



Uncharted territories in tropical seas? Marine scaping and the interplay of reflexivity and information

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Introduction

Current economic expansions into the marine realm reiterates calls, first heard in the mid-2000s, to coordinate action through Marine Spatial Planning (MSP) (Douvere 2008; Douvere and Ehler 2009; Crowder et al. 2006; Foley et al. 2010; Halpern et al. 2008). The European Commission, for example, has high expectations of MSP's contribution to boosting the Blue Growth agenda by its potential use in identifying space for new economic activities and synergies (EASME 2018). Also, long-standing calls for conservation and protection of our oceans' ecological riches are increasingly effectuated through spatial measures, including a widespread commitment to establish Marine Protected Areas (MPAs) both in Exclusive Economic Zones (EEZs) and at high seas (Ardron et al. 2008; Agardy 2010; Foley et al. 2010). Marine ecological interconnectivity is however a main cause for complexity in planning economic activities at sea and in balancing socioeconomic interests with conservation needs (Crowder and Norse 2008).

At the same time, ocean governance, especially in transboundary areas, is complicated by institutional fragmentation, and/or institutional ambiguity, the first referring to fragmentation in roles and responsibilities of institutions, policies, and regulations and the latter to "the mismatch between institutions of the different policy-making settings which come

together" (Van Leeuwen et al. 2012: 637; Jay et al. 2013; Raakjær and van Tatenhove 2014; van Tatenhove 2013, 2016, 2017). Navigating the complexity of transboundary MSP (TMSP) depends on actors' abilities to understand and influence the rules of governing and dominant policy discourses. Moreover, governance arrangements tasked with, or designed for, planning in transboundary contexts should foster reflexivity, providing room for these actors to jointly (re-) examine courses of action, and formulate new logics which might fall outside dominant regimes and discourses (Beck 2006; Feindt and Weiland 2018; van Tatenhove 2017).

In allocating space for marine uses and the marine environment, MSP is presented as an important tool that will facilitate decision-making processes. Dominant definitions refer to MSP as "the rational organization of the use of marine space and the interactions between its uses, to balance demands for development" (Douvere 2008: 766); and to "a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that usually have been specified through a political process" (Ehler and Douvere 2009: 18). While these definitions do not automatically preclude reflexivity, common interpretation in academia and policy practice emphasizes ordered and rational action, and refers to national governments as responsible for directing the public process (van Tatenhove 2017). In such a paradigm, the extent to which MSP can become reflexive largely depends on the capabilities of the state to engage in deliberative and informational processes. We find this problematic: first and foremost, we argue that governance-by-government is always complemented by networked forms of governance, particularly in transboundary marine areas (van Tatenhove 2013). A better focus on informational flows is needed to identify and analyze MSP as a process of (re-) constructing and shaping marine reality, but such flows are not just governed by states

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(Gray 2018; Lamers et al. 2016; Toonen and Bush 2018; Toonen and van Tatenhove 2013). We claim that market parties, environmental non-governmental organizations (eNGOs), and other non-state actors also play a crucial role as they have capabilities that enable them to move information (separate, with or next to money and goods) across traditional (state) borders (cf. Sassen 2013). To gain better insights into the opportunities of a broad range of actors (including the state) to develop capabilities relevant for reflexive TMSP, research and policy initiatives should be developed beyond the state. Another important problem is that ordered and rational approaches of MSP neglect issues of specific distributive impacts and power dynamics (Flannery et al. 2016).

To overcome the shortcomings of a state-dominated, rational approach to MSP, we argue that TMSP should be (re-) conceptualized as a process of marine scaping (Toonen and van Tatenhove 2013). Marine scaping puts informational processes—rather than state authority—at the center of analysis of MSP. By building upon our earlier work, and that of other (environmental) sociologists, we aim to show that marine scaping sheds light on how reflexivity in TMSP comes about. We illustrate our argument with two examples from the tropical part of the world's oceans, the Tropical Eastern Pacific Ocean, and the Tropical Atlantic Ocean. These tropical oceans provide us with an interesting empirical frontier: MSP, when defined in its usual terms, is close to non-existent in these areas (Paddle project/Bonnin n.d.; Jay et al. 2013; IOC-UNESCO 2019). Ecological values and socio-economic interests seem however high for state and non-state actors from all over the world. Consequently, it is not clear who is in charge of reconciling marine conservation with ocean use, leaving room for a diverse set of actors to exercise their capabilities to change the ways in which marine space is governed.

Marine scaping and reflexivity

Thinking of (T)MSP as reflexive governance for dealing with spatio-environmental challenges at sea implies that it is underpinned by processes of political modernization (Arts and van Tatenhove 2006). The marine realm is especially a space in which many forms of multi-level and multi-actor governance prevail, following from the relatively limited jurisdiction for nation states in the high seas, as stipulated by the United Nations Convention of the Law of the Sea (UNCLOS) (Bush and Mol 2015; Van Tatenhove 2013, 2016). Reflexive governance implies (re-) invention of political practices outside the dominant political system (Voß et al. 2006), which in the realm of transboundary oceans and seas is typically characterized by high institutional fragmentation (Raakjaer et al. 2014; van Tatenhove 2017; Van Tatenhove 2013). Also, reflexive governance is grounded in processes of deliberation

and learning, wherein (new) information is the key resource for actors (cf. Beck 2006; Feindt and Weiland 2018). Information is in particular crucial for marine governance, due to the many knowledge gaps and uncertainties about the functioning of marine ecosystems, and marine biological processes. Also, environmental issues and spatial challenges remain largely out of sight, so information, often to be generated through advanced systems and technologies, is thus needed to illuminate what is happening where and when, by whom and how (Fairbanks et al. 2018; St. Martin and Hall-Arber 2008; Mol 2008; Toonen and Mol 2016; Toonen and Bush 2018).

The need to scrutinize information in governance processes is well-explained by Bullock (2017). By drawing on Foucault's "in knowing we control and in controlling we know", he states that "As its means of communication, information is central to this power of knowledge. Information represents an individual's ability to translate tacit, internalized knowledge into explicit, articulated words and symbols that can influence the knowledge and actions of others" (Bullock 2017: 17). In this understanding, information should not be perceived as an empty carrier, but as a mediator with power, that finds its way into different knowledge frames and decision-making processes. Mol (2006, 2008) concurs by explaining that informational flows are particularly formative in processes of environmental governance. In organizing and coordinating activities that result in a strong(er) potential to exploit marine resources (e.g. Blue Economy) and more effective marine conservation, new and incoming information does indeed not only affect the substance of environmental decision-making. Given the characteristics of today's Information Age, such as the rise of a high-tech global economy, an increasing democratization of knowledge, yet also the digital divide and loss of scientific authority, informational flows can, and do, change power balances between actors (Mol 2008; Bullock 2017). Focus on the central role of information and related changes allow for a better understanding of whose authorities and territories are not just dominant but also meaningful for deliberation and leaning about (new) logics and courses of action.

