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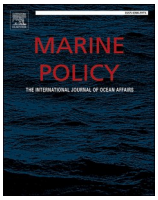

Enabling conditions for effective marine spatial planning

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ABSTRACT

As marine spatial planning (MSP) continues to gain global prominence as an approach to ocean governance, planners and other stakeholders are eager to evaluate its social and ecological outcomes and to better understand whether plans are achieving their intended results in an equitable and cost-efficient manner. While a plan's outcomes for marine environments and coastal communities may be of particular interest, these results cannot be separated from planning processes. The field has yet to fully develop the guidance necessary for this critical consideration of how features of an MSP process and external factors interact with plan performance and outcomes. To fill this gap we used a literature review and expert discussions to identify 19 enabling or disabling conditions of MSP within four major categories: Plan Attributes, Legal Context, Plan Development and Social Context, and Integration. We propose semi-quantitative scoring and the development of narratives to operationalize the framework as part of a comprehensive methodology for MSP outcome evaluation. Applying the framework can add depth to quantitative MSP evaluation, shed light on questions of outcome attribution, and inform plan adaptation. Evaluating MSP outcomes in the explicit context of the enabling or disabling conditions identified here can stimulate discussion around what works in MSP and provide a path forward for assessing the benefits and costs of MSP worldwide. By identifying conditions instrumental to effective MSP, and alternatively, conditions hindering a plan, the framework can be used to guide plan adaptation and promote learning across the wider MSP community.

1. Introduction

As marine spatial plans mature, planners and stakeholders are eager to evaluate social and ecological outcomes and better understand whether plans are achieving their intended results in an equitable and cost-efficient manner [33,46]. Still, substantive gaps exist in both the theory and practice of comprehensive marine spatial planning (MSP) evaluation, and uncertainties remain regarding the long-term effects of the approach [92,113]. Challenges related to ambiguous plan objectives and evaluation criteria, insufficient data, and the difficulty of attributing social and environmental changes to particular plans limit the scope of current outcome evaluations [22]. Further complicating evaluation

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practice is the understanding that outcomes of a plan cannot be separated from the processes that precede it, the actions that follow it, and the broader socio-economic and policy contexts that surround planning and implementation [22,117]. As such, methods for linking MSP process and outcome evaluations, and for critically considering external factors that may interact with plan implementation and performance, are essential for moving the field forward.

Here, we present the concept of *enabling and disabling conditions of MSP* and propose methods for operationalizing these conditions as an integral part of a comprehensive outcome evaluation. Enabling or disabling conditions are factors related to planning and implementation processes and other relevant contextual factors that enhance or undermine a plan's effectiveness. Important enabling conditions have been identified for various ocean use sectors [4], management interventions [34,59,76], and approaches to ocean and coastal governance [20,24,27,45]. For example, performance indicators for fisheries highlight and incorporate 15 different enabling factors and conditions that influence the sustainability of fisheries globally [4]. While much of this theory of enabling conditions in other realms of marine and natural resource governance is relevant, unique characteristics of MSP require additional consideration. For example, a condition related to policy inconsistencies or overlapping government jurisdictions is likely more expansive for MSP than for a single ocean use sector (e.g., fisheries) given MSP's multi-objective and multi-sectoral approach.

In this paper we synthesize existing research and expert opinion from interdisciplinary and international scholars into a framework for understanding, making decisions around, and acting upon enabling and disabling conditions specific to MSP. By organizing a diverse set of conditions into an evaluative framework that engages with real-world MSP examples, we not only provide a starting point for identifying key determinants of effective MSP (and alternatively key hindrances), but also showcase a widely-applicable means of linking process and outcomes in MSP evaluations. Whereas a stand-alone outcome evaluation might answer the question 'what happened?', this framework and approach will improve evaluators' abilities to understand why an outcome did or did not occur by uncovering pathways of influence or causation [22,63]. As a result, this new framework can simultaneously guide plan development, inspire plan adaptation, and promote learning across the wider MSP academic and practitioner community.

2. Approach to framework development

Two members of the authorship team jointly conducted a critical interpretive review of the academic literature and prominent MSP guidance documents (c.f. McDougall 2015) with the parallel goals of 1) better understanding the diverse factors that can influence MSP outcomes, regardless of plan content or intentions, and 2) compiling evidence of connections between such factors and outcomes. The literature review was conducted across three major databases from December 2020 through May 2021 (Web of Science, Science Direct, and SpringerLink) as well as with the Google Scholar search engine. Search terms included pairing 'enabling conditions' and 'principles' with 'marine/maritime spatial planning', 'conservation' and 'ocean planning'. Although this was not a systematic review, systematic techniques were employed, including a snowballing approach to identifying subsequent sources in the ocean governance, MSP, natural resources management, development, and conservation planning literatures [8].

