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Protecting biodiversity in areas beyond national jurisdiction: An earth system governance perspective

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ABSTRACT

In September 2018, following over a decade of informal discussions, the United Nations General Assembly launched an intergovernmental conference to address the conservation and sustainable use of biodiversity beyond national jurisdiction. This process is scheduled to take two years and is structured around four themes: marine genetic resources, area-based management tools (including marine protected areas), environmental impact assessments, and capacity building and marine technology transfer. This Perspective draws on the earth system governance literature and the authors' own experience of and views on the BBNJ process to provide insights and recommendations for the ongoing negotiations. It highlights three areas of concern: (i) the politicization of science and coping with scientific uncertainty, (ii) institutional fragmentation; and (iii) the need for a new agreement to respond to the complex set of multiple, multilevel, and systemic threats to marine biodiversity beyond national jurisdiction.

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1. Introduction

After over a decade of preparatory discussions, in September

2018 the United Nations (UN) began formal negotiations on an international legally binding instrument to address the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction (BBNJ). Discussions in the UN General Assembly leading up to the negotiations reaffirmed the urgency of protecting areas beyond national jurisdiction, which encompass more than 64% of the ocean's surface, 95% of its volume, and contain numerous rare and vulnerable ecosystems and species currently lacking international protection, such as marine microbes, algae, sponges and corals, some of which also have potential medical and other human uses. Areas beyond national jurisdiction comprise the high seas (water column) and "the area" (seabed) beyond nation states' 200 nautical mile exclusive economic zones

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and are found in all of the world's oceans, from the Arctic to the Antarctic.

UN General Assembly Resolution 72/249 authorized an inter-governmental negotiation process for 2018–2020 focused on four key issues: access to and benefit sharing of marine genetic resources; area-based management tools including marine protected areas; environmental impact assessments; and capacity building and marine technology transfer to help developing countries benefit from and contribute to the conservation and sustainable use of BBNJ. The new international legally binding instrument will be nested within the UN Convention on the Law of the Sea (UNCLOS) and is designed to complement existing international agreements on issues such as high seas fisheries, deep sea mining, marine pollution, intellectual property rights and biodiversity protection. Assuming the negotiations succeed and produce an ambitious regulatory framework, this agreement will constitute a major innovation in earth system governance and could add more complexity and robustness to existing global ocean governance (Young, 2017). The BBNJ negotiations also represent an important shift in focus for UNCLOS, from control and prevention of pollution and living marine resource overexploitation to direct management and conservation of biodiversity, including its genetic components.

Social science research on earth system governance offers numerous insights on the factors that have promoted successful negotiation, design, and implementation of international environmental agreements that are similar to the planned BBNJ instrument (Young, 1999, 2001, 2011; Andresen and Hey, 2005; Biermann, 2014; Brown Weiss and Jacobson, 1998; Byrne, 2015; Dombrowsky, 2008; Haas et al., 1993; Helm and Sprinz, 2000; Miles et al., 2002; Underdal and Young, 2004; Victor et al., 1998; Vollenweider, 2013; DeGarmo, 2005; Dimitrov, 2010, 2016; Koremenos, 2016; Koremenos et al., 2001). Here we identify findings from various literature relevant to those negotiations, including regime theory, critical theory, science and technology studies, and coupled human and natural systems. Negotiators must overcome three major challenges to reach meaningful agreement: (i) the politicization of science, which may inhibit agreement on whether to act, especially in a context of decision-making under uncertainty; (ii) institutional fragmentation and interplay, which make it challenging to add elements to an already crowded ocean governance space in ways that increase coherence and effectiveness; and (iii) the need for the new international legally binding instrument to respond to the complex set of multiple, multilevel, and systemic threats to marine biodiversity beyond national jurisdiction (including, among other things, overfishing, plastic pollution, and climate change).

