



Conclusions: Benefits, lessons learned, and future challenges of marine spatial planning

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ABSTRACT

This article summarizes briefly the principal conclusions from papers presented in this special issue on marine spatial planning. It identifies potential economic, ecological, and administrative benefits (and costs) that might be realized from the implementation of MSP. Finally, the article summarizes lessons learned and identifies future challenges and directions for MSP, including the development of international guidelines for its implementation.

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“An invasion of armies can be resisted, but not an idea whose time has come.”

Histoire d'un crime, 1852¹
Victor Hugo (1802–1885)

“Let our advance worrying become advance thinking and planning”

Winston Churchill (1874–1965)

0. Introduction

Marine spatial planning (MSP) is an evolving idea, and one whose time has come. The place-based character of ecosystems, the spatial and temporal development of human activities and resource use conflicts (both current and potential) within them, together with the need to develop human uses in places that minimize their impacts on important natural places of the marine environment, all draw attention to the need to manage marine areas from a spatial and temporal perspective.

Spatial planning is an essential tool for managing the development and use of the terrestrial environment in many parts of the world. In North America and Europe, for example, it is commonly used as a central component of economic development and environmental planning. The principal purpose of spatial planning on land is to regulate development and land use in the public interest. Over the past century, the traditional approach of making individual permit decisions on a project-by-project, case-by-case basis—and the unplanned outcome of this approach—has been replaced by a more strategic planning process that lays out a vision—or comprehensive plan—that can guide individual

sectoral planning and permitting. This approach has become the standard for terrestrial land-use planning and management.

We are now at a stage where ecosystem-based management, its place-based character, and the important role of marine spatial management to help implement it, has become generally accepted in many places. What is missing, however, is a clear demonstration of how it can be implemented. The time has come for clear, concrete, and comprehensive guidelines that outline—in a practical manner—the steps that need to be taken to implement ecosystem-based, sea use management in marine areas. This special issue is a step in that direction.

Only a few clearly articulated spatial visions for the human use of marine areas exist (see the article of Douvère in this issue). This situation does not mean that human activities taking place in marine areas are unregulated. On the contrary, they have been regulated in a number of different ways, but most importantly, they have been regulated incrementally and predominantly within sectors, such as shipping and ports, fisheries, or dredging. Little effort has made to anticipate conflicts; even less has been done to evaluate cumulative effects. Currently, there are few frameworks that facilitate integrated strategic planning across all activities within specific marine areas.

1. Conclusions

Some of the principal conclusions of this special issue on MSP are as follows:

- (a) Sea use management is a continuous, iterative, adaptive, and participatory process, comprising a set of functions including research, analysis and planning (including MSP), financing, implementation, monitoring, and evaluation—all of these individual functions must be carried out for the management to be successful, i.e., to achieve specified objectives (see the

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¹ Special thanks to Elliott Norse for this inspirational quotation from Victor Hugo.

articles of Douvere, Gilliland, and Laffoley, and Day in this issue).

- (b) MSP is an important function of ecosystem-based sea use management. MSP can be used to identify biologically and ecologically sensitive areas of marine places in time and space, to identify existing and potential human uses of marine places, and to evaluate the cumulative effects of human activities on marine ecosystems. It can be used to influence the location in space and time of human activities and therefore encourage compatible uses, reduce conflicts among uses, and reduce conflicts between human uses and the environment (see the article of Gilliland and Laffoley in this issue).
- (c) However, MSP is only one part of the tool box for ecosystem-based, sea use management—plans for sea use management should include a mix of many management measures including input, process, and output measures that can be used to influence the *performance* of human activities (see the article of Douvere in this issue).
- (d) The management boundaries of the marine area often may not coincide with the boundaries of a single ecosystem, because typically a number of ecosystems of varying sizes exist within, and may extend beyond, the designated management area. The management boundaries may or may not coincide with the boundaries of regional, national, or local governments that have jurisdiction and powers of implementation. Finally, the boundaries are not likely to delimit the external influences of natural processes on the designated area, such as upwelling, sediment transport, and atmospheric deposition of contaminants. Thus, the boundaries for MSP often will not (and do not have to) coincide with the boundaries for management (see the article of Gilliland and Laffoley in this issue).
- (e) Different marine places have differing values—and sensitivities—in both biophysical and human dimensions. Some ecosystems are more resistant or resilient to disturbance than others. As long as the productive capacity and resilience of marine ecosystems are left intact, marine areas can be managed for human uses that do not harm ecosystem functions (see the article of Crowder and Norse).
- (f) Early and continuing engagement of stakeholders in a clear management process is critical to the long-term success and engenders trust and ownership of the process. People are at the heart of MSP and both the setting of objectives and the selection of management measures are ultimately a matter of societal choice. Stakeholder participation is not enough; stakeholders must be empowered to participate effectively throughout the MSP process (see the article of Pomeroy and Douvere in this issue).
- (g) Integrating the human dimension into MSP requires the same diversity of disciplines/perspectives as does the ecosystem approach relative to the biophysical environment. Coastal communities increasingly recognize that they need to make themselves visible, i.e., to put themselves on the map, if they are to play an active and effective role in MSP (see the article of St. Martin & Hall-Arber in this issue).
- (h) Monitoring, reporting, and evaluation are critical functions that allow MSP to adapt to changing conditions. The real value of evaluation is the extent to which its findings and recommendations feed back and improve management plans and decisions (see the article of Day in this issue).

