Examining the role of integration in marine spatial planning: Towards an analytical framework to understand challenges in diverse settings

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1. Introduction

Marine spatial planning (MSP) as a means of marine governance has been given more prominence recently in response to the problems of fragmentation of marine regulation, environmental protection from increasing pressures upon the seas and the emergence of new maritime industries (Douvere and Ehler, 2009). Therefore enhancing multiple aspects of the way that marine authorities, sectors and stakeholders interact and engage with each other is integral to MSP's role and function and seen as a key means to address fragmented and isolated decision-making in marine space (Portman, 2016). While the function and processes of enhancing integration should not be seen as ends in themselves, they aim to create institutionalised platforms that support multi-level and multi-sectoral governance interaction to achieve 'sustainable use' of marine space (Gilek et al., 2016; Ritchie and Ellis, 2010; Varjopuro et al., 2015). Here, integration mostly plays an instrumental role in realising multiple and divergent political ends (e.g. blue growth, sustainable use, legitimate decision-making) related to 'integrated spatialized outcomes' that seek to reflect a balance of competing goals (Flannery et al., 2016; Flannery et al., 2018; Jones et al., 2016; Olsen et al., 2014a). Integration is also seen to be important to foster greater connectivity over borders, beneficial for conservation, shipping and fishing (Jay et al., 2016).

While claims of the benefits of more integration are intuitively appealing, whether and how these are actually delivered through integration practices remains under-examined in MSP practice; as are empirical insights on the multiplicity of roles that integration plays in MSP. So, while integration has been universally adopted as a policy principle where it is believed that more integration is seen to be closely related to successful planning in numerous ways, there is confusion about what it means, how to do it and what it implies in different MSP contexts. In response, the key aim of this article is to develop an analytical framework useful for examining integration in MSP across a diversity of contexts and processes. Given the central role of integration

in MSP, it is vitally important to better understand the linkages between ideas of integration and their practical application in MSP.

To examine the role of integration across multiple MSP contexts, we first describe the approach taken in this study. This is followed by a review of relevant MSP and integration related literature to develop an analytical framework. We draw on this framework to illustrate important expressions of integration challenges and responses in our cases. The experiences from the multiple cases are then discussed to generate insights into the various roles that integration plays in MSP and how problems arise and have been addressed. In closing, we underline key findings and reflect on the usefulness and adaptability of the integration approach developed in this article.

2. The approach

This research qualitatively examines different dimensions of integration across several MSP case studies. To undertake this, we examine the integration literature on MSP to develop a five-part analytical framework, which includes cross-border, policy/sector, knowledge, stakeholder and temporal integration dimensions. The analytical framework is then applied to understand the functions and types of integration in MSP practice across several Baltic Sea Region (BSR) cases as well as experiences from Australia (the Great Barrier Reef Marine Park - GBRMP) and the United States (Rhode Island). These cases were selected because they deal with multiple MSP integration challenges in which different governmental institutional arrangements are involved - both horizontally across sectors and vertically between levels of government. Table 1 presents the main characteristics of each of these cases. The different experiences examined in the BSR cover different stages of the development of MSP national plans: from Denmark, which is very early in the process, to Lithuania which has adopted a plan, but as yet has not implemented it, through to Germany where second generation planning has been completed in some coastal areas. While coherence across national borders is not a big concern in

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Table 1
Overview of the cases.

Case-study	Main objective in governance analyses	Formal MSP status	Case study references
[a] Lithuania/Latvia	International cross-border comparison of the way MSP process related to the development of national MSPs in Lithuania and Latvia.	Lithuania adopted a national MSP covering all Lithuanian sea waters in 2013, but it has yet to be implemented. The Latvian national MSP is still under development. It is due to be finalised in 2018.	Hassler et al. (2017); Luttmann and Maack (2017); Morf et al. (2017); Saunders et al. (2017)
[a] Poland	Conflicts related to parts of the fisheries sector engaging in MSP.	The first phase of planning for the national Polish MSP was concluded in March 2015, which produced a non-legally-binding report. A draft version of the national MSP is due in 2018.	Hassler et al. (2017); Luttmann and Maack (2017); Morf et al. (2017); Saunders et al. (2017)
[a] Germany	Cross-border interaction/degree of integration between EEZ and coastal MSPs. Focus also on different ambitions of these different MSP jurisdictions.	Germany has two fully operational maritime spatial plans in the Baltic. The EEZ plan has been in place since 2009, while the plan for the coastal waters of Mecklenburg-Vorpommern has been in place since 2005 with a revised plan finalised in summer 2016.	Hassler et al. (2017); Luttmann and Maack (2017); Morf et al. (2017); Saunders et al. (2017)
[a] The Sound (Öresund), Denmark and Sweden	The role of Sweden and Denmark's different MSP institutional contexts and the implications for cross-level, horizontal type of planning in the Sound.	In 2018 Sweden published draft national marine spatial plans, currently out for public comment and due to be finalised in 2019. Denmark is at the very beginning of its MSP process with new legislation and a freshly appointed authority. It is expected that there will be a single plan for both the North Sea and the Baltic Sea, which will be in place in 2021.	Hassler et al. (2017); Luttmann and Maack (2017); Morf et al. (2017); Saunders et al. (2017)
Rhode Island, United States	Application of MSP to site offshore wind energy (OSWE) while protecting existing economic, cultural, and environmental activities in both state and federal waters.	Ocean Special Area Management Plan (SAMP) policies and procedures continue to be relevant as the state is now using the Ocean SAMP and its accompanying authorities to respond to the potential development of other offshore wind lease blocks and oil and gas in federal waters.	Carniero et al. (2017); McCann et al. (2013); McCann et al. (2014); Olsen et al. (2014b); Smythe and McCann (2018); Smythe et al. (2016)
GBRMP, Australia	Focus on the formation and design of multi-sectoral/use zoning, including key moments of stakeholder engagement.	Zoning has long been a key management tool in the GBRMP; the rezoning which led to the 2003 Zoning Plan was comprehensive with unprecedented levels of stakeholder engagement.	Day (2015); Day (2017); Day and Dobbs (2013); Day et al. (2003); Fernandes et al. (2005); Kenchington and Day (2011)

