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Review of Marine Spatial Planning Best Practice of Relevance to Ireland

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**Review of Marine Spatial Planning
Best Practice of Relevance to Ireland**

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Table of Contents

1. INTRODUCTION.....	2
2. CASE STUDY SELECTION AND EVALUATION CRITERIA.....	2
3. CASE STUDY FINDINGS.....	4
4. INITIAL LESSONS FOR IRISH MSP.....	35
5. FUTURE RESEARCH AND ANALYSIS.....	41
6. REFERENCES.....	42

1. Introduction

Making room for new marine uses and safeguarding more traditional uses, without degrading the marine environment, will require the adoption of new integrated management strategies. Current management frameworks do not facilitate the integrated management of all marine activities occurring in one area. To address this issue, the government developed *Harnessing Our Ocean Wealth – An Integrated Marine Plan (IMP) for Ireland*. *Harnessing Our Ocean Wealth* presents a ‘roadmap’ for adopting an integrated approach to marine governance and for achieving the Government’s ambitious targets for the maritime sector, including: exceeding €6.4 billion turnover annually by 2020, and doubling its contribution to GDP to 2.4% by 2030. As part of this roadmap, *Harnessing Our Ocean Wealth* endorses the development of an appropriate Marine Spatial Planning (MSP) Framework. One way to develop an MSP Framework is to learn from early adapters. Critical assessments of key elements of MSP as implemented in early initiatives can serve to inform the development of an appropriate framework.

The aim of this project is to contribute to the development of this framework by reporting on MSP best practice relevant to Ireland. Case study selection and evaluation criteria are outlined in the next section. This is followed by a presentation of case study findings. The final section of the report focuses on outlining how the lessons could be transferred to the Irish context.

2. Case Study Selection and Evaluation Criteria

A number of nations have begun to implement MSP at various scales. Table 1 contains the final list of case studies, including selection criteria, that was agreed in conjunction with the Project Steering Group. A set of evaluation criteria was developed in order to draw useful lessons from international MSP case studies. These criteria were derived from a review of MSP guides including: the EC’s Roadmap for MSP, The Nature Conservancy’s MSP Guide; and UNESCO’S step-by-step approach (Ehler and Douvère, 2009). These guides contain a number of planning principles and approaches for the development of successful MSP initiatives. A cross comparison of these principles and approaches was undertaken to ascertain a set of core MSP planning criteria. This was combined with the evaluation headings contained in the tender call to produce a broad evaluation framework. It was recognised the evaluation criteria should be sufficiently broad so as to allow lessons to be drawn across all case studies. The final evaluation framework was refined in consultation with the Project Steering Group (see Table 2).

Case study	Justification
BaltSea Plan	<ul style="list-style-type: none"> • Contains many of the key MSP criteria included in tender specification • Regional planning approach • Addresses issue of transnational cooperation • Detailed account of development of key data sets, analytical methods etc • Adopts a hierarchical approach to marine planning
Canada's Eastern Scotian Shelf Integrated Management Initiative	<ul style="list-style-type: none"> • Contains many of the key MSP criteria included in tender specification • Widely recognised as a good example of MSP • Developed a number of key datasets • Stakeholder consultation process
German Plan for the North Sea	<ul style="list-style-type: none"> • Contains many of the key MSP criteria included in tender specification • Based in EU legislative Framework • Contains specific actions relating to strengthening the German Maritime Economy through the rational use of marine space;
Great Barrier Reef Marine Park	<ul style="list-style-type: none"> • Contains many of the key MSP criteria included in tender specification • Zoning approach • Hierarchical planning approach • Longstanding initiative that has undergone a number of reviews.
Norwegian plan for the Barents Sea-Lofoten area	<ul style="list-style-type: none"> • Contains many of key MSP criteria. • Plan successfully implemented and contains many of the key MSP criteria; • Second iteration of planning process • Plans specifically deal with issue of user conflict
Scottish Pilot Projects	<ul style="list-style-type: none"> • Contains many of the key MSP criteria included in tender specification • Integrated with terrestrial planning • Shetland Plan recently reviewed by planners and participants • Similar planning system to Ireland
The Netherlands	<ul style="list-style-type: none"> • Requested by Steering Group
England and Wales (MMO).	<ul style="list-style-type: none"> • Contains many of the key MSP criteria included in tender specification • Shared marine space with ROI

Table 1 Case Studies and Selection Criteria

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1. Ecosystem-based Approach & Environmental Assessment
 2. Setting Objectives
 3. Scope of Planning Process & Plans
 4. Governance, Legislative and Political Issues
 5. Implementation, Enforcement & Review
 6. Stakeholder Participation
 7. Data, Tools (including zoning) & Resources
 8. Boundary and Scale Issues
-

Table 2 Evaluation Criteria

3. Case Study Findings

Case study findings are present in this section. Each case study begins with a brief description of the MSP initiative. This is followed by a presentation of findings as they relate to the evaluation criteria presented in Table 2.

3.1. Canada's Eastern Scotian Shelf Integrated Management (ESSIM) initiative

Canada is recognised as a leading country in terms of place-based marine management. Canada implemented its Large Ocean Management Areas (LOMAs) programme to plan and manage marine activities in five different areas. The Eastern Scotian Shelf Integrated Management (ESSIM) initiative was the longest running and most developed initiative. ESSIM had developed a strategic plan for its planning area and is often cited as a good example of MSP. The place-based plan was developed in collaboration with stakeholders and contains objectives for the future management of the area. The ESSIM initiative approximates the 'Minimal Parallel System' described in the Marine Legal Study.

3.1.1. Ecosystem-based Approach & Environmental Assessment

The ecosystem approach is one of ESSIM's guiding principles. The ESSIM initiative strives to implement this by focusing on three overarching objectives: ecosystem health; sustainable development; and integrated management. The overall goal in respect of ecosystem health is the maintenance or improvement of marine ecosystems by ensuring that their structure, function and quality are not compromised by human use or associated management regimes. Adopting this approach, according to the ESSIM plan, means that "the management of human activities should make every effort to ensure the integrity of ecosystem components, functions and properties are maintained and/or restored at appropriate temporal and spatial scales" (DFO, 2007, p.13). To achieve this, the management plan focuses on ensuring human activity does not adversely affect biodiversity, ecosystem productivity or marine environmental quality (DFO, 2007). The plan contains a number of strategies to implement this, such as: identifying threats and management options for biodiversity conservation; assessing and reviewing factors influencing productivity; and assessing sources and impacts of wastes and debris (DFO, 2007). To implement an ecosystem-based approach "the ESSIM planning process considers the ecosystem and all of its users comprehensively" rather than concentrating on individual sectors (DFO, 2007, p.3). Efforts at adopting this approach, however, are ultimately undone by the ESSIM plan's weak implementation strategy which eschews coordinated action planning in favour of sectoral planning (discussed below in section 3.1.5). A recent review of the ESSIM found that: a) transitioning to MSP will require lead agencies to develop ecosystem-based work practices; and b) applying EBM requires place-based rather than sectoral based implementation strategies (Flannery and Ó Cinnéide, 2012a).

Element	Objective (What)	Strategy (How)
Integrated Management	Collaborative structures and processes with adequate capacity, accessible to community members, are established.	<ul style="list-style-type: none"> • Implement ESSIM collaborative planning model. • Identify and support existing multi-sectoral and inter-governmental coordinating mechanisms and establish new mechanisms where needed. • Facilitate stakeholder involvement and capacity.
	Information and Knowledge Appropriate legislation, policies, plans and programs are in place.	<ul style="list-style-type: none"> • Assess effectiveness and efficiency of current legislation, policies, plans and programs. • Develop mechanisms for evaluating proposed legislation, policies, plans and programs. • Initiate policies, plans and programs and identify the need for new legislation as required. • Assess international obligations and commitments and ensure that they are fulfilled. • Incorporate integrated management objectives into sector management plans. • Clarify jurisdictional relationships and fulfil constitutional obligations. • Ensure adequate resources are in place.
	Legal obligations and commitments are fulfilled.	
	Ocean users and regulators are compliant and accountable.	<ul style="list-style-type: none"> • Develop and implement frameworks for compliance promotion. • Develop and implement frameworks for accountability. • Develop and implement frameworks for performance monitoring, reporting and assessment.
	Ocean stewardship and best practices are implemented.	<ul style="list-style-type: none"> • Review existing guidelines and best practices and improve/adapt as necessary. • Develop new guidelines and best practices as necessary. • Support stewardship through education, training and awareness programs.
	Multi-sectoral resource use conflict is reduced.	<ul style="list-style-type: none"> • Understand existing use patterns and interactions. • Identify and characterize spatial and/or temporal conflicts. • Develop procedures and tools for addressing conflicts.

Table 3: ESSIM Integrated Management Objectives (Adapted from: DFO, 2007).

3.1.2. Setting Objectives & Scope of Planning Process & Plans

The ESSIM Plan is a multi-year, strategic-level plan. It contains strategic objectives and high-level management strategies, intended to provide long-term direction and commitment for integrated, ecosystem-based and adaptive management of all marine activities in or affecting the Eastern Scotian Shelf. In this regard, the plan focuses on sectoral integration. The goal of the ESSIM Plan is to provide an objectives-based approach to ocean management (DFO, 2007). The plan contains three overarching objectives: collaborative governance and integrated management; sustainable human use; and healthy ecosystems. These goals are supported by more specific objectives and strategies (see Table 3 for examples). These goals and objectives are designed to “underlay the Plan and provide the basis for defining management strategies and measuring progress on Plan implementation” (DFO, 2007, p. 5). Many of the strategies contained in the plan are very general. For example, one strategy supporting the objective of integrated management is to: facilitate stakeholder involvement and capacity. The strategy contains no indication about the actions that are to be taken to facilitate this or who will lead the participation process. None of the plan’s strategies contain information regarding lead agencies or implementation bodies.

3.1.3. Legislative, Governance and Political Issues

A number of legislative and policy developments in Canada shaped the development of the ESSIM Plan. Canada enacted the Oceans Act in 1997 as a result of growing concern regarding the cumulative impacts of human activities on its marine ecosystems and in response to international treaties. In 2002, Canada released its national *Oceans Strategy* (DFO 2002a). The strategy focuses on high-level planning principles and approaches and is developed around three central topics: 1) establish institutional governance mechanisms to enhance coordinated, collaborative oceans management across the federal government; 2) implement a programme of integrated management planning to engage partners in the planning and managing of ocean activities; and 3) promoting stewardship and public awareness. The strategy does not identify spatial development patterns for particular areas or include indicative policies in relation to the location of particular sea uses.

The strategy is accompanied by *The Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada*, which primarily outlines planning principles associated with integrated marine management and an ecosystem approach (DFO 2002b). Finally, *Canada's Oceans Action Plan* was released in 2005 as a federal multi-year, multi-sector plan (Government of Canada 2005). The Plan serves as the overarching umbrella for coordinating and implementing oceans activities, and as the framework to sustainably develop and manage our oceans. The Oceans Action Plan is based on four inter-connected pillars: 1) International Leadership, Sovereignty and Security; 2) Integrated Oceans Management for Sustainable Development; 3) Health of the Oceans; and 4) Ocean Science and Technology. It reiterates the planning principles discussed above and outlines initiatives to be implemented in 'Phase 1' to operationalize these principles. This included the adoption of the LOMA concept. Phase 1 includes a series of interrelated initiatives that will be completed within 24 months, which build on progress made to date and set the foundation for achieving the long-term objectives of the Oceans Act and Canada's Oceans Strategy. Subsequent phases of the Oceans Action Plan will broaden the geographic scope of oceans management, deepen action across the Government and take advantage of lessons learned in Phase 1. No further iterations of the Action Plan have been developed and it has not transitioned to Phase 2.

The Oceans Act mandated Department of Fisheries and Oceans Canada (DFO) to lead and facilitate the development and implementation of integrated management plans for Canada's oceans in collaboration with maritime stakeholders. The ESSIM initiative was the first integrated ocean management project established under this act (Foster *et al.*, 2005). The impetus for the initiative partly emanated from the *Sable Gully Conservation Strategy* (1997) which recommended that integrated management approaches be applied to the offshore area surrounding The Gully Area of Interest (Rutherford *et al.*, 2005). The Eastern Scotian Shelf was also chosen for the application of integrated ocean management because it contains an extensive range of living and non-living resources, has areas of high biological diversity, and has multiple and conflicting human activities (Walmsley *et al.*, 2007). Fisheries, offshore oil and gas, marine transportation, communications and submarine cables, maritime defence operations, scientific research, recreation and tourism, ocean disposal, and marine conservation and protection are the main activities in the area (Walmsley *et al.*, 2007).

The ESSIM initiative developed a collaborative planning governance model (see fig 1). The model has four institutional structures: the Government Sector Structure; the ESSIM Planning Office; the ESSIM Forum; and the Stakeholder Advisory Council (SAC) (DFO, 2007). The Government Sector Structure comprises two bodies: the Regional Committee on Ocean Management, and the Federal-Provincial Working Group. The Regional Committee

acts as the ‘senior executive level forum for federal and provincial departments and agencies with ocean-related programs’ and includes representatives from federal government departments and government departments and agencies from Nova Scotia, New Brunswick and Prince Edward Island (DFO, 2007, p. 25). The Regional Committee coordinates, *inter alia*, the intergovernmental and interdepartmental planning on issues related to coastal and ocean management (DFO, 2007). The Federal-Provincial Working Group is ‘an intergovernmental forum that focuses on policy, management, operations and regulatory coordination for the ESSIM Initiative’ (DFO 2007, p. 26). The Group comprises representatives of ocean-related federal and provincial departments, agencies and boards and is concerned with building government support and cohesion for integrated ocean management (DFO, 2007).

