# ARTICLES

# MARINE PROTECTED AREAS ON THE UNCERTAIN FRONTIERS OF CLIMATE CHANGE

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## \_\_\_\_\_ S U M M A R Y \_\_

Scientific communities and policy experts argue that marine protected areas (MPAs) will increase the potential of marine ecosystems to tackle climate change impacts. Yet to date, there has been little legal scholarship about how to design, manage, and implement climate-resilient MPAs. This Article underscores the importance of considering climate change in the design, planning, and implementation of MPAs, and identifies mechanisms for incorporating climate change elements into MPAs. It highlights a newly developing international instrument, the draft biological diversity of areas beyond national jurisdiction treaty, that provides opportunities for facilitating creation of MPAs; discusses the relevant articles of the latest draft; and emphasizes the potential to more fully incorporate climate change considerations. It also draws attention to the need to improve national-level frameworks governing MPAs to address climate change.

o we really want to be remembered as the generation that buried its head in the sand, that fiddled while the planet burned?" remarked United Nations Secretary General António Guterres at the annual meeting of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC)<sup>1</sup> in 2019. This statement precisely sums up the urgency of climate action required, and serves as a dire warning in the aftermath of the shocking data published by the World Meteorological Organization (WMO)<sup>2</sup> in its Statement

on the State of the Global Climate in 2019.<sup>3</sup> The report marked 2019 as the year that was likely to be the second warmest on record, with retreating sea ice extent, record-high levels of ocean heat, accelerating ocean acidification, and rising sea levels.<sup>4</sup>

Importantly, the report's findings highlight the inextricable link between oceans and climate change, including that the "ocean absorbs around 90% of the heat that is trapped in the Earth system by rising concentrations of greenhouse gases [GHGs],"<sup>5</sup> and that "over the decade 2009-2018, the ocean absorbed around 23% of the annual [carbon dioxide]  $CO_2$  emissions, lessening the increase in atmospheric concentrations."<sup>6</sup> Essentially, the report reemphasizes the fact that oceans, as the globe's largest carbon sinks, have a direct and paramount role in climate change regulation and climate change mitigation.<sup>7</sup>

However, the accompanying challenge is that the effects of climate change keep altering ocean systems in a disturbing manner that would potentially push their normal

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United Nations Secretary-General, Secretary-General's Remarks at Opening Ceremony of UN Climate Change Conference COP25 [As Delivered] (Dec. 2 2019), https://www.un.org/sg/en/content/sg/statement/2019-12-02/secretary-generals-remarks-opening-ceremony-of-un-climate-change-conference-cop25-delivered; United Nations Framework Convention on Climate Change, May 9, 1992, S. TREATY DOC. NO. 102-38, 1771 U.N.T.S. 107 [hereinafter UNFCCC].

<sup>2.</sup> See WMO, Home Page, https://public.wmo.int/en (last visited Dec. 2, 2020).

 <sup>&</sup>quot;Statement on the State of the Global Climate" reports are published every year by WMO about the global climate, key weather and climate trends, and events at the global and regional levels. *See* WMO, WMO STATEMENT ON THE STATE OF THE GLOBAL CLIMATE IN 2019 (2020), https://library. wmo.int/doc\_num.php?explnum\_id=10211.
*See id.* at 7.

See
Id.

<sup>6.</sup> *Id.* 

See Robin K. Craig, Ocean Governance for the 21st Century: Making Marine Zoning Climate Change Adaptable, 36 HARV. ENV'T L.J. 314 (2012).

dynamism beyond tolerable resilient limits.<sup>8</sup> Consequently, "marine governance regimes will increasingly need to take account of climate change impacts to remain relevant and effective"<sup>9</sup> in the long run.

Despite this strong interlinkage between climate and oceans, "[c]limate change mitigation and adaptation do not feature prominently in existing ocean conservation measures." Under the UNFCCC,<sup>10</sup> Kyoto Protocol,<sup>11</sup> and Paris Agreement,<sup>12</sup> "oceans are afforded limited treatment."<sup>13</sup> "Attention to climate change mitigation and adaption is similarly scant" under the Convention on Biological Diversity (CBD),<sup>14</sup> in Aichi Target 11,<sup>15</sup> and in the United Nations Sustainable Development Goals<sup>16</sup> (SDGs).<sup>17</sup>

Yet recently, there have been "encouraging signals that the considerable gap between climate action and oceans governance is starting to close."<sup>18</sup> "Ocean and climate champions—including nations, non-federal governments, and nongovernmental organizations [NGOs]—are creating ocean-climate leadership coalitions, working to elevate ocean issues in international climate negotiations, and incorporating ocean issues into their own climate goals."<sup>19</sup> Further, out of the measures taken by countries to reduce GHG pollution that include ocean-based measures, "policy experts have increasingly promoted marine protected areas (MPAs)."<sup>20</sup>

MPAs that were "originally conceived as a nature-based tool for repairing damage to overexploited fish stocks and habitats"<sup>21</sup> are now progressively known to be an "attractive nature- and area-based management tool [ABMT]<sup>22</sup> at the intersection of ocean governance and climate action that, when properly designed and implemented, contribute to ecosystem health and climate change resilience."<sup>23</sup>

There are many scientific arguments for using MPAs to increase the resilience of the oceans to climate change, as opposed to the more traditional focus on using MPAs to protect biodiversity.<sup>24</sup> However, although there is considerable literature addressing how MPAs should be designed to achieve traditional goals such as fisheries conservation,<sup>25</sup> to date "few studies have specifically considered how to

- 19. ANNE MERWIN ET AL., OCEAN CONSERVANCY, OCEAN AND CLIMATE DIS-CUSSION SERIES: "CLIMATE-SMART" MARINE PROTECTED AREAS FOR MITI-GATION AND ADAPTATION POLICY (2020), https://oceanconservancy.org/wpcontent/uploads/2020/07/Climate-Smart-MPAs-Brief\_FINAL\_7\_1\_update.pdf.
- 20. Id. at 1.
- Callum M. Roberts et al., Marine Reserves Can Mitigate and Promote Adaptation to Climate Change, 114 Proc. Nat'L ACAD. Sci. 6167 (2017).
- 22. "Area-based management tools could be defined as regulations of human activity in a specified area to achieve conservation or sustainable resource management objectives." INTERNATIONAL UNION FOR CONSERVATION OF NATURE, MEASURES SUCH AS AREA-BASED MANAGEMENT TOOLS, INCLUD-ING MARINE PROTECTED AREAS, https://www.un.org/depts/los/biodiversity/prepcom\_files/area\_based\_management\_tools.pdf.
- 23. JEFFERIES, *supra* note 10, at 2.
- 24. See generally Roberts et al., supra note 21; see also Charlotte Rachael Hopkins et al., Perceptions of Practitioners: Managing Marine Protected Areas for Climate Change Resilience, 128 OCEAN & COASTAL MGMT. 18 (2016); Isabelle M. Côté et al., Rethnking Ecosystem Resilience in the Face of Climate Change, 8 PLoS BIOLOGY e1000438 (2010); Elizabeth McLeod et al., Designing Marine Protected Area Networks to Address the Impacts of Climate Change, 7 FRONTIERS ECOLOGY & ENV<sup>+</sup>T 362 (2009) available at https://www.researchgate.net/publication/303855892\_Designing\_marine\_protected\_area\_networks\_to\_address\_the\_impacts\_of\_climate\_change.
- 25. See Satie Airamé et al., Applying Ecological Criteria to Marine Reserve Design: A Case Study From the California Channel Islands, 13 ECOLOGICAL APPLICA-TIONS S170 (2003); LOUIS W. BOTSford et al., Principles for the Design of Marine Reserves, 13 ECOLOGICAL APPLICATIONS S25 (2003); Alan Friedlander et al., Designing Effective Marine Protected Areas in Seaflower Biosphere Reserve, Colombia, Based on Biological and Sociological Information, 17 CONSERVA-TION BIOLOGY 1769 (2003); Leanne Fernandes et al., Establishing Representative No-Take Areas in the Great Barrier Reef: Large-Scale Implementation of Theory on Marine Protected Areas, 19 CONSERVATION BIOLOGY 1733 (2005); Camilo Mora et al., Coral Reefs and the Global Network of Marine Protected Areas, 312 SCIENCE 1750 (2006).

<sup>8. &</sup>quot;By the year 2100, without significant changes, more than half of the world's marine species may stand on the brink of extinction. Today, 60% of the world's marine ecosystems that underpin livelihoods would be degraded or used unsustainably." United Nations Educational, Scientific, and Cultural Organization (UNESCO), *Facts and Figures on Marine Biodiversity*, http://www.unesco.org/new/en/natural-sciences/ioc-oceans/focus-areas/rio-20-ocean/blueprint-for-the-future-we-want/marine-biodiversity/facts-and-figures-on-marine-biodiversity/ (last visited Dec. 2, 2020).

<sup>9.</sup> See Craig, supra note 7, at 314.

<sup>10.</sup> Under the UNFCCC, "treatment of ocean conservation is limited to the broad principle of maintaining and enhancing all 'sinks and reservoirs' of greenhouse gases in article 4(1)(d)." CAMERON S.G. JEFFERIES, DESIGNING HIGH SEAS MARINE PROTECTED AREAS TO CONSERVE BLUE CARBON ECO-SYSTEMS: A CLIMATE-ESSENTIAL DEVELOPMENT 2 (Centre for International Governance Innovation, CIGI Papers No. 232, 2019), https://www.cigionline.org/sites/default/files/documents/no.232\_0.pdf.

<sup>11.</sup> See Kyoto Protocol to the UNFCCC, Dec. 11, 1997, 2303 U.N.T.S. 148. Unfortunately, there is no discussion regarding ocean management directly in the Kyoto Protocol.

<sup>12.</sup> UNFCCC, Report of the Conference of the Parties (COP) 21st Session, Annex, U.N. Doc. FCCC/CP/2015/10/Add.1 (2016) [hereinafter Paris Agreement]. "[T]he Paris Agreement reconfirms the importance of ocean carbon sinks in article 5 and, in the preamble, declares 'the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity." JEFFERIES, *supra* note 10, at 9.

<sup>13.</sup> JEFFERIES, supra note 10, at 2.

United Nations Convention on Biological Diversity, June 5, 1992, 31 I.L.M. 818, 1993 A.T.S. 32 (entered into force Dec. 29, 1993) [hereinafter CBD].

<sup>15.</sup> At the 10th meeting of the COP of the CBD held October 18-19, 2010, in Nagoya, Aichi Prefecture, Japan, a "revised and updated Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets, for the 2011-2020 period" was adopted. *Strategic Plan for Biodiversity 2011-2020, Including Aichi Biodiversity Targets*, CBD, Jan. 21, 2020, http://www.cbd.int/sp. There are 20 Aichi targets in total, CBD, *Aichi Biodiversity Targets*, https://www.cbd.int/sp/targets/ (last visited Dec. 2, 2020). Aichi Target 11 calls for 10% of coastal and marine areas to be conserved by 2020 through effectively managed, ecologically representative, and well-connected systems of protected areas, and integrated into the wider landscapes and seascapes. CBD, COP 10, Decision X/2. The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets, at 9, U.N. Doc. UNEP/CBD/DEC/X/2 (2010), https://www.cbd.int/doc/decisions/cop-10/cop-10-dec-02-en.pdf.

<sup>16.</sup> The 2030 Agenda for Sustainable Development was adopted by all United Nations Member States in 2015. There are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries to promote prosperity while protecting the planet. United Nations, *Sustainable Development Goals*, https://www.un.org/sustainabledevelopment/sustainable-development-goals/ (last visited Dec. 2, 2020). With regards to marine protected areas (MPAs) specifically, SDG target 14.5 calls for, "[b]y 2020, to conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information." United Nations, *Goal 14: Conserve and Sustainably Use the Oceans, Seas, and Marine Resources for Sustainable Development* [hereinafter *SDG Goal 14, Target 14.5*], https://www.un.org/development/desa/disabilities/envision2030-goal14.html (last visited Dec. 2, 2020).

<sup>17.</sup> JEFFERIES, *supra* note 10, at 2.

<sup>18.</sup> For example,

negotiations for the Paris Agreement included a number of side events focused on ocean conservation and involved a heightened presence and participation of ocean scientists, and while express treatment of ocean conservation was limited in the Paris Agreement, a number of negotiating states produced the influential Because the Ocean Declaration. Additionally, ocean mitigation and adaptation goals are included in more than 70 percent of nationally determined contributions.

*Id*. at 9.

design MPAs and MPA networks to be resilient to climate change threats,"<sup>26</sup> within the existing institutional and legal frameworks, to address future climate change scenarios and uncertainties.

This Article seeks to fill the gap by analyzing how the legal frameworks governing the oceans should be adjusted to promote the use of MPAs to help the oceans mitigate and adapt to climate change. It analyzes leading scientific arguments for using MPAs to play a role in mitigation and adaptation to climate change, and identifies the challenges of designing and implementing MPAs, both within and outside ocean waters under national control, to address climate change. Most important, it identifies the legal and other institutional changes that are necessary to facilitate the creation of MPAs to address impacts of climate change on the oceans. In doing so, it offers timely recommendations for the text of the new treaty to protect biodiversity in the areas beyond national jurisdiction (ABNJ)27 that countries currently are negotiating (the draft biological diversity of areas beyond national jurisdiction (BBNJ) treaty). The BBNJ treaty negotiation offers an important opportunity to facilitate the creation of MPAs in the ABNJ and, depending on the text of the treaty, it could provide a framework for developing MPAs that play a significant role in mitigating and adapting to climate change.

The Article proceeds in four parts. Part I provides background on MPAs by examining what MPAs are, the global targets for increasing MPAs, the international and national legal frameworks for MPAs, and the associated challenges in establishing MPAs within the current framework. Part II highlights the capacities of MPAs in mitigating and adapting to climate change, and identifies the generic and climate change challenges in using MPAs for climate change mitigation and adaptation. Part III recommends principles for creating a global network of MPAs, and suggests incorporating elements into the draft text of the new internationally legally binding instrument for conservation and sustainable use of marine biodiversity in the ABNJ. This part also discusses the need to strengthen national legal frameworks for MPAs in areas of the oceans under national control.

Part IV concludes on a pragmatic note, with the observation that although MPAs are a potential tool to tackle climate change, they cannot be considered as the solution for climate change in the oceans. They can be a powerful complementary tool to the existing instruments and policies for reducing GHG emissions and other sustainable ocean measures. Overall, this highlights the significant role of well-designed, climate-inclusive MPAs, so that legal and institutional frameworks can be reformed to enable MPAs to become an integral part of the ongoing efforts to mitigate and adapt to climate change.

### I. Background and Legal Framework

This part defines MPAs, identifies the global targets for increasing MPAs, and explains the legal framework for establishing MPAs and the challenges that framework creates for establishing MPAs.

#### A. Defining MPAs

In simple terms, an MPA is a marine region with geographically defined boundaries that is given a special protective status because of its historical, scientific, cultural, ecological, or biological significance. MPAs safeguard habitat, fish, wildlife, and cultural resources, by either restricting or prohibiting commercial and extractive activities. Although "MPA" is a commonly used term in national and international documents, there seems to be no universally accepted legal definition.