[a] Part of the BONUS BALTSPACE Project.

the Australian and US cases, the relatively hard demarcation of administrative responsibility for different aspects of marine governance between federal and state jurisdictions may well provide insights useful for cross-country MSP interaction elsewhere. Additionally, MSP in both of these settings are seen to be exemplars, where marine planning has been in place far longer than all of the BSR cases (Blau and Green, 2015). This approach to exploring the work integration does in MSP across multiple cases shows how and why challenges occur, as well as, how such challenges have been addressed.

In each case, findings are derived from research based on stakeholder knowledge and experience collected through qualitative methods, such as interviews, roundtables, participant observation etc. as well as through document analysis. In the Baltic cases, the empirical material was collected in the BONUS BALTSPACE project.[1] In the other cases (GBR and Rhode Island), the accounts are based on empirical research as well as the involvement of the co-authors in several previous MSP projects as reflected in the references listed below. More detailed descriptions of the methods used in each case study setting are available in the articles and reports referred to in Table 1.

3. Developing an integration framework for MSP

3.1. Previous integration literature

Integration as a policy and analytical problem has also been discussed elsewhere – most saliently in the fields of sustainable

development (Adger and Jordan, 2009; Brown et al., 2005), ICZM (Bremer and Glavovic, 2013; McKenna et al., 2008), environmental policy integration (Jordan and Lenschow, 2010; Persson et al., 2018), planning theory (Healey, 2006; Stead and Meijers, 2009; Vigar, 2009), marine policy (Underdal, 1980), health (Kidd, 2007), EU (Faludi, 2008) and socio-ecological systems (Ostrom, 2009), among others.

In addition to this integration work in related fields, Table 2 presents a summary of key integration frameworks that have been developed to analyse and help shape the practical implementation of MSP. While there is no room here for an expansive discussion of these frameworks, or a detailed review of integration frameworks developed in other fields, we draw on this body of work to develop our analytical framework. Significant overlaps between the frameworks in Table 2 are apparent, with most of the frameworks including boundary, sector and stakeholder integration dimensions in various configurations with different levels of sub-category detail. In scoping our proffered framework, we were mindful of gaining an understanding of different governance functions of MSP and their interdependence. To the dimensions listed above, we added knowledge, given the importance MSP places on evidence-based decision-making (Blau and Green, 2015) and a temporal dimension given the forward-looking function of marine planning (balancing current problems in anticipation of future needs) and growing importance of incorporating adaptive capacity for governance. To inform our conception of each of our integration dimensions we also draw on relevant theoretical literature.

3.2. A proposed integration framework for MSP

First, *cross-border integration* (integration across administrative borders) has been recognised as a problem to be solved in several natural resource and environmental governance fields, not least MSP (Hassler et al., 2018; Jay et al., 2016). This analytical dimension is concerned with examining aspects related to the relative coherency (or compatibility) of MSP policies/sectors/uses over administrative

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[1] Much of the conceptual thinking and the empirical material related to the Baltic Sea Region (BSR) countries in this article has been derived from the BONUS BALTSPACE research, which was a project carried out during 2015–2018 in the BSR (see case study descriptions in Table 1). This project aimed to understand the various roles that integration plays, as well as the forms that it takes in MSP, with a particular focus on the overarching goals of marine sustainability.

Table 2
Previous Integration Frameworks for Analysing MSP.

Author	Application	Integration Dimensions Covered	Analytical focus
Ehler and Douvere (2009)	MSP as integrated ecosystem management	sectors and agencies, scales (levels of government), temporal (future oriented and adaptive), stakeholders	Practitioner oriented guidelines to implement an ecosystem-system approach to MSP.
Jay et al. (2016)	EU Marine Governance	sectors/policy, stakeholders, socio-economic, ecological policy	Characterises integration along two axes – fragmented-coordinated and deliberative-confrontational bargaining
Jones et al. (2016)	EU multiple case study	sectors/policies, levels of government, stakeholders, knowledge	Centred on who has influence, what was prioritised and how conflict was handled.
Kidd (2013)	MSP in the Irish Sea	sectors, territorial, organisation, technical (all with associated multiple sub-dimensions)	Organises the various dimensions into an integration framework comprising human and natural systems.
Portman et al. (2012)	ICZM (comparative study across 8 countries)	sectors, government, environment, temporal	Uses various mechanisms to assess need/opportunities for improving integration.
Portman (2016)	MSP (drawing on European and US cases illustratively)	spatial, temporal, governance and sectors (users/stakeholders)	General discussion on key principles of integration in marine planning.
Olsen et al. (2014a,b)	MSP comparative study of national marine planning in Belgium, Norway and the US	sectors (horizontal) and levels of government (vertical)	Uses the conceptual framing of horizontal and vertical integration to examine the extent of inclusion of stakeholders in MSP
Schultz-Zehden et al. (2008)	MSP practice-oriented guide to fostering integration, stemming from work in the Baltic, Black and Adriatic seas	scales, stakeholders, information/data management, land and sea use	Offers practical knowledge on how to go about integrated marine spatial planning.
Vince (2015)	Oceans management in Australia	sectors/policies, levels of government	Drawing on environmental integration policy literature this work explores why large-scale integrated approaches are prone to failure by analysing the case of Australia's Oceans Policy.