Due to the fragmented and highly dynamic institutional setting, rule-making at sea needs to be conceptualized in a way that territorialization is not automatically coupled to the nation state (Campbell et al. 2016; Jay 2018; Havice and Zalik 2018; Lamers et al. 2016; van Tatenhove 2016, 2017; Toonen and Bush 2018). This argument finds support in spatial and social theory alike, yet we draw predominately on the latter. Both schools of thought are influential in MSP studies, and moving towards each other in terms of ontology—particularly critical scholars find common ground in their call for a reconceptualization of MSP (Clarke and Flannery 2019; Ritchie and Ellis 2010; Fairbanks et al. 2018; Flannery et al. 2016; Jay 2012, 2018, 2019; Tafon 2018). While we do not want to promote separating the spatial and the social, acknowledging

the different vantage points helps to highlight different aspects of MSP as a governance process and allows to develop and discuss new conceptualizations. Spatial theory centers around the rethinking of the notion of space, such as Jay who reframes space “from soft to lively” (Jay 2018) and emphasizes a spatial dialect between “the striated and the smooth” (Jay 2019), so advocating for a more constructivist, relational, and flexible understanding of MSP. This is fully in line with our ontology, but we argue that social theorists can provide interesting insights because for them, the concept of space is *not* the key issue at stake. Starting questions are rather “who and how”, in order to analyze why social structures and interactions (can) bring about change, which in our case refers to creating more reflexivity in TMSP.

The analytical framework used in this paper is based on our earlier work on marine scaping, yet here complemented and refined with ideas about reflexivity and capabilities. We have suggested marine scaping as a conceptual approach to analyze stability and change in arrangements in which information is key as resource and/or governing mechanism for decision-making about spatial claims and conflicts at sea (Toonen and Van Tatenhove 2013). For a full description, we refer to our 2013 paper, yet here, we shortly explain the key elements: scaping, scapes, information, and Archer’s morphogenetic approach to capture the interplay between structure and agency (cf. Archer 2010a; Archer 2012; Appadurai 1996; Verrips 1988).

Marine scaping is the staging and ordering of maritime activities in space and time as the result of the interrelations between seascape, humanscape, and mindscape—which together make an overlapping, disjunctive order. The three scapes are analytically separated to be able to explicitly connect information (its substance, quantity, formats, processes of collection, processing, and use) to the physical environment and the spatial interactions between users and the environment (interplay seascape-humanscape, in Archer’s terms “structural conditioning”); and at the same time, to open up normative and ideological notions on both maritime and informational practices (interplay mindscape-humanscape, in Archer’s terms “cultural conditioning”; see Fig. 1).

Conceptually, MSP can be defined as marine scaping: it is a process of constructing and shaping marine reality in space and time, where relations between seascapes, humanscapes and mindscapes, at a specific moment in time, are the result of earlier day-to-day interactions between human activities at sea. Information makes these interactions visible, legible, understandable, and thereby governable (Toonen and Bush 2018), and allow them to become stabilized in institutional rules. In other words, marine scaping is the result of the interplay of agency and structure in a specific setting. In general, agency refers to individual or group abilities to affect physical, economic, and sociocultural environments, whereas structure refers to the material and ideational conditions, which define the range of actions available to actors. To capture dynamics

and change of marine scaping in terms of agency and structure we have drawn on Archer’s morphogenetic approach (Toonen and van Tatenhove 2013). Archer’s morphogenetic approach consists of cycles of changes that can be summarized as follows (see Fig. 2): the social interactions of agents are affected by the structural and cultural conditions (conditioning), which are the result of past actions (T^1 —marking the analytical starting point of understanding processes of change). There is not a deterministic relation between structure and agency; in social interactions, agents have at least some degree of independent power to affect events in social interactions (T^2 – T^3). This might result in changing conditions. This process of elaboration (or reproduction) is a result that no group or individual could foresee beforehand but emerges as the outcome of conflict or compromise. The changed structural and cultural context marks the beginning of a new circle of change (T^4 is the new T^1 of the next cycle of conditioning–interactions–elaboration). But in many cases, events leave conditions relatively unchanged, or actions fail to bring about desired changes (process of morphostasis) (Archer 2010b).

Using marine scaping as a conceptual lens in the study of reflexive governance in TMSP helps to better understand the ways and extent to which (T)MSP can follow new courses of action and become connected to different logics and discourses, if and how a governance arrangement is (becoming) reflexive.

Studies of a reflexive turn in (marine) environmental governance are associated with social theorists as Beck and Giddens (Beck et al. 1994; Giddens 1990; Beck, 2009; Mol 2008; Boström et al. 2017; van Tatenhove 2017; Feindt and Weiland 2018). Beck’s notion of “reflexive modernization” refers, to put it shortly, to a social order that is characterized by profound uncertainties and wide-reaching unintended consequences. Governance is then no longer aimed at problem-solving, but at problem-handling (Voß et al. 2006). Giddens highlights the importance of information in reflexive modernization: “social practices are constantly examined and reformed in the light of incoming information about those very practices, thus constitutively altering their character” (Giddens 1990: 38). Information is here, again, defined as a formative force. However, whether this force is for better or for worse depends, at least partly, on the ability of actors to (re)consider and change habitual action (“reflection”), and to handle (the idea of) one’s unknowing (“self-confrontation”) (cf. Beck et al. 2009).

This leads to the other addition to our original framework, which is to focus on *capabilities*, generally defined as the ability of actors to perform actions at one’s discretion, so representing their effective freedom to act (cf. Sen 1997; Jentoft et al. 2010). To better understand capabilities in the context of reconciling spatial claims at sea, we draw on the work of Sassen (2006, 2009, 2013). Although her work is on cities, Sassen provides an analytical perspective on bordering

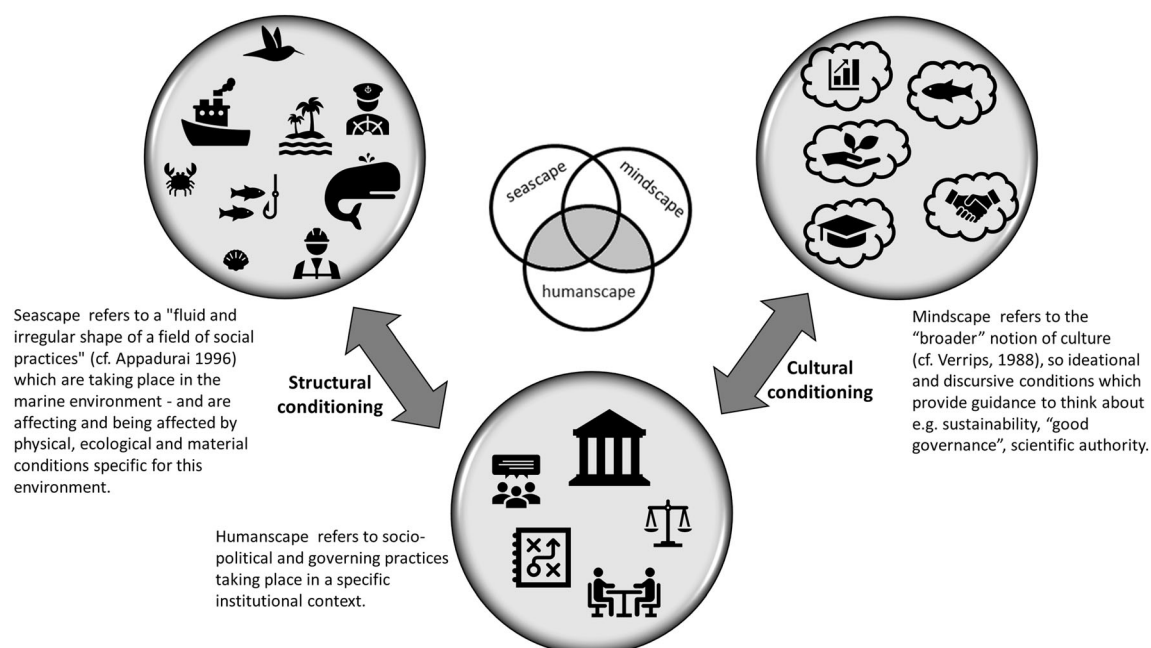


Fig. 1 Marine scaping: the interplay of humanscape with seascape and mindscape

capabilities by which non-state actors are able to shape bordered spaces transversal to traditional state borders, which can be applied also on the marine domain. Sassen's idea of "transversal bordering capabilities" refers to the ability to steer and control cross-border flows of money, goods, and information. Her central thesis is "that opening of traditional national borders may, in fact, strengthen a range of transversal bordering capabilities—transversal in the sense that these capabilities cut across traditional borders and enter and exist deep inside national institutional spaces" (Sassen 2008: 596). Transversally

bordered spaces are not merely cross-border flows, but are constitutive of distinct territories. These bordering capabilities can be mobilized for a broad range of dynamics, including some with scale-up potentials that can unsettle the territorial authority of the state. Sassen states that territory, as an analytic category, cannot be confined to its national instantiation; it should be conceived as a complex capability, because then it shows to have more meanings than are signaled by prevalent notions of territoriality. Transversally bordered spaces deborder territoriality—that singular encasement which