The ESSIM Planning Office is managed by DFO. It is tasked with providing leadership and coordination, in cooperation with the SAC and the Government Sector Structure, in the development and implementation of the ESSIM Plan (DFO, 2007). The ESSIM Planning Office acts as the secretariat for the overall collaborative planning process. The ESSIM Forum is an all-encompassing stakeholder congress that functions as a broad communication forum but has no decision-making authority (DFO, 2007). It is open to all stakeholders and interested individuals. The Forum also allows for workshops to be convened for “information sharing, topical discussion and feedback, as required” (DFO, 2007, p.22).

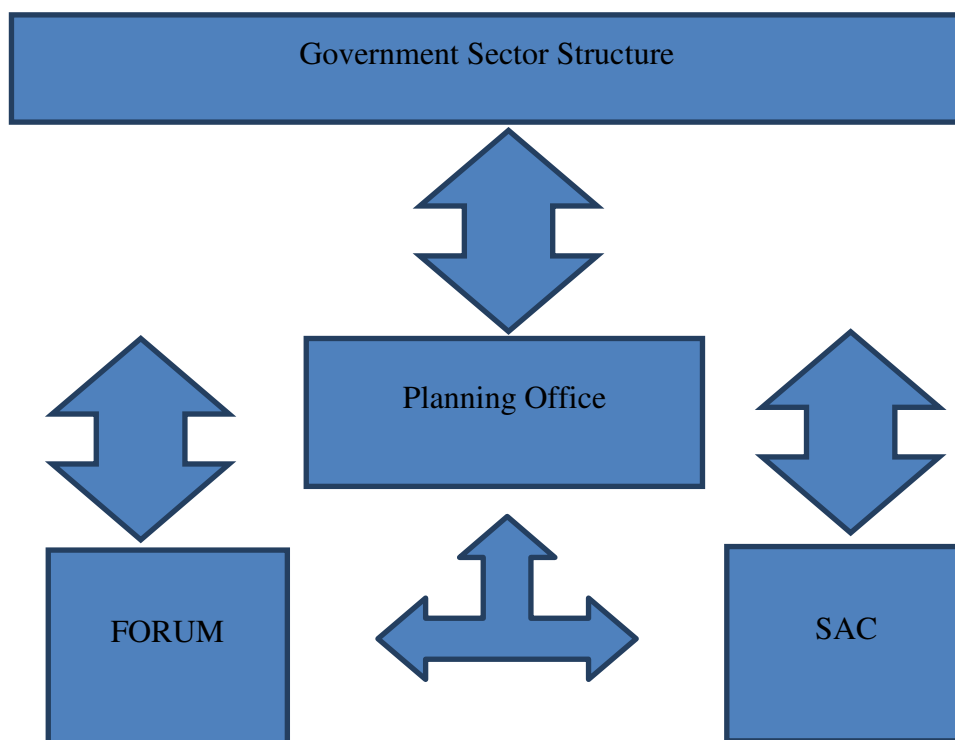


Figure 1: ESSIM collaborative planning model

The SAC is limited to stakeholder representatives and is responsible for providing leadership, guidance and stewardship for the development and implementation of the ESSIM Plan (DFO, 2007). The SAC is the main stakeholder participation mechanism employed by ESSIM and is discussed in detail in section 3.1.4.

3.1.4. Stakeholder Participation

Stakeholder representation on the SAC is shown in Table 4. Membership is balanced by sector as well as by criteria such as group size, capacity, and commitment. According to the ESSIM Plan (DFO, 2007) the optimum size for the SAC approximates 30. The SAC is comprised of both ‘community’ and ‘regulatory’ stakeholders. This led to some tensions amongst stakeholders as some government departments and agencies were reluctant, or not empowered, to discuss issues in a public forum (Flannery, 2011).

Stakeholder Group	Number of Seats
Government of Canada	4
Conservation Groups	3
Government of Nova Scotia	3
Community Groups	2
Academic & Private Sector Research	2
Government of Newfoundland & Labrador	1
Transportation	1
Municipal Government	2
Offshore Petroleum Board	1
Telecommunications	1
Aboriginal Peoples	2
Tourism	1
Fisheries	5
Citizens at Large	1-2
Oil and gas	2
Total	31-32

Table 4: ESSIM SAC Membership (Source: DFO, 2007).

The plan does not contain information on how SAC membership was balanced. Various methods are used to select representatives: for example, environmental non-governmental groups form a caucus to nominate their representatives. SAC members are encouraged to send alternates if they are unable to attend particular meetings (SAC, 2008). The SAC meets quarterly at a minimum. Meetings are co-chaired: one chair from DFO and another drawn from the non-government sectors.

The SAC used a consensus based decision-making process. However, a recent review found that although consensus based decision-making has ensured stakeholder buy-in it had greatly prolonged the planning process and led to rather general planning objectives (Flannery and Ó Cinnéide, 2012a). Also, it found that: a) involving stakeholders in the design of the process builds trust in the lead agency; b) fostering face-to-face- dialogue among stakeholders leads to increase trust and new relationships and networks; c) decision-making on the basis of consensus has significant limitations indicating that other decision-making processes may need to be explored; d) although process flexibility is desirable, collaborative planning initiatives must remain focused on the key issues at hand so as not to alienate stakeholders; e) engaging all stakeholders in the MSP process requires issues of fragmented governance to be resolved in advance of plan development; f) and the role of government departments and agencies as ‘participants’ in MSP initiatives needs to be clarified from the outset, so as to avoid unnecessary tensions arising between them and other stakeholders (Flannery and Ó Cinnéide, 2012a).

3.1.5. Implementation and Enforcement

The ESSIM strategic plan does not provide detailed strategies or actions plans to achieve its cross-sectoral objectives. Instead, the plan aims “to augment or enhance existing decision-making processes by linking sector planning and management to an overarching set of goals and objectives” (DFO, 2007, p.5). Action planning is left to the preserve of the various marine sectors with little or no coordination or integration of these plans. Thus, the implementation of the ESSIM initiative’s planning objectives is largely dependent on individual sectors voluntarily adopting planning principles and related objectives and strategies in their own plans.

Thus, sectoral interests are expected to unilaterally develop action plans to implement the ESSIM Plan. There is little or no evidence of a concerted effort by sectors to develop these plans. By the time the ESSIM ended on the 23rd of May 2012 only two ‘sector’ actions plans were developed: a Spatial Conservation Action Plan (led by an environmental non-governmental organization caucus) and a Fisheries Sector Framework Action Plan (co-led by industry and DFO) (McCuaig and Herbert, 2013). The former is best categorised as an advocacy action plan whereas the latter is primarily a framework for developing a more detailed action plan in the future. It is questionable, therefore, as to whether these action plans resulted in the implementation of ESSIM’s strategic objectives or resulted in changed practices on the water.

Furthermore, implementation is proving to be challenging for other initiatives established under the Oceans Act. Partly as a result of this, Canada ocean policy is altering, with integrated management initiatives being discontinued in favour of a bioregional approach (DFO, 2011). Bioregional plans will focus on producing operational guidance rather than on strategic-level planning objectives (Jay *et al.*, 2013).

3.1.6. Data, Tools (including zoning) & Resources

DFO has undertaken a significant amount of scientific research and assessment work in support of the ESSIM initiative. In 2002, DFO released *The Scotian Shelf: An Ecological Overview for Ocean Planning* which describes the ecosystem and its components. In 2003, it released *The State of the Eastern Scotian Shelf Ecosystem*, which identifies trends and changing environmental conditions in the planning area (DFO, 2007). In 2006, DFO published *Implications of Ecosystem Dynamics for the Integrated Management of the Eastern Scotian Shelf*, which provides a description of the dynamics between the marine environment (including physical habitat, species and trophic interactions) and human activities and impacts (DFO, 2007). As well as these technical reports, DFO has also published a number of discussion papers regarding the planning process. These include: *The Development of a Collaborative Management and Planning Process*, which was designed to stimulate and guide discussion on the structures of the collaborative planning model; *Issues, Challenges and Opportunities: A Discussion Paper prepared for the Federal-Provincial ESSIM Working Group*, which was based on the bilateral discussions between DFO and various ocean sectors and which outlined broad management issues; *A Strategic Planning Framework for the Eastern Scotian Shelf Ocean Management Plan: A Discussion Paper prepared for the ESSIM Forum*, which presented the core elements of the plan and various options for the development of a comprehensive ocean management framework; and *Eastern Scotian Shelf Integrated Management (ESSIM) Initiative: Proposed Collaborative Planning Model – A Discussion Paper*, outlining the proposed collaborative planning model (DFO, 2007).

Stakeholders commented that these reports were as valuable as the scientific reports as they helped to structure the planning process (Flannery and Ó Cinnéide, 2012a). An atlas of

human activity in the planning area was also produced. This contains spatial and temporal information about a number of activities in the planning area including: fisheries; conservation; oil and gas; military exercises; research; submarine cables; marine tourism; and ocean dumping (DFO, 2007). It was noted by a recent study that during the planning process the SAC was able to draw on the expertise of a number of its members who had relevant planning skills and previous experience of integrated management and that this was considered to be beneficial by a number of stakeholders (Flannery and Ó Cinnéide, 2012a).

3.1.7. Boundary and Scale Issues

The spatial boundaries of the ESSIM initiative are based on a combination of administrative and ecological considerations (DFO, 2007). For example, the eastern boundary was delineated so that the planning area would not abut US waters. The other boundaries have been the subject of much debate and controversy. The planning area as designated corresponds with the Northwest Atlantic Fisheries Organization (NAFO) fisheries management division 4VW (DFO, 2007). This area, however, encroaches on the jurisdictional area of the Canada-Newfoundland and Labrador Offshore Petroleum Board, who are not party to the ESSIM process. This meant that petroleum development in the overlapping area could be the subject of two separate management processes. This issue was not satisfactorily resolved before the development of the ESSIM Plan, with the result that the Minister of Fisheries and Oceans refused to endorse it, which in turn led to implementation issues and frustrated many stakeholders involved in the process. The landward boundary of the planning area has been changed a number of times. The ESSIM initiative was originally designed to be Canada's first integrated ocean management project with an exclusively offshore focus. Later it sought to incorporate coastal waters into the initiative (Rutherford *et al.*, 2005). However, during the process of developing the ESSIM plan the initiative returned to its original remit with the plan focusing exclusively on offshore seas, specifically the area beyond the 12nmi territorial sea limit (DFO, 2007). The moving landward boundary caused some tension amongst stakeholder as the plan was being developed. Some sectors believed that 'coastal stakeholders', such as community groups, were outside the planning area and therefore should not be influencing the design of the plan and its objectives.

The ESSIM plan is not formally integrated with any adjoining terrestrial plans. After the ESSIM plan was completed an MOU was signed by the province of Nova Scotia wherein DFO and the Nova Scotia Department of Fisheries and Aquaculture agreed to explore collaborative opportunities to advance Nova Scotia's and Canada's priorities for coastal and oceans management.

3.2. BaltSea Project

The BaltSeaPlan Project was implemented between January 2009 and April 2012. The German Federal Maritime and Hydrographic Agency led the project, which had 14 partners in total drawn from across the EU Baltic Sea Region. The project was intended to demonstrate the potential of MSP. As it was mainly a research project, it did not produce legally binding plans. It did, *inter alia*, engage in a large amount of data gathering and analysis, develop draft maritime spatial plans for pilot areas and stakeholder engagement and is a useful case study in terms of the overall aim of this report. Due to its non-statutory standing, the case study does on report on lessons relating Legislative, Governance, Implementation and Enforcement criteria.

3.2.1. Ecosystem-based Approach & Environmental Assessment

The BaltSea Project had 'the ecosystem approach' as one of its core principles. The BaltSeaPlan Vision 2030 argues that the ecosystem must be viewed in a holistic manner, and

that ecosystem structures and functions must not be compromised by marine uses. It claims that achieving this “requires that any decision taken on sea use must be integrated and looked at for cross-sectoral aspects, including the potential harm that could come to natural systems and services” (Gee *et al*, 2012 p.14). No guidance, however, is provided on how to engage in ecosystem-based decision-making. As the plans developed as part of the BaltSea Project are not implementable it is not possible to ascertain if the ecosystem approach translated from principle to practice. Conducting an environmental assessment of the Baltic Sea was beyond the scope of the BaltSea project. The project, however, contains some useful lessons and suggestions relating to environmental assessment and MSP. For example, The Pilot Maritime Spatial Plan for the Pomeranian Bight and Arkona Basin describes how MSP can help achieve Good Environmental Status (GES) by linking spatial planning practice to a number of Marine Strategy Framework Directive (MSFD) descriptors (see Table 5).

