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# NAVIGATING THE BLUE ECONOMY

EDWARD CANUEL\*

*The time has come, the Walrus said,  
To talk of many things:  
Of shoes—and ships—and sealing-wax—  
Of cabbages—and kings—  
And why the sea is boiling hot—  
And whether pigs have wings.<sup>1</sup>*

And like the conversation of the Walrus and Carpenter walking along the “wet as wet could be”<sup>2</sup> sea, the blue economy offers us the opportunity to talk of many things. Part I of this Article analyzes what the blue economy *is* and its relevance. Governance mechanisms, including ecosystem-based management and marine spatial planning are introduced and reviewed. The section discusses the benefits associated with such mechanisms, including streamlined decision-making, promoting levels of certainty, and convening stakeholders. Associated challenges also exist, such as emboldening bureaucratic in-fighting, perceptions of sovereignty threats, and implementation hurdles. Part II further reviews public and private law issues which intersect the blue economy within the domestic and international governance context, focusing on topics including seafood fraud; illegal, unreported, and unregulated (“IUU”) fishing; and bio-prospecting. This includes analysis of various coordination challenges concerning international enforcement measures, particularly regarding the United States and European Union. Part III examines the Arctic as a blue economy case study where many of these governance-focused concepts intersect. The Article concludes with a discussion of the blue economy’s unique research potential.

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<sup>1</sup> Lewis Carroll, *The Walrus and the Carpenter*, POETRY FOUND., <https://www.poetryfoundation.org/poems/43914/the-walrus-and-the-carpenter-56d222cbc80a9> [https://perma.cc/ET3V-6C2W] (last visited Nov. 2, 2020).

<sup>2</sup> *Id.*

## I. BOILING THE OCEAN: THE BLUE ECONOMY'S ROOTS, IMPORTANCE, AND CHALLENGES

To understand the blue economy requires investigating its roots in “sustainable development,” a term melding “existing and future economic, human development, and social issues and needs.”<sup>3</sup> The 1987 Brundtland Commission’s *Our Common Future* further defined sustainable development as a means to reach “the needs and aspirations of the present without compromising the ability to meet those of the future.”<sup>4</sup> The 1992 U.N. Conference in Rio de Janeiro led to a *Declaration* that set out sustainable development principles.<sup>5</sup> Agenda 21 then recommended ways to address environmental degradation and advance sustainable development.<sup>6</sup> In 2006 the U.N. Millennium Declaration also fostered goals, which expired in 2015, that broadened sustainable development to include a significant social dimension.<sup>7</sup> Thereafter, the 2012 Rio+ 20 UN Conference on Sustainable Development’s Declaration presented a common vision while reemphasizing sustainable development principles.<sup>8</sup>

Rio+ is viewed as the conceptual birth of the blue economy.<sup>9</sup> In 2015, the blue economy gained further attention as the U.N. General Assembly adopted the Resolution *Transforming Our World: the 2030 Agenda for Sustainable Development*.<sup>10</sup> Building on the Millennium Development Goals, the U.N. introduced seventeen Sustainable Development Goals, or SDGs,

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<sup>3</sup> See Edward T. Canuel, *Sustainable Development, Natural Resource Extraction, and the Arctic: The Road Ahead*, 33 ALASKA L. REV. 32, 33 (2016).

<sup>4</sup> World Comm’n on Env’t & Dev., *Our Common Future*, ¶ 49, U.N. Doc. A/42/427 (1987), <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf> [<https://perma.cc/CQ9M-WSCR>].

<sup>5</sup> U.N. Conference on Environment and Development, *Rio Declaration on Environment and Development*, A/CONF.151/26 (Vol. 1), annex 1 (Aug. 12, 1992).

<sup>6</sup> AGENDA 21: EARTH’S ACTION PLAN § 38.1 (Nicholas A. Robinson ed., 1993).

<sup>7</sup> See U.N. Dep’t of Econ. and Soc. Affs., *The Millennium Development Goals Report 2006* (June 2006), [http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2006/MDG\\_Report2006.pdf](http://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2006/MDG_Report2006.pdf) [<https://perma.cc/B99X-FRGH>].

<sup>8</sup> See Rio+20 Conference on Sustainable Development, *The Future We Want*, U.N. Doc. A/CONF.216/L.1 (June 19, 2012).

<sup>9</sup> Jennifer J. Silver et al., *Blue Economy and Competing Discourses in International Oceans Governance*, 24 J. ENV’T & DEV. 135, 137 (2015) (suggesting the blue economy gained meaning due to a hybrid of: “(a) oceans as natural capital, (b) oceans as good business, (c) oceans as integral to Pacific Small Island Developing States (SIDS), and (d) oceans as small-scale fisheries (SSF) livelihoods.”); see also Michelle Voyer et al., *Shades of Blue: What Do Competing Interpretations of the Blue Economy Mean for Oceans Governance?*, J. ENV’T POL’Y & PLAN. (2018).

<sup>10</sup> See G.A. Res. 70/1, *Transforming Our World: The 2030 Agenda for Sustainable Development* (Oct. 21, 2015).

with 169 guiding targets through 2030.<sup>11</sup> The SDGs are viewed as “a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030.”<sup>12</sup> Of note, SDG Goal 14 seeks to “[c]onserve and sustainably use the oceans, seas and marine resources for sustainable development” for guidance in identifying the blue economy.<sup>13</sup>

Throughout its progression as a widely acknowledged concept, it remained unclear as to what exactly a blue economy looks like and how best to develop it.<sup>14</sup> Even today, there is no singular definition; as a socially constructed concept, any attempted definition is fluid.<sup>15</sup> In such a vacuum, multiple definitions, with varying degrees of overlap, emerged. The *Economist* posited that “[a] sustainable ocean economy emerges when economic activity is in balance with the long-term capacity of ocean ecosystems to support this activity and remain resilient and healthy.”<sup>16</sup> In 2015, The World Wildlife Fund further defined the blue economy as a marine based economy that:

Provides social and economic benefits for current and future generations, by contributing to food security, poverty eradication, livelihoods, income, employment, health, safety, equity, and political stability. Restores, protects and maintains the diversity, productivity, resilience, core functions, and intrinsic value of marine ecosystems—the natural capital upon which its prosperity depends. Is based on clean technologies, renewable energy, and circular material flows to secure economic and social stability over time, while keeping within the limits of one planet.<sup>17</sup>

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<sup>11</sup> See *id.* ¶ 3.

<sup>12</sup> U.N. DEV. PROGRAMME, *What are the Sustainable Development Goals?*, <https://www.undp.org/content/undp/en/home/sustainable-development-goals.html> [https://perma.cc/CD98-6A4P] (last visited Nov. 2, 2020).

<sup>13</sup> See U.N. DEP’T ECON. & SOC. AFFS., *Sustainable Development Goal 14*, <https://sustainabledevelopment.un.org/sdg14> [https://perma.cc/6J73-W395] (last visited Nov. 2, 2020).

<sup>14</sup> See Natalie Parletta, *Making the Blue Economy Sustainable*, FORBES (June 21, 2019), <https://www.forbes.com/sites/natalieparletta/2019/06/21/making-the-blue-economy-a-sustainable-reality/#1dab109426f8> [https://perma.cc/YP3J-3382].

<sup>15</sup> See Andrew Hancock, U.N. Dep’t Econ. & Soc. Affs. Stat. Div., Overview: “Investigating the Blue Economy: Towards a Statistical Standard,” ESA/STAT/AC.340/17 (Aug. 25, 2017).

<sup>16</sup> *The Blue Economy: Growth, Opportunity and a Sustainable Ocean Economy*, ECONOMIST 7 (2015), [https://www.woi.economist.com/wp-content/uploads/2018/04/m1\\_EIU\\_The-Blue-Economy\\_2015.pdf](https://www.woi.economist.com/wp-content/uploads/2018/04/m1_EIU_The-Blue-Economy_2015.pdf) [https://perma.cc/RGJ6-NHW7].

<sup>17</sup> *Principles for a Sustainable Blue Economy*, WORLD WILDLIFE FUND 4 (2017), <https://>

And multiple countries have additionally offered multiple nuanced definitions.<sup>18</sup> A senior U.S. official opined, for example, that the blue economy “recogniz[es] that conservation and environmentally sustainable management practices are the pathways, not the roadblocks, to enabling long-term economic development and growth.”<sup>19</sup> A blue economy is also an entrepreneurial, collaborative, and competitive knowledge-based economy, that scans the global sea for extraction of material goods and the data and information to address societal challenges—and inspire their solutions.<sup>20</sup> The key elements in this holistic approach are: “sound science, innovative management approaches, effective enforcement, meaningful partnerships, and robust public participation.”<sup>21</sup> The blue economy’s economic importance is vast. In 2016, the U.S. Ocean and Great Lakes economy accounted for \$129,000,000,000 in wages.<sup>22</sup> As of 2017, Europe’s maritime sector employed over five million jobs generating almost 500,000,000,000 euro a year.<sup>23</sup> The marine fisheries sector additionally supports an estimated 8% of the global population.<sup>24</sup> The potential

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[www.wfse.cdn.triggerfish.cloud/uploads/2019/01/wwf-principles-for-a-sustainable-blue-economy-15\\_1471\\_.pdf](http://www.wfse.cdn.triggerfish.cloud/uploads/2019/01/wwf-principles-for-a-sustainable-blue-economy-15_1471_.pdf) [https://perma.cc/LQU4-CQLY].

<sup>18</sup> See Jon Axworthy, *Africa’s Blue Economy: Five Nations Poised for Growth*, RACONTEUR (Sept. 10, 2019), <https://www.raconteur.net/finance/maritime-economy-2019/blue-economy-africa> [https://perma.cc/XVN5-3YDR].

<sup>19</sup> Catherine Novelli, *Celebrating Ingenuity in the Blue Economy*, DIPNOTE (Dec. 20, 2016), <http://2007-2017-blogs.state.gov/stories/2016/12/20/celebrating-ingenuity-blue-economy.html> [https://perma.cc/T66E-2BX3].

<sup>20</sup> Rick Spinrad, *We Can Live Better by Learning from Our Oceans*, MIAMI HERALD (July 6, 2016), <https://www.miamiherald.com/opinion/op-ed/article88120617.html> [https://perma.cc/RN4M-MGXS]; see also *Exploring the Potential of the Blue Economy*, U.N. DEPT ECON. & SOC. AFFS. (June 17, 2017), <https://www.un.org/development/desa/en/news/sustainable/exploring-potential-of-blue-economy.html> [https://perma.cc/2SYZ-C4MX] (Statement of Wu Hongbo, Secretary-General of the Ocean Conference and Under Secretary General of the U.N. Department of Economic and Social Affairs) (“A blue economy is a long-term strategy aimed at supporting sustainable economic growth through oceans-related sectors and activities, while improving human well-being and social equity and preserving the environment”).