Fig. 2 The marine scaping framework and the morphogenetic approach. Derived from Toonen and Van Tatenhove 2013: 47

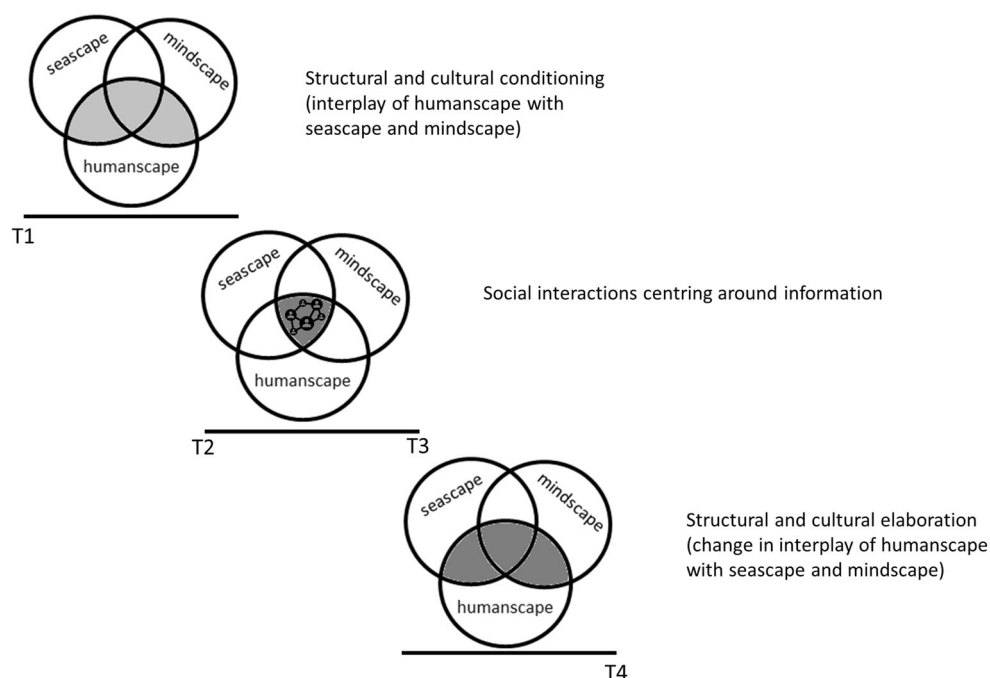
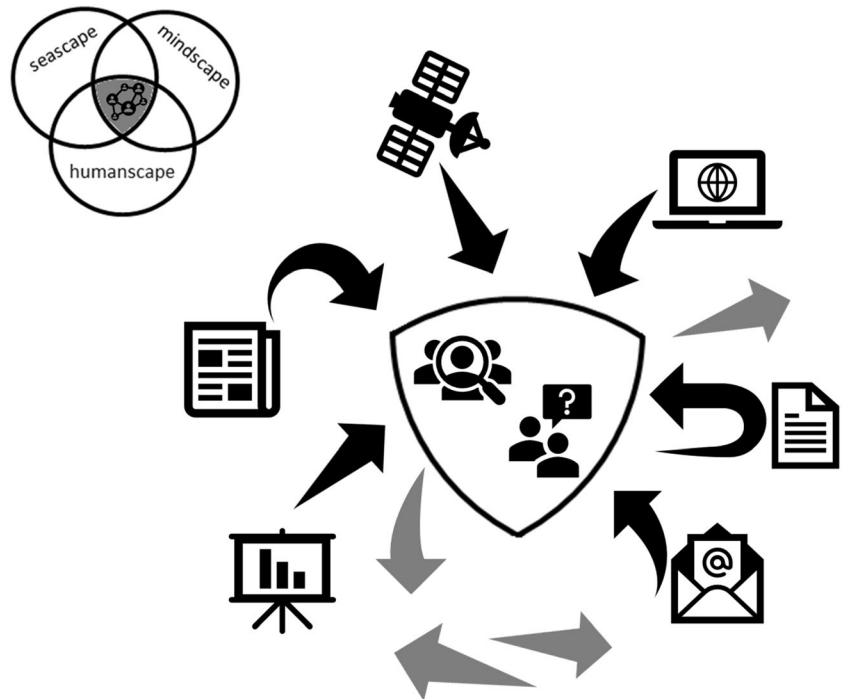


Fig. 3 Marine scaping and informational interactions



In informational interactions, all actors gather, produce, use, discuss information coming from different sources, by which they all try to influence each other and policy outcomes. Through personal and social reflexivity, norms, rules, perspectives and values can be challenged. (Grey arrows represent information are also flowing out, and/or not coming in).

constitutes it as national territory. In so doing, a focus on territory makes conditions, that are at risk of remaining blurry in the shadow of national/state territoriality, legible. The capability to make borderings has itself switched organizing logics: from institutionalizing the perimeter of a territory to multiplying transversal borderings cutting across that perimeter (Sassen 2008: 571). While Sassen (2013: 31) in her work on cities argues that transversally bordered spaces entail the making of distinct, albeit elementary territories and jurisdictions inside nation states, our focus here goes beyond or outside a single nation state. Nevertheless, it is of value to explore if Sassen's concept works out in the research field of marine governance: given the institutional ambiguity in the marine realm, all actors, state and non-state, can be expected to have transversal bordering capabilities; however, to what extent is a question open for research.

In bringing reflexivity and capabilities together in the marine scaping framework, it is useful to follow Donati (2010, 2011) who distinguished between personal reflexivity (a deep "self-conversation") and social reflexivity (insights evolving in/from interaction between actors when they seek to accommodate not only one's own interests and concerns (see Fig. 3). Building upon Archer's ideas about reflexivity (Archer 2007), Donati argues that reflexivity is not only a reactive process (as described by Beck et al. (1994)) but "a

capacity for reorientation and redirection, helping to build up new structures (...)" (Donati 2010: 144). Next to personal and social reflexivity, Donati also defines *systemic reflexivity*, referring to the sociocultural structures and their interactive parts, that is if reflexivity has pertained to structural and cultural conditions, and becomes an elaboration emerging from personal and social reflexivity in the social interactions (Donati 2010).

In line with the morphogenetic approach, as visualized in Fig. 2, we can thus state that maritime activities in a globalized society are mediated by different modes of reflexivity practiced by actors in their mutual interactions under the constraints of structural and cultural conditioning (T^1). At T^2 , we can observe actors who might have different (transversal) bordering capabilities in social interactions, in the context of T^1 . In these interactions (T^2 - T^3) personal reflexivity elaborates the informational interactions between actors, and social reflexivity can broaden or deepen these interactions. The new conditions emerging at T^4 depend on the extent to which reflexivity has been developed between T^2 and T^3 .

