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The Need for a Common Vocabulary for Marine Spatial Planning in Ecosystem-based Marine Management

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Abstract

During the past decade, the evolution of marine spatial planning and ocean zoning has become increasingly important in implementing ecosystem-based marine management. Originally, marine spatial planning was used to improve the management of marine protected areas. One of the best-known examples is Australia's Great Barrier Reef Marine Park. Australia's approach permits multiple human activities, e.g., fisheries and tourism, while simultaneously providing a high level of protection for specific areas. However, more recent attention has been placed on managing the multiple use of marine space, especially in areas where conflicts among users and the environment are already clear as, for example, in the North Sea. Despite academic discussions and the fact that some countries already have started implementation, the scope of marine spatial planning has not been clearly defined. One of the main conclusions of UNESCO's first international workshop on marine spatial planning highlighted the need for some form of common understanding of the scope of marine spatial planning and what added value it can provide in moving toward ecosystem-based management in the marine environment. This article aims to clarify why we need marine spatial planning, how it can be defined appropriately, and what benefits it can offer. It also briefly discusses some international examples of marine spatial planning today.

1. Introduction: Why do we need Marine Spatial Planning?

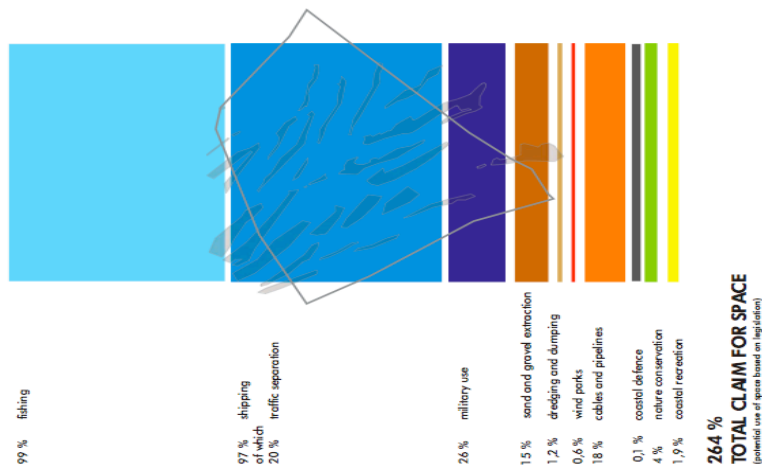
Biodiversity in the marine environment continues to decline and human activities are at the centre of this destructive evolution. Ongoing population growth, technological change and shifting consumer demands, especially in richer countries, all have considerably increased the need for more food, more energy, and more trade. An increasingly larger share of goods comes from marine resources. Especially after World War II, existing activities such as fisheries, shipping, dredging and oil exploitation expanded rapidly

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while new uses including recreation, mineral extraction, and more recently wind energy and offshore marine aquaculture, have started to claim their own spaces in the marine environment. A study done for the Belgian part of the North Sea revealed that the total claim for ocean space was almost three times the available amount (Figure 1)¹. Similar experiences in other countries confirm this trend.

Figure 1: Total claims for ocean space exceeding almost three times the available amount in the Belgian Part of the North Sea



Source: F Maes, et al., 2005

With resources being limited both in space and amount, these developments have proven to be devastating for many places and resources, elevating competition among users and interest groups, and resulting in increasingly undesirable effects, loss of marine biodiversity and threats to the health of the oceans as a whole.

Essentially, increased pressure on the marine environment has led to two important types of conflict. First, not all uses are compatible with one another and are competing for ocean space or have adverse effects on each other (use-use conflicts, e.g., offshore oil exploitation and fisheries). But a much bigger concern, however, is the cumulative effects of these activities on the marine environment, or in other words the conflicts between users and the environment (use-environment conflicts, e.g., fisheries and habitat loss).

Traditional concerns about nature included direct impacts such as water quality, pollution or habitat loss. More recently, environmental concerns shifted to the marine life support system or 'ecosystem' that nurtures and sustains important resources that are in our prior interest for economic reasons (for example, high-value fish). This shift has drawn the attention to the need to approach environmental problems from an ecosystem

perspective. One way to restore or protect marine biodiversity, is through the delineation of protected areas in which human pressure is reduced or excluded. Today not only economic and social incentives, but also ecological objectives (e.g., finding space for nature), are driving and increasing the demand for use (or non-use) of space in the marine environment.