Success in the BBNJ negotiations will require both that an international legally binding instrument enters into force, and that negotiators design the agreement so that it achieves its objectives, which may also require soft law approaches such as global and national guidelines, best practices, and principles for conservation and use (Abbott and Snidal, 2000). The prospects for success in the BBNJ negotiations depend upon the ability of governments to address a range of challenges that were already in evidence during the first intergovernmental conference in September 2018 (De Santo, 2018; Tiller et al., 2019), including responding to the challenges of climate change and biodiversity loss (Dryzek and Pickering, 2019). The large number of interested states and stakeholders with vested interests present negotiators with the classic negotiation dilemma of identifying obligations and commitments that are demanding enough to solve the problem but not so demanding that states will oppose their inclusion in an agreement or reject membership in an agreement that includes them. Negotiators will need to find a “sweet spot” that requires enough effort from states to generate real environmental benefits but not efforts

that are so costly that states choose not to participate in, or implement, the agreement.

2. Knowledge and uncertainty

Efforts to promote international environmental cooperation depend on developing a shared view of the causes and impacts of an environmental problem and identifying available and effective strategies to address it (Haas, 1992a; Mitchell et al., 2006a). Both threats to biodiversity and the benefits of biological resources often result from broad and complex chains of cause and consequence, elevating the importance of scientific information for understanding sources and impacts. As a result, progress in environmental negotiations can be hindered by several aspects of scientific uncertainty, including incomplete data, scientific ignorance (Wynne, 1992), uncertainty related to system complexity, and the manipulation of uncertainty to cause confusion (Oreskes and Conway, 2010). Limited knowledge about both the condition of and dynamic processes that characterize biodiversity in the world's oceans and their possible commercial use, especially in areas beyond national jurisdiction, ensures that scientific ignorance and uncertainty will play an even larger role in the BBNJ negotiations than they have in other environmental negotiations. Furthermore, various states and corporate actors already have strong security and economic interests in controlling or exploiting biodiversity in these regions and consequently also have incentives to exploit and exacerbate this uncertainty to block international cooperation altogether, or channel it in directions advantageous to their interests. There are many ways in which values and interests become embedded in what environmental research is conducted, what solutions get proposed, and how scientific results are interpreted by various audiences, points clarified in the science and technology studies literature (Jasanoff, 1990).

The politicization of scientific advice can be particularly problematic with respect to BBNJ, where we are missing key information about the distribution of biodiversity in relevant parts of the ocean and the vulnerability of those ecosystems to human activities (Harden-Davies, 2018; De Santo, 2010; Ramirez-Llodra et al., 2010; Inniss and Simcock United Nations, 2017; Gollner et al., 2017). There is also a degree of information asymmetry wherein powerful industries, including fishing, mining, pharmaceuticals, and commercial shipping, can use their significant informational advantage to influence policy, disadvantaging developing countries in particular. For example, almost half of all patents related to marine genetic resources are held by one international corporation, BASF (Williams, 2018), and a recent analysis of nearly 13,000 genetic sequences derived from 862 marine species found that 98% of all patent sequences were registered in 10 countries, leaving 165 countries underrepresented (Blasiak et al., 2018).

Developing countries have pushed for capacity building and marine technology transfer in the new BBNJ instrument, in part to redress this data collection asymmetry; it is a critical element of current negotiations, particularly with respect to access and benefit sharing. While the Convention on Biological Diversity has developed a regime for the fair and equitable sharing of resources related to the utilization of genetic resources within the Nagoya Protocol, it applies only to territory within national jurisdiction (Article 4). If and how this regime will be adapted and applied to BBNJ as a truly global approach remains to be determined. It is also worth noting that the potential profitability of marine genetic resources is still uncertain (Leary, 2019a).