MSFD Descriptor of good environmental status	How MSP can contribute
Descriptor 1: Securing biological diversity	Active use of information on the spatial distribution of species or underwater habitats
Descriptor 2: non-indigenous species which are introduced by human activities are at a level that does not negatively affect the ecosystem	Assessment of shipping routes and areas of ballast water exchange to derive spatial objectives for sustainable shipping.
Descriptor 3: the population of all commercial fish and seafood stocks are in safe biological limits and show population age and size structures which indicate a healthy status.	Active use of information on spawning stocks and nursery areas, as well as catch surveys as a tool for designating fisheries management areas and protected zones.
Descriptor 5: Eutrophication induced by human activities	Active use of information on eutrophication for siting decisions (including temporal uses). Translate HELCOM data into thematic maps for the MSP assessment phase. Relevant map layers could oxygen content, distribution maps for sea grass or other macrophytobenthos, or chlorophyll A in coastal areas.
Descriptor 6: the integrity of the sea floor is in a state that secures that the structure and the function of the ecosystem will be safeguarded and that benthic ecosystems will not be negatively affected.	As descriptor 1
Descriptor 7: the permanent alteration of hydrographic conditions does not negatively affect the marine ecosystem.	MSP can help secure this by ensuring that sea uses do not endanger hydrographic conditions.
Descriptor 11: Introduction of energy including underwater noise into the system stays on a level that does not negatively affect the marine environment.	MSP can play a role in minimising underwater noise (e.g. from shipping and offshore wind turbines) in proximity to important habitats/species. (e.g. considering buffer zones for porpoises)

Table 5: MSFD Descriptors and MSP (adapted from Käppeler *et al*, 2012).

3.2.2. Setting Objectives & Scope of Planning Process & Plans

Rather than develop a set of conceptual aims, the BaltSea project sought to develop objectives that were based on sectoral trends and existing management goals for the planning areas (Schultz-Zehden and Gee, 2012). To develop these planning objectives, project partners analysed existing regional and national policy documents, including: national and regional development strategies; spatial strategies and development programmes; economic and innovation policies as well as infrastructure development; sectoral policies and funding programmes (Schultz-Zehden and Gee, 2012). The analysis sought to address two questions: 1) the extent to which the implementation of the objectives/priorities of a policy will influence the use of sea space (direct versus indirect impact); and 2) the likelihood of their implementation (strong versus weak impact) (Schultz-Zehden and Gee, 2012). An impact table was produced for every policy that was analysed (see Table 6). “A combined look at all the policy impact tables made it possible to identify any explicitly stated government

priorities that can act as a driving force for marine development. If priorities could be identified, their compatibility was checked across the various policy levels (i.e. from municipal to the transnational level) and across policy areas (i.e. cross-sectoral/horizontal – sectoral)” (Schultz-Zehden and Gee, 2012 p.17). Also, trends and pressures in different maritime sectors were analysed so as to identify any spatial implications these may have (Table 7) (Schultz-Zehden and Gee, 2012).

Impact	Direct	Medium	Indirect
Strong/Weak	Policy creates legal or administrative conditions for sea use or proposes specific politically accepted targets, goals and principles for this use	Policy creates strong incentives or disincentives for the use of sea space	Policy might influence use of sea space through awareness raising, changing the priorities/values of decision makers, influencing the availability of sea resources or non-administrative conditions of their use

Table 6: Policy Impact Table (Adapted from Schultz-Zehden and Gee, 2012).

Trends and pressures	Implications	Policy responses commonly called for	Relevance for MSP
Intensification of fishing/overuse Compared to available resources (growth also in recreational fishing)	reduced fish stocks	restore habitats in inland waters reduce overfishing: e.g. set maximum limits, use selective fishing techniques	take into account in siting decisions for other uses designation of fishing zones
Continued investment in offshore wind farming	new offshore wind farms to be established (planning permission already granted, search areas established)	sensitive siting	siting decisions, designation of suitable areas/unsuitable areas

Table 7: Trends/Pressures and Relevance to MSP (Adapted from Schultz-Zehden and Gee, 2012).

3.2.3. Legislative, Governance, Implementation and Enforcement

Due to the non-statutory standing of the BaltSea Project, this case study does on report on lessons relating Legislative, Governance, Implementation and Enforcement criteria.

3.2.4. Stakeholder Participation

Stakeholders were highly involved in the development of plans for the project pilot areas. Through the lifetime of the project, stakeholders were afforded the opportunity to report planning problems and to actively participated in the development of solutions. Table 8 illustrates the planning phases that included stakeholder participation.

	Planning Phases	Phases in stakeholder involvement
Phase 1:	Pre-planning	Identify relevant stakeholders
Phase 2	Context analysis and definition of aims and objectives for the planning area	Plan stakeholder involvement: define who should be involved and when
Phase 3:	Stocktake	Obtain information from various stakeholders
Phase 4:	Conflict analysis	First stakeholder meeting: a professionally moderated workshop to discuss the different possible futures for the area. Follow-up on the results to the participants.
Phase 5:	Finding solutions	Second stakeholder meeting: Discuss possible measures for each zone in small thematic groups. Discuss the environmental impact of each measure.
Phase 6	Drafting the plan	Public hearing: present the draft MSP and SEA report to the authorities in charge of the MSP implementation.
Phase 7	Implementation	Not part of the pilot project.
Phase 8	Evaluation	Carried out during stakeholder process.

Table 8: Drafting a maritime spatial plan and steps of stakeholder involvement (adapted from Käppeler *et al*, 2012)

Due to the diverse range of stakeholders, governance institutions and planning practices across the Baltic Sea, a number of stakeholder participation methods were employed by the project partners. Stakeholder participation in the project was divided into three broad categories: informing; consulting and involving. Methods used to inform stakeholders included factsheets, websites, open houses, press releases, brochures and exhibitions. Consulting mechanisms included public hearings; focus groups, surveys and interviews. Methods of actively involving stakeholders in the planning process included Scenario workshops, deliberative polling, Café Scientifique and site visits and excursions (Pentz, 2012). Only a small number of these participation methods have been evaluated by the project. For example, it's reported that the Café Scientifique approach adopted in Lithuanian "proved to be an effective way to educate the public, highlight existing conflicts and promote stakeholders by encouraging open expression of different views on MSP" (Pentz, 2012:19). Similarly, a brochure produced by one of the partners was found to be a useful way to communicate with the general public and that it is now "used by experts, officials, politicians, teachers and scientists in all kinds of events and official documents" (Pentz, 2012:21).

Notwithstanding national differences and the plethora of participation mechanisms employed in the project, five common steps were employed in all project pilot planning areas: step 1: agreement on the purpose of the stakeholder participation process; step 2: identification of potential participants; step 3: stakeholder analysis; step 4: find the right techniques and timing to interact with different stakeholder groups; and step 5: evaluation of the stakeholder participation process (Pentz, 2012).

The project focused on three categories of stakeholders and identified them through three separate processes. Stakeholders categories included: 1) formal stakeholders, this group of stakeholders was mainly comprised of representatives from ministries and other public authorities and were identified through an analysis of the legislative and governance framework for pilot planning areas; 2) commercial and non-commercial stakeholders, stakeholders in this category were linked to commercial and non-commercial activities in and around the planning area and were identified through the stocktake of sea uses and claims to the maritime space, desktop research, analysis of conference participants lists and through a snowballing approach where identified users were asked to identify other possible stakeholders; and 3) stakeholders which contribute to the debate regarding the use of the marine and coastal space, stakeholders in this category included politicians, NGOs and citizens groups and were identified through media content analysis, interdisciplinary science literature research and the snowball system (Pentz, 2012).

After stakeholders were classified, their interests and expectations regarding the planning process were identified through a stakeholder analysis process. The project highlights a number of questions that should be addressed through the stakeholder analysis process: 1) stakeholder's attitude about MSP in general and their willingness to spend resources on participation? 2) What are their interests and expectations regarding the planning area? 3) Does the stakeholder have valuable input (e.g. marine data, research facilities, technologies) which could be helpful for developing the plan? 4) How does stakeholder envisage being affected by MSP? 5) Has the stakeholder the resources to take part in the planning process? 6) How is the stakeholders' work and communication organised, and what networks do they belong to? 7) How experienced is the stakeholder with stakeholder involvement and MSP? 8) Has the stakeholder the power to make their voice and opinion heard in a planning process? 9) What communication and involvement techniques are suitable for the stakeholder? (Pentz, 2012).

Table 9 gives an overview of how this information was incorporated into a stakeholder matrix. As part of the stakeholder analysis process, project partners analysed stakeholder groups against a number of criteria (Organisation, Resources, Willingness, Experience and Voice). They rated stakeholders' capacity in these categories from 1 (very high) to 5 (very low). So as to provide a better overview this rating then was translated into a traffic light scheme 1-2 (green), 3 (yellow) and 4-5 (red) (Pentz, 2012). The traffic light scheme enabled stakeholder engagement officers to quickly assess how to improve stakeholder capacity to participate in the planning process (Pentz, 2012).

Stakeholder group	Interest, Expectations	Input	Network	Organisation	Resources	Willingness	Experience	Voice	Preferable techniques
Small sized NGO, nature Conservation	<ul style="list-style-type: none"> - Protect certain species - Conflict with sand gravel extraction 	Knowledge about sightings of species x and habitats	University, Local press						Local meetings, Bilateral communication, workshops

Table 9 Stakeholder Analysis Matrix (Adapted from Pentz, 2012).

3.2.5. Data, Tools (including zoning) & Resources

Project partners gathered and mapped a range of baseline information for their respective planning areas. The aim of this exercise was to create an overview of the following:

1. the marine administrative context, including boundaries at sea;
2. the physical/biological context, including bathymetry/ecology including habitats / geology/ oceanography data;
3. climate data/indices (vulnerability, biodiversity etc.)
4. human activities (present/planned/relevant former activities/functions);
5. designated areas and regulations (MSP/national, IMO, EU etc.);
6. designated areas for nature conservation (national/EU/HELCOM/UNESCO etc.) (Fetissov *et al.*, 2011).

Most of the BaltSea pilot projects experienced some difficulties in completing this task, mainly due to the fact that spatially relevant data was not always readily accessible (Fetissov *et al.*, 2011). In most pilot projects it was hard to obtain or generate environmental spatial data. Although much ecological data is available it usually is not available in a spatial format, allowing only rather general descriptions of habitats and bird and fish distribution (Fetissov *et al.*, 2011).

All pilot projects generated a marine map to illustrate spatial overlaps of different sea uses (Fetissov *et al.*, 2011). These maps were found to be useful stakeholder communication tools.

Conflict matrices also were developed in most pilot areas. Categorisation of conflicts, however, varied from pilot to pilot. For example, Latvia used a simple distinction of main marine conflicts, such as those arising from new sea uses such as offshore wind farming and oil extraction impacting on fisheries and shipping, and smaller coastal conflicts, such as those between coastal biodiversity and local communities. In the Middle Bank pilot project, conflicts were categorized according to the degree to which they can be solved by MSP (Fetissov *et al.*, 2011).

Whatever the means of categorising conflict, the BaltSea project concluded that, “conflict analysis should end with a specific and coherent task for planners to be tackled in the planning stage” (Schultz-Zehden and Gee, 2012 p. 84).

Zoning was central to the draft plans produced. Table 10 illustrates the zoning typology employed in one of the Pilot Plans. As plans were not implemented, it is not possible to evaluate the utility of the zoning approach adopted.

Priority areas	no use is allowed that would significantly constrain the use that is given priority in this area. Strict priority areas could be shipping lanes, nature protection areas, offshore wind farm sites, fish spawning and nursery areas, raw material resources, marine archaeological sites, or areas important for tourism.
Reservation areas	a certain use is given special weight in the process of balancing the competing interests in the area. The difference to priority areas is that it is not certain that the use receiving specific attention has absolute priority.
Suitable areas	an activity is exclusively assigned to respective suitable areas which have been chosen along a range of parameters – outside of these areas the activity is not allowed and not licensable
Open use areas	no use has priority and all uses other than those restricted to suitable areas are allowed

Table 10: zoning typology for the Pilot plan (Source: Käppeler *et al.*, 2012)

A Web-GIS portal, BaltSeaPlan Web, was developed as part of the overall project. It was built on ESRI ArcGIS and Silverlight technology and serves as a platform for developing different project related web applications (Fetissoff *et al.*, 2011). The Web-GIS was found to be a useful communication tool.

3.2.6. Boundary and Scale Issues

Transboundary MSP was the focus of the Pomeranian Bight/Arkona Basin pilot project. The planning area comprises parts of the territorial seas and EEZs of Denmark, Sweden, Poland and Germany. However, as the pilot project began to delineate the planning area, it realised that there were a number of contradicting claims between Germany and Poland (Käppeler *et al.*, 2012). Also, the border between the Danish and Polish EEZ had not been agreed. While these issues were ignored due to the pilot nature of the project, they would pose significant challenges when designing implementable marine spatial plans.

The report on this pilot plan argues that transnational consultation should be conducted at a very early stage of the MSP process. The project also highlighted that other problems arose due to institutional and cultural diversity, different languages, terminologies and planning philosophies and suggested that other transboundary MSP initiatives should make provisions at an early stage with regard to developing a common understanding of partners' cultural and institutional differences and should develop a cross jurisdictional working-group to continuously exchange experiences (Käppeler *et al.*, 2012). They recommend that members of the cross jurisdictional working-group should be those directly involved in the development of maritime spatial plans.

3.3. German Plan for the North Sea

In Germany, MSP occurs at both Federal and State levels and has been facilitated by extending terrestrial planning legislation to cover the marine environment. In this manner, the

German example comes close to approximating the extended terrestrial option discussed in the Legal Study Report. This review is concerned with Federal level MSP in the German part of the North Sea.

