europe, as an integrated, cross-sectoral and ecosystem-based planning framework, with its requisite features of integration, participation and adaptiveness, provides a developing context which may provide an opportunity to address some of the planning constraints faced by the sector. Managing conflicts, understanding cumulative effects, along with other issues which require interaction between different actors and developing a broad understanding of complex problems, may be supported by the participation and dialogue which is central to MSP, in addition to spatial measures and planning policies which can directly support the sector. However, the extent to which this is possible will depend on a range of factors, including the emphasis placed on MSP within a particular country, and how this translates into resourcing and capacity for a rigorous and fully participatory process and to what extent the MSP process influences and shapes the sector-specific licensing and decision-making of projects. The AquaSpace project has developed tools and methods to aid MSP, and these will provide the topics for the next 5 units. In addition, there is an obvious need for further research into how the MSFPD is being applied in the EU and way in which the various challenges and issues raised in section 7 are impacting on the creation of additional space for aquaculture.

9 Exercises and reading

1. For a simple (and uncritical) introduction to MSP, view the short video about Marine Spatial Planning in a Nutshell at <https://vimeo.com/album/3680099/video/219515087>.
2. Review the status of MSP across Europe on the European MSP Platform: <http://www.msp-platform.eu/>. Go to [Countries page](#) and click on a country (an EU member state with a coastline) to find out more. Choose a country and examine its MSP status critically, drawing on concepts introduced in this text.
3. Read the [EC's Strategic Guidelines for EU aquaculture](#) (European Commission, 2013).

10 Self-Assessment Questions

1. How does MSP differ from existing sector planning and management?
2. How do the 'key characteristics of MSP', as set out in section 2, relate to the principles of the Ecosystem Approach, as discussed in topic 2 of this module?
3. What is the status of MSP in your country, and to what extent is aquaculture a priority sector? Who is responsible for planning aquaculture and MSP?
4. What is the difference between MSP and the MSPFD?
5. What is, or could, limit the success of MSP in your country?

11 References

- Allen, C. R., Fontaine, J. J., Pope, K. L., & Garmestani, A. S. (2011). Adaptive management for a turbulent future. *Journal of environmental management*, 92(5), 1339-1345.
- Ehler, C. (2014). A Guide to Evaluating Marine Spatial Plans. *IOC Manuals and Guides*, 70 (ICAM Dossier 8). Obtainable from unesdoc.unesco.org/images/0022/002277/227779e.pdf
- Ehler, C. N. (2018). Marine spatial planning: an idea whose time has come. pp 6-17 in *Offshore Energy and Marine Spatial Planning*, ed. Yates, K. & Bradshaw, C. Routledge, London.
- Ehler, C. & Douvère, F. (2009). Marine Spatial Planning: A Step-by-Step Approach. *Intergovernmental Oceanographic Commission Manuals and Guides*, 53(53), pp.1–99.
- European Commission (2012). Progress of the EU's Integrated Maritime Policy – Report from the commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Luxembourg, Publications Office of the European Union: 11 pp.
- European Commission (2013). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Strategic Guidelines for the sustainable development of EU aquaculture. (COM(2013)229). Online here: https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/com_2013_229_en.pdf
- FAO, IFAD, UNICEF, WFP and WHO. 2017. The State of Food Security and Nutrition in the World 2017. Building resilience for peace and food security. Rome, FAO. viii+119 pp.
- Galparsoro, I., A. Murillas, K. Pınarbaşı, Á. Borja, A. M. O'Hagan, E. MacMahon, . . . L. Arantzamendi (2018). Synthesis of the lessons learned from the development and testing of innovative tools to support ecosystem-based spatial planning to aquaculture (revised). *AquaSpace project (H2020 no 633476) Deliverable 5.1*. Oban, SAMS. 103 pp. Online at : www.aquaspace-h2020.eu.
- Gimpel, A., V. Stelzenmüller, S. Töpsch, I. Galparsoro, M. Gubbins, D. Miller, . . . R. Watret (2018). A GIS-based tool for an integrated assessment of spatial planning tradeoffs with aquaculture. *Science of the Total Environment in press*: 12. doi: <https://doi.org/10.1016/j.scitotenv.2018.01.133>
- Greenhill, L. 2018. Challenges and Opportunities for Governance in Marine Planning, pp. 56-73, in Yates, K and Bradshaw, C. (Eds.) *Offshore Energy and Marine Spatial Planning*, Routledge, London.
- Habermas, J. (1987). The Theory of Communicative Action. Volume 2: Lifeworld and System: a Critique of Fundamentalist Reason. Boston, MA/Cambridge, England, Beacon Press/Polity Press.
- Hofherr, J., Natale, F., & Trujillo, P. (2015). Is lack of space a limiting factor for the development of aquaculture in EU coastal areas? *Ocean & Coastal Management*, 116, 27-36.
- Jones, P. J., Lieberknecht, L. M., & Qiu, W. (2016). Marine spatial planning in reality: Introduction to case studies and discussion of findings. *Marine Policy*, 71, 256-264.
- Linke, S. & S. Jentoft (2016). Ideals, realities and paradoxes of stakeholder participation in EU fisheries governance. *Environmental Sociology* 2(2): 144-154. doi: 10.1080/23251042.2016.1155792
- Maclean, I., Inger, R., Benson, D., Booth, C. G., Embling, C. B., Grecian, W. J., ... & Wilson, B. (2014). Resolving issues with environmental impact assessment of marine renewable energy installations. *Frontiers in Marine Science*, 1, 75.
- Mette, A. (2011). Bridging the Gap between Science and Society. In *Sustaining Coastal Zone Systems*. P. Tett, A. Sandberg and A. Mette, eds. Edinburgh, Dunedin Academic Press: 103-149.

- O'Hagan, A. M., R. A. Corner, J. Aguilar-Manjarrez, J. Gault, R. G. Ferreira, J. G. Ferreira, . . . M. Service (2017). Regional review of Policy-Management Issues in Marine and Freshwater Aquaculture. *AquaSpace Project (H2020 no. 633476) Deliverable 2.1*. Oban, SAMS: 181 pp. Online at : www.aquaspace-h2020.eu.
- Ostrom, E. (2005). *Understanding Institutional Diversity*. New Jersey, Princeton University Press. xv+355 pp.
- Ostrom, E. (2009). Beyond Markets and States: Polycentric Governance of Complex Economic Systems. *The Nobel Prizes 2009*. K. Grandin, ed. Stockholm, Nobel Foundation: 408-444.
- Prno, J. (2013). An analysis of factors leading to the establishment of a social licence to operate in the mining industry. *Resources Policy* **38**: 577-590. doi: [10.1016/j.resourpol.2013.09.010](https://doi.org/10.1016/j.resourpol.2013.09.010)
- SCBD (2004). *The Ecosystem Approach, (CBD Guidelines)*. Montreal, Secretariat of the Convention on Biological Diversity. Online: www.cbd.int/doc/publications/ea-text-en.pdf
- Stelzenmüller, V., et al. 2013. *Guidance on a Better Integration of Aquaculture, Fisheries, and other Activities in the Coastal Zone: From tools to practical examples, Ireland: COEXIST project*, 79pp.
- Tett, P., K. Black, R. Brennan, E. Cook & K. Davidson (2015). Sustainable Mariculture at high Latitudes. In *Coastal Zones: Solutions for the 21st Century*. J. Baztan, O. Chouinard, B. Jorgensen et al.,eds., Elsevier: 73-81.