Two main strands of social science research offer important insights for overcoming the risks posed by ignorance, uncertainty, and politicization to policy progress on international environmental issues. First, research on epistemic communities has

demonstrated that under conditions of uncertainty, policy-makers often turn to scientists in their effort to identify the political implications of environmental impacts, to identify their short and long-term interests in the face of those impacts, and to understand the availability, costs, and benefits of policies that might mitigate or otherwise respond to those impacts (Haas, 1992a, 2015). This suggests the importance of developing a *consensus-based narrative that the scientific community needs to be ready and able to promote* (Blasiak et al., 2017). For example, in the climate change negotiations, scientific assessments are separated from the means of implementation. The independent Intergovernmental Panel on Climate Change (IPCC) provided scientific consensus on the issue, while the Conference of Parties to the UN Framework Convention on Climate Change negotiated the political approach, i.e. the Paris Agreement. The biodiversity regime is following a similar model with its Intergovernmental Science-policy Platform on Biodiversity and Ecosystem Services (IPBES), an independent intergovernmental body established by member states of the UN Convention on Biological Diversity in 2012. In 2016 it produced an assessment of pollinators, pollination, and food production (IPBES et al., 2016), and in 2019 it released the most comprehensive global assessment of biodiversity to date (IPBES Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services et al., 2016). The pollination and biodiversity assessments highlighted scientific consensus and generated a lot of media attention and awareness-raising. In the case of pollinators, several countries and US states have taken a more precautionary approach to pesticide use in the wake of the IPBES report.

Second, recent research has identified conditions under which science, and particularly the science in global environmental assessments, influences policy choices. This research has shown that science is more likely to channel policy responses toward scientific recommendations when the scientific process and its integration in the policy process are designed to be salient (i.e., relevant and important to pressing policy decisions), credible (i.e., likely to be true), and legitimate (i.e., reflecting the audience's interests and concerns) (Haas, 2017; Mitchell et al., 2006b). In the case of BBNJ, as in many others, the risk is that the "best" credible science will fail to realize its potential in fostering environmental progress because insufficient attention is paid to ensuring that the science involves major stakeholders in ways that lead them to believe the science reflects their interests and concerns (legitimacy) and is presented at a time and in ways that reflect the policy-making context and constraints (salience).

Attentiveness to how information and those who produce it are integrated into negotiations can increase the utility of science for policymaking and treaty design (Haas and Littoz-Monnet, 2017; Kowarsch et al., 2017). A diversity of perspectives is important, including from both natural and social scientists, the global North and global South, the media, as well as indigenous, local, and traditional perspectives. Strong, independent epistemic communities and transnational science networks can foster deeper understanding of an issue while also providing a bulwark against manipulation by one state or interest group (Haas, 1992b). The aforementioned IPBES example brings together global networks of scientists and indigenous perspectives, with other relevant stakeholders. Another relevant example is ICES (the International Council for the Exploration of the Sea), which has been used as a clearinghouse for scientific information for fisheries negotiations in the North Atlantic, thus helping negotiations avoid getting bogged down in dispute about the science.

Side events held at the first BBNJ negotiations included a range of relevant topics and information, including presentations from developing states, which focused on access and benefit sharing and

marine technology transfer (Intergovernmental Conference, 2018). Given the distributional implications of the use of BBNJ resources, voices from the global South are especially critical. Indeed, equity concerns were prominent at the first round of BBNJ negotiations raised by both individual governments and regional coalitions (e.g., Pacific Small Island Developing States, the Caribbean Community, the Alliance of Small Island States, and the African Group).

An *autonomous and diverse scientific advisory body*, in line with the aforementioned IPCC and IPBES examples, should be created to help facilitate the new international legally binding instrument. This advisory body would help reduce uncertainty while fostering a strong epistemic community around BBNJ. Currently, the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organisation (IOC-UNESCO) partially fills that function, promoting international cooperation and helping foster sustainable development of the marine environment. It may be built upon for this role, if creating a new body is not possible or preferred. The science advisory body will also need to be geographically representative and should be tasked with systematically assessing the effectiveness of regulatory options, along with more fundamental natural and social science research, increasing the salience and credibility of scientific contributions to BBNJ governance. Building on the principles of deliberative democracy, an advisory body could strengthen the legitimacy of the BBNJ process (Dryzek 2002). For example, international scientific assessment bodies such as the IPCC are often internally deliberative, as participants must develop a common language to bridge different specializations. To the extent that this common language can be made accessible to non-specialists, deliberations can include a greater variety of actors, especially those who would otherwise have an informational disadvantage. Deliberation here could even extend to ordinary citizens, recruited into transnational citizen forums (Baber and Bartlett, 2015), reflecting the necessity for global representation when managing the common heritage of humankind. Additionally, if such a body were to have decision-making power, similar to the Commission on the Limits of the Continental Shelf, clarity would be needed as to whether such decisions are legally-binding (Vega-Barbosa).