borders.[2] This includes how administrative responsibilities for marine space are allocated and coordinated between separate, but adjacent jurisdictions within and across country contexts (Day, 2015; Jay et al., 2016; Soma and Silvis, 2013). Within national contexts, this type of integration in MSP commonly involves examining planning functions and relations between coastal waters and those further ashore, such as exclusive economic zones. Key questions to explore include, what administrative bridges are there between these different jurisdictions and how does this play out in marine planning outcomes/activities? Some aspects of this integration challenge relate to whether laws that guide MSP in separate administrative contexts are similar enough to enable the close alignment of MSP approaches or how specific provisions and designations may be difficult, because sea uses commonly differ between EEZs and coastal waters (Jay et al., 2016; Hassler et al., 2018; van Tatenhove 2017). Similar legislation alone may not necessarily lead to spatial coherence as the interpretation of the respective laws may differ due to different ambitions of different plans. Moreover, similar interpretations may lead to different outcomes because of diverging contextual factors. Whether different jurisdictions correspond to each other (e.g., flow of information, mutual impact, and spatial use continuity/compatibility) is likely to be important to determining the effects of integration. Synergistic interaction between jurisdictions would reflect integration between levels where regulations, norms and practices not only are mutually adjusted, but actually reinforce each other.

Second, *policy and sector integration* is integral to MSP aspirations to achieve balanced outcomes of the environmental, social and economic pillars (Portman, 2016). Kidd and Shaw (2014) have argued that MSP development and implementation should be undertaken in partnership and through consensus-oriented processes with a wide range of organisations from the public, private, and voluntary sectors. From a practical perspective, we do not see integration across sectors and policies as a purpose in itself, but rather that it becomes necessary either in connection with gaps in focus and responsibilities or with incompatibilities between policy packages and sectors, such as competition and disturbance in the interaction between use interests and policy pillars (Hassler et al., 2017). Here it is important to reflect on the

balance or the relative weight given to environmental protection or maritime development (in its various guises) in inter-sectoral MSP interaction and whether mechanisms/processes are in place to deal with incongruences/incompatibilities of interest, conflicts and trade-offs (Kidd, 2013; Qiu and Jones, 2013).

Third, *stakeholder integration* relates to both inclusion in the formation of national MSPs, as well as how stakeholders are engaged with during different MSP policy phases, i.e., implementation, evaluation and review (Flannery and Ó Cinnéide, 2012). Important aspects to examine include, which stakeholders have been involved (as well as those who have not) and on what terms. The terms of stakeholder inclusion relate to qualitative aspects of engagement processes, such are the recognition or management of uneven power relations among the various stakeholder groups (i.e., capacity to act, argue and influence substantive aspects of MSP) and whether interaction is through formal or informal processes (Flannery et al., 2018; Ritchie and Ellis, 2010). Other factors deemed important in achieving effective representation in MSP include, early and continuous stakeholder involvement, clarification of stakeholder roles and assessment of the capacity of stakeholders to engage and have meaningful opportunities to affect MSP decision-making (Jones et al., 2016; Schultz-Zehden and Gee, 2013). How to 'balance' development deemed to be of strategic (political) importance, with environmental care and deliberative processes of stakeholder involvement is no doubt a challenging ambition for the role of integration in MSP (Olsen et al., 2014a).

Fourth, *knowledge integration* deals with the forms of knowledge included as the MSP evidence base. Examining this will require consideration of the platforms and processes that support data and knowledge coordination and sharing among relevant authorities, sectors and levels (sub-nationally) (Saunders et al., 2017). The challenges facing MSP require that participatory forms of governance are coupled with receptivity to different forms of expertise and local knowledge (Raymond et al., 2010; Van Assche et al., 2017). Important here is how to galvanise both generalizable (scientific) and contextual knowledge (Long et al., 2015). This requires examination of whether MSP supports knowledge bridging (e.g., through deliberation processes) to assess the relevance, meaning and interpretations of different knowledge input in MSP (including socio-cultural, experiential or placed-based knowledge) (Blythe and Dadi, 2012), as well as, exploration of what tools and approaches are in place to broker agreements/settlements over epistemic-based conflicts (Katsanevakis et al., 2011).

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[2] But here we do include the transnational case of the Sound because we think it is illuminating for both understanding sub-national and trans-border integration.

Fifth, relating to *temporal integration*, a key role of MSP is to provide a basis for marine use that takes account of current uses, while being future-oriented (Ehler and Douvere, 2009). In MSP, this may range from multi-sectoral forward-looking spatial planning aimed at defining the present and opening for new spatial uses while considering conservation needs in marine areas to minimising perceived conflicts though a more reactive and regulatory approach. There is a clear connection here with the sustainability goal of intergenerational equity. This temporal focus on integration is on the extent that MSP processes prefigure future uses (and relatedly) desired socio-environmental states as well as if there are reflexive processes to adapt to changing socio-environmental aspirations or circumstances (Jones, 2014; Portman, 2011). In other words, this integration dimension implies a focus on how marine planning seeks to consolidate 'the now with the future' (Saunders et al., 2016).