With human activities and resource use developing in space and time and nature itself changing in space and time, it is obvious that conflicts will also develop in space and time. The only solution to resolve these conflicts is through management of human activities (sea use management) that addresses their impact in space and time. There is an urgent need to organize human activities in certain places, and with certain time constraints that minimizes negative impacts on ecologically valuable areas of the marine ecosystem and among each other. A comprehensive way to achieve this, is through the use of marine spatial planning.

2. What is Marine Spatial Planning?

2.1 A Spatial Vision for the Marine Environment

Spatial planning is an essential tool for managing the development and use of land in many parts of the world. In North America and Europe it is commonly used as a central component of economic development and environmental planning. The principal purpose of a planning system on land is to regulate the development and use on land in the public interest². The traditional approach of making permit decisions of a project-by-project, case-by-case basis has been replaced by a planning process that lays out a vision to be developed for the use of certain areas. This approach has become the standard for terrestrial land-use planning and decision-making.

With only a few exceptions, there is no clearly articulated spatial vision for the use of marine areas, no plan-based approach to management³. This does not mean that activities taking place in our seas are unregulated. On the contrary, there are a number of spatial measures already taken to allocate space to different uses.

At a global scale, the UN Convention on the Law of the Sea (UNCLOS), that came into effect in 1994, provides an over-arching framework for the allocation of marine space to national states, through the codification of concepts such as the Territorial Sea (TS) of 12 nautical miles, Exclusive Economic Zone (EEZ) of 200 nautical miles, Contiguous Zone, and the Continental Shelf. Most coastal countries already allocate ocean space. Among the most obvious are concession zones for resource exploitation, designations of dumping sites, and shipping routes or traffic separation scheme (see Table 1)⁴.

Table 1: Examples of Existing Ocean Space Designations

Designation of Space for
Vessel Traffic Routes
Vessel Traffic Separation Zones & Precautionary Zones

Areas to be Avoided (by vessels)
Safety Zones Around Vessels and Terminals
Anchoring and No-Anchoring Areas
Security Zones in Ports and Waterways
Oil & Gas Lease or Concession Areas
Wind Farm and Wave Park Lease or Concession Areas
Safety Zones Around Oil & Gas Installations, wind Farms, Wave Parks, etc.
Military Operations or Exercise Zones
Dredging Sites or Areas
Designated Dredges Material Dumping Areas or Zones
Oil & Gas Pipeline Rights of Way
Submarine Communications Cable Rights of Way
Energy Transmission Line Rights of Way
Sand & Gravel (Aggregate) Extraction Areas
Fishery Closure Areas, including Seasonal Closures
No Trawl Areas
Critical Habitat Designations
Offshore Aquaculture Areas
Marine Protected Areas
Protected Archeological Areas, e.g. Ship Wrecks
Cultural or Religious Areas
Scientific Reference Sites

Source: Ehler & Douvère, 2007

The problem, however, is that most of these initiatives to allocate space occur on a single-sector basis without any planning that looks at the area as a whole. Despite numerous efforts toward nature conservation, the currently existing *laissez-faire-laissez-aller* approach to the way ocean space is allocated has, for example, resulted in very few and, most often, no space for nature. The private sector is left to maximize its own interests. Although this might seem a logical consequence, the oceans are a common property resource, and therefore some kind of public process that allocates space in a more efficient, effective and equitable manner is needed. That process is marine spatial planning.

Currently, there is no framework that facilitates integrated strategic and holistic planning in relation to all activities within most marine areas⁵. The lack of such a framework, often translates into⁶:

- Developments and uses that are considered through different policies and regimes, resulting in single-sector responsibilities for determining development and uses in the marine environment in most countries;
- Lack of connection between the various authorities responsible for individual activities or the protection and management of the environment as a whole;
- Lack of certainty for marine developers and users as well as for environmental managers; and
- Lack of protection and conservation of marine areas with high levels of biodiversity.

Recent advances in science and technology however are changing the way we view life in the oceans⁷. Geo-technologies are revolutionizing marine resource management. Through remote sensing, tracking technologies, and global positioning technologies

science is making visible what had previously been hidden or inaccessible. Living and mineral resources, marine habitats, environmental conditions, sea bottom morphology, and species ranges and interactions are becoming increasingly documented and mapped⁸. In addition, new technologies are being used to add the “human dimension” to marine areas⁹. As a result, spatial planning of human activities in the marine environment has become possible and increasingly more attractive. In many respects, planning in the marine environment today resembles terrestrial planning in the 1960s. Where land use planning is the spatial planning component of land use management, marine spatial planning is the spatial planning component of sea use management.