<sup>21</sup> *Status of Stocks 2017*, NOAA FISHERIES (May 14, 2018), <https://www.fisheries.noaa.gov/feature-story/status-stocks-2017> [https://perma.cc/2ZVH-CEN7] (specifically referencing sustainable fisheries management).

<sup>22</sup> NOAA REPORT ON THE U.S. OCEAN AND GREAT LAKES ECONOMY, NOAA OFF. COASTAL MGMT. 1 (2018), <https://coast.noaa.gov/data/digitalcoast/pdf/econ-report.pdf> [https://perma.cc/E3K9-D22G]; see also Charles S. Colgan, *Measurement of the Ocean and Coastal Economy: Theory and Methods*, NAT’L OCEAN ECON. PROGRAM PUBL’N 3 (Dec. 1, 2003).

<sup>23</sup> Eur. Comm’n, *Commission Staff Working Document: Report on the Blue Growth Strategy Towards More Sustainable Growth and Jobs in the Blue Economy*, at 3, SWD (2017) 128 (Mar. 31, 2017), [https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/swd-2017-128\\_en.pdf](https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/swd-2017-128_en.pdf) [https://perma.cc/48YJ-TR54].

<sup>24</sup> Subrata Sarker et al., *From Science to Action: Exploring the Potentials of Blue Economy*

economic gain from restoring fish stocks and “optimally” reducing fishing capacity is approximately \$50,000,000,000 per year.<sup>25</sup> And let’s not forget energy and mineral extraction potential. According to the International Energy Agency, offshore wind has the potential to generate more than 420,000 TWh per year worldwide.<sup>26</sup> The IEA forecasts that within the coming decades offshore wind will evolve into a \$1,000,000,000,000 business.<sup>27</sup>

The blue economy can also tackle pressing socioeconomic problems affecting the world. An estimated thirty-two percent of fish stocks globally are overexploited, recovering from depletion, or depleted.<sup>28</sup> Emissions cause coral bleaching, ocean acidification, and sea level rise.<sup>29</sup> Other coastal tourism pressures include water pollution and consumption, waste, pressure on biodiversity, and survival of indigenous cultures.<sup>30</sup> The global population could grow to around 8,500,000,000 in 2030, 9,700,000,000 in 2050, and 10,900,000,000 in 2100<sup>31</sup>—and marine food and energy sources will play key roles in meeting future needs.<sup>32</sup> To meet such challenges, the blue economy plays a pivotal role: bringing critical constituencies together to make coordinated, informed decisions concerning how marine resources may be sustainably derived and utilized, considering diverse actors ranging from industry to governments.

But we must also balance the aspirational nature of the blue economy and tackle, analyze, and, to some extent, tilt the *hypothetical* to

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for *Enhancing Economic Sustainability in Bangladesh*, OCEAN & COASTAL MGMT. 157, 180 (2018).

<sup>25</sup> See U.N. ENV’T PROGRAMME, *Green Economy in a Blue World: Synthesis Report*, at 8 (2012), <https://unctad.org/meetings/en/Contribution/ted-ditc-05122016-cancun-GreenEconomy-Blue-unep.pdf> [<https://perma.cc/2GTF-4BFD>]; see also V.N. Attri, *An Emerging New Development Paradigm of the Blue Economy in IORA: A Policy Framework for the Future*, INDIAN OCEAN RIM ASS’N 1 (2016), <https://www.iora.int/media/23838/the-blue-economy-and-iora-2016.pdf> [<https://perma.cc/4GF4-97Q4>].

<sup>26</sup> Int’l Energy Agency [IEA], *Offshore Wind Outlook 2019* (2019), <https://www.iea.org/reports/offshore-wind-outlook-2019> [<https://perma.cc/SN2V-HLEF>] (noting that as of 2019, offshore wind currently provides 0.3% of global power generation).

<sup>27</sup> *Id.*

<sup>28</sup> U.N. ENV’T PROGRAMME, *supra* note 25, at 8.

<sup>29</sup> *Ocean Acidification and Coral Bleaching*, EARTH JOURNALISM NETWORK (June 9, 2016), <https://earthjournalism.net/resources/ocean-acidification-and-coral-bleaching> [<https://perma.cc/UY9W-FXJD>].

<sup>30</sup> See U.N. ENV’T PROGRAMME, *Marine and Coastal Ecosystems and Human Well-Being*, at 22–29 (2006).

<sup>31</sup> U.N. DEP’T OF ECON. AND SOC. AFF., Population Div., *World Population Prospects 2019: Highlights*, 1, ST/ESA/SER.A/423 (2019).

<sup>32</sup> Carlos M. Duarte et al., *Will the Oceans Help Feed Humanity?*, 59 BIOSCIENCE 967, 967 (2009).

focus on the *achievable*. To accomplish this, one should strongly consider a bedrock of the blue economy, governance. EU blue growth strategies, in particular, are aspirational in vision while emphasizing governance.<sup>33</sup> Take, for example, The Marine Strategy Framework (“MSF”) Directive, adopted on June 17, 2008, as affected by Commission Decision (“EU”) 2017/848 of May 17, 2017.<sup>34</sup> The MSF Directive seeks to achieve Good Environmental Status (“GES”)<sup>35</sup> of the EU’s marine waters by 2020 and protect the resource base which marine-related economic and social activities depend on.<sup>36</sup> Each Member State is required to develop a strategy for its marine waters (or Marine Strategy) that must be kept up-to-date and reviewed every six years.<sup>37</sup> The EU also established a framework for Maritime Spatial Planning,<sup>38</sup> where the application of an ecosystem-based approach is considered essential to promote “the sustainable development and growth of the maritime and coastal economies and the sustainable use of marine and coastal resources.”<sup>39</sup>

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<sup>33</sup> Eur. Comm’n, *supra* note 23, at 3.

<sup>34</sup> Commission Decision 2017/848, 2017 O.J. (L 125) 1.

<sup>35</sup> Under MSF Directive Article 3, GES is “the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive.” See Eur. Comm’n, *Our Oceans, Seas and Coasts: Achieve Good Environmental Status*, [https://ec.europa.eu/environment/marine/good-environmental-status/index\\_en.htm](https://ec.europa.eu/environment/marine/good-environmental-status/index_en.htm) [<https://perma.cc/UD56-FMUZ>] (last updated Dec. 31, 2019) (note that to help Member States interpret what GES means in practice, the Directive sets out, in Annex I, eleven qualitative descriptors which describe what the environment will look like when GES has been achieved).

<sup>36</sup> *Id.*

<sup>37</sup> Eur. Comm’n, *Our Oceans, Seas and Coasts: The Marine Strategy Framework Directive*, [https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index\\_en.htm](https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm) [<https://perma.cc/MSX6-L7MZ>] (last updated Feb. 7, 2020) (“A Marine Strategy includes . . . (i) an initial assessment of the current environmental status of national marine waters and the environmental impact and socio-economic analysis of human activities in these waters; (ii) determination of what GES means for national marine waters; (iii) establishment of environmental targets and associated indicators to achieve GES by 2020; (iv) the establishment of a monitoring program for the ongoing assessment and the regular update of targets; and (v) development of a program of measures designed to achieve or maintain GES by 2020.”).

<sup>38</sup> Directive 2014/89/EU, of the European Parliament and of the Council of 23 July 2014, Establishing a Framework for Maritime Spatial Planning, 2014 O.J. (L 257) 1, <https://eur-lex.europa.eu/eli/dir/2014/89/oj> [<https://perma.cc/536P-V822>].

<sup>39</sup> Council Regulation 1005/2008 of Sept. 29, 2008, Establishing a Community System to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing, 2014 O.J. (L 257) 1; see also Council Regulation 1224/2009 of Nov. 20, 2009, Establishing a Community Control System For Ensuring Compliance with the Rule of the Common Fisher Policy, 2009 O.J. (L 343) 1; see also Regulation 1379/2013 of the European Parliament and of the

Federal maritime spatial planning in the U.S. is guided by a National Policy for the Stewardship of the Ocean, Our Coasts, and the Great Lakes.<sup>40</sup> The National Ocean Policy Implementation Plan<sup>41</sup> and Implementation Plan Appendix describe federal agency actions addressing ocean challenges, greater opportunities for federal, state, local, tribal, and territorial (“SLTT”) engagement in marine planning decisions and streamlining federal operations.<sup>42</sup> The National Policy notes marine planning as a national implementation objective to address the sustainable use of the ocean, U.S. coasts, and the Great Lakes.<sup>43</sup> The intended result is promoting more efficient, effective decision-making and enhance regional “well-being.”<sup>44</sup> Note that the Implementation Plan has voluntary initiatives.<sup>45</sup> Such planning considers the multiplicity of stakeholder interests, adheres to flexible approaches, and, through a coordinated approach, may reduce permitting disputes and delays while striving for advancing regulatory streamlining and certainty.<sup>46</sup>

Marine spatial planning (“MSP”)<sup>47</sup> is an important additional governance tool; it assembles ocean participants—including energy, industry,

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Council of Dec. 11, 2013 on the Common Organization of the Markets in Fishery and Aquaculture Products, 2013 O.J. (L 354) 1.

<sup>40</sup> Exec. Order No. 13,547, 3 C.F.R. 13,547 (2011).

<sup>41</sup> NAT’L OCEAN COUNCIL, EXEC. OFF. OF THE PRESIDENT, NATIONAL OCEAN POLICY IMPLEMENTATION PLAN (2013), [https://obamawhitehouse.archives.gov/sites/default/files/nop\\_ip\\_overview.pdf](https://obamawhitehouse.archives.gov/sites/default/files/nop_ip_overview.pdf) [<https://perma.cc/7YHN-LW46>].

<sup>42</sup> NAT’L OCEAN COUNCIL, EXEC. OFF. OF THE PRESIDENT, NATIONAL OCEAN POLICY IMPLEMENTATION PLAN APPENDIX, at 3, 5, 12–13, 16–17, 24 (2013), [https://obamawhitehouse.archives.gov/sites/default/files/national\\_ocean\\_policy\\_ip\\_appendix.pdf](https://obamawhitehouse.archives.gov/sites/default/files/national_ocean_policy_ip_appendix.pdf) [<https://perma.cc/Q5WS-N4MZ>].

<sup>43</sup> Exec. Order No. 13,547, *supra* note 40.