2. What are the benefits of MSP?

Hard evidence of the benefits of MSP is relatively limited, given its early stage of evolution and the lack of rigorous evaluation of practical experience. However, quantitative evidence of the

benefits of MSP is likely to appear in the next few years as new MSP plans are developed and implemented (see Gilliland and Laffoley, Table 1, in this issue for further discussion of benefits). While some of the benefits may be seen quickly, e.g., avoidance of use conflicts such as between new and existing uses through planning, many of the benefits may not be achieved for a decade or more (see the article of Plasman in this issue). Some of the anticipated benefits of MSP include the following:

(a) Economic benefits

- Identification of compatible uses and areas for development; integration of information on the current uses of the marine environment and key marine features across different sectors so that developers can be aware of potentially conflicting uses in selecting their proposed sites.
- Reduction of conflicts among uses and between uses and the environment.
- Consideration of the requirements of developers across a range of sectors for marine space to be considered at the same time so that potential conflicts can be identified and addressed at an early stage before significant capital has been invested.
- Provision of greater certainty for long-term investment decisions.

(b) Ecological benefits

- Management focuses on the whole marine ecosystem rather than individual sites for development or protection.
- Support for an ecosystem approach by seeking to ensure that economic and social objectives respect environmental limits.
- Identification and establishment of areas of biological or ecological importance or sensitivity, and reduction of risk of conflict with human activities.
- Opportunity for biodiversity commitments to be at heart of MSP and management.
- Allocation of space for biodiversity and nature conservation.
- Provision of a context for a representative network of marine protected areas.

(c) Administrative benefits

- Improvement in the speed, quality, accountability, and transparency of decision-making and better regulation.
- Improvement and reduction of the cost of information collection, storage, and retrieval.
- Opportunity to assess a combination of multiple objectives and balance benefits and costs of management measures in a particular marine area.
- Evolution of the management approach for marine areas from regulation and control to planning and implementation.
- Provision of a focus for stakeholder involvement.
- Potential improvement in the quality and availability of information for scoping and environmental assessments, including information with which to evaluate cumulative effects.

Costs will also be incurred in the development, implementation, monitoring, and enforcement of marine spatial plans. Certain human activities could be denied access to some areas of sea, but international agreements such as the United Nations Convention on the Law of the Sea (UNCLOS) provide common access rights and must be respected (see the article of Maes in this issue). If international co-operation is needed to develop an MSP strategy, it could take a long time to implement any plans. If the plans are

too complex, both the business and the government will not support their implementation over time.

3. What have we learned from MSP practice so far?

MSP can only be successful if most, if not all of, the following factors are present:

- (a) Legal authority and political support for MSP are important factors for success. Ideally, MSP should be implemented as a statutory, enforceable process, rather than a non-binding one. Experience with integrated coastal management, especially in Western Europe where it has been developed on a voluntary, non-binding basis, has shown the limitations of this approach. While a statutory basis may not be possible when MSP is initiated, it should be a goal toward which planning should work (see the article of Plasman in this issue).
- (b) A sound information base, comprising both natural and social science information, is critical (see the articles of Crowder and Norse and St. Martin and Hall-Arber in this issue).
- (c) MSP objectives should be clear and measurable (see the articles of Gilliland and Laffoley and Day).
- (d) Stakeholder involvement should be early and often in the MSP process. It needs to be conducted in a manner that is sustainable over time (see the articles of Pomeroy and Douvere in this issue).
- (e) MSP should consider explicitly plans and objectives of other sectors of the economy, e.g., energy and transportation, in terms of the time pattern of proposed, and in progress, capital investments and operations and maintenance expenditures. Activities in other sectors may have major implications for the marine sector, and vice versa.
- (f) MSP should be integrated with plans for adjoining coastal areas, with terrestrial land-use plans, and with coastal watershed (catchment) plans (see the article of Gilliland and Laffoley).