While Donati (2010) describes personal and social reflexivity, there is no clear insight in the extent to which the conditions of reflexivity are affected. This is however important for the understanding if and how a TMSP is (becoming)

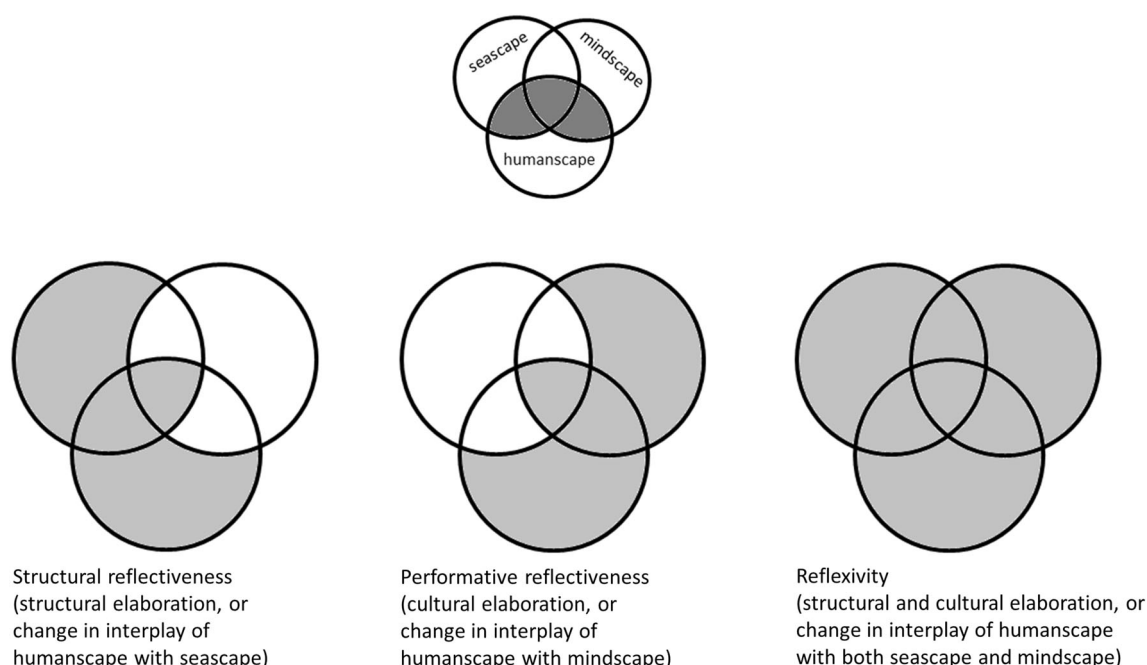


Fig. 4 Marine scaping and elaboration: structural and cultural reflectiveness and reflexivity

reflexive: the final assessment is the extent to which elaboration or morphostasis occurs. According to Van Tatenhove (2017), a reflexive governance arrangement for TMSP is both when actors are able to make use of different rule systems in order to change the institutional rules in which the arrangement is embedded (structural congruence, cf. Boonstra 2004) and the existing discursive space of a policy domain has been challenged (performative mobilization, cf. Pestman 2001). As such, reflexivity involves the recognition that governance subject and object—the governance system and the area of intervention—are so constituted through a recursive mutual contingency of subjective representations and interventions (Hertin 2016; Stirling et al. 2006). In other words, Van Tatenhove (2017) refers to a reflexive arrangement only if personal reflexivity and social reflexivity go beyond interactions and result in both structural and cultural elaboration (so in Donati's words, when systemic reflectivity occurs).

By using the typology of Van Tatenhove (2017), we distinguish three modes of reflexivity, representing different extents: structural and performative reflectiveness, and reflexivity. These three modes are possible outcomes of a process of marine scaping (see Fig. 4). *Structural reflectiveness* refers to the ability of actors to use rules and resources from different institutional settings within a given discursive space of a policy domain, but actors are not able to change the rules of the game. The dominant form of mobilization of actors is action-oriented¹ within

an existing governance setting. Despite informational interactions, conditions remain relatively unchanged (in Archer's terms, a process of morphostasis). *Performative reflectiveness* refers to the ability of actors to challenge the discursive space of a governance arrangement (performative mobilization)², resulting in for example alternative discourses, and related new coalitions, rules and resources existing side by side with the existing governance arrangement, but existing institutional rules and power relations (polity) are not challenged. As such, informational interactions fostered personal and social reflexivity leading to cultural elaboration, or the reproduction of the interplay between mindscape and humanscape. Van Tatenhove (2017) speaks of *reflexivity* when actors both challenge the existing discursive space of a policy domain, and are able to change the institutional rules (structural congruence)³, which thus refers to a process of morphogenesis (structural and cultural elaboration).

¹ Action-oriented mobilization is a form of mobilization where actors try to increase their political opportunities by mobilizing resources, applying rules, or forming coalitions within a certain institutional setting (Pestman 2001).

² Performative mobilization is a form of mobilization in which the discursive space of a policy domain is challenged (Pestman 2001). As a result, new coalitions are made possible and new rules and resources may become relevant. A discursive space consists of accepted conceptualizations, categorizations, and problem definitions of a socially and politically debated policy theme. The discursive space determines the actor's political opportunity for maneuvering, since it legitimizes the relevance of relationships between actors, rules, and resources.

³ In general, congruence means sufficient coherence or similarity between two objects, for example, coherence between the discourses actors use or coherence between the dimensions of a governance arrangement (Boonstra 2004). Structural congruence refers to the extent to which the governance arrangement as a whole is embedded in or matches the wider institutional context, or when there is no conflict between the governance arrangement and the institutional context.

Because each form of reflexivity (structural reflectiveness, performative reflectiveness, and reflexivity) is mobilized in informational interactions (T^2 – T^3) we can identify the different ways the discursive spaces of humanscapes and seascapes, and the institutional rules from structural and cultural conditioning have been challenged. This could shed light on alternative discourses for TMSP (about territory, authority, and legitimate ways of governing and governability), as well as the use of institutional rules from different institutional settings or the changing of institutional rules governing maritime activities (humanscape related to seascapes and mindscapes). In other words, the possibilities of structural and cultural elaboration (or reproduction) leading to new or alternative (transversally) bordered spaces is dependent on the forms of reflexivity developed in interactions.

TMSP as marine scaping in tropical oceans

Tropical seas are covering the equatorial midsection, generally positioned between the Tropic of Cancer and the Tropic of Capricorn (e.g., 23.5° North and South latitudes). Oceans considered to be tropical are the central Pacific, the central Atlantic, and most of the Indian ocean, encompassing large parts of the world's high seas, and bordering all continents but Europe and Antarctica (Hoyle and Duncan 2019). Tropical oceans, characterized by a water temperature at or above 20 °C, play a key role in regulating the Earth's climate, are biologically diverse and provide room to important and unique ecosystems (Ibid; Soliveres et al. 2016). For example, the world's most famous coral reef, the Great Barrier Reef (GBR), is a tropical system.

Governance of the GBR is an early example, and often also presented as a good practice, of applying spatial management approaches (Day 2008; Hassan et al. 2015). In the largest parts of the tropical oceans, MSP—as it is commonly referred to—is however close to non-existent (Paddle project/Bonnin n.d.; Jay et al. 2013). Ardron et al. (2008: 833) stated that “the broad variety of existing arrangements clearly demonstrates that some high seas management and protection is already achievable within current arrangements, albeit in a very piecemeal fashion”, but recognized that, regarding these existing arrangements, “management assessments have not been conducted” (ibid). About a decade later, this still is a valid claim.