3.3.1. Ecosystem-based Approach & Environmental Assessment

The German plan for the North Sea is not based on a detailed assessment of environmental and ecological conditions in the planning area. However, an SEA of the plan has been carried. The assessment report focused on: Relationship to other relevant plans and programmes; Presentation and consideration of environmental protection objectives; Description and assessment of environmental status; Prospective development in the event that the plan is not implemented; Presentation of the uses in the EEZ; Effects of uses on the subjects of protection seabed and water; Development of the subjects of protection seabed and water in the event that the plan is not implemented; Description and evaluation of the prospective significant effects of implementation of the Maritime Spatial Plan on the marine environment; Measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the marine environment through the implementation of the Maritime Spatial Plan; Examination of possible alternatives and description of the environmental assessment implementation; and Planned measures for monitoring the significant impacts of implementation of the Maritime Spatial Plan on the environment.

The SEA report contains input from the Federal Agency for Nature Conservation which describes the biological features of protected areas and reports probable development scenarios if the plan is not implemented. For the SEA, the planning area was subdivided into a number of smaller areas to account for specific ecological and geological conditions. The SEA report centres on the describing and evaluating any substantial impacts that are liable to be caused by the implementation of the plan. The SEA report used the assessment of the marine environmental status as a basis for measuring likely impacts (NOAA, 2011). The findings in the SEA concerning the importance of specific areas, in terms of ecological features, have been taken into when zoning areas for particular uses. Similarly, spatial designations made during the plan development phase were evaluated for their environmental impact and adapted as appropriate (NOAA, 2011).

3.3.2. Setting Objectives & Implementation, Enforcement & Review

The plan is principally motivated by the need to manage a number of key sectors in order to avoid user conflict. It pays particular attention to the wind farm development. The objectives of the plan reflect Germany's commitments under international conventions and EU Directives as well as national objectives for specific sectors such as shipping and wind energy (NOAA, 2011). The setting of planning objectives has been steered by the following guidelines: 1) Securing and strengthening maritime traffic; 2) Strengthening economic capacity through orderly spatial development and optimization of spatial use; 3) Promotion of offshore wind energy use in accordance with the Federal Government's sustainability strategy; 4) Long-term sustainable use of the properties and potential of the EEZ through reversible uses, economic use of space, and priority of marine uses; and 5) Securing natural resources by avoiding disruptions to and pollution of the marine environment.

These guidelines could be considered high-level, normative objectives. Based on these guidelines, a set of targets and principles are developed for a number of key sectors: shipping, non-living resources (hydrocarbons and sand and gravel), pipelines and cables, scientific research, energy production (especially wind energy), fisheries and mariculture and the marine environment. The main approach to achieving these targets is to establish zones within which defined uses are given favourable treatment. The plan also contains a justification for the measures developed for each sector and a brief description of sectoral legislative framework (NOAA, 2011).

The plan is relatively weak in terms of sectoral integration (which was one of the aims of the planning process) as the plan itself is structured sectorally, with a number management strategies for individual sectors (Jay *et al.*, 2012).

The plan does not make explicit reference to enforcement or review strategies. Implementation is primarily achieved through the licensing and permitting process. Monitoring is primarily achieved through project-specific monitoring. This will be used to evaluate the implementation of the overall plan; how this will be achieved is not detailed in the plan (UNESCO, 2011).

3.3.3. Scope of Planning Process & Plans

The plan covers an area of approximately 28,600 km². The planning process for the EEZ began in 2005 when The Ministry for Transport, Building and Urban Development, tasked the German maritime agency to develop a plan for the German EEZ. This process was completed in 2009, after consultation with stakeholders on an initial scoping report in 2005 and a draft plan in 2008.

Despite covering the entire EEZ, the plan covers only a small number of marine activities. For example, the plan does not provide a framework for managing mineral extraction, fishing, mariculture, defence, tourism or MPAs (NOAA, 2011).

3.3.4. Governance, Legislative and Political Issues

MSP in Germany is based on existing legislation for terrestrial planning, which has been amended to extend spatial planning to the marine environment. The 2004 amendment to the Federal Spatial Planning Act, charges the ministry responsible for planning (The Ministry for Transport, Building and Urban Development) with the development of spatial plans setting out objectives and principles for Germany EEZs.

3.3.5. Stakeholder Participation

Stakeholder participation mainly consisted of consultations with other federal agencies and affording the public opportunities to review the draft plan (UNESCO, 2011). During two rounds of participation, drafts of the spatial plan and the environmental report were made available to neighbouring states, other German authorities and the public.

3.3.6. Data, Tools (including zoning) & Resources

The Plan is primarily based around a zoning approach. The plan designates areas within which defined uses are given favourable treatment. Zones include priority areas, in which a use has priority over others, or reservation areas, in which special consideration is given to a particular use. The plan focuses on the sectors given priority and reservation areas. This includes: 1) Shipping: a network of priority areas, including internationally recognized lanes and reservation areas for safety zones and anchorage; 2) Pipelines and cables: various gas and oil pipeline corridors, and cable corridors have designated; 3) Research: large reservation areas for scientific research; and 4) Wind energy: priority area blocks, mostly closer to the coast and defined by shipping areas (NOAA, 2011).

Other uses are only permitted in these zones if they do not compromise the zones 'primary use'. For example, wind turbines are not permitted to be built in shipping areas, but pipelines and cables may be permitted. These designations do not necessarily stop 'primary use' activities from occurring outside their zones elsewhere. The draft plan did, however, prevent wind farm developers from proposing developments outside their priority areas. This measure was overturned, as a result of lobbying, before adoption of the final plan (Jay *et al.*, 2012).

3.3.7. Boundary and Scale Issues

No Boundary or Scale Issues are evident in this case study.

3.4. Great Barrier Reef Marine Park

Australia's Great Barrier Reef Marine Park (GBRMP) is recognised as a good example of ocean zoning. Management of the park is overseen by the Great Barrier Reef Marine Park Authority (GBRMPA). Although, the GBRMP is synonymous with a zoning approach, it contains useful lessons for many of the other evaluation criteria listed in Table 2.

3.4.1. Ecosystem Approach & Environmental Assessment

In 1998, the GBRMPA initiated the Representative Areas Program (RAP) that entailed rezoning the entire Marine Park. At the beginning of the rezoning process, the GBRMPA engaged with the scientific and research community to identify and map habitat types. Expert panels compiled 40 existing data sets to characterize the biological and physical diversity of the GBRMP (NOAA, 2011).

A study of the shift towards an ecosystem approach highlighted 5 strategies adopted by the GBRMPA: 1) internal organizational changes; 2) bridging science and policy; 3) changing people's perceptions; 4) facilitating public consultation and participation, and 5) gaining political support (Olsen *et al.*, 2008). In terms of bridging science and policy, the RAP process relied heavily on the input from scientific experts and their synthesis of the best available data on Great Barrier Reef's species and habitats (Olsen *et al.*, 2008). Other 'transition' strategies are discussed below in the context of the evaluation criteria.

3.4.2. Setting Objectives, Scope of Planning Process & Plans

The Zoning Plan covers all allowable uses in the marine park, including environmental conservation, tourism, commercial fishing, recreational fishing, aquaculture, traditional uses, scientific research, and addresses shipping lanes.

The overall objectives for the Great Barrier Reef Marine Park are derived from the Great Barrier Reef Marine Park Act 1975. They include: 1) The conservation of the Great Barrier Reef (GBR); 2) The regulation of the wise use of the Marine Park so as to protect the GBR while allowing the reasonable use of the GBR Region; 3) The regulation of activities that exploit the resources of the GBR Region so as to minimize the effect of those activities on the GBR; 4) The reservation of some areas of the GBR for its appreciation and enjoyment by the public; and 5) The preservation of some areas of the GBR in its natural state undisturbed by man except for the purposes of scientific research.

As described above, the independent Scientific Steering Committee provided advice to the GBRMPA on scientific issues relevant to the selection of representative areas of biodiversity and developed social, cultural and management operational principles to guide the rezoning process.

3.4.3. Governance, Legislative and Political Issues

The zoning plan prepared by the Authority becomes a legislative instrument on the day the Minister signs it. The GBRMPA is responsible for developing zoning plans and for the management of the Marine Park. A board oversees the agency, which is structured into four main branches: Marine Park Management, Environment and Sustainability, Communication and Policy Coordination, and Corporate Services. The authority reports to the Australian Government Minister for Sustainability, Environment, Water, Population and Communities.

The Great Barrier Reef Ministerial Council was established in 1979 to coordinate Commonwealth and Queensland Government policy for the management of the Great Barrier Reef. It comprises two Ministers from each of the Commonwealth and Queensland Governments with responsibility for marine parks, science, tourism and/or the environment, and is chaired by the Commonwealth Minister for the Minister for Sustainability, Environment, Water, Population and Communities. Under an agreement with the Australian Government, Fisheries Queensland undertakes much of the fisheries management within the Marine Park. The GBRMPA and the Queensland Parks and Wildlife Service operate a joint program of education, compliance and enforcement to support the rules governing protection of the ecosystem.

The GRMPA also reorganised itself to facilitate the implementation of an ecosystem approach and to facilitate the rezoning. Reorganisation focused on improving communication between the different branches and pooling resources and experiences (Olsen *et al.*, 2008).

3.4.4. Implementation, Enforcement & Review

Spatial management in the GBRMP is based on eight zones, ranging from the least restrictive “general use zone” in which shipping and most commercial fishing are allowed, to the most restrictive “preservation zone” where virtually no use is permitted. RAP increased the no-take areas, up to about a third of the entire area of the GBRMP.

One of the recommendations of a 2006 governmental review of the Great Barrier Reef Marine Park Act of 1975 was the preparation of an “Outlook Report” every five years that will document the overall condition of the GBRMP, the effectiveness of management, and the pressures on the ecosystem. The Outlook Report has been an important contribution in the consideration of any future changes to zoning plans. However, the Australian government has indicated that the existing Great Barrier Reef Marine Park Zoning Plan 2003 would not be amended until it has been in operation for at least seven years to provide stability for business, communities, and biological systems. No amendments have been made to the plan since the moratorium ended in 2010.

Enforcement of zoning rules conducted by Queensland and Australian Government agencies including the Queensland Boating and Fisheries Patrol, Queensland Water Police, Queensland Parks and Wildlife Service, Australian Federal Police, Australian Customs Service (Coastwatch and the National Marine Unit), Australian Quarantine Inspection Service, and the Australian Maritime Safety Authority (GBRMPA, 2005).

3.4.5. Stakeholder Participation

Formal community participation in the RAP process took place in two phases, with informal consultation throughout the planning phase. Over a 3-month period from May 2002, GBRMPA sought formal community input for preparation of a Draft Zoning Plan for the entire GBRMP. This resource-intensive process used a range of techniques to ensure that all coastal communities adjoining the marine park were aware of the RAP. This first round of formal public participation resulted in 10,190 written submissions. The second formal community participation phase resulted in 21,500 additional written submissions. In late 2003, the Draft Zoning Plan was revised to incorporate information from the second consultation process, resulting in the Revised Zoning Plan, which increased the percentage of no-take areas in the GBRMP by 6-fold to 33%, including at least 20% of each of the 70 bioregions (Olsen *et al.*, 2008).

Some community groups, particularly fishery groups, were opposed to no-take zones. Furthermore, many people still thought that of the Great Barrier Reef as a unspoiled environment (Olsen *et al.*, 2008). To address this issue, GBRMPA employed a communication officer to produce a “reef under pressure” information campaign illustrating that the reef was subject degradation caused by anthropogenic pressures (Olsen *et al.*, 2008). This raised awareness of the need to rezone the Reef. The campaign included a number of resources, adapted for a range of stakeholder groups. Resources included web sites, posters, pamphlets, and television advertisements showing local celebrities promoting for initiative. The information campaign was followed up by opinion polling to evaluate its (Olsen *et al.*, 2008).

The rezoning initiative was occasionally misunderstood or misinformation about the intended location of no-take zones had been circulated (Olsen *et al.*, 2008). To address these issues, the GBRMPA produced a “Correcting Misinformation” fact sheet (Olsen *et al.*, 2008). GBRMPA also attended all public meetings they were invited to and organised small group meetings themselves so as to avoid large public meetings that could be dominated by one or a few people (Olsen *et al.*, 2008). This approach resulted in GBRMPA holding several hundred community information sessions in regional and local community centres (Olsen *et al.*, 2008).

3.4.6. Data, Tools (including zoning) & Resources

In high use areas near Cairns and the Whitsunday Islands, special Plans of Management are in place in addition to the underlying Zoning Plan. In addition, other Special Management Areas have been created for particular types of protection, such as the Dugong Protection Areas.

An Oracle database with a Microsoft Access interface was used to manage the submission response forms from the public.

Social, economic, cultural and management datasets collected as part of the RAP process included: Existing GBRMPA zoning, Queensland Government Fisheries Closures, Queensland Government adjacent National Parks, Australian Maritime Safety Authority shipping lanes, Australian Maritime Safety Authority ship reports, GBRMPA Spill risk map, Ports, Land Use Characteristics, Coastal developments, Native Regulatory Impact Statement, Title claims, Key informant recreational fishing information, Boat ramps, Suntag-fish tagging data, Recreational fishing diary and logbook data, 6 minute and 30 minute commercial crab-pot/net fishing/reef line/trawl/harvest/charter data, Historic shipwrecks, National Estate, Museum specimen sampling sites, Anchorage and mooring data, More than 30,000 public submissions to GBRMPA on the rezoning process (GBRMPA, 2005).