<sup>44</sup> *Id.*

<sup>45</sup> The Implementation Plan supports voluntary regional marine planning, a science-based tool that regions can use to address specific ocean management challenges and advance their economic development and conservation objectives. *See generally* NAT’L OCEAN COUNCIL, EXEC. OFF. OF THE PRESIDENT, NATIONAL OCEAN POLICY IMPLEMENTATION PLAN MARINE PLANNING (2013), [https://obamawhitehouse.archives.gov/sites/default/files/national\\_ocean\\_policy\\_implementation\\_plan.pdf](https://obamawhitehouse.archives.gov/sites/default/files/national_ocean_policy_implementation_plan.pdf) [<https://perma.cc/7V73-GNHX>]. An example of what is considered effective marine planning includes Oregon, which mapped resources to identify information gaps to avoid potential wave energy conflicts. *Id.* Additionally, Rhode Island identified uses/resources, including military needs, to ensure offshore wind energy may be situated in proper places. *Id.* “Neither the National Ocean Policy nor marine planning creates or changes regulations or authorities.” *Id.*

<sup>46</sup> NATIONAL OCEAN POLICY IMPLEMENTATION PLAN APPENDIX, *supra* note 42, at 4, 19, 24.

<sup>47</sup> Andy Lanier, *Marine Spatial Planning in Oregon for Marine Renewable Energy Development*, EUR. TECH. & INNOVATION PLATFORM FOR OCEAN ENERGY (Nov. 19, 2019), <https://www.etipocean.eu/assets/Uploads/MSPlanning-ETIPOceanMSP-Webinar-Nov2019-Andy-Lanier.pdf> [<https://perma.cc/C8KF-ZN6L>].

government, conservation and recreation stakeholders—to make informed and coordinated decisions about how to use marine resources sustainably.<sup>48</sup> MSP involves integration and policy frameworks.<sup>49</sup> Ecosystem-based Management (“EBM”) is another powerful, yet complex, governance mechanism.<sup>50</sup> “Here,<sup>51</sup> managers are encouraged to build on ecosystems and other physical and spatial conceptualizations of the marine environment,” with EBM suggested as a means to assist with effective sea governance.<sup>52</sup> Issues threatening ocean health can be reviewed, such as the effects of climate change, IUU fishing or marine pollution.<sup>53</sup>

EBM, as with marine planning writ large, is not without challenges. Regional organizations and governments may view such initiatives as potentially threatening previously designed priorities, funding, or threaten autonomy/control, which would jeopardize the values of any related initiative.<sup>54</sup> A champion is additionally needed. Sound government policies or legislative anchors are asserted as crucial to implementing EBM-based plans, which will never be operative if government departments or agencies are without capacity to implement them.<sup>55</sup> Analysis of any implementation measures focuses on specific cases. “Identifying relevant actors, management units, social and environmental processes, and timetables involved in effective implementation of a policy or legal obligation is not a generic task with a set checklist of activities.”<sup>56</sup> Implementation is also difficult, as different approaches differ dependent on the individual sector; a uniform, cross-sectoral model may be difficult to implement in practice.<sup>57</sup> Nonetheless, looking to and across cases can inform what needs to be effected in any specific sector. Further, while the similarly voluntary nature

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<sup>48</sup> *Id.*

<sup>49</sup> Joanna Vince, *Oceans Governance and Marine Spatial Planning in Australia*, 6 AUSTL. J. MAR. & OCEAN AFF. 5, 5, 11 (2014).

<sup>50</sup> *Ecosystem Approaches*, DIV. FOR OCEAN AFFS. & THE L. OF THE SEA, U. N. (updated July 21, 2010), [https://www.un.org/Depts/los/ecosystem\\_approaches/ecosystem\\_approaches.htm#:~:text=While%20there%20is%20no%20single,to%20ensure%20that%20ecosystems%20structure](https://www.un.org/Depts/los/ecosystem_approaches/ecosystem_approaches.htm#:~:text=While%20there%20is%20no%20single,to%20ensure%20that%20ecosystems%20structure) [<https://perma.cc/YDH8-VYUG>], cited in Joseph F.C. DiMento, *Environmental Governance of the Arctic: Law, Effect, Now Implementation*, 6 U.C. IRVINE L. REV. 23, 52 n.136 (2016) (referring to ecosystems-based management).

<sup>51</sup> *Ecosystem-Based Management*, NOAA, <https://ecosystems.noaa.gov/EBM101/WhatIsEcosystem-BasedManagement.aspx> [<https://perma.cc/EV7R-CHPE>] (last visited Nov. 2, 2020).

<sup>52</sup> DiMento, *supra* note 50, at 52 (referring to ecosystems-based management); see also Rachel D. Long, Anthony Charles, & Robert L. Stephenson, *Key Principles of Marine Ecosystem-Based Management*, 57 MARINE POL'Y 53, 53–54 (2015).

<sup>53</sup> Vince, *supra* note 49, at 13.

<sup>54</sup> DiMento, *supra* note 50, at 53–54 (referring to ecosystems-based management).

<sup>55</sup> Vince, *supra* note 49.

<sup>56</sup> DiMento, *supra* note 50, at 51 (referring to ecosystems-based management).

<sup>57</sup> *Id.* See also NOAA, *supra* note 51.

of marine spatial planning allows operational flexibility, the inability to mandate planning measures also questions whether compliance will be fulsome.<sup>58</sup> Moreover, what of the *ex ante* and *ex post* transaction costs, such as continued monitoring and enforcement? If measures are not simply repackaged as old wine in new bottles, assumably additional costs will be borne by stakeholders, whether from SLTTs or the private sector.<sup>59</sup>

## II. GOVERNANCE CHALLENGES: SEAFOOD FRAUD, IUU FISHING AND EMERGING BIO-PROSPECTING

Blue economy governance implementation challenges are evident in IUU fishing and seafood fraud.<sup>60</sup> These differ in their scale and scope.<sup>61</sup> Seafood is the most valuable traded commodity in the world, with nearly \$150,000,000,000 in sales each year.<sup>62</sup> Relatedly, the stakes are high for IUU fishing, which amounts to an estimated \$23,500,000,000 worth of seafood annually.<sup>63</sup> IUU fishing is a broad term that captures a wide variety of fishing activity, concerning all aspects/stages of the capture and utilization of fish.<sup>64</sup> IUU fishing is found in all types and dimensions of fisheries; it occurs both on the high seas and in areas within national jurisdiction.<sup>65</sup> Seafood fraud is the practice of misleading consumers about their seafood in order to increase profits<sup>66</sup>: “buyers are deceived as to the type, quality, or amount of seafood they purchase.”<sup>67</sup>

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<sup>58</sup> MARITIME SPATIAL PLANNING: PAST, PRESENT, FUTURE, 365, 367, 389 (Jacek Zaucha & Kira Gee eds., 2019).

<sup>59</sup> SOFIA O’CONNOR ET AL., BLUE PROSPERITY COAL., DESIGNING MARINE SPATIAL PLANNING LEGISLATION FOR IMPLEMENTATION: A GUIDE FOR LEGAL DRAFTERS, 42 (2020), <https://www.eli.org/sites/default/files/eli-pubs/msp-law-workshop-report-11may20-final.pdf> [<https://perma.cc/FZ66-UR7T>].

<sup>60</sup> SJARIEF WIDJAJA ET AL., HIGH LEVEL PANEL FOR A SUSTAINABLE OCEAN ECONOMY, ILLEGAL, UNREPORTED, AND UNREGULATED FISHING AND ASSOCIATED DRIVERS, 9–10 (2020), <https://oceanpanel.org/sites/default/files/2020-09/Illegal%2C%20Unreported%20and%20Unregulated%20Fishing%20and%20Associated%20Drivers.pdf> [<https://perma.cc/CP2L-G52R>].

<sup>61</sup> *Id.*; Huw Thomas, *To Fight Illegal Fishing, Follow the Money*, PEW CHARITABLE TRS. (June 18, 2018), <https://www.pewtrusts.org/en/research-and-analysis/articles/2018/06/19/to-fight-illegal-fishing-follow-the-money> [<https://perma.cc/EDV7-WAMZ>].

<sup>62</sup> Thomas, *supra* note 61.

<sup>63</sup> *Id.*

<sup>64</sup> *What is IUU Fishing?*, FOOD & AGRIC. ORG. OF THE U.N., <http://www.fao.org/iuu-fishing/background/what-is-iuu-fishing/en/> [<https://perma.cc/S398-STUL>] (last visited Nov. 2, 2020).

<sup>65</sup> *Id.*

<sup>66</sup> *What is Seafood Fraud?*, OCEANA, <https://oceana.org/what-seafood-fraud#:~:text=Seafood%20fraud%20is%20the%20practice,conservation%20efforts%20and%20human%20health> [<https://perma.cc/98T3-NGNQ>] (last visited Nov. 2, 2020).

<sup>67</sup> Thomas Lampert, *Stopping Illegal Fishing and Seafood Fraudsters: The Presidential Task*

IUU fishing and seafood fraud cause numerous problems: undermining national and regional fish stock management and conservation efforts,<sup>68</sup> threatening the global fisheries' robustness, and posing health risks (particularly from high levels of mercury) to people consuming mislabeled seafood.<sup>69</sup> The obstacles to tackle these challenges include "the international nature of the industry, a byzantine supply chain, the large number of entities responsible for combating the issue, the lack of resources provided to these agencies, and the difficulty identifying and differentiating species of seafood."<sup>70</sup>

Significant difficulties in addressing IUU fishing and seafood fraud include the nature of complicated, international supply chains<sup>71</sup>:

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*Force's Plan on Tackling IUU Fishing and Seafood Fraud*, 58 B.C. L. REV. 1629, 1630 (2017) (referencing DEP'T OF COM., PRESIDENTIAL TASK FORCE ON COMBATING IUU FISHING AND SEAFOOD FRAUD: ACTION PLAN FOR IMPLEMENTING THE TASK FORCE RECOMMENDATIONS, 5 (2014)).

<sup>68</sup> FOOD & AGRIC. ORG. OF THE U.N., *supra* note 64.

<sup>69</sup> Lampert, *supra* note 67, at 1630–31; *see generally* Michael Conathan & Avery Siciliano, *The Future of Seafood Security: The Fight Against Illegal Fishing and Seafood Fraud*, CTR. FOR AM. PROGRESS (June 8, 2016), <https://www.americanprogress.org/issues/green/reports/2016/06/08/139004/the-future-of-seafood-security-the-fight-against-illegal-fishing-and-seafood-fraud/> [<https://perma.cc/HZ8P-7JW6>].

<sup>70</sup> Lampert, *supra* note 67; U.S. FOOD & DRUG ADMIN., IMPORTANT ALERT 16-04: MISBRANDED SEAFOOD (published Feb. 4, 2020) ("The guidance section provides an alphabetical listing of seafood names associated with previous entries broken out into three parts. Part I lists acceptable names, appropriate scientific names and/or the source of Product (Country or Geographical Origin) for species that have historically been substituted or otherwise misbranded, Part II lists examples of known fictitious names, and Part III provides recent examples of misbranded products and the names of the actual species that they were substituted for, found in interstate commerce. The Red List at the end of this document identifies firms that have misbranded seafood products entering the United States.").