The dimensions described in the analytical framework above are likely to closely affect each other in MSP practice. For instance, how sectoral representation is defined in MSP decision-making will have implications for the extent of stakeholder inclusion, and what knowledge is included and considered in decision-making.

4. Results

The results presented below have been sorted into the different integration dimensions. The cases presented represent a variety of integration problems and responses.

4.1. Cross-border integration

4.1.1. Germany

As a federal state, Germany must align MSP plans between states (Länder) and between these state plans and the federal plan for EEZ waters (which is subject to a separate plan and process). The laws that guide MSP in both administrative contexts (Länder and Federal) are similar enough to permit the close alignment of MSP approaches, as well as specific provisions and designations. In practice, despite this common legal framework, the EEZ plan is regarded as a regulatory plan designed to minimise conflict between a narrow range of strategic interests whilst the function of the MV plan is a regulatory spatial development programme designed to deliver tangible environmental, economic and societal benefits. Although the EEZ plan also seeks to deliver this range of benefits, this is made much less explicit and is not pursued in the sense of actively developing space – the approach is restricted to proactively managing spatial conflicts, involving a narrower range of strategic sectoral interests. The German case also highlights the value of combining formal and informal structures.

4.1.2. Rhode Island

The Rhode Island Ocean Special Area Management Plan (Ocean SAMP), in the US domestic setting, covers both state and federal waters and provides an example of a formalised approach of cross-border coherence between coastal and territorial waters. The Ocean SAMP's stated purpose was to direct the integration of a new marine dependent industry - offshore wind energy (OSWE) - into an already busy ocean environment. This regulatory document included information, policies and regulations for major issues and activities including commercial fisheries, recreational uses, shipping, ecology, cultural and historic resources, and OSWE. The documentation process, within the US legislative architecture, provided the State of Rhode Island's Coastal Resources Management Council (CRMC) with information to secure formal federal approval of the Geographical Location Description (GLD) for Ocean SAMP federal waters. This approval allows the state to apply Ocean SAMP information and policies to many federal agency activities or federally approved projects in federal waters within the SAMP area.

4.1.3. The Great Barrier Reef Marine Park

Federal-state relations are a key part of the effective management throughout the Great Barrier Reef (GBR) World Heritage Area which includes the federal Marine Park, adjoining state Marine Parks and the 1000 + islands within the outer boundaries of the GBR Region, the majority of which are under state jurisdiction.[3] Management therefore relies on federal and state (Queensland) government agencies working within the framework of a Great Barrier Reef Intergovernmental Agreement (IGA, revised in 2009). The primary federal agency is the Great Barrier Reef Marine Park Authority (Representative). The IGA and other agreements and MOUs, support the coordination of sectoral-based activities in the GBR despite being undertaken by a range of federal and state government agencies. Some of these agencies address specific aspects of management, such as shipping, fisheries, defence training and aerial surveillance, and operate under their own legislation. The GBR Marine Park Act provides precedence over inconsistent provisions of other federal and state laws, and under the Australian Constitution, federal laws have precedence over inconsistent state (Queensland) laws within the GBR Region. In this way the GBR Marine Park Act, in conjunction with complementary state and federal legislation and related agreements, ensures adherence with use stipulations (zoning etc.) and collectively provides relative certainty in planning and management across administrative borders within the entirety of the GBR World Heritage Area.

4.1.4. The Sound

The Sound case illustrates that despite overall favourable conditions for multilevel, transnational collaboration on MSP, potential benefits may be hard to realise. Sweden and Denmark are neighbouring countries with almost identical commitments in relation to relevant global treaties, and regional MSP agreements, but quite different domestic MSP (and sector-based) institutional architecture and strategic priorities. There are significant differences in public administration structures between these two countries, including the distribution of responsibility between authorities at different levels as well as between ministries and sector authorities. For example, Swedish municipalities have a right to plan in territorial waters, with national planning by the Swedish Authority for Marine and Water Management partially overlapping. In Denmark, this responsibility is entirely national, located with the Maritime Authority. Concretely, it means that municipalities on the Swedish side have no counterpart on the Danish side to coordinate planning efforts with. There are also divergences in prioritisation placed on nature protection and promotion of blue growth as well as on how and when stakeholder participation ought to be promoted.

4.2. Cross-sector

4.2.1. Latvia and Lithuania

Latvia and Lithuania adopted contrasting approaches in prioritising sectors in their respective MSP national plans. For instance, in Lithuania a goal 'to maintain balance between economic development and good ecological status' has been set (The Parliament of the Republic of Lithuania No. 12-1781). In addition, coherence is emphasised as an MSP planning principle to ensure 'a balance between regional economic development, social well-being and healthy or (and) resilient ecosystem of the Baltic Sea' (Saunders et al., 2016, p.4). The wording here implies that the marine environment is a sectoral interest to be considered alongside other maritime sectors. The Latvian National MSP was elaborated by explicitly developing and applying an ecosystem approach (EA) based methodology, which involved mapping provisioning, regulating and cultural services to assess the impacts of various sea use scenarios and proposed permitted uses of Latvian marine areas. In

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[3] The GBR Region covers 345,000 km^2.

developing this EA approach, the descriptors for Good Environmental Status from the EU Marine Strategy Framework Directive (MSFD) were explicitly drawn on to assess the significance of human pressure. This indicates an approach where perceived ecological limits informed MSP, presumably with the aim to make sure that ecosystem services and values are not subjected to threshold level pressures from proposed use of marine areas and resources.