In this section, we will present two cases to illustrate whether, and if so, how marine scaping processes in the tropical part of our ocean can be characterized by a mode of either structural or performative reflectiveness, or reflexivity. As cases, we selected two existing arrangements: the International Seabed Authority (ISA) and the International Commission for the Conservation of Atlantic Tunas (ICCAT). These arrangements are intergovernmental organizations, established for the regulation and control of mineral-related activities in the seabed in areas beyond national jurisdiction (ABNJ), respectively the management and conservation of tuna and tuna-like species (ISA 2019a; ICCAT 2019). Both are addressing important marine environmental issues in the tropical oceans for which spatial measures are (being) discussed and implemented (see Fig. 5). While neither will be considered an MSP arrangement from a conventional understanding of MSP (they do not have an exclusive or primary focus on spatial planning), we consider marine scaping to be a key process in the overall functioning and development of the arrangements as spatiality is of direct



Fig. 5 Geographic indication of Clarion-Clipperton Zone (CCZ) and the spatial Conservation and Management Measure (CCM) in the extended Gulf of Guinea, related to spatial approaches by the International Seabed

Authority (ISA) and the International Commission for the Conservation of Atlantic Tunas (ICCAT), respectively. World map blank template derived from (Wikimedia Commons 2008). Adaptions by the authors

concern, such as in exploring and exploiting mineral-rich grounds and protecting spawning areas and biodiversity hotspots. Moreover, we think of these arrangements to be nodes, or even hubs, in information networks related to marine environmental challenges. To us, they serve as what Buscher and Urry (2009: 108) call “transfer points” where mobilities (in our case, information flows) are “temporarily immobilized” and can become object of social science study. In that way, these transfer points illuminate the transversal bordering capabilities of actors by which space (or more specifically territories) can be (re)defined and (b)ordered. Because our analysis serves a theoretical purpose of exploring the extent to which marine scaping in a transboundary context bears reflexivity, our case studies are based on a desk study of available literature, policy documents, secondary sources (particularly Zalik (2015, 2018) for the ISA case), and additional information publicly available (online) such as news items, blogs, and position statements.

International Seabed Authority (ISA)

Seabed mining in the deep and the high seas is a specific process of marine scaping, i.e. ordering and regulation of mining activities (the exploration and exploitation of the extracting of minerals and energy sources from the seabed) in vulnerable marine ecosystems (humanscape–seascape). These activities include materials such as polymetallic sulphides, manganese nodules, cobalt-rich ferromanganese crusts, methane hydrates, and the potential mining of rare earth elements. Core of the seabed mining arrangement is the International Seabed Authority (ISA), which regulates and manages seabed mining at the high seas, i.e., beyond the limits of national jurisdiction. ISA is a UN agency⁴, consisting of the Assembly, the Council, the Financial Committee, and the Legal and Technical Commission (LTC). The Assembly consists of 168 member states, which are divided in regional groups⁵. Observer groups consist of non-member states, at this moment thirty countries including the United States of America (USA); UN and inter-governmental organizations; and non-state organizations, including eNGOs, i.e., Conservation International, Greenpeace, and the World Wide Fund for Nature (WWF), and also research centers and industry alliances like the World Ocean Council (ISA 2019b).

The LTC is responsible for reviewing mining applications, the supervision of exploration or mining activities, and the assessment of the environmental impact of such activities. Besides ISA, the seabed mining arrangements consist of firms (both private and state) who want to exploit minerals and

resources from the seabed and eNGOs. The humanscape of this arrangement consists of the political and regulatory institutional context as defined by UNCLOS and the claims of mining companies. The mindscape of seabed mining, i.e., the way actors define seabed mining, and the knowledge needed revolves around competing approaches to maritime law: “the deep seabed is divergently represented as *null* versus *common* property” (Zalik 2018; 2). “*Terra nullius*” or no-man’s land refers to the position that everybody has free access to and can claim the marine resources in ABNJ. The “common property” discourse implies that marine resources and the ABNJ are common heritage of humankind and everybody should have equal access to them. The “common property” discourse is the core principle of ISA. UNCLOS (Art. 145) stipulates that ISA is required to take necessary measures to ensure effective protection for the marine environment from harmful effects which may arise from mining activities in “the Area”⁶, that is, the seabed and the international waters beyond state jurisdiction. To realize this common property ideal, UNCLOS (Art. 153) has defined the “*the parallel system*”. This parallel system refers to the principle that in case of polymetallic nodules an application must be sufficiently larger and of sufficient value to accommodate two mining operations of “equal estimated commercial value”. One part is to be allocated to the applicant and the other is to become *reserved area*. These reserved areas are set aside for activities by developing states or by the Authority through its *Enterprise* and is managed by the signatory states of UNCLOS via the ISA. However, research activities in the area are marked by geopolitical tensions between the Global North and South and unequal power positions related to historical claims of private contractors before UNCLOS came into force (for an extensive overview, see Zalik 2018).

By example of the *Clarion-Clipperton Zone* (CCZ) we analyze the process of marine scaping and the possibility of reflexivity in seabed mining as a process of marine scaping. The CCZ is a seabed area of about 6 million km² in ABNJ in the Eastern Central Pacific Ocean (see Fig. 5). The CCZ is considered as a prime location for commercial exploration and exploitation of polymetallic nodules. Although scientific exploration and prospecting research has been conducted since the 1960s, no commercial exploration has yet taken place (Lodge et al. 2014).

The development of the Environmental Management Plan for the CCZ by ISA’s LTC can be seen as a form of (non-state

⁴ Mandated under the United Nations Convention on the Law of the Sea (UNCLOS) and the 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea.

⁵ ISA regional groups are African group, Asian-Pacific group, Eastern European group, Latin-American and Caribbean States, Western European, and other states (ISA 2019a).

⁶ “To this end the Authority shall adopt appropriate rules, regulations, and procedures for inter alia: (a) the prevention, reduction, and control of pollution and other hazards to the marine environment, including the coastline, and of interference with the ecological balance of the marine environment, particular attention being paid to the need for protection from harmful effects of such activities as drilling, dredging, excavation, disposal of waste, construction and operation or maintenance of installations, pipelines and other devices related to such activities; (b) the protection and conservation of the natural resources of the Area and the prevention of damage to the flora and fauna of the marine environment.” (UNCLOS, art. 145)

directed) MSP in the high seas. In 2010, the LTC organized a workshop with marine reserve and management specialists to discuss and draft a management plan for the CCZ, which was decided upon in 2011. This plan divided CCZ spatially in three strata for conservation management. The plan included, besides areas for exploration of polymetallic nodules, also the possibility of the establishment of a network of protected areas, called Areas of Particular Environmental Interest (APEI). The plan formulated scientific design principles of APEIs, also incorporating flexibility (ability to modify the location and size of the APEI, based on for example, improved information about the location of mining activities) (ISA 2011: 6–8). On 26 July 2012, ISA approved the Environmental Management Plan for the CCZ to be implemented in three years, including the designation (on a provisional basis) of a network of APEIs (ISA 2012). Nine APEIs in different bio-geographic sub-regions were designated, with a protected area of 400 km × 400 km, placing roughly 25% of the whole CCZ management area under protection. The Council noted in its decision that, by designating APEIs, the precautionary approach as called for by the Regulations had been put in place and decided that for a period of five years, no application for exploration rights should be granted in these protected areas.