Key ideas were extracted from reviewed documents through a process involving a thorough reading of sources to identify factors theorized or shown through evaluation to interact with plan implementation and performance. These were coded and collated into an initial list of 20 enabling or disabling conditions of MSP. This initial list was then presented to 11 members of the interdisciplinary, international authorship team for validation and refinement, such as differentiating and combining several of the conditions for clarity. The full team included members with expertise in: conservation planning, management, and evaluation; risk assessment and integrated management; marine spatial planning; marine policy; and stakeholder participation. The team consisted of scientists and practitioners employed in academia, government, and the nonprofit sectors in Brazil, Canada, Germany, the United Kingdom, and the United States. Furthermore, the team had experience with MSP in all populated continents. A subset of the authors met in person in 2017 to begin exploring MSP outcome evaluation, with this full authorship team continuing and expanding the discussions through a series of seven virtual meetings from Spring 2020–Spring 2021.

An iterative process of both structured and unstructured expert elicitation [108] involved a formal ranking survey, in which team members sorted the relevance and importance of the enabling and disabling conditions listed, as well as in-depth, facilitated group and break out discussions over the course of 3, 2-hour team meetings. Such discussions incorporated the team's diverse areas of expertise along with their varied geographic perspectives to further hone and finalize the list of conditions and sort them into overarching categories [104]. Examples of prompts that catalyzed these discussions include: 'Please consider the social and institutional factors that you've seen influence - positively or negatively - a MSP process' and 'How might published principles of MSP inform this framework of enabling conditions and are there any important principles that aren't reflected in the current list?'. The process next drew on team members' knowledge of and experiences with real-world MSP cases from around the world to craft short examples (found in Appendix A, Table A.1) that demonstrate how conditions operate within actual MSPs and provide insight into the process of assessing these conditions for an evaluation. For this, we drew particularly from team members' expertise as conservation and MSP practitioners to ground each condition in the proposed framework in reality. Integrating results from the literature review with the team's expert insight and hands-on experiences with MSP informed our framework for identifying factors that contribute to MSP effectiveness and incorporating enabling or disabling conditions of MSP into more robust outcome evaluations.

3. Results

3.1. A framework for understanding enabling and disabling conditions of MSP

Our review revealed a set of overlapping literatures and several approaches to evaluation that we drew from to inform this framework (Table 1). Each body of literature motivated the inclusion of one or more enabling or disabling condition of MSP in the framework or informed our thinking on how the framework could be best applied. Our review provided theory and empirical information from which we compiled the 19 conditions and built an understanding of the specific relevance of each condition to MSP. We grouped the conditions into four major categories: **Plan Attributes**, **Legal Context**, **Plan Development and Social Context**, and **Integration**. Each condition may influence (positively or negatively) the ability of MSP to succeed (Table 2). Despite overlaps between some of the conditions, each represents distinct factors (described in Sections 3.1.1 to 3.1.4 of this paper) that warrant inclusion and separate treatment.

3.1.1. Plan attributes

Many basic attributes are likely to influence an MSP's effectiveness. For instance, plan type (e.g., information-based, strategic and vision-based, or regulatory), planning phase (e.g., UNESCO-IOC phase of MSP: pre-planning, analysis for planning, plan development, plan completion, plan approval, plan implementation or plan revision), and the underlying motivation and intent of a plan provide essential context [37]. Within this category, we identified eight conditions.

Institutional capacity | Institutional capacity reflects the ability of the entity developing a plan. It includes planners' knowledge of the natural and social system, previous experience with planning processes,

Table 1
The major theories and literatures that informed the framework for understanding enabling and disabling conditions of MSP, and a brief description of their relevance.

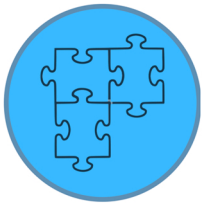
Literature and Citations	Relevance
Social-ecological systems (SES) theory [15,95]	Marine spatial plans exist within complex coupled human and natural systems, and can be best understood by applying social-ecological systems theory. We identified enabling conditions relevant to each of the four subsystems identified in SES theory (resource system, resource units, users, governance system).
Common pool resource (CPR) theory [94]	Marine spatial plans are diverse and context-specific, but generally address the management of CPRs, and are likely to share a set of common conditions that accompany successful management. The conditions presented here were informed by the institutional design principles for sustainable governance of CPRs. Two fields strongly influenced by CPR theory, marine protected area (MPA) governance [67] and community-based conservation [27,84], each also informed many of the conditions presented here.
Sustainable development [37,101]	The wider sustainability discourse and literature on sustainable development, especially regarding the apparent tension between a Blue Growth approach vs. a conservation-first approach (loosely aligning with 'soft' and 'hard' conceptualizations of sustainability) shaped the development of this framework.
Ecosystem-based management (EBM) and ecosystem services [6,60,79,88]	Principles of EBM have strongly influenced the evolution of MSP and are broadly relevant for its evaluation. Embedded in the EBM literature are theories and approaches for evaluating trade-offs, often through the lens of ecosystem services. We draw on general ecosystem service theory and the more targeted literature on cultural ecosystem services that provides an entry point for incorporating socio-cultural dimensions of MSP and integrative approaches into the framework.
Critical studies in MSP (drawing from political ecology and environmental justice) [41,107,116]	The framework was strongly influenced by the growing critical literature on MSP which draws from theories in political ecology and environmental justice studies. These critiques provided especially useful insight into the profound ways that a failure to establish enabling conditions can marginalize individuals and communities that MSP aims to benefit.
Theory-based evaluation [28,29,48,85,97]	Various approaches to theory-based evaluation, including realist evaluation, provide avenues for operationalizing this framework. Notably, the theory-of-change approach provides evaluation techniques well-suited to complex systems and interventions with outcomes that are difficult to measure.
Conservation evaluation [18,39,83,86,87]	The conservation evaluation literature emphasizes an embrace of system complexity as is necessary for comprehensive MSP evaluation, and the importance of understanding mechanisms by which conservation interventions affect social-ecological outcomes. Much of the focus to date has been on evaluating MPAs, and we find significant opportunities for this literature to inform advances in MSP evaluation.