4.2.2. The Great Barrier Reef Marine Park

While the primary objective of the GBR legislation is to "*provide for the long-term protection and conservation of the environment, biodiversity and heritage values*", the legislation provides for a multiple-use marine park, allowing 'reasonable use' of natural resources to coexist with conservation through a multiple-use zoning system.

The current zoning plan is the result of a systematic and comprehensive rezoning of the entire area during the period 1999–2003. The Representative Areas Program (RAP) was a methodological approach that aimed to conserve biodiversity while ensuring a systematic planning approach to sea-use. The multiple-use Zoning Plan was the primary planning instrument and continues to be the cornerstone of GBRMP management but is only one of many statutory management tools used in the park. A range of other spatial and temporal management tools are drawn on to support effective and integrated protection of the GBR. For example, various plans have been developed by other sectoral agencies using their own specific legislation (e.g. for fisheries management or shipping). However, when these plans are applied in the GBRMP, they are still subject to the underlying zoning and therefore must be consistent with the relevant zone objectives.

4.3. Stakeholder

4.3.1. Latvia and Lithuania

In Lithuania, the Ministry of Environment (Division of Spatial Planning) was given the main responsibility for developing a national framework for MSP. The practical work was, however, performed by a consortium led by the natural science dominated Coastal Research and Planning Institute at Klaipeda University. In Lithuania, to support the development of the national MSP, only key sectoral stakeholders and governmental institutions were involved, with relatively little dialogue with local or regional actors or non-state actors. The Lithuanian process was politically oriented towards supporting a fast expanding OSWE sector, without broader intersectoral involvement.

In contrast, an ambitious inter-sectoral engagement process underpinned the formation of Latvian National MSP. The development of the Latvian National MSP was led by an environmental NGO, called Baltic Environmental Forum Latvia (BEF). In Latvia there were several rounds of engagement with a diverse range of stakeholders, including not only central political and administrative authorities, but also representatives from regional and local levels,[4] as well as non-government sector stakeholders. The platforms for interaction included broad-ranging workshops and seminars, sectoral meetings as well as three rounds of cross-sectoral regional seminars, involving discussions on alternative MSP scenarios and proposed sea use solutions.

4.3.2. Rhode Island

For each Ocean SAMP chapter a Technical Advisory Committee (TAC), made up of researchers, regulators, industry, resource users, and non-profit organisations with expertise on the chapter topic, was gathered to provide advice and content on chapter development. This integrated writing process allowed for different knowledge and information to be shared amongst diverse stakeholders. During both the

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[4] This could partly be explained by the fact that local municipalities have been given the right to plan and manage the 2 km zone seawards from the coastline.

development and implementation of the Ocean SAMP, the project team established both formal and informal opportunities for diverse stakeholders to meet and discuss their issues of concern and share knowledge. Throughout the 3-year period of the Ocean SAMP development, researchers presented at monthly stakeholder meetings to communicate research methods and findings as a foundation for information exchange. This allowed researchers to better understand stakeholder concerns as well as gather observations and anecdotal findings from seasoned mariners and resource users that would help enhance research methods and interpret research findings to help inform policy. For example, researchers, recommended to site the renewable energy zone (REZ) southwest of Block Island due to the increased wind velocity and benthic environment conditions. Because commercial and recreational fishermen were part of these siting discussions, they were able to communicate to CRMC immediately that if the REZ was sited further east of the researcher's proposed location, it would minimise conflict with existing fishing activity. (G. Fugate, personal communication February 12, 2018).

4.3.3. The Great Barrier Reef Marine Park

GBRMPA performed a comprehensive review of the RAP across the entire GBRMP during the period 1999–2003. This involved two formal phases of stakeholder engagement (to provide input into, and comment on a draft plan), using different means of interaction and involving an extensive range of stakeholders, including indigenous Traditional Owners, NGOs, local communities, commercial and recreational fishing organisations and federal and state politicians, as well as, professional sector organisations such as the Association of Marine Park Tourism Operators, among many others. Key lessons derived from this experience include the importance of being: clear about expectations and possibilities for influence; prepared to show influence when it has occurred; upfront (with stakeholders) about the limitations of scientific understanding; active in soliciting input from key stakeholder groups, such as fishers, and; informed and alert to the implications of decisions on people's livelihoods. The GBRMP experience indicates that conflict is more likely than consensus and thus compromises between stakeholders need to be negotiated.

4.4. Knowledge

4.4.1. Poland

Tensions between fishing and nature conservation in MSP in Poland have proved difficult to resolve with no possibility of a consensus type agreement currently apparent. An important part of this conflict concerns the validity of fishers' knowledge, which is largely seen by MSP authorities to be imbued with self-interest and therefore partial. Conflict between (prospective) OSWE and fishing interests seems to have a slightly different origin. As a new marine actor, OSWE is not seen as a legitimate marine actor/sector by fishers. Fishers also argue that there is insufficient data to show the implications of OSWE developments on fisheries and therefore a precautionary approach should be adopted.