Various international bodies have defined MPAs, and some examples of definitions are those by the International Union for Conservation of Nature (IUCN),<sup>28</sup> Food and Agriculture Organization of the United Nations (FAO),<sup>29</sup> CBD,<sup>30</sup> and World Wildlife Fund (WWF).<sup>31</sup> Apart from these definitions, individual countries have defined and categorized MPAs for purposes within their jurisdiction,

<sup>26.</sup> McLeod et al., supra note 24, at 362.

<sup>27. &</sup>quot;ABNJ, commonly called the high seas, are those areas of ocean for which no one nation has sole responsibility for management. In all, they make up 40% of the surface of our planet, comprising 64% of the surface of the oceans and nearly 95% of its volume." FOOD AND AGRICULTURE OR-GANIZATION OF THE UNITED NATIONS, GLOBAL SUSTAINABLE FISHERIES MANAGEMENT AND BIODIVERSITY CONSERVATION IN THE AREAS BEYOND NATIONAL JURISDICTION (ABNJ): PRESERVING THE WORLD'S LAST GLOBAL COMMONS (2011), http://www.fao.org/fishery/docs/brochure/GEF-ABNJ/ GEF-ABNJ.pdf.

<sup>28.</sup> The IUCN defines a protected area as "[a] clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values." *See* JON DAY ET AL., GUIDELINES FOR APPLYING THE IUCN PROTECTED AREA MANAGEMENT CATEGORIES TO MARINE PROTECTED AREAS 8 (IUCN, Best Practice Protected Area Guidelines Series No. 19, 2d ed. 2019), https://portals.iucn.org/library/sites/library/files/documents/PAG-019-2nd%20ed.-En.pdf.

<sup>29.</sup> The FAO defines an MPA as "any marine geographical area that is afforded greater protection than the surrounding waters for biodiversity conservation or fisheries management purposes." FAO, *About MPAs*, http://www.fao.org/ fishery/topic/4400/en (last visited Dec. 2, 2020).

<sup>30.</sup> The Ad Hoc Technical Expert Group of the CBD adopted this definition: Marine and Coastal Protected Area means any defined area within or adjacent to the marine environment, together with its overlying waters and associated flora, fauna, and historical and cultural features, which has been reserved by legislation or other effective means, including custom, with the effect that its marine or coastal biodiversity enjoys a higher level of protection than its surroundings.

SECRETARIAT OF THE CBD, TECHNICAL ADVICE ON THE ESTABLISHMENT AND MANAGEMENT OF A NATIONAL SYSTEM OF MARINE AND COASTAL PRO-TECTED AREAS (CBD, Technical Series No. 13, 2004), https://www.cbd.int/ doc/publications/cbd-ts-13.pdf.

<sup>31.</sup> The WWF defines an MPA as "an area designated and effectively managed to protect marine ecosystems, processes, habitats, and species, which can contribute to the restoration and replenishment of resources for social, economic, and cultural enrichment." WWF, *The Case for MPAs*, https://wwf. panda.org/our\_work/our\_focus/oceans\_practice/solutions/protection/protected\_areas/ (last visited Dec. 2, 2020).

including the United States,<sup>32</sup> the European Union,<sup>33</sup> Brazil,<sup>34</sup> the Philippines,<sup>35</sup> and Senegal.<sup>36</sup>

Interestingly, the concept of an MPA is extremely dynamic and used in very diverse situations. They may include marine reserves, marine parks, marine or ocean sanctuaries, no-take zones, and fully protected marine areas, to name a few types of protection measures referred to as MPAs. Further, MPAs have different purposes, varied legal authorities, and may range from highly protected areas to limited protection areas that allow or prohibit various types of activities. For instance, MPAs may be multiple use areas, in which fishing is allowed, or no-take areas, where any kind of extractive activity is prohibited.

#### Β. Global Targets and Coverage of MPAs

The United Nations Convention on the Law of the Sea (UNCLOS)37 is the comprehensive legal framework for all activities in the oceans and seas. UNCLOS divides the oceans into various zones, namely the territorial sea,<sup>38</sup> contiguous zone,<sup>39</sup> exclusive economic zone (EEZ),<sup>40</sup> con-

Marine reserves form a subset of MPAs in which impacts from human activities such as resource extraction and fisheries are not permitted.

European Environment Agency, Marine Protected Areas, https://www.eea. europa.eu/themes/water/europes-seas-and-coasts/assessments/marine-protected-areas (last updated Oct. 29, 2018).

34. The FAO provides the following example:

In Brazil, there are two main categories of protected areas: (i) areas under total protection (no-take zones) and (ii) areas for sustainable use. The main difference between the two relates to permission to extract natural resources and to live inside their boundaries, which is forbidden in the first category and allowed in the second. Within these two categories, there are different types of no-take and sustainable-use protected areas, each of them with specific objectives.

FAO, FAO TECHNICAL GUIDELINES FOR RESPONSIBLE FISHERIES—FISHER-IES MANAGEMENT: 4. MARINE PROTECTED AREAS AND FISHERIES pt. 1, at 12 (2011), http://www.fao.org/3/i2090e/i2090e01.pdf.

- 35. "In the Philippines . . . MPAs are defined as 'any specific marine area which has been reserved by law or other effective means and is governed by specific rules or guidelines to manage activities and protect part of the entire enclosed coastal and marine environment." Id.
- 36. As described by the FAO:
  - In Senegal . . . the role of MPAs has been defined as "protection, on a scientific basis, for current and future generations, of important natural and cultural resources and ecosystems representative of the marine environment." In practice, MPAs in Senegal have two main characteristics. First, the purpose of MPAs is to contribute to the conservation of marine and coastal biodiversity. Second, an area of particular interest can be designated according to bioecological, territorial or socio-economic considerations and given special management measures for improving conservation, while taking the livelihoods of the resource users into account.

- 37. United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 (entered into force Nov. 1, 1994).
- 38. See id. art. 3.
- 39. See id. art. 33.
- 40. See id. art. 55.

tinental shelf,<sup>41</sup> the Area,<sup>42</sup> and high seas.<sup>43</sup> Out of this, the high seas along with the Area are not under the jurisdiction of any State, and are commonly referred to as ABNJ.44 "Nearly two-thirds of the world's ocean is beyond national jurisdiction-where no single state has authority. This area reaches depths of over 10 [kilometers] km and represents 95% of the Earth's total habitat by volume."45

The territorial sea, contiguous zone, EEZ, and continental shelf are under national control, although States have varying degrees of rights and responsibilities in these zones. This legal division of the oceans into areas under the control of no State-the ABNJ-and areas under national control is important to keep in mind in considering global targets for establishing MPAs, progress in achieving these targets, and the framework for establishing MPAs. Section I.C further discusses the international and national legal frameworks for creating MPAs.

#### 1. Global Targets and Trends

There is growing interest in the international community in increasing the number of MPAs, including in the ABNJ.<sup>46</sup> Although there is no one specific global convention for establishing MPAs, in various contexts, nation States have recognized the need for a global representative system of MPAs.<sup>47</sup> In 2010, the CBD's Aichi Target 11 established a new target of designating 10% of the global ocean as protected areas by 2020.48 In 2014, the IUCN World Parks Congress recommended that 30% of the ocean be protected through the designation of MPAs.<sup>49</sup> In 2015, SDG Goal 14, Target 14.5 called for conservation of at least 10% of coastal and marine areas by 2020.50 The UN CBD released an updated draft proposal for a post-2020 framework, which includes a target to protect at least 30% of the

At the 2002 World Summit on Sustainable Development, participating States agreed to establish a representative network of MPAs by 2012 encompassing 10% of all ecological regions. This call was further reiterated at both the 2003 and 2008 IUCN World Conservation Congresses, which called for protected areas to encompass 20-30% of all marine habitats.

Emily S. Nocito et al., Gazing at the Crystal Ball: Predicting the Future of Marine Protected Areas Through Voluntary Commitments, 6 FRONTIERS MARINE SCI. 2 (2020), https://www.frontiersin.org/articles/10.3389/ fmars.2019.00835/full.

48. See supra note 15 and accompanying text.

- 50. SDG Goal 14, Target 14.5, supra note 16.

<sup>32.</sup> In the United States, an MPA is "any area of the marine environment that has been reserved by federal, state, tribal, territorial, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." Exec. Order No. 13158, 65 Fed. Reg. 34909 (May 31, 2000).

<sup>33.</sup> In the European Union,

MPAs are geographically distinct zones for which protection objectives are set. They constitute a globally connected system for safeguarding biodiversity and maintaining marine ecosystem health and the supply of ecosystem services.

Id.

<sup>41.</sup> See id. art. 76.

<sup>42.</sup> See id. art. 1.

<sup>43.</sup> See id. art. 86.

<sup>44.</sup> See United Nations, Chair's Streamlined Non-Paper on Elements of A DRAFT TEXT OF AN INTERNATIONAL LEGALLY-BINDING INSTRUMENT UN-DER THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA ON THE Conservation and Sustainable Use of Marine Biological Diversity OF AREAS BEYOND NATIONAL JURISDICTION, https://www.un.org/depts/los/ biodiversity/prepcom\_files/Chairs\_streamlined\_non-paper\_to\_delegations. pdf.

<sup>45.</sup> IUCN, Issues Brief: Governing Areas Beyond National Jurisdiction 1 (2019), https://www.iucn.org/sites/dev/files/issues\_brief\_governing\_areas\_beyond\_national\_jurisdiction.pdf.

<sup>46.</sup> See Kristina M. Gjerde et al., Protecting Earth's Last Conservation Frontier: Scientific, Management, and Legal Priorities for MPAs Beyond National Boundaries, 26 (Suppl. 2) AQUATIC CONSERVATION: MARINE & FRESHWATER ECOSYSTEMS 45 (2016), available at https://onlinelibrary.wiley.com/doi/ pdf/10.1002/aqc.2646.

<sup>47.</sup> For example:

<sup>49.</sup> See Gjerde et al., supra note 46, at 47.

land and sea by  $2030.5^{1}$  Separately, at the national level, targets have been set by individual countries, which vary from 10% to  $30\%.5^{2}$ 

According to the website Our Shared Seas:

Several trends stand out as the global community has sought to achieve 10 percent protection of coastal and marine areas. At a high-level, those trends include: 1) an accelerated rate of MPA declarations in anticipation of 2020 targets, 2) a rise in designating large-scale marine reserves in remote areas, 3) an underperformance in ensuring ecological connectivity and representation, 4) a varied pattern of protection by ocean basis, and 5) increased attention on the protection of the high seas.<sup>53</sup>

This Article will elaborate further on the growing interest in protecting the ABNJ, for example in Part III in discussing the draft BBNJ treaty.

To date, only 52 countries and territories have protected at least 10% of their marine areas.54 While we have reached only 6.4% globally, leading scientific experts assert that we need a more rigorous approach to conservation, including a goal of 30% protection by 2030.55 Although the global community may fall short of reaching the 10% global target, several countries (e.g., Great Britain, Palau, the United States) are poised to exceed this target for areas within their national jurisdictions.<sup>56</sup> Currently, the CBD secretariat, along with many partner organizations, conventions, and initiatives, works to facilitate conservation and sustainable use through protected areas, including the UNEP World Conservation Monitoring Centre<sup>57</sup> and the World Wide Fund for Nature, among other prominent international organizations.58 This ensures keeping a check on the protected area networks around the globe.

#### 2. Global Coverage and Disparities

Since 2000, there has been a tenfold increase in MPA coverage, driven by the establishment of very large MPAs (over 100,000 sq. km) created or expanded by a few overseas

- 54. See Marine Conservation Institute, supra note 52.
- 55. Id.

countries and territories.<sup>59</sup> However, only seven countries<sup>60</sup> have created 80% of the surface of MPAs in the ocean.<sup>61</sup> Also, most MPAs have been created in the areas of the oceans under national control rather than in the ABNJ.

As a result, there is a large gap between the share of waters under national control in MPAs and the share of the ABNJ in MPAs. Nearly 17.26% of national waters (which represent 39% of global oceans) are designated as protected areas and, in contrast, only 1.18% of the ABNJ (which represents nearly 61% of the global oceans) is designated as protected areas.<sup>62</sup> The paucity of MPAs in the ABNJ means that this area, which is more than half of the earth, is essentially unprotected, and underscores the importance of creating MPAs in the ABNJ.

#### C. International and National Legal Frameworks for MPAs and Challenges

#### 1. International Framework and Challenges

An important reason for the paucity of MPAs in the ABNJ is that the existing legal regime for the ABNJ poses several challenges to creating MPAs in the ABNJ.

First, UNCLOS, which establishes the main international legal framework for the oceans, does not provide for any legal institutions for creating MPAs, although it creates a duty to protect the oceans.<sup>63</sup> "As an overarching mandate, UNCLOS places an unqualified general obligation on coastal states and other states to protect and conserve the marine environment, regardless of zone."<sup>64</sup> Yet, while

Protected Planet, *Explore the World's Marine Protected Areas*, https://web.archive.org/web/20200702135308/https://www.protectedplanet.net/marine (last visited Jan. 5, 2021).

See UN Environment Programme, Update of the Zero Draft of the Post-2020 Global Biodiversity Framework, CBD/POST2020/PREP/2/1 (Aug. 17, 2020), https://www.cbd.int/doc/c/3064/749a/0f65ac7f9def86707f4eaefa/ post2020-prep-02-01-en.pdf.

Marine Conservation Institute, Global Marine Protection Agreements, Atlas of Marine Protection, https://mpatlas.org/ (last visited Dec. 22, 2020).

Our Shared Seas, *Threats—Habitat and Biodiversity*, https://oursharedseas. com/threats/threats-habitat-and-biodiversity/ (last visited Dec. 22, 2020).

Id.; see also Enric Sala et al., Assessing Real Progress Towards Effective Ocean Protection, 91 MARINE POL'Y 11 (2018), available at https://doi. org/10.1016/j.marpol.2018.02.004.

<sup>57.</sup> The center "is a world leader in biodiversity knowledge. It works with scientists and policy makers worldwide to place biodiversity at the heart of environment and development decision-making to enable enlightened choices for people and the planet." United Nations Environment Programme World Conservation Monitoring Centre, *Home Page*, https://www.unep-wcmc. org/ (last visited Dec. 2, 2020).

See COP 7 Decision VII/28, Protected Areas (Articles 8(a) to (e)), https:// www.cbd.int/decision/cop/?id=7765.

<sup>59.</sup> Protected Planet, Marine Protected Areas, https://www.protectedplanet.net/ en/thematic-areas/marine-protected-areas (last visited Jan. 5, 2021). The progress in growth results from a combination of sites being ex-

panded e.g. US Papahānaumokuākea Marine National Monument in the USA which increased to just over 1.5 million km<sup>2</sup>, and new sites being created e.g. the Pitcairn Islands Marine Reserve which covers an area greater than 800,000 km<sup>2</sup>, and the recent designation of Marae Moana Marine Park in the Cook islands covering an area of 1.97 million km<sup>2</sup>.

<sup>60.</sup> See Protected Planet, Explore the World's Marine Protected Areas, supra note 59 ("As of 2018, the USA, France and United Kingdom and their overseas countries and territories make up over 50% of the area covered by MPAs while Australia, Cook Islands, New Zealand and Mexico cover an additional 30%.").

