MSP AS A GOVERNANCE APPROACH? KNOWLEDGE INTEGRATION CHALLENGES IN MSP IN THE BALTIC SEA

BALTSPACE DELIVERABLE: D2.4: MSP AS A GOVERNANCE APPROACH? KNOWLEDGE INTEGRATION CHALLENGES IN MSP IN THE BALTIC SEA.

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Summary

Developing integrative decision-making underpinned by a diverse knowledge base is seen as essential to meet marine spatial planning's (MSP) sustainable development aspirations. In contributing to a better understanding of how this might be achieved, this report considers knowledge integration challenges drawing on several MSP empirical cases across the Baltic Sea Region. Each case-study, involves Baltic Sea states at different stages of developing national marine spatial plans. At the Baltic-wide level, HELCOM-VSAB has interpreted the Ecosystem Approach in MSP as relying heavily on an evidence-base informed by natural scientific and expert knowledge. The results of the report show that challenges arise when trying to apply scientific knowledge to MSP events or processes for a number of reasons such as, the poor quality of scientific data available or because stakeholders contest the policy interpretation of the data. This raises questions of how to assess or evaluate the quality of scientific and stakeholder knowledge or input into MSP decision-making, particularly in highly politicised, conflictual contexts, such as the integration of parts of the fishing sector in MSP in Poland. MSP in German territorial waters provides a positive example, where science and stakeholder knowledge input have been integrated in decision-making through informal and formal processes. This case exhibits evidence of social learning where authorities have reflected on previous experience and invested in actively nurturing the meaningful participation of a wide variety of stakeholders (to form a community of practice) over an extended period of time. The key findings of the report call for more attention to be paid to ways that scientific and stakeholder knowledge can be fruitfully incorporated in MSP, through initiatives such as: the development of knowledge evaluation measures; drawing more actively on social science expertise to help facilitate processes of stakeholder engagement and knowledge inclusion; and paying more attention to how to include heterogeneous socio-cultural values and knowledge (placed-based) in a way that improves the salience of scientific knowledge and the legitimacy of MSP decision-making.

1. Introduction

1.1 Context

As pressures for development of marine space grow, marine spatial planning (MSP) is increasingly seen as a key approach for effective governance. MSP has gained increasing prominence recently in response to the problems of fragmentation of marine regulation, increasing pressures upon the seas and tensions between sectoral interests and environmental damage (Douvere & Ehler 2009). The Maritime Spatial Planning Directive (2014/89/EU) is a recent attempt by the EU to address these integration challenges by placing a legal requirement on Member States to develop and implement Maritime Spatial Plans by 2021, including the requirements to use of best available data and information and to work with neighbouring states. This has led to a widespread recognition of the need for a more systematic and integrated approach to the management of national as well as transnational marine areas.

Resolving, or at least addressing in some way, these different forms of fragmentation by developing integrative decision-making underpinned by a diverse knowledge base is seen to be at the core of mediating competing interests (stemming from different sectors of governments, business, and civil society) in marine environments and meeting aspirations for sustainable development (SD) (Ritchie & Ellis 2010). Knowledge integration implies here the ambition of mixing different types of knowledge in order enhance understanding of the issue at stake. It may also result in shifting or at least affecting power relations and influence in decision-making.

MSP in the EU is still largely in its formative planning phase, so little has been written about science: policy interaction, other forms of knowledge integration or how stakeholders variously conceptualize and experience the role of knowledge in pursuing the multidimensional sustainability goals of MSP in the Baltic Sea Region. Despite common governance directives, both at the EU and regional level, countries around the Baltic Sea are likely to interpret and adopt MSP differently. This suggests that there will be variability in MSP related knowledge integration processes, issues and concerns across the region that relate to different country contexts, different levels and different types of intra and intersectoral interaction.

1.2 Purpose

This report is a deliverable in the BALTSPACE project that examines the role of different dimensions of integration in MSP. It presents an analysis of the knowledge[1] integration challenges arising in empirical work across several Baltic Sea countries, including Poland, Germany, Lithuania, Denmark, Sweden and Latvia (see Table 1 for an overview of the case-studies). It explores how different MSP conceptions and empirical settings generate varying knowledge integration problems, which then can affect MSP aspirations for achieving sustainable marine governance. Examining the role of knowledge may also help to further understand how to address emerging schisms in MSP between those calling for a radical

[1] Saunders et al. (2015) describe the relationship between data, information and knowledge thus: data are 'claimed facts (in a 'raw' form), the organized presentation of 'facts' (through whatever means) into 'information' links to its comprehension and acceptance (or not) as knowledge.' (p. 3)

overhaul to enhance the way it deals with social sustainability concerns versus those who tend to focus narrowly on MSP's performance and technical aspects (Flannery et al. 2016). The former tends to be concerned with social sustainability goals such as procedural justice, social inclusion, knowledge pluralism and fair distributive outcomes, while the latter tends to be preoccupied with MSP as a techno-rational means to reach consensus on allocating spatial planning in the seas (Kidd and Shaw 2014). Arguably, for MSP to develop as a form of sustainable marine governance, it needs to find ways to marry these different sets of concerns.

1.3 Linkages with overall project structure and related tasks

This deliverable focusses on knowledge integration in MSP and is one of four reports that seek to analysis different integration dimensions important to MSP[2] that draws on empirical work undertaken across a range of Baltic Sea contexts. It should be read in conjunction with other BALTSPACE analytical reports to get an overview of the way that different dimensions of integration overlap and interact in interdependent ways.

1.4 Structure

The report is structured in the following way: First, we situate the role of knowledge in MSP and develop a three-part conceptual approach to inform and underpin the analysis of the empirical material. We then describe the MSP in the Baltic Sea Region as the research setting. This is followed by a description of the research methodology where we elaborate the multiple case studies across the Baltic Sea Region that constitute the empirical work as well as the types of methods used and the actors interviewed in these empirical settings. We then present the empirical data and in doing so consider the views of different actors involved in MSP across a range of empirical contexts in the Baltic Sea Region. The paper discusses these results and finally concludes by underlining key findings.

2. A discussion of the literature: situating the role of knowledge and its integration in MSP

MSP is conceived here as a governance arrangement to address complex transboundary sustainability problems. In addition to different types of scientific knowledge, MSP as governance, suggests that different knowledge types may be valuable to consider across different MSP empirical settings. Arguably, how these are dealt with will vary depending on the procedures and norms at play in the different MSP empirical settings. Additionally, how knowledge problems, challenges and solutions are framed is therefore likely to vary depending on the actor's role, perspectives and experience in relation to formal MSP

[2] Saunders et al. (2016) in a recent BALTSPACE report identified several integration dimensions to support analysis of MSP practice. The report argues that governance choices concerning the following integration dimensions give insights into the sustainability of MSP practice: balance (ecological protection vs. development), vertical (territorial), cross-border (territorial), horizontal (policy/sector), stakeholder knowledge and temporal. The report provides an analytical framework that can support comparative research on how MSP relates to notions of sustainability across different contexts.

institutional arrangements. While different aspects of MSP are likely to require different degrees of integration, MSP in an overall sense is supposed to foster spatial integration of different interests in way that enables the furthering of those interests within a framework of societal cohesion and sustainability. That is, there is a sense here that the mapping processes and outcomes themselves are meant to act as integrators of sorts, connecting, juxtaposing, cohering and balancing different values, knowledges and interests. Maps, together with the policies attached to different areas, may in fact depict the results of successful integration. Academics and practitioners alike are in general agreement of the need to bridge different types of social and ecological knowledge to inform MSP in this role, yet there are difficulties about understanding what this might mean - what achieving (meaningful) knowledge integration is, or should be. A key problem for MSP is that this lack of agreement on a clear way forward invariably invokes different explanations around knowledge problems and solutions in support of MSP decision-making, as well as raising questions about whose knowledge should count. To examine this problem here we see knowledge integration implies including and bridging different types of knowledge. So, to examine this in MSP we need to focus on the: (1) the prioritisation of different types of knowledges; (2) framing of knowledge problems; and (3) mechanisms to bridge different types of knowledge.

2.1 Different framing: knowledge problems and solutions

Arguably, the literature on MSP reflects two distinctive ways of conceiving MSP, which affect what are considered knowledge problems and therefore 'solutions' or possibilities for knowledge integration. The challenges evident in both perspectives need to be addressed for MSP's aspirations of being scientifically informed and democratically legitimate are to be met.

Ritchie (2014) and Tynkkynen (2015) (in the Baltic context) found that the framing of the marine 'problem' in largely scientific and political terms has paved the way for scientific-technical interventions, while limiting citizen participations in finding solutions. There is a considerable body of MSP literature that emphasises the need for (more) scientific knowledge to address problems. Much of this literature is concerned with operationalising the Ecosystem Approach in MSP (Jay et al. 2016; Kidd et al. 2011). A major principle of ecosystem-based MSP is the underlying logic that the successful management of human activities towards socio-ecological sustainability rests fundamentally on the application of science-based ecosystem knowledge (Agardy et al. 2010; Borja et al. 2016; Tafon forthcoming). While this is understood differently, focal points of activity towards this ambition include MSP stocktaking, linking to establishing reference status of marine areas and efforts to understand and monitor multiple cumulative socio-ecological impacts on interacting ecosystem components (Douvere & Ehler 2009). Other common concerns raised in this more technocratically inclined MSP literature include ways to improve poor or 'non-linear linkages' between scientific knowledge and administrative policy-making, how to adjust strategic planning to local ecological conditions and the need to develop rational planning approaches and tools for planners to apply across scales to harmonise and spatialize diverse data. This conception of MSP stresses the importance of scientific and technical expertise/ knowledge linked to facilitating bureaucratic arrangements as the key

means to advance MSP. Others have argued in the broader nature conservation literature thplanning

e basis for inclusion of stakeholders from this perspective as an instrumental means of legitimizing already established ends (Jagers et al., 2012; Saunders, 2011; Myers and Muhajir, 2015).

The second discernible perspective focuses more on the MSP problem of how include, organise and consider knowledge of a broader range of actors in decision-making across multiple levels and sectors. While this view also recognises the importance of scientific and expert knowledge, considerable weight is given to the importance of including more voices during both strategic and operational phases of MSP to achieve effective, legitimate, just and place-sensitive planning (cf. Flannery et al. 2016; Kidd and Ellis 2012; Kidd and Shaw 2014; Mazzola et al. 2015; Ritchie and Ellis 2010;; Tafon forthcoming). While there are more critical voices who advocate agnostic approaches (c.f. Flannery et al. 2016; Tafon forthcoming), 'genuinely' deliberative interaction is proposed to address competing marine use options, and choices among different knowledge claims and their relation to interests (Ritchie and Ellis 2010). This perspective tends to see MSP as site of political governance, where interactive governance processes need to be developed, so struggles between different types of knowledge and interests can be played-out. This perspective adopts a normative view of the value of including stakeholders in MSP – not just to achieve desired MSP decision-making ends, but as an end in itself.