Table 2
A framework for understanding the enabling and disabling conditions of effective MSP.

Category	Condition	Brief Description
PLAN ATTRIBUTES	**Institutional capacity**	The ability of the entity developing the plan and their past experience with plan recipients. Also the institution's capacity for continued implementation, monitoring and enforcement, evaluation, and adaptation of the plan.
	Clear objectives	Whether the plan includes a clear statement of what it is working to achieve and if measurable objectives were defined early in the planning process.
	Data and evidence	The types, quality, spatial scale, thematic resolution, temporal dimensions, and relevance of the data used for plan development.
	Future-oriented	If the plan takes a forward-looking approach, accounting for future social and environmental conditions and planning for future ocean uses.
	Trade-offs	The data and tools used to quantify and assess trade-offs, forums where trade-offs were discussed, and how costs and benefits to marginalized communities were considered during the planning process.
	Cumulative impacts	If and how the planning process incorporated information on the cumulative effects of existing and potential human activities and uses.
	Monitoring, evaluation and learning	A plan's approach to monitoring and evaluation and how that approach does or does not align with the goals and objectives of the plan.
	Adaptability	Whether the plan outlines an iterative and adaptive process meant to facilitate ongoing updates to incorporate new information, or to reflect changing stakeholder needs, social preferences or threats to the system.
LEGAL CONTEXT	**Legal authority**	The scope of a plan's legal authority, whether authority to conduct MSP was established prior to the planning process, any change in legal status over time, and whether a lack of authority has limited any aspect of MSP.

(*continued on next page*)

Table 2 (*continued*)

Category	Condition	Brief Description
	Inclusion of rightsholders	The leadership, acknowledgement and inclusion of rightsholders, often Indigenous peoples and local communities, in MSP decision-making processes.
	Enforcement mechanisms and incentives for plan compliance	Methods of enforcement for rules and policies related to a plan, and information about the effectiveness of enforcement procedures.
PLAN DEVELOPMENT & SOCIAL CONTEXT	**Stakeholder engagement and participation**	Stakeholder engagement, participation and empowerment processes as related to plan development and plan implementation.
	Power in MSP	How power asymmetries were considered as part of the planning process, and whether the plan considers and addresses the ways in which power dynamics can shape both the plan process and outcomes.
	Equity and justice	The extent to which the MSP process recognized and was inclusive of diverse stakeholders and perspectives, whether stakeholders were given genuine decision-making power and/or influence in plan development, and whether planners anticipated and worked to address inequities related to the likely distribution of benefits and harms resulting from MSP.
INTEGRATION	**Cross-boundary integration**	Whether a plan acknowledges transboundary issues and engages in transboundary coordination and collaboration - across socio-cultural lines, across ecosystems, and across administrative or jurisdictional boundaries.
	**Integration across levels of government**	The scope and scale of coordination and collaboration between levels of government, avenues of communication among levels, and whether there exist incompatible policies, unclear jurisdiction or conflicting priorities among levels.
	Policy and sectoral integration	If the plan appropriately addresses interests and concerns across ocean use sectors.
	Knowledge integration	Ways in which diverse perspectives and knowledge, including Indigenous knowledge, were integrated into MSP processes and into the plan itself, and how this diversity is reflected in plan outputs.
	Integration of ecosystem-based approaches	How a plan does or does not meet the principles of ecosystem-based management.

and leadership potential. This condition also considers whether the intended recipients of plan benefits have experience (positive or negative) with the entity developing the plan and/or with other relevant actors involved in implementation [27,105]. Relevant here is whether the plan and planners have legitimacy and the social license to operate (i.e., the acceptance and approval of society to conduct and implement planning; [50,58]). Institutional capacity is also linked with the concept of planning culture, the norms and practices by which individuals and institutions act to develop a plan. Planning culture can significantly influence the choices that planners make and, therefore, the outcomes of a plan. Finally, this condition encompasses a plan's capacity for continued implementation, monitoring and enforcement, evaluation, and adaptive management. This includes the financial resources that have been allocated for MSP (with attention to funding contingencies and resilience), as well as personnel, supplies and/or facilities, and the ratio of available resources to those estimated as necessary for full plan implementation [53,98].