2.2 Defining Marine Spatial Planning

Despite the existence of academic discussions and the fact that some countries already have started to apply the concepts of marine spatial planning in their management practices, no commonly approved *operational* definition for marine spatial planning has been developed. Descriptions can be found throughout the spatial planning literature, but the terms, e.g., ocean zoning or marine spatial management, maritime spatial planning, are not applied consistently.

One of the key conclusions of the *First International workshop on marine spatial Planning*, held at UNESCO from 8-10 November 2007¹⁰, referred to the need to develop a common vocabulary for marine spatial planning. The workshop highlighted the challenge in doing so through several examples, including the Polish language that does not have a word for *zoning* and the lack of the word *governance* in the Chinese language¹¹. Some form of common language becomes even more important in areas where national boundaries, do not coincide with boundaries meaningful from an ecological standpoint and where cooperation between neighboring nations will be a fundamental requirement for the establishment of an integrated management at ecosystem level.

The UNESCO marine spatial planning workshop mentioned above, attempted to define marine spatial planning. Marine spatial planning in its broadest sense was defined as¹²:

‘A process of analyzing and allocating parts of three-dimensional marine spaces to specific uses, to achieve ecological, economic, and social objectives that are usually specified through the political process.’

Marine spatial planning aims to¹³:

‘(...) create and establish a more rational organization of the use of marine space and the interactions between its uses, to balance demands for development with the need to protect the environment, and to achieve social and economic objectives in an open and planned way (...). An agreed plan should provide a firm basis for rational and consistent decisions on license applications, and allow users of the sea to make future decisions with greater knowledge and confidence’.

Marine spatial planning has the overall goal to provide a mechanism for a strategic and integrated plan-based approach for marine management that makes it possible to look at the wider picture and to manage (potential and existing) conflicting uses, the cumulative effects of human activities and marine protection. A spatial planning system for the marine environment provides decision makers with a spatial and temporal context for the implementation of policies, developed at the regional, national and international level. It gives an opportunity not only to better manage and understand the marine environment but also allows a long-term planning in a way that processes become more transparent with a greater certainty in permitting, planning and resource allocation for both developers and environmental managers¹⁴. In doing so, it can replace the current piecemeal view resulting from single-sector based allocation of ocean space, and make sure that commitments made in a number of important international and national marine policy commitments can be fulfilled¹⁵. Concretely, marine spatial planning has the objective to achieve¹⁶:

- *Responsible management of natural resources and protection of the environment*

By promoting strategies to minimize conflicts between the growing demand for natural resources and the need to conserve them, it seeks to ensure responsible management of the environment, the resources of marine areas, with special attention to areas of natural beauty and to the cultural and natural heritage;

- *Rational use of space in the marine environment*

By being concerned in particular with the location, organization and future development of large complexes, major infrastructures, and the protection of the marine environment;

- *Coordination between the various sectors*

By coordinating concerns on the distribution of population, economic activities, habitat, public facilities and energy supplies, transport, supply of resources, water quality, prevention of noise and waste disposal, protection of the marine environment and of natural, historical, cultural assets and resources;

- *Facilitation of the coordination and cooperation between the various levels of decision-making (international, national, regional and local)*

- *Balanced socio-economic development in maritime regions*

By allocating certain spaces for certain uses through a comprehensive analysis, greater security for business operations in the marine environment can be established. Serious business investments, for example, offshore wind energy, would not risk the failure of their initiatives because of a failure to obtain a permit.

It is important to keep in mind, however, that marine spatial planning is not the only instrument to manage the oceans. A marine spatial planning process provides measures that influence the *spatial and temporal components* of human activities and ecological aspects of the marine environment. Other measures and tools will be needed that

influence the *performance* of human activities and ecological processes of the marine environment, e.g., measures that influence the input and output of human activity in the marine environment such as total allowable catches, limits on infrastructure, landing quotas, etc¹⁷.

A key problem with various existing definitions on marine spatial planning is that they refer to *planning* and *management* of human activities and protection of the marine environment as if they were synonymous. They are not, however, and the lack of consistency in the use and application of both terms is one of the main reasons why fruitful discussions and interactions on the need of marine spatial planning regularly fail to go any further. In general, management refers to the effective and efficient uses of resources to achieve a specified outcome and has two phases (a) planning and (b) implementation. Planning without implementation is sterile. Implementation without planning is a recipe for failure. Due to a rapidly changing world, marine spatial planning, to be effective, needs to be conducted as an adaptive, iterative and continuous process. Finally, the involvement of stakeholders and continuous financing are essential elements to make the process of marine spatial planning sustainable over time¹⁸.