These two distinguishable discourses in MSP may help us to examine how different actors variously frame different aspects of the MSP knowledge problem, as well as, how the timing of different knowledge inclusion (or exclusion) affects how knowledge is integrated. This also includes consideration of the weight given to these different perspectives in MSP practice. How a knowledge challenge is framed directs attention to what ought to be done in response – it sets a course of action, putting more onus on some solutions over others and in doing and so omits (or lowers preferences) possibilities for alternative problematisations and responses.

2.2 Prioritisation of different types of knowledges

Kidd and Shaw (2014) and others have criticised MSP for being overly dependent on natural science knowledge to inform decisions. This has occurred, it is argued, because historically MSP has organisationally arranged in government departments and agencies with environmental sectoral responsibility. Contemporary MSP in the EU context, however, is driven by a diverse range of sectoral interests including 'new blue industries' such as off-shore wind energy (OSWE)[3], mariculture and seabed mining (Buhl-Mortensen et al. 2016). While there have always been traditional users of the sea, with the rise of these 'newcomers' on the marine scene, emphasis is increasingly put on the need for multi-sectoral decision-making underpinned by knowledge integration. This has meant that MSP

[3] A major plank in the EU's Blue Growth Strategy is to increase electricity generation capacity of offshore wind energy (European Commission 2012; 2017).

is being increasingly approached as a cross-sectoral and multi-disciplinary concern. With this shift comes a need to mediate both different scientific disciplinary evidence and diverse stakeholder interests. However, it is not yet clear, what this means or how is to occur. Therefore, a particularly difficult question confronting MSP and environmental governance more generally is how to assess and validate different forms of knowledge in such governance contexts.

The variety of ways in which knowledge has been categorized results in considerable confusion in environmental governance endeavours such as MSP (Fazey et al. 2006). Raymond et al. (2010) loosely frame different knowledge categories as local knowledge, scientific knowledge and hybrid knowledge. Raymond et al. (2010) are at pains to stress that these categories should be regarded as multidimensional, fluid and therefore not separated by hard boundaries, but they may be useful for our analytical purposes. They are characterisations that have assumptions embedded within them, such as varying degrees of generalizability, explicitness, formality and recognition (expertise). These assumptions are likely to be related to the treatment afforded to different categories of knowledge in MSP. For instance, the category of scientific knowledge clumps together knowledge generated by various academic disciplines, which we know are separated by different epistemological assumptions, such as between qualitative and quantitative forms of knowledge. Even though there are formalised ambitions and calls for increased participation and consideration of diverse knowledges, evidence-based policy making (EBPM), privileging (quantitative natural) scientific knowledge is widely adopted in MSP (Kidd and Shaw 2014; Ritchie 2014). This indicates that the relative value of knowledge beyond quantitative natural science remains highly uncertain and contested (Ritchie and Ellis 2010). To address this, recently there have been calls to include more social science perspectives in sustainability science in general (Hackmann & Moser 2013) and MSP (Kidd and Ellis 2012).

The brief discussion above suggests that there may be a tension between privileging some forms of scientific knowledge and the ambition of galvanising a pluralistic knowledge platform for MSP. Examination of this involves not only how (or whether) 'objective' and 'subjective' knowledges are being included and handled in MSP practice, but also how this is spoken about by different knowledge bearers in different contexts. Different MSP contexts will also reflect different political and administrative traditions (reflected in current institutionalised practices) and legislative requirements[4], which are also likely to have a bearing on how stakeholder engagement and relatedly knowledge integration is handled.

2.3 Bridging knowledge in MSP

Identifying opportunities to bridge different knowledge systems has been a key concern of environmental governance for some time (Reid et al. 2006), and has attracted attention through the 'need to integrate' disparate types of knowledge in MSP. Arguably, at the regional Baltic and perhaps national level, this could mean the promotion of certain norms

[4] Marine spatial planners will need to comply with different national-based MSP legislation, which affect what is required of planners to produce a legally sound and legitimate plan. In Germany, for example, there is a requirement to consult stakeholders.

to foster knowledge integration as well as data and information coordination and harmonisation both across sectors and between levels in MSP. To go beyond a mere knowledge exchange and to facilitate a 'collective knowledge integration' with the aim of social learning, however, a more deliberative governance approach is required. In line with this, much attention has been paid to participatory approaches to support knowledge integration for sustainability in an increasingly complex world (Rodela & Swartling 2015).

Within participatory processes, deliberative approaches assume actors involved in MSP adopt a *willingness* to revise understandings and preferences considering claims made by others (Reed et al., 2010). Process factors may affect this, such as, are stakeholders given the opportunity to provide meaningful knowledge input in a way that this contribution is respected, valued and considered when the decision is made (George & Reed 2016). In practical terms, this means that stakeholders need to be recognised and that they have information regarding their role, including the purpose of their involvement as well as how the knowledge they put forth will be considered. The likelihood of effective integration of stakeholder knowledge in practice will also be affected by factors relating to complexity of the collective knowledge generation, such as the degrees of novelty related to the issue (of concern) and importance of the stakes and conflicts among the actors and (Stange et al. 2015:503).

The purpose of knowledge bridging fora then would not be to set up contests between different types of knowledge, but create settings for exchange of understandings for mutual learning, including respectful interactive scrutinising of the validity of others' knowledge claims – a mixing of objective and subjective knowledges. Learning through such processes is argued to help to familiarise stakeholders with different information, facilitate an understanding of divergent claims, as well as, open-up possible options to gain agreement on matters of mutual concern (Rodela & Swartling 2015). Reed et al. (2010) argue that for social learning to have occurred the following process conditions must have been met: '(1) demonstrate that a change in understanding has taken place in the individuals involved; (2) demonstrate that this change goes beyond the individual and becomes situated within wider social units or communities of practice; and (3) occur through social interactions and processes between actors within a social network.'

Deliberative processes engaging diverse stakeholders may not result in consensus-based decision-making outcomes directly as often simplistically advocated, but may contribute to generating more trust among actors by enabling better understanding of the cognitive arguments and moral positioning and create opportunities for social learning over time (Rodela and Swartling 2015). It is also important to keep in mind that administrative cultures interact with power relations in governance interactions to shape institutional stances on the weight given to different types of stakeholder views or knowledge. Some actors might be regarded as bearers of 'dubious knowledge' or their input 'merely political claims' (disembedded from 'reliable' or 'useable' knowledge *per se*) whereas others may be seen as bearers of 'credible knowledge' and thereby seen as authoritative when acting in MSP. Some stakeholders might even look to discrediting the knowledge of particular stakeholders as a conscious strategy. So not all knowledge is equal, but is related to the power/standing of the bearers of that knowledge. The politics and judgements of credible knowledge will

affect the terms of inclusion and interaction in MSP. This point may be articulated in different ways. For example, it may be expressed in terms a lack of data quality or the difficulty of transposing a type of knowledge input into terms or a format amenable to MSP needs (e.g., spatial) (Janßen et al. 2017). Interpretation of what is credible knowledge will affect how the evidence-base for MSP is constituted and in turn to how the precautionary principle is interpreted. That is, consideration of non-science-based stakeholder input could help to complement and perhaps even contextualise the evidence-base underpinning MSP, especially where there is uncertainty and an acknowledged lack of knowledge.

The pluralist approach to knowledge discussed here and at least rhetorically adopted in the formal institutional expressions of MSP, suggests that both 'objective' and 'subjective' knowledge[5] inputs be evaluated for their salience to context and is deeply concerned with the development of knowledge integration (hybridisation) as a process (social learning), not just as a product or outcome (Rodela 2011). While there is much discussion about how to handle uncertainty in science, the production of scientific knowledge has well established disciplinary-based norms to ensure quality control, such as through the peer review of publications, equivalent mechanisms to evaluate hybrid or 'mixed-actor knowledge production' are lacking (Stange et al. 2015). The EU's fishing policy and the operation of Advisory Councils is one of the few well-known initiatives where there has been a deliberate institutionalised effort towards knowledge integration. Here the EU sought to reform what was seen as a top-down science-based approach towards one with increased stakeholder involvement and knowledge inclusion. While this has been broadly seen as a successful venture, it also shows that interactive learning processes require more time, resources and modes of interaction among the various actors (Saunders et al. 2017).

Different tools and approaches in some instances, may have the potential to support multi-stakeholder engagement in MSP, but currently there are few approaches being practised in MSP in the Baltic Sea setting that have undertaken this types of scenario modelling to inform planning. That said, tools such as *Marxan* and *InVest*, have been used in other marine planning jurisdictions to run marine zoning scenarios[6] (Grantham and Possingham, 2010; Guerry et al. 2012). Other approaches such as *Open Standards for Conservation* have been used in the Baltic Sea context with some success (Rabe 2017). For example, this approach was used to support a process to establish a HELCOM MPA at St Anna-Missjö in

[5] In the MSP context 'objective knowledge' could be seen as quantified knowledge that aims to accurately measure an event, phenomenon or issue generated through a scientific method/review process (the so-called 'hard sciences'). To some extent some forms economic knowledge, while not considered to be 'hard science', share a similar epistemology and are presented in a similar format – perhaps making it more amenable to decision-making and perhaps even to spatialization. Subjective knowledge on the other hand, is derived from feelings and/or experiences through either individual or collective processes. This type of knowledge tends not to be quantitative nor is it generated through a scientific process/method as understood above. Thinkers like Husserl (1936) sees this dichotomy of knowledge as false, when he argues that we do not merely sense reality; we make sense of reality. That is reality we combine an essential understanding (subjective) with knowledge of actual objects (objective).

[6] BALTSPACE will be testing several approaches and tools in several Baltic Sea MSP contexts. The results of this testing will be published in subsequent BALTSPACE deliverables.

Sweden. In this conservation intervention, it helped to support interaction between local stakeholders and planners and was seen to offer opportunities for 'genuine participation' in the establishment of the MPA that valued knowledge input and where influence was possible (Rabe 2017).

2.4 Summing up

In summing up this discussion, on one hand we have (natural) scientific knowledge and on the other we have stakeholder knowledge. Of course, in practice we have a plethora of different types of knowledge, including diverse expert input in different formats, qualitative social science knowledge, socio-economic data that do not fit easily into these discrete categorisations. These types of knowledge are required to be interpreted to inform MSP decision-making. This opens the potential for interpretative ambiguity or strategic leveraging of knowledge, since knowledge is about sense-making and interpretation there are always opportunities for alternative interpretations even when applying 'neutral' scientific knowledge. Ideally, though MSP decision-making would be undertaken through a deliberative approach that involves interaction and decision-making over the importance of different types of knowledge. Although it should be noted that this would not be straight-forward in 'contexts characterised by conflicts' to provide the necessary institutional conditions to support such constructive engagement resulting in scientifically informed, salient knowledge.