IUCN, ISSUES BRIEF: MARINE PROTECTED AREAS AND CLIMATE CHANGE (2017), https://www.iucn.org/sites/dev/files/mpas\_and\_climate\_change\_issues\_brief.pdf.

<sup>62.</sup> Id.

<sup>63. &</sup>quot;By combining articles 192 and 193... with the *rationale* of articles 194(5) and 145 [of UNCLOS] we can argue ... the duty to protect the marine environment is all-embracing ... [and that] the creation of MPAs is one of the measures that States can adopt to protect the marine biodiversity." Marta Chantal Ribeiro, *Marine Protected Areas: The Case of the Extended Continental Shelf, in* 30 YEARS AFTER THE SIGNATURE OF THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA: THE PROTECTION OF THE ENVIRONMENT AND THE FUTURE OF THE LAW OF THE SEA 182 (Marta Chantal Ribeiro ed., Coimbra Editora 2014), *available at* https://www.researchgate.net/publication/263008039\_Marine\_Protected\_Areas\_the\_case\_of\_the\_extended\_continental\_shelf.

<sup>64.</sup> BARBARA LAUSCHE, GUIDELINES FOR PROTECTED AREAS LEGISLATION 81 (IUCN, Environmental Policy & Law Paper No. 81, 2016), https://portals. iucn.org/library/sites/library/files/documents/EPLP-081.pdf.

UNCLOS allows for the creation of MPAs, it does not establish mechanisms for creating MPAs.<sup>65</sup>

A second challenge to creating MPAs is that pursuant to UNCLOS, the ABNJ is managed through a "suite of activity-specific agreements and global and regional bodies, each with their own mandates and priorities."<sup>66</sup> The sectoral bodies with a role in managing the ABNJ include the International Maritime Organization (IMO), which regulates shipping, and the International Seabed Authority, which regulates mining in the Area.<sup>67</sup> The regional organizations include the regional fisheries management organizations (RFMOs) that regulate fisheries and the regional seas conventions.<sup>68</sup> These bodies may have some authority to protect or restrict activities in areas of the ABNJ, but these bodies have different mandates, some of which are highly specific to certain activities and places; they would

In ABNJ, the CBD does not have a management role—its role instead is to produce scientific and technical advice which can be used by the competent authorities in these areas. The absence of a global mandate for the establishment and management of MPAs in ABNJ, as well as the issue of the coordination and cooperation between the various existing global and regional organisations, leaves the results of this important scientific endeavour hanging, without any effective mechanism for an appropriate response.

ELISABETH DRUEL & KRISTINA GJERDE, IUCN, AN INTERNATIONAL IN-STRUMENT ON CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY IN MARINE AREAS BEYOND NATIONAL JURISDICTION—EXPLORING DIFFERENT ELEMENTS TO CONSIDER: PAPER VI, OPTIONS AND APPROACHES FOR ESTAB-LISHING AND MANAGING MARINE PROTECTED AREAS IN ABNJ 4, https:// www.iucn.org/sites/dev/files/import/downloads/paper\_vi\_\_options\_and\_ approaches\_for\_establishing\_and\_managing\_marine\_mpas.pdf.

Further, "the three global instruments that define geographic areas for special protection," namely the Ramsar Convention, World Heritage Convention, and Man and the Biosphere Programme, also do not establish a framework for "designation of marine areas beyond the 12-mile territorial sea." MARIJN RABAUT ET AL., MARINE PROTECTED AREAS: INTERNATION-AL FRAMEWORK, STATE OF THE ART, THE BELGIAN SITUATION 4 (2013), https://agris.fao.org/agris-search/search.do?recordID=AV20120153367. *See* Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat, 996 U.N.T.S. 245 (entered into force Dec. 21, 1975); Convention for the Protection of the World Cultural and Natural Heritage, 1037 U.N.T.S. 151 (entered into force Dec. 17, 1975); UNES-CO, *Man and the Biosphere (MAB) Programme*, https://en.unesco.org/mab (last visited Dec. 2, 2020).

- See DRUEL & GJERDE, supra note 65, at 7. On shipping, see International Convention for the Prevention of Pollution From Ships, Nov. 2, 1973, 1340 U.N.T.S. 61 (entered into force Oct. 2, 1983).
- 68. See DRUEL & GJERDE, supra note 65, at 7.

apply different factors in deciding upon protections; and their decisions bind different Parties.<sup>69</sup>

It is widely recognized that the governance structure resulting from the multiplicity of bodies with a hand in managing in the ABNJ is fragmented and has major gaps, including the lack of a global legal framework to establish a comprehensive system of MPAs.<sup>70</sup> Although there are some existing measures protecting parts of the ABNJ in the Southern Ocean, Pacific Ocean, Northeast Atlantic Ocean, and Mediterranean Sea,<sup>71</sup> there is no overarching legally binding global instrument that provides for creating and managing MPAs in the ABNJ.

Related to the multiplicity of bodies governing the ABNJ, a third challenge to creating MPAs is that the decision of a particular body only binds the States Parties to that body. According to Article 34 of the Convention on the Law of Treaties, "a treaty does not create either obligations or rights for a third State without its consent."<sup>72</sup> This means that measures adopted within the framework of the regional seas for the management of MPAs in the ABNJ are not binding on States that are not contracting Parties to these conventions.<sup>73</sup> This raises questions regarding the efficiency of the measures adopted within the framework of these conventions.<sup>74</sup> The decisions of sectoral bodies, such as the RFMOs, also only bind their members, giving rise

- 70. See, e.g., id. at 2.
- 71. Creation of MPAs in the ABNJ has been widely discussed in the context of the regional seas conventions.

[T]here are 18 regional seas programmes, [and] only four of them currently have the mandate to address ABNJ: (i) the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention); (ii) the Convention on the Conservation of Antarctic Marine Living Resources (CAMLR Convention); (iii) the Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (SPREP Convention); and (iv) the Convention on the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention). To these four conventions must be added the Protocol on Environmental Protection to the Antarctic Treaty, or Madrid Protocol, which also applies in ABNJ.

These five conventions all contain to some extent a legal basis to establish MPAs in ABNJ and four of them are currently engaged in the process of establishing and managing protected areas beyond national jurisdiction.

- *Id*. at 4.
- 72. Vienna Convention on the Law of the Treaties, May 23, 1969, 1155 U.N.T.S. 331 (entered into force Jan. 27, 1980).
- 73. DRUEL & GJERDE, *supra* note 65, at 5 (referring to the "lack of global recognition granted to the MPAs adopted at the regional level").
- 74. See id.; see also Tullio Scovazzi, United Nations Environment Programme, Note on the Establishment of Marine Protected Areas Beyond National Jurisdiction or in Areas Where the Limits of National Sovereignty or Jurisdiction Have Not Yet Been Defined in the Mediterranean Sea (2011), https://www.cbd.int/doc/meetings/mar/ ebsaws-2014-03/other/ebsaws-2014-03-submission-rac-spa-8-en.pdf.

<sup>65.</sup> See Kristina Gjerde et al., Strong High Seas Project, Conservation AND SUSTAINABLE USE OF MARINE BIODIVERSITY IN AREAS BEYOND NATION-AL JURISDICTION: OPTIONS FOR UNDERPINNING A STRONG GLOBAL BBNJ Agreement Through Regional and Sectoral Governance 6 (2018), https://www.prog-ocean.org/wp-content/uploads/2018/08/STRONG-High-Seas-Policy-Brief\_Options-for-underpinning-BBNJ-agreement.pdf. UNCLOS "provides neither a mechanism nor specific procedures to enable States to implement" their "responsibilities" to protect the marine environment. Other international conventions that one might think would provide mechanisms for creating MPAs in the ABNJ also do not do so. For example, the CBD has no specific article on marine and coastal biodiversity. In order to fill this gap, in 1995, the COP to the CBD adopted the Jakarta Mandate on the Conservation and Sustainable Use of Marine and Coastal Biological Diversity. This mandate contains basic principles, develops thematic areas, and has further been implemented through a multi-year program of work described in Decision VII/5. See CBD, COP 7, Decision VII/5. Marine and Coastal Biological Biodiversity, U.N. Doc. UNEP/CBD/COP/DEC/VII/5 (2004), https://www.cbd.int/doc/decisions/cop-07/cop-07-dec-05-en.pdf. "CBD with 'Jakarta Mandate' decisions express the duty of cooperation in the field of the protection of the marine environment set out in article 197 of UNCLOS." See Ribeiro, supra note 63, at 185. However, it is important to underscore:

<sup>66.</sup> GJERDE ET AL., *supra* note 65.

<sup>69.</sup> DRUEL & GJERDE, supra note 65, at 5. For example:

<sup>[</sup>A]n area may be declared as an MPA at the regional level [pursuant to a regional seas convention, and] this decision would only apply to Contracting Parties to the regional seas convention. These Contracting Parties may seek additional protection at the IMO: a decision regarding shipping may (or may not) be adopted there which would apply to all members of the IMO. In the meantime, fisheries would be regulated through the competent RFMO, with a number of Contracting Parties being distant-water fishing nations, present there because they have an economic interest in the fisheries of the region.

*Id.* at 5.

to a similar problem that their restrictions do not bind non-Member States or vessels under their jurisdiction.

Despite the challenges of creating MPAs in the ABNJ, there has been growing appreciation of the potential role of MPAs in climate change mitigation and adaptation.<sup>75</sup> After almost two decades of preparation, one of the most promising options for establishing well-designed MPAs in a binding legal framework may be the binding legal instrument that countries are currently negotiating to better protect biodiversity in the ABNJ (the draft BBNJ treaty).

In 2017, the United Nations General Assembly (UNGA)<sup>76</sup> decided to develop an international legally binding mechanism under UNCLOS on conservation and sustainable use of marine biodiversity of the ABNJ.<sup>77</sup> To this end, it decided to convene an intergovernmental conference (IGC) under the auspices of the United Nations to negotiate the text of the draft BBNJ treaty.<sup>78</sup>

The negotiations on the draft BBNJ treaty are focusing on four issues, namely marine genetic resources, including questions on the sharing of benefits; measures such as ABMTs, including MPAs; environmental impact assessments; and capacity-building and the transfer of marine technology. IGC has already held three substantive sessions; the final session, which was due to take place between March 23 and April 3, 2020, was postponed due to the coronavirus pandemic and is scheduled to take place at the earliest available time to be decided by UNGA.<sup>79</sup>

An interim online briefing session took place on September 14, 2020, that announced the start of virtual intersessional work ahead of the next in-person meeting of the IGC. The aim is to keep the dialogue among the Parties going on key and cross-cutting issues of the draft BBNJ treaty. This virtual platform is facilitated using an online discussion forum where Parties will have a chance to take stock and prepare for the fourth IGC session.<sup>80</sup>

This international instrument is a potential platform for establishing a comprehensive and systematically designed network of MPAs. Further, such a framework would be useful to progressively guide regional seas conventions and also build a framework for creating cross-sectoral MPAs in those areas of the globe where there is no regional sea convention.<sup>81</sup>

#### 2. National Framework and Challenges

Legally, it is more straightforward to establish MPAs within the areas of the oceans where nation States have legal rights under UNCLOS, such as the territorial sea and the EEZ, compared with the ABNJ. Within the areas where nation States have legal rights, such as their EEZs, the nation State has clear legal authority to unilaterally establish MPAs, meaning that the State does not need the agreement of other States or regional or sectoral bodies to establish the MPA.<sup>82</sup>

Depending on the domestic legal framework within ocean areas under national control under UNCLOS, governments at various levels establish MPAs—namely the national, state, local, and tribal governments.<sup>83</sup> In response to the growing recognition by scientists and policy experts that marine ecosystems require special legal frameworks, due to their distinct features and unique challenges, nation States have started establishing legislation to create MPAs.<sup>84</sup>

Nation States may use a variety of different legal frameworks for creating MPAs. Some countries choose to include MPAs within the principal protected areas legislation, while some countries, with huge marine areas, prefer to have distinct legislation considering the complexity and coverage requiring protection.<sup>85</sup> In some countries, a number of laws authorize the creation of MPAs,<sup>86</sup> while

Sometimes, national governments work together to establish an MPA that crosses borders. Italy, France, and Monaco together established the Pelagos Sanctuary for Mediterranean Marine Mammals. It covers parts of sea that is in the nations' own territories as well as international waters. National Geographic, *The Importance of Marine Protected Areas (MPAs)*, https://www.nationalgeographic.org/encyclopedia/importance-marine-protected-areas/ (last visited Dec. 2, 2020).

- 85. See, e.g., the Australia case study in Ben Boer & Stefan Gruber, Legal Framework for Protected Areas: Australia (IUCN, IUCN-EPLP No. 81, 2010), https://www.iucn.org/downloads/australia\_1.pdf. See id.
- 86. For example, in the Philippines, protected areas legislation, fisheries law, and local government code authorize marine protection with respect to matters under those jurisdictions. See the Philippines case study in ANTONIO G.M. LA VIÑA ET AL., LEGAL FRAMEWORK FOR PROTECTED AREAS: PHILIPPINES (IUCN, IUCN-EPLP No. 81, 2010). See id.

<sup>75.</sup> See Roberts et al., supra note 21, at 6168.

<sup>76. &</sup>quot;Since 1984, the [UNGA] has considered developments pertaining to [UN-CLOS] as well as those relating to ocean affairs and the law of the sea" and adopts every year a resolution on Oceans and the Law of the Sea. UNGA, 62nd Session: Oceans and the Law of the Sea: Joint Debate, https://www.un.org/en/ga/62/plenary/oceansseas/bkg.shtml (last visited Dec. 2, 2020). In 2010, the UNGA, in its Resolution 65/37 on 'Oceans and Law of the Sea' declared that it "encourages States to further progress towards the 2012 target for the establishment of marine protected areas, including representative networks, and calls upon States to further consider options to identify and protect ecologically or biologically significant areas, consistent with international law and on the basis of the best available scientific information." EMILY BARRITT & JORGE E. VIÑUALES, A CONSERVATION AGENDA FOR BIODIVERSITY BEYOND NATIONAL JURISDICTION 56 (2016), https://www.ceenrg.landecon.cam.ac.uk/report-files/report-001.

<sup>77.</sup> G.A. Res. 69/292, U.N. GAOR, 69th Sess., U.N. Doc. A/RES/69/292 (2015).

<sup>78.</sup> G.A. Res. 72/249, U.N. GAOR, 72d Sess., U.N. Doc. A/RES/72/249 (2017).

<sup>79.</sup> See United Nations, Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction, https://www.un.org/bbnj/ (last visited Dec. 2, 2020).

Intersessional Work of the Intergovernmental Conference on the Conservation and Sustainable Use of Marine Biodiversity of Areas Beyond National Jurisdiction, IISD REPORTING SERVS., Sept. 14, 2020, https://enb.iisd.org/oceans/ bbnj/intersessional-work/.