Polish fishers also complained that the scarcity of scientific data is used to excessively promote environmental protection by invoking the precautionary principle instrumentally to serve conservation interests. While fishers may accept science-based evidence, they expressed strong concerns how this evidence-base is used in MSP related processes. Interviewed fishers, indicated that MSP decisions are being undertaken unilaterally by central authorities who have scant knowledge and understanding of the sea and fisheries. Furthermore, that authorities are seen to apply scientific data in a politicised way against the fishers' interests, e.g. in support of OSWE. There was also a clear thread in discussing MSP with fishers that they want science to better addresses 'their' problems and answer 'their' questions.

4.4.2. Rhode Island

It has been observed that interactions increased stakeholder' knowledge of the natural and human use aspects of the Ocean SAMP as well as on the policy and regulatory components (G. Fugate, personal communication 2018). The Ocean SAMP process included documentation of the Narragansett Indian Tribe's oral history, which was the first time the tribe's oral history was incorporated into a regulatory document in Rhode Island (Mulvaney, 2013). Because CRMC and other project leaders demonstrated respect and responsiveness, trust developed between this tribal nation and the state entities. This trust led to the agreement and commitment to continue to work together to ensure that tribal information was appropriately and respectfully incorporated into future offshore planning.

During the latter part of the Ocean SAMP project, the project team established Fisherman's and Habitat Advisory Boards to serve as mechanisms to ensure that knowledge from these stakeholders was part of the regulatory process. The Fisherman's Advisory Board (FAB), a nine-member committee representing different Rhode Island and Massachusetts fishing sectors etc., has the authority to comment on potential fishery-related impacts of proposed development projects. The Habitat Advisory Board (HAB), made up of natural scientists and representatives from environmental and conservation non-governmental organisations (ENGOs), considers the potential impacts and avoidance measures related to development and habitat in the Ocean SAMP area. Research revealed that meetings allowed interaction and sharing amongst these individuals. The Ocean SAMP requires developers to consult with the FAB and HAB prior to submitting an application. During the HAB and FAB joint meetings, the sharing of knowledge led to influencing decision-making about the SAMP area. The HAB has been influential in identifying data gaps in state and federal permitting processes and the FAB involvement has expanded the baseline fisheries monitoring implemented by the OSWE company, Deepwater Wind, at the Block Island Wind Farm. Recognising that these boards are advisory, it is up to CRMC to determine what advice is taken and ultimately incorporated into policy and regulatory decisions (G. Fugate, personal communication February 12, 2018). Because of this commitment to these stakeholders, however, CRMC ensures that developers respond to all questions, concerns, and opinions from HAB and FAB members.

4.4.3. The Great Barrier Reef Marine Park

The 2003 rezoning was widely seen as successful due to a combination of aspects including the blending of the best scientific knowledge (both biophysical and social science) which provided broad operating principles with the more detailed spatially specific knowledge derived through community and stakeholder engagement. Independent experts greatly assisted in the development of a number of items that were fundamental in the planning process including the comprehensive map of 70 'bioregions' covering the entire GBR. An independent Scientific Steering Committee helped to define the biophysical operational principles which guided the development of the representative network of no-take zones in the GBRMP. Finally, the comprehensive engagement process led to a mutual respect and collective learning between different knowledge holders.

4.5. Temporal

4.5.1. Germany

Among the MSP settings considered, the German case was the only example of marine planning in the BSR with implementation experience. The second MV LEF MSP Plan (2016), indicates that the limitations and problems of the 2005 process had been reflected upon, with a more collaborative approach to planning adopted. After being excluded from the initial MV LEF MSP Plan in 2005, coastal fishers were integrated into the subsequent revision, and the planners adopted a more inclusive and patient approach, which featured considerable informal

exchange with other authorities and stakeholder groups. Fishery associations made constructive use of the two rounds of consultation in the 2016 process and while all their demands were not met, they saw that their concerns and suggestions were taken seriously. Understanding has also grown on the part of the planning authority of the legal prerequisites available for designating reservation areas for fishery.

4.5.2. Rhode Island

The Ocean SAMP is part of a broader governance process that has been taking place in Rhode Island for over 40 years, through which the state has looked to the future of its coastal and ocean waters and adapted to changing environmental and social conditions. The state initiated the development of its first coastal management plan in the 1970s. In the 1980s, CRMC implemented two planning tools that initiated MSP within the state and have served to guide shoreline and offshore development for more than three decades. The 1983 water use category zoning designated one of six water use categories to all state waters and defined both permitted and prohibited activities within each category. Over the years this zoning mechanism has protected coastal uses, including but not limited to working waterfronts as well as wetlands, due to their social and environmental values to the state. Over the time that followed, SAMPs were developed for areas that required a more comprehensive planning effort. The Ocean SAMP, the seventh such plan in the state, built upon this management process and expertise and directed the integration of a new potential social and environmental pressure - OSWE - into an already busy ocean environment.

4.5.3. The Great Barrier Reef Marine Park

Given that multiple use spatial planning has been a key component of the integrated management approach developed in the GBRMP over the last 40 years, it also provides a longer-term example of marine spatial planning. As the GBR Zoning Plan is subordinate legislation under the federal act, it is relatively complex and resource-intensive to amend. However, the Zoning Plan also allows for temporal provisions (including Special Management Areas), plus there is an ability to apply regulatory controls elsewhere in the GBR (such as seasonal closures or site planning), as well as individual permit conditions, all of which can provide finer levels of both spatial and temporal controls to adapt to changing circumstances and conditions.