The RAP planning process used a variety of analytical planning tools including MARXAN, ReST and TRADER. These helped to apply the key operating principles, and in conjunction with other GIS-based spatial analysis tools, were vital to the systematic integration of biophysical, social and economic values (NOAA, 2011).

It was concluded, that as far as practicable, the pattern of zones within a multiple-use marine protected area should avoid sudden transitions from highly protected areas to areas of relatively little protection. The concept of ‘buffering’ (i.e. a gradation in zone types) should be applied wherever possible.

However, despite having an effective zoning system, the GBRMP has no long-term management plan. This lack of a strategic approach has recently been pointed out by UNESCO’s World Heritage Centre in a report on the impacts of port development and increased shipping pressures on the GBR. Specifically, UNESCO noted that the GBRMP lacks “an overall plan for the future sustainable development of the reef that will protect its OUV [Outstanding Universal Value] and ensure its ecological integrity while simultaneously achieving sustainable economic and social goals” (Douvere and Badman, 2012, p.59).

3.4.7. Boundary and Scale Issues

No Boundary or Scale Issues are evident in this case study.

3.5. Norwegian plan for the Barents Sea-Lofoten area

MSP in Norway is being developed by means of integrated management plans. A management plan has been developed for the Lofoten–Barents Sea, mainly as there was a push from the petroleum industry to gain access to this region. The Norwegian Parliament approved the plan in 2006 and revised it in 2011. The Norwegian experience comes close to approximating the minimal parallel option highlighted in the Legal Study Report.

3.5.1. Ecosystem-based Approach & Environmental Assessment

The plan was developed through three distinct phases: 1) Status Reports and Scoping; 2) Strategic Environmental Assessment; 3) Aggregated Assessment (Knoll, 2010). Generating scientific knowledge about the environment was one of the main priorities of the planning process, with research institutions and governmental directorates being commissioned to write a number of status reports in 2002–2003. The reports produced in phase 1 were mainly aggregations of existing knowledge and were the basis for the assessment processes in phase 2 and phase 3 (Knol, 2010).

As well as assessing the impact of the petroleum sector, the impact of fisheries, marine transport, and external effects, such as climate change, long-range transboundary pollution and migrating species also were assessed (Knol, 2010). At the beginning of Phase 1, it was not decided whether the various SEAs should be combined to form a comprehensive impact assessment. As a result of this, individual SEAs only briefly investigated the possible impacts on the other sectors (Knol, 2010). This led to a high degree of uncertainty when SEA reports were combined “since knowledge about joint impacts is generally low the uncertainty is even higher when the consequences are combined. The expert committee therefore argued that policy decisions in the management plan are necessarily made under uncertainty about their consequences” (Knol, 2010, p.256). Ecological quality objectives were developed by the Institute of Marine Research and the Norwegian Polar.

3.5.2. Setting Objectives

In phase 1 the steering committee set the overall aims and delimited the management area. The objectives of the plan were defined as twofold: 1) co-existence of the different sectors and the promotion of (economic) value creation and 2) maintaining the structure, functioning and productivity of the ecosystems of the area (Knol, 2010). The expert group was commissioned to formulate more precise management goals. Objectives were formulated on three levels: 1) vision, 2) strategic goals and 3) management objectives, with major focus on the last category (resulting from feedback of the governmental steering committee). However, most of these objectives are aspirational and do not include SMART Objectives.

3.5.3. Scope of Planning Process & Plans & Boundary and Scale Issues

The planning area is delimited by the Norwegian Sea in the southwest, by the Arctic Ocean in the north and by the Russian part of the Barents Sea in the east, with the landward boundary set at 1nm from the coastal baseline. The assessment and mapping of valuable and vulnerable areas has been turned into a spatial management tool that regulates the petroleum industry by conditioning or prohibiting petroleum activity in each area (Knol, 2010).

3.5.4. Governance, Legislative and Political Issues

The planning process was initiated top-down by creating a ministerial steering group led by the ministry of environment. The ministerial steering group is chaired by the Ministry of the Environment and consists of representatives from other ministries, including Trade and Industry, Petroleum and Energy, Fisheries and Coastal Affairs, Finance, Justice, Local and Regional Government, Labour and Inclusion, Foreign Affairs and Defence. The plan itself is not a legislative instrument; rather, it serves to guide the regulation of different sectors which operate under the existing legal frameworks (Knol, 2010).

3.5.5. Implementation, Enforcement & Review

The plan is implemented through existing sector-based legislation, such as the 1996 Petroleum Act, the 1981 Pollution Act, and the 2008 Oceans Resources Act and they provide a tool that facilitates cooperation on oceans management between the relevant authorities. There are different monitoring activities in place, carried out by a variety of institutions. The objective of such an overall monitoring system is to integrate monitoring data into a comprehensive report that policy-makers can use for management decisions. This enables a more responsive form of management that can deal with development trends in the ecosystem (Knol, 2010).

3.5.6. Stakeholder Participation

There seems to have been limited stakeholder participation in the planning process. Stakeholder engagement was mainly facilitated by affording stakeholders to comment on draft documents.

3.5.7. Data, Tools (including zoning) & Resources

As is one of the most studied sea areas in the world, the Barents Sea planning process was able to draw upon a large number of high quality studies and publications, including, for example, descriptive baselines, trends analysis, impacts assessments, conflict identification, geospatial mapping etc. (NOAA, 2011).

3.6. Clyde and Shetland Pilot Plans

In 2002, the Scottish Government initiated the The Scottish Sustainable Marine Environment Initiative (SSMEI) to develop and test MSP options for the sustainable development of its marine resources. The SSMEI sought to explore these options through the establishment of four pilot projects, two of which, The Clyde and Shetland Islands Pilots, are reviewed below.

3.6.1. Ecosystem-based Approach & Environmental Assessment

The Clyde Pilot devoted significant attention to the adoption of an ecosystem approach (Flannery and Ó Cinnéide, 2012b). A report entitled *Sustainable Development Criteria and the Ecosystem Approach* was commissioned (Haskoning UK Ltd., 2005). The report includes a

brief overview of the ecosystem approach and the 12 principles advanced by the Convention on Biological Diversity (Flannery and Ó Cinnéide, 2012b). It was also defined in a discussion paper presented at the Clyde Steering Group meeting in May, 2007, as “a holistic method for management of human activities. It looks at all the links among living and nonliving resources, rather than considering single issues in isolation”. It seems, however, that it was hard to arrive at a uniform understanding of the ecosystem approach and how it might be applied to MSP in the Clyde area (Thompson and Donnelly, 2010). Although much time was spent discussing and defining the ecosystem approach, there is little or no evidence of it being adopted in the Clyde plan. The final plan contains various sectoral plans with no attempt at mediating between the ambitions of the various sectors or at accounting for their cumulative impacts (Flannery and Ó Cinnéide, 2012b).

The Shetland Plan is not prescriptive about what can occur where and when in specific areas of the Islands. Rather it presents the current known situation, and clarifies the distribution of planning constraints and important assets that require safeguarding. The Shetlands Pilot, however, places great emphasis on the ecosystem and has developed a suite of policies that could account for pressures on the local ecosystem. For example, the plan contains policies in relation to invasive species, climate change and water quality. Evaluating the impact of the policies is difficult, however, as the plan has not been formally adopted. The Shetland Plan is also considered a ‘living’ document that can be adapted quickly to account for new environmental data. The sensitivity matrix in the current plan was a first step in determining potential impacts between human activities and important species and habitats around Shetland. Currently the initiative is using GIS to map cumulative pressure areas around Shetland based on an ecosystem-based risk assessment (Kelly *et al*, 2012). This place specific method is an advancement on the generic, single sector analysis approach of interactions matrices, and is considered to be more considerate of local factors (Kelly *et al*, 2012). An SEA of the Shetland Plan also was conducted.

3.6.2. Setting Objectives & Scope of Planning Process & Plans

The Clyde Plan contains three broad long-term aims and eight key objectives. The three aims relate to: a) maintaining and enhancing the biodiversity, landscape and seascape of the Firth of Clyde, by protecting and improving its natural resources; b) providing a framework that supports current economic activity, opportunities for growth and attracts investment; and c) maintaining the wellbeing and cultural diversity of coastal communities (Donnelly *et al.*, 2010). These high-level, long-term aims are to be achieved through eight key objectives: a) developing an integrated suite of policies and proposals for future development; b) improving the knowledge base of habitats, species and pressures; c) promoting maritime transportation; d) enhancing understanding of the importance of seascape and associated landscapes; e) increasing participation in marine-related recreational activities; f) maintaining and improving the wellbeing, culture, heritage and diversity of coastal communities; g) increasing commercial confidence through better- informed decision-making; and h) safeguarding and enhancing the quality of the marine, coast and intertidal habitats and species (Donnelly *et al.*, 2010). These overarching and key objectives are largely aspirational (Flannery and Ó Cinnéide, 2012b). The Clyde Plan, however, contains four cross-cutting policy themes

(environment, communities, heritage, and safety) and five sectoral plans (recreation and tourism; shipping and transport; mariculture; fishing; and energy and sub-sea infrastructure) which are intended to detail how these objectives are to be achieved (Flannery and Ó Cinnéide, 2012b). These, however, mostly consist of further aspirational policies and sectoral ambitions with no operational strategies or action plans (Flannery and Ó Cinnéide, 2012b). For example, the first policy under the environment theme, points to the deficit of detailed and useable knowledge environmental data but proposes no actions or strategies to address this issue (Flannery and Ó Cinnéide, 2012b). The sectoral plans carry on in a similar fashion. For example, Policy R T 8, identifies a need for integrated marketing of the Firth of Clyde and a need for better stakeholder participation but does not, however, propose a strategy to addresses these issues. The Clyde Plan contains a ‘proposed action plan’ which is helpful in highlighting potential partners for the implementation of the various policies but does not contain any strategies for achieving these (Flannery and Ó Cinnéide, 2012). Although it is not an action plan, *per se*, it does enforce time-lines on the Clyde Plan’s policies by highlighting a target year for the delivery of each strategy. Stakeholders interviewed for a recent study claim the objectives are too sectorally focused and fall well short of the level of integration that is consistent with an ecosystem approach (Flannery and Ó Cinnéide, 2012b). This is echoed in the evaluation document produced by the Clyde Pilot which argued that future MSP efforts should focus on developing policies that mediate between the aspirations of various sectors while safeguarding ecosystem functioning (Thompson and Donnelly, 2010). A recent study reported that, one interviewee with a terrestrial planning background, stated that they had advised the project team and steering group that there was little or no connection between the sectoral plans and the overarching objectives for the plan but that this advice was ignored (Flannery and Ó Cinnéide, 2012b).

The objectives for the Shetland plan were also developed by a local stakeholder groups. The objectives in the Shetland Plan focus more on current issues rather than on the ambitions of different sectors. One of the objectives of The Shetland Plan is to guide all marine users, planners and regulators in the placement of existing and proposed activities, operations or developments and sets out a number of considerations for proposed development. For example, proposals for development should demonstrate that they have taken into account issues surrounding: existing facilities; post-development activity; the impact on the land side of the development, including in relation to any increase in flood risk; climate change; water quality; marine litter; introduction of non-native species; wider ecosystem function; and coastal erosion and sediment transport. As the plan is not legally binding it is difficult to examine if these polices have been adopted.

The plan also contains a number of high-level polices for individual sectors (e.g. A coordinated water quality strategy should be developed). For some sectors these polices reflect existing legislation. For example, the Heritage Policy 1 reiterates requirement of Appropriate Assessment in relation to Natura 200 sites.

3.6.3. Governance, Participation & Implementation

The Clyde Pilot adopted an existing voluntary stakeholder-regulator partnership, The Firth of Clyde Forum (FCF), as a means of implementing MSP. Using a pre-existing group to implement MSP had a number of advantages. The FCF provided an established mechanism through which to connect with stakeholders. Members of the FCF also had already developed good working relationships, had built trust in one another and, having previously completed an ICZM project, had become familiar to working together in a planning context (Flannery and Ó Cinnéide, 2012b). Some stakeholders were of the opinion that using the FCF as a platform to deliver MSP avoided redundant duplication of effort as its members were largely representative of the relevant stakeholders for any MSP initiative (Flannery and Ó Cinnéide, 2012b). Building on a pre-existing governance structure also had a number of disadvantages. Due to this governance structure, participation in the planning process was perceived by some potential stakeholders to be the sole prerogative of members of the FCF.

It is hard to ascertain if either plan is being implemented. This is mainly due to the fact that they are pilot plans with no legislative underpinning. The Shetland Pilot, however, has moved to gain some legislative standing for its plan. The plan will become formally adopted through Shetland Islands Council's Local Development Plan as Supplementary Guidance in 2013.

3.6.4. Data, Tools (including zoning) & Resources

One study conducted as part of the Clyde process investigated sectoral interactions in the Firth of Clyde (see Table 11). For this report, representatives of individual marine sectors were asked to complete an interaction matrix and to categorise the interaction between their sector and other marine activities (see Table 12). Although the report is useful in terms of highlighting conflicts between marine sectors it is largely devoid of spatial data and does not indicate where these conflicts occur or are likely to occur.

The Shetland Pilot produced a marine atlas depicting current activities of the various marine sectors within the planning area. The Pilot also produced a Regional Locational Guidance for Wave and Tidal Devices in the Shetland Islands. This guide did not zone areas for wave and tidal devices but, rather, mapped areas of constraints. Constraints were mainly defined as a negative impact on existing activities and the environment. The mapped output indicates areas where development would avoid causing these impacts. These maps were created through a process of consultation with local advisors, planners, regulators, communities and developers. They are designed as a support tool to make more informed decisions about where developments are likely to be successful.