Clear objectives | Measurable and clear objectives (often referred to as SMART objectives; [35]) should guide plan development, provide direction for plan implementation, and allow for the identification of appropriate evaluation criteria [22,35]. This condition characterizes whether measurable objectives (as distinct from high-level goals or aspirations) were defined early in a planning process, whether a clear statement of a plan's outcome(s) is included [26], and if specific targets and indicators exist to measure progress toward stated objectives. Also relevant to this condition is the extent to which the objectives articulated in the plan represent societal aspirations and were developed with contributions from all stakeholders. It should be noted that when vague language (e.g., "sustainable development") is used in objectives, it has the potential to signal progressive approaches to ocean governance while resisting evaluation and allowing for the continuation of environmentally or socially detrimental practices [25].

Data and evidence | An assessment of the evidence that informed a plan is central to understanding a planning process and the set of goals and objectives articulated in that plan [26]. This condition relates to the quality, spatial scale and thematic resolution, temporal dimensions, and relevance of the data used [21]. It also relates to considerations of data uncertainty in planning, whether analyses are robust and reproducible, and information about adherence to ethical standards in data collection, storage and use. Ideally, a plan will be informed by a variety of quantitative and qualitative data sets that represent a range of knowledge sources. Widely recognized as lacking in many MSP processes, social data (including those not captured through common geo-technologies, e.g., GIS, or in maps) should be capable of measuring and tracking the complex dynamics and relationships in the human systems that influence and are impacted by MSP [19,74,77,111]. A critical concern when assessing this condition is the tendency in some MSP processes to focus on addressing gaps in data or knowledge as opposed to addressing actual causes of environmental degradation or social issues [25].

Future-oriented | This condition explores whether a plan takes a forward-looking approach (e.g., through visioning, scenario testing or scenario-based planning), accounting for future social and environmental conditions and future ocean uses, as opposed to only documenting present and historical changes [36,62]. To be future-oriented, a MSP process should acknowledge and address tension between historically tenured and emerging users of ocean space. Of particular

importance is the extent to which plans address future conditions associated with climate change, considering both how climate change is likely to impact marine social-ecological systems and keeping in mind the often vastly different adaptive capacities of different communities [47]. The time frames of future-oriented planning (i.e., how far in the future scenario-based exercises extend) will vary, but a key consideration should be the license, permit or concession periods associated with ocean and coastal spaces.

Trade-offs | Trade-offs are an inevitable, yet complex, reality of any multi-sector, multi-objective planning process [120]. Explicit, transparent consideration and analysis of trade-offs between competing objectives and impacts on different groups of people can improve the likelihood that a plan equitably balances the diverse values and needs of ocean and coastal users [78]. An analysis of this condition should include information about the data and tools used to quantify and resolve trade-offs as well as whose values and which costs and benefits were unrepresented by available data. It is also important to understand the forums where trade-offs were discussed, and how costs and benefits to marginalized populations and imperiled biodiversity were considered during the planning and decision-making process [26].

Cumulative impacts | This condition addresses whether the planning process incorporated information on the cumulative effects of existing and potential human activities and uses and/or naturally occurring processes. To adequately characterize cumulative impacts, a plan should not only identify uses within the planning region, but also explore the three-dimensional spatial footprint and temporal reach of each use and consider potential synergistic effects of multiple, overlapping stressors [80]. Viewing cumulative effects through the lens of social-ecological tipping points may best situate a plan to avoid unwanted outcomes [109]. Furthermore, planning processes that include effective communication of the uncertainty associated with cumulative impacts and social-ecological system responses can lead to more transparent and socially acceptable policy and management [114]. There are numerous assessment methods, visualization tools, and analytical approaches for identifying cumulative impacts and understanding system-wide responses to them (e.g., [9,55,61,70]).

Monitoring, evaluation and learning | Ongoing and targeted monitoring of social and environmental systems, evaluation of a plan's outcomes, and the pivotal processes of learning from and communicating knowledge are key to successful management [33,65,112,113]. This condition aims to incorporate information about a plan's approach to monitoring and evaluation (including how it deals with uncertainty, [112]) and how well that approach aligns with the goals and objectives of the plan. It asks whether the approach is feasible and if it includes monitoring of social dynamics relevant to the MSP. It considers whether there are planned or ongoing monitoring activities aimed at understanding perceptions of stakeholders. Importantly, it incorporates whether the plan outlines methods for monitoring distribution of costs and benefits with an emphasis on vulnerable populations that often bear the costs of management, and on identification and monitoring of unintended impacts of planning and plan implementation [40]. Finally, while learning in MSP is often given less attention than monitoring and evaluation, participatory or social learning that occurs during an MSP process can be a valuable outcome of planning in itself and an essential condition for effective adaptive management [57,69].