5. Discussion – analytical insights on integration in MSP

The empirical accounts have provided a wide range of MSP practices which describe multi-dimensional aspects of integration, including challenges, problems and solutions. Here we reflect on both the empirical results and the integration framework.

Both the GBRMP and the Rhode Island cases provide examples where care has been taken through the design of specific provisions and designations to provide clear direction on the distribution of cross-border authority, rights and responsibilities across federal and state jurisdictions. Additionally, the GBRMPA is guided by the primacy of conservation goals, which arguably give a planning mandate to prioritise (environmental uses) in integrated planning processes[5] – this approach resonates with an Ecosystem Management Approach, as adopted in Latvia, where ecosystems were viewed as boundary conditions. The hierarchical Federal and State relationships in the GBR and Rhode Island cases also means that there is increased vertical integration in planning. Clearly the zoning mechanism is also integral to giving effect to this in practice by offering a systematic and transparent basis for multi-use planning while ensuring that core conservation goals are not being compromised. While the Sound case illustrated the importance of

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[5] This is not to say that planning processes in the GBR are likely to be any less complex, as the area supports different types of livelihoods and economic activities in the coastal zone.

not assuming that coordinated and coherent planning necessarily follows from old and established relationships between bordering country jurisdictions.

The successful examples of cross-border integration highlight the importance of combining both informal and formal approaches to build networks of relations that can then function actively in MSP processes. Establishing a dedicated cross-border project, drawing on existing cross-border relations may be a way, in some cases, of recognising and perhaps targeting the institutional misfit issues described in the Sound case. While we only present one cross-country case, it is likely given the differences in contexts between countries that effective cross-border integration is easier to achieve within countries than between countries. Arguably this is because (a) it tends to be easier to coordinate the more similar the settings are, and (b) governments have much more leverage in managing domestic issues than international organisations have in managing transnational issues. In some MSP cross-border situations ,'sufficient' or 'functional' integration, ((avoidance or minimization of conflicts of interest), rather than deeply entwined institutional arrangements (more demanding or onerous) is most effective.

The Lithuania/Latvia comparative case illustrates how country contexts affect MSP in terms of substantive goals and priorities as well as processes linked to their realisation. The contrasts in this case relate to the differing priorities given to environmental protection and stakeholder engagement. It also highlights that examining integration as an end in itself, say through measuring degrees (or strength) of integration, is not likely to be insightful. Connecting integration to normative MSP goals is likely to provide more insights into the character of integration in specific contexts, i.e., the implications of integration practice. For example, if sectoral representation is conceived narrowly (as in the case of Lithuania), there is little analytical insight in interpreting this as 'strong integration' if it only involves a narrow range of sectors and stakeholders. That is, it is dubious whether this should be regarded as a positive integration scenario if sector and stakeholder participation is limited in such a narrow way. Taking a top-down approach in the early stages of MSP may result in easier pathways to integration and thereby increase efficiency and functionality of strategic decision-making, but as Kidd and Ellis (2012) point out it may also result in an implementation deficit which temporally displaces conflicts only to see them reemerge latter on.

The GBRMP case showed that establishing governance mechanisms, where sectoral agencies are given the independence to develop their own strategies for operation in the GBRMP, but subject to the overall zoning framework and particular zone objectives may provide an effective means to facilitate integrated use of marine space. This enables sectors, such as shipping to autonomously develop strategies within known parameters, rather than compelling them to participate in intersectoral dialogue that may just heighten value or goal conflict. Of course, such an institutional arrangement requires a strong (in terms of authority) and well-resourced agency to oversee and enforce stipulated requirements – and of course requirements must be developed and agreed to in the first place.

Both the GBRMP and Rhode Island MSP cases emphasised the importance of involving a diverse range of stakeholders throughout the planning process, where there are genuine opportunities for stakeholders to have influence. These experiences reflect findings in MSP elsewhere (cf. Jones et al., 2016; Flannery et al., 2018). In the GBRMP case, evidence of stakeholder influence was evident in the difference between the draft zoning plan and the final zoning plan. These cases also underline the importance of developing systematic strategies for stakeholder participation involving different platforms and means of interaction. Some important stakeholders may be more difficult and complex to engage than others (e.g. fishers). Effective integration in these situations may require the development of tailored approaches that consider the particularities of different groups, including why it is important that stakeholder participate, how their aspirations will be considered in planning and what can be expected from the

participation. Also, in the Rhode Island case, ongoing stakeholder-based forums (organised along broadly conceived interest lines) have been important in reproducing in implementation the gained trust between management agencies and stakeholders and between the stakeholders themselves.