Sector	Sub - Sector	Shellfish	Tankers	Bulk carriers	Container vessels	Ferries	Cruise ships
Renewable Energy	Offshore Wind	Neutral	Conflict	Conflict	Conflict	Conflict	Conflict

Table 11: Example of Sectoral Interactions Matrix (adapted from: Thompson *et al.*, 2008)

Neutral	Where the activity of the other (sub)sector has no positive or negative
Competition	Where there is sustainable competition for access to the same resources or areas between the other (sub)sector and your
Conflict	Where conflict arises as a consequence of unmanaged competition between the other (sub)sector and your (sub)sector
Incompatible	Where there is a fundamental and unmanageable incompatibility between the activity of the other (sub)sector and your (sub)sector
Positive	Where the activity of the other (sub)sector has a positive influence on

Table 12: Categories from Clyde Pilot sectoral interactions matrix (source: Thompson *et al.*, 2008)

3.7. UK Marine Planning

The section will review MSP initiatives in the UK. Legislation has been introduced for MSP in England, Scotland and Northern Ireland. The England example, through the MMO, comes close to approximating the full MSP regime outlined in the Legal Study Report. The planning process in England is at a much more advanced stage than in the other jurisdictions. Therefore, this review will primarily focus on MSP in England but will make reference to the other jurisdictions where applicable. In England, the MMO has begun a rolling programme of plan-making with MSP being at its most advanced in the East Planning areas.

3.7.1. Ecosystem-based Approach & Environmental Assessment

All English marine plans are legally required to have a sustainability appraisal (SA), incorporating a strategic environmental assessment (SEA). “The SA fulfils the requirements of the SEA Directive, specifically the reporting of the consultation with stakeholders and the impact of the environmental report (and the whole SA) on the decisions made in the final plan. SA also looks more specifically than SEA at the social and economic impacts of the plan, giving a more integrated assessment than would happen through SEA alone” (MMO, 2012 p.1).

An SA of the Scottish National Marine Plan is also being conducted.

In Northern Ireland, *A State of the Seas Report* has been produced. As MSP is at an early stage in Northern Ireland, it is not clear how this report will be used in the marine planning process.

3.7.2. Setting Objectives

MSP in Scotland, Northern Ireland and England has been introduced by way of primary legislation. A UK Marine Policy Statement (MPS) has now been agreed and will set the high level policy context for marine planning in each jurisdiction. The Policy Statement also sets the direction for marine licensing. The Policy Statement outlines the objectives of marine planning: Achieve integration between different objectives; Recognise that the demand for use of our seas and the resulting pressures on them will continue to increase; Manage competing demands on the marine area, taking an ecosystem-based approach; Enable the co-existence of compatible activities wherever possible; and Integrate with terrestrial planning (HM Government, 2012).

In the draft East Area Plans, strategic objectives are supported by more prescriptive policies. For example, the objective *‘to promote the sustainable development of economically productive activities, while taking account of spatial requirements of other activities of importance to the East marine plan areas’* is supported by the policy *‘Proposals that provide sustainable economic productivity benefits which are additional to GVA generated by existing activities should be supported’*. Similar to the German plans, each policy is supported by text that explains and justifies it.

3.7.3. Scope of Planning Process & Plans

Rather than work towards a strict zoning system marine plans in the UK will provide guidance to inform marine licensing and give broad indications of suitable locations for particular activities.

Ten regional marine spatial plans will be developed by the MMO covering the English marine area. The plans will extend inland up to the level of mean high water spring tides. Marine spatial plans must conform to the MPS and should ensure a strong link between national policy and regional application.

The East Area Plans “give an area-specific expression of the MPS (and other national policy)” (MMO, 2013 p.1). The aim of the plans is to apply or clarify the intent of national policy to the East Inshore and East Offshore areas plans rather than to establish new requirement. The overall goal of the Plans is “to reduce the net regulatory burden on applicants and users by acting as an enabling mechanism for those seeking to undertake activities or development in the future, and providing more certainty about where activities could best take place”(MMO, 2013 p.1). The marine plans will be implemented by public authorities through existing regulatory and decision-making mechanisms. There are no new additional mechanisms.

3.7.4. Governance, Legislative and Political Issues

Through the Marine and Coastal Access Act 2009(MCAA), the UK Government introduced a number of measures to deliver its vision of "clean, healthy, safe, productive and biologically

diverse oceans and seas". These measures included providing for the introduction of a marine planning system, establishing the Secretary of State as the marine plan authority and enabling them to delegate marine planning functions. The Secretary of State delegated these functions to the MMO in April 2010. The MMO is an executive non-departmental public body established and given powers under the Marine and Coastal Access Act 2009. This brings together, for the first time, key marine decision-making powers and delivery mechanisms. The MMO began operating in April 2010, incorporating the work of the Marine and Fisheries Agency (MFA) and acquiring new roles, powers and functions previously associated with the Department of Energy and Climate Change (DECC) and the Department for Transport (DfT). Establishing the MMO marked a fundamental shift in how activities in our marine area are planned, regulated and licensed, with an emphasis on sustainable development.

The MMO also is responsible for most marine licensing in English inshore and offshore waters and for Welsh and Northern Ireland offshore waters. The Secretary of State is the licensing authority for oil and gas-related activities and administers marine licences through the Department for Energy and Climate Change.

3.7.5. Implementation, Enforcement & Review

Plans will interpret and present the policies of the MPS at a sub-national level. The Marine and Coastal Access Act requires all public authorities taking, permitting or enforcing decisions that affect or might affect the UK marine area to do so in accordance with the MPS and marine plans "unless relevant considerations indicate otherwise". Where a decision is not taken in accordance with the MPS and marine plans the public authority must state its reasons.

Implementation will be facilitated through the decisions made by public authorities. Authorities making "authorisation or enforcement decisions, e.g. on an approval, confirmation, consent, licence, or permission which affect or might affect the UK marine area, must do so in accordance with marine policy documents (marine plans and the MPS) unless relevant considerations indicate otherwise" (MMO, 2013 p.2). Where a decision is not made in accordance with the marine plans, the public authority must state its reasons. However, decision-making in relation to nationally significant infrastructure projects (NSIPs) under the Planning Act 2008 is exempted from these regulations. Public authorities making a decision on NSIPs only has to have regard to marine plans (MMO, 2013).

Beyond the requirements placed on public authorities described above, "there is no explicit requirement placed upon public authorities in general or upon the MMO specifically, as to what implementation should include" (MMO, 2013b, p.1). Although the East Area Plans contain little or no information on monitoring an *Outline approach to marine plan implementation, monitoring and review* (MMO, 2013) has been developed. This describes how monitoring mechanisms will be developed in the future. According to this document, the Implementing and Monitoring Plan will include a description of marine plan policies, the lead and contributing public authorities, how the policy will be implemented and the expected outcome of the policy, the indicator or measure to be used for each policy or objective, and the baseline, where the evidence will come from (such as which existing monitoring programme) and the timescale for measuring the effects.

A review of marine plans must be taken every 3 years. The review should focus on the effectiveness of marine plan in achieving its objectives and the MPS objectives. “After each report, the marine planning authority should decide whether or not the marine plan needs to be amended or replaced” (MMO, 2013 p.142).

3.7.6. Stakeholder Participation

The Statement of Public Participation (SPP) is required under the Marine and Coastal Access Act 2009 (“the Act”), which set up the marine planning system. This document sets out how and when people can become involved in marine planning within the plan areas. It briefly describes the main stages and activities in producing a marine plan. The SPP outlines that , while it is important to draw on best practice and experience, the MMO should take account of stakeholders' views on how they want to be involved to ensure their participation at appropriate stages in the planning process.

The Statement outlines the MMO’s approach to stakeholder participation based on a number of principles (early engagement, engaging interested parties at the appropriate time and in an efficient manner, respectful of diversity etc.). In the Statement they seek to build on existing stakeholder fora, such as coastal partnerships, present a clear timetable of planning phases and engagement opportunities and solicit input from stakeholders regarding suitable engagement processes.

Statements of Public Participation have also been published in Scotland and Northern Ireland.

3.7.7. Data, Tools (including zoning) & Resources

A wealth of ecological and socio-economic data has been collected to inform MSP in England. Studies conducted include: *Evaluation of the potential for co-location of activities in marine plan areas; Economic Baselines; Evaluation of the current state of knowledge on potential cumulative effects from offshore wind farms (OWF) to inform marine planning and marine licensing; Recommendations on the use of habitats maps in the planning process and requirements for future planning areas; Compilation of spatial data on marine recreation activities; A review of marine social and economic data; Evaluating the distribution, trends and value of inshore and offshore fisheries in England; Seascape character area assessment.*

There are 16 staff members working marine planning function of the MMO. Roles within this team include evidence gathering and analysis, stakeholder engagement, plan production and implementation.

The Department for Environment, Food and Rural Affairs (DEFRA) prepared an Impact Assessment (IA) as part of its consultative process. The IA estimates the costs of setting up and running the marine planning system both to government bodies, to industry, and others. The total setting-up costs are estimated to be around £40m and the total running costs are estimated to be around £1m (US\$ 1.5m) per year. The IA also includes a tentative initial estimate of the economic benefits associated with the planning system of around £200m per year (NOAA, 2011).

3.7.8. Boundary and Scale Issues

The MMO developed a methodology for selecting planning areas. The methodology is based on 7 'decision streams.' The decision streams are: 1) Stakeholder engagement in plan area selection; 2) Assessment of coastal stakeholder partnerships; 3) Technical report of economic, environmental and social information; 4) Implications of current and proposed marine protected areas; 5) Future pressures and their implications; 6) Implications of planning inshore and offshore together; and 7) Implications of planning with bordering nations.

In terms of bridging the land-sea interface, the MMO states that marine plans will embrace the core planning principles detailed in the National Planning Policy Framework. They have also checked the NPPF for land-use policies that relate to marine planning and ensured that the marine plan objectives are in line with them. "The MMO has taken "all reasonable steps", as required by the MCAA, to ensure that the inshore marine plan is compatible with the relevant development plans (or their equivalent). The MMO is also working with public and local authorities responsible for other plans affecting the East of England marine area (MMO, 2013 p.2).

In Scotland, The National Marine Plan, due out for consultation in summer 2013, will set out the strategic objectives for the Scottish marine area including important marine activities such as renewable energy, aquaculture, conservation, recreation and tourism, ports, harbours and shipping, etc. In order to take forward the objectives that the National Plan, smaller Scottish Marine Regions (SMRs) need be created to allow planning to take place at a local level. The government conducted a public consultation on defining regional planning areas. The consultation documents contained an outline of current spatial designations in Scottish waters, including: Fisheries Management Areas, WFD areas, Inshore Fishery Groups; Coastal Partnerships etc.

The government is currently consulting the legislation that would underpin a regional approach. The consultation document identifies 11 marine planning regions. The landward boundary is Mean High Water Spring tide and the extension of the boundaries out to the 12nmi limit.

In Northern Ireland, one marine plan, covering the entire inshore area, will be produced.

Scotland also has produced a Marine Atlas, as an assessment of the condition of Scotland's seas, based on scientific evidence from data and analysis, supported by expert judgement. It provides baseline information from which the national marine plan will be developed, and an online Interactive Marine Map.

3.8. The Netherlands

In 2005, the Dutch government addressed MSP in the national spatial planning policy paper (Nota Ruimte), which included a North Sea paragraph. This resulted in an Integrated

Management Plan for the North Sea 2015 (IMPNS2015) being developed. A legal basis for the plan was lacking until 2008 when the new Spatial Planning Act (and in 2009 the new Water Act) came into force, extending jurisdiction to the territorial sea and the Dutch EEZ. In November 2011, a revised IMPNS2015 was adopted. The Dutch example comes close to approximating the overlapping system outlined in the Legal Study Report.

3.8.1. Ecosystem-based Approach & Environmental Assessment

A number of research institutes are systematically gathering marine data on the North Sea and resulting in high quality data on area-specific features of the North Sea for management purposes (NOAA, 2011).

3.8.2. Setting Objectives

The plan is guided by reference to the ‘North Sea paragraph’ in the *Spatial Planning Policy Document*. “The North Sea paragraph takes relevant international agreements and obligations and national policy frameworks into account. The next step is to organize the implementation, enforcement and other management tasks in such a way that the North Sea manager is able to implement the policy effectively, efficiently and in accordance with existing policy frameworks” (IDON, 2015 p.1). The Plan focuses on three overarching areas: Healthy Sea; Safe Sea; and Profitable Sea.

The plan introduces a number of management approaches and objectives with the aim of putting the vision of the North Sea Paragraph into practice. These include: Integrated assessment framework for permitting, which introduces spatial considerations to the permitting process, including the development of opportunity maps for key sectors; Protection of area-specific natural features, which focuses on the protection of four key ecological areas; and Optimisation of the performance of management tasks, wherein ministries outline cooperative task so as to increase effectiveness and efficiency.