Adaptability | Intimately tied to monitoring, evaluation and learning processes is the concept of plan adaptability. Adaptation is seen as a fundamental principle of MSP and as essential to a plan's ability to guide the management of highly variable and ever-changing marine and coastal social-ecological systems, especially in the face of accelerating climate change [44,57]. This condition documents whether a plan outlines an iterative and adaptive process meant to facilitate ongoing updates to the plan to incorporate new information, or to reflect changing stakeholder needs, social preferences or new threats to the system. To be adaptable, a plan must have both the legal authority to respond to change and established processes that enable stakeholder participation in the adaptation process [30]. Characterization of this condition will include information on these components of adaptability as well as information on how a plan balances flexibility in the face of changing conditions with the need for predictable governance for industry and ocean users.

3.1.2. Legal context

Legal authority | Academics and practitioners alike recognize the imperative of legal authority for achieving desired outcomes of multi-objective MSP [2]. This condition describes the scope of legal authority, whether authority to conduct MSP was established prior to the planning process, any change in a plan's legal status over time, and whether lack of authority has limited any aspect of MSP [26,36]. It documents whether authority was established through existing or new legislation or by administrative action. It also asks whether the plan relies on statutory authority of other institutions (e.g., sectoral agencies) to meet its objectives, and importantly, whether the plan has legal authority to compel those institutions to act. It examines whether the plan is compliant with relevant local, Indigenous, national and international laws, policies and agreements that it interacts with. While not explicitly part of the existing legal authority for a plan, a characterization of this condition should also include whether there exists political will and leadership for implementation.

Inclusion of Indigenous rightsholders[1] | The leadership, acknowledgement and inclusion of rightsholders (or claimholders), often Indigenous peoples and local communities (IPLCs), in MSP decision-making processes is fundamental to equitable and just ocean and coastal management [107]. Of particular concern is the exclusion of those who hold formal and informal (and recognized or unrecognized) rights allowing their use of the ocean and coast [11,13]. While many MSP initiatives have failed to fully respect relevant rightsholders, done thoughtfully and through partnerships, the process of MSP has the potential to provide a venue for IPLCs to assert their rights and gain meaningful representation [10,11]. Characterization of this condition includes information on processes related to the inclusion or exclusion of rightsholders in MSP.

Enforcement mechanisms and incentives for plan compliance | Monitoring and enforcing MSP compliance is a logistically challenging, but necessary, condition of effective MSP. This condition explores the methods of enforcement and types of sanctions for rules and policies related to a plan, and provides information about the effectiveness of enforcement procedures. Along with formal enforcement of rules, this condition assesses incentives or other mechanisms that might influence compliance with the MSP (e.g., informal enforcement by resource users; graduated sanctions, see [94]). An important aspect of this condition relates to whether planners are aware of and understand the motivations of those using ocean space and resources; this understanding can enable managers and those tasked with enforcing MSP to address underlying barriers to compliance [1].

3.1.3. Plan development and social context

Stakeholder[2] **engagement and participation** | The participation of those individuals and groups with a vested interest in the planning area is considered essential for building a sense of ownership among plan constituents, for the creation of socially legitimate policies and to

[1] We use the following definition of rightsholders from Vince and Day [118]: ".individuals or groups socially endowed with legal or customary rights with respect to land, water and natural resources of (or possibly adjacent to) the area."

[2] Rightsholders are distinct from stakeholders in MSP processes and we discuss the inclusion of rightsholders in the planning process in the 'Legal dimensions of MSP' section. However, components of this stakeholder engagement section are also relevant when considering engagement with rightsholders.

overcome democratic deficits associated with current forms of natural resource management. This condition characterizes the stakeholder engagement and participation process as related to plan development and plan implementation [42,54,56,99]. Understanding both formal and informal participation of stakeholders is essential and should include information regarding the phases of planning where various stakeholders were or are involved, their roles, and the extent to which they were engaged in decision-making and/or had the capacity to meaningfully influence the content of the plan [51,52,107]. To examine this condition, it is important to engage with recent criticism regarding MSP stakeholder participation processes, including observations of tokenistic or choreographed participation, whether the need for consensus in a MSP process has limited participation to those individuals or groups amenable to the options or scenarios presented, and the extent to which stakeholders were empowered to imagine and debate radically alternative futures for the ocean and coast [25]. Importantly, this condition asks whether barriers to participation (e.g. financial resources, time, language) were addressed as part of the planning process. Numerous frameworks for analyzing participation in MSP have been proposed, notably Morf et al. [89] and others referenced therein.