Insights drawn from this discussion are drawn on to support the presentation of the data and the analytical approach adopted in this report. So, to examine the knowledge integration in MSP here, we explore *diverse views on conceptions of knowledge problems*, *how different types of knowledge are prioritised* and *experiences of integrating or bridging knowledge*.

3. Methodology

To examine MSP actors' views and experiences on a range of integration themes, including knowledge integration challenges and solutions in MSP in the Baltic Sea, document analysis was undertaken and a range of actors were interviewed across a diversity of MSP case-study settings, these included: Swedish/Danish involvement in MSP in the Oresund, German MSP across domestic administrative jurisdictions, the role of the HELCOM-VSAB MSP Working Group (HELCOM-VASAB MSP WG); MSP in Poland and cross-border comparison of MSP between Lithuania and Latvia. In each of the settings, in addition to document analysis, interviews were conducted, which focussed on understanding knowledge and other MSP integration problems and how they were being handled in MSP through the views and experiences of those actors involved in the different MSP settings. This included interviewing actors involved in and responsible for MSP in each country/case study setting as well relevant national authorities, sector representatives, scientists, Intergovernmental organisations (IGOs) and other affected actors, such as fishers, wind power entrepreneurs, NGOs (non-governmental organisations), municipality representatives and lower level experts and decision makers, among others (see Table 2.). The range and types of questions

asked differed to some extent between the cases but the focus was on trying to understand knowledge challenges in the case study settings.

Table 1. Presents a summary of the case-study settings

Baltic Sea Case-study	Status	Focus
Regional, HELCOM Baltic-wide	Working arrangements have been established and MSP has been adopted several formal HELCOM/VASAB agreements	HELCOM/VASAB WG coordinating/norm making role
Lithuania and Latvia comparison	Lithuanian has established an MSP. Still in development in Latvia	Cross-border institutional interaction on MSP/comparison on approaches to develop national MSP
Germany – a sub-national comparison	Established MSP in territorial waters (by Bundesländer) and EEZ (Federal government)	Comparison and MSP cross-border relations between the EEZ and territorial waters in Germany - describing different conceptions of sustainable development and cross-boundary compatibility
The Sound (Öresund) - Denmark and Sweden	Sweden and Denmark are at different stages of national MSP development. Sweden has municipal MSP in place	An examination of the role of Sweden and Denmark's different MSP institutional contexts and the implications for cross-level, horizontal of planning in the Sound.
Poland	Development of a national MSP strategy for Poland is ongoing.	A focus on the problems of engaging coastal fishers in MSP in Poland

Table 2. Sampling of actors in case studies

Case	Public authorities/Politicians	IGOs	Sector organisations/users	NGOs	Science
Baltic-wide	17*,**	6	-	1**	1**
Latvia/Lithuania	22	-	-	5	-
The Sound	23	-	-	-	-
Germany	6	2	5	2	-
Poland	5	-	12	3	2

* Interviews partly undertaken by Baltic SCOPE, shared with BALTSPACE;
**Interviews/Questionnaires/Personal communication

(Source: adapted from Hassler et al. 2017)

4. Results

This section presents views among actors involved in MSP practices, sorted into themes that have arisen in the data, but also influenced to some extent by the conceptual discussion above. There are also some short reflections in the results section, which have also been informed to some extent by the conceptual discussion. Where this occurs, effort has been

made to ensure a clear distinction between the authors' voice and respondents. Efforts have been made to clearly represent the 'type' of actors making the presented direct quotations. The purpose in presenting the quotations is varies and is twofold: to give a better sense of the depth of feeling expressed by some informants and to illustratively connect to larger analytical points. Reflection on the results is deepened in the (5) Discussion section.

4.1 Building Baltic Sea Region norms

There has been a long history of regional norm building around environmental issues in the Baltic Sea. However, despite this long history of cooperation and common requirements under the European Union MSP Directive and policies[7] and Baltic Sea governance, national jurisdictions are likely to adopt MSP differently (Hassler 2015). HELCOM is considered by some as more of a soft-law institution, with limited capacity to impose regulations. This suggests that its capacity to exert top-down influence is limited. It also infers that there will be variability in the way that stakeholders in different country contexts throughout the Region conceptualise the role of knowledge in MSP as well as the way different systems of knowledge is handled in diverse institutional arrangements.

However, there are recent efforts at the regional BSR level, via the HELCOM-VASAB MSP WG to provide guidelines on key aspects of MSP to foster regional understanding and direction for member countries. For instance, there has been the recent adoption of the Baltic Sea Broad–scale Maritime Spatial Planning Principles (HELCOM-VASAB MSP WG 2010), which in acknowledging the importance of knowledge generation to support MSP, emphasises the need for spatial mapping and data harmonisation and sharing. As can be seen from the following quote:

> 'This calls for close cooperation of relevant GIS and geo-statistical databases, including the HELCOM GIS, monitoring and research in order to facilitate a trans-boundary data exchange process that could lead to a harmonised pan-Baltic data and information base for planning.' (p.3)

In addition, the MSP principles urge that all relevant authorities and stakeholders should be involved in MSP initiatives *'at the earliest possible stage and public participation should be secured' (p.3).* This implies a concern for including stakeholders, but tells us little about what form this should take or how different stakeholder knowledge should be included or valued in MSP decision-making.

The work of the HELCOM-VASAB MSP WG itself, could be a process of knowledge integration where these two prominent, but distinctive, regional bodies come together to combine different perspectives, interests and knowledge in further regional cooperation, understanding and guidance of MSP.

[7] These are MSP initiatives applicable to all Baltic Sea rim countries except Russia.

According to the EU Marine Strategy Framework Directive (EU 2014) and the Baltic Sea Action Plan (HELCOM 2007)[8], MSP must seek to protect and enhance the marine environment and thus should contribute to achieving Good Environmental Status. To this end, HELCOM-VASAB also strongly emphasises that MSP should be based on EA[9], which in turn should be underpinned by an evidence-based approach rooted in scientific knowledge (HELCOM 2007; HELCOM-VASAB MSP WG 2010; HELCOM-VASAB MSP WG 2015).

The recently adopted *Guidelines for the implementation of ecosystem-based approach in Maritime Spatial Planning (MSP) in the Baltic Sea area*, also emphasise that MSP should be 'best available scientific knowledge' and invokes that the 'precautionary principle' be adopted where there are knowledge gaps. These guidelines were developed by a high-level working group consisting of VSAB and HELCOM representatives with the WWF, acting as an NGO/observer. It drew on expertise and experience on the EA from elsewhere. The Guidelines (HELCOM-VASAB MSP WG 2015), implicitly acknowledge that knowledge gaps and uncertainty are an ongoing condition of MSP. The Guidelines urge that relatively wide-ranging participative approaches be adopted:

> Facilitate the participation of authorities responsible for nature protection and ecosystems, and relevant authorities, NGOs and other stakeholders that should be involved in applying the ecosystem-based approach in the planning process. (p. 13)

However, it does not indicate how forms of knowledge other than that derived from science should be considered in MSP (HELCOM-VASAB MSP WG 2015: 2), nor are there suggestions or directions on how to evaluate knowledge quality or sufficiency or to reconcile between different knowledges in the case of contradictory understandings or claims. These guidelines, while stressing the need for scientific knowledge, also discuss MSP within the context of 'sustainable growth' which at least implies a need to consider economic data and /or socio-economic information, presumably though, through official, authoritative sources. While there are a growing number of higher level institutionalized MSP initiatives (at the EU and Baltic regional level mentioned above) with attendant norms and even requirements, arguably individual member states have a relatively free-rein to implement MSP processes to reach the EU and regional objectives.

4.2 Reconciling incommensurate knowledges?

In Germany, fisheries was not included in Mecklenburg-Vorpommern Landesraumentwicklungsprogramm (MV LEP) first marine plan in 2005, nor is it included as an area designation the current EEZ plan. The BaltSeaPlan project (2009-2012) noted doubts in MV's fisheries sector as well as the MSP community as to whether fisheries should be subject to MSP (Lamp 2012). Some favouring the classic sectoral approach argued out of tradition; others claimed that fisheries were too complicated to manage through MSP or that the appropriate data were missing. Current legislation was also given as a reason, based on the understanding that there is no legal framework for integrating fisheries within

[8] HELCOM Baltic Sea Action Plan (Principle 2) (HELCOM 2007).

[9] It has observed that in MSP the EA is interpreted and operationalized variably across different contexts (Qiu & Jones 2013).

the same regime as other sea uses. Two BaltSeaPlan reports then suggested ways of integrating fishery in MSP, contributing to greater awareness of the issue and paving the way for the current MV plan to integrate fishery as a spatially relevant use. Planners express a sense of pride in that achievement:

> "I know few other plans that include fishery based on ecosystem services – fishing areas and spawning areas" (German MSP planner).

The 2016 MV LEP plan stipulates reservation areas for fishery; the preservation of important species and habitats is a key aspect here. The overall aim is to preserve traditional coastal fisheries for reasons of cultural heritage and as a traditional source of income and to enable sustainable fisheries. In line with these aims, the plan also contains a general provision that fishery is to be excluded from as little marine space as possible because of other activities.

Realisation has also grown among the fishing community itself that MSP is here to stay. Participation during the two rounds of consultation on the 2016 MV LEP was high, and the creation of reservation areas for fishing was welcomed not only by fishing associations and operators but also by nature conservation organisations and local municipalities. Many suggestions made in the first round of consultation were considered in the following draft, although some still felt their interests incompletely reflected and were critical in the second round of consultation with regards to conflicts with nature conservation and offshore wind farming, insufficient consideration of coastal harbour towns as part of the fishery designations, as well as the areas selected (or not selected) as reservation areas. One fishing association explicitly complimented the planning authority for taking up their earlier suggestions; another suggestion made by the same association during the second round of consultation was also taken up in the final plan (see online documentation of consultation, http://awd.mv-regierung.de/lep_2016_01/anz_abschn.php). A proposed priority area for offshore wind (first draft) was removed because of concerns expressed by the fishing sector.

Overall, a more constructive relationship can therefore be noted between the (predominantly coastal, small scale fishery sector) and the planning authority and greater understanding of each other's needs. Fishery associations have made constructive use of the two rounds of consultation and have seen their concerns taken seriously, although not all aspects have been resolved in line with their demands. Understanding has also grown on the part of the planning authority of the legal prerequisites available for designating reservation areas for fishery; existing state fishery regulations were taken as a basis and expanded by adding a spatial planning designation.