3.8.3. Scope of Planning Process & Plans & Boundary and Scale Issues

The Integrated Management Plan for the North Sea 2015 sets out how the North Sea will be managed until 2015. The plan will be reviewed every 5 years. The plan covers Dutch territorial waters and its EEZ. These two areas are subdivided into several maritime zones. The boundary for seabed management is the same as the provincial or municipal border and corresponds to the 1 kilometre line. The water management boundary is the high-waterline. This corresponds to the boundary set out in the Pollution of Surface Waters Act. The air column is also important for the height of visible permanent projects, which are prohibited within the 12-mile zone in order to keep the horizon clear.

3.8.4. Governance, Legislative and Political Issues

Planning within the territorial sea is a shared responsibility of municipal, provincial and national authorities. For the EEZ, sectoral interests and marine environmental protection are taken up by the national government (thirteen departments under five ministries). Since 1998, the Interdepartmental Directors’ Consultative Committee North Sea (IDON) serves as coordinating body and is the main player in MSP.

In the first IMPNS2015 (2008), the design of opportunity maps was a key tool in MSP, wherein the private sector was given scope to develop initiatives. In the new IMPNS2015 (2011) a stronger steering role for government in site selection is emphasized, particularly for activities of national importance (e.g. offshore wind park development and sand extraction).

3.8.5. Implementation, Enforcement & Review

The plan is primarily implemented through the permitting process. The plan contains a number of recommendations to streamline the permitting process. Two main areas in need of improvement are highlighted: 1) There should be more uniformity in the processing of permit applications. The information to be submitted and the duration of the procedure differs for each permit; and 2) There should be a single point of contact for each usage function where all the required permits can be arranged because some activities require more than one permit.

A North Sea Management Network was established for IMPNS 2015. It is coordinated by the North Sea Department of the Directorate-General for Public Works and Water Management. The North Sea Management Network's main tasks are enhancing knowledge and information management thus reducing the burden for users. For example, the North Sea Office will be expanded to include up-to-date information about procedures, permits and permitting conditions. This information will also improve enforcement effectiveness because it will give North Sea enforcement agencies a better idea of what is going on (including in other departments).

3.8.6. Stakeholder Participation

Stakeholder participation included documents being sent out for public comment and a number of public meetings (NOAA, 2011).

3.8.7. Data, Tools (including zoning) & Resources

Different spatial designations were determined based on past usage and for their ability to meet the planning objectives. Conflicts were attempted to be minimized during the allocation of space. Some models, including cost-benefit analysis, were used to calculate the costs of wind energy and safety risks.

Current uses of the planning area were mapped. Opportunity maps for two key sectors, mineral extraction and wind energy, also were developed. The maps show the locations that have the most potential within the established parameters of policy.

In order to form a picture of potential problem areas, an analysis was made of current and future use of space in the North Sea. This produced a picture of the future pressure on space in the North Sea and potential conflicts and guided the design of spatial designations.

4. Initial Lessons for Irish MSP

This section briefly discusses the key lessons from the review of international examples and discusses how they may be implemented in the Irish context.

4.1. Ecosystem-based Approach & Environmental Assessment

Most of the MSP initiatives reviewed above did not undertake detailed environmental assessment of their planning areas. Rather, existing data sets were collated and analysed, often with additional input from the scientific community. A similar strategy should be adopted in Ireland. Existing datasets, such as those relating to MSFD, WFD, INFOMAR, Habitat Mapping etc. could be collated to give an overview of the Irish marine environment. The initiatives evaluated as part of this study that were within the EU all conducted SEAs of their plans. At a minimum, in Ireland screening should be conducted to ascertain whether a full SEA should be conducted.

It was noted in a number of initiatives that it was difficult to find spatially relevant environmental data. In Ireland, MSP should begin by building on the marine atlas being constructed as part of the MSFD and identify data gaps through the planning process. Similarly, researchers at the CMRC (UCC) have developed the Marine Irish Digital Atlas and researchers at SEMRU (NUIG) will map the marine socio-economic data they have collected and analysed. Useful spatial datasets from these projects should be incorporated into any future marine atlas.

Many of the initiatives reviewed had strong relationships with their research communities or developed new relationships to bridge the science-policy gap. In Ireland, the marine planning team should develop a research engagement strategy. For example, the approach adopted in the GBRMPA where Scientific Steering Groups were formed could be explored within the overall governance framework (see fig 2).

The ecosystem-based approach appears to be difficult to put into practice. A number of initiatives, including ESSIM and Clyde, placed considerable emphasis on the ecosystem approach as a planning principle but failed to implement it successfully. It is clear that MSP initiatives need to develop an explicit understanding of how an ecosystem approach may be incorporated into the planning process and how this approach is to be implemented once planning has been finalised. Both the Clyde Pilot and the ESSIM initiative mirrored the marine EBM projects reviewed by Arkema *et al* (2006) insofar as they experienced considerable difficulties in progressing EBM from abstract concept to practice. Adopting a sectoral approach to the formulation of management policies and to the implementation of EBM strategies is not compatible with an ecosystem approach. In Ireland, the ecosystem approach must therefore be clearly defined in terms of what it will mean in practice in the Irish context and emphasised in the objective setting phase, through the plan development stage and fully incorporated into implementation strategies. The sensitivity matrix approach adopted in the Shetland Pilot, wherein the impacts of sectors on particular ecosystem components were rated and developed into a spatially relevant matrix, could also be explored. A brief report outlining Ireland's approach to MSP should be produced, similar to the ESSIM

report on collaborative planning, and this should detail how the ecosystem approach will be adopted and implemented.

The GBRMPA example illustrates that the transition to an ecosystem approach requires constructive communication amongst marine regulators, agencies and government departments. A clear understanding of what an ecosystem approach means and how it can be facilitated needs to be developed amongst these actors.

4.2. Setting Objectives

The process of developing high-level objectives adopted in the Baltsea Project is very useful. BaltSea project evaluated: 1) the impact of existing national policy documents on the use of marine space; and 2) Trends and pressures in key marine sectors and their spatial implications. The necessary research to adopt this approach in Ireland has been initiated as part of the HOOW initiative. The *Sectoral Briefs Document* prepared as part of HOOW contains Opportunities and Key Constraints, Existing Government Policy, Plans and Targets for each sector. These should be updated and analysed to evaluate the spatial impact of existing policy, trends and pressures of each sector. National-level objectives for MSP could then be derived from this review. The approach adopted by DFO in the ESSIM case study, of engaging bilaterally with stakeholders, to produce an Issues and Prospects report could be adopted to involve stakeholders in this process.

As demonstrated in particular by the ESSIM and Clyde Pilot case studies, it is vitally important that proper consideration be given to the manner in which objectives are to be achieved. Both initiatives experienced difficulties in designing strategies to give practical effect to their aspirational objectives and in transitioning to plan implementation. The use of the SMART (Specific, Measurable, Achievable, Realistic and Time-bound) principles for objective setting may be useful in ensuring that aspirational objectives are translated into operational objectives (Day, 2008). As demonstrated by the BaltSea Project, ecological objectives could be tied to the implementation of the MSFD. However, it is important to avoid MSP being perceived as an 'environmental' management regime and equal emphasis should be placed on all three elements of sustainable development.

Furthermore, MSP should concentrate on mediating the aspirations and objectives of different stakeholders as opposed to developing individual sectoral policies, as happened in the Clyde Pilot and, to a lesser extent, in Norway. It is important that sectoral policies, or at least likely sectoral trends, are developed prior to the MSP process so that planners can develop a future orientated marine plan. However, using the MSP process to develop sectoral policies, as happened in the Clyde Pilot, may remove the place-based focus of MSP and result in a number of unconnected and uncoordinated sector specific policies being developed. As illustrated in the Shetland Pilot, MSP should also be concerned with resolving existing issues and not just about facilitating the ambitions of marine sectors.

4.3. Scope of Planning Process & Plans

Most of the case study initiatives incorporated all sectors in the planning process. Germany and Norway, however, focused on a small number of key sectors. The approach adopted by Germany and Norway fall short of the integrated aspirations of HOOW.

The ESSIM, Clyde, UK, GBRMPA and Norwegian examples illustrate the value in developing documents that outline the planning principles, objectives and practices that will be adopted during the MSP process and of explaining the participation process to stakeholders.

4.4. Governance, Legislative and Political Issues

That MSP needs to be undertaken on a statutory basis is clear the case studies. It is difficult to implement non-statutory plans, as the Clyde Pilot demonstrates. Although a variety of tools can be used to effect a legally binding process (Schaefer and Barale, 2011) the ESSIM case study demonstrates that a legal obligation to consider certain planning principles and guidelines in the decision process does not automatically result in the successful implementation of these principles. Canada's Oceans Act affords the ESSIM initiative legal status; even so it has still experienced difficulties in implementing its plan because it does not imbue DFO with the competence to extract commitments from other governmental departments and agencies or to make them comply with the master plan.

In Ireland, legislation needs to provide the lead agency for MSP with the competency to hold other departments and agencies responsible for their actions in the planning area and to make them comply with marine plans. In time, the experience of the MMO could be explored in this regard. Although not reviewed above, the experience of the National Sanctuary Program in the US could be explored as a possible model as The Marine Protection, Research and Sanctuaries Act empowers the Office of National Marine Sanctuaries, through the Secretary of Commerce, to hold federal agencies responsible for their actions in the sanctuaries. National legislation should also clearly define the roles and responsibilities of other participants, including other government departments and agencies, in the MSP process.

Many of the case studies have an inter-departmental group steering the overall MSP process, although one department often oversees the entire process. In this case, one agency typically leads the development of plans and reports to Inter-Departmental Group/Lead Department. In terms of time and cost efficiencies, Ireland's Inter-Departmental Group could be tasked with leading the MSP process. They would provide high-level guidance to the marine planning team. See figure 2 for an example of one possible governance framework for Ireland.

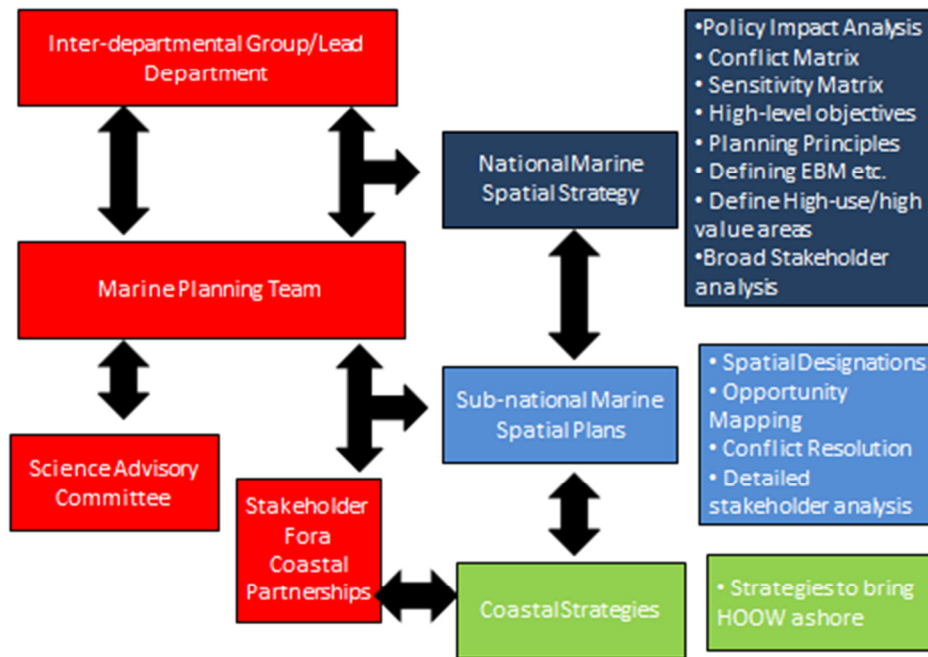


Figure 2: Possible MSP Governance Model for Ireland

4.5. Implementation, Enforcement & Review

It is clear from the ESSIM experience that an implementation strategy based on sectoral action plans is likely to inhibit coordinated implementation of marine spatial plans.

These processes should be treated as an inherent part of the overall planning process and should be developed in conjunction with plan objectives. Performance measures should be developed during the planning process and not added as an afterthought. The lead agency for MSP could be tasked with monitoring and evaluation of the implementation of marine plans.

From the case studies reviewed above, implementation and enforcement is primarily achieved through the licensing and permitting process. Depending on the approach adopted in Ireland, there could be a number of agencies involved in the implementation, enforcement and monitoring of marine plans. As demonstrated by the Dutch example, it is important, therefore, that clear inter-agency communication strategies are developed early in the planning process. The Dutch example also outlines how they propose streamlining their permitting process by having one contact point for each marine function that could issue all necessary permits to developers within that sector.

4.6. Stakeholder Participation

The MMO and DFO explicitly involved stakeholders in the design of their engagement strategies as it is important to understand the manner in which stakeholders want to participate. Many of the initiatives build on existing coastal partnerships or stakeholder fora. Ireland should develop national or regional marine stakeholder forum(s) and explore if these can be funded through the European Marine and Fisheries Fund. As outlined in HOOW, there is a fundamental need to reconnect the Irish public with the marine environment. This could be

facilitated by these fora. The fora should not only be seen as a means of facilitating stakeholder engagement in the MPS process, they should be tasked with actively engaging with HOOW so as to realise its ambitions. Therefore, stakeholder fora should be tasked with developing coastal strategies to ensure that some of the benefits of HOOW accrue to coastal populations (see fig. 2). As demonstrated by the GBRMPA example, it may be necessary to ‘sell’ MSP to stakeholders, dispel myths and to correct misinformation. The value of MSP to stakeholders and Ireland should be emphasised at the beginning of the planning process.