Currently, 16 contractors have been granted exploration licenses for the CCZ (see Annex 1). Some of these contractors are successor firms to the pioneer investors who had been given exclusive rights to undertake “pioneer activities”. For example, Lockheed Martin has an exploration permit for the CCZ⁷, holding only rights under the US law. The USA, an observer in ISA, has not ratified UNCLOS, but allows, also through agreements with other states, US companies to capitalize on their first mover advantage (Zalik 2018). Moreover, greater access to capital as well as proprietary data keep these companies in pole position (Ibid.). Although UNCLOS is promoting information exchange, when considered commercially sensitive data, there is much room for exceptions, which especially benefits those with longstanding experience and strong research connections, like Lockheed Martin that can play the role “as purveyor of data to competing firms” (Ibid.: 347).

Another tension expressed in informational processes relates to the lack of a comprehensive approach to marine conservation. International debates on marine biodiversity run parallel to ISA’s development of its extractive regime. While ISA exploration contracts require firms to carry out ecological research, including a baseline study, this research does not need to include, or provide, the requisite data needed to meaningfully measure impact (Zalik 2018). According to the LTC, there is

a lack of raw data associated with environment baseline studies, while data are also considered to be of insufficient quantity and quality impeding the validity of a regional environmental management plan (Lodge et al. 2014: 69). The concern of eNGOs is that proceeding with seabed mining in the absence of detailed knowledge is contrary to the precautionary principle. For example, in 2018, the European-wide, Brussels-based NGO “Seas at Risks” demanded the Belgian government and ISA to conduct a public consultation regarding the exploration contract of the Belgian company Global Sea Mineral Resources (GSR), in particular the environmental impact assessment related to a mining equipment test (Seas at Risk 2018a). Seas at Risk stated that the procedure was unclear but succeeded to get their request granted by the Belgian authorities, which organized an open consultation and reviewed GSR’s impact assessment (FPS Economy 2018; Seas at Risk 2018b). Seven comments (all Belgian but one) were received of which two were rejected; the other five were separately addressed. The Belgian government issued an overall response in which it recognized the problem of knowledge gaps, stating “knowledge gained from this test is important in order to set the bar for environmental standards as high as possible” (Government 2018: 3). It set out several action points, including the request to GSR to revise its executive summary of its assessment report. It also recommended to GSR to make parts of annual reports publicly available, recognizing that the Belgian government itself “is bound, as a member of ISA, to follow the confidentiality rules” (Ibid: 2). Also, the response refers to an announcement made by the LTC chair to set up a workgroup to consider the review process of an environmental impact assessments in the future (ibid: 3).

Governance by ISA, at least in case of CCZ, can be characterized as a form of structural reflectiveness. Marine scaping is predominantly affected by persistent and longstanding power relations, particularly showing transversal capabilities of pioneer firms in steering informational processes. They use historical rules and their first mover advantage, based on rights granted before the negotiations and ratification of UNCLOS to maneuver within the ISA arrangement. While this can be considered a rather morphostatic process, the establishment of the Environmental Plan including APEIs does affect the interplay between seascape and humanscape. Furthermore, the open consultation regarding the GSR exploration contract shows the ability of eNGOs to apply procedures common in a different governance setting, e.g., Belgium, to mobilize an ISA member to improve working practices in the arrangement.

International Commission for the Conservation of Atlantic Tunas (ICCAT)

The International Commission for the Conservation of Atlantic Tunas (ICCAT) is one of the five Regional

⁷ The USA developed its own legislation on deep sea mining, the 1980 Deep Seabed Minerals Resources Act. Based on this act and because the USA set up agreements with “reciprocating states” (such as the UK, France, and Germany), Lockheed got an exploration permit for the CCZ (Zalik 2018).

Fisheries Management Organizations (RFMOs⁸) focusing on tuna and tuna-like species. ICCAT entered into force in 1969, and its main goal is to make recommendations to its Contracting Parties about the design, implementation, and control of fishing effort limits and technical measures, which may include spatial management. Many tuna stocks managed by ICCAT are fully exploited or overfished, such as bigeye, yellowfin, and bluefin tuna. Tuna (and tuna-like) species are highly migratory, which means that marine scaping (more specifically the interplay of seascape–humanscape) relates to the whole convention area, which spans the Atlantic Ocean and adjacent seas. Given the high commercial value of tuna, ICCAT has 53 Contracting Parties (52 nation states and the European Union), so including distant water fishing nations (ICCAT n.d.). There are five cooperating non-Contracting Parties, both Atlantic countries as well as distant water fishing nations (Ibid). At ICCAT's core is scientific and technical information “on the abundance, biometry and ecology of the fishes; the oceanography of their environment; and the effects of natural and human factors upon their abundance” (ICCAT 2019, Art. IV), resulting in an organizational emphasis on committees tasked with collecting, compiling, and reviewing available scientific data (Fig. 6; interplay mindscape – humanscape). Moreover, eNGOs are eligible for (long-term) observer status since 1998 (ICCAT 2005). In the past, ICCAT has been heavily criticized for prioritizing economic interests (advocated by a strong EU “friends-of-fishing” coalition, cf. Belschner 2015) and accused of disregarding information from its own scientific advisors, particularly regarding bluefin tuna (BBC news and Black 2008; Mongabay and Hance 2009; WWF 2013). Currently, ICCAT seems to grow a more pro-sustainability attitude (Belschner 2015). However, WWF who holds ICCAT observer status, stated to be very disappointed by the outcomes of ICCAT's 2018 meeting, again claiming scientific advice is being ignored (SeafoodSource 2018; WWF 2018).

Boerder et al. (2019) state that given the highly mobile nature of tuna, spatial management has not received much scientific attention in general, but ICCAT seems a frontrunner, by its recognition of the potential of “dynamic zoning” or “flexible spatial management” for tuna governance. Zoning is considered a key management measure in MSP (cf. Kenchington and Day 2011), so by focusing on discussions of spatial Conservation and Management Measures (CMMs) by Panel 1 (tropical tunas), we here elaborate on the process of marine scaping and the reflexive mode of governance by ICCAT.

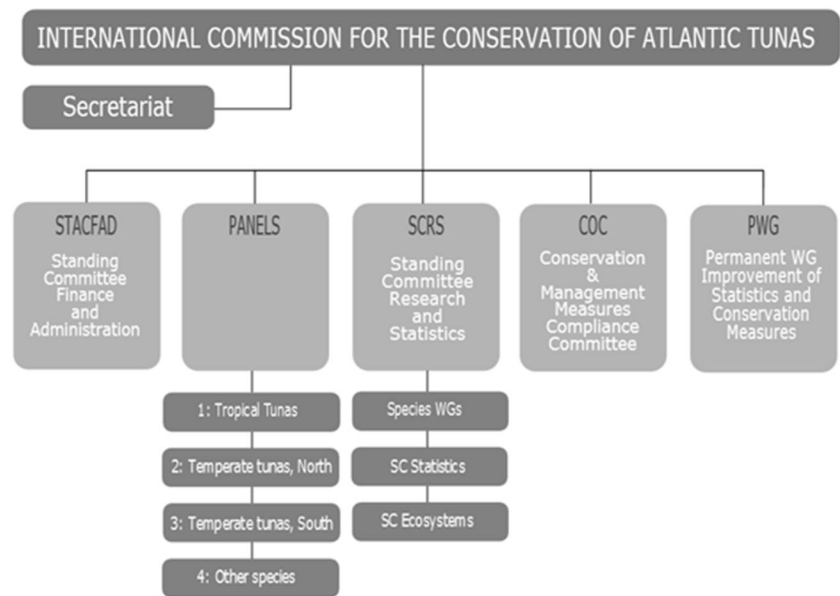
In the early 2000s, ICCAT started discussing spatial CMMs, like seasonal (e.g., related to spawning) and gear-specific closings for reducing fishing pressure on tropical tuna. This resulted in a one-month area closing for bigeye tuna fishing in 2004 (ICCAT Rec. 04–01). The closed area can be roughly defined as an extended Gulf of Guinea, a transboundary area covering (parts of) the EEZs of Liberia, Ivory Coasts, Ghana, Togo, Benin, Nigeria and Cameroon, and ABNJ (see Fig. 5). In 2008, Recommendations 04–01 were replaced, implying a decrease of the area and an increase of the closing season (to three months; ICCAT Rec. 08–01), followed in 2011 by adjustment in seasonal and gear-specific closing, an addition to also protect yellowfin juveniles, and a change in area and time (two-month closure, ICCAT Rec. 11–01).