In contrast, Polish coastal fishers have also been rather reluctant to participate in MSP for several reasons. They have pointed to a lack of 'hard' as evidence of claims of a benign relationship between proposed OSWE developments and their effect on fisheries. In the fishers' view this lack of knowledge should result in MSP taking a precautionary approach to OSWE development (as the fishers claim that authorities do regarding other potential disturbances where there is a scarcity of 'reliable' knowledge). Fishers expressed concern that this was not the case. In Poland, fishers saw MSP to give OSWE interests equal, or more sea rights than traditional users (i.e., fishers). Specifically, fishers expressed a lack of trust

that their knowledge would be valued and given effect in decision-making processes in marine governance in general and MSP specifically, as the following quotes from fishers indicate:

> "[Decision-makers] do not value the opinion of [fishers] who use the sea since tens of years because we are not well-organized and do not have unlimited funds. And unfortunately we lose due to lack of money and they [the off-shore energy sector] win." [Polish fisher]

Fishers tended to accept science-based evidence but contested how scientific data is applied – seeing science: policy interactions as politicised and weighted against their interests as can be discerned by some of the quotes presented below. Many fishers underlined that the role of science should be to solve practical problems and assist in managing marine areas and natural resources. Instead scientists were seen to be self-serving, rather than working in the broader public interest, as can be seen by the following quote from a fisher:

> "[Science] is important but only when it is linked to practice; if it is done only to advance in academic career, it is worth nothing." [Polish fisher]

Lack of incorporation of fishers' local knowledge, claims and objections into final decisions about sea use and management (i.e., capacity to influence) is not the only problem. The way that they saw themselves being a treated during the consultations, and more generally in overall fisheries management and in interactions with other sectors, is similarly important. Many fishers believed that they are *shown no respect* – by decision-makers:

> "We [the fishers] are aware that off-shore wind farms will have to be developed sooner or later as this is what the modern world demands. However, we wish we were treated as partners and not as savages as we have been using the sea for years. And I often have a feeling that all these men and women behave as if they were visiting some kind of natural park full of uneducated savages. And they fell they should give us some colourful beads." [Polish fisher]

In keeping with this many of the Polish fishers interviewed saw MSP decisions as being undertaken unilaterally by central authorities who had scant knowledge and understanding of the sea and fisheries. Polish fishers also complained that the scarcity of scientific data is also used to excessively promote environmental protection by invoking the precautionary principle instrumentally so as 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.

In Poland, fishers also accused MSP related authorities of poor science communication. Some fishers opined that scientists tended to use scientific jargon with stakeholders in a way that restricts their capacity to engage in meaningful dialogue. They saw this tendency in MSP consultations as making cooperation even more difficult as indicated in the following quotes from fishers:

> "[Scientific results] were presented, some numbers were shown but it was all difficult to understand. It was like a professor is giving a lecture to students who are not listening to him." [Polish fisher]

> "Scientists are careless how to communicate their knowledge. They cannot present it in a way that fishers expect. They show charts, drawing and bars, but what is the conclusion?" [Polish fisher]

The issues raised above in the Polish case encompass knowledge credibility, legitimacy and salience problems have led to a diminishment of trust in scientists and scientific knowledge among fishers. This poses a significant problem for MSP and efforts towards knowledge integration as fishers are a major stakeholder group and their relative hostility to MSP has consequences for meaningfully considering fishers' knowledge and interests in planning processes. This is particularly so if we take seriously the view that incorporation of stakeholders' knowledge is important to enhance science: policy interactions leading to effective decision-making (Saunders et al. 2017). As a retort to the fishers' view expressed above, MSP practitioners in the Polish context have expressed concern that fishers are incapable of participating in MSP in a productive and meaningful way. Whether this refers to stakeholders not being informed enough (an incapacity or incapability) to contribute to such processes or because of fishers are seen to carry the *emotional baggage* of historical grievances into current MSP is unclear, but it is likely to involve both these aspects. However, the important point to note here is that for the fishers to become 'credible bearers of knowledge' from the practitioners'/scientists' perspective it should not come from the practitioners (and scientists) *adapting* their usual methods to incorporate fishers' knowledge, but rather through the fishers themselves adapting their approach and ways of communicating to be accepted and taken seriously by MSP practitioners/scientists. In the German case, it seems that after initial some obstacles, fishers' knowledge and interests were able to be included in the MV LEF MSP. Perhaps important to note here is that fishers' concerns, interests and knowledge were taken seriously and in evidence of this they tangibly affected planning decisions in some instances. That said, while both German and Polish fisheries operate under common governance arrangements at the EU and Regional level, there are other varying factors, such as administrative culture, the historical and contemporary role of fisheries, sectoral complexity, national institutional arrangements, the fervour of the politics, etc. which has likely lead to the contextual challenges confronting the integration of Polish fisheries in MSP.

4.3 Communication - timing and style

While engagement with the broader public on MSP in the development of national approaches is still extremely limited in most of our cases, it has occurred to some extent in the Sound case, on the Swedish side through municipal MSP processes, which have been in place for several years

The timing of the consideration of stakeholders' knowledge (or interaction) within MSP was raised as an important concern by a number of institutional actors and stakeholders in the Sound area both on the Swedish and Danish sides who all held the view that 'stakeholders and citizens' knowledge should be included as 'early as possible' in order to minimize the risk of negative opinions emerging later in the planning process, but also so stakeholders and citizens more generally have a meaningful possibility to influence MSP strategic and operational outcomes.

In Germany, planners and stakeholders confirm the importance of early involvement in the MSP process. Early in this case, means informal involvement in the pre-planning stage, in other words before the formal planning process, the drafting of the plan and its associated consultation begins. Expected benefits on the part of stakeholders include early information on the planning authority's planning intentions to avoid spatial misconceptions. Recalling the planning process in MV LEF MSP in 2005, one authority describes the situation as follows:

> "[In the draft], certain areas were positioned exactly where the majority of shipping traffic was. So there wasn't necessarily a great deal of technical knowledge. (...) The impression is that they could have asked earlier, before they started the process. Because afterwards, it's a little irritating. You also come across as someone who has to shoot down a relatively finished product – which you can't avoid."

Means of achieving such informal involvement include planning conferences, sector workshops or public events. Arguably it is likely that early informal stakeholder consultations are likely to be public authorities, rather than say 'smaller' actors. In addition to informal interaction, in second iteration of the MV LEF MSP in 2016 saw a wide range of stakeholders involved. This included civil society actors, who were invited to information events, such as 'Citizen dialogues'.

. There is still some uncertainty on how to achieve a good balance between manageable early (informal) involvement and the formal process that follows, especially given time and resource constraints.

In the Sound case the urging of broad, early stakeholder involvement was made at a regional and local level, where these actors perhaps deemed that it was important to include local voices to ensure that these views can influence wider scale processes as they cascade down to the local level, such as the rolling out of the Swedish National MSP. This interaction between the national and the local level in MSP in Sweden (which is to some extent mediated through the regional County Administrative Boards (CAB)) is still being played out. While the German MV LEF case discussed above provides evidence of stakeholder influence in MSP, recent evidence on MSP throughout Europe shows a distinct lack of stakeholder influence at all levels of MSP decision-making due to the dominant role played by the state in collaboration with dominant sector actors in setting strategic MSP goals related to large infrastructure projects (Jones et al. 2016).

It should also be noted that these comments in the Sound case, urging the early involvement of stakeholders, were made in the context of MSP for OSWE, where citizens in some municipalities (and the municipalities themselves) in the Region have expressed strong aesthetic concerns in opposition to OSWE developments. Involving stakeholders input early in MSP was also seen to be important to enhance the legitimacy of MSP (and its relationship to initiatives such as placed-based OSWE), to assist with generating more comprehensive knowledge of problems linked to better possibilities of avoiding conflicts later in the process and as well as to facilitate early adaptation, presumably in response to expressed concerns.

4.4 Subjective vs. objective knowledges

The discussion over differential treatment of what are broadly seen as subjective and objective knowledges and the tendency in MSP to grant more value to what it sees as objective knowledge is evident in the following experience in the Sound.

OSWE facilities can be seen from long distances, which make them controversial[10] to many people, especially in a densely populated narrow strait such as the Sound. Objections from local government and residents to OSWE can pose a significant problem for renewable energy development in such coastal areas (Künneke et al. 2015). In the Sound, OWSE is indeed a controversial development topic, supported by some municipalities in the region (e.g., Copenhagen and Malmö municipalities) and strongly resisted by others (e.g., Kävlinge, Lomma and Helsingborg). It should also be noted that in both Sweden and Denmark, OSWE development is not specified as a national interest in the Sound. While EIA procedures in both countries (which would be triggered in the case of OSWE development) include attempts at objective approaches to assess aesthetic impacts, such as visualization analyses, there are still contested views around whether such approaches can be undertaken in a scientifically objective way. For instance, on the Swedish side of the Sound, environmental expert that were interviewed working at the local and national levels expressed views that assessing aesthetic impacts from OSWE was a highly subjective issue – implying that expert advice (e.g., through visual analysis) may not be able to generate knowledge deemed as legitimate, sufficiently reliable or underpinned through scientific reasoning. It was also mentioned by a senior CAB officer in the region that the so-called diary studies (social psychological studies) on land show that if you can see the turbine, you also tend to hear it to a much higher extent than if it is hidden, but placed within the same distance – implying the complexity or the problem of objectively determining impacts through techniques like visualisation analysis. Nevertheless, in OSWE developments in Sweden visualization analyses influence where wind farms are placed, e.g., height restrictions in some Swedish municipalities. In Denmark visualisation analysis is also used to identify which residents may be eligible for compensation of projects (købsretsordning) (1288 of 27/10/2016 chp.2). As they do in the German EEZ MSP – where knowledge to inform OSWE draws exclusively on scientific and technical knowledge. In discussions on the Sjollen/Nordre Flint project in the Sound, it has also been noted that any OSWE facility development would be more visible from the Swedish side than the Danish. It has also been conjectured that it has considerable visual impact from some municipal coastlines, affecting their views of the Sound, which may explain the complex cross-municipal situation.

The German approach to OSWE in the EEZ MSP is 'limited' on the type of knowledge it admits to guide planning decisions. As can be seen in the following quote, while the strategic planning interests (OSWE) are centred in the planning approach, the ambition seems to be to consider other interests and related knowledge to minimize spatial conflicts:

> "For example, if offshore wind farming is the major objective, then data and information is included that has to do with offshore wind farming. The key planning question is where can there be options for offshore wind farming without destroying other interests" [German Water and Shipping Directorate representative]

[10] Of course, such concerns may not just be aesthetic

While acknowledging the value of gaining 'comprehensive' knowledge of the sea and that engaging meaningfully with stakeholders is worthwhile, the following comments provide an insight into the planner's approach in this case:

> "[] having to know everything can make planning more difficult" [Planners should have] "the courage to plan despite gaps" [German Water and Shipping Directorate representative]

This comment from a stakeholder suggests that incomplete knowledge is a norm that planners must deal with and that the uncertainty is ever-present in MSP decision-making.