3. Fragmentation, overlap, and institutional complexes

A second important challenge of the BBNJ negotiations involves determining how to integrate a new international legally binding instrument into the existing institutional landscape in ways that create synergies with, rather than conflict or negative feedback with, the overlap and fragmentation among existing institutions (Biermann et al., 2009). While UNCLOS provides the main framework for managing living and non-living resources in areas beyond national jurisdiction through regional fisheries management organizations, UN Regional Seas Programmes, and the International Seabed Authority, many other multilateral and bilateral agreements touch on BBNJ in some way, including the Convention on International Trade in Endangered Species, regional and species-specific instruments related to the Convention on Migratory Species, regulations addressing marine pollution from land-based sources and from ships (under the International Maritime Organisation conventions), and agreements addressing maritime boundaries, deep-sea cables, and ocean navigation rules.

Ideally, the new BBNJ regime will transform this multiplicity of existing treaties into an institutional "complex," reducing frictions while creating synergies to create a complex that is greater than the sum of its parts (Oberthür and Stokke, 2011). If institutional fragmentation is mostly due to gaps or overlaps in coverage, synergies can be achieved relatively easily using smart institutional design. For example, gap analysis can identify areas where the new BBNJ

agreement could add value and reveal ways to reduce fragmentation through better coordination among related agreements. Once this is done, overlaps and conflicts can be reduced through intentional coordination using memoranda of understanding and harmonization processes. For example, states developed the Kobe Process to harmonize and increase efficiencies among five tuna-related regional fishery agreements. Such an approach increases polycentricity, whereby multiple treaty bodies and other decision-making authorities interact and mutually adjust to each other while working toward overarching objectives (e.g., of a new BBNJ agreement). By eschewing complete institutional integration in the sense of creating a new centralized coordinating mechanism or decision-making body with a global oversight function, such an approach avoids compromising the legal autonomy of existing treaty regimes, thereby, reducing the resistance of governments to adopting it.

In the end, some cooperative fragmentation could remain, by establishing enough integration to prevent open conflicts between different institutions but stopping short of full integration) (Biermann et al., 2009; Alter and Raustiala, 2018). Lessons can be drawn from regions where regional environmental or fishery agreements overlap geographically. For example, in the North-East Atlantic, the boundaries of the OSPAR Convention and the North East Atlantic Fisheries Commission overlap completely, however their efforts on designating marine protected areas are only loosely coordinated and do not yet include full participation from the International Seabed Authority or the International Maritime Organisation (De Santo, 2018).

However, the fragmentation of global governance architectures often results from conflicting national (and corporate) interests, with many governments preferring to deal with different regional and issue-specific concerns separately to protect the benefits they derive from the current system (Benvenisti and Downs, 2007). For instance, UNCLOS relegates management of migratory fish stocks to regional fisheries management organizations, allowing governments to negotiate access rights that are tailored to their own role in a region. This fragmented system has been preserved in related agreements, largely due to demands from countries that are powerful within regional fisheries management organizations (Webster, 2011, 2015). We can see similar moves to reinforce fragmentation in the current negotiations, with an injunction in Resolution 72/249 that the “process and its results should not undermine existing relevant legal instruments and frameworks and relevant global, regional and sectoral bodies.” In fact, negotiation records show that there is a clear divide over how this provision is interpreted between the countries with vested interests in maintaining status quo fragmentation of BBNJ governance, including the United States, Russia, Iceland, Japan, South Korea, Singapore, and China (Views Expressed by the UN, 2016).