<sup>81.</sup> See generally GLEN WRIGHT ET AL., THE LONG AND WINDING ROAD: NEGO-TIATING A TREATY FOR THE CONSERVATION AND SUSTAINABLE USE OF MA-RINE BIODIVERSITY IN AREAS BEYOND NATIONAL JURISDICTION 26 (Institute for Sustainable Development and International Relations, Study No. 08/18, 2018), https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Etude/20180830-The%20long%20and%20winding%20 road.pdf; see also Kathleen Morris & Kamrul Hossain, Legal Instruments for Marine Sanctuary in the High Arctic, 5 MDPI Laws 7 (2016), available at https://www.mdpi.com/2075-471X/5/2/20/htm.

See, e.g., Massachusetts Lobstermen's Ass'n v. Ross, 945 F.3d 535, 543, 50 ELR 20008 (D.C. Cir. 2019) ("under international law," the federal government exerts "significant" "authority to exercise restraining and directing influence over the EEZ") (quoting Administration of Coral Reef Resources in the Northwest Hawaiian Islands, 24 Op. O.L.C. 183, 196-97 (2000)).

<sup>83.</sup> National Geographic explains: For example, the U.S. state of California has established the Point Lobos State Marine Reserve to protect underwater canyons and kelp forests. The Quileute Tribe of the U.S. state of Washington works with the federal government to keep the Olympic Coast National Marine Sanctuary a sustainable fishery.

<sup>84.</sup> LAUSCHE, *supra* note 64, at 211.

in some, there may be umbrella marine legislation within which specific MPAs are protected and governed by different regulations.<sup>87</sup> Some countries also have a specific law depending on a large complex area that needs protection.<sup>88</sup> Other countries use a mixed approach, where the protected areas legislation authorizes MPAs; however, the areas are regulated by separate marine living resource legislation.<sup>89</sup> Some countries separate legislative coverage, if the site is offshore and not attached to the tidal zone, with distinct legislation for offshore and coastal areas.<sup>90</sup>

It is heartening that a number of countries have effectively implemented MPAs in their respective sovereign waters, such as Australia, Canada, and New Zealand.91 Australia has been exemplary in developing marine management measures far ahead of other countries. It has both the largest and the highest number of MPAs in the world.92 Relatively, "the US seems to lag in its use of MPAs,"93 although it "controls more of the ocean than any other nation: its exclusive economic zone accounts for 55% of total U.S. acreage of federal lands and waters."94 "As of June 2020, 26% of U.S. waters (including the Great Lakes) are in some type of MPA . . . [but only] 3% of U.S. waters are in the most highly protected category of MPAs"95 that do not allow any fishing, mining, drilling, or other extractive activities. This is in no way close to the global MPA targets discussed in this Article.

However, recently the United States has "started to recognize the importance of MPAs and move toward implementing them as a fundamental component of U.S. ocean management policy."<sup>96</sup> President Bill Clinton issued an

- 88. For example, the Great Barrier Reef Marine Park in Australia created in 1975. See BOER & GRUBER, supra note 81.
- For example, the South Africa case study detailed in Alexander Ross Paterson, Legal Framework for Protected Areas: South Africa (IUCN, IUCN-EPLP No. 81, 2010). See id.
- 90. For example, the France case study in Armelle Guignier & Michel Prieur, Legal Framework for Protected Areas: France (IUCN, IUCN-EPLP No. 81, 2010). *See id.*
- 91. Randall S. Abate, Marine Protected Areas as a Mechanism to Promote Marine Mammal Conservation: International and Comparative Law Lessons for the United States, 88 OR. L. REV. 255, 258 (2009), available at https://www. academia.edu/2296389/Marine\_Protected\_Areas\_as\_a\_Mechanism\_to\_ Promote\_Marine\_Mammal\_Conservation\_International\_and\_Comparative\_Law\_Lessons\_for\_the\_United\_States.
- 92. See RABAUT ET AL., supra note 65, at 11.
- 93. Abate, *supra* note 91, at 258.
- 94. Darryl Fears & Juliet Eilperin, Trump Lifts Limits on Commercial Fishing at Ocean Sanctuary Off New England, WASH. POST, June 5, 2020, https://www.washingtonpost.com/climate-environment/2020/06/05/ trump-fishing-seamounts-marine-national-monument/.
- 95. LAUREN WENZEL ET AL., NATIONAL MARINE PROTECTED AREAS CENTER (NMPAC), MARINE PROTECTED AREAS 2020: BUILDING EFFECTIVE CONSERVATION NETWORKS 2 (2020), https://nmsmarineprotectedareas. blob.core.windows.net/marineprotectedareas-prod/media/docs/2020-mpa-building-effective-conservation-networks.pdf. "Nearly all the MPAs are in the remote marine national monuments around Hawaii and U.S. territories in the Pacific, established unilaterally under the Antiquities Act, far from the coast of the contiguous U.S., where most human-caused pressures are centered." Lucy Marita Jakub, *The Muddy Waters of US Ocean Protection*, Env'T HEALTH NEWS, Aug. 17, 2020, https://www.ehn.org/us-ocean-protectedareas-2646956715.html.
- 96. Abate, *supra* note 91, at 258.

Executive Order<sup>97</sup> that required the establishment of new MPAs that would strengthen the protection of marine and coastal ecosystems and habitats of U.S. waters.<sup>98</sup> To this end, government bodies such as the National Oceanic and Atmospheric Administration (NOAA)<sup>99</sup> and federal, state, and tribal governments have worked with private actors.<sup>100</sup>

According to the National Marine Protected Areas Center:

Approximately 75% of the [United States'] MPAs are managed by coastal states and territories, while 22% are under federal jurisdiction. Fewer than 1% of U.S. MPAs are managed by a local agency. Although most U.S. MPAs are managed by states and territories, these areas are typically quite small. In contrast, federally managed areas such as Federal fishery closures and National Monuments are often very large. For this reason, approximately 98% of the total MPA area is managed by federal agencies.<sup>101</sup>

To facilitate efficient and effective management of MPAs, the United States established the National System of MPAs.<sup>102</sup> "In the U.S., the MPAs span a range of habitats, including the open ocean, coastal areas, inter-tidal zones, estuaries, and the Great Lakes."<sup>103</sup>

However, MPAs are not free from political and legal problems in the national frameworks of the United States as well as other countries. Removal or reduction of legal protections on protected areas is one of the political moves by countries that would undermine the progress of establishing MPAs. In the United States, for instance, the Donald Trump Administration's rollback of the protections of Northeast Canyons and Seamounts Marine National Monument by removing commercial fishing restrictions<sup>104</sup> is one such regressive political move that threatens the protection of marine ecosystems.

This marine monument was designated in 2016 by the Barack Obama Administration as the first marine national monument in the U.S. EEZ in the Atlantic Ocean.<sup>105</sup> The Trump Administration's decision to remove the restrictions on fishing enraged environmentalists, as they believe

- 101. NMPAC, ANALYSIS OF UNITED STATES MPAS 4 (2012), https://nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/ archive/pdf/helpful-resources/mpa\_analysis\_2012\_0320.pdf.
- 102. See NMPAC, FRAMEWORK FOR THE NATIONAL SYSTEM OF MARINE PRO-TECTED AREAS OF THE UNITED STATES OF AMERICA (2015), https://nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/ media/archive/nationalsystem/framework/final-mpa-framework-0315.pdf.
- 103. NMPAC, MARINE PROTECTED AREAS: BUILDING RESILIENCE TO CLIMATE CHANGE IMPACTS 1 (2013), https://nmsmarineprotectedareas.blob.core. windows.net/marineprotectedareas-prod/media/archive/pdf/helpful-re sources/mpas\_climate\_change\_march\_2013.pdf.
- 104. The creation of the national monuments was legally challenged by fishing groups as it restricted commercial fishing. The federal appeals court dismissed their claims and upheld the designation. Further, the U.S. Court of Appeals for the District of Columbia (D.C.) Circuit upheld the decision. See Massachusetts Lobstermen's Ass'n v. Ross, 945 F.3d 535, 50 ELR 20008 (D.C. Cir. 2019).
- 105. See Press Release, Earthjustice, Federal Court Upholds Protections for Oceans and National Monuments (Oct. 8, 2018), https://earth justice.org/news/press/2018/federal-court-upholds-protections-for-oceansand-national-monuments.

<sup>87.</sup> For example, the Gully case study detailed in David L. VanderZwaag & Paul Macnab, Marine Protected Areas: Legal Framework for the Gully off the Coast of Nova Scotia (Canada) (IUCN, IUCN-EPLP No. 81, 2010). *See id.* 

<sup>97.</sup> See Exec. Order No. 13158, supra note 32.

<sup>98.</sup> See id.

<sup>99.</sup> See NOAA, Home Page, https://www.noaa.gov/ (last visited Dec. 2, 2020). 100. See Abate, supra note 91, at 258.

it could devastate protections of the marine ecosystems in this region and lead to permanent degradation of the region.<sup>106</sup> In June 2020, environmental groups filed a federal lawsuit stating that the decision violates the federal Antiquities Act.<sup>107</sup>

Further, in 2019, the Trump Administration dissolved the MPA Federal Advisory Committee that was run by NOAA.<sup>108</sup> This panel was known for providing expert advice to NOAA on measures to strengthen U.S. MPAs and identifying challenges facing them.<sup>109</sup> Similarly, in Australia, there have been several instances of legal downgrading. In 2013, the government suspended the legally binding management plans of a network of MPAs established in 2012.<sup>110</sup> This was repeated again in 2017 when the government proposed lesser protection.<sup>111</sup>

From the above discussion, it is clear that establishment of MPAs faces legal, institutional, and political challenges, both in national and international frameworks, particularly in the ABNJ. Apart from overcoming these challenges, there are climate-specific challenges that could impact MPAs in the long term. For this, it is important primarily to understand what MPAs can offer for mitigating and adapting to climate change impacts and the specific challenges that climate change poses in designing, planning, and establishing MPAs, which is discussed in Part II.

#### II. Benefits and Challenges of MPAs in the Context of Climate Change

While MPAs were initially regarded as a tool for protecting fisheries, interest is growing in using MPAs to help mitigate climate change and facilitate adaptation to it.<sup>112</sup> However, the extent to which MPAs can safeguard oceans from the uncertainties of climate change seems to have remained an open question.<sup>113</sup> This part discusses some leading scientific arguments for using well-managed MPAs as a tool for climate change mitigation and adaptation.

- A. Benefits of MPAs in Mitigating and Adapting to Climate Change
- 1. Mitigation Potential of MPAs
- a. Carbon Sinks and Buffering

MPAs are crucial to protect and sustain oceans, which are the biggest carbon sinks. In particular, "MPAs are an important tool to support restoration and conservation of 'blue carbon ecosystems,'<sup>114</sup> which are globally significant carbon sinks and to aid carbon sequestration."<sup>115</sup> Further, there are benefits offered by MPAs even outside their boundaries, such as the "protection of bordering or buffering habitats and the production of larval, juvenile, and adult marine species that 'spillover' into outside areas."<sup>116</sup>

#### b. Reduced Stressors and Enhanced Ecosystem Services

Although MPAs are not invulnerable to risks posed by climate change, they provide opportunities for creating areas of limited stress.<sup>117</sup> Thus, they aid in reducing ocean stressors such as ocean deoxygenation and acidification, and support marine species to cope with climate change effects. Similarly, though MPAs cannot completely avert the spread of warmer waters that contribute to climate change, they have the potential to alleviate other stressors, such as habitat destruction, that exacerbate risks of climate change.<sup>118</sup> Overall, "MPAs can facilitate the maintenance of higher degrees of ecosystem resilience and put them in a better position to absorb climatic perturbations."<sup>119</sup> Ultimately, by preventing biodiversity loss, reducing ocean stressors,

<sup>106.</sup> See Gabrielle Mannino, Environmental Groups Sue to Stop Trump Changes to Atlantic Ocean Monument, News CENTER ME., June 18, 2020, https:// www.newscentermaine.com/article/news/national/environmental-groupssue-to-stop-trump-changes-to-atlantic-ocean-monument/97-f9707416f9cb-430c-a8ea-158ce1a11b37.

<sup>107.</sup> Antiquities Act, 1906, Pub. L. No. 59-209, 34 Stat. 255. Under the Antiquities Act of 1906, presidents are given power to create a national monument, but the Act does not specifically provide for undoing such a designation. On the lawsuit, see, e.g., David Abel, *Environmental Groups Sue Trump Administration for Allowing Commercial Fishing in Protected Waters*, BOSTON GLOBE, June 17, 2020, https://www.bostonglobe.com/2020/06/17/metro/environmental-group-sues-trump-administration-allowing-commercial-fishing-protected-waters/.

<sup>108.</sup> Miranda Green, White House Eliminates Advisory Boards for Marine Life, Invasive Species, HILL, Oct. 1, 2019, https://thehill.com/policy/energyenvironment/463893-white-house-eliminates-advisory-boards-overseeingmarine-life; see NMPAC, MPA Federal Advisory Committee, https://marineprotectedareas.noaa.gov/fac/ (last visited Dec. 2, 2020).

<sup>109.</sup> See Green, supra note 108.

Sophie Bertazzo, Australia Bid to Drop Protected Waters the Wrong Move, Experts Say, CONSERVATION INT'L, May 8, 2018, https://www.conservation.org/blog/australia-bid-to-drop-protected-waters-the-wrong-move-experts-say.
Id.

<sup>112.</sup> See Xuechan Ma, Governing Marine Protected Areas in a Changing Climate: Private Stakeholders' Perspectives, 9 ARCTIC REV. ON L. & POL. 335, 337 (2018), available at https://arcticreview.no/index.php/arctic/article/ view/1208; Hopkins et al., supra note 24, at 3.

<sup>113.</sup> See generally Roberts et al., supra note 21.

<sup>114.</sup> Blue carbon ecosystems are coastal ecosystems such as mangroves, salt marshes, and seagrass meadows that play an important role in sequestering carbon. "[T]hese ecosystems sequester and store significant amounts of coastal blue carbon from the atmosphere and ocean and hence are now recognized for their role in mitigating climate change," and "sequester approximately 10% of the carbon buried in ocean sediment annually." Blue Carbon Initiative, *About Blue Carbon*, https://www.thebluecarboninitiative. org/about-blue-carbon (last visited Dec. 2, 2020).

<sup>115.</sup> Howard et al. provide:

One study in Indonesia demonstrated that over a 10-year period, MPAs reduced mangrove loss by ~14000 [hectares] and avoided approximately 13 million metric tons (CO<sub>2</sub> equivalent) of blue carbon emissions... Such research highlights the value of blue carbon projects in climate mitigation and in maintaining the full suite of services these ecosystems provide.

Jennifer Howard et al., *The Potential to Integrate Blue Carbon Into MPA Design and Management*, 27 AQUATIC CONSERVATION: MARINE FRESHWATER ECOSYSTEMS 100, 101 (2017), *available at* https://onlinelibrary.wiley.com/doi/pdf/10.1002/aqc.2809; *see also* IUCN, ISSUES BRIEF: BLUE CARBON (2017), https://www.iucn.org/sites/dev/files/blue\_carbon\_issues\_brief.pdf.

<sup>116.</sup> Coral Reef Education Institute, *Protect*, https://www.onecoralreef.org/creating-marine-protected-areas-and-eco-tourism (last visited Dec. 2, 2020).