<sup>71</sup> The seafood sector is characterized by complex supply chains. In fact, 'chain' is a slightly misleading term because the layers, including multiple levels of middlemen, can be so intricate and opaque as to more closely resemble a web. Fish and shellfish are harvested in open waters or raised via aquaculture in ponds, tanks, or bounded coastal waters. Some wild-caught fish may be transported from the catching vessel by transshipment vessel to market. After harvest, shellfish are sold via auction, broker or market system and then packed and transported to processing facilities or wholesalers. Processors convert the shellfish to consumer products such as canned, frozen, or smoked products, and fillets or other fresh products. Some fish may pass through multiple levels of processing, while others, such as certain kinds of shellfish, are transported live. Wholesalers receive both processed products, as well as more minimally processed fresh fish, from both foreign and domestic sources. The wholesalers then distribute the products to retailers and restaurants, where

“seafood passes through various entities on its way from the ocean to the [consumer], and is often not labeled with its country of origin[; as a result], species substitution and mislabeling are extremely difficult to identify.”<sup>72</sup> Additionally, as fishers often package and process their catch at sea, on processing vessels, it becomes difficult to ensure that legal and illegal catch are not mixed, presenting added challenges for regulators and buyers to accurately identify correct species.<sup>73</sup> The numerous domestic entities fighting seafood fraud and IUU fishing and/or serving in rule-making capacities complicate enforcement efforts.<sup>74</sup> In the United States, at least three federal agencies are involved.<sup>75</sup> Constrained resources also affect enforcement. As of 2016, an estimated ninety-two U.S. inspectors are responsible for inspecting American seafood—suggesting that each inspector would need to physically examine fifty-six million pounds of seafood.<sup>76</sup> Different international organizations, states, and multilateral fora tackle related enforcement challenges differently: the United Nations (“U.N.”), Regional Fisheries Management Organizations (“RFMOs”),<sup>77</sup> the EU, and the United States “combat IUU fishing and seafood fraud through a variety of treaties and legislation designed to identify and punish those engaged in these practices[.]”<sup>78</sup> including the Port State Measures Act (the PSMA).<sup>79</sup>

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they are purchased by consumers. Accurately mapping a supply chain requires an understanding of the roles of all of these different actors.

*Protections Against Trafficking in Persons: Mapping the Seafood Supply Chain*, RESPONSIBLE SOURCING TOOL, 1–2, [https://www.responsiblesourcingtool.org/download/seafood/SF\\_Tool\\_03.pdf](https://www.responsiblesourcingtool.org/download/seafood/SF_Tool_03.pdf) [<https://perma.cc/378L-M9BX>] (last visited Nov. 2, 2020).

<sup>72</sup> Lampert, *supra* note 67, at 1637.

<sup>73</sup> Kashfi Halford, *Illegal, Unreported, and Unregulated Fishing: Frequently asked questions*, PEW CHARITABLE TRS. (Feb. 25, 2013), <https://www.pewtrusts.org/en/research-and-analysis/articles/2013/02/25/illegal-unreported-and-unregulated-fishing-frequently-asked-questions> [<https://perma.cc/ZP4S-66HD>]; Lampert, *supra* note 67, at 1638.

<sup>74</sup> Lampert, *supra* note 67, at 1638.

<sup>75</sup> *Id.*

<sup>76</sup> *Id.* at 1639. *But see* Jason Huffman, *Trump’s signature gives 26% boost to imported seafood inspections*, UNDERCURRENT NEWS (Feb. 18, 2019), <https://www.undercurrentnews.com/2019/02/18/trumps-signature-gives-26-boost-to-imported-seafood-inspections/> [<https://perma.cc/B6TU-XRTM>] (noting that “98% of the foreign seafood coming in is not even tested. When it’s tested, the FDA often finds that it contains salmonella, it contains listeria, it contains dirt and it contains illegal drugs, like antibiotics. What does that mean? Well, if you eat enough of this stuff, aside from the fact that you could grow an extra ear or glow in the dark, you develop a resistance to antibiotics.”).

<sup>77</sup> Tore Henriksen, *The Arctic Ocean, Env’t Stewardship, and the Law of the Sea*, 6 U.C. IRVINE L. REV. 61, 73 (2016).

<sup>78</sup> Lampert, *supra* note 67, at 1640.

<sup>79</sup> FOOD & AGRIC. ORG. OF THE UN, *Agreement on Port State Measures (PSMA)*, FAO,

“These various efforts call for the collection and tracking of data, various modes of enforcement, support and training for developing countries, and coordination among domestic and international entities.”<sup>80</sup>

Four UN treaties lay the foundation for efforts to combat IUU fishing and seafood fraud.<sup>81</sup> The various UN agreements call on nations to organize RFMOs, which may “create mandatory international standards designed to combat IUU fishing.”<sup>82</sup> RFMOs may include “mandates for reporting, vessel monitoring, enforcement, and inspection mechanisms.”<sup>83</sup> Examples of RFMOs are the Commission for the Conservation of Antarctic Marine Living Resources, the North Atlantic Fisheries Organization, the North East Atlantic Fisheries Commission, and the Southeast Atlantic Fisheries Organization.<sup>84</sup>

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<https://www.fao.org/port-state-measures/en/> [<https://perma.cc/VF99-WFY>] (last visited Nov. 2, 2020) (explaining the PSMA is “the first binding international agreement to specifically target [IUU] fishing. Its objective is to prevent, deter and eliminate IUU fishing by preventing vessels engaged in IUU fishing from using ports and landing their catches. . . . The provisions of the PSMA apply to fishing vessels seeking entry into a designated port of a State which is different to their flag State.”); see Tony J. Pitcher et al., *Estimating Illegal and Unreported Catches From Marine Ecosystems: A Basis For Change*, 3 FISH & FISHERIES 317, 319 (2002) (discussing definitions of IUU fishing); see also *Enforcement Efforts to Combat Illegal, Unreported and Unregulated Fishing*, NOAA FISHERIES, <https://www.fisheries.noaa.gov/enforcement-efforts-combat-illegal-unreported-and-unregulated-fishing> [<https://perma.cc/YGF4-LVCZ>] (last visited Nov. 2, 2020) (“The PSMA sets minimum standards for exercising port state controls over foreign vessels seeking entry into ports, and over those vessels’ activities while in port. Implementing the PSMA also ensures compliance with [RFMOs]’ conservation and management measures. Another major provision of the PSMA is an emphasis on increased information sharing and communications among participating nations, relevant enforcement agencies, and relevant international organizations, such as RFMOs.”).

<sup>80</sup> Lampert, *supra* note 67, at 1640.

<sup>81</sup> See, e.g., United Nations Convention on the Law of the Sea art. 62, Dec. 10, 1982, 1833 U.N.T.S. 243 [hereinafter UNCLOS]; Food and Agriculture Organization of the United Nations, Agreement to Promote Compliance With International Conservation and Management Measures by Fishing Vessels on the High Seas, preamble, Nov. 24, 1993, 2221 U.N.T.S. 91; Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, Sept. 8, 1995, 2167 U.N.T.S. 3; Food and Agriculture Organization of the United Nations, Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, Nov. 22, 2009, S. Treaty Doc. No. 112-4.

<sup>82</sup> Lampert, *supra* note 67, at 1644.

<sup>83</sup> *Id.*

<sup>84</sup> *Regional fisheries management organizations and deep-sea fisheries*, FAO OF THE U.N., FISHERIES DIV., <http://www.fao.org/fishery/topic/166304.en> [<https://perma.cc/5TT6-9927>] (last visited Nov. 2, 2020).

Although RFMOs often take an ecosystem-focused approach, such governance frameworks face obstacles that include unavailable or incomplete data and ineffective administration systems.<sup>85</sup> No RFMOs exist with a mandate to manage deep-sea fisheries in the Arctic, Central, and Southwest Atlantic; as such, regulation of fishing in those areas falls to each flag State's discretion.<sup>86</sup> But note that under UNCLOS, States must "cooperate with other States on the conservation of marine living resources in the high seas and in developing appropriate management measures where nationals exploit similar resources or different resources in the same area."<sup>87</sup>

Various EU measures combat IUU fishing and seafood fraud.<sup>88</sup> These regulations acknowledge the EU's treaty obligations and lay out specific steps.<sup>89</sup> U.S. federal efforts to combat IUU fishing and seafood fraud focus on The Magnuson-Stevens Fishery Conservation and Management Act ("MSA"),<sup>90</sup> addressing fishing in federal waters, tackling overfishing and seeking to ensure consumers receive safe seafood.<sup>91</sup> The Act creates eight regional fishery management councils comprised of public and private entities, includes measures "to improve identification, tracking, and consequences for IUU fishing[.]" and "creates enforcement mechanisms."<sup>92</sup> The MSA requires a biennial report to Congress<sup>93</sup> regarding compliance with requirements *internationally*, recognizing the importance of global cooperation tackling IUU fishing, and also preventing fishing methods adversely impacting marine resources and harming the U.S. seafood industry.<sup>94</sup> And within the United States, a June 17, 2014 Presidential Memorandum established a Presidential Task Force Combatting

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<sup>85</sup> *Id.*

<sup>86</sup> *Id.*

<sup>87</sup> *Id.*

<sup>88</sup> *Seafood Fraud*, OCEANA, <https://eu.oceana.org/en/our-work/seafood-fraud/overview> [<https://perma.cc/NA6L-XBDW>] (last visited Nov. 2, 2020).

<sup>89</sup> Establishing a Community System to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing, *supra* note 39.

<sup>90</sup> *About the Magnuson-Stevens Act (MSA)*, U.S. REG'L FISHERY MGMT. COUNCILS, <http://www.fisherycouncils.org/about-the-msa/> [<https://perma.cc/HC7Z-WZH7>] (last visited Nov. 2, 2020); *Magnuson-Stevens Act*, NOAA FISHERIES, <https://www.fisheries.noaa.gov/topic/laws-policies> [<https://perma.cc/K9FQ-FHP6>] (last visited Nov. 2, 2020).

<sup>91</sup> Lampert, *supra* note 67, at 1647.

<sup>92</sup> *Id.*

<sup>93</sup> CHRIS OLIVER & NEIL A. JACOBS, IMPROVING INTERNATIONAL FISHERIES MANAGEMENT, 2019 REPORT TO CONGRESS, DEP'T OF COM. & NOAA FISHERIES at 7 (2019).

<sup>94</sup> Lampert, *supra* note 67, at 1647–48.