Power in MSP | MSP cannot be the transformative approach to ocean governance that it is promoted as without a consideration of the roles that power plays through the planning process and beyond [116]. This condition addresses whether power asymmetries were considered before and during plan development, and if the plan addresses how power dynamics might shape plan outcomes [91,102]. This could be seen in power imbalances between planning entities, between planners and those impacted by the plan, or among various stakeholders. It might include both the power to influence ideas or plan direction and the power to silence others' ideas. A consideration of power in MSP likely necessitates that planners are intentional about overcoming any recognized power imbalances, recognize the diverse identities of stakeholders and work to empower those marginalized and/or disenfranchised in the MSP process [107]. However, it goes beyond whether power was considered (in its many forms) and asks whether opportunities for participation were sufficient to overcome exclusion and marginalization of the values and voices of less powerful groups in the MSP process.

Equity and justice | The concepts of equity and justice interact with all enabling conditions presented in this framework, but are given separate treatment here as conditions essential to fair, effective and durable MSP [12]. Boucquey et al. [19] ask "Will MSP amount to an 'ocean grab' by the most well-represented, data-rich actors, or could it be a mechanism that helps constitute greater socio-natural well-being?" This condition characterizes the extent to which the MSP process recognized and was inclusive of diverse stakeholders and perspectives (recognitional justice) [81,107]. The condition also encompasses whether stakeholders were given genuine decision-making power and/or influence in the development of the plan (procedural justice) [66,91,94]. Information regarding this condition should include whether planners acknowledged and/or worked to address challenges related to procedural fairness, and the extent to which MSP processes and the entity leading the process could be described as transparent or accountable. Finally, this condition describes whether planners anticipated and worked to address inequities related to the likely distribution of benefits and harms to different groups of people resulting from MSP (distributional justice; [14,41]).

3.1.4. Integration[3]

Cross-boundary integration | Integration across social, ecological, administrative and jurisdictional boundaries is widely considered to be a key attribute of MSP [52,72]. This condition assesses whether a plan acknowledges transboundary issues and engages in transboundary coordination and collaboration - across socio-cultural lines, across ecosystems (especially across the land-sea boundary), and across administrative or jurisdictional boundaries [7,36,96]. This includes both formal cross-boundary integration (e.g., coordinating plans across national boundaries or other jurisdictional borders), and integration across informal boundaries, such as distinct socio-cultural regions with divergent interests. Finally, this condition asks whether and how the planning team engaged in exchange of information across relevant boundaries [75].

Integration across levels of government | MSP is not a prescriptive process; plans originate across levels of government, from multinational collaborations to federal-tribal partnerships, from subnational strategic plans to local zoning strategies. Jurisdiction over marine and coastal spaces and the management of activities in those spaces is often complex, spanning multiple agencies and institutions. Regardless of the level of government where MSP is conducted, vertical integration between national (and sometimes international) laws and policies, subnational (e.g., state) governing bodies, and local government interests is fundamental to multi-sectoral MSP. This condition characterizes the scope and scale of coordination and collaboration between levels of government and explores avenues of communication among them. It identifies incompatible policies, unclear jurisdiction or conflicting priorities among levels [100,118]. Relevant integration might be through intra-agency, inter-agency (across agencies in the same government) or intergovernmental (across state, federal and/or tribal governments) coordination [118]. Challenges can arise when some jurisdictions are missing. Additionally, acceptance of the plan by lawmakers at all levels can be important for plan adoption, implementation and continued support, and should be explored [93].

Policy and sectoral integration | The intentional or unintentional omission of user groups or ocean use sectors can compromise effective MSP. This condition examines whether a plan appropriately addresses interests and concerns across ocean use sectors [93]. It explores ways in which the plan does or does not integrate the range of ocean and coastal uses, social and environmental concerns, and economic sectors, sometimes referred to as horizontal integration [36]. With an understanding that all public, private and voluntary sectors will not participate in the MSP process with the same resources and power, this condition addresses whether sectors were integrated in an equitable way. Because much current ocean and coastal policy is sector-based, this condition also includes the level of coherence between the plan and existing policies and other statutory instruments relevant to the region.

Knowledge integration | Many have noted that despite aspirations to include diverse knowledge types in MSP, scientific data (and more specifically, data from the natural sciences) is often emphasized in the process, thereby excluding entirely or relegating other forms of knowledge to a second tier [38,73]. This condition evaluates the extent to which diverse perspectives and knowledge (including knowledge not amenable to spatial visualization and/or quantitative analysis) were integrated as part of a well-facilitated MSP process and in the plan itself, and whether this diversity is reflected in plan outputs [49,106]. Furthermore, it examines how status has been assigned to different knowledge or information types and interrogates the basis for

[3] Multiple frameworks for examining integration in MSP have been published (summarized in Table 2 of [106]), providing comprehensive treatments of the many facets of integration in MSP. We note that stakeholder integration is a widely-accepted principle of MSP and an important dimension of MSP integration. In this framework, it is captured in the Plan Development and Social Context section.

prioritizing any knowledge type over others [107]. This condition includes consideration of local forms of knowledge, particularly Indigenous knowledge, and if inclusion was guided by Indigenous knowledge holders [91]. It also considers the range of disciplinary knowledge (natural sciences, social sciences, humanities) that makes up a plan's evidence base. Finally, how knowledge is shared and communicated among stakeholders and organizations involved in the MSP process is an important aspect of this condition.