As suggested above, (natural) science was also seen to be serving different special interests, i.e., not neutral or objective in its endeavours (which can be seen in several of the subsequent quotes). One response to this in the Polish case was a call for scientists *to work more for fishers*:

> "It is not that we dislike scientists but we would like to see that the research they undertake are done for fishers…and that their goal is not to close the whole Baltic for five years." [Polish fisher]

> "If you want to ask me if businesses use scientific institutes to do research for them, and if this is proper, then I would say science should not be used to support investments but – on the contrary -- it should investigate what effects will these investments have on the coastal areas." [Polish fisher]

This indicates that Polish fishers want science that addresses 'their' problems and answer 'their' questions. In their opinion, science is not currently linked strongly enough with the 'reality of fishing'; they also called for more underlying data that could guide species conservation, especially if restrictions are to be introduced based on limited knowledge.

The natural scientists who were interviewed in the Polish case were not fully aware of how their work is being perceived by the fishers, however, they saw their role as a provider of *objective facts* to underpin MSP decision-making, while recognising that there are likely to be divergent views:

> " I am aware that sometimes fishers say that they can see on the echo-sounder that sea is full of fish but they cannot fish [because of conservation measures]. The fact that there is plenty of fish in one place does not imply that there are many of them in the whole Polish marine areas, and that it is possible to increase quotas. And here I entrust scientific knowledge coming from different disciplines. This knowledge is extremely important as planners can have their subjective opinions and fishers might also have different expectations. And all these [conflicting expectations] need to be considered." [Polish scientist]

> "Industrial fishing is not a problem, although according to fishers it impoverishes food available for cod, so the cod becomes skinny. This is a huge simplifications and basically it is not true. I can take full responsibility for that because management of Clupeidae fish family is based on ecosystem approach. So fishing quotas consider other elements of the ecosystem, including predators from the Baltic Sea waters, i.e., seals, harbour porpoises, cod and salmon." [Polish scientist]

In asserting the truth of scientific knowledge, the scientist above contests the small-scale fishers' (SSF) view that industrial fisheries is problematic. This is done by arguing that the

SSF view (and the knowledge therein) that industrial fishing is responsible for the depletion of cod is overly simplistic and 'not true'. This in effect clearly underlines the role of knowledge in the politics of fishing. Different views on casual relationships, responsible agents and solutions to these problems go to the heart of the current knowledge schism affecting MSP and other forms of marine governance in Poland.

The above discussion captures, to some extent, larger concerns of how to give expression to socio-cultural values and related knowledge in MSP. Socio-cultural values are often interpreted as intangible or non-monetary values, although they also have an economic dimension through links to tourism or traditional sectors. Questions in this context relate to what is valued in a particular planning area, whether there are conflicting values, who does the valuing, why value is ascribed in the first place (e.g. what benefits are derived from a particular location or practice) and what qualities are needed to sustain the particular value or practice. Knowledge plays an important role here but the links between knowledge and intangible place-based values are not always made clear. Apart from identifying relevant socio-cultural values (with all the attendant questions of representation, transparency, participation etc.), there is also the challenge of how to spatially represent the socio-cultural values that have been identified (Gee and Burkhard 2010). Effectively linking knowledge holders to socio-cultural values has proved to be a difficult in MSP, as in other related fields (natural resource management - Ecological Services for instance). Clearly there will be cognitive and affective elements that make up this knowledge/values nexus, as is the case with other values. Because such values are non-tangible (seen in turn as synonymous with non-economic) and subjective these interests have not commonly been incorporated into MSP (Gee et al. 2017).

4.5. Handling knowledge gaps and coordination problems

Much activity surrounding MSP is concerned with compiling comprehensive and coordinated databases of ecosystem and actual and proposed marine activity to inform decision-making (Jay 2010). The 'precautionary principle' has been invoked in the Baltic Sea context by HELCOM-VSAB to deal with various knowledge related shortcomings across different MSP settings (HELCOM-VASAB MSP WG 2010). Indeed, the 'precautionary principle', while not defined or elaborated on in the Helsinki Convention is an integral part of giving effect to the EA in MSP (HELCOM-VASAB MSP WG 2015). This section looks at some of problems and approaches related to such knowledge gaps and coordination deficiencies raised by informants.

The German case is unique in the Baltic context for having established MSPs both in the EEZ and territorial waters. In recollecting the initial formation, the Mecklenburg-Vorpommern (MV) Landesraumentwicklungsprogramm (MV LEP) MSP in 2005, a planner commented regarding knowledge gaps and cooperation problems:

> "either because knowledge didn't exist, or because the responsible authorities hesitated to give us their data, or because information wasn't available in the right format. Some partners said yes, interesting, we'll make available data to you, but we couldn't use them as they stood. But we persevered and took a pragmatic approach. We did what was possible with the idea that further information could be added later (...) and took planning decisions where we

> could. It was mostly about resolving and pre-empting future conflicts of use in coordination with other authorities". [MV LEP Planner]

The MV LEP was subsequently reviewed in 2016. From the planners' view the 2016 MV LEP was based on better data because the attitude of some stakeholders had begun to change towards MSP:

> "We had much more open discussions in some areas, more willingness to participate with own information and knowledge (leading some planning stipulations to be altered because of better or additional data), not least because sectoral authorities had seen an added value in working with us to realise their interests." [MV LEP Planner]

The above experience suggests that capacity building to foster knowledge integration processes takes time and that maintaining an ongoing focus on the legitimacy and the benefits of MSP is likely to improve the cooperative knowledge base, both in terms of platforms of interaction and the comprehensiveness of the database. It should also be noted that the German MV LEP process involved extensive formal consultation with a wide range of public authorities, municipalities, business and civil society actors. This constituted a process that was widely accepted by stakeholders and not generally called into question. This established platform of interaction, albeit a quite formalised one. The planning authority is legally required to respond to every comment and must explain how it intends to deal with any suggestions or statements made. An advantage at the Länder level is the fact that marine planning forms an integral part of a wider state regional plan, where similar consultations on local and regional plans are common. Public information meetings and hearings also form part of the formal consultation process; six such information events took place during the first round of consultation on the MV LEP 2016.

Although the consultation process, apart from opinions and interests, also yields detailed local knowledge in some instances (e.g. fishing and conservation knowledge, see first and second round of consultation documentation MV), planning decisions are still mostly based on codified knowledge such as established nature conservation or fishing areas. Only rarely does specific local knowledge find its way into the spatial provisions of a plan; if it is included at all it is mostly general sectoral knowledge.

Interesting though, both planners and stakeholders, reflecting on their experience in the 2005 and 2016 formal processes also stressed the importance of establishing informal contacts prior to and outside the formal consultation:

> "Things don't work out without the informal level. It's the most important thing as otherwise, you just hit the wall during the formal procedure." (Interview 9). "There was an informal exchange with technical experts and partly also with NGOs during the preparation phase. We also bought in scientific expertise. The same applied to the actual LEP process." [MV LEP Planner]

This informal interaction was mostly between ministries and authorities but also with some NGOs, mostly nature conservation NGOs. Thus, the planning process consists of informal cooperation and negotiation prior to the actual planning process, using the formal consultation process only as a formality to confirm or instrumentally legitimise a draft plan

already developed. The EEZ MSP planners noted this as an important lesson, particularly when planning is controversial, as in the case of OSWE.

> "MV has organised conferences in certain regions because the topic of offshore wind was so heated. I think this is very good indeed (...) Next time round we need to make sure that we meet early and discuss with stakeholders what are your wishes and expectations of the revision [of the plan]. (...) It's quite legitimate for planners to be asking the questions. I don't know whether there is an explicit formal basis for this, but this doesn't stop us from taking such, let's call them informal steps. (...) The feedback from the first time round was, well, you presented us with a draft, many thanks, but we get the feeling that we can't really change this draft in any meaningful way. And stakeholders want to communicate their wishes relatively early now given the culture of transparency (...) even though we can't implement every single wish (…)." [EEZ Planner]

What is interesting in this view, is the expressed need for transparency (even in informal processes) and the inference that stakeholders have little or no capacity to influence decisions through the formal processes of consultation, which are conducted later in the MSP development phase. Such as view is also expressed in Baltic-wide processes important for MSP such as development of EA guidelines by the narrow membership group of the HELCOM-VASAB MSP WG:

> "If we involve more [stakeholders], we have more comments and more confusion so I think that looking on how much time it took us, perhaps it was ok". [HELCOM VASAB MSP WG member]

Many of the institutional actors interviewed in the Sound case mentioned the problems of data and knowledge coordination and sharing among relevant authorities, sectors and levels at the sub-national level as well as between Sweden and Denmark. There was an observation on the Swedish side of the difficulties of matching categories of different values on maps between national and local levels and among municipalities (about a regional Scania MSP related process). It was also noted that data categories were more standardised in some countries (e.g. Poland[11]). Concerns were raised in several of the case studies, that the lack of data quality affected the quality of maps for MSP. Data quality as a more general concern for map making in MSP is likely to have many different aspects. For example, it might relate to perceived data gaps, the temporal and spatial resolution of data, the type of data, and then the problem of cohering data, if it has been collected in different way or is different formats in different countries/municipalities. A further factor contributing to this in the Sound was the lack of institutional mechanisms for efficiently organising and exchanging knowledge. It was observed that international conventions such as the Espoo Convention[12] may in some instances provide a framework that stimulates cross-border exchange of data and perhaps knowledge at least regarding potentially large impact MSP

[11] It should, however, be noted that data collection process for MSP in Poland was performed by central administration, and no stakeholders/local/regional level involved. How this would be affected by an institutional context where there was more interplay between different levels is hard to say.

[12] And indeed, the Aarhus Convention, which stipulates that signatories provide on access to information, public participation in decision-making and access to justice in environmental matters (http://ec.europa.eu/environment/aarhus/)

initiatives, but this would be in a reactive rather than a proactive mode that may or may not be beneficial for forward planning avoiding conflicts and ongoing knowledge exchange/interaction etc. In the Sound case several Danish actors thought that there were few opportunities to get influence in marine governance or planning contexts because strategic environmental assessment/environmental impact assessment if it is triggered is part of later stages of a planning/project process. The international convention of Espoo is focused on sharing information with affected neighbouring countries on adverse environmental and health related issues of any plan or project. However, in the case of marine material extraction in the Sound, experience indicated that different interpretations of cross-sector effects of extraction activities between Sweden and Denmark led to different views regarding to what extent transnational coordination should occur. In some instances, where transnational interaction has taken place (although not always formally channelled through formal Espoo Convention processes) it was observed that this interaction could provide a framework that stimulates cross-border exchange of data and perhaps knowledge at least in regard to potentially large impact project and measures. While this shows promise for transnational knowledge integration, as mentioned above, this occurs in a reactive rather than a proactive mode. Because of this, the Espoo Convention may not be beneficial for forward planning to avoid conflicts and support ongoing knowledge exchange/interaction etc. It is also worth noting here that at the Baltic-wide level, *The Baltic Sea Region Maritime Spatial Planning Data Expert Sub-group* working under *HELCOM-VASAB MSP WG* supports data, information and evidence exchange for MSP processes regarding cross-border/transboundary planning issues – mostly including data related to ecological and environmental parameters.