One strategy for reducing fragmentation involves expanding the scope of the agreement to foster issue linkages and side-payments (including financial mechanisms for technology transfer and distribution of benefits), improving the prospects for striking a bargain acceptable to all. If governments cannot negotiate a legally binding agreement that can overcome existing fragmentation while maintaining an agreement that is broad, negotiators may need to consider soft-law options that will allow some level of harmonization of currently fragmented requirements and standards (Skjærseth et al., 2006). Experience in other issue areas (e.g., the Arctic Council's approach (Wilson, 2016)) has shown that soft-law arrangements reduce the danger of stalemate and evolve into customary law by fostering social practices that parties come to accept over time.

Shared norms can also lead to more binding approaches: the new 2018 Agreement to Prevent Unregulated High Seas Fisheries in

the Central Arctic Ocean is particularly precautionary in nature, protecting an area from commercial fisheries prior to its exploitation. However, the flexibility of soft-law approaches is not necessarily adequate for addressing cross-cutting and complex environmental issues such as climate change (Nevitt and Percival, 2018). Regardless of the combination of hard and soft approaches, *the best results are achieved when negotiators design institutions that: a) fit current political will and preferences; b) foster dynamic progress toward stronger goals and obligations going forward; and c) allow for increasing participation without making obligations weaker.*

Institutional competition between international organizations or treaty secretariats may also become an issue, especially for those institutions whose mandates will be influenced by the BBNJ negotiations. Although the BBNJ instrument is expected to fully respect jurisdictional boundaries, any perceived threats to sovereignty or authority will likely evoke both resistance from states and international institutions (Kim and Bosselmann, 2013; UNEP, 2001). At the same time, nesting the international legally binding instrument as an implementing agreement under UNCLOS would create opportunities for better harmonization and synergies without increasing fragmentation and competition. The new instrument could benefit from innovative treaty provisions that (i) clearly define its relationships with existing and future instruments, especially in case of inconsistencies; (ii) require its treaty bodies to cooperate and coordinate with other such bodies; and (iii) further strengthen and operationalize the no-transfer clause of UNCLOS (Article 195) that calls for an integrated approach to environmental protection (Kim et al., 2016).

4. Systemic forces and complex dynamics

The BBNJ negotiations need to develop governance solutions for marine issues that involve complex coupled human and natural systems (Young, 2017; Liu et al., 2007). The concerns relevant to governing BBNJ reflect numerous complex interactions among multiple natural systems (e.g., marine currents, individual species biodynamics, food webs), complex interactions among multiple social systems (e.g., the direct and indirect effects of overfishing, marine pollution and dumping, land-based sources of pollution, and climate change), and complex interactions between natural and social systems, including benefit sharing and equity concerns and intellectual property rights. Each of these systems exhibits different cycles, rhythms, trends, thresholds, and feedbacks individually, which become increasingly complex given the interactions among them. *The failure to recognize and adequately respond to such complexities has overwhelmed many earlier governance attempts.* Climate change and similar complex pressures and problems, such as plastic pollution, will make the challenges to effective governance of marine biodiversity only more complex (McCauley et al., 2015; Ásgeirsdóttir, 2008), and are having increasing and increasingly-complicated effects on living marine resources (Mendenhall, 2018; Tiller and Nyman, 2018).

Earth system governance research offers important insights into this issue. *When dealing with complex systems where the potential for significant and surprising shifts is high, negotiators must design governance systems to be agile* (Kim and Bosselmann, 2013). Early warning capabilities and rapid response procedures (for example, allowing for emergency closures where marine protected areas are needed but will take time to enact (De Santo and Jones, 2007)) can be useful in identifying new developments and increasing the adaptability of institutional responses. Regular performance assessments and progress evaluations can also contribute to improved performance over time, by identifying prior successes and failures and their causes. These functions could be fulfilled by a new institution created by the BBNJ instrument (which itself is too

narrowly focused thematically to address these wider complex threats), or existing institutions or organizations, and be supported by soft law commitments. Indeed, the Food and Agriculture Organisation has promoted and systematized assessments of regional fisheries management organizations in order to both evaluate and improve the management of the numerous fish stocks that they oversee (Szigeti and Lugten, 2015). Such assessments highlight unexpected outcomes from particular management approaches and identify “best practices” (e.g., adaptive management) that foster effective biodiversity management in the short term and reduce scientific uncertainty and improve scientific and policy integration over the long term (Anton and Kim, 2015).