4. Where do we want to go?

“Knowing is not enough; We must apply. Willing is not enough; We must do.”

Johann Wolfgang von Goethe (1749–1832)

Some of the basic problems that must be addressed if ecosystem-based, marine spatial management is to continue to evolve from concept to implementation include the following:

- (a) Define the purpose of MSP more clearly

“Would you tell me, please, which way I ought to go from here?” “That depends a good deal on where you want to get to,” said the Cat. “I don’t much care where.” said Alice. “Then it doesn’t matter which way you go,” said the Cat

Alice’s Adventures in Wonderland, 1865
Lewis Carroll (1832–1898)

The concepts of MSP now included in many policy documents and plans are open to very diverse interpretations about meaning and direction. Concepts and terminology should be more commonly understood and consistent. Despite academic discussions and the fact that some countries already have started implementation, the scope of MSP has not been clearly defined. Terms such as integrated management, marine spatial management, and ocean zoning are often used inconsistently. This situation is one of the reasons why its importance is not more seriously reflected at the levels of policy and decision-making in most countries.

(b) Make the MSP knowledge base more certain: The ability to predict ecosystem behavior is limited. The knowledge about states, processes, and outcomes regarding ecosystem impacts is, and will continue to be very uncertain. Existing knowledge about the interdependence of marine ecosystems is insufficient or cannot be generalized. Limited resources for applied research should be directed toward reducing the uncertainty of management decisions related to the effects on both natural and social systems (see the articles of Crowder and Norse and St. Martin and Hall-Arber in this issue).

(c) Ensure that MSP practice is adaptive: Because of the uncertainty inherent in MSP, as well as the dynamic nature of marine and human ecosystems, management must be adaptive over time. Adaptive management is learning by doing. MSP and management should be seen as an experiment within which we can learn something about how human activities affect ecosystem structure and processes. In this way, we can learn how we can plan and manage human activities within marine places better over time.

(d) Build on the good work of MSP “pioneers”

“The perfect is the enemy of the good.” (*Le mieux est l’ennemi du bien*).

La Bégueule, 1772

Voltaire (François-Marie Arouet, 1694–1778)

When the US Congress established Yellowstone National Park in 1872, hunting and fishing were still allowed within the park boundaries. Hunting was banned in 1883; recreational fishing was banned in 1917—35 years after the park was established. The Great Barrier Reef Marine Park Authority took 13 years to develop and implement its first zoning plan. Often we criticize these early efforts because they are not as comprehensive or integrated as we would like them to be. Early “pioneers” in MSP may not get it quite right either on the first try, but they are establishing precedents and processes that can and should be built upon in the future.

(e) Develop methods to make existing knowledge relevant to marine spatial management: Ecosystems have real thresholds and limits which, when exceeded, can effect major system restructuring. Once thresholds and limits have been exceeded, changes can be irreversible. Specifically, management objectives and associated criteria and reference points need to be developed further. Similarly, methods for incorporating the diverse, dynamic, and multi-scalar social landscape into MSP will require new methods and data collection efforts that document “at-sea” locations, interests, and dependencies of specific communities and groups of stakeholders.

(f) Apply MSP principles and practice to the High Seas: The existing fragmented and piecemeal nature of existing management measures, combined with increasing pressures of human activities in the High Seas, suggests a growing need for international institutional arrangements to better coordinate MSP in the High Seas (see the article of Ardron et al. in this issue).

(g) Develop guidelines for ecosystem-based marine spatial management: The time has come to move beyond the conceptual level and develop a comprehensive, operational manual of principles and guidelines that outlines the steps to implement marine spatial management. As a result of the first International Marine Spatial Planning Workshop held at UNESCO in November 2006, the Gordon and Betty Moore Foundation and the David and Lucille Packard Foundations have provided funds to UNESCO to develop such international guidelines. To achieve this objective, a manual of principles and guidelines for marine managers will be developed that lays out a step-by-step procedure for the

implementation of ecosystem-based, marine spatial management. The following activities are included in the project:

- Surveying, analyzing, and documenting the lessons learned from international case studies of good practice on ecosystem-based, marine spatial management.
- Creation of an international expert group of contributors and advisors (i.e., experts in the functions of ecosystem-based, marine spatial management) to help develop the principles and guidelines.
- Evaluation, clarification, and adaptation of the general principles and guidelines to two region-specific contexts.
- Revision and distribution of the final manual of principles and guidelines.
- Development of an international reference website for communications and outreach for ecosystem-based, marine spatial management.

The guidelines will be available by the summer of 2009.