Several actors across the case studies discussed the knowledge gap problem in the context of understanding cumulative effects and the consequences of current decisions on future ecosystem status (inferring concerns about desired resource availability and perhaps the overarching MSP goal to achieve Good Environmental Status). In Germany and Poland, as has been experienced elsewhere in MSP, fisheries emerged as a problem in terms of data and knowledge integration. Also raised were how to deal with climate change, and whether the impacts of climate change (e.g. on fishing grounds or habitats and changing species distribution) could be modelled in such a way that it could be included in MSPs. Forward modelling of knowledge or the capacity to 'estimate' (or even 'predict') the consequences (ecological, social and economic) of adopting particular MSP decisions and scenarios is by its very nature likely to be fraught with (even more) uncertainty given the complexity of the shifting domain in which it is being applied. Still, adaptive planning for the future is also a core ambition of MSP (HELCOM-VASAB MSP WG 2016). In Poland some respondents raised this issue in terms of concerns over a lack of proper economic/social data and simulations allowing to assess the impact of certain developments (especially off shore wind farms) on societal well-being. The Latvian Ministry informant claimed that the EA – identifying ecosystems services and associated existing and prospective uses - that has been adopted for the Latvian MSP national plan will (to some extent) enable assessment of the implications of development proposals on the specific ecological values and processes. The Latvian Ministry informant went on to describe how the national MSP was being developed

using EA related methodologies, where ecosystem services maps underpinned MSP scenarios and propose solutions of the permitted uses of the marine waters in Latvia.

Also, importantly in the Latvian MSP development process, broad non-expert and expert input was sought in using the EA to systematically support decisions by working through relationships between existing marine values and processes spatially linked to actual and proposed uses. While this did not extend to broader publics, it did provide opportunities for significant 'place-based knowledge' input by coastal municipalities and government and non-government sectoral interests. This contrasted with the Lithuanian approach to the development of its national MSP, where there was very little scope given for wider engagement. In lieu of the lack of this type of 'evaluative knowledge'[13] and the challenge of knowledge uncertainty more generally, the precautionary principle was variously referred to as important across several of case-study settings. In Germany, it has been invoked as a means of keeping large areas of the EEZ free of designations to enable future uses and preserve 'free' space as a value in its own right. A similar approach to the Latvian example seems to have been undertaken in the German MV LEF:

> "The new MV LEP has a new quality compared to the 2005 MV LEP. There is a lot more regulation; I know few other plans that include fishery based on ecosystem services – fishing areas and spawning areas - an idea that came from the planning authority and not the sector; this is added value." [MV LEP Planner]

At the Baltic-wide level, the HELCOM Secretariat, while reflecting on the outcome of a regional workshop on the evaluation of marine and coastal ecosystem services in the Baltic Sea stressed that ecosystem services should not be considered in MSP only for the purpose of protecting the environment as the services also have an impact on the economic and social dimensions of sustainability.

The view emanating from the Sound case was that national MSP authorities usually do not rely 'much' on local knowledge bearers (with variability among authorities and processes, i.e., rural development and concrete resource use are most likely to be more based on non-expert knowledge). Furthermore, in the experience of these actors, the more local a planning process is, the more non-scientific knowledge can become relevant as local mapping and planning needs a much higher resolution than national MSP. Local experts, including municipal planners/environmental strategists and CAB planners, expressed concern that important information gets lost in the upscaling (regarding their experience in the Scania CAB MSP process on the Swedish side of the Sound case). There was evidence in some municipalities on the Swedish side of actively including citizens in marine mapping experiences, such as in Lomma where an ecologist working for the municipality informed us that the public has been involved in the mapping processes that have resulted in changes to actual municipal marine spatial plans.

[13] Which from a post normal science perspective, would mean drawing on plural knowledge perspectives (not just science) which would be mediated through reciprocal dialogue where a collective negotiation of knowledge quality would take place according to credibility, salience and legitimacy (Bremer & Glavovic 2013:52).

In the Polish case, scientists and MSP practitioners alike agreed that, while there were significant data gaps, MSP had been a success knowledge-wise because it stimulated sharing of data among a variety of marine research and administrative institutions, as well as the compilation of an extensive marine data base. Perhaps unsurprisingly most data gaps identified across our cases related to environmental values, fish resources or processes affecting marine ecosystems, rather than socio-economic, socio-cultural or other types of data. A Swedish CAB official working in the environmental protection field reasoned why this is so:

> 'Not many people know what it looks like under the surface – we need to allocate more resources to make that knowledge. What is happening with forests is visual to us, but we can't see what happens under the ocean, with the sea bed, when trawling, etc. If we could show that, the public opinion will also change. We need to show why the sea is worth protecting.' [Swedish CAB) official]

That said a lack of data was seen to give (subversive) stakeholders knowledge space to protest MSP's imposed restrictions that have 'no scientific justification'. It was viewed that this could be addressed by employing social scientists, including psychologists and sociologists to support MSP consultation processes.

> "(…) [maritime] administration has no power to ensure that marine spatial plans will be socially accepted, but it can steer the process. And the attitude of maritime administration towards stakeholders is important; there is a need for more psychological approach to different stakeholders, to think over how discuss [different issues] with different stakeholders and not just to organize consultation meetings. Administration should consider how to encourage different stakeholders to attend the meetings, to get them involved in discussions to make them understand [information] provided and to accept certain solutions. Therefore, it is necessary to engage a group of psychologists and sociologists to address these issues, but I think that maritime administration already understand it." (Polish Public administration official)

The role for social scientists in MSP therefore could be to provide expertise (e.g., tools and methods) that could improve the way stakeholders are involved in MSP. More meaningful involvement would ultimately lead to increased social acceptance – according to this respondent – which of course might not necessarily happen.

5. Discussion

5.1 Knowledge integration norms

Clearly problems of knowledge integration are closely connected with other MSP integration dimensions most notably the institutional arrangements and related processes of stakeholder engagement, which vary across different MSP jurisdictions. Scale to some extent plays a role in determining knowledge integration challenges apparent in the different case studies. For example, knowledge integration at the Baltic-wide scale is mostly about norm setting, organising and arranging coordination and data exchange and harmonisation across all of the Baltic Rim states, while at local levels it is more likely to be about how to prioritise different types of knowledge in decision-making. Knowledge integration in terms of fostering a shared cognitive approach to MSP at the Baltic wide level

could also mean developing norms through the development of common principles, such as those developed in relation to MSP and the EA. How EA is expressed in the Baltic context however, shows a 'limited' interpretation of EA as elaborated in the Malawai Principles, where greater emphasis is placed on the importance of societal choice and relatedly the inclusion of local and indigenous knowledges in EA decision-making (Gilek et al. forthcoming; Tafon forthcoming). While, reference is made to the need to include and consider stakeholder views in MSP in the BSR, the formal institutional context that MSP in the Baltic Sea Region is embedded in leans heavily towards an evidence base for decision-making informed by scientific knowledge, so the role of broader stakeholder knowledge is unclear.

Linked to the idea of planning as a 'neutral' player – the idea of being an arbiter, 'balancing interests and knowledge inputs' infers that the evidence base should be as 'objective' as possible. The rationale so far has been to rely on technical-scientific knowledge to provide this objective knowledge and less on deliberative approaches and inclusive open-ended negotiation that takes into consideration all types of knowledge, including what may be seen as subjective views (where the difference between knowledge and opinion becomes extremely blurred). The experience of the German MV LEF case suggests that MSP planners have gone beyond a *de facto* position of rational planning as a process of 'applying scientific knowledge' to establishing processes of engagement with stakeholders where there was a willingness to revise understandings and preferences in the light of credible claims made by others. Furthermore, where stakeholders are given the opportunity to make meaningful contributions in a way that is respected in decision-making. That said, the informal processes that are important in the overall negotiations surrounding MSP, are not transparent and may even favour those stakeholders who lobby behind the scenes. The 2016 MV LEP is more comprehensive and arguably more balanced (than the 2005 version) – as it now considers fishery. So, while the experience from the first MV LEF plan to the second iteration shows evidence of social learning when assessed against Reed et al.'s (2010) criteria[14], the problem of including other forms of knowledge is still not resolved and would require a more focussed process of deliberation.

Different states (and intra-state jurisdictions) have taken varying approaches to developing national and subnational MSPs, which have consequences for understanding knowledge integration and its relation to MSP as a form of governance in these settings. An example of this is the starkly contrasting approaches taken by Latvia and Lithuania to conceptualising sector integration (Saunders et al. 2016) and relatedly stakeholder and knowledge integration. Clearly the Latvian EA approach, sought to actively draw on ecological and use knowledge and experience from a wide range of experts and stakeholders to generate what might be considered a form hybrid knowledge for MSP – through processes of collaborative environmental governance. This contrasts sharply with the approach taken in Lithuania, which we characterise as top-down, narrow and strongly underpinned by natural science and knowledge from dominant sectors. Where there appeared to be little effort to inform

[14] More detailed and focused examination of the dynamics of change over time in the German MV LEF case would be required to confidently make this claim.

the development of its national MSP with knowledge derived either through placed-based or interest-based (beyond strategic sectors of government). Lithuania's approach was expert dominated and strategic in character, which involved a minimum number of formal consultation events with key sectoral stakeholders and governmental institutions (Blazauskas et al. 2014). These contrasting experiences reflect approaches to MSP and indeed different interpretations of the Ecosystem Approach. Both MSP processes were underpinned by scientific knowledge and consideration of sectoral uses and interests (human use/economic dimensions), so in this way conform with the minimum requirements of HELCOM-VSAB guidelines. While there is a suggestion to engage in participation beyond government in the HELCOM-VSAB MSP guidelines when developing national MSP, there is no direction on who should be involved or how this should be done. As this case shows this left to the discretion of the different Baltic countries and therefore subject to interpretation through diverse political circumstances and administrative cultures.

5.2 Knowledge gaps

It is unsurprising that knowledge gaps and coordination problems were raised across our case study sites given the early stages of MSP in the BSR. Arguably, knowledge gaps and coordination problems are fundamental and ever-present (with degrees of empirical variability) condition of MSP that can never be completely addressed given the uncertainty, dynamism and complexity of MSP as a form of sustainability governance. While informants expressed concerns about the lack of data and information in some cases, such as the Sound, it was not clear what processes were in place to assess or validate whether the existing knowledge base is adequate or of sufficient quality to inform decisions.