IUU Fishing and Seafood Fraud.<sup>95</sup> An implementing Task Force Action Plan targets IUU fishing and seafood fraud, “call[ing] for international efforts targeting IUU fishing and seafood fraud, improved enforcement mechanisms, coordination with non-governmental actors, and the proliferation of traceability requirements.”<sup>96</sup>

Recalling criticism of Marine Spatial Planning, the coordination between state and international schemes may be difficult to follow.<sup>97</sup> “There are important differences between the EU and U.S. approaches to IUU fishing and seafood fraud: first, their efforts to identify and punish perpetrators of IUU fishing are separate.”<sup>98</sup> The U.S. and EU inspection schemes also differ, given that the PSMA does not require specific inspection targets.<sup>99</sup>

A burgeoning commercial aspect of the blue economy which poses unique governance issues is bio-prospecting, where no singular, universally recognized governance regime exists. Marine bio-prospecting consists of procuring and analyzing samples of marine genetic material, and identifying potentially commercial products to be developed from them.<sup>100</sup> This includes discovering components that have potential uses in the food, industrial, and pharmaceutical sectors.<sup>101</sup> An estimated 24,000 catalogued marine-derived molecules exist.<sup>102</sup> Of the known marine natural compounds, thirteen different chemical agents that have their origins in marine environments are in clinical trials, eleven of which show cancer-fighting properties.<sup>103</sup> Potential is there: only 1 % of the bacteria present in seawater has been examined for potentially beneficial chemistry.<sup>104</sup> That said, the lack of a universal definition of bio-prospecting creates

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<sup>95</sup> Presidential Memorandum from the White House on Comprehensive Framework to Combat Illegal, Unreported, & Unregulated Fishing & Seafood Fraud (June 17, 2014), <https://obamawhitehouse.archives.gov/the-press-office/2014/06/17/presidential-memorandum-comprehensive-framework-combat-illegal-unreported> [https://perma.cc/8BRN-7YTT].

<sup>96</sup> Lampert, *supra* note 67, at 1648.

<sup>97</sup> See Joseph F.C. DiMento, *Environmental Governance of the Arctic: Law, Effect, Now Implementation*, 6 U.C. IRVINE L. REV. 23, 32 (2016).

<sup>98</sup> Lampert, *supra* note 67, at 1653.

<sup>99</sup> *Id.*

<sup>100</sup> See NORWEGIAN MINISTRIES, NATIONAL STRATEGY 2009, MARINE BIOPROSPECTING—A SOURCE OF NEW AND SUSTAINABLE WEALTH GROWTH, [https://www.regjeringen.no/global-assets/upload/fkd/vedlegg/rapporter/2009/marine\\_bioprospecting\\_report.pdf](https://www.regjeringen.no/global-assets/upload/fkd/vedlegg/rapporter/2009/marine_bioprospecting_report.pdf) [https://perma.cc/G48S-2SRM].

<sup>101</sup> *See id.*

<sup>102</sup> David Wolman, *Humanity's Health May Rely on what Sits on the Arctic's Seabed*, BBC FUTURE (May 6, 2016), <https://www.bbc.com/future/article/20160506-the-arctic-gold-rush-for-tomorrows-medicines> [https://perma.cc/6ABV-XNQX].

<sup>103</sup> *Id.*

<sup>104</sup> *Id.*

uncertainty<sup>105</sup>: theorists debate the international regimes that may apply, including the UNCLOS, the Convention on Biological Diversity and international instruments such as those made through the World Trade Organization and World Intellectual Property Organization.<sup>106</sup>

The benefits and uncertainties associated with governance structures are more pronounced when focusing on the Arctic.<sup>107</sup>

### III. THE ARCTIC: THE BLUE ECONOMY IN ACTION

The Arctic<sup>108</sup> offers a complex blue economy case study. The Arctic Ocean is indeed vast, affected by evolving environmental conditions and increasing socioeconomic drivers.<sup>109</sup> The ocean contains an approximately 6,100,000 square mile area and is nearly 1.5 times the size of the United States.<sup>110</sup> And the Arctic Ocean is changing—and changing by extremes.<sup>111</sup> After only modest changes from 2013–2015, minimum sea ice extent at the end of summer 2019 tied with 2007 and 2016 for the second lowest since modern record keeping began in the late 1970s.<sup>112</sup> Additional factors to consider are that average surface air temperatures have been the

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<sup>105</sup> See SALVATORE ARICO & CHARLOTTE SALPIN, UNU-IAS, BIOPROSPECTING OF GENETIC RESOURCES IN THE DEEP SEABED: SCIENTIFIC, LEGAL, AND POLICY ASPECTS at 15 (2006), <https://www.cbd.int/financial/bensharing/g-absseabed.pdf> [<https://perma.cc/V5JH-F6GF>].

<sup>106</sup> *Id.* at 2–3.

<sup>107</sup> See generally Zhao Long, *Arctic Governance: Challenges and Opportunities*, COUNCIL ON FOREIGN RELS. (Nov. 29, 2018), <https://www.cfr.org/report/arctic-governance> [<https://perma.cc/8M65-NLWV>].

<sup>108</sup> Arctic Member states control territory at or above the Arctic Circle (66 degrees 33'N): the United States, Russia, Canada, Iceland, Finland, Norway, Sweden, and Denmark. *Frequently asked questions about the Arctic*, NOAA PMEL ARCTIC ZONE, <https://www.pmel.noaa.gov/arctic-zone/faq.html> [<https://perma.cc/99M3-4CS3>] (last visited Nov. 2, 2020); *Arctic States*, ARCTIC COUNCIL, <https://arctic-council.org/en/about/states/> [<https://perma.cc/6RGC-MJP7>] (last visited Nov. 2, 2020). 15 U.S.C. § 4111 defines the Arctic as “all United States and foreign territory north of the Arctic Circle and all United States territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwim Rivers; all contiguous seas, including the Arctic Ocean and the Beaufort, Bering, and Chukchi Seas; and the Aleutian chain.” 15 U.S.C. § 4111.

<sup>109</sup> See Jimena Alvarez et al., *A Framework for Assessing the Economic Impacts of Arctic Change*, 49 AMBIO 407 (2020).

<sup>110</sup> The average depth of the Arctic Ocean is 3,953 feet and it is 18,264 feet at its deepest point. *What is the world's smallest ocean?*, NAT'L OCEAN SERV., NOAA, <https://ocean.service.noaa.gov/facts/smallestocean.html> [<https://perma.cc/368H-97LK>] (last modified Apr. 4, 2020).

<sup>111</sup> See *2019 Arctic Sea Ice Minimum Tied for Second Lowest on Record*, NASA (Sept. 23, 2019), <https://climate.nasa.gov/news/2913/2019-arctic-sea-ice-minimum-tied-for-second-lowest-on-record/> [<https://perma.cc/JB2Z-YQ46>].

<sup>112</sup> An analysis of satellite data by NASA and the National Snow and Ice Data Center illustrates that the 2019 minimum extent measured 1,600,000 square miles. *Id.*

highest since 1900,<sup>113</sup> and snow cover extent in the North American Arctic during spring has been the lowest in satellite record.<sup>114</sup> Ocean acidification is increasing, due primarily to the absorption of carbon dioxide from the atmosphere.<sup>115</sup>

The socioeconomic changes involving and affecting Arctic maritime issues are also increasing.<sup>116</sup> In 2016, the thirteen-deck cruise ship *Crystal Serenity* embarked on its sold-out voyage through the Northwest Passage.<sup>117</sup> The ship safely docked in New York City thirty-two days later—but significant search and rescue concerns were raised given the scope of this voyage.<sup>118</sup> Projected vast amounts of Arctic energy resources exist.<sup>119</sup> The oft-cited 2008 United States Geological Survey Arctic-wide hydrocarbon potential study estimates the Arctic contains 90,000,000,000 barrels of oil, 1,669,000,000,000,000 cubic feet of natural gas and 44,000,000,000 barrels of natural gas liquids.<sup>120</sup>

The existing structure of Arctic governance reveals how blue economy matters would fit into this evolving construct.<sup>121</sup> Key emerging issues—from sustainable fisheries to bio-prospecting—are often covered (or not) under existing legal mechanisms.<sup>122</sup> To discuss Arctic governance involves the nascent discipline of Arctic law, which examines the laws and regulations affecting the Arctic, “including the rights, responsibilities and obligations of governmental and private actors.”<sup>123</sup>

While treaties and conventions exist that deal with Arctic-related issues, no treaties exclusively focus on the Arctic.<sup>124</sup> The primary example is UNCLOS (which has yet to be ratified by the United States)<sup>125</sup> that

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<sup>113</sup> *Arctic Report Card: Update for 2016*, ARCTIC PROGRAM, NOAA, <https://www.arctic.noaa.gov/Report-Card/Report-Card-2016> [<https://perma.cc/885L-NV9L>].

<sup>114</sup> *Id.*

<sup>115</sup> *Id.*

<sup>116</sup> See Arctic Law & Policy Institute, University of Washington, *Arctic Law & Policy Year in Review: 2016*, 7 WASH. J. ENV'T L. & POL'Y 115, 117 (2017).

<sup>117</sup> *Id.* at 123.

<sup>118</sup> *Id.* at 209–10.

<sup>119</sup> U.S. DEP'T OF THE INTERIOR, U.S. GEOLOGICAL SURVEY, CIRCUM-ARCTIC RESOURCE APPRAISAL: ESTIMATES OF UNDISCOVERED OIL AND GAS NORTH OF THE ARCTIC CIRCLE 1 (2008).

<sup>120</sup> *Id.*

<sup>121</sup> See Edward T. Canuel, *The Four Arctic Law Pillars: A Legal Framework*, 46 GEO. J. INT'L L. 735, 739–40 (2015).

<sup>122</sup> See generally ARICO & SALPIN, UNU-IAS, *supra* note 105, at 7.

<sup>123</sup> Canuel, *supra* note 121, at 737–38. Arctic law is divided into four distinct components: hard law, soft law, domestic law, and transboundary private law.

<sup>124</sup> *Id.* at 739–740.

<sup>125</sup> UNCLOS, *supra* note 81, at 397, 404, 411.

guarantees signatory state vessels' navigational rights and freedoms throughout the world's oceans. "UNCLOS codifies member rights over all oceanic resources, including on and under the ocean floor in a member state's 200-nautical-mile Exclusive Economic Zone."<sup>126</sup> The Convention provides Arctic maritime scientific research rules, territorial limitations, and marine environment protection responsibilities (and rights).<sup>127</sup> Additionally, the Convention covers various Arctic issues that should sound familiar to the blue economy, including "fisheries management, pollution prevention, resource conservation, and international shipping regulations."<sup>128</sup> Additionally, many of the Arctic soft law regional and international instruments do not have unanimous support from the Arctic states.<sup>129</sup>

Within this legal framework, governance plays an integral role. The Arctic Council is the principal intragovernmental forum contending with Arctic issues, composed of the eight Arctic states, with membership including the six groups representing the Arctic indigenous peoples.<sup>130</sup> The Council promotes cooperation, coordination and interaction among the Arctic states with a mandate of Arctic sustainable development and environmental protection.<sup>131</sup> The current Chair country of the Council is Iceland (through 2021), espousing the theme "Together towards a sustainable Arctic."<sup>132</sup> Marine issues are crucial throughout the Council's four working

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<sup>126</sup> Canuel, *supra* note 121, at 740 (citing to UNCLOS, *supra* note 81, at arts. 2,33,57). Under certain conditions, UNCLOS allows states to extend their EEZ outside 200 nautical miles to 350 miles. Christopher Joyner, *The Legal Regime for the Arctic Ocean*, 18 J. TRANSN'L L. & POL'Y 195, 203 (2009).