<sup>117.</sup> See IUCN, supra note 115.

<sup>118.</sup> Neil Davis, What Role for Marine Protected Areas in a Future of Climatic Change?, in BIODIVERSITY OF BRITISH COLUMBIA (Brian Klinkenberg ed., Univ. of British Columbia 2020), https://ibis.geog.ubc.ca/biodiversity/ MarineProtectedAreasUnderClimateChange.html.

<sup>119.</sup> Id.

and promoting ecosystems, MPAs enhance livelihoods and ecosystem services.<sup>120</sup>

#### c. Corridors

Numerous small MPAs could be structured as a chain to form corridors, and this could be used to track climate change by executing them in stages.<sup>121</sup> When there are harmful effects in one MPA, habitats can shift from that one to another MPA through corridors that are ecologically connected.<sup>122</sup> In fact, "well-developed, functionally connected MPA networks provide added protection by having multiple examples of a range of protected habitats as an insurance policy against climate change and other impacts."<sup>123</sup>

#### d. Public Education and Tourism

A well-established MPA with on-site managers and facilities could be a trusted place for local communities to receive information, and can educate local residents on climate change. The use of sustainable technologies and innovations with explicit consideration for effects of climate change<sup>124</sup> could motivate people in the area to adapt to climate change and raise awareness on reduction of carbon emissions and its benefits to the environment.<sup>125</sup> MPAs have triggered public interest in learning more about marine species and ecosystems conservation, which has paved the way for increased tourism in these areas.<sup>126</sup> This increases awareness and has the potential to lead to behavioral changes among communities and tourists to encourage activities that reduce GHG emissions.<sup>127</sup>

#### 2. Adaptation Potential of MPAs

#### a. Ecosystem Adaptation

"Climate change being a long term, systemic disturbance"<sup>128</sup> worsens the already threatened marine environments from anthropogenic disturbances such as fishing, shipping, developmental activities, and tourism.<sup>129</sup> Well-designed and effectively managed MPAs, "particularly no-take marine reserves, can be powerful tools for climate change adaptation."<sup>130</sup> MPAs can be designed to maintain species diversity, promote genetic diversity, safeguard reproductive output, increase the spatial extent of the targeted populations, and enhance the gene pool, which can increase both the adaptability and resilience of populations to climatic changes in oceans.<sup>131</sup>

#### b. Human Community Adaptation

□ Guard against sea-level rise and storms. "Coastal ecosystems<sup>132</sup> can protect coastal communities, infrastructure, and property from storms and the increased flooding and soil erosion that accompany sea level rise."<sup>133</sup> Highly protected MPAs that restrict or prohibit extractive or harmful activities such as fishing and developmental activities can "buffer local impacts of storms and sea level rise and increase the resilience of local communities."<sup>134</sup>

□ Recovery of fisheries. Well-designed MPAs can effectively aid the recovery of depleted fish stocks; protect essential fish habitat (e.g., wetlands, seagrasses); increase reproduction; promote genetic diversity and rebuild the age structures of fish populations, which increase the resilience of ecosystems and fish populations; and improve the health of surrounding populations and habitats, as juvenile and adult animals, eggs, and larvae find their way out of reserves.<sup>135</sup>

Further, "in recent years, there has been progress with respect to MPAs also being designed with the economic and social resilience of fisheries-dependent communities, tribal communities, and other traditional users in mind."<sup>136</sup>

□ Monitoring climate change. "MPAs can also facilitate adaptation to climate change by acting as sentinel sites for monitoring the impacts of climate change. This is mainly because they have a place-based focus, long-term

<sup>120.</sup> See Roberts et al., supra note 21, at 6169. In fact, "[t]he total ecosystem service benefits of achieving 10% coverage of MPAs have been estimated at USD 622-923 billion over the period 2015-2050." ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD), MARINE PROTECTED AREAS: ECONOMICS, MANAGEMENT, AND EFFECTIVE POLICY MIXES 7 (2016), https://www.oecd.org/environment/resources/Marine-Protected-Areas-Policy-Highlights.pdf.

<sup>121.</sup> See Heather Cayton, The Role of Biogeography in Planning and Designing Marine Protected Areas, CONSERVATION CORRIDOR, Apr. 24, 2018, https:// conservationcorridor.org/digests/2018/04/the-role-of-biogeography-inplanning-and-designing-marine-protected-areas/.

<sup>122.</sup> See generally NMPAC, ECOLOGICAL CONNECTIVITY FOR MARINE PROTECT-ED AREAS (2020), https://nmsmarineprotectedareas.blob.core.windows.net/ marineprotectedareas-prod/media/docs/2020-ecological-connectivity-formpas.pdf.

<sup>123.</sup> NMPAC, supra note 103, at 3.

<sup>124.</sup> For example, the first MPA with climate change considerations in the Philippines has been established by the municipalities of Lubang and Looc in Occidental Mindoro. CONSERVATION INTERNATIONAL—PHILIPPINES, CLIMATE-SMART MARINE PROTECTED AREAS, http://www.coraltriangleinitiative.org/sites/default/files/resources/17\_Climate%20SMART%20 MPA%20(brochure).pdf.

<sup>125.</sup> See generally DAY ET AL., supra note 28.

<sup>126.</sup> See Australia Department of the Environment and Heritage, The Benefits of Marine Protected Areas (2003), https://www.environment. gov.au/system/files/resources/5eaad4f9-e8e0-45d1-b889-83648c7b2ceb/ files/benefits-mpas.pdf.

<sup>127.</sup> See Davis, supra note 118.

<sup>128.</sup> MERWIN ET AL., *supra* note 19, at 2.

<sup>129.</sup> See id.

<sup>130.</sup> Conservation Gateway, MPA Network Design for Fisheries, Climate Change, and Biodiversity Objectives, https://www.conservationgateway.org/ConservationPractices/Marine/Area-basedManagement/Pages/MPA-Design-for-Fish-Climate-Change-Biodiversity.aspx (last visited Dec. 2, 2020).

<sup>131.</sup> See Roberts et al., supra note 21, at 6169, 6170.

<sup>132.</sup> Coastal ecosystems include mangroves, salt marshes, seagrass meadows, intact wetlands, mudflats, and reefs.

<sup>133.</sup> See MERWIN ET AL., supra note 19, at 3.

<sup>134.</sup> Id.

<sup>135.</sup> Id. 136. Id.

data sets and controlled activities."<sup>137</sup> The evidence acquired from monitoring MPAs can be used to adapt the management of MPAs to ward off "existing or emerging threats and impacts."<sup>138</sup>

#### B. Challenges in Using MPAs for Climate Change

While there is considerable potential for MPAs to assist in mitigating and adapting to climate change, there are challenges to using MPAs to address climate change. Part I underscored the legal and institutional challenges to establishing MPAs, especially in the ABNJ. This section identifies other formidable challenges involved in establishing MPAs as a tool for climate change mitigation and adaptation. These are in the nature of general as well as climatespecific challenges, and will be discussed separately for the sake of clarity.

#### 1. Generic Challenges

Inadequate funding, governance, and management are major stumbling blocks for the creation and management of MPAs. These issues are elaborated below to show how they pose a great challenge for establishing, managing, and increasing the number of MPAs within and outside national jurisdiction.

#### a. Lack of Adequate Funding

Financial capacity has remained a consistent constraint across most MPA sites,<sup>139</sup> and poses a major challenge by weakening the potential of MPAs to preserve and aid recovery of ecosystems.<sup>140</sup> With the pressure for countries to meet the 10% target under the CBD and SDGs, this challenge seems even more insurmountable.<sup>141</sup> Generally, sources of MPA funding need not be limited to just government budgets and global aid, but may include even private sources such as NGOs and voluntary donations, user fees, and tourist fees.<sup>142</sup>

However, government budgets seem to be the major source of funding for MPAs in developed countries, and for developing countries, international sources seem to be the potential source of funding.<sup>143</sup> Yet MPAs are poorly funded in both developed and developing countries.<sup>144</sup> Consequently, inadequate funding creates governance and management hurdles for the establishment and implementation of MPAs.

#### b. Poor Governance and Management

In countries where the legal and institutional frameworks are inadequate or poorly implemented, MPAs exist only on paper, commonly known as "paper parks."<sup>145</sup> Such paper parks obstruct conservation objectives.<sup>146</sup> In fact, "most existing MPAs offer little protection for marine life because they often do not strictly regulate high impact activities, are not properly managed or enforced, or are located in areas with low biological value."<sup>147</sup> Climate change will compound the problem of paper parks, and as the pressure to tackle climate change keeps building, the efforts to conserve the marine environment through MPAs will increase, which in turn will increase the governance costs of MPAs.<sup>148</sup>

#### c. Dealing With Uncertainties

As much as marine systems have unique characteristics, there are several uncertainties associated with their management and conservation. Due to the inaccessibility of the oceans, data collection is bound to be onerous, less verifiable, costly, and very sparse. Therefore, making decisions based on such limited knowledge, coupled with climate change uncertainties, makes it daunting and debatable.<sup>149</sup> Further, the marine environment is so dynamic that it is difficult for conservationists and MPA managers to make decisions about the types of environment they should be protecting.<sup>150</sup>

#### 2. Climate Change Challenges

In addition to the challenges elaborated above, there are notable climate-specific challenges in establishing MPAs that can mitigate and adapt to climate change, and addressing climate change in already-existing MPAs.

#### a. Many Existing MPAs Do Not Address Climate Change

"Most existing MPAs were established without consideration of climate change."<sup>151</sup> This poses a challenge for the reliability of MPAs in tackling the threats of climate

<sup>137.</sup> NMPAC, supra note 103, at 3.

<sup>138.</sup> *Id*.

<sup>139.</sup> See Ma, supra note 112, at 338; see also David A. Gill et al., Capacity Shortfalls Hinder the Performance of Marine Protected Areas Globally, 543 NATURE 665 (2017), available at https://www.nature.com/articles/nature21708.

<sup>140.</sup> See Ma, supra note 112; see also LUCY EMERTON ET AL., SUSTAINABLE FI-NANCING OF PROTECTED AREAS: A GLOBAL REVIEW OF CHALLENGES AND OPTIONS 13-14 (IUCN, Best Practice Protected Area Guidelines Series No. 13, 2006), https://portals.iucn.org/library/sites/library/files/documents/ PAG-013.pdf.

<sup>141.</sup> See OECD, supra note 120, at 9.

<sup>142.</sup> See Ma, supra note 112; see also EMERTON ET AL., supra note 140.

<sup>143.</sup> See Ma, supra note 112. 144. See id.

<sup>145.</sup> World Resources Institute, *Marine Protected Areas of the World*, https://www. wri.org/resource/marine-protected-areas-world (last visited Dec. 2, 2020).

<sup>146.</sup> See Ma, supra note 112, at 337.

<sup>147.</sup> Sarah O. Hameed et al., Incentivizing More Effective Marine Protected Areas With the Global Ocean Refuge System (GLORES), 4 FRONTIERS MA-RINE SCI. 208 (2017), https://www.frontiersin.org/articles/10.3389/ fmars.2017.00208/full.

<sup>148.</sup> See Ma, supra note 112, at 338.

<sup>149.</sup> There has been the problem of lack of spatial data regarding the spread and coverage of biodiversity and habitats that could be a hurdle for planning of MPAs in the ABNJ. See Morgan E. Visalli, Data-Driven Approach for Highlighting Priority Areas for Protection in Marine Areas Beyond National Jurisdiction, 122 MARINE POL'Y 2 (2020), available at https://www.science-direct.com/science/article/pii/S0308597X19309194.

<sup>150.</sup> See Chelsea Harvey, To Conserve Marine Species, Make Protected Areas Mobile, E&E NEWS, Jan. 17, 2020, https://www.scientificamerican.com/article/ to-conserve-marine-species-make-protected-areas-mobile/.

<sup>151.</sup> See Craig, supra note 7, at 324.

change. There are also criticisms that many countries are increasingly creating MPAs without paying due attention to critical aspects of establishing MPAs. It is not very clear whether this is out of concern to cover and protect as much of the marine environment as possible, or merely to meet international targets.<sup>152</sup>

#### b. Lack of Flexibility to Accommodate Shifting Species and Habitats

Most of the existing MPAs are legally static. Thus, their legal boundaries do not in any sense morph in line with the species and the habitats that they are intended to protect. Generally, the vulnerability of marine species to biodiversity loss is high, due to their migratory nature and inhabitation of more than one natural habitat.<sup>153</sup> So the fixed nature of the legal boundaries of MPAs is a problem in an era of climate change, when changes in the oceans, such as increased water temperatures, are likely to increase the mobility of species and habitats.<sup>154</sup>

#### c. Inadequate Knowledge of Climate Change Impacts and Management Issues in the Marine Environmen<sup>1</sup>

As discussed above, there are specific hurdles that are unique to the marine environment, which is quite different from terrestrial ecosystems. Scientists often have a better understanding of climate impacts in the terrestrial environment than marine ecosystems, and consequently management lags on the oceans compared with on land.

For example, both wildfires and coral bleaching events devastate ecosystems and are exacerbated by climate change. While managers largely understand how to manage and, to an extent, prevent wildfires, there is still some uncertainty as to the main drivers of coral bleaching events and management actions to prevent bleaching, such as sun shielding and cold-water pumping, that are in their infancy.<sup>155</sup>

Not only does scientific understanding of climate impacts in the oceans lag compared with understanding of impacts on land, but knowledge also varies depending on the part of the oceans. There is better scientific "understanding . . . of climate impacts in coastal and nearcoastal habitats" than further offshore.<sup>156</sup> Also, Zachary Cannizzo et al. report that "much of the adaptation work that has been conducted in marine systems has focused on

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impacts to human communities, with less attention paid to the ecological communities on which these livelihoods often depend."<sup>157</sup>

Compounding the problems of scientific uncertainty, marine environments are dynamic,<sup>158</sup> and "the magnitude and timeline of the climate benefits of MPAs . . . vary greatly depending on factors such as geography, ecosystem type (e.g., deep sea corals, seagrasses), connectivity, level of protection, and effectiveness of management measures."<sup>159</sup>

#### d. MPAs Cannot Be a Panacea

Despite the potential of MPAs in mitigation of, and adaptation to, climate change, they cannot be a panacea for the extreme changes such as storm intensity, sea-level rise, and ocean acidification that oceans will be undergoing due to a gradual rise in sea temperatures.<sup>160</sup> Ultimately, as there are warmer oceans, there will be warmer MPAs that will surpass the heat-tolerant levels of species, thereby destroying ecosystems and habitats.<sup>161</sup> It is even predicted that this "extreme warming would devastate all currently designated MPAs, causing many species to go extinct, and changing many marine food webs."<sup>162</sup>

#### III. Recommendations

To tackle climate change, it is important to attempt to foresee the potential climate impacts and to be prepared with available tools and management strategies. All stakeholders involved in developing and implementing MPAs should first fully acknowledge the current and possible threats that climate change poses to the oceans. Then, policymakers, MPA managers, and other stakeholders need to proactively develop and apply adaptation strategies and build flexible MPA management systems.<sup>163</sup>

This part offers key recommendations on how climate change mitigation and adaptation considerations could be integrated into MPA design and management. Drawing on existing literature, Section III.A identifies principles that are useful to keep in mind in considering the use of MPAs in the context of climate change. Section III.B provides more specific suggestions for how these principles can be

<sup>152.</sup> See Shreya Dasgupta, The Ups and Downs of Marine Protected Areas: Examining the Evidence, MONGABAY, Jan. 25, 2018, https://news.mongabay.com/2018/ 01/the-ups-and-downs-of-marine-protected-areas-examining-the-evidence/.