Integrating ecosystem-based approaches | Stojanovic and Gee [115] suggest an emerging consensus among MSP practitioners that ecosystem-based management (EMB) is a foundation of MSP, and many others have identified MSP as a mechanism by which to operationalize EBM [5,32]. This condition characterizes whether a plan meets EBM principles (especially those not addressed by other conditions in this framework). Taking an ecosystem approach means situating MSP within a social-ecological systems worldview that acknowledges the links and feedbacks between human and non-human systems. This includes if a plan integrates information on ecosystem patterns and processes, biological and physical dynamics of marine and coastal systems, and the interconnectedness of marine and coastal ecosystems [43,71]. The condition considers if the planning region aligns with spatial and temporal scales of important ecosystem processes and/or whether any mismatches are accounted for, and the ways species interactions, species distributions, habitat diversity, and ecosystem connectivity were incorporated [54,82]. Importantly, a plan's objectives and activities must reflect the underlying imperative of functional ecosystems that can continue to provide services to people [31,43,46]. Though there are many conceptions of EBM or ecosystem approaches, the Convention for Biological Diversity Malawi Principles can provide a starting point for assessing key principles related to this condition [23].

4. Applying the framework

Our framework brings together a set of well-researched concepts that should be considered as important enabling or disabling conditions for effective MSP. We argue that the exercise of evaluating MSP outcomes can be more comprehensive and produce more knowledge when these conditions are considered (Fig. 1). It also provides an opportunity to incorporate qualitative data into the evaluation process. To operationalize the framework, each condition can be assessed in the context of progress (or lack thereof) toward a plan's social and ecological objectives. Applying semi-quantitative scoring to each condition can provide a standardized approach for examining how these conditions may change over the life of a plan and for comparison across plans (see Appendix B, Table B.1 for an example scoring template). Scoring would also promote transparency in evaluation and facilitate communication of evaluation results. To supplement a quantitative score, we recommend compiling and synthesizing descriptive information regarding each condition in a narrative format. The information might be sourced from published or gray literature and reports, or, importantly, by speaking with planners and diverse stakeholders with first-hand experience with the planning process and subsequent implementation. Where possible, the narrative should describe information relevant to each enabling or disabling condition, any change that has occurred in a condition over time and the drivers of that change, and how these dynamics are affecting MSP outcomes. If applied during a participatory evaluation, the framework can provide useful structure and potential themes to guide conversations with stakeholders and among planners [22].

The issue of causation or attribution has long challenged practitioners and academics seeking to understand whether MSP provides