3. Marine Spatial Planning: Key process towards integrated maritime policy

Various countries around the world have started to implement, or at least experiment, with marine spatial planning. At first, marine spatial planning was primarily used for the management of marine protected areas. Some of the best-known examples are Australia's Great Barrier Reef Marine Park (GBRMPA)¹⁹, the Florida Keys National Marine Sanctuary²⁰ and the Trilateral Wadden Sea Cooperation Area²¹. In all three these initiatives, marine spatial planning is applied with the principal objective of nature conservation and in all three cases, marine spatial planning is either a key instrument or seen as a critical requirement to achieve management objectives.

Recently, however, marine spatial planning becomes increasingly more important for the management of entire marine areas where the principal objective is to balance ecologic, economic and social interests. This new direction is particularly gaining importance in Europe. The European Union (EU) Green paper '*Toward a Future Maritime Policy for the Union: A European Vision for the Oceans and Seas*' sees marine spatial planning as a key instrument for the management of a growing and increasingly competing maritime economy, while at the same time safeguarding marine biodiversity²². The EU Marine Strategy²³, the environmental pillar of the EU Maritime Policy, introduced the principle of ecosystem-based marine spatial planning²⁴ and provides a supportive framework for national initiatives toward spatial planning, designed for achieving a good status for the environment. The latest communication from the European commission confirms that integrated marine spatial planning is a fundamental requirement for sustainable development and for achieving an integrated approach to marine management. Building further on existing EU initiatives with a strong marine spatial planning dimension, the EU commission plans the development of a *road map* and a system for the exchange of

best practice to facilitate and encourage the further development of marine spatial planning in the member states²⁵.

Various European countries have started to develop marine spatial planning initiatives. Germany has developed marine spatial plans for the territorial waters in the Baltic Sea²⁶ that are currently being implemented, while a draft marine spatial plan for the entire German EEZ is underway. The latter has been made possible through an amendment of the Federal Spatial Planning Act that extends the spatial planning system to the marine environment²⁷. In Germany, marine spatial planning initiatives are to a large extent embedded in concurring efforts toward integrated coastal and ocean management (ICZM)²⁸. Belgium is one of the first countries that actually implemented a multiple objective marine spatial plan covering its TS and EEZ. A multiple-objective 'Master Plan' for the Belgian part of the North Sea has been implemented incrementally since 2003, and includes the spatial demarcation for the extraction of sand and gravel, zones for offshore wind energy and, delimitation of marine protected areas²⁹. In 2005, the Netherlands developed an overarching spatial planning framework for the Dutch part of the North Sea with the primary objective to establish a healthy, safe and profitable sea³⁰. In March 2007, the United Kingdom released its Marine Bill White Paper in which a new system is introduced for marine spatial planning that will allow a strategic, plan-led approach to the use of marine space and the interactions between its uses for the entire UK waters³¹. Other countries, including Nordic countries³², Poland, and various Adriatic countries³³ are also moving in the direction of marine spatial planning³⁴.

Outside the EU, marine spatial planning initiatives are also moving ahead, in particular in Canada, Australia (beyond the Great Barrier Reef), China, and at a slower pace, the United States.

4. Benefits of marine spatial planning

Most evidence of the benefits of marine spatial planning is qualitative rather than quantitative. More quantitative (and measurable) evidence of benefits is likely to appear in the next few years as spatial planning schemes are further developed, and the consequences currently underway are more systematically documented. Potential benefits of marine spatial planning with regard to economic activity include³⁵:

- *Facilitating sector growth*: marine spatial planning can provide a framework that facilitates the sustainable development of different economic activities, therefore helping to enhance income and employment;
- *Optimizing the use of the sea*: marine spatial planning can help to ensure that maximum benefits are derived from the use of the sea by encouraging activities to take place where they bring most value and do not devalue other activities; and
- *Reducing costs*: marine spatial planning can reduce costs of information, regulation, planning and decision-making.