In the German EEZ case, the sectoral stakeholder talked about coping with an inadequate knowledge on which to base decisions – inferring that 'this is the lot of the planner', who must make decisions in any case. That said, it may be valuable to reflect on the lack of broader stakeholder engagement in the German EEZ. Could a more pluralistic knowledge approach be valuable here? This of course may depend on the various perceptions of the worth of engaging with stakeholders to garner more knowledge – could it help fill gaps or not? Also, the perceived consequences of different decisions are also likely to be a factor that affects whether a precautionary approach is adopted or not. Another less generous interpretation in the context of the reluctance to incorporate knowledge other than scientific-technical type in EEZ MSP is that wider consultation and input from different types of knowledge is seen to *over-complicate matters* (arguably because certain types of knowledge are seen to be of little value or not directly applicable or useable in spatial planning) and that planners are best placed to make the mostly technical judgements required (perhaps because political or strategic goals have already been set). There may also be legalistic compliance requirements that may constrain the inclusion of non-scientific knowledge in some cases (e.g., German context).

Narrowly defined natural science disciplinary input into MSP, such is evident in the cases of Lithuania, the German EEZ and Poland may mean that broader interactive and multidimensional problems (of sustainability) may be under addressed or ignored. Also, it may be possible to expand the evidence base underpinning MSP if what counts as a credible

knowledge is not so narrowly defined. If we conceive MSP as a form of governance for sustainability, as we have here, then it requires pluralistic knowledge input – rather than operating as form of rational ecological governance, which is not to say that scientific knowledge should not play a large role in informing MSP. This would require more purpose designed ways on how to handle the quality concerns that might arise from adopting such an approach (this is discussed further below). Social science competence may be able to support such engagement, perhaps most critically as it relates to how to better integrate so-called socio-cultural values and knowledge into MSP. Such work must, however, go beyond a role concerned with sensitising stakeholders to decisions already made or spatializing values and knowledge in MSP to dealing with a broader range of questions associated with MSP as a form of governance.

5.3 The prioritisation of different knowledges

When and how MSP practitioners engage with different knowledge holders could be seen as a reflection of how *important* they are seen to be, an indication of the relative priority given to the knowledge that the stakeholders bear and relatedly how they align with strategic interests. As is evident on the section discussing objective and subjective knowledges some knowledge bearers are given more credibility than others in MSP, given its preference for quantitative scientific knowledge that is amenable to evaluation and translation in spatial terms. The case studies discussed here exhibited what could be regarded as limited stakeholder engagement with few indications of formal mechanisms that facilitate 'knowledge exchange'. There were also indications in municipal MSP in the Sound and the German MV LEF that stakeholders could present knowledge to influence planning decisions. The relatively early stage of MSP development in the BSR region in most cases, except Germany may be a limiting factor in providing more complete evidence. This may also be attributable to the mainly technical approach taken to addressing knowledge challenges in MSP, where the focus is placed on providing more scientific knowledge to expert dominated planning processes to address what are seen as technical problems. While these cases lack the depth of empirical understanding to more fully understand the full set of factors at play, some basic insights are evident.

The case has been made that in the more strategic phase of MSP (as in transnational and national MSPs) the nature of the interaction is more suited to the general knowledge[15] of natural science, policy-making and perhaps even economics. This seems to be evident in the EEZ MSP in Germany where national strategic interests underpinned by science and technical knowledge dominates the planning process, but perhaps not in the case of the MV LEF, where more localised planning processes included ongoing engagement with a wide range of stakeholders. Also, relevant here is evidence of social learning over time and the development of knowledge capacity to support MSP as an unfolding process. The German MV LEF illustrates that developing competence, platforms of engagement and substantial integrated databases is likely to take time. Also, important here are factors that enable supportive institutional capacity building that supports social learning, including ongoing

[15] Meaning knowledge that is less context dependant

investment in platforms of collaborative engagement where stakeholder influence is seen to be both possible and salient. It should also be noted that while increasing stakeholder participation may improve social sustainability, it might not necessarily improve aspects of ecological sustainability. This highlights the need that judgements need to be continually made between different dimensions of sustainability, often through difficult trade-offs.

While the discussion in MSP may not characterise the problems of integrating fishers' knowledge as socio-cultural knowledge problem because it contains economic dimensions, it certainly mirrors, at least partially, characteristics related to 'the problem' of incorporating socio-cultural knowledge' in MSP. While fishers are at least recognised as stakeholders in most MSP jurisdictions (because of their 'tangible' interests, not their 'intangible' interests), their knowledge is often not represented (or not in a way that they would agree to) in MSP. Flannery et al. (2016) suggest that the problem may even more fundamental than this in some cases (i.e., where the cultural basis of the knowledge leads to different epistemological framing) in that some types of knowledge are incommensurate and therefore integration is neither desirable nor possible. This tension between the value:knowledge nexus was most evident in the relationships between MSP and Polish fisheries and OSWE elsewhere – in relation to expression of socio-cultural knowledge. In both cases, concerns around the intangibility of value and relatedly the subjectivity of knowledge appeared to militated against the possibility of knowledge integration. Especially in the Polish case, a deep conflict between MSP authorities/scientists and fishers was apparent. Clearly the antagonistic relations involved both ethical and cognitive dimensions, where there appeared to be little hope of any kind of consensus based agreement on MSP process or decisions, although the German MV LEF does provide some hope here. Effectively capturing intangible values, such as social relations, sense of place, or the capabilities emerging from human-ecosystem relationships that relate to fishers' knowledge and what they value has proved evasive.

5.4 Bridging knowledge

There is little explicit evidence of efforts to bridge different types of knowledge in our case-studies – certainly no clear evidence has emerged that indicate characteristics recognisable as deliberative processes.

In the Polish context, it appears as if little effort been invested in creating purposely designed forums to facilitate knowledge exchanges through deliberative processes that recognise different and perhaps conflicting worldviews, values and knowledge. This is despite an ongoing struggle to include fishers in MSP. As discussed in the Lithuanian context and Germany (EEZ) there also appeared to be little effort to garner diverse forms of knowledge for various reasons, which may or may not be reasonable based on other sustainability reasoning. In the case of Lithuania this may be attributable to the traditionally strong and close role of science working with government and the strong strategic interests (i.e., OSWE and port development). In the German EEZ case it may be related to the few number of large sector users combined with the strategic importance of these off-shore areas. However, in the case of the German MV LEF (and to a lesser extent in the Latvia

National MSP) there appears to have been considerable effort over a period to engage a broad array of stakeholders. Certainly, in the German MV LEF examples discussed, there were indications of more collaborative approaches that may reflect knowledge exchange and perhaps in the German case, social learning – certainly they are cases where efforts were made to adopt a more systematically participatory approach that provides preconditions for knowledge integration in a broader sense than just between sectoral interests or different scientific disciplines. Fishers in Germany have gradually been integrated into MSP, and the planners have learned to be more inclusive and perhaps also patient – lots of informal exchange with other authorities – a group of planners that meets twice a year to share experiences with MSP, which includes all coastal states and the EEZ planners. In MV LEF case, there appears to be much more awareness now of what MSP is all about and what issues it can and cannot address, and there is more openness on the part of the planners to institutional stakeholders (e.g. pro-actively involving other authorities beforehand and jointly agreeing planning objectives or minimum requirements for a sector).

6. Lessons Learnt

This paper has presented findings from a range of MSP case studies from around the Baltic Sea. The cases involved a diverse range of stakeholders and issues. While the experience considered here is limited, several tentative lessons are offered below. These reflections on the experience of knowledge integration issues in the Baltic Sea have been loosely sorted into the categories listed below.

6.1 Transnational

- At the regional level HELCOM-VSAB established norms that emphasise natural science as the evidence-base to draw on in support of MSP. Attention is needed to ensure other types of scientific knowledge and other forms of knowledge are included in a way that improves the contextual relationship between scientific knowledge and the legitimacy of the MSP event or process.

- In cross-border MSP contexts, reaching agreement on norms early on about what constitutes data quality and data sharing may establish the institutional pre-conditions conducive to more effective knowledge integration.

- The Espoo Convention is likely to be limited in offering meaningful possibilities for stakeholder engagement, knowledge inclusion and influence in transnational MSP.

- EA may offer the potential to integrate ecological and social knowledge (as shown in the Latvian case), but this should be done, if the social sustainability ambitions of MSP are to be addressed, through broad stakeholder engagement, rather than just drawing on narrow scientific and technical knowledge.

- There is a lack of understanding of the importance and treatment of the role of economic (incl. commercial) knowledge in MSP. More attention needs to be paid to how this form of knowledge at various scales influences and helps inform MSP decision-making in meeting sustainable development goals.

6.2 Sectoral

- While it is proving difficult to effectively incorporate fisheries in the Polish case, lessons from the German experience may be useful to draw on while keeping in mind the contextual differences between the two cases (which need to be further elaborated and distinguished).

- Taking a more nuanced and careful approach towards differentiating the ambitions, concerns and roles of different stakeholders (within the same sector, e.g., fisheries in Poland or different holders of socio-cultural values and knowledge) may provide openings for inclusion of different forms of representation and related knowledge in MSP.

- High degrees of knowledge integration may reflect a narrow knowledge base rather than effectively integrating different forms of data, information or knowledge.

6.3 Evaluation and bridging

- It may be beneficial to develop robust evaluative criteria to judge the sufficiency and quality of evidence bases (incl. the limits of science) in cases where hybrid knowledge processes may usefully supplement and feed into MSP decision-making.

- If knowledge contests are particularly contentious, third parties seen as neutral evaluators/mediators may be needed to moderate engagements, resolve conflicts and address uncertainties.

- Social science expertise should be drawn on in MSP to develop approaches to better support stakeholder engagement, particularly over controversial or conflictual matters in MSP. The point would be not to sensitise stakeholders to already decided upon goals, but to meaningful engage in robust mutual exchanges to help inform and set goals.

- Social science expertise may also help deal with the problems of engaging with socio-cultural issues, which may be more likely to explicitly involve knowledge and values dimensions.

- Institutional capacity building supporting social learning: takes time; requires institutional (and resource) investment and political will; necessitates a relatively wide recognition of stakeholders and their knowledge contributions; and requires that stakeholders are given a clear focus or purpose with some chance of influence.

- The German MV LEF, some aspects of the Sound and the Latvian cases show that, even if genuinely deliberative fora may not have yet been established in MSP, there are ways to engage with stakeholders that give possibilities for a broad array of actors to exchange views and different types of knowledges useful for MSP.

References

Agardy T., Di Sciara G. and Christie P. 2011. Mind the Gap: addressing the shortcomings of marine protected areas through large scale marine spatial planning. *Marine Policy* 35: 226–232.