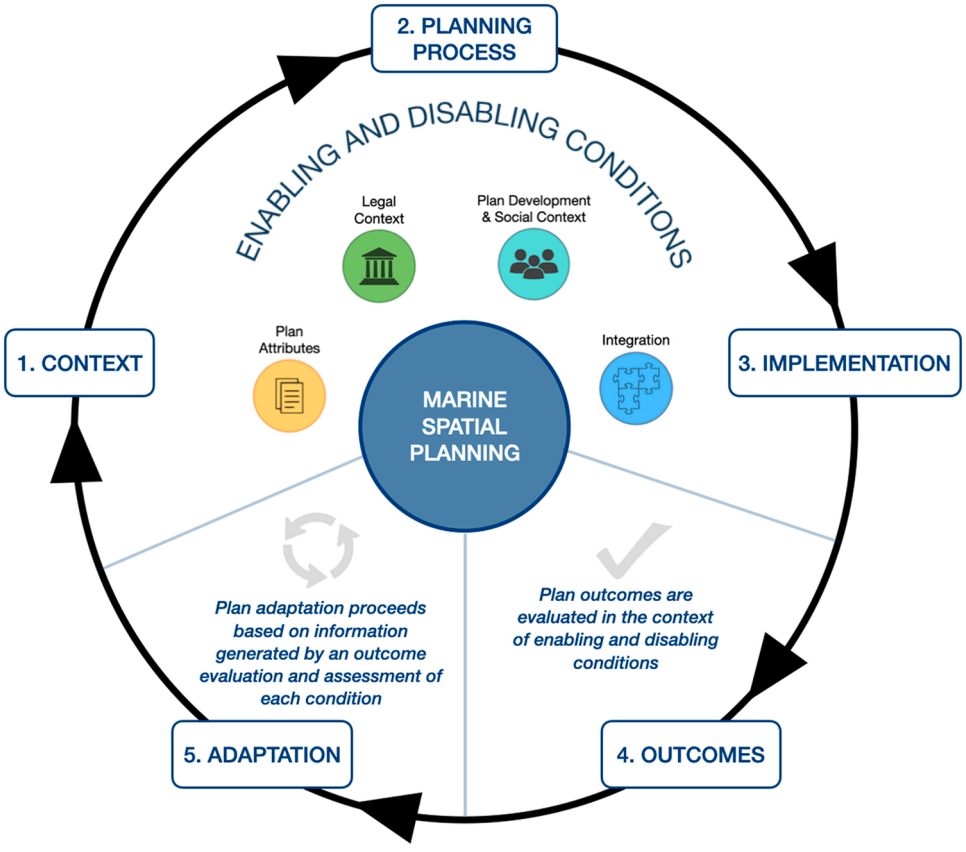


Fig. 1. A graphical depiction of the MSP process and how an outcome evaluation can explicitly incorporate the social-environmental context of planning (1), aspects of the planning process (2) and of plan implementation (3) through the examination and characterization of enabling and disabling conditions. The evaluation places outcomes (4) in the context of these conditions to inform adaptation (5). Building on Hockings et al. [64].

social and ecological benefits above and beyond those benefits achieved through sectoral planning. Demonstrating unequivocal attribution of a societal or environmental outcome to a marine spatial plan may never be possible, but we believe that characterizing the social conditions, attributes of a plan and planning process, and institutional capacities comprising these enabling conditions will facilitate progress toward understanding causality. One promising way to apply the framework to this end is through the use of theory-based evaluation, where theories of change are constructed and tested to better understand outcomes and establish attribution [16,103,119]. The theoretical chain might start with adoption of a plan, move through multiple actions and causal links, and end with the achievement of an objective. Presence or absence of the conditions detailed here can provide explanation as to whether and why each of those causal links occurred.

While we created this framework to conceptualize enabling conditions in the context of an outcome evaluation, we also advocate for its use as a tool to support reflection before and during a planning process and throughout implementation. We envision it as a conversation-starter for planning teams, an entry point for assessing programs before they are implemented, and a collection of important conditions that will ideally be in place prior to a planning process.

5. Conclusions: what we gain by considering enabling conditions in MSP evaluation

An effective evaluation not only documents progress toward a plan's goals and objectives, but also supports learning and informs plan adaptation. Practitioners and evaluators can use this framework to evaluate conditions that supported or hindered plan effectiveness, thus making it a useful tool for guiding data-informed decisions when adapting a plan. Examining each condition and exploring links between the condition and plan outcomes has the potential to highlight areas where improvement can be made, and ways to leverage various conditions to enable success. Jones et al. [68] studied twelve plans, concluding that many of them focused on single sectoral objectives (*Policy and sectoral integration*), that tradeoff analyses were driven by sectoral priorities rather than diverse social, environmental and economic goals (*Tradeoffs*), and that stakeholders were rarely granted real influence and decision-making power (*Stakeholder engagement, participation and empowerment*). All of these disabling conditions represent points of entry for shaping and improving future MSP strategy.

There is currently a widespread interest in coastal and ocean governance, evidenced by the United Nations (UN) Decade of Ocean Science for Sustainable Development (2021–2030), efforts surrounding SDG 14: Life Below Water, and a growing recognition that our ability to effectively manage coastal and ocean resources and the ecosystem services they provide is essential for meeting the UN Sustainable Development Goals (SDGs; [90,110]). There is also a growing concern that current forms of governance are often not producing their anticipated social and environmental outcomes. Adoption of a Blue Growth (or Blue Economy) MSP narrative for shaping ocean development is accompanied by a deep skepticism among many that this growth-focused approach can adequately protect and restore the ecosystems on which coastal communities and ocean economies depend [14]. Recent years have also seen a growing consensus that natural resource management must be linked more tightly with work addressing social and environmental injustices [3,17].

It remains to be seen whether MSP is a process that can balance demands for coastal and ocean space while facilitating global progress toward more just ocean governance and major societal goals such as the UN SDGs. A failure to assess and document the important sociocultural, political and institutional factors that we know impact the performance of MSPs will certainly make this less likely. Alternately, evaluating MSP outcomes in the explicit context of enabling and disabling conditions can stimulate discussion around what works in MSP, encourage new adaptive strategies, and provide a path forward for MSP to more fully meet its potential to radically shift ocean governance in a direction that truly benefits people and nature.

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Rachel Zuercher: Conceptualization, Writing – original draft, Project administration. **Nicole Motzer:** Conceptualization, Writing – review & editing, Supervision, Funding acquisition. **Jonathan G. Kramer:** Conceptualization, Writing – review & editing, Supervision, Funding acquisition. **Natalie C. Ban:** Conceptualization, Writing – review & editing. **Wesley Flannery:** Conceptualization, Writing – review & editing. **Anne D. Guerry:** Conceptualization, Writing – review & editing. **Benjamin S. Halpern:** Conceptualization, Writing – review & editing. **Rafael Almeida Magris:** Conceptualization, Writing – review & editing. **Shauna L. Mahajan**: Conceptualization, Writing – review & editing. **Ana K. Spalding:** Conceptualization, Writing – review & editing. **Vanessa Stelzenmüller:** Conceptualization, Writing – review & editing.

Declarations of interest

None.

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Appendix A. Supporting information

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