These benefits arise through:

- *Strategic planning*: marine spatial planning provides a strategic planning

- framework that helps to facilitate sectoral development by guiding investment decisions. Oil and gas have benefited from strategic planning approaches at a sectoral level. There is reason to believe that other sectors such as ports and fisheries would also benefit from strategic planning. An integrated and cross-sectoral approach to marine spatial planning could provide significant further economic benefits by considering the different needs and opportunities of different users of marine areas and helping to resolve potential conflicts;
- *Conflict resolution*: The potential for conflicts between different marine sectors is increasing over time, particularly as developing sectors such as aquaculture and renewable energy grow in significance. Marine spatial planning provides a means of avoiding and managing potential conflicts, and ensuring that the needs of different sectors are addressed in a coordinated way.
 - *Sustainable resource use*: MSP should facilitate the sustainable exploitation of natural resources, such as fisheries and aggregates, and thereby secure the long-term future of the industries that depend on them;
 - *Provision of development of space*: MSP helps to ensure that all marine activities, including developing sectors such as renewable energy and aquaculture as well as more established ones, are fairly allocated space to develop;
 - *Promoting appropriate uses*: By considering the variety of uses appropriate to the area in question, the value of different activities, the potential conflicts of use, and the suitability of different areas for different uses, MSP should help to promote a mix of uses that are compatible with each other and the environment, and helps to optimize the use of the maritime area;
 - *Supporting the environmental economy*: By improving the conservation and management of the marine environment, MSP helps to promote activities that depend on environmental quality, such as recreation and fishing. This is particularly true in areas of high conservation value where activities such as diving and wildlife tourism are significant;
 - *Improving stakeholder involvement*: MSP can provide a transparent and structured mechanism in which the interests of different sectors can be represented and reconciled;
 - *Information efficiencies*: By developing common approaches to the acquisition and dissemination of information, MSP can help to improve information provision and reduce duplication of effort, therefore bringing cost efficiencies; and
 - *Regulatory efficiencies*: By improving information exchange and providing a more certain environment in which regulatory decisions are made, MSP can be expected to reduce regulatory and compliance costs.

Other benefits of marine spatial planning include:

- *Finding space for nature*: Marine spatial planning is a practical tool to make marine conservation a reality. In many countries, specific nature conservation legislation that affects the marine area is currently made of regimes that are primarily terrestrial in focus but which have been extended to the marine realm. Marine spatial planning that is coordinated among all sectors and users of the marine area can help achieve marine nature conservation goals and objectives without limiting future economic growth;
- *Transparency in human and environmental impacts*: The use of marine

spatial planning allows for early identification of potential conflicts, and therefore a chance to resolve them, between industries and between development and important wildlife areas. Marine spatial planning can offer transparency in both human and environmental impacts and enable potential conflicts to be identified and resolved at the planning stage, rather than at a later stage when considerable investment has been made for individual proposals or damage to the environment is irreversible³⁶; and

- *Improved understanding*: A marine spatial planning system allows a more strategic approach to management that can substantially improve our understanding and consideration of the cumulative and combined effects between different activities and the environment itself. This understanding allows planning pro-actively, rather than just reacting to applications, changes and situations³⁷.

4. Conclusion

During the past 10 years, marine spatial planning has become increasingly recognized as a crucial process in making integrated management in the marine environment a reality, either in the form of integrated coastal and ocean management or more recently ecosystem-based, sea use management. Marine spatial planning is a process that allows the allocation of space in a more effective, efficient and equitable manner.

The problem with the current practice of allocating space in the marine environment is that it is done on a single-sector basis, mainly without a plan-based approach and with little or no consideration of objectives from other uses or conservation requirements that may be conflicting or compatible³⁸. The huge demand for space together with the lack of an integrated approach that pays attention to the heterogenic characteristics of ocean space, leads to conflicts among uses, and between human use and the natural environment.

As countries are moving ahead with the development and application of spatial planning systems in the marine environment, there is a need for at least some form of common understanding of the scope, objectives, and added value of marine spatial planning. In particular in marine regions where neighboring, national states are required to cooperate to achieve an integrated management at a broader ecosystem level (e.g. the Baltic Sea, Adriatic Sea, North Sea, etc.), a common language – and to some extent also a set of principles that underpin the application of marine spatial planning – is *sine qua non* to make marine spatial planning effective and sustainable over time.

The activities in the framework of UNESCO's *Marine Spatial Planning Initiative* are an attempt to deal with these needs. The action program for this Initiative includes the development of a web-based network for the exchange of good practices on marine spatial planning, and more importantly, the development of a manual with guidelines and principles providing a step-by-step approach for the implementation of ecosystem-

based, marine spatial management. The publication of this manual is planned for April 2009.

Further Readings

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