<sup>153.</sup> See Abate, supra note 91, at 261.

<sup>154.</sup> See generally Harvey, supra note 150.

<sup>155.</sup> Zachary J. Cannizzo et al., Adapting to a Changing Ocean: Experiences From Marine Protected Area Managers, 36(1) PARKS STEWARDSHIP F. 114, 115 (2020), available at https://escholarship.org/uc/item/8cp5f070.

<sup>156.</sup> Id.

<sup>157.</sup> Id.

<sup>158.</sup> Id. at 114.

<sup>159.</sup> See Merwin et al., supra note 19, at 1, 2.

<sup>160.</sup> Derek P. Tittensor et al., Integrating Climate Adaptation and Biodiversity Conservation in the Global Ocean, 5 SCI. ADVANCES 1 (2019), https://advances.sciencemag.org/content/5/11/eaay9969 ("[MPAs] cannot halt the effects of climate change and are not a panacea").

<sup>161.</sup> Matthew O. Berger, Report: Marine Protected Areas Offer No Protection From Climate Change, OCEANS DEEPLY, May 7, 2018, https://www. newsdeeply.com/oceans/articles/2018/05/07/report-marine-protected-areasoffer-no-protection-from-climate-change.

<sup>162.</sup> Karla Lant, Marine Protected Areas Cannot Tolerate Climate Change, ENVT MONITOR, Aug. 9, 2018, https://www.fondriest.com/news/marine-protected-areas-cannot-tolerate-climate-change.htm.

<sup>163.</sup> See RODNEY V. SALM & ELIZABETH MCLEOD, CLIMATE CHANGE IMPACTS ON ECOSYSTEM RESILIENCE AND MPA MANAGEMENT IN MELANESIA (Climate Change and Biodiversity in Melanesia Project, CCBM Paper No. 7, 2008), http://www2.bishopmuseum.org/ccbm/Areas/Melanesia/Papers/CCBM\_ Paper7.pdf.

translated into the design and management of MPAs in the ABNJ and in national waters.

Although extensive efforts may be required to implement these recommendations on the ground (considering that the ongoing efforts at the international level still remain at a nascent stage), this Article attempts to provide some initial yet crucial steps to be taken and highlights the potential of MPAs to help address climate change threats in the long term.

#### A. Principles for Establishing a Global Network of MPAs

In the context of climate change, there is a need for a "globally representative" and ecologically connected network of MPAs.<sup>164</sup> Such a network of MPAs would enhance carbon sequestration and magnify the area of biodiversity that will be protected, thereby promoting the mitigation and adaptation potential of MPAs. It is true that climate change threats faced by oceans cannot be nullified by the creation of a global network of MPAs. However, by protecting the oceans from stressors and destructive activities such as fishing and extractive practices, the global network could achieve the twin goals of keeping factors that exacerbate climate change to a minimum, and restoring degraded coastal habitats through carbon sequestration.<sup>165</sup>

With this background, this part identifies key principles that should be considered when designing and establishing a global network of MPAs that will be resilient to climate change. While these principles may not be absolute<sup>166</sup> or provide a panacea for the climate change threats in marine ecosystems, they may enable individual MPAs and MPA networks to better address climate change threats and uncertainties. Further, although these principles are suggested keeping in mind their application predominantly for a global network of MPAs, some of them could be applied for establishing individual MPAs as well.

164. NMPAC explains:

See NMPAC, supra note 102, at 7. Our Shared Seas states: While countries race to reach overall coverage targets, it appears that the ability to ensure ecological connectivity and representation has fallen short—which is partly due to the political capital required and intricacies of implementing large-scale systematic conservation planning processes.

#### 1. Design Larger MPAs

A globally representative network of MPAs should be designed to include larger-size MPAs. It is crucial for the sustenance of marine life that populations and ecosystems are well-connected, and large MPAs provide opportunities for this connectivity. Generally, large MPAs consist of networks of MPAs and a variety of habitats that preserve key species and enable migration. This would ensure that populations stay connected and intact, overall helping to build resilience in a changing environment caused by climate change.<sup>167</sup>

Also, large MPAs have unique characteristics that can complement networks of small MPAs. For example, large MPAs can act as buffers against uncertainty,<sup>168</sup> especially in situations where there are shifts in species' ranges due to climate change effects,<sup>169</sup> and minimize extinction rates by sustaining large populations of protected species. Further, large MPAs are "less susceptible to 'edge effects' where human impacts spread into the protected area from outside."<sup>170</sup> Therefore, as important as it is to increase the number of MPAs and build MPA networks, it is vital to ensure inclusion of large MPAs, in order to reap maximum benefits and build a robust system of a global network of MPAs.

#### Establish Highly Protected Areas and Safeguard the Interests of Local Communities

MPAs should be designed as "highly protected areas" in which extractive activities, such as fishing, and transiting vessels are limited. There is "mounting scientific research which indicates that fully protected marine areas can help build resilience against the effects of climate change."<sup>171</sup> Establishing highly protected areas will increase the likelihood that MPA objectives are achieved.

However, there is a downside to local communities in establishing highly protected areas. As these areas limit extractive activities such as fishing, they essentially deny the right of these communities to exploit ocean resources. This is one of the main reasons why fisheries communi-

An *ecological network* of MPAs is a set of MPAs within a region that links key habitats for important marine species to grow and reproduce throughout their life cycles. These ecological networks are a key tool for reducing the vulnerability of marine species and their habitats to the impacts of climate change.

Our Shared Seas, *supra* note 53. 165. See IUCN WORLD COMMISSION ON PROTECTED AREAS, ESTABLISHING RE-

<sup>105.</sup> see IUCIN WORLD COMMISSION ON PROTECTED AREAS, ESTABLISHING RE-SILIENT MARINE PROTECTED AREA NETWORKS: MAKING IT HAPPEN (2008), https://www.iucn.org/sites/dev/files/import/downloads/mpanetworksmakingithappen\_en.pdf; see also IUCN, supra note 61.

<sup>166.</sup> While several factors such as political, economic, social, and practical factors also need to be taken into consideration while creating these principles, this Article focuses on key climate change factors that need to be taken into account for establishing principles for a global network of MPAs.

<sup>167.</sup> Pew Bertarelli Ocean Legacy Project, Fact Sheet: The Case for Marine Protected Areas (2020), https://www.pewtrusts.org/-/media/ assets/2020/07/fact-sheet---the-case-for-marine-protected-areas\_final.pdf.

<sup>168. &</sup>quot;Governments should design MPAs large enough to encompass such shifts" because "creating a large MPA can offer a buffer" for some species whose "habitats are seasonal or vary from year to year. . . For example, biologists are beginning to see moving regions of hypoxia (low levels of oxygen) in the water during the summer off the west coast of North America, pushing fish and invertebrates to follow the oxygen." Erica Gies, *Designing Marine Protected Areas in a Changing Climate*, HAKAI MAG., Mar. 21, 2018, https://www.hakaimagazine.com/news/ designing-marine-protected-areas-in-a-changing-climate/.

<sup>169.</sup> Natasha J. Gownaris et al., Gaps in Protection of Important Ocean Areas: A Spatial Meta-Analysis of Ten Global Mapping Initiatives, 6 FRONTIERS MARINE SCI. 650 (2019), https://www.frontiersin.org/articles/10.3389/ fmars.2019.00650/full.

<sup>170.</sup> Scientists' Consensus Statement on Marine Protected Areas (MPAs): Characteristics, Governance, and Sustainable Financing, Conference on Marine Protected Areas: An Urgent Imperative—A Dialogue Between Scientists and Policymakers (Mar. 7-9, 2016), https://www.oceansanctuaryalliance.org/new-page-1.

<sup>171.</sup> See Pew Bertarelli Ocean Legacy Project, supra note 167.

ties often express dissatisfaction and object to the creation of MPAs.<sup>172</sup> Therefore, it is important that the measures taken to establish MPAs and protect the marine ecosystems do not increase the inequalities and denial of rights facing these communities. MPA managers should design an inclusive management plan that would protect the ecosystem and balance the economic interests and cultures of affected communities.

#### 3. Use a Science-Based Approach and Include Relevant Stakeholders

A well-designed and strong science-based criterion, which includes projections of climate change, is required to protect MPAs and MPA networks as well as to monitor their progress.<sup>173</sup> Science suggests many factors to consider in designing MPAs. For instance, science underscores the need to identify and include critical areas that are of biological or ecological importance<sup>174</sup> in global MPA networks. Science also can help to identify these areas.

There are suggestions for giving higher priority to inclusion of resilient sites, such as:

mangroves that have space to move inland with rising sea levels . . . ; and ecosystems that have resisted or recovered from damage (e.g. coral bleaching) in the past . . . or have characteristics that indicate they are more likely to survive impacts in the future (e.g. heat-tolerant corals that may be more resistant to coral bleaching).<sup>175</sup>

These sites will help maintain biodiversity that is threatened by climate change.

Science also suggests the need to use overlapping layers of protection to address the risks of climate change in creating MPAs, and for strategies to spread climate change risks into the design of MPA networks, as climate impacts on marine habitats are uneven.<sup>176</sup> Also, it is important to spread out multiple replicates of habitat type to ensure that even if one type of habitat is damaged, those in other areas may survive to supply larvae needed to replenish the areas. This, overall, brings down the risks posed by climate change.<sup>177</sup> Such scientifically based strategies can increase the resilience of MPAs against risks posed by climate change.<sup>178</sup> and increase the potential for MPAs to act as "climate refugia," which Derek Tittensor et al. have

Although it is crucial to use science in designing and managing MPAs, the designation and management of MPAs cannot be a purely mechanical and technical process. Scientific knowledge should be reconciled and integrated with local and traditional knowledge in planning and designing global MPA networks. This will ensure that the knowledge on the area gathered by communities over years is utilized not only to improve MPA design and effectiveness, but also to enhance relationships between MPA managers and local communities. Integrating community knowledge can also "account for other potential adaptation needs such as preservation of local or tribal culture and traditions,"<sup>180</sup> and guarantee that "key community needs for climate adaptation are fully considered."<sup>181</sup>

Further, including relevant stakeholders, such as locally based NGOs who can be a link between local communities and larger NGOs, could be crucial in establishing and governing MPAs. NGOs have the power to support conservation efforts taken by government agencies, safeguard the interest of locals, and balance the influence exerted by other stakeholders.<sup>182</sup> Ultimately, the MPA managers can hope to create a successful "coalition of stakeholders to tackle climate change effects and implement adaptation and mitigation efforts, only by way of a purposive, inclusive partnership and robust capacity building."<sup>183</sup>

#### 4. Create an Adaptive Management Framework With Flexible MPAs

"MPAs and MPA networks need to be adaptively managed and designed to address altered coastal and ocean conditions and habitat shifts due to climate change, which may affect future boundaries, locations, and sizes."<sup>184</sup> There are many dimensions to designing and implementing an adaptive framework for MPAs. For example, at the outset, in designing and planning sustainable MPAs, policymakers must attempt to "predict the location of future habitat sites, and build these potential sites into MPA design and adaptation."<sup>185</sup>

Because predictions are difficult due to uncertainty, policymakers also must bear in mind the need to adjust MPA boundaries over time to respond to changes in environmental conditions. As discussed in Section II.B.2, habitats will keep shifting due to increased water temperatures, which is one of the major challenges faced by MPAs. This is a challenge because the boundaries of protected areas are legally defined. Therefore, "flexible MPA boundaries could

<sup>172.</sup> See, for example, the U.S. fishermen who opposed the creation of the marine national monuments in *Massachusetts Lobstermen's Association v. Ross*, 945 F.3d 535, 50 ELR 20008 (D.C. Cir. 2019).

<sup>173.</sup> See id.; Hameed et al., supra note 147, at 1.

<sup>174. &</sup>quot;Critical areas include nursery grounds, fish spawning aggregation sites, regions that feature high species diversity or high rates of endemism, and areas that contain a variety of habitat types in close proximity to one another." McLeod et al., *supra* note 24.

<sup>175.</sup> See Coral Triangle Support Partnership, Designing Marine Protected Area Networks to Achieve Fisheries, Biodiversity, and Climate Change Objectives in Tropical Ecosystems: A Practitioner Guide 25 (Alison Green et al. eds., 2013), https://www.reefresilience.org/ pdf/PractitionerGuide\_FINAL\_031113.pdf.

<sup>176.</sup> See McLeod et al., supra note 24, at 365.

<sup>177.</sup> Id.

<sup>178.</sup> See generally Tittensor et al., supra note 160.

<sup>179.</sup> Id. at 3 (referring to "temporary climate refugia").

<sup>180.</sup> MERWIN ET AL., *supra* note 19, at 3.

<sup>181.</sup> Id. at 5.

<sup>182.</sup> See Ma, supra note 112, at 353.

<sup>183.</sup> See Cannizzo et al., supra note 155, at 120.

<sup>184.</sup> NMPAC, *supra* note 103, at 3. "Adaptive management refers to the integration of design, management, and monitoring to systematically test assumptions and continuously adapt and learn. It is critical to address the uncertainties associated with climate change, ecological response, and the effectiveness of management actions." Howard et al., *supra* note 115, at 107.

<sup>185.</sup> SALM & MCLEOD, supra note 163, at 11.

be considered, especially for MPAs zoned for multi-use, where highly protected core areas could be expanded without requiring more potentially politically difficult changes to the total area of the MPA."<sup>186</sup> There need to be policy reforms to incorporate flexibility into existing and newly established MPAs, and a mechanism to regularly review their boundaries and adjust them as the need demands.

One of the emerging and popular ideas welcomed by scientists is the concept of "mobile MPAs," which have flexible boundaries that can shift across oceans when needed.<sup>187</sup> When species or habitats choose to migrate outside MPA boundaries, mobile MPAs can offer protection by acting as connectivity corridors between one or more static MPAs. This will ensure that the species are safeguarded against shifts that could occur due to climate change.<sup>188</sup> However, it has to be borne in mind that mobile MPAs are not a substitute for static MPAs. They could supplement the role of existing stationary MPAs in preserving marine habitats and increasing climate resilience, and thereby potentially enhance their effectiveness.<sup>189</sup>

To promote adaptation to climate change, MPA managers need to develop climate adaptation action plans and integrate them into existing management strategies.<sup>190</sup> To encourage them to develop such plans, there could be a target developed by the Parties to the CBD for the "post-2020 global biodiversity framework that measures the proportion of MPAs,"<sup>191</sup> both in national waters and the ABNJ, "that explicitly integrate climate change adaptation in their management plans."<sup>192</sup>

#### 5. Clearly Identify MPA Objectives

All of the crucial aspects regarding the size, location, and boundaries of MPAs and management decisions can be achieved only if objectives are clearly identified and defined. "MPAs are often implemented to achieve multiple objectives such as biodiversity conservation, fisheries sustainability, and climate adaptation."<sup>193</sup> Depending on the specific management objective for

187. For example:

Movable marine protected areas aren't a new idea. They're already used in certain local conservation efforts. In the United States, for instance, NOAA's TurtleWatch map displays up-to-date information about the sea surface temperatures preferred by loggerhead sea turtles. The map helps fishing vessels avoid areas where turtles are likely to be hanging out at any given time, reducing turtle bycatch in the process. *See* Harvey, *supra* note 150.