According to Hobday et al. (2010) CMMs require regular, up-to-date information and/or predictions to be successfully implemented. In 2011, it was noted “that the SCRS does not have the data necessary to fully evaluate options for area/time closures and to propose precise relevant recommendations” (ICCAT Rec. 11–01); while in 2014, ICCAT was “*EXPRESSING GRAVE CONCERN* about the difficulties encountered by the Standing Committee on Research and Statistics (SCRS) in investigating the state of the stocks of tropical tunas from the Convention area and to fully evaluate options for area/time closures and propose precise relevant recommendations because of the lack of reliable data collection mechanisms by some CPCs” (ICCAT Rec. 14–01, p. 1; *Italics in original*). In 2015, the SCRS had concluded that area/time closure has not been, or only minimally, effective because of increased effort into areas adjacent to the closed area (ICCAT 2015). This did however not result in dismissing the CMM. The new Recommendations showed an adjustment in area size back to the 2008 parameters, and skipjack tuna were added as protected species (ICCAT Rec. 15–01). In Recommendations 16–01, which are currently in force, the area/time closure remains in place with no change in conditions compared to 2015 (ICCAT 2016). The area/time closure was to be evaluated in 2019 (ICCAT Rec. 16–01).

ICCAT recognized the need to also adopt monitoring and control measures to effectuate the area/time closure. In 2012, a port sampling programme was developed to monitor compliance, and in 2014, an observer programme has been put in place, setting coverage of national observers on a minimum of 5% of the fishing effort, which is now increased to 100% coverage (ICCAT 2016). Moreover, Ghana whose small-scale fisheries are largely affected by the area/time closure had been participating as one of the two pilot countries in the Common Oceans ABNJ Tuna Project. This project focused on the use of Electronic Monitoring Systems, and was a joint effort of WWF, the International Seafood Sustainability Foundation (ISSF), the Ghanaian tuna industry, the Ghanaian

⁸ RFMOs are mandated under the United Nations Convention on the Law of the Sea (UNCLOS) and the 1995 United Nations Fish Stocks Agreement (UNFSA). Tuna RFMOs can be considered specialized RFMOs, while there are also general (so non-species specific) RFMOs.

Fig. 6 Organigram Commission Structure. Derived from (ICCAT n.d.-a.)



government, and the Food and Agricultural Organization (FAO) (FAO 2018, 2019).

The subsequent Recommendations and the discussions in ICCAT's Panel 1 also show a growing recognition that the impact of increased use of particular gear (fishing aggregation devices; FADs) has to be addressed, although members agree "that more input from the SCRS is required to determine the best options for managing FADs" (ICCAT 2018b: 3). This could read as an expression of the precautionary principle. Generally, ICCAT indeed seems to move to more broad and holistic deliberations, e.g., by recognizing the need for multi-species management, and developing a pilot ecosystem plan for the Atlantic Tropical Region (ICCAT 2018a). Spatial CMM remain part of possible measures, and discussions also address how these relate to other measures. In the last Panel 1 meeting, for example, El Salvador suggested extensive Atlantic-wide area/time closure as an alternative to setting a Total Allowable Catch (TAC). In response, a scientific expert recalled results from previous SCRS analysis, stating "If the fleets harvest more during the open season to make up for the lost catch during the closure, then any potential benefits would be offset by this additional effort" (ICCAT 2018a: 3).

The governance mode expressed by ICCAT can be assessed as a form of performative reflectiveness. The discursive space of ICCAT reflects willingness to adapt to new insights, at least to some extent, shown by the implementation and refinement of the spatial CCM in the Gulf of Guinea and by the related port sampling and observer programmes and the pilot ecosystem plan for the Atlantic Tropical Region. Also, the fact that documentation including meeting reports are publicly available opens up possibilities for personal and social reflexivity, also by non-ICCAT states, observers, and others. Furthermore, the Ghanaian pilot study in the Common Oceans

ABNJ Tuna Project points to the transversal capabilities of different public and private actors forming a new coalition (with new resources) existing side-by-side ICCAT.

Discussion

Our cases represent two governance arrangements in the high seas, the largest part of the world's oceans, where MSP as it is commonly defined, seems to be merely absent. By using marine scaping as an analytical framework, we bring informational (rather than state) processes to the fore, so to better scrutinize the spatial approaches and processes developed to improve environmental management in ABNJ, which is often described as uncharted territory. This informational focus demonstrates reconciliation of human use and nature protection by the delineation of protected areas as part of deep seabed mining governance, governed by ISA, and the spatio-temporal allocation of tuna fisheries by ICCAT. It also emphasizes processes of territorialization in transboundary areas, in which states play an important role, yet side-by-side non-state actors. States are engaged through a public process (ISA and ICCAT are mandated by the UN), but also bound by strong economic interests. In ISA, some nation states act as close allies of big international companies. The CCZ case shows how nation-specific rules or practices, such as on regulation on data protection (US-Lockheed Martin) or public consultation (Belgium-GSR) affect informational processes in the deep seabed mining arrangement. ICCAT's convention area also spans EEZs, so there is clear state responsibility defined for monitoring and surveillance, such as the West- and Central African countries in the above-discussed spatial CMM in the Gulf of Guinea. However, tuna fishing is a global

billion dollar industry, and large parts of catch quota are held by distant water fishing nations (for example, the EU is in the top three for big eye tuna). The NGO critique that member states (still) ignore scientific advice points to a strong economic rationality, and a more skeptic reader might indeed think of the panel decisions to wait for more scientific input as delaying tactics in favor of short-term economic benefits.

This paper presents a theoretical elaboration of marine scaping as presented in earlier work (Toonen and van Tatenhove 2013), by incorporating the concepts of capabilities and reflexivity. Sassen's transversal bordering capabilities make it possible to get insight and to explain the process of scaping (the ordering of maritime activities in time and space as the interplay of the three scapes) in more depth, by focusing on the capacity of actors to make borderings beyond and outside the territories and authority of nation states. More generally, by incorporating capabilities in the marine scaping framework, processes of territorialization become explicitly linked to an understanding of marine environmental governance as highly networked and increasingly driven by high-tech developments and democratization of knowledge. The two cases show different transversal capabilities of actors. In the deep seabed-mining case, companies that are granted license to exploit the CCZ are big multi- and/or international players who are able to mobilize technological expertise to explore possible exploitation in this area far out, and deep in, the ocean. The mining industry, especially pioneer firms, possesses what Zalik (2018) calls "first mover advantage" because they hold proprietary knowledge of the Area, have invested in ecological data (which are not automatically shared), and are able to make use of historical rules to strengthen their position within the mining governance arrangement. While this refers to acting within traditional state-based structures, smart shifting, and combining of these resources makes it possible for these firms not only to steer and govern the interplay of seascape and humanscape, but also to define its bordering. The ICCAT case also shows examples of transversal capabilities. In the Ghanian pilot study in the Common Oceans ABNJ Tuna Project, different public and private actors have demonstrated the ability to form a new international coalition and to seek new ways to improve transparency by integrating (new) electronic monitoring in fisheries management. Also for ICCAT itself, (increased) transparency can be seen as a way to cut across traditional ways of working. Moreover, WWF is, by both collaborating with, and criticizing ICCAT member states, an example of the role NGOs are often considered to play well in marine environmental governance, that is, to promote spatial approaches while also traversing national borders (Calado et al. 2012; Campbell et al. 2016; Parmentier 2012).