The five steps of participation, outlined in the BaltSea case study, offer a useful guide to stakeholder engagement and incorporate most of the lessons from the other case studies. The process of conflict analysis should be included in the stakeholder analysis process and should result in specific tasks for marine planners (e.g. which sectors need to be separated spatially).

It is also important to differentiate between sectoral stakeholders and governance stakeholders in participation processes, as failure to do this led to conflict in the ESSIM initiative. It is important that both sets of stakeholders are involved in a meaningful manner and not solely tasked with commenting on draft plans. To facilitate this approaches adopted in the BaltSea Plan and ESSIM could be combined, with separate roundtable fora being used to engage both sets of stakeholders (see. Fig 2). Alternatively, the Inter-Departmental Group of the Enablers Taskforce could be adapted to facilitate engaging governance stakeholders in Ireland.

4.7. Data, Tools (including zoning) & Resources

Data should be presented in a spatial format, where possible. Most MSP initiatives recognised the importance of collecting socio-economic data to inform the development of marine plans. In this regard, the work of SEMRU on quantifying Ireland’s Ocean and Coastal Economies will be useful.

In an Irish context, once the scale of the planning areas has been decided, an assessment of available data relating to each region needs to be conducted and research needs to be undertaken to fill any critical knowledge gaps. Human use atlases and interaction matrices should be produced for each region.

The Clyde and ESSIM examples demonstrate that expertise in spatial planning needs to be recruited to facilitate MSP. Furthermore, as described above Norway, GBRMPA and the ESSIM initiative all formed Scientific Expert/Advisory Committees (including socio-economic committees) that contributed to: data collection and analysis; the development of monitoring criteria; and the SEA processes. The possibility of establishing a Scientific Steering Committee for MSP in Ireland should be explored. The committee should be comprised of natural and social scientists as well as planning experts.

In terms of expertise, the marine planning team should have expertise/previous experience of MSP planning principles; detailed knowledge of sectors, good relationship with sectors; ability to organise a stakeholder engagement process; experience with appropriate planning software (GIS, MARXAN etc.); and a good relationship with the research community.

4.8. Boundary and Scale Issues

There are a hierarchy of plans in most countries undertaking MSP. There is usually a National Plan/Policy and this is usually implemented through Regional/Local Initiatives. Other examples, such as GBRMPA, developed plans for high-use or vulnerable areas. This approach to MSP could be adopted in Ireland. A National Marine Strategy could be developed to guide the overall spatial planning process. Through the development of the strategy, and the analysis described in 4.2 above, areas requiring detailed spatial measures could be identified. These would include high-use or high-value priority areas.

However, an approach to MSP that is too narrowly focused on intensely used marine areas ignores the fluid, interconnected nature of the marine environment and is at odds with implementing an ecosystem approach. Such an approach is more likely to exacerbate issues arising from the fragmented governance of the seas than resolve them (Flannery and Ó Cinnéide, 2011). While some sea areas may be less intensively used, they provide vital ecosystem services such as climate regulation and nutrient recycling. Focusing MSP efforts on intensely used areas may result in new development being pushed into less regulated and possibly less suitable and more vulnerable areas. There is a danger that development in these areas will be project-led, rather than plan-led, resulting in the sub-optimal use of marine space and resources. A piecemeal approach, with separate and largely independent plans for various parts, may serve to aggravate issues arising from the fragmented governance. To avoid this, an approach which would see detailed sub-national plans include priority areas and their more remote hinterlands should be adopted (Flannery and Ó Cinnéide, 2012c). Detailed spatial measures would be developed within the plan for intensely used or valuable areas and less detailed measures for less intensively used areas. However, by incorporating both areas, the plan would recognise the relationship between these two areas and avoid new development being pushed into less developed and possibly more vulnerable areas. It would also encourage co-location of activities and ensure that ‘free space’ is maximised.

It would be important to ensure that both the national strategy and sub-national plans were taken into account when terrestrial strategies and plans are being delivered and *vice versa*. This is particularly important if coastal communities are to reap the benefits outlined in HOOW.

In terms of opportunity mapping the Dutch case study indicates that while this is a valuable exercise it is important that this is not solely left to stakeholders and that there is strong government steering during the process.

In the initiatives reviewed above, there is little evidence of trans-boundary planning. Neighbouring countries are often simply consulted as part of the stakeholder consultation process. However, in Ireland there are a number of transboundary mechanisms, including the Loughs Agency, North-South Ministerial Council, British–Irish Council, which could facilitate some transboundary planning – though these often meet infrequently and cover a broad range of topics (Flannery *et al*, 2013). The BaltSea recommendation of establishing transboundary working groups could be explored.

Implementation of the ESSIM initiative has been frustrated due to negative institutional interplay between it and other marine resource management regimes. Similarly, the Dutch example illustrates that a number of different landward boundaries were being used, depending on different management functions. The MSP Framework for Ireland needs to be cognisant of the different regime boundaries and foster positive interplay between MSP and other resources management regimes. Furthermore, the BaltSea project demonstrates that boundary agreement may be translated differently by parties with no exact agreement as to where the boundary is at sea.

5. Future Research and Analysis

It is clear that a vast amount of pre-planning research and analysis is necessary for effective MSP. In Ireland, a considerable amount of relevant data is available which can be used to inform future plans. Analysis of key datasets should be conducted to develop some of the necessary information for MSP in Ireland and to identify key data and information gaps. In Northern Ireland, pre-planning data gathering and stakeholder engagement began before MSP legislation was finalised. In Ireland, analysis of the spatial implications of policies, trends and pressures, stakeholder analysis, ecological and socio-economic data collation and mapping could be undertaken prior to the MSP process being formalised.

6. References

- Arkema, K. K., Abramson, S. C. and Dewsbury, B. M. (2006) Marine ecosystem-based management: from characterization to implementation, *Frontiers in ecology and the environment*, 4(10), pp. 525-532.
- Day, J. (2008) The need and practice of monitoring, evaluating and adapting marine planning and management lessons from the Great Barrier Reef, *Marine policy*, 32(5), pp. 823-831.
- DFO (2002a) *Canada's Ocean Strategy*, available at: <http://www.dfo-mpo.gc.ca/oceans/publications/cos-soc/index-eng.asp>
- DFO (2002b) *The Policy and Operational Framework for Integrated Management of Estuarine, Coastal and Marine Environments in Canada*, available at: <http://www.dfo-mpo.gc.ca/oceans/publications/cosframework-cadresoc/index-eng.asp>
- DFO (2007) *Eastern Scotian Shelf integrated ocean management plan*, Dartmouth, NS: DFO.
- DFO (2011) Transformation at Fisheries and Oceans Canada, Memorandum issued to all DFO employees 13th October 2011, available at: <http://www.cbc.ca/news/pdf/nl-dfo-memo-20111013.pdf>
- Donnelly, J. E., Thompson, K. and Ross, D. (2010) Firth of Clyde marine spatial plan, Clydebank: SSMEI Clyde Pilot.
- Douvere, F. and Badman, T. (2012) *Mission Report, Reactive Monitoring Mission to Great Barrier Reef, Australia, 6th to 14th March 2012*, available at: <http://whc.unesco.org/en/documents/117104/>
- Ehler, C. and F. Douvere (2009), *Marine spatial planning: a step-by-step approach toward ecosystem-based management*, Paris: UNESCO.
- Fetissov, M., Aps, R. and Kopti, M. (2011) *BaltSeaPlan Web - advanced tool in support of Maritime Spatial Planning*. BaltSea Project, available at: www.baltseaplan.eu.
- Flannery, W. (2011) *Marine Spatial Planning From an Irish Perspective: Towards Best Practice in Integrated Maritime Governance*, National University of Ireland Galway: Galway (unpublished thesis).
- Flannery, W. and Ó Cinnéide, M. (2012a) Deriving Lessons Relating to Marine Spatial Planning from Canada's Eastern Scotian Shelf Integrated Management Initiative, *Journal of Environmental Policy & Planning*, 14 (1), pp. 97–117.
- Flannery, W. and Ó Cinnéide, M. (2012b) Stakeholder Participation in Marine Spatial Planning: Lessons from the Channel Islands National Marine Sanctuary, *Society & Natural Resources*, 25 (8), pp. 727–742.
- Flannery, W. and Ó Cinnéide, M. (2012c) A roadmap for marine spatial planning: A critical examination of the European Commission's guiding principles based on their application in the Clyde MSP Pilot Project, *Marine Policy*, 36 (1), pp. 265–271.
- Flannery, W., O'Hagan, A.M., O'Mahony, C., Ritchie, H., and Twomey, S. (2013) Transboundary Marine Spatial Planning: Challenges and Opportunities on the island of Ireland, Working paper - to be submitted to *Marine Policy*.
- Foster, E., Haward, M. and Coffen-Smout, S. (2005) Implementing integrated oceans management: Australia's south east regional marine plan (SERMP) and Canada's eastern Scotian shelf integrated management (ESSIM) initiative, *Marine policy*, 29(5), pp. 391-405.

- Gee, K., Kannen, A. and Heinrich, B. (2012) *BaltSea Vision 2030*. BaltSea Project, available at: www.baltseaplan.eu.
- Government of Canada (2005) *Canada's Oceans Action*, available at: <http://www.dfo-mpo.gc.ca/oceans/publications/oap-pao/page01-eng.asp>
- Haskoning UK Ltd. (2005) *Sustainable development criteria and the ecosystem approach: SSMEI desk study*. Edinburgh: Haskoning UK Ltd.
- Haskoning UK Ltd. (2005) *Sustainable development criteria and the ecosystem approach: SSMEI desk study*. Edinburgh: Haskoning UK Ltd.
- Jay S, Klenke T, Ahlhorn, F. & Ritchie, H. (2012) Early European experience in marine spatial planning: planning the German exclusive economic zone. *European Planning Studies*, 20, pp. 2013-2031.
- Jay, S., Flannery, W., Vince, J., Liu, W., Xue, J.G., Matczak, M., Zaucha, J., Janssen, H., van Tatenhove, J., Toonen, H., Morf, A., Olsen, E., Suarez de Vivero, J.L., Rodriguez Mateos, J.C., Calado, H., Duff, J. & Dean, H. (2013). International progress in marine spatial planning, *Ocean Yearbook*. 27.
- Käppeler, B., Toben, S., Chmura, G., Walkowicz, S., Nolte, N., Schmidt, P., Lamp, J., Göke, C. and Mohn, C. (2012) *Developing a Pilot Maritime Spatial Plan for the Pomeranian Bight and Arkona Basin*. BaltSea Project, available at: www.baltseaplan.eu.
- Kelly, C., Gray, L., Shucksmith, R. and Tweddle, J. (2012) *Review of the Marine Spatial Plan for the Shetland Islands*. NAFC Marine Centre, available at: <http://www.nafc.ac.uk/Review-of-the-Shetland-Marine-Spatial-Plan.aspx>
- Knol, M. (2010) Scientific advice in integrated ocean management: The process towards the Barents Sea plan, *Marine Policy*, 34, pp. 252–260.
- McCuaig, J. and Herbert, G. (2013) *Review and evaluation of the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative*, available at: <http://waves-vagues.dfo-mpo.gc.ca/waves-vagues/search-recherche/display-afficher/348379>
- NOAA (2011). *Strategic Advice on Designing and Implementing Coastal and Marine Spatial Plans Report from the NOAA Science Advisory Board*. Available at: http://www.sab.noaa.gov/Meetings/2011/may/ESMWG_CMSP_Report_Text_2May11.pdf
- Olsson, P., Folke, C. Hughes, T.P. (2008) Navigating the transition to ecosystem-based management of the Great Barrier Reef, Australia, *Proceedings of the National Academy of Sciences*, 105 (28). pp. 9489 –9494.
- Pentz, T. (2012) Stakeholder involvement in MSP. BaltSea Project, available at: www.baltseaplan.eu.
- Rutherford, R. J., Herbert, G. J. and Coffen-Smout, S. S. (2005) Integrated ocean management and the collaborative planning process: the Eastern Scotian Shelf Integrated Management (ESSIM) Initiative, *Marine policy*, 29(1), pp. 75-83.
- SAC (2008) *ESSIM stakeholder advisory council terms of reference*, Dartmouth, NS: DFO.
- SAC (2008) *ESSIM stakeholder advisory council terms of reference*, Dartmouth, NS: DFO.
- Schaefer, N. and Barale, V. (2011) Maritime spatial planning: opportunities and challenges in the framework of the EU integrated maritime policy, *Journal of coastal conservation*, 15(2), pp. 237-245.

- Schultz-Zehden, A. and Gee, K. (2013) *BaltSeaPlan Findings – Experiences and Lessons*. BaltSea Project, available at: www.baltseaplan.eu.
- Thompson, K. and Donnelly, J. E. (2010) *Lessons learned for marine spatial planning in Scotland*, Clydebank: SSMEI Clyde Pilot.
- Thompson, K., Donnelly, J. E., and Ross, D. (2008) *Sectoral interactions in the Clyde: Report of sectoral interactions survey*, Clydebank: SSMEI Clyde Pilot.
- UNESCO (2011) *Marine Spatial Planning Initiative*, available at: http://www.unesco-ioc-marinesp.be/marine_spatial_planning_msp
- Walmsley, J., Coffen-Smout, S., Hall, T. and Herbert, G. (2007) Development of a human use objectives framework for integrated management of the eastern Scotian shelf, *Coastal management*, 35(1), pp. 23-50.