188. See Sara M. Maxwell et al., Mobile Protected Areas for Biodiversity on the High Seas, 367 SCIENCE 252 (2020), available at https://science.sciencemag.org/ content/367/6475/252.summary. which an MPA is established, priorities should be determined and planned accordingly.<sup>194</sup>

Further, there should be time frames specified for achieving the objectives that will facilitate tracking of performance of an MPA or MPA networks as well as set realistic targets. As discussed in Section III.A.4, relevant stakeholders such as local community leaders, indigenous peoples, government representatives, and industry groups should be involved in setting objectives. This will ensure consistent support for the objectives from the relevant stakeholders, "enable collaboration among stakeholders and find mutually acceptable solutions, foster accountability of experts, authorities and scientists and increase transparency of decisions."<sup>195</sup>

#### 6. Improve MPA Funding Strategies

No planning and management could ultimately succeed without adequate financial supply. As discussed in Section II.B.1, since MPA funding has been a major challenge and government funding has been poor, additional finance strategies "such as user fees, trust funds, taxes on activities that are harmful to marine biodiversity, and payments for ecosystem services, amongst others, can be explored," and incorporated into existing MPA financing strategies.<sup>196</sup> Further, there could be a separate fund, namely an MPA Climate Fund, similar to a Green Climate Fund that provides support for nations, to include climate change efforts and considerations into the design and implementation of objectives of MPAs and MPA networks.

#### B. Incorporating Climate Change Considerations Into MPAs in the ABNJ

This section recommends ways of incorporating the principles elaborated in Section III.A into the design and management of MPAs in the ABNJ. The recommendations in this section are particularly aimed at helping to inform the ongoing negotiations of the draft BBNJ treaty. If properly structured, this treaty offers the potential to create a new platform to facilitate the creation of a global network of MPAs that can help mitigate and adapt to climate change.

Given that only a very limited portion of the global ocean falls within MPAs, "countries still have a long way to go to reach global targets and doing so in ABNJs will be a key element."<sup>197</sup> As discussed in Section 1.C.1, one of the identified gaps in governance in the ABNJ is a lack of a global framework to establish a comprehensive system of MPAs. A network of MPAs with the potential to protect species and conserve ecosystems is critical for the ABNJ that covers more than half of the oceans.

<sup>186.</sup> See Davis, supra note 118. "We recommend that ABMTs be flexible so that, if necessary or desirable, their geographic boundaries can change over time." Guillermo O. Crespo et al., Beyond Static Spatial Management: Scientific and Legal Considerations for Dynamic Management in the High Seas, 122 MA-RINE POL'Y 1, 8 (2020), available at https://www.sciencedirect.com/science/ article/pii/S0308597X19309248.

<sup>189.</sup> See Harvey, supra note 150.190. See Tittensor et al., supra note 160, at 9.

<sup>190.</sup> See 191. Id.

<sup>192.</sup> *Id*.

<sup>193.</sup> See Howard et al., supra note 115, at 102.

<sup>194.</sup> For instance, "if the management objective is to protect carbon storage, then priority should be given to the protection of mangroves, seagrasses, and saltmarshes within an MPA or the MPA should be expanded to include such areas where possible." *Id.* at 103.

<sup>195.</sup> See IUCN WORLD COMMISSION ON PROTECTED AREAS, supra note 165, at 33.

<sup>196.</sup> See OECD, supra note 120, at 12.

<sup>197.</sup> See Nocito et al., supra note 47, at 2.

Although a globally representative, well-designed, highly connected, and comprehensive MPA network is not feasible in the ABNJ, under the current ocean governance structure, the draft BBNJ treaty offers a tremendous opportunity to address this gap. The more the treaty facilitates the creation of MPAs with clear objectives, robust management plans, and enforcement protocols—for example, by clearly authorizing the Conference of the Parties (COP) of the new treaty to establish MPAs—the more likely it is that the treaty will enable the creation of MPAs that can help the oceans address climate change.

For MPA networks to survive efficaciously in the long term and tackle the crisis of climate change, the BBNJ treaty should facilitate the design of MPAs in such a way that it adequately accommodates climate change considerations. As future changes in oceans will be unpredictable, MPAs should be flexible and dynamic to tackle rapid climate change impacts and build resilience to cope with its effects, despite the limited knowledge and other technical barriers. Therefore "it is important for the BBNJ treaty to provide a legal platform that specifically enables, rather than inhibits or ignores, the implementation and monitoring of dynamic tools in ABNJ."<sup>198</sup>

For the purpose of this Article, the most relevant components of the draft BBNJ treaty is the part dealing with ABMTs, which under the draft treaty includes MPAs.<sup>199</sup> In its present form, Part III of the draft treaty text on ABMTs comprises eight draft articles (Articles 14-21).<sup>200</sup> This section is an effort to address the gaps that exist in the ability to establish MPAs in the ABNJ.

Some of the major issues covered in the draft text include the objectives of the Parties for ABMTs in the ABNJ; the criteria to be used to identify areas of the ABNJ warranting the area-based protection; the process that will be followed under the treaty for proposing ABMTs; the role of the COP to the treaty in creating ABMTs; and how ABMTs created pursuant to the treaty will be monitored. Many of the provisions in the draft BBNJ treaty dealing with these issues have not yet been agreed upon, as indicated by the pervasive presence of square brackets throughout the draft text. As a result, the scope and wording of many of the provisions dealing with ABMTs remains in negotiation.

With respect to the inclusion of the climate change perspective in MPAs, the current draft text is far from comprehensive, and is yet to incorporate climate change considerations in designing, planning, and establishment of MPAs. It has no explicit or suggestive reference to designing MPAs or MPA networks that will adapt to, mitigate, or be resilient to climate change, although there are a few references to climate change and ocean acidification in some parts in a different context.<sup>201</sup>

This Article focuses on the ways that the treaty should be strengthened to facilitate the creation of a network of MPAs in the ABNJ, conducive to addressing climate change in particular. It is hoped that such climate-specific suggestions for MPAs are brought to the forefront of negotiations and included in the final text of the BBNJ treaty.<sup>202</sup>

#### 1. Objectives and Criteria for Areas

For MPAs to be climate-inclusive, it is integral that addressing climate change is included as one of the key objectives that policymakers should have in view in designing MPAs. From the point of view of using MPAs to address climate change, the draft text does not seem to give sufficient prominence to addressing climate change as an "objective" for establishing ABMTs. There is a mention of "climate change" in Article 14(e), which lays out objectives for ABMTs, but only in the context of how climate change is one of the ocean stressors, and not as an element that should be included as a "criteria" or "objectives" for establishing MPAs.<sup>203</sup>

Therefore, it is vital that the article corresponding to objectives incorporates language clearly reflecting that the MPAs should be scientifically well-designed to include climate-adaptive and climate-resilient considerations, in order to be sustainable to climate change impacts in the long term. Further, it should also incorporate the idea that management strategies for MPAs should include climate adaptation objectives. For this purpose, the treaty text could provide that the management measures for MPAs should encompass the "ability to address all or most of the climate change impacts/threats/activities including cumulative impacts of climate change."<sup>204</sup>

There also could be a separate section (if feasible) within Part III of the BBNJ treaty to deal specifically with design of MPAs (distinct from other types of ABMTs). This section should acknowledge that the design of MPAs and MPA networks "should incorporate existing climate

<sup>198.</sup> See Crespo et al., supra note 186, at 7.

<sup>199.</sup> Under the draft BBNJ treaty, "area-based management tool" is defined in Part 1, Article 1(3) as "a tool, including a marine protected area, for a geographically defined area through which one or several sectors or activities are managed with the aim of achieving particular conservation and sustainable use objectives [and affording higher protection than that provided in the surrounding areas]." UNGA, 4th Sess., U.N. Doc. A/CONF.232/2020/3 (2019), https://undocs.org/en/a/conf.232/2020/3.

<sup>200.</sup> Id. at 13-19.

<sup>201.</sup> See Article 1(6), Article 5(h), Article 14(e), and Annex I(f) of the draft BBNJ treaty, *id.* at 5, 7, 13, 43.

<sup>202.</sup> In identifying recommendations for improving the draft text of the BBNJ treaty, the author found helpful IUCN ET AL., INTERNATIONAL LEGALLY BINDING INSTRUMENT UNDER THE UNITED NATIONS CONVENTION ON THE Law of the Sea on the Conservation and Sustainable Use of Ma-RINE BIOLOGICAL DIVERSITY OF AREAS BEYOND NATIONAL JURISDICTION-IUCN COMMENTS (2020), https://www.iucn.org/sites/dev/files/content/ documents/iucn\_comments\_on\_revised\_bbnj\_draft\_text\_february\_2020. pdf; Klaudija Cremers et al., A Preliminary Analysis of the Draft HIGH SEAS BIODIVERSITY TREATY (Institute for Sustainable Development and International Relations, Study No. 1/20, 2020), https://www.iddri.org/ sites/default/files/PDF/Publications/Catalogue%20Iddri/Etude/202001-ST0120-high%20seas.pdf; Elizabeth M. De Santo, Implementation Challenges of Area-Based Management Tools (ABMTs) for Biodiversity Beyond National Jurisdiction (BBNJ), 97 MARINE POL'Y 34 (2018), available at https:// reader.elsevier.com/reader/sd/pii/S0308597X18303166?token=9E57C6E9 6834FFAF3A4269318B816FE4259A5912406B2DC2647564740C522A-BEB37B09FE21991C8A9A5223DBD10F6078; INTERNATIONAL UNION FOR CONSERVATION OF NATURE, supra note 22.

<sup>203.</sup> See UNGA, supra note 199, art. 14, at 13.

<sup>204.</sup> INTERNATIONAL UNION FOR CONSERVATION OF NATURE, *supra* note 22, at 12.

change (warming, deoxygenation, acidification) syntheses and projections into evaluation of vulnerability, need for protections, and resilience.<sup>205</sup> Further, the design of MPAs should "recognize that climate change-related impacts can alter habitat suitability and representativeness, redistribute species and modify biodiversity and thus designs and management [of MPAs] should insure replication, adaptive protection of migratory corridors, and incorporate predicted habitat shifts.<sup>206</sup>

In addition to identifying the objectives of the Parties in using ABMTs, the draft text also includes Annex I (much of which has yet to be agreed by the Parties), outlining criteria for the identification of specific areas that require protection through ABMTs including MPAs.<sup>207</sup> This annex takes into account "vulnerability," including climate change as one of the criteria in point (f).<sup>208</sup> However, by including this language, the draft gives an impression that the text of the BBNJ treaty considers climate change only as a "vulnerability" and not a significant element to be imparted in the design of ABMTs, particularly MPAs. For instance, one of the criteria to consider under this annex could be identifying resilient sites that are of biological/ecological importance that require protection through MPAs (as discussed in Section III.A).

#### 2. Process for Proposing ABMTs

The draft BBNJ treaty proposes a process for the establishment of ABMTs, "including MPAs," by way of proposals from one or more State Parties (Article 17).<sup>209</sup> It has already been emphasized in the recommendation in Section III.B.1 that it is vital for the MPAs to have a distinct section that deals with designing MPAs. So, instead of including MPAs within ABMTs in Article 17, there could be a separate provision for the submission of proposals for establishing MPAs distinct from that of other ABMTs. This distinction is important because not all ABMTs have similar standards, scientific references, and principles for dealing with climate change effects.<sup>210</sup>

In this respect, Article 17(1) of the current draft treaty, which provides that State Parties could submit proposals for establishment of "ABMTS including MPAs," could exclude proposals for MPAs from ABMTs, and then in the separate section for MPAs (as proposed above), elements could be outlined for MPA proposals that State Parties could submit individually or collectively to the secretariat the draft treaty proposes to create. Further, it is important that while developing such proposals and deciding such priority elements, the involvement of relevant stakeholders is made mandatory.<sup>211</sup>

#### 3. Designating and Overseeing MPAs

To ensure that scientific considerations, including climate science, and relevant local and traditional knowledge of communities are given weight in the decisionmaking process, a scientific and technical body (STB) should be created by the treaty and empowered to recommend establishment of MPAs, with the COP having the authority to decide whether to accept the recommendations. The STB should also have the authority to review the management of MPAs in light of the objectives for which the MPAs were established. In recommending the establishment of MPAs, the STB should establish objectives for the MPAs that include climate change and prioritize the processes and measures for achieving these objectives, after taking due consideration of the opinions of relevant stakeholders. These recommendations could be incorporated into an amended Article 16 (the article that currently provides for identification of areas requiring protection) of the draft BBNJ treaty.212

#### 4. Creating Provisions for Flexible-Boundary MPAs

As discussed in Section II.B.2, most existing MPAs are legally static and thus their borders will not change to address the issue of habitat shifts due to increased water temperature. One of the principles for establishing MPAs endorsed in the Article is to adjust MPA boundaries over time to respond to changes in climate change conditions. Including in the draft BBNJ treaty mechanisms that will enable the boundaries of MPAs in the ABNJ to be adjusted over time will contribute to enabling these MPAs to respond to climate change impacts.<sup>213</sup> These recommendations could be incorporated into an amended Article 19 (the article that currently provides for decisionmaking) of the draft BBNJ treaty, where the COP shall make decisions related to the adjustment of MPA boundaries as needed.<sup>214</sup>

#### 5. Cooperation and Communication at All Levels

Cooperation and communication are essential catalysts for MPA networks to be well-managed and ecologically wellconnected. Since climate change is not geographically confined and its effects are transboundary in nature, increased cooperation at different levels—national, regional, and international—can help bolster governance of MPAs and their resources. This would ensure that MPAs and MPA

<sup>205.</sup> DEEP-OCEAN STEWARDSHIP INITIATIVE ET AL., POLICY BRIEF: CLIMATE CHANGE IN OCEANS BEYOND NATIONAL JURISDICTIONS 5 (2016), http:// dosi-project.org/wp-content/uploads/2015/08/BBNJ-Policy-brief-climatechange.pdf.

<sup>206.</sup> See id.

<sup>207.</sup> See UNGA, supra note 199, Annex I, at 3.

<sup>208.</sup> See id.

<sup>209.</sup> See id., art. 17, at 15.

<sup>210. &</sup>quot;There may need to be different requirements for MPA proposals versus other ABMTs as other types of ABMTs may not require a management plan, simply a plan for monitoring and review." IUCN ET AL., *supra* note 202, at 33.

<sup>211.</sup> In the current text, Article 17(2) states that "State Parties may collaborate with relevant stakeholders in the development of proposals." *See* UNGA, *supra* note 195, art. 17(2), at 15. The word could be replaced with "shall" to emphasize the seriousness of their involvement in establishing MPAs.

<sup>212.</sup> See id., art. 16, at 14.