Being able to effectively draw on different types of knowledge to inform MSP also seems to be linked to addressing other integration challenges such as stakeholder and cross-sectoral integration. This is most clear in the Rhode Island case with the use of multiple topic-specific Technical Advisory Committees (TAC). It is also fundamental to linking strategic ambitions with adaption to local contexts. The experience of Poland and Rhode Island contrasted sharply over how well fishers have been integrated into MSP. At the pre-planning stage in Poland, fishers have shown a strong reluctance to engage in MSP processes. The fishers who participated in this research argued that their knowledge is not respected and that science-based support is not directed towards fishers' concerns or interests. They further claimed that science-based support is put behind strategic goals such as OSWE despite the lack of scientific knowledge on OSWE effects on fishing. This difficulty of integrating fishers in MSP in Poland is not unique, but it does present as a particularly difficult case – where preconceptions of 'the other' have hardened. Rhode Island, on the other hand, through the establishment of multiple TACs which included diverse stakeholder groups and gave them responsibility for systematically developing the Ocean SAMP, created a means to incorporate a broad cross-section of knowledge from stakeholders into the MSP process. Interestingly, this approach also culminated in the establishment of more specialised environment and fisher groups (Fisherman's and Habitat Advisory Boards) that took shape during plan implementation. These Boards play an ongoing role in ensuring that proposed new marine and resource uses do not undermine or overly impact on livelihoods and environmental values and thereby are compatible with key MSP goals. Sharing of knowledge between these two groups has also led to increased knowledge exchange within the MSP. Given that much of the fisher angst in the Polish MSP is directed towards conservation, there may be some insights from the Rhode Island experience that Polish authorities might consider to shape a different type of interaction approach and as way to reduce scientific knowledge gaps. In the GBRMP, the comprehensive engagement process was a key aspect that led to mutual respect and collective learning between different knowledge holders.

Finally, while cases on temporal integration presented here are limited, the Rhode Island cases shows the importance of continuity of an institutional approach supported by different types of knowledge to adapt to changing social and environmental conditions. This allowed the introduction of a new user, OSWE (largely promoted as an adaption to climate change), to be integrated into existing MSP. Similarly, the GBRMP case highlighted the importance of instituting review processes (in this case, use zoning) in order to adapt to changing conditions. Having the capacity to adapt to changing conditions such as those brought about either because of climate change or in societal responses to it, would seem to be integral to effective marine spatial planning.

6. Conclusion

This article has sought to apply a conceptually informed multi-dimensional perspective on integration to understand MSP practice. In doing so, we successfully illuminated several different MSP integration-related problems and responses across a diverse range of settings. The empirical results illustrate and confirm the multiplicity of roles integration plays, the close interrelation between different dimensions of integration, as well as, the complexity of challenges and factors at play in different empirical settings.

We argue throughout the article that integration is a rich concept that is put to work to meet various goals in MSP, such as efficiency, participation and sustainability. From a policy perspective, the results presented give examples of diverse ways to address integration

Table 3
Analytical framework for examining the role of integration in MSP.

Integration Dimension	General MSP Ambition	Key Analytical Aspects
cross-border	To garner cooperation among administrative borders to further coherent planning and use between maritime activities and good environment status across borders (including land-sea) and in the open sea.	Coordination/coherence between different administrative levels/functions and cooperation between and within countries (e.g. a goal may be a harmonised approach across boundaries to development and environmental protection)
policy/sector	To pre-emptively address sectoral use incompatibilities, but also to achieve synergistic interaction between sectoral interests – where mutual benefit/interest is emphasised (and sought after) - rather than only where sectoral interests are pursued	Interaction between different sectors over use of marine space. Most notably between blue growth and environmental protection goals, including how trade-offs are made and/or synergies achieved.
stakeholder	To develop processes to support engagement among a range of stakeholders and put measures in place to manage conflicting interests in a timely, fair and deliberative manner; to support legitimate and high-quality policy/planning processes and outcomes.	The extent of representation of interests as well as the terms of stakeholder inclusion and participation.
knowledge	To interlink different forms of multi-disciplinary, science-based knowledge to support evidence-based approaches to underpin MSP decision-making in pursuit of sustainable marine governance.	Diversity of the evidence-base and opportunities for a broad range of stakeholders' knowledge to be valued
temporal[a]	To design governance arrangements that respond effectively to existing problems, but are future-oriented and able to adapt to changing environmental and social conditions	Capacity of the MSP process to adopt a reflexive approach over time in responding to changing socio-environmental conditions/expectations

[a] There are also time: space integration aspects to MSP zoning and use, which affect coherency of spatialized use outcomes; as well in sustainable development thinking related to the relative weight given to resolving short-term problems over long-term sustainable development visions.

challenges, such as integration over state and federal boundaries (GBRMP, Rhode Island and Germany), between environmental protection and maritime development (Latvia); between strategic decision-making and participation (GBRMP); between scientific and experiential knowledge (Latvia and Rhode Island), in adapting to changed conditions (GBRMP and Rhode Island) among others. That said, difficult challenges of MSP integration were also presented, such as trans-boundary integration in The Sound; inclusion of fishers' knowledge in Poland and striking a 'balance' between strategic sector dominated planning and participatory planning in Lithuania.

The framework supported qualitative comparison between different cases by sorting and analysis of empirical material linked to the different integration dimensions. While the integration framework's dimensions clearly interrelate and overlap in different ways in practice, the conceptual thinking underpinning them differs given the ambition of each integration in MSP (see Table 3). This allowed deeper analysis of different integration practices as well as understandings of how the different dimensions interrelated in practice. What became clear is that how they interrelate in practice is always contingent on the particular empirical setting, i.e. just because a wide range of stakeholders participate in MSP does not necessarily mean that stakeholders were influential or that diverse knowledge types were meaningfully considered in decision-making.

In finishing, more research that links conceptual understandings of the role of integration to MSP practice is needed. We see this as especially important in regard to how different integration practices affect the realisation of the overarching, but rather vague MSP goal of delivering sustainable seas for the purpose of sustainable societies.

Disclaimer

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