Most important, in areas where systemic forces are strong, issues are easier to grasp and address when framed accurately – as a complex, interrelated system rather than a fragmented set of disconnected issues. The proposed international legally binding instrument is intended to provide a framework for conserving and sustainably managing marine biodiversity beyond national jurisdiction. But the suite of management measures currently on the table (e.g., marine protected areas, environmental impact assessments, and technology transfer), indicates that negotiators are not yet grappling with these systemic issues. In fact, negotiators in preparatory meetings decided not to include cross-cutting issues as a specific topic in the negotiations due at least in part to national interests in maintaining fragmentation. *Though difficult, reframing to include threats to biodiversity like climate change and marine plastics could increase the potential for issue linkages and help to counteract vested interests in fisheries, mining, and commercial use of marine genetic resources* (Leary, 2019b).

For example, the developing rules on environmental impact assessment and marine protected areas could include trans-boundary and cumulative impacts as criteria, and/or highlight specific threats, such as climate change and ocean acidification. Doing this result in a higher standard for approving environmental impact assessments and a lower standard for designating marine protected areas, however there is already debate and pushback about including such criteria in the ongoing negotiations. Another important factor to consider is the issue of adjacency – how and what this means (i.e. to states whose marine territory abuts the high seas area under question) and how it is framed would shape the overall role of coastal states. Currently the focus on adjacency revolves around control of resources, not responsibility on the part of the state – if this could be shifted by the BBNJ treaty to better reflect UNCLOS’s obligations on coastal states to prevent, reduce, and control land-based pollution, ocean plastics could be addressed, for example. Alternatively, the process could be reframed to simply highlight the wide array of threats to ocean biodiversity, especially in light of the 2019 IPBES Global Biodiversity Assessment, shifting the emphasis of the BBNJ negotiations from sustainable use to conservation. Because these broader systemic issues are currently receiving high levels of attention, capturing some of the resultant political will could provide the impetus needed to create a truly innovative BBNJ agreement, one that goes beyond the existing law of the sea framework to better conserve and sustainably manage biodiversity beyond national jurisdiction.

5. Conclusion: key lessons from the earth system governance literature

We conclude by reiterating three key lessons for negotiators seeking to develop an effective agreement to protect marine biodiversity in areas beyond national jurisdiction.

First, the nature of relevant scientific information, its linkages to political processes, and the influence of power dynamics suggest the value of developing an independent scientific advisory body that has

sufficient resources to assess both social and natural aspects of BBNJ governance and is grounded in deliberative processes. It is likely an advisory body will be created, as discussed at the first round of negotiations, but the challenge will be to ensure it has an effective mandate, addresses the concerns of all state parties, and is fully inclusive.

Second, the dangers of politically entrenched institutional fragmentation make it important to craft an agreement that maximizes prospects for synergistic interactions with other agreements (rather than “filling the gaps”) while fostering increasing inclusiveness and effectiveness over time. To that end, negotiators could consider expanding the scope of the BBNJ agreement to foster issue linkages and adopting a hybrid, soft and hard law approach. Furthermore, the agreement could include innovative treaty provisions that clearly define its relationships with other agreements while emphasizing the need for institutional cooperation and coordination.

Third, systemic factors and complex dynamics make it essential to create an agreement that is resilient, strengthens UNCLOS, and responds promptly and effectively to new and unexpected developments. Indeed, an early obstacle that the BBNJ negotiations may face is failing to finalize an international legally binding instrument or negotiating one that fails to encompass important elements that we have identified above. Soft law strategies may provide solutions in these circumstances. Such an event may even be a blessing in disguise, as it could help achieve progress on elements not currently addressed by the BBNJ process, eventually resulting in a more effective outcome.

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