Secondly, by following Van Tatenhove's argument that reflexivity as governing principle is essential to (T)MSP, marine scaping also gained explanatory power in its diachronic

analysis. By distinguishing different forms of reflexivity (structural reflectiveness, performative reflectiveness, and reflexivity), it is possible to analyze and to explain how and under what conditions the discursive spaces of an arrangement are challenged and what the possibilities are to challenge institutional rules and to introduce new ones. The two cases show different developments of marine scaping (in the sense of different elaborations of sea- and mindscapes with the humanscape), due to different forms of reflexivity⁹. The possibilities of governing deep seabed mining activities is shaped by structural reflectiveness. Firms are capable of using historical rules next to the rules of ISA but are not able to change the rules of the ISA arrangement. Governance in the ICCAT case is affected by performative reflectiveness. The examples of the implementation and refinement of the spatial CCM in the Gulf of Guinea and the pilot ecosystem plan for the Atlantic Tropical Region show possibilities to change discursive space of ICCAT.

Conclusions

MSP processes in transboundary areas, such as ABNJ but also in regional seas, need to be defined in a way that captures its most dominant explanatory factor, which we argue is the interplay between information and reflexivity rather than the dominant planning authority of nation states. In that way, we can understand MSP to come about in various guises, as complex power processes that go beyond the formal and expectable. By selecting our cases from a different and largely unexplored empirical reality, the tropical seas, we aimed to demonstrate that if (T)MSP is defined differently, we come to understand nation states as one of many actors and not necessarily the ones steering planning processes, allowing to get a fuller picture of how planning processes at sea work out, specifically about the extent to which a broad range of actors is able to affect reflexivity in (T)MSP arrangements. The ISA case about the exploitation of the CCZ shows in particular that non-state actors (e.g., Lockheed Martin and Seas at Risk) are deliberately drawing on state authority rather than being directed by it.

Within territorial waters, MSP is very much state driven and is presented as an instrument to deal with handling both

⁹ We recognize that our analysis has been based on desk study only, which served the purpose of this paper, but limits the level of detail in which the personal and social reflexivity in informational interactions have been studied. The work by Zalik (2015, 2018), here used as secondary source, is however based on interview data and has shed light on particularly personal reflexivity of participants of the ISA arrangement related to the CCZ. The documentation, including meeting reports, made publically available by ICCAT provided some more insights in discussions and deliberations, as such in the social reflexivity. For future research and closer assessments, we suggest data collection methods like interviewing and participatory observation will be very useful and insightful to further scrutinize personal and social reflexivity.

environment–user and user–user conflicts. When moving to the high seas, the processes of spatial ordering and staging changes from balancing these conflicts, or even predominantly managing multi-use conflicts, to a focus on environment–user conflicts. These conflicts are being dealt with in sectoral arrangements, like ISA and ICCAT, confirming the claim by Ardrón et al. (2008) that high sea management is uncoordinated. We are however more reserved when considering their plea for high-level global support and coordination, particularly that a UN body “with a broad mandate to ensure coordination, coherence and cooperative action” should be established and “agreed overarching governance rules” are to be developed (Ardrón et al. 2008: 837). Our two cases show no sign of multi-use conflicts¹⁰ and other clear examples in the high seas are also lacking, so to increase focus on user–user conflicts by installing a high-level body does not seem in line with today’s reality. Although we agree cumulative impacts of multiple uses (e.g., Freestone et al. 2014) and potential/future conflicts in (tropical) transboundary areas deserve more scrutiny, we still question whether a meta-agency for TMSP on the global level would be desirable. A key pitfall is that this emphasizes (again) traditional ordering based on state authority rather than the transversal bordering capabilities of non-state actors, and networked environmental governance (cf. Gray 2018). Also, marine scaping by a meta-agency runs the risk of particularly leaning towards the interplay of mind- and humanscape, as informational processes in a high-level approach become footloose from particular seascapes to serve the purpose of feeding into all-compassing principles (cf. Kidd and Shaw 2014). This would be in contrast with our understanding that it is actually structural elaboration that reflects change in the ways in which the marine environment is used and protected.

Attention should go to designing ways to increase, support, and secure reflexivity in existing arrangements, and their interlinkages, especially since we wish to bring the environment to the forefront. But then new conceptualizations to understand spatial allocation in transboundary areas, including the high seas, are needed. The marine scaping framework, enriched with the concepts of capabilities and reflexivity, provides new insights because it explains processes of change and stability in more depth by emphasizing the abilities of actors in informational interactions to change the rules of the game and discursive spaces, resulting in changing structural and cultural conditions (elaboration). Understanding (T)MSP as marine scaping makes it therefore possible to, firstly, analyze and explain the role of state and non-state actors and their relations with the seascape and, secondly, assess the performative force of information and reflexivity.

¹⁰ Except for multi-species considerations in ICCAT, as also indicated by Ardrón et al. 2008

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Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Annex 1: Contractors in CCZ

- China Minmetals Corporation. (China). Contract May 12, 2017–May 11, 2032
- Cook Islands Investment Corporation (Cook Islands). Contract: July 15, 2016–July 14, 2031
- UK Seabed Resources Ltd. (UK) Contract: March 29, 2016–March 28, 2031 (CCZ II)
- Ocean Mineral Singapore Pte Ltd. (Singapore) Contract January 22, 2015–January 21, 2030
- UK Seabed Resources Ltd. (UK) Contract: February 8, 2013–February 7, 2028 (CCZ I)
- Global Sea Mineral Resources NV (Belgium), Contract: January 14, 2013–January 13, 2028
- Marawa Research and Exploration Ltd. (Kiribati). Contract: January 19, 2015–January 18, 2030
- Tonga Offshore Mining Limited (Tonga). Contract: January 11, 2012–January 10, 2027
- Nauru Ocean Resources Inc. (Nauru). Contract: July 22, 2011–July 21, 2026
- Federal Institute for Geosciences and Natural Resources of Germany (Germany). Contract: July 19, 2006–July 18, 2021
- Institut français de recherche pour l’exploitation de la mer (France). Contract: June 20, 2001–June 19, 2016. Extension: June 20, 2016–June 19, 2021
- Deep Ocean Resources Development Co. Ltd.(Japan). Contract: June 20, 2001–June 19, 2016. Extension: June 20, 2016–June 19, 2021
- China Ocean Mineral Resources Research and Development Association (China). Contract: May 22, 2001–May 21, 2016. Extension: May 22, 2016–May 21, 2021
- Government of the Republic of Korea (Republic of Korea). Contract: April 27, 2001–April 26, 2016. Extension: April 27, 2016–April 26, 2021
- JSC Yuzhmorgeologiya (Russian Federation). Contract: March 29, 2001–March 28, 2016. Extension: March 29, 2016–March 28, 2021
- Interoceanmetal Joint Organization (Bulgaria, Cuba, Czech Republic, Poland, Russian Federation, and Slovakia). Contract: March 29, 2001–March 28, 2016. Extension: March 29, 2016–March 28, 2021

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