<sup>127</sup> Canuel, *supra* note 121, at 740 (citing to UNCLOS, *supra* note 81, at arts. 3, 238, 56).

<sup>128</sup> *Id.* (citing to UNCLOS, *supra* note 81, at arts. 63, 211, 115–19, 58).

<sup>129</sup> This includes the 1973 International Convention for the Prevention of Pollution from Ships (MARPOL), Nov. 2, 1973, 1340 U.N.T.S. 184 (as modified by Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from ships, Feb. 17, 1978, 1340 U.N.T.S. 61), the 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage, Nov. 23, 1972, 1037 U.N.T.S. 151, and the International Convention on Oil Pollution Preparedness, Response, and Co-operation, Nov. 30, 1990, 1891 U.N.T.S. 51.

<sup>130</sup> See Declaration on the Establishment of the Arctic Council, Sept. 19, 1996, 35 I.L.M. 1387.

<sup>131</sup> *Id.* See also Canuel, *supra* note 121, at 741.

<sup>132</sup> "The theme of the Arctic Council Chairmanship program for 2019–2021 reflects Iceland's commitment to the principle of sustainable development and refers to the necessity of close cooperation between the states and peoples of the region and beyond. With sustainable development as an overarching theme, Iceland will highlight four priorities: The Arctic Marine Environment, Climate and Green Energy Solutions, People and Communities of the Arctic, and a Stronger Arctic Council." *Icelandic Chairmanship*, ARCTIC COUNCIL, <https://arctic-council.org/en/about/chairmanship/> [<https://perma.cc/MWS2-9RTJ>] (last visited Nov. 2, 2020).

groups.<sup>133</sup> One of the Arctic Council's major marine-focused deliverables with blue economy implications was the Arctic Marine Shipping Assessment of 2009, a groundbreaking report, which weighed 120 factors as it discussed the future of Arctic marine use.<sup>134</sup> The report presented various recommendations, focusing on issues including the legal governance frameworks in the Arctic Ocean, limited seasonal windows of operation for Arctic shipping, and the role of transit fees in coastal Arctic routes.<sup>135</sup>

And there are calls for the Arctic Council to assume a role in enforcing binding agreements—currently outside its mandate.<sup>136</sup> Take the International Maritime Organization (“IMO”), a specialized agency of the United Nations, which developed an International Code of Safety for Ships Operating in Polar Waters (“Polar Code”).<sup>137</sup> Entered into force on January 1, 2017, the Polar Code is mandatory under both the International Convention for the Safety of Life at Sea (“SOLAS”) and the International Convention for the Prevention of Pollution from Ships (“MARPOL”). The Code covers “design, construction, equipment, operational, training, search and rescue and environmental protection matters relevant to ships operating in” the Arctic and Antarctica.<sup>138</sup> The Polar Code covers the full range of design, construction, equipment, operational, training, search and rescue, and environmental protection matters relevant to ships operating in the inhospitable waters surrounding the two poles.<sup>139</sup> It sets global standards on the safety, security, and environmental performance of international shipping.<sup>140</sup> The Polar Code is the IMO's first binding bipolar instrument.<sup>141</sup> However, although the Polar Code is binding, the IMO does not

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<sup>133</sup> *Id.*

<sup>134</sup> ARCTIC COUNCIL, ARCTIC MARINE SHIPPING ASSESSMENT 2009 REPORT 93 (2009), [http://pame.is/images/03\\_Projects/AMSA/AMSA\\_2009\\_report/AMSA\\_2009\\_Report\\_2nd\\_print.pdf](http://pame.is/images/03_Projects/AMSA/AMSA_2009_report/AMSA_2009_Report_2nd_print.pdf) [<https://perma.cc/7MNJ-AY8K>].

<sup>135</sup> *Id.*

<sup>136</sup> Richard Wanerman, Note, *Freezing Out Noncompliant Ships: Why the Arctic Council Must Enforce the Polar Code*, 47 CASE W. RESV. J. INT'L L. 429, 431 (2015); SEAS AT RISK, BLUE MANIFESTO: THE ROADMAP TO A HEALTHY OCEAN IN 2030 (2020), [https://seas-at-risk.org/images/pdf/publications/SAR\\_BLUE\\_MANIFESTO\\_DEPLIANT\\_A4\\_plie\\_BaT.pdf](https://seas-at-risk.org/images/pdf/publications/SAR_BLUE_MANIFESTO_DEPLIANT_A4_plie_BaT.pdf) [<https://perma.cc/AB9N-A8MV>].

<sup>137</sup> *Shipping in polar waters*, INT'L MAR. ORG., <http://www.imo.org/en/MediaCentre/HotTopics/polar/Pages/default.aspx> [<https://perma.cc/66Q2-UHXQ>] (last visited Nov. 2, 2020).

<sup>138</sup> *Id.*; see also Armand de Mestral, *The EU as an Arctic Power: Analysis of the Competence of the EU in the Arctic by Policy Areas*, 35 DAL. L.J. 329, 339 (2012).

<sup>139</sup> *Shipping in polar waters*, *supra* note 137.

<sup>140</sup> *Id.*

<sup>141</sup> Øystein Jensen, *The International Code for Ships Operating in Polar Waters: Finalization, Adoption and Law of the Sea Implications*, 7 ARCTIC REV. L. & POL. 60, 61 (2016).

have a mandatory enforcement mechanism; it is up to individual states to comply with the Polar Code.<sup>142</sup>

The Polar Code demonstrates a trend that has emerged which impacts the blue economy, the growth of soft law, and the hardening of soft law.<sup>143</sup> On May 28, 2008, the five Arctic Ocean coastal states (United States, Russia, Canada, Norway, and Denmark) issued the Ilulissat Declaration.<sup>144</sup> They agreed to forestall a “new comprehensive international legal regime to govern the Arctic Ocean”<sup>145</sup> which influenced outside calls for a hard law Arctic Treaty.<sup>146</sup>

The *Oslo Declaration*, signed by the five coastal Arctic states in 2015, brings us back to IUU fishing, a key consideration of the blue economy.<sup>147</sup> The *Declaration* deters unregulated commercial fishing in the

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<sup>142</sup> ARCTIC COUNCIL, *supra* note 134, at 4; ØYSTEIN JENSEN, THE IMO GUIDELINES FOR SHIPS OPERATING IN ARCTIC ICE-COVERED WATERS: FROM VOLUNTARY TO MANDATORY TOOL FOR NAVIGATION SAFETY AND ENVIRONMENTAL PROTECTION?, at v (2007), <https://www.fni.no/getfile.php/131675-1469868943/Filer/Publikasjoner/FNI-R0207.pdf> [<https://perma.cc/9J8A-WAQ9>].

<sup>143</sup> The trend of creating certain Arctic binding obligations is most pronounced within the Arctic Council’s recent deliverables, and all of them affect the blue economy; *e.g.*, Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic art. 2, May 12, 2011, T.I.A.S. No. 13-119 (specifying rescue assistance and information sharing obligations across the Arctic); Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic art. 1, May 15, 2013, T.I.A.S. No. 16-325; Agreement on Enhancing International Arctic Scientific Cooperation art. 1, May 11, 2017, T.I.A.S. No. 18-523. For a discussion on how soft law instruments are hardening within the Arctic context, see Canuel, *supra* note 3, at 55–56.

<sup>144</sup> Arctic Ocean Conference, 2008 Ilulissat Declaration, May 28, 2008, <https://cil.nus.edu.sg/wp-content/uploads/2017/07/2008-Ilulissat-Declaration.pdf> [<https://perma.cc/9JYU-X9DC>].

<sup>145</sup> *Id.*

<sup>146</sup> The Declaration stated that

[n]otably, the law of the sea provides for important rights and obligations concerning the delineation of the outer limits of the continental shelf, the protection of the marine environment, including ice-covered areas, freedom of navigation, marine scientific research, and other uses of the sea. We remain committed to this legal framework and to the orderly settlement of any possible overlapping claims. . . . This framework provides a solid foundation for responsible management by the five coastal States and other users of this Ocean through national implementation and application of relevant provisions. We therefore see no need to develop a new comprehensive international legal regime to govern the Arctic Ocean. We will keep abreast of the developments in the Arctic Ocean and continue to implement appropriate measures.

*Id.*

<sup>147</sup> *Declaration Concerning the Prevention of Unregulated High Seas Fishing in the Central Arctic Ocean*, July 16, 2015, <https://www.regjeringen.no/globalassets/departementene/ud>

high seas waters of the 1,100,000 square mile Central Arctic Ocean.<sup>148</sup> The *Declaration*, which is non-binding, recognizes that, although commercial fishing in Arctic waters is not imminent, the reduction of Arctic sea ice and environmental challenges in the region necessitates a precautionary approach to prevent unregulated fishing in the area.<sup>149</sup> “The so-called Arctic Ocean high seas ‘donut hole’ covered by [the *Declaration*] lies beyond the five states’ exclusive economic zones.”<sup>150</sup>

The diversity of governance mechanisms blur international, domestic, and substate distinctions. Blue ocean topics previously raised more broadly are amplified when examined within the Arctic context.<sup>151</sup> Marine management is one example: from a U.S., purely domestic perspective, the “Arctic Fishery Management Plan<sup>152</sup> is the guiding plan for fisheries in the Chukchi and Beaufort Seas. It closes all federal waters in [these seas] to commercial fishing until there is enough information to manage them sustainably.”<sup>153</sup> Yet, there are gaps in this regime: the move does not regulate subsistence fishing.<sup>154</sup> The Council recognized that the

emergence of unregulated, or inadequately regulated, commercial fisheries in the Arctic EEZ [Exclusive Economic Zone] off Alaska<sup>155</sup> could have adverse effects on the

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[/vedlegg/folkerett/declaration-on-arctic-fisheries-16-July-2015.pdf](https://perma.cc/P94B-9FWH) [https://perma.cc/P94B-9FWH] (last visited Nov. 2, 2020).

<sup>148</sup> Arctic Law & Policy Institute, University of Washington, *supra* note 116, at 125, 131.

<sup>149</sup> *Declaration Concerning the Prevention of Unregulated High Seas Fishing in the Central Arctic Ocean*, *supra* note 147.

<sup>150</sup> Arctic Law & Policy Institute, University of Washington, *supra* note 116, at 125.