Blazauskas, N., V. Langas, D. Depellegrin, A. Ruskule and Kalvane, I. 2014. *Lithuanian model case: case study report.* PartSEApate. Available at: http://www.partiseapate.eu/wp-content/uploads/2014/09/Lithuanian-case-report.pdf

Borja, A., Elliott, M., Andersen, J.H., Berg, T., Carstensen, J., Halpern, B.S., Heiskanen, A., Korpinen, S., Stewart Lowndes, J.S., Martin, G., and Rodriguez-Ezpeleta, N. et al. 2016. Overview of Integrative Assessment of Marine Systems: The Ecosystem Approach in Practice. *Frontiers in Marine Science*. doi: 10.3389/fmars.2016.00020

Buhl-Mortensen, L., Galparsoro, I., Vega Fernández, T., Johnson, K., D'Anna, G., Badalamenti, F. Garofalo, G. et al. 2016. Maritime ecosystem-based management in practice: lessons learned from the application of a generic spatial planning framework in Europe. *Marine Policy* 75: 174–186.

Bremer, S. and B. Glavovic 2013. Mobilizing knowledge for coastal governance: re-framing the science–policy interface for integrated coastal management. *Coastal Management* 41(1): 39-56.

Douvere, F. and C.N. Ehler 2009. New perspectives on sea use management: Initial findings from European experience with marine spatial planning. *Journal of Environmental Management* 90(1): 77-88.

European Commission 2012. *Blue Growth – Opportunities for marine and maritime sustainable growth*, COM (2012)494

European Commission 2017. *Report on the Blue Growth Strategy. Towards more sustainable growth and jobs in the blue economy*, Commission staff working document, SWD(2017) 128.

European Union 2014. Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning.

Fazey, I., Proust, K., Newell, B., Johnson, B., and J. Fazey 2006. Eliciting the implicit knowledge and perceptions of on-ground conservation managers of the Macquarie Marshes. *Ecology and Society* 11(1)

Flannery, W., Ellis, G., Nursey-Bray, M. et al. 2016. Exploring the winners and losers of marine environmental governance/Marine spatial planning: Cui bono? Etc. *Planning Theory & Practice* 17(1): 121-151.

Gee, K. and Burkhard, B. 2010. Cultural ecosystem services in the context of offshore wind farming: a case study from the west coast of Schleswig-Holstein. *Ecological Complexity* 7(3): 349-358.

Gee K., Kannen, A., Adlam, R., Brooks, C., Chapman, M., Cormier, R., Fischer, C., Fletcher, S., Gubbins, M., Shucksmith, R., Shellock, R. 2017. Identifying culturally significant areas for marine spatial planning. *Ocean and Coastal Management* 136:139-147.

Gilek, M., Saunders, F., Stalmokaite, I. (forthcoming) The Ecosystem Approach in Baltic Sea Marine Spatial Planning - The Social Pillar, a Slow Train Coming

George, C. & Reed, M. 2016. Revealing inadvertent elitism in stakeholder models

of environmental governance: Assessing procedural justice in sustainable organisations. *Journal of Environmental Planning and Management* 60(1): 158-177.

Grantham, H. and Possingham, H. 2010. *Zoning marine protected areas for biodiversity conservation and community livelihoods: a case study from Raja Ampat, West Papua*. University of Queensland, Internal Technical Report.

Guerry, A.D., Ruckelshaus, M.R., Arkema, K.K., Bernhardt, J.R., Guannel, G., Kim, C.K., Marsik, M., Papenfus, M., Toft, J.E., Verutes, G., Wood, S.A., Beck, M., Chan, F., Chan, K.M.A., Gelfenbaum, G., Gold, B., Halpern, B., Labiosa, W.B., Lester, S., Levin, P.S., McField, M., Pinsky, M.L., Plummer, M., Polasky, S., Ruggiero, P., Sutherland, D.A., Tallis, H., Day, A., & Spencer, J. 2012. Modeling benefits from nature: using ecosystem services to inform coastal and marine spatial planning. *International Journal of Biodiversity Science, Ecosystem Services & Management* 1-15.

Hackmann, H. and S. C. Moser 2013. Social sciences in a changing global environment: General Introduction. In: *World Social Science Report* 2013, 31-43, UNESCO, ISSC, Paris.

Hassler, B. 2015. Coping and adaptation in socio-ecological problem structures: Towards an integrated framework for analyzing trans-boundary environmental problems in marine settings. *Södertörn Working Paper*, ISSN 1404-1480 ; 2015:1. Huddinge: Södertörns högskola

HELCOM-VASAB MSP Working Group 2010*. Baltic Sea broad-scale marine spatial planning principles*. Available at: http://www.helcom.fi/Documents/HELCOM%20at%20work/Groups/MSP/HELCOM-VASAB%20MSP%20Principles.pdf

HELCOM-VASAB MSP Working Group 2015. *Guideline for the implementation of ecosystem-based approach in Maritime Spatial Planning (MSP) in the Baltic Sea.* Available at: http://www.helcom.fi/news/Pages/New-Guideline-adopted-on-ecosystem-based-approach-in-maritime-spatial-planning-in-the-Baltic-Sea.aspx

Husserl, E. (1936/2002). The way into phenomenological transcendental philosophy by inquiring back from the pregiven life--world. In D. Moran & T. Mooney (Eds.), *The phenomenology reader* (pp. 151--174). London: Routledge.

Jagers, S. Berlin, D. & S. Jentoft 2012. Why comply? Attitudes towards harvest regulations among Swedish fishers. *Marine Policy* 36: 969–976

Jay S. 2010, Built at sea – Marine management and the construction of marine spatial planning. *Town Planning Review* 81(2): 173-191.

Jay, S., Klenke, T., & Janßen, H. 2016. Consensus and variance in the ecosystem approach to marine spatial planning: German perspectives and multi-actor implications. *Land Use Policy* 54: 129-138.

Jones, P.J.S., Lieberknecht, L.M., Qiu, W. 2016. Marine spatial planning in reality: Introduction to case studies and discussion of findings. *Marine Policy* 71: 256–264.

Jordan, J., Rudiger K., and Zito, A. 2005. The Rise of `New' Policy Instruments in Comparative Perspective: Has Governance Eclipsed Government? *Political Studies* 53: 477-496.

Kidd S. 2013. Rising to the Integration Ambitions of Marine Spatial Planning: reflections from the Irish Sea. *Marine Policy* 39: 273–282.

Kidd, S. and G. Ellis 2012. From the land to sea and back again? Using terrestrial planning to understand the process of marine spatial planning. *Journal of Environmental Policy and Planning* 14(1): 49-66.

Kidd, S., Maltby, E., Robinson, L., & Barker, A. 2011. The Ecosystem Approach and Planning and Management of the Marine Environment. In S. Kidd, A. Plater, & C. Frid (Eds.), *The Ecosystem Approach to Marine Planning and Management*, (pp. 300). London: Earthscan.

Kidd S. and Shaw D. 2014. Quo Vadimus. The Social and Political realities of marine Spatial marine protected areas through large scale marine spatial planning. *Marine Policy* 35: 226-232.

Künneke, R., Mehos, D., Hillerbrand, R., & Hemmes, K. 2015. Understanding values embedded in offshore wind energy systems: Toward a purposeful institutional and technological design. *Environmental Science & Policy* 53: 118-129.

Mazzola P., Roe M., Cowie P. Marine spatial planning and terrestrial spatial planning: reflecting on new agendas. *Environment & Planning C: Government & Policy* 33(5): 1156-1172.

Myers, R. and Muhajir, M. 2015. Searching for Justice: Rights vs 'Benefits' in Bukit Baka Raya National Park, Indonesia. *Conservation and Society* 13(4):370–381.
Planning: some land-based reflections. ICES Journal of Marine Science 71 (7): 1535-1541.

Qiu, W. and P.J.S. Jones 2013. The emerging policy landscape for marine spatial planning in Europe. *Marine Policy* 39: 182-190.

Rabe, L. 2017. *Participation and Legitimacy: Actor Involvement for Nature Conservation* PhD Thesis, Södertörn University.

Raymond, C., Fazey, I., Reed, M., Stringer, L., Robinson, G. and A. Evely 2010. Integrating local and scientific knowledge for environmental management. *Journal of Environmental Management* 91(8): 1766-1777.

Reed, M. S., A. C. Evely, G. Cundill, I. Fazey, J. Glass, A. Laing, J. Newig, B. Parrish, C. Prell, C. Raymond, and L. C. Stringer. 2010. What is social learning? *Ecology and Society* 15(4). Available at: http://www.ecologyandsociety.org/vol15/iss4/resp1/

Ritchie H. 2014. Understanding Emergent Discourses of Marine Spatial Planning in the UK. *Land Use Policy* 38: 666-675.

Ritchie, H. and Ellis, G. 2010. A system that works for the sea? Exploring Stakeholder Engagement in Marine Spatial Planning. *Journal of Environmental Planning and Management* 53 (6): 701-723.

Rodela, R. 2011. Social learning and natural resource management: the emergence of three research perspectives. *Ecology and Society* 16(4): 30.

Rodela, R., Gerger Swartling, Å. 2015. *Environmental Governance in an Increasingly Complex World: An Interdisciplinary Exchange on Adaptation, Collaborative Learning and Knowledge Integration*. Report from the SEI/ Södertörn University Symposium held from 27th to 28th of May 2015 in Stockholm, Sweden

Saunders, F. 2011. *The Politics of People – Not Just Mangroves and Monkeys: A study of the theory and practice of community-based management of natural resources in Zanzibar*. Sodertorn Doctoral Dissertation 58, School of Life Sciences, Sodertorn University.

Saunders, F P., Gilek, M., Linke, S. 2017. Knowledge for environmental governance: probing science–policy theory in the cases of eutrophication and fisheries in the Baltic Sea. *Journal of Environmental Policy and Planning* https://doi.org/10.1080/1523908X.2017.1286575 2016

Saunders, F., Gilek, M., Hassler B. and R. Tafon 2015. *An Analytical Framework – Examining Integration in Marine Spatial Planning in the Baltic Sea. BALTSPACE Deliverable: D1.1: Internal guidance document: Analytical and methodological framework for analyzing MSP*.

Saunders, F., Gilek, M., Gee, K., Göke, C., Hassler, H., Lenninger, P., Luttmann, A., Andrea Morf, A., Piwowarczyk. J., Schieled, K., Stalmokaite, I., Strande, H.,Tafon, R. and J. Zaucha 2016. *BONUS BALTSPACE Deliverable D1.2: Possibilities and Challenges for MSP Integration*. Available at: http://sh.diva-portal.org/smash/get/diva2:1050666/FULLTEXT01.pdf

Stange, K., van Tatenhove, J. & van Leeuwen, J. 2015. Stakeholder-led knowledge production: Development of a long-term management plan for North Sea. *Science and Public Policy* 42: 501–513.

Tafon, R. (forthcoming) Taking Power to Sea: Towards a Poststructuralist Discourse. Theoretical Critique of Marine Spatial Planning. *Environment and Planning C: Politics and Space*

Tynkkynen N (2015) Baltic Sea Environment, Knowledge and the Politics of Scale. *Journal of Environmental Policy & Planning* 17(2): 201-216.

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