<sup>213.</sup> See generally Crespo et al., supra note 186, at 8.

<sup>214.</sup> See UNGA, supra note 199, art. 19, at 17.

networks are adequate and effective to fulfill their potential as a key tool for climate change mitigation and adaptation.

This need for cooperation at all levels should be acknowledged either in the preamble or in the body of the draft BBNJ treaty, for instance in Article 6, International Cooperation.<sup>215</sup> The acknowledgement should state how marine ecosystems and biodiversity are undermined by cumulative as well as multiple effects<sup>216</sup> of climate change. Further, it should include how the treaty can address this major challenge through different levels of cooperation. This kind of acknowledgement is already found in the CBD and UNFCCC in the context of international cooperation, and the draft BBNJ treaty, being a potentially binding international instrument, should certainly include such an acknowledgement.<sup>217</sup>

By incorporating the climate change aspects suggested above in the text of the draft treaty, the negotiations could likely give more attention to climate change considerations while designing and establishing MPAs, than under the current draft text. This will enable the establishment of a legally binding international framework for MPAs in the ABNJ that are climate-inclusive. This will potentially lead to the creation of a robust framework of MPAs that can sustain climate change impacts in the long run, which is currently absent.

#### C. Incorporating Climate Change Considerations Into National Systems of MPAs

While it is important to develop a framework for facilitating the creation of MPAs in the ABNJ that can address climate change, it is also important not to lose sight of the potential to use MPAs in national waters, which constitute roughly 40% of the oceans, to address climate change.

At the national level, countries are taking several measures to address climate change impacts in the oceans, including reducing GHG emissions and building resilience of marine ecosystems. In addition to these measures, "coastal states are well positioned to make use of MPAs for ecosystembased adaptation and mitigation as a 'no-regret'<sup>218</sup> climate change strategy."<sup>219</sup>

As discussed in Section I.B, in recent years, countries have created more MPAs in ocean spaces under national control, perhaps motivated in part by the CBD Aichi Target 11. However, the MPAs established under national frameworks are too often fragmented and are burdened with complexity. Thus, in reality, the areas protected under

No Regrets: Circles of Climate Change Adaptation, Home Page, https:// www.circlesofclimate.org (last visited Dec. 2, 2020). national jurisdiction may not be sufficiently effective to handle climate change threats, as countries have not only ignored these threats in the design and planning processes, but also have political, legal, and management issues that undermine the efficacy of MPAs.

A glance at national systems of MPAs in different countries provides evidence that the incorporation of climate change considerations in designing MPAs is still in its infancy. For instance, a study published by an international group of researchers reviewed the scientific literature on climate change adaptation in the design and operation of MPAs and MPA networks.<sup>220</sup> The study revealed that "[o]f the 98 relevant papers identified, only 6 papers reported concrete on-the-ground implementation . . . Of the six examples with on-the-ground implementation, only one (the Greater Farallones National Marine Sanctuary in California) explicitly considered climate change in its management plan."<sup>221</sup>

It is beyond the scope of this Article to offer detailed recommendations for bolstering the use of MPAs in national waters to deal with climate change. Such an exercise would require a detailed analysis of national systems of MPAs and their gaps. However, keeping in mind the importance of national frameworks for creating MPAs that are climate responsive, as well as the growing need to establish a robust system of MPAs that will aid in tackling environmental fluctuations including climate change effects, this Article briefly discusses the national systems of MPAs of a few countries and their problems.

The following discussion highlights that countries are still grappling with some fundamental issues in establishing MPAs within the areas of the oceans under national control, and that climate change has yet to be fully incorporated into national approaches to MPAs. Further, the discussion underscores the need to translate some of the principles identified in Section III.A for establishing a global network of MPAs into legal requirements at the national level, to improve the potential for MPAs under national control to address climate change.

#### 1. China

China has created more than 270 MPAs covering about 5% of its national waters.<sup>222</sup> Research has concluded that these MPAs have been ineffective in "remedying habitat degradation and over exploitation of marine resources, chiefly due to lack of monitoring and enforcement."<sup>223</sup> Particularly, in "South East China, although multiple MPAs have been established, their current coverage and effectiveness in management seem to be inadequate to address threats to marine habitats such as those of the Chinese white dolphin."<sup>224</sup> To improve management, the country

<sup>215.</sup> See id., pmbl., at 4 & art. 6, at 7.

<sup>216.</sup> These multiple impacts include ocean acidification, warming waters, and reduced oxygen levels.

<sup>217.</sup> CBD, *supra* note 14, arts. 5, 18; UNFCCC, *supra* note 1, art. 9(2)(d). 218.

No Regrets strategies are based on concepts and measures that can begin to be enacted now without being certain about all dimensions of future climate change. Measures are taken and strategies are thus adopted in a precautionary sense with the aim of responding to possible negative impacts before they intensify.

<sup>219.</sup> See IUCN, supra note 61.

<sup>220.</sup> See Tittensor et al., supra note 160, at 2.

<sup>221.</sup> Id.

<sup>222.</sup> Yunzhou Li et al., Correspondence, *China Fortifies Its Marine Conservation*, 573 NATURE 346 (2019), *available at* https://media.nature.com/original/ magazine-assets/d41586-019-02774-3/d41586-019-02774-3.pdf.

<sup>223.</sup> See id.

<sup>224.</sup> United Nations Development Programme, Strengthening Marine Protected Areas in South-East China to Conserve Globally Significant Coastal Biodiver-

has planned to create "national guidelines, establish a management institution by the end of 2020, enact a regulatory framework by 2025 and have a well-planned and an effectively managed MPA system by 2035."<sup>225</sup>

To achieve all these targets, as suggested in the principles for creating a global network of MPAs in Section III.A, a clear science-based approach for identifying and designating MPAs is necessary, along with clearly defined objectives, the involvement of relevant stakeholders, enhanced funding and governance, and larger highly protected areas. The combination of these strategies may enable existing and future MPAs and MPA networks to better address climate change threats and uncertainties and ensure that these MPAs are secure in the long term.

#### 2. Australia

"The Australian Government has created the largest National System of Marine Protected Areas (NSMPAs) in the world and . . . approximately 36 percent of Australian marine waters will be within the protected area network by 2020."<sup>226</sup> Although Australia is way ahead of the Aichi target of 10%, the Australian MPAs seem to have failed to produce conservation outcomes.<sup>227</sup>

A research study on the national framework of Australia's MPAs by the National Parks Australia Council suggests that the main reasons for the failure are the lack of a comprehensive system that is representative of Australia's marine ecosystems and a lack of leadership.<sup>228</sup> Further, the study states that the "absence of robust scientific criteria and strong political motivations to create low cost residual reserves has undermined intended outcomes of the MPA system, thereby losing track of effective protection of marine biodiversity."<sup>229</sup> Also, the study points out that there is "resistance to adjusting boundaries to incorporate under-represented values which proves a hindrance in establishing a representative MPA system."<sup>230</sup>

Yet another study conducted in Australia (which surveyed 30 MPA managers across three Australian management agencies), on the perceptions of MPA managers regarding the role, importance, and achievability of adaptation for managing the risks of climate change, revealed that MPA managers have relatively less understanding of choosing climate adaptation for purposes of managing the risks in MPAs compared to their understanding of the range and severity of risks posed by climate change.<sup>231</sup> The study also recommends that along with science, other types

sity, https://oceanconference.un.org/commitments/?id=18588# (last visited Dec. 2, 2020).

of knowledge such as local and cultural knowledge should be incorporated into the decisionmaking process, and that there should be an unbiased and evidence-based practical approach while making policy and management recommendations, so that they are realistically achievable.<sup>232</sup>

Yet again, the recommendations for changes to the Australian approach to MPAs in national systems broadly overlap with some of the key principles identified in Section III.A for establishing a global network of MPAs, such as the recommendation to integrate local and community knowledge along with scientific knowledge.

#### 3. Brazil

In 2018, Brazil established two new MPAs around São Pedro and São Paulo archipelagos, which increased the MPA coverage from "1.5% to 24.5% surpassing the target set by the [CBD]."<sup>233</sup> However, many management, scientific, and institutional challenges remain in its national system of MPAs. One of the research studies<sup>234</sup> that analyzed the Brazilian national system of MPAs states that some of the major flaws include

poor inter-institutional coordination of coastal and ocean governance; institutional crisis faced by the national government marine conservation agency; poor management within individual MPAs; problems with regional networks of MPAs; an overly bureaucratic management and administrative system; financial shortages creating structural problems and a disconnect between MPA policy and its delivery.<sup>235</sup>

With all these fundamental problems to be overcome, Brazilian national systems for MPAs seem to be far from including climate change considerations in their current MPA frameworks. However, with political will and the creation of a strong legal framework, these problems could be addressed along with long-term problems such as climate change effects. It is important that the government while planning ahead incorporates future effects on MPA systems to ensure protection of degrading marine ecosystems.

Overall, the national examples indicate that there are significant inadequacies in national frameworks in designing and implementing MPAs. The national-level experiences also underscore that the design and management of MPAs are still in their infancy, and suggest that consideration of climate change aspects is likely nascent. Thus, there is a long road ahead for establishing a robust, wellconnected, ecologically representative network of MPAs to address climate change, even at the national level.

<sup>225.</sup> See Li et al., supra note 222.

<sup>226.</sup> SARAH MAY, NATIONAL PARKS AUSTRALIA COUNCIL, NATIONAL PARKS: AUSTRALIA'S MARINE PROTECTED AREAS 4 (2017), https://vnpa.org.au/wpcontent/uploads/2019/03/Australias-Marine-Protected-Areas.pdf.

<sup>227.</sup> See id. at 4.

<sup>228.</sup> Id. at 4, 28.

<sup>229.</sup> *Id.* at 28. 230. *Id.* at 27.

<sup>231.</sup> Christopher Cvitanovic et al., Perceptions of Australian Marine Protected Area Managers Regarding the Role, Importance, and Achievability of Adaptation for Managing the Risks of Climate Change, 19 ECOLOGY & SOC'Y 33 (2014), available at https://www.ecologyandsociety.org/vol19/iss4/art33.

<sup>232.</sup> See id.

<sup>233.</sup> Press Release, United Nations Environment Programme, Brazil Designates Two New Marine Protected Areas, Surpassing Biodiversity Targets (Mar. 21, 2018), https://www.unenvironment.org/news-and-stories/press-release/ brazil-designates-two-new-marine-protected-areas-surpassing.

Leopoldo Gerhardinger et al., Marine Protected Dramas: The Flaws of the Brazilian National System of Marine Protected Areas, 47 Env'r MGMT. 630 (2011).

<sup>235.</sup> Id. at 630.

To help bolster national-level MPAs, it might be helpful to develop standards or principles for addressing the legal, political, and management issues entailed in designing and implementing MPAs in national waters, with due regard to diverse situations and capacities of different countries. Regional forums or institutions could cooperate and coordinate their efforts to incorporate climate change aspects into the design of national-level MPAs, which should be part of the formal system of protected areas. "Jurisdictional responsibilities should be clear and compatible, and legislation should be harmonized and integrated into the principal protected areas legal framework, either directly or by cross reference."<sup>236</sup>

#### **IV.** Conclusion

In an ever-changing climate that is capable of causing serious threats to the marine environment, one real-time potential solution is to design, plan, and establish climateinclusive, scientifically robust, and well-designed MPAs that are flexible and adaptively managed. Such MPAs could be powerful tools of climate change mitigation and adaptation that can sustain valuable coastal and marine resources within the nation's waters and beyond. However, relying on existing legal frameworks to use MPAs for climate change mitigation and adaptation will likely prove ineffective. The establishment of MPAs in the ABNJ is still in its infancy, and there is no international agreement that has dealt specifically with the establishment of MPAs in the ABNJ. Also, at the national level, climate change impacts have yet to be comprehensively addressed even in countries making extensive use of MPAs.

Fortunately, there is now an opportunity for the international community to address climate change threats in oceans through building MPAs that are climate-resilient. Now, it is more possible than ever to create such MPAs in the ABNJ, as our understanding of the oceans and interlinkages with climate change is far more advanced than it was when UNCLOS was drafted. In fact:

Climate-informed high seas MPAs would be a novel link between global climate action, impelled largely by the UNFCCC regime, and by the duty to protect and preserve the marine environment under Part XII of the [UNCLOS]. Importantly, because the UNFCCC regime is primarily oriented toward terrestrial activity and is principally focused on areas under national jurisdiction, it is logical for future action to be led by institutional structures associated with the [UNCLOS].<sup>237</sup>

The ongoing negotiation of the BBNJ treaty is "one of the key actions that States can take to provide the necessary international legal framework to mitigate and adapt to the effects of climate change on our ocean. To do this, the text needs to clearly make the link between climate and ocean and the ocean and coasts,"<sup>238</sup> and carefully consider climate change impacts in the provisions on ABMTs, which include MPAs. It is reasonable to expect that the BBNJ treaty addresses the existing management gap in the establishment of MPAs in the ABNJ. If not now, then it is quite far-fetched that any other international framework in the future will provide a viable opportunity to address climate change impacts through MPAs in the ABNJ.

This Article has shown that establishing climateinclusive MPAs requires more than an adequate legal framework for creating and implementing MPAs at the international and national levels. It also entails a comprehensive multidisciplinary approach that includes some key principles, such as designing larger MPAs; enhancing coordination, cooperation, and communication between the national, regional, and international levels; careful management and scientific considerations; and the resolution of many politically complex issues. "There is also increasing evidence to suggest that the benefits of MPAs are considerable and that the costs of inaction will continue to rise if further corrective measures are not taken. Adopting a precautionary approach in this context is therefore relevant."<sup>239</sup>

Another significant factor to be borne in mind is that MPAs are just one of the many marine conservation strategies that address the variety of human stressors on oceans. MPAs will not halt or drastically reduce climate change threats within their boundaries, and so cannot be an alternative to tools to rapidly reduce GHG emissions or for ocean management that will develop resilience for climate change. Although MPAs protect areas within their boundaries, they are still affected by threats posed by climate change such as ocean acidification, sea-level rise, and activities of humans outside MPAs.

Therefore, the fundamental truth remains that we need to roll back GHG emissions to permissible levels to address climate change. Thus, activities that contribute to climate change need to be kept in check to ensure that the carbon capacity of ecosystems within MPAs is maintained. Further, only a very limited portion of the global ocean falls within MPAs, and so relying solely on MPAs for climate change mitigation and adaptation in oceans would not be appropriate and realistic. Ultimately, governments and other stakeholders involved in pursuing the establishment of MPAs should be clear that MPAs as a tool to mitigate and adapt to climate change will be complementary to other effective tools that aim to reduce GHG emissions to tackle the impacts of climate change uncertainties in the future.

<sup>238.</sup> IUCN, Area-Based Management Tools in Marine Areas Beyond National Jurisdiction: Building Ambition, Broadening Participation, and Planning Ahead (2019), https://www.iucn.org/sites/dev/files/content/documents/2020/iucn\_abmt\_-report\_final\_web.pdf.

<sup>239.</sup> See OECD, supra note 120, at 11.

<sup>236.</sup> See LAUSCHE, supra note 64, at 211.

<sup>237.</sup> See JEFFERIES, supra note 10, at 10.