<sup>151</sup> Thomas Au et al., Note, *Niagra International Moot Court Competition 2013: Commentary: The Arctic Ice Melt: Emerging Resources, Emerging Issues*, 38 CAN.-U.S. L.J. 195, 204 (2013).

<sup>152</sup> David Roche et al., *Ocean Policy and the Trump Administration*, 47 ENV'T L. REP. 10287, 10291–92 (2017).

<sup>153</sup> *Id.*

<sup>154</sup> Under the FMP,

[a]ll Federal waters of the U.S. Arctic will be closed to commercial fishing for any species of finfish, mollusks, crustaceans, and all other forms of marine animal and plant life; however, harvest of marine mammals and birds is not regulated by the Arctic FMP. The Arctic FMP will not regulate subsistence or recreational fishing or State of Alaska-managed fisheries in the Arctic.

*Arctic Fishery Management*, N. PAC. FISHERYMGMT. COUNCIL, <https://www.npfmc.org/arctic-fishery-management/> [https://perma.cc/NBF2-5FZC] (last visited Nov. 2, 2020).

<sup>155</sup> The Council’s Arctic FMP covers the U.S. Arctic EEZ waters offshore Alaska. This area is the Arctic Management Area, and is defined as all marine waters in the U.S. EEZ of the Chukchi and Beaufort Seas from three nautical miles offshore the coast of Alaska or its baseline to 200 nautical miles offshore, north of Bering Strait (from Cape Prince of

sensitive ecosystem and marine resources of this area, including fish, fish habitat, and non-fish species that inhabit or depend on marine resources of the U.S. Arctic EEZ, and the subsistence way of life of residents of Arctic communities.<sup>156</sup>

The Council's Arctic Plan is created under authority of the Magnuson-Stevens Act;<sup>157</sup> the management plan for the U.S. Arctic EEZ is an ecosystem-based management policy.<sup>158</sup>

Even with that approach, uncertainty exists. For example, the Magnuson-Stevens Act currently states that overfishing is disallowed and sets quantitative definitions as to what constitutes overfishing.<sup>159</sup> However, the MSA does *not* address the harm to fisheries from activities in other sectors, with the exception of calling for consultation on activities authorized by federal agencies that may impact essential fish habitats.<sup>160</sup> "An EBM approach could focus on these impacts by including cross-sectoral and cross-agency consideration of impacts along with development of management measures to address those impacts."<sup>161</sup>

On the bilateral front, the United States and Russia entered into a treaty combatting IUU fishing in 2015.<sup>162</sup> "Alaskan crab fishers in the Bering Sea, which lies just south of the Arctic, strongly supported the agreement (which is not geographically limited)."<sup>163</sup> Illegally harvested Russian crab has cost Alaskan Bering Sea fishermen up to an estimated \$560 million.<sup>164</sup> From 2003–2013, The World Wildlife Fund had previously issued a research report highlighting the significance of the problem from 2003–2013: "overharvest due to illegal crab harvesting was two to four

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Wales to Cape Dezhneva) and westward to the 1990 U.S./Russia maritime boundary line and eastward to the U.S./Canada maritime boundary. *Id.*

<sup>156</sup> *Id.*

<sup>157</sup> *About the Magnuson-Stevens Act (MSA)*, *supra* note 90; *Magnuson-Stevens Act*, *supra* note 90.

<sup>158</sup> *Arctic Fishery Management*, *supra* note 154.

<sup>159</sup> 16 U.S.C.A. § 1853(a) (West 2007).

<sup>160</sup> *Magnuson-Stevens Act*, *supra* note 90.

<sup>161</sup> NOAA, *supra* note 51.

<sup>162</sup> *United States and Russia Sign Agreement to Prevent Illegal Fishing*, NOAA FISHERIES, <https://www.fisheries.noaa.gov/feature-story/united-states-and-russia-sign-agreement-prevent-illegal-fishing> [<https://perma.cc/Y5ZU-6AMA>] (last visited Nov. 2, 2020).

<sup>163</sup> Kristina Daugirdas & Julian Davis Mortensen, *Contemporary Practice of the United States Relating to International Law*, 110 AM. J. INT'L L. 126, 127 (2016).

<sup>164</sup> *Id.*

times the legal limit, causing grave concern about the sustainability of several Russian Far East crab species.”<sup>165</sup>

Turning to Ecosystem Based Management,<sup>166</sup> the Arctic Council has called for the use of EBM, articulating nine principles including incorporating expert knowledge, inclusivity, and recognizing that ecosystems and human activities are dynamic.<sup>167</sup> Critics assert that the “articulation of ecological criteria, determinations of scales, operational definitions of what is sustainable, modeling of cumulative impacts, and integration of types of knowledge not have commonly accepted, consensus meanings.”<sup>168</sup> These elements of EBM<sup>169</sup> each require “assignment of resources including human resources to individual elements with, ideally, specified implementation markers, including deadlines.”<sup>170</sup>

On bio-prospecting, Arctic Sea ice provides for varied microbial communities because of its unique characteristics and is home to a great number of diverse viruses and bacteria.<sup>171</sup> Climate change also allows greater access to Arctic genetic resources and Arctic bio-prospecting is emanating as a key blue economy product.<sup>172</sup> For example, in Arctic Norway, cold waters “collide with warmer waters carried by northward by the Gulf Stream.”<sup>173</sup> “Here, organisms tolerate not only freezing or near-freezing temperatures, but also turbulence caused by this clash of currents. . . . [T]hose currents also allow the waters to be high in nutrients,

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<sup>165</sup> ILLEGAL RUSSIAN CRAB: AN INVESTIGATION OF TRADE FLOW, WORLD WILDLIFE FUND (2014), [https://wwfeu.awsassets.panda.org/downloads/wwf\\_illegal\\_crab\\_report.pdf](https://wwfeu.awsassets.panda.org/downloads/wwf_illegal_crab_report.pdf) [<https://perma.cc/4RDS-5KKY>].

<sup>166</sup> EXPERT GRP. ON ECOSYSTEM-BASED MGMT., ARCTIC COUNCIL, ECOSYSTEM-BASED MANAGEMENT IN THE ARCTIC (2013), [https://oaarchive.arctic-council.org/bitstream/handle/11374/122/MM08\\_EBM\\_report%20%281%29.pdf?sequence=1&isAllowed=y](https://oaarchive.arctic-council.org/bitstream/handle/11374/122/MM08_EBM_report%20%281%29.pdf?sequence=1&isAllowed=y) [<https://perma.cc/4QY9-UEFE>] (“[Ecosystem-based management] is the comprehensive, integrated management of human activities based on best available scientific and traditional knowledge about the ecosystem and its dynamics, in order to identify and take action on influences that are critical to the health of ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity.”).

<sup>167</sup> *Id.*

<sup>168</sup> DiMento, *supra* note 50.

<sup>169</sup> See Rachel D. Long, *Key Principles of Marine Ecosystem-Based Management*, 57 MARINE POL'Y 53 (2015).

<sup>170</sup> DiMento, *supra* note 50.

<sup>171</sup> Mar Campins Eritja, *Bio-Prospecting in the Arctic: An Overview of the Interaction Between the Rights of Indigenous Peoples and Access and Benefit Sharing*, 44 B.C. ENV'T AFF. L. REV. 223 (2017).

<sup>172</sup> *Id.*

<sup>173</sup> Wolman, *supra* note 102.

making biodiversity rich and full of undiscovered chemistry.”<sup>174</sup> To date, some 150 novel bioactive compounds and fifty drug development leads have been found in the Arctic, the majority of which are active against cancer or influence immune response.<sup>175</sup> “While enzymes adapted to warmer temperatures are better known to science, cold-adapted enzymes are not—and they might hold their own unique properties.”<sup>176</sup> The roles of indigenous peoples in identifying potential bio-prospecting sources, using traditional knowledge, or concerns that their food sources would be disaffected by bioprospecting, has also spurred debate—particularly calls for assurances of an equitable disposition of harvested resources.<sup>177</sup>

#### IV. THE BLUE ECONOMY AHEAD: RESEARCH OPPORTUNITIES

*My big fish must be somewhere.*

—Ernest Hemingway, *The Old Man and the Sea*<sup>178</sup>

The blue economy is a researcher’s dream. With uncertain enforcement and application of diverse governance structures, a multiplicity of actors and stakeholders at the domestic and international levels, and frequently competing legal regimes affecting vast economic potential, the stakes are high.<sup>179</sup> That said, the opportunities for research are many, extending across disciplines including legal and social science subjects, such as international relations, political science, and economics.<sup>180</sup> And here are just a few thoughts as to possible areas of future blue economy research.

The role of indigenous ownership concerning offshore energy development raises legal questions in the blue economy context.<sup>181</sup> Within and across different legal jurisdictions throughout the Arctic states, what property rights, if any, may be raised by indigenous peoples under respective

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<sup>174</sup> *Id.*

<sup>175</sup> See Eritja, *supra* note 171 (“[u]sing genetic resources from the Arctic’s marine environment and microorganisms, biotechnology research has targeted a few key areas, such as industrial processes, food technology, pollution control technologies, pharmaceutical and medical products, and health-related advancements”).

<sup>176</sup> Wolman, *supra* note 102.

<sup>177</sup> Eritja, *supra* note 171.

<sup>178</sup> ERNEST HEMINGWAY, *THE OLD MAN AND THE SEA*, 12 (1952).

<sup>179</sup> *Taskforce on Ocean Governance: Blue Economy*, OCEAN GOVERNANCE, [https://www.earthsystemgovernance.net/oceans/?page\\_id=79](https://www.earthsystemgovernance.net/oceans/?page_id=79) [<https://perma.cc/958D-MS6Q>] (last visited Nov. 2, 2020).

<sup>180</sup> *Id.*

<sup>181</sup> Sandy Kerr et al., *Rights and Ownership in Sea Country: Implications of Marine Renewable Energy for Indigenous and Local Communities*, 52 *MARINE POL’Y* 108, 108 (2015).

federal, state, local, territorial, or tribal law? In Alaska, for example, the federal government has paramount power to regulate seabed and ocean exploitation to safeguard the defense of the U.S. and regulation of international commerce.<sup>182</sup> That concept conflicts with certain case law, including *People of Gambell v. Clark*, 746 F.2d 572, 574 (9th Cir. 1984) which held that “aboriginal title or right is a right of exclusive use and occupancy held by Natives in lands and waters used by them and their ancestors prior to the assertion of sovereignty over such areas by the United States.”<sup>183</sup> In this context, and throughout the legal regimes of the Arctic states, to what extent do aboriginal rights exist against claims that the so-called paramountcy doctrine otherwise trumps/extinguishes them? What are the implications for commercial actors seeking certainty when undertaking potential projects affected by that U.S. legal doctrine, or its foreign correlatives?

Blue economy sustainability within the context of *corporate* governance is an area ripe for additional scholarship.<sup>184</sup> For example, “[s]ustainability reporting—publishing information on an organization’s governance and impacts on the environment, economy, and society—is a type of soft law and intended to catalyze dialogue and action about stakeholder concerns.”<sup>185</sup> Concepts such as regulation by voluntary disclosure, though global in scope, are not grounded singularly in common law or civil law traditions.<sup>186</sup> The applicability of the blue economy could accordingly reveal unique governance mechanisms.

Further research could exist on the declaration, implementation, and enforcement of Marine Protected Areas (“MPAs”), particularly in the Arctic. One may assess the legal and policy implications associated with such MPAs.<sup>187</sup> Relatedly, is there the feasibility of a Pan-Arctic Network of MPAs, including high seas MPAs? And to additionally mire the issue,

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<sup>182</sup> Edward Canuel, *U.S. Arctic Hydrocarbon Extraction: Exploring the Confluence of Law and Identity*, 11 TEX. J. OIL GAS & ENERGY L. 299, 318 (2016).

<sup>183</sup> *Id.* (citing *Native Vill. of Eyak v. Trawler Diane Marie, Inc.*, 154 F.3d 1090, 1096 (9th Cir. 1998)).

<sup>184</sup> *Taskforce on Ocean Governance: Blue Economy*, *supra* note 179.

<sup>185</sup> Gerlinde Berger-Walliser et al., *Using Proactive Legal Strategies for Corporate Environmental Sustainability*, 6 MICH. J. ENV'T & ADMIN. L. 1, 29 (2016).

<sup>186</sup> *Id.* at 30 (citing to Adam J. Sulkowski & D. Steven White, *Financial Performance, Pollution Measures and the Propensity to Use Corporate Responsibility Reporting: Implications for Business and Legal Scholarship*, 21 COLO. J. INT'L ENV'T L. & POL'Y 491, 496, 503–04 (2009)).

<sup>187</sup> See ENV'T L. INST., LEGAL TOOLS FOR STRENGTHENING MARINE PROTECTED AREA ENFORCEMENT: A HANDBOOK (2016), [https://www.eli.org/sites/default/files/eli-pubs/legal-tools-strengthening-mpa-enforcement-eli-2016\\_2.pdf](https://www.eli.org/sites/default/files/eli-pubs/legal-tools-strengthening-mpa-enforcement-eli-2016_2.pdf) [<https://perma.cc/W7VA-D4U3>].

there are no clear, internationally recognized “uniform” legal definitions of MPAs.<sup>188</sup>

And what of the Arctic Council? Is there a way to even further integrate or socialize the various multiple marine-focused projects that exist among the various Council Working and Expert groups? Is there room for the Council to tackle the harmonization of standards and regulations—perhaps by Arctic States’ marine industries?<sup>189</sup> Does the hardening of soft law have unintended consequences for future Arctic Council agreements? How can a broader discussion of innovative topics like the blue bioeconomy be effectively advanced through, or by, the blue economy?<sup>190</sup>

Building on the Council’s extensive work on black carbon issues could support the increasing global discussion of blue carbon.<sup>191</sup> Namely, room exists to explore synergies and governance issues between black carbon projects and blue carbon habitats. Coastal blue carbon is the carbon stored and sequestered in coastal ecosystems (mangrove forests, seagrass meadows, and salt marshes).<sup>192</sup> Blue carbon habitats are being lost rapidly worldwide,<sup>193</sup> but the benefits of carbon sequestration and storage provide a driver for accelerated conservation and restoration of

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<sup>188</sup> *Id.* at 2–3.

<sup>189</sup> For more information on the Arctic Council, see *Arctic Council—About*, ARCTIC COUNCIL, <https://arctic-council.org/index.php/en/about-us/> [<https://perma.cc/KJ7N-YP4U>] (last visited Nov. 2, 2020).

<sup>190</sup> The term ‘blue bioeconomy’ refers to sustainably maximising the value and use of aquatic bioresources using innovative processing methods. It is a source for great optimism for the circumpolar region. Today, estimates reveal that up to 43% of captured fish and shellfish resources end up either as wastage or discarded material. This means that companies are throwing away 43% of the biomass that could potentially generate substantial profits by developing methods for turning ‘waste’ into high value products for food, feed, bio-products and bioenergy sectors. The blue bioeconomy is a kind of back to basics thinking in the sense that it revolves around making the most of available resources, and maximizing the value of and revenue from marine catches while minimizing waste and negative environmental impacts of marine operations.

Arctic Frontiers Side Event on Blue Economy, ARCTIC COUNCIL (Jan. 2020), <https://arctic-council.org/index.php/en/our-work2/8-news-and-events/565-arctic-frontiers-side-event-on-blue-bioeconomy> [<https://perma.cc/FU5L-99SH>].

<sup>191</sup> *Id.*

<sup>192</sup> *What is Blue Carbon?*, NAT’L OCEAN SERV., <https://oceanservice.noaa.gov/facts/bluecarbon.html>. [<https://perma.cc/FL3W-7ABP>] (last visited Nov. 2, 2020).

<sup>193</sup> Linwood Pendleton et al., *Estimating Global “Blue Carbon” Emissions from Conversion and Degradation of Vegetated Coastal Ecosystems*, 7 PLOS ONE 1 (2012).

these habitats—with global (climate) and local (fisheries and ecosystem services) benefits.<sup>194</sup>

Similarly, Arctic stakeholders could strengthen efforts to examine the emerging threat of “gray waters” in the Arctic.<sup>195</sup> As greater maritime transportation is anticipated as sea ice declines, particularly related to tourism, gray water dumping is projected to increase.<sup>196</sup> Gray water includes detergent-containing shower or laundry water, that may also contain nutrients, metals, food particles, and microplastics—all with the possibility of contaminating shellfish and causing algae blooms creating oceanic “dead zones.”<sup>197</sup> Not all Arctic State jurisdictions have Arctic-specific regulations that require onboard marine sanitation devices before releasing gray water.<sup>198</sup>

Concerning IUU fishing, one could compare the fishing regimes of states with annual catch limits to hopefully further reduce, and eventually halt, overfishing.<sup>199</sup> Evaluating governance schemes to maintain monitoring catch levels and keeping them in check on an annual basis could reduce the chance of overfishing and ensure long-term biological and economic sustainability.<sup>200</sup> Similarly, beneficial, impactful results could result upon studying management tools to increase regulatory efficiency of marine aquaculture, supporting science and technology development to increase production, and collaborating with international partners on scientific exchanges. All of these could ease impacts from the growing global population, and produce creative ways to increase food production.<sup>201</sup>

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<sup>194</sup> Jennifer Howard et al., *The Potential to Integrate Blue Carbon into MPA Design and Management*, 27 AQUATIC CONSERVATION: MARINE & FRESHWATER ECOSYSTEMS 100 (2017).

<sup>195</sup> Katherine Balpataky, *Greywater Dumping In Arctic Waters Set to Double By 2035*, WATER CAN. (Aug. 16, 2018), <https://www.watercanada.net/greywater-dumping-in-arctic-waters-set-to-double-by-2035/> [<https://perma.cc/5M37-EWAT>].

<sup>196</sup> *Gray Water in Canada's Arctic Raises Concern*, CAN. PRESS (Aug. 16, 2018), <https://www.thestar.com/news/canada/2018/08/26/grey-water-in-canadas-arctic-raises-concern.html> [<https://perma.cc/4DUZ-FMMK>]. Tourism is anticipated to be the biggest source of gray water dumping by 2035. *Id.*

<sup>197</sup> *Id.*

<sup>198</sup> *Id.* See also Sarah Bobbe, *All You Need to Know About Graywater Discharge from Ships*, OCEAN CONSERVANCY: BLOG (May 27, 2019), <https://oceanconservancy.org/blog/2019/05/27/need-know-graywater-discharge-ships/> [<https://perma.cc/PJ8L-9YBY>].

<sup>199</sup> Halford, *supra* note 73.

<sup>200</sup> *Setting an Annual Catch Limit*, NOAA FISHERIES, <https://www.fisheries.noaa.gov/in-sight/setting-annual-catch-limit> [<https://perma.cc/E66V-RQL3>] (last visited Nov. 2, 2020).

<sup>201</sup> CHRISTOPHER COSTELLO ET AL., WORLD RES. INST., *THE FUTURE OF FOOD FROM THE SEA* (2019), [https://oceanpanel.org/sites/default/files/2019-11/19\\_HLP\\_BP1%20Paper.pdf](https://oceanpanel.org/sites/default/files/2019-11/19_HLP_BP1%20Paper.pdf) [<https://perma.cc/4SW9-HMFA>].

International research opportunities focusing on the blue economy should gather universities and centers of excellence across the globe, undertaking an *inter*, and *intra*, disciplinary approach. The group could tackle activities organized around major themes, including 1) evaluating and exploring the role of scientific advances and enabling technologies in driving innovation in the ocean economy; 2) investigating emerging patterns and platforms of collaboration in innovation among different marine and maritime actors in ocean research and development around the world; 3) extending the frontiers of the use of socioeconomic valuation, analysis, and tools further into areas of ocean-related activities; and 4) analyzing the role of the public sector and the impacts of policy mixes in boosting innovation in the ocean economy.

The great American baseball player and wit Yogi Berra once said that “[i]f the world were perfect, it wouldn’t be.”<sup>202</sup> Exploring the blue economy is fraught with uncertainties, including imperfect governance mechanisms, data gaps, and lack of resources to safeguard enforcement measures.<sup>203</sup> Acknowledging, addressing, and confronting related legal challenges affecting our oceans will continue to yield important opportunities to promote near and long-term sustainable development.<sup>204</sup> Berra also noted that “when you come to a fork in the road, take it.”<sup>205</sup> We are at such a crossroad. Through a thoughtful understanding of the blue economy, the right path could be taken, so that we can, at the very least, attempt to tackle the daunting hurdles facing the global sea.

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<sup>202</sup> Michael F. Kay, *When You Come To A Fork In The Road, Take It!*, FORBES (June 17, 2014), <https://www.forbes.com/sites/michaelkay/2014/06/17/when-you-come-to-a-fork-in-the-road-take-it/#7c615156c80f> [<https://perma.cc/QN9S-L29J>].

<sup>203</sup> WORLD BANK GRP., BLUE ECONOMY DEVELOPMENT FRAMEWORK (APR. 2016), <http://pubdocs.worldbank.org/en/446441473349079068/AMCOECC-Blue-Economy-Development-Framework.pdf> [<https://perma.cc/7GL3-LNWG>].

<sup>204</sup> Douglas M. Johnston & David L. VanderZwaag, *The Ocean and International Environmental Law: Swimming, Sinking, and Treading Water at the Millennium*, 43 OCEAN & COASTAL MGMT. 141 (2000).

<sup>205</sup> Kay, *supra* note 202.