



Andrew Trites, The University of British Columbia

Advancing Ecosystem-Based Marine Management in the Arctic: Recommendations to the Arctic Council Task Force on Arctic Marine Cooperation

by the UC Irvine School of Law Center for Land, Environment, and Natural Resources
(CLEANR)¹

¹ Joseph F.C. DiMento, Professor of Law & CLEANR Faculty; Elizabeth M. Taylor, CLEANR Staff Attorney; Stephanie L. Talavera, CLEANR Environmental & Land Use Fellow.

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I. Introduction

The Arctic² marine environment is undergoing record change.³ The Arctic Council leads many efforts to identify and prepare for these changes, including its recent formation of the Task Force on Arctic Marine Cooperation (the Task Force). On April 22, 2016, a small group of Arctic scholars⁴ convened a roundtable at the University of California, Irvine School of Law to address the question of how to advance ecosystem-based marine management in the Arctic.⁵ Recognizing that there has been increasing worldwide interest and presence in the Arctic, and that in twenty years the Arctic Ocean⁶ will no longer be an isolated marine ecosystem, participants emphasized the need to consider how to prepare for change as well as the mechanisms and institutions in place to do so. This white paper reflects the ideas and recommendations for the Task Force discussed at the roundtable.

² There is no universally accepted definition of the Arctic Region. Timo Koivurova & Sébastien Duyck, *A New Ocean to Govern: Drawing on Lessons from Marine Management to Govern the Emerging Arctic Ocean*, in THE FUTURE OF INTERNATIONAL ENVIRONMENTAL LAW 179, 180 (David Leary & Balakrishna Pisupati eds., 2010). “A working definitionmight include ‘the tree line (the northernmost boundary where trees grow) or the 10°C isotherm (the southernmost location where the mean temperature of the warmest month of the year is below 10° C).” Joseph F.C. DiMento & Hermanni Backer, *Environmental Governance of the Great Seas—The Arctic: The Region of the Century*, MEPIELAN CTR.: MEPIELAN E-BULLETIN (Feb. 18, 2014), <https://perma.cc/39FD-QULX> (citing Koivurova & Duyck, *supra*). “Geographically, other [analysts] conclude that [the Arctic through] the Arctic Circle begins at 66°, 33” latitude.” *Id.* “For certain international law purposes, the Arctic is defined by memberships in institutions and governance mechanisms of the entities in the ‘Arctic region.’” *Id.*

³ Andrew Freedman, *Arctic Sea Ice Set a Record Low Every Single Day in May*, MASHABLE (June 1, 2016), <http://mashable.com/2016/06/01/arctic-sea-ice-record-low/#kKZcNngOvEqd>.

⁴ Roundtable participants included Aaron Adams, Univ. of Cal., Irvine Sch. of L.; Betsy Baker, Vt. L. Sch.; Sarah Burt, Earthjustice; Alejandro Camacho, Univ. of Cal., Irvine Sch. of L., CLEANR.; Jordan Diamond, Univ. of Cal., Berkeley Sch. of L.; Joseph F.C. DiMento, Univ. of Cal., Irvine Sch. of L., CLEANR; Brian Israel, U.S. Dep’t. of State; Timo Koivurova, Arctic Research Ctr.; Thomas Leschine, Univ. of Wash.; Gail Osherenko, Univ. of Cal., Santa Barbara; Michael Robinson-Dorn, Univ. of Cal., Irvine Sch. of L., CLEANR; Jessica Shadian, Univ. of Akureyri; Hilde Skorpen, Royal Norwegian Consulate; Glen Smith, Univ. of Tromsø, Nor.; Stephanie Talavera, Univ. of Cal., Irvine Sch. of L., CLEANR; Elizabeth Taylor, Univ. of Cal., Irvine Sch. of L., CLEANR; Fran Ulmer, U.S. Arctic Research Comm’n; and, Oran Young, Univ. of Cal., Santa Barbara.

⁵ Univ. of Cal., Irvine Sch. of L., CLEANR, *Environmental Governance and Management in the Arctic* (Apr. 22, 2016), available at <http://www.law.uci.edu/events/2015-16/s2016/04-22-arctic-governance-workshop.html>.

⁶ The Arctic Ocean (and its marginal seas including Hudson Bay) is the smallest and shallowest of the planet’s oceans, covering an area of some 14 million square kilometers. See NORWEGIAN POLAR INST., REPORT SERS. NO. 129, BEST PRACTICES IN ECOSYSTEMS-BASED MANAGEMENT IN THE ARCTIC 110 (Alf Håkon Hoel ed., 2009) [hereinafter BEPOMAR REPORT], available at http://www.pame.is/images/03_Projects/EA/EA_Docs_and_Workshop_Reports/BePOMAr.pdf. (“There are numerous definitions of the Arctic. The Arctic ocean proper, to the North of the continents, is about 14 million km². Little economic activity take[s] place here. The bulk of the commercial economic activity in the Arctic region takes place in the bordering seas, like the Bering and the Barents Sea, the waters around Iceland and Greenland, and in the Baltic.”).

II. The Current Status of Ecosystem-Based Management in the Arctic

The Arctic Council is a high-level forum with a long history of effective cooperation on issues related to ecosystem-based management (EBM). In 2007, the Arctic Council working group for the Protection of the Arctic Marine Environment (PAME) established an expert group on the ecosystem-based approach to management. This expert group broadened in 2011 to become a PAME-led joint expert group with participation from other Arctic Council working groups addressing marine-related issues. In 2013, the Arctic Council approved the definition, principles and recommendations set out in the expert group's final report, as well as its revised map of 18 large marine ecosystems (LMEs), and encouraged Arctic States to ensure coordination of approaches and implement recommendations both within and across boundaries.⁷ The EBM expert group work is ongoing.⁸

As defined by the expert group, EBM 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.⁹ EBM is a place-based approach, requiring consideration of entire ecosystems, which involves assessing the total cumulative impacts on ecosystems. EBM recognizes that humans are an essential part of ecosystems, and that ultimately we are managing people's influences on ecosystems rather than ecosystems themselves. In addition, EBM involves multi-sectoral processes engaging a broad range of participants in developing management options and reconciling conflicting uses. Transboundary perspectives and partnerships can contribute significantly to the success of EBM efforts.¹⁰

⁷ ARCTIC COUNCIL, SENIOR ARCTIC OFFICIALS' REPORT TO MINISTERS, KIRUNA, SWEDEN 24–28 (May 15, 2013), *available at* https://oaarchive.arctic-council.org/bitstream/handle/11374/848/MM08_Kiruna_SAO_Report_to_Ministers_Final_formatted.pdf.

⁸ *See generally*, ARCTIC COUNCIL, ECOSYSTEM APPROACH PROGRESS REPORT, JOINT GROUP OF EXPERTS ON THE ECOSYSTEM APPROACH TO MANAGEMENT 3–6 (Apr. 2015), *available at* https://oaarchive.arctic-council.org/bitstream/handle/11374/416/EA_Progress_Report.pdf.

⁹ ARCTIC COUNCIL, ECOSYSTEM-BASED MANAGEMENT IN THE ARCTIC 1 (May 2013) [hereinafter ECOSYSTEM-BASED MANAGEMENT IN THE ARCTIC], *available at* [https://oaarchive.arctic-council.org/bitstream/handle/11374/122/MM08_EBM_report\(1\).pdf](https://oaarchive.arctic-council.org/bitstream/handle/11374/122/MM08_EBM_report(1).pdf).

¹⁰ ECOSYSTEM-BASED MANAGEMENT IN THE ARCTIC, *supra* note 9, at 11–18.

This paper will address the expert group's recommendation to encourage initiatives between two or more Arctic States and to build greater coordination and integration capacity across the Arctic Council in order to advance implementation of EBM in the Arctic, with a focus on the marine environment.

III. What Does Successful Marine EBM in the Arctic Look Like?

As sea ice retreats, Arctic marine areas open to increased shipping and resource extraction, which affects ecosystems, economies and traditional ways of life for indigenous peoples. Recognizing that the Arctic is undergoing rapid changes and that our understanding of these ecosystems is constantly evolving, successful EBM efforts must be flexible and adaptive. Success will require the engagement of relevant actors from the beginning of the process, including indigenous peoples, scientists, nongovernmental organizations, academics, and Arctic and non-Arctic States. Success will also require enhanced information exchange and monitoring, and improvements in the development and use of integrated ecosystem assessments.

Because EBM is place-based, with geographic areas defined by ecological criteria, successful implementation will require efforts at a range of spatial scales (e.g., within an LME; within an exclusive economic zone (EEZ); within a multinational management region). The 200 nautical mile limit of the EEZ is ecologically arbitrary, and the traditional practice of addressing a transboundary issue by conducting a national process may limit effectiveness. From a governance standpoint, roundtable participants raised several core questions concerning marine EBM in the Arctic:

- Is it an informal decision-making process? Or does it lead to binding management criteria?
- Is it law-based or institution-based?
- Is the Arctic Council the best forum to oversee marine EBM in the Arctic given the dynamic nature of marine ecosystems?
- Should international coordination of EBM be at the bilateral level in some cases (e.g., among states that exercise coastal state jurisdiction within a given LME), rather than regional in every case?
- How can EBM involve indigenous communities and how can it incorporate indigenous knowledge into the process?

This paper attempts to assist the Task Force in answering these questions and fulfilling their mandate to consider future needs for strengthened cooperation in Arctic marine governance, as well as mechanisms to meet those needs.¹¹

¹¹ See ARCTIC COUNCIL, SENIOR ARCTIC OFFICIALS' REPORT TO MINISTERS 76–77 (Apr. 24, 2015) (discussing Task Force on Arctic Marine Cooperation's objectives, mandate, scope and relationship to the Arctic Council),

available at https://oaarchive.arctic-council.org/bitstream/handle/11374/494/ACMMCA09_Iqaluit_2015_Iqaluit_SAO_Report_to_Ministers_formatted_v.pdf.pdf.

IV. A Growing Need for Marine EBM in the Arctic

In addition to the key principles identified above, EBM can function as a consultative process which can serve as a support system for decision-making, helping to frame questions and accurately characterize problems. Roundtable participants stressed the need for greater cooperation and coordination and identified three impediments to effective marine governance and management in the Arctic with EBM as the solution.

IMPEDIMENTS TO EFFECTIVE ECOSYSTEM-BASED MARINE MANAGEMENT

Sectoral fragmentation and systemic effects

Marine management often operates in silos, with separate agencies and institutions focusing on defined activities such as oil and gas development, shipping, or commercial fishing. However, these different human activities impinge on each other.¹² EBM highlights the need for sectoral integration and underlines the importance of thinking in terms of arrangements that are able to encompass a broad range of specific concerns (e.g., ocean acidification or oil spills). A useful tool in facilitating this shift is the concept of LMEs, based on ecological rather than political or economic criteria.¹³ LME mechanisms aim at implementing the ecosystem-based approach to the marine environment, from knowledge of social-ecological systems to management of human activities and their impacts.

Jurisdictional fragmentation and the need for cooperation within and beyond the Arctic Council

Increasing human activities lead to emerging needs for governance pertaining to the Arctic Ocean.¹⁴ The current governance structure is highly fragmented, with multiple decision makers,

¹² See Oran. R. Young, *Governing the Arctic Ocean*, MAR. POL. (forthcoming 2016) (discussing sectoral fragmentation in the Arctic Ocean and its effects).

¹³ LME boundaries are based on four linked ecological criteria: bathymetry, hydrography, productivity and trophic relationships. *Introduction to the LME Portal: The Large Marine Ecosystem Approach to the Assessment and Management of Coastal Ocean Waters*, LARGE MARINE ECOSYSTEMS OF THE WORLD (last visited Aug. 31, 2016), available at <http://www.lme.noaa.gov/>.

¹⁴ Young, *supra* note 12 (evaluating options for a more integrated governance system for the Arctic Ocean).

stakeholders,¹⁵ and governance arrangements¹⁶ applicable to human activities in the Arctic Ocean.¹⁷ Management authority resides in a variety of institutions at different levels of government. Similarly, the working groups of the Arctic Council have substantial overlap in their topic areas. Each of these entities has the independent ability to represent its recommendations and positions before other international bodies. Since there is no legally binding charter or treaty, the Arctic Council is not authorized to speak for the region as a whole and only recommends positions and agreements to be adopted by its members.

To a significant extent, implementing an ecosystem-based approach necessitates coordination at the national level,¹⁸ working across fragmented authorities and jurisdiction. This raises the questions: (1) what aspects of EBM in the Arctic necessitate (or would be served by) international cooperation: and (2) what is the optimal combination of legal/institutional arrangements to facilitate such cooperation?

Complexity and dynamics, lack of data

Arctic marine ecosystems are inherently complex and rapidly changing, and our understanding of their functioning is constantly evolving. Two significant challenges are the data deficiency for much of the region and the extremely high variability in the region (i.e., annually and seasonally), both of which hinder the ability to predict future conditions. EBM highlights the importance of adaptable, flexible governance. However, the capacity to be adaptive relies on accurate, focused, and up-to-date information on which to base decisions. Observing, monitoring and research in the Arctic are all challenging and expensive because of the size of the region and conditions that are present. Better collaboration among researchers and research operations would help provide opportunities to leverage research investments. Increased cooperation has not been accomplished largely because of a lack of structure and funding.¹⁹

¹⁵ For example, interested parties and organizations include the Arctic Council, the International Maritime Organization, the Arctic coastal states (Canada, Denmark in respect of Greenland, Norway, Russia, and the United States), non-Arctic coastal states that are still members of the Arctic Council (Finland, Iceland, and Sweden), non-Arctic coastal states and non-member states of the Arctic Council that nonetheless have large fishing interests in the Arctic (China, Japan, Korea, and the European Union), and the many indigenous peoples of the Arctic Circle.

¹⁶ For example, governance arrangements applicable to the Arctic Ocean include: the United Nations Convention on the Law of the Sea; the 1946 International Convention on the Regulation of Whaling; the 1973/1978 International Convention for the Prevention of Pollution from Ships; the 1992 United Nations Framework Convention on Climate Change; and the 2001 Stockholm Convention on Persistent Organic Pollutants. For a more complete list, see Joseph F.C. DiMento, *Environmental Governance of the Arctic: Law, Effect, Now Implementation*, U.C. IRVINE L. REV. (forthcoming 2016).

¹⁷ Young, *supra* note 12 (stating that each of the coastal states has adopted regulatory arrangements dealing with human activities taking place within its own Exclusive Economic Zone in the Arctic Ocean, as authorized under United Nations Convention on the Law of the Sea).

¹⁸ This also includes subnational and indigenous governments in indigenous land claim areas.

¹⁹ However, the Arctic Council's Task Force for Enhancing Scientific Cooperation in the Arctic is making significant progress on this issue. See *generally*, ARCTIC COUNCIL, <http://www.arctic-council.org/index.php/en/component/tags/tag/34-sctf> (last visited Aug. 31, 2016).

IDENTIFYING INSTITUTIONAL AND SCIENTIFIC GAPS AND OPPORTUNITIES

The Task Force has expressed the view that an assessment of future needs for cooperation should encompass not only gaps, but also opportunities.²⁰ Accordingly, roundtable participants identified several gaps and opportunities in the current marine management regime.

Enhanced coordination and information sharing

First, better coordination is needed within the Arctic Council to improve follow-up on working group and expert group EBM-related work products. There have been multiple studies and assessments conducted pertaining to EBM, and data generated through these activities provide important inputs into the EBM process, e.g., through the Arctic Biodiversity Assessment (ABA) and the Circumpolar Biodiversity Monitoring Program (CBMP).²¹ However, no formal mechanism exists to compile all relevant data and ensure any recommendations are implemented in a timely manner. In addition, there is no coordinated way that the goals outlined in the Arctic Marine Strategic Plan (AMSP)²² are actualized. Opportunities exist to enhance efficiency and avoid redundancy through the creation of a centralized Arctic marine EBM data portal as well as a formal EBM reporting structure within the Arctic Council.

Relatedly, there is a need for better information exchange within the Arctic Council and better coordination with outside bodies. With most science and EBM projects conducted at the national level, a dedicated forum for information exchange of best and worst practices in marine EBM is essential. This can enhance access to, and use of, the multidisciplinary data required for the implementation of EBM by building upon ongoing work within and beyond the Arctic Council to contribute to an Arctic marine EBM data portal. This will facilitate scientific cooperation, including the identification and resolution of data compatibility issues. For example, it could encourage the use of the revised map of 18 LMEs in ongoing marine research efforts such as the Marine Biodiversity Monitoring Plan.²³ Opportunities also exist to better incorporate indigenous knowledge and engage indigenous communities in this information sharing through expanded Community Based Monitoring (CBM).²⁴ The 2009 *BePOMAr* report²⁵ by the Norwegian Polar Institute documents the status of Canada, Denmark/Greenland, Finland, Iceland, Norway, Russia

²⁰ ARCTIC COUNCIL, ARCTIC COUNCIL TASK FORCE ON ARCTIC MARINE COOPERATION (TFAMC) 1ST MEETING SEPTEMBER 21–22, 2015, IN OSLO, COCHAIRS SUMMARY REPORT (Working Draft, Sep. 2015), available at https://oaarchive.arctic-council.org/bitstream/handle/11374/1532/EDOCS-2805-v1ACSAOUS201_Anchorage_2015_8-2_TFAMC_first_meeting_summary.pdf?sequence=1&isAllowed=y.

²¹ See, e.g., CONSERVATION OF ARCTIC FLORA & FAUNA (CAFF), ARCTIC BIODIVERSITY ASSESSMENT: REPORT FOR POLICY MAKERS, CAFF, AKUREYRI, ICELAND 3–6 (2013), available at <http://www.caff.is/assessment-series/arctic-biodiversity-assessment/229-arctic-biodiversity-assessment-2013-report-for-policy-makers-english>; see also, *infra*, app. I.

²² ARCTIC COUNCIL, ARCTIC MARINE STRATEGIC PLAN 2015–2025, at 6–7 (Apr. 2015) (outlining the goals), available at <http://www.pame.is/index.php/projects/arctic-marine-strategic-plan>.

²³ See CAFF, *Monitoring Series*, http://caff.is/monitoring-series/view_document/3-arctic-marine-biodiversity-monitoring-plan (last visited Aug. 31, 2016) (containing monitoring plan and annual reports from 2011 to present).

²⁴ Timo Koivurova, *Status and Role of Indigenous Peoples in Arctic International Governance*, 3 YEARBOOK OF POLAR L. 169, 182–83 (2011) (noting the distinct contribution provided by indigenous organizations to scientific assessments).

²⁵ BEPOMAR REPORT, *supra* note 6.

and the United States in implementing ecosystem-based approaches to oceans management. An update documenting the important progress made in recent years presents another opportunity to advance the state of knowledge and share lessons learned.

Climate change, ocean acidification and high pollutant levels are all mostly a result of activities outside the Arctic region, demonstrating the need for enhanced regional coordination in order to implement global instruments to address activities both within and beyond the Arctic. The Arctic Council can serve as an “Arctic voice,” speaking on behalf of the Arctic States to communicate key EBM recommendations to other international forums. In addition, the Arctic Council can provide leadership to encourage coordinated action. Participants pointed to the Arctic Migratory Bird Initiative²⁶ and the work on Persistent Organic Pollutants²⁷ as good examples of the enhanced level of cooperation required among Arctic countries, as well as cooperation between Arctic countries and countries outside of the Arctic.

UNCLOS Framework

The United Nations Convention on the Law of the Sea (UNCLOS) is the overarching legal framework for human activities that take place in the marine environment and is the basis for national, regional, and global action and cooperation in the marine sector in the Arctic. Participants asked what could be accomplished within the framework of UNCLOS²⁸ to enable the Arctic States to coordinate both internally and externally on the ecosystem-based approach to Arctic marine areas, including areas beyond national jurisdiction (ABNJ).

Part XII of UNCLOS addresses environmental protection of the marine environment. Under Article 192, “[s]tates have the obligation to protect and preserve the marine environment.”²⁹ This general obligation must be fulfilled through the adoption, individually or jointly, of measures addressing pollution from various sources, such as ships, land-based discharges, seabed exploitation, and dumping. UNCLOS also provides that states shall take measures “necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life.”³⁰ States must also act to prevent, reduce, and control pollution from any source using the “best practicable means at their disposal.”³¹

UNCLOS includes active obligations on the part of states to protect and preserve the marine environment, and to cooperate on a global or regional basis “directly or through competent international organizations” in order to do so.³² In addition, UNCLOS addresses specific pollution sources: “States shall adopt laws and regulations to prevent, reduce and control pollution of the

²⁶ CAFF, *Arctic Migratory Birds Initiative*, <http://www.caff.is/arctic-migratory-birds-initiative-ambi> (last visited Aug. 31, 2016).

²⁷ ARCTIC MONITORING & ASSESSMENT PROGRAMME ET AL., TECHNICAL REPORT NO. 7, TRENDS IN STOCKHOLM CONVENTION PERSISTENT ORGANIC POLLUTANTS (POPS) IN ARCTIC AIR, HUMAN MEDIA AND BIOTA (2014), <https://oarchive.arctic-council.org/handle/11374/731>.

²⁸ Some participants noted that Inuit and other indigenous groups feel that UNCLOS does not adequately account for indigenous historical use and occupancy. See Robin Campbell, *An Introduction to Inuit Rights and Arctic Sovereignty*, LAWNOW (May 7, 2015), <http://www.lawnow.org/introduction-inuit-rights-arctic-sovereignty>.

²⁹ United Nations Convention on the Law of the Sea, U.N. Doc. A/CONF.62/122, pt. XII, art. 192 (Oct. 7, 1982), available at <https://documents-dds-ny.un.org/doc/UNDOC/GEN/NL8/200/95/pdf/NL820095.pdf?OpenElement>.

³⁰ *Id.* at art. 194, para. 5.

³¹ *Id.* at art. 194, para. 1.

³² See *id.* at art. 197.

marine environment from land-based sources Coastal states shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment arising from or in connection with sea bed activities”³³ Article 209 covers pollution from activities in the Area; Article 210, pollution by dumping; and Article 211, pollution from vessels.³⁴

Under UNCLOS, states have an obligation to take measures for their own nationals for the conservation of the living resources of the high seas; to cooperate with other states in the conservation and management of those resources; and to base those measures on the best scientific evidence available, environmental and economic factors, and international standards.³⁵

One approach is to create subsidiary bodies, such as regional fisheries management organizations (RFMOs) or regional seas agreements (RSAs), to address Arctic Ocean issues.³⁶ This is authorized under UNCLOS Article 197, which provides for global and/or regional cooperation in formulating a governance structure for the protection and preservation of the marine environment.³⁷

Frameworks exist for two or more states to come together for management of shared resources, building on structures and practices already in place. For example, several Regional Fishery Bodies (RFBs) have areas of competence within or close to the Arctic Ocean.³⁸ The Arctic Council could consider leading efforts to revise the mandates of any RFBs that do not explicitly incorporate an ecosystem-based approach to fisheries. The Joint Norwegian-Russian Fisheries Commission,³⁹ which has adopted an ecosystem-based approach to fisheries, could serve as an example for other RFBs in the region. Although this could improve synergies and fill regional gaps,⁴⁰ it does not address the underlying issue of sectoral fragmentation.

Others have suggested an Arctic RSA as a plausible governance mechanism and useful framework to improve coordination of implementation of the ecosystem-based approach to

³³ *Id.* at art. 207, para. 1; art. 208, para. 1.

³⁴ *Id.* at arts. 209–11.

³⁵ *Id.* at arts. 117–18; art. 119, para. 1.

³⁶ Young, *supra* note 12. The United Nations Environment Programme (UNEP) Regional Seas Programme has employed EBM in some of its programs [including that of the West and Central African Seas]. JOSEPH F. C. DIMENTO & ALEXIS JACLYN HICKMAN, ENVIRONMENTAL GOVERNANCE OF THE GREAT SEAS: LAW AND EFFECT (Edward Elgar, 2012). The Regional Seas Conventions and Action Plans Strategic Direction 2013–2016 has among its aims to strengthen collaboration on the development and application of ecosystem approaches for management of marine and coastal ecosystems and to contribute to globally agreed targets including some from the Convention on Biological Diversity Aichi Targets. *Aichi Biodiversity Targets*, CONVENTION ON BIOLOGICAL DIVERSITY, <https://www.cbd.int/sp/targets/> (last visited Aug. 31, 2016).

³⁷ Article 197 provides “States shall co-operate on a global basis and, as appropriate, on a regional basis, directly or through competent international organizations, in formulating and elaborating international rules, standards and recommended practices and procedures consistent with this Convention, for the protection and preservation of the marine environment, taking into account characteristic regional features.” UNCLOS, *supra* note 29, § 2, art. 197.

³⁸ For example, the Joint Norwegian-Russian Fisheries Commission, the North Atlantic Marine Mammal Commission (NAMMCO), the Northwest Atlantic Fisheries Organization (NAFO), the North Atlantic Salmon Conservation Organization (NASCO) and North-East Atlantic Fisheries Commission (NEAFC). For a map of RFBs, see *Regional Fisheries Bodies*, FISHERIES & AQUACULTURE DEP’T (Aug. 2013), <http://www.fao.org/fishery/rfb/en>.

³⁹ For general information, see JOINT NORWEGIAN-RUSSIAN FISHERIES COMM’N, <http://www.jointfish.com/eng> (last visited Aug. 31, 2016).

⁴⁰ Julien Rochette et al., *Regional Oceans Governance Mechanisms: A Review*, 60 MAR. POL. 9, 12 (2015).

management of the Arctic marine environment.⁴¹ However, the question of the appropriate membership of an Arctic RSA could prove challenging. Arctic coastal states are unlikely to accept any arrangement in which they do not have a stronger voice than non-Arctic states regarding substantive matters of Arctic Ocean governance.⁴²

Some have also suggested applying the provisions of UNCLOS Part IX dealing with enclosed or semi-enclosed seas to the Arctic Ocean, as envisioned in Article 123, as a possible approach to addressing the governance challenge.⁴³ By encouraging the development of an integrated governance system, with coastal states taking the lead while also cooperating with noncoastal states asserting an interest in the Arctic Ocean, this may be a plausible approach that could allow for effective EBM.⁴⁴

Dedicated Marine Science Organization

Participants also asked whether the region should advocate for the creation of a dedicated marine science body, similar to the International Council for the Exploration of the Sea (ICES) or North Pacific Marine Science Organization (PICES). Both ICES⁴⁵ and PICES⁴⁶ collaborate with the Arctic Council on many topics, including integrated observing systems, ecosystem assessments, survey coordination, and marine spatial planning. However, several roundtable participants stressed that for the potential organization to be truly valuable, it would need to be specific to and focused on the Arctic. Noting the great need for enhanced Arctic marine observation, they suggest that this approach would garner the expertise of non-Arctic states that have an interest in the region and the capacity and willingness to contribute to this research. This would allow all interested parties to bring their full suite of talents and resources to the table. The question then arose of whether this marine science body should be governmental or led by a nongovernmental research institution. Treaty-based science bodies like ICES and PICES serve as models for an intergovernmental approach, but the sui generis character of the Arctic Council as a high-level forum may call for a hybrid approach.

Others suggested that the creation of a dedicated forum for convening existing organizations such as ICES, PICES and the International Arctic Science Committee (IASC), as well as a process for determining whether a new Arctic marine science organization is necessary, is an appropriate next step for the Task Force.⁴⁷ In addition, a formal mechanism could be developed to request

⁴¹ Heather Exner-Pirot, *New Directions for Governance in the Arctic*, Arctic Yearbook 224, 224–43 (2012).

⁴² Young, *supra* note 12 (noting that while it is possible an Arctic RSA could adopt varying levels of membership, no existing RSAs provide for different categories of membership to recognize differences in the rights and interests of the participating states).

⁴³ *Id.* (asking whether it is plausible to treat the Arctic Ocean as an enclosed or semi-enclosed sea, as defined in art. 122).

⁴⁴ *Id.* (stating that this approach might make sense because it would reflect the actual balance of power between the coastal states and various non-Arctic states asserting an interest in Arctic Ocean governance).

⁴⁵ Arctic research is a priority area for ICES, see ICES, *Action Areas, Arctic Research*, <http://www.ices.dk/explore-us/Action%20Areas/Pages/Arctic.aspx> (last visited Aug. 31, 2016).

⁴⁶ See, e.g., Andrea Belgrano et al., *Toward Ecosystem-Based Management for the Oceans: A Perspective for the Fisheries in the Bering Sea*, [http://pices.int/projects/Bering_Indicators/pr_documents/white_papers/Belgrano white paper.pdf](http://pices.int/projects/Bering_Indicators/pr_documents/white_papers/Belgrano%20white%20paper.pdf) (last visited Aug. 31, 2016).

⁴⁷ Betsy Baker, *ICES, PICES and the Arctic Council Task Force on Arctic Marine Cooperation*, U.C. IRVINE L. REV. (forthcoming 2016).

and use indigenous knowledge and science together, as few currently exist for management authorities.⁴⁸

⁴⁸ *Id.*; DAVID ROCHE ET AL., ENVTL. LAW INST., CLIMATE & COMMUNITIES: CONDUCTING MARINE RESEARCH IN A CHANGING ARCTIC, at i (2014).

V. Opportunities for Enhanced Transboundary Cooperation

Numerous opportunities exist for the Arctic Council to improve and enhance cooperation and coordination for ecosystem-based marine management in the Arctic. The actions and mechanisms outlined below should be viewed as a bundle of complementary tools to advance ecosystem-based marine management.

ARCTIC MARINE EBM STRATEGY

The 2015–2025 Arctic Marine Strategic Plan (AMSP) is a non-legally binding document developed under the auspices of the Arctic Council that highlights strategic goals and actions to advance EBM.⁴⁹ These strategies apply to the entire Arctic region, with implementation at the national level, individually, or on a bilateral, trilateral or broader basis, depending upon the identified geographical extent of a particular ecosystem. LMEs provide a useful framework for determining the level at which implementation should occur⁵⁰—for example, at the bilateral level between states that exercise coastal state jurisdiction within a given LME. Decision processes should involve participation by indigenous peoples and subnational governmental units as appropriate. The AMSP builds on prior and ongoing EBM efforts.

Several components of an Arctic marine EBM strategy are already in place, including the adoption of an EBM definition, core principles, and the AMSP.⁵¹ However, additional steps are necessary to fully develop and implement a strategy for Arctic marine EBM. These include development of conservation and reporting standards. Environmental reporting should be periodic and cumulative. Reviews of implementation should be done on a regular basis with the assistance of an independent advisory board. In addition, marine spatial planning should be integral to the EBM process.⁵² The components discussed below could also be included in the framework of an Arctic marine EBM strategy.

⁴⁹ ARCTIC COUNCIL, *supra* note 22.

⁵⁰ See Robert Siron et al., *Ecosystem-Based Management in the Arctic Ocean: A Multi-Level Spatial Approach* 61(1) ARCTIC 86, 86–102 (2008) (referencing Beaufort Sea management as a case study for using LMEs to frame EBM).

⁵¹ See INT'L UNION FOR CONSERVATION OF NATURE & NATURAL RES. DEF. COUNCIL, WORKSHOP ON ECOSYSTEM-BASED MANAGEMENT IN THE ARCTIC MARINE ENVIRONMENT, WORKSHOP REPORT 7–10 (2010) (discussing components of an Arctic Marine EBM Strategy), *available at* http://cmsdata.iucn.org/downloads/arctic_workshop_report_final.pdf.

⁵² *Id.* at 8–10.

ECOLOGICALLY OR BIOLOGICALLY SIGNIFICANT MARINE AREAS

A central element of EBM is the identification of ecologically significant or vulnerable areas that should be considered for protection due to their role in maintaining valued ecosystem functions and resilience. There have been several recent efforts to do so, in collaboration with the Arctic Council Working Group on the Conservation of Arctic Flora and Fauna (CAFF), including a 2010 workshop to facilitate the description of Ecologically or Biologically Significant Marine Areas (EBSAs).⁵³ The workshop convened scientists and indigenous peoples' representatives with expertise in various aspects of Arctic marine ecosystems and species to identify biologically or ecologically significant or vulnerable habitats using internationally accepted criteria developed under the auspices of the Convention on Biological Diversity (CBD). The workshop focused most intensely on the high Arctic, resulting in a set of maps depicting 77 Arctic marine EBSAs based on the CBD criteria.⁵⁴

More recently, a CBD regional EBSA workshop for the Arctic was convened in 2014, resulting in the description of 11 areas as meeting the scientific criteria for EBSAs, which were subsequently approved by the CBD Conference of the Parties for inclusion in the EBSA repository.⁵⁵ At the workshop, Russia was the only Arctic coastal state that included the consideration of EBSAs within their own EEZ. The workshop report noted the need for better coordination between national and regional-level processes to apply EBSA criteria, including the need for uniform practices and standards as well as the need for a whole-ocean perspective to take the ongoing ecological changes into account.⁵⁶

An opportunity exists for the Arctic Council to build on these efforts and better coordinate national and regional efforts, as well as to incorporate Arctic marine EBSAs into LME management plans that transcend national borders. In addition, a systematic and coordinated effort to gather and incorporate indigenous knowledge across national borders would contribute significantly to this undertaking. Such an effort would also help ensure that indigenous peoples are included in management decisions, and identify opportunities for co-management.

Pan-Arctic MPA Network

A strategic action identified by PAME and others is to develop a Pan-Arctic network of marine protected areas (MPAs) to strengthen marine ecosystem resilience and contribute to human wellbeing, including traditional ways of life. The Framework for a Pan-Arctic Network of MPAs is a non-binding document outlining a common vision based on international best practices and previous Arctic Council initiatives.⁵⁷ The Pan-Arctic MPA Network will hinge on individual Arctic

⁵³ LISA SPEER, THOMAS L. LAUGHLIN, INT'L UNION FOR CONSERVATION OF NATURE & NATURAL RES'S DEF. COUNCIL, WORKSHOP TO IDENTIFY AREAS OF ECOLOGICAL AND BIOLOGICAL SIGNIFICANCE OR VULNERABILITY IN THE ARCTIC MARINE ENVIRONMENT, WORKSHOP REPORT 1–8 (2011), *available at* <https://portals.iucn.org/library/efiles/edocs/Rep-2011-001.pdf>.

⁵⁴ *Id.* at 5–8.

⁵⁵ CONVENTION ON BIOLOGICAL DIVERSITY, REPORT OF THE ARCTIC REGIONAL WORKSHOP TO FACILITATE THE DESCRIPTION OF ECOLOGICALLY OR BIOLOGICALLY SIGNIFICANT MARINE AREAS 2–4 (2014).

⁵⁶ *Id.* at 32.

⁵⁷ ARCTIC COUNCIL, FRAMEWORK FOR A PAN-ARCTIC NETWORK OF MARINE PROTECTED AREAS 17 (April 2015), *available at* <https://oaarchive.arctic-council.org/handle/11374/417>.

state efforts to develop MPAs and MPA networks within their respective national waters. Developing a regional network will require designated leads within each Arctic state and a mechanism within the Arctic Council to facilitate ongoing coordination. The MPA Expert Group currently serves this ongoing coordination and network development function.⁵⁸

However, the Pan-Arctic MPA network will not wholly achieve its conservation objectives unless it is integrated into a broader Arctic management regime such as EBM. An opportunity exists for enhanced collaboration between the MPA and EBM expert groups to coordinate on future planning, management, and actions, such as stakeholder engagement efforts and marine spatial planning. There is also an opportunity to develop a mechanism within the Arctic Council to facilitate improved coordination among the Arctic states and regional governance bodies. For example, Norway has proposed the marine part of seven national parks and four nature reserves in Svalbard as Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) MPAs.⁵⁹

Integrated Ecosystem Assessments

An integrated ecosystem assessment (IEA) uses quantitative analyses of cumulative impacts and ecosystem modeling to estimate how key components change under alternative management options. These assessments provide scientific support for policy and decision making for managers and stakeholders.⁶⁰ Efforts are underway to develop IEAs for the Arctic. For example, the ICES Working Group on the Integrated Assessments of the Barents Sea conducts IEAs with the goal of analyzing and summarizing knowledge on the state of the Barents Sea ecosystem and assisting adaptive management by providing input to monitoring strategies.⁶¹ ICES is also currently working with the Arctic Council on developing an IEA for the Central Arctic Ocean (CAO) LME.⁶²

An opportunity exists for the Arctic Council to build on its current work⁶³ and lead in developing IEA frameworks and guidelines for all Arctic LMEs. This could include identifying a common set of objectives, management strategies and models, as well as uniform measurements, monitoring approaches and reporting standards. The Council could also facilitate information sharing by creating a forum to share best practices, such as identifying useful indicators and thresholds. Similar to the Arctic Council work conducted in the context of black carbon,⁶⁴ with countries

⁵⁸ *Id.*

⁵⁹ OSPAR COMM'N, 2012 STATUS REPORT ON THE OSPAR NETWORK OF MARINE PROTECTED AREAS (2013), available at http://www.ospar.org/ospar-data/p00618_2012_mpa_status%20report.pdf.

⁶⁰ ECOSYSTEM-BASED MANAGEMENT FOR THE OCEANS 211 (Karen Mcleod & Heather Leslie eds., Island Books 2009).

⁶¹ ICES, *Working Group on the Integrated Assessments of the Barents Sea*, <http://www.ices.dk/community/groups/Pages/WGIBAR.aspx> (last visited Aug. 31, 2016).

⁶² ICES, *ICES/PAME Working Group on Integrated Ecosystem Assessment (IEA) for the Central Arctic Ocean*, <http://www.ices.dk/community/groups/Pages/WGICA.aspx> (last visited Aug. 31, 2016).

⁶³ See ARCTIC COUNCIL, ECOSYSTEM APPROACH PROGRESS REPORT (2015) (discussing plan to prepare briefing on IEAs of Arctic LMEs in fall 2016/spring 2017), available at https://oaarchive.arctic-council.org/bitstream/handle/11374/416/EA_Progress_Report.pdf.

⁶⁴ ARCTIC COUNCIL, RECOMMENDED ACTIONS OF THE ACAP REPORT ON THE REDUCTION OF BLACK CARBON EMISSIONS FROM RESIDENTIAL WOOD COMBUSTION (2014), available at https://oaarchive.arctic-council.org/bitstream/handle/11374/387/ACMMCA09_Iqaluit_2015_ACAP_ACAPWOOD_report_pamphlet_w eb.pdf.

submitting emission inventory data, each country could submit IEAs for the LMEs within their jurisdiction. Countries that share LMEs could be encouraged to work together to share research efforts and close knowledge gaps. The Arctic Council can request that Arctic states, building on efforts of the various working groups, submit periodic progress reports and action plans to measure indicators of success.⁶⁵

Transboundary LME Pilot Initiatives

The definition of ecosystems is fundamental to implementing EBM because of the need to know the geographic scope over which the negative consequences of human activities are to be identified, assessed, and addressed. Consequently, one of the strategic actions of the 2004 AMSP was to identify the large marine ecosystems of the Arctic based on the best available ecological information, ultimately resulting in the revised map of 18 Arctic LMEs.⁶⁶ Several of these LMEs offer opportunities for transboundary cooperation. The possible utility of developing scenarios for one or more ecosystem-based transboundary LME pilot initiatives could be considered. Possible pilots are discussed below.

Northern Bering-Chukchi Seas LME

Bordering countries: United States, Russia

This LME encompasses the highly productive and sensitive area north and south of the Bering Strait. The Bering Strait is a narrow international strait that connects the North Pacific Ocean's Bering Sea to the Arctic Ocean, creating a natural chokepoint for marine traffic. The region is highly productive ecologically and extensively used by creatures migrating between the Pacific and Arctic Oceans. The Strait conveys water-laden nutrients and larval fish and crustaceans from the Bering Sea into the Arctic via the Chukchi Sea, possibly an important pathway for the recruitment of fish species harvested by local residents. The coastline of the Bering Strait region is rich archaeologically and has been continually occupied by indigenous peoples who have depended on marine mammals, fish, birds, macro algae, shellfish and other invertebrates for thousands of years. With diminishing summer sea ice in the Arctic Ocean, the Bering Strait region is likely to experience increased marine traffic, including to oil and gas exploration areas in the Beaufort and Chukchi seas and to the Red Dog Mine in northwest Alaska. Such traffic poses a variety of risks to marine resources in the region, including ship noise, strikes, entanglements, invasive species, routine pollution and the potential for a major petroleum spill.⁶⁷

⁶⁵ States should also work with the Permanent Participants through the various working groups to incorporate indigenous knowledge into IEAs.

⁶⁶ ARCTIC COUNCIL, LARGE MARINE ECOSYSTEMS (LMEs) OF THE ARCTIC AREA REVISION OF THE ARCTIC LME MAP (May 15, 2013), *available at* http://www.pame.is/images/03_Projects/EA/EA/PAME_revised_LME_map_with_explanatory_text_15_Aug_2013_-_Vefur.pdf.

⁶⁷ L. BRIGHAM ET AL., BERING STRAIT REGION CASE STUDY (last visited Aug. 31, 2016), *available at* <http://www.institutenorth.org/assets/images/uploads/files/5.5-Bering-Strait-Region-Case-Study.pdf>.

Canadian Eastern Arctic-West Greenland LME

Bordering Countries: Canada, Greenland

This is a large and diverse LME made up of several sub regions. Most of the LME is ice-covered in winter and clear of ice in summer, with large migratory populations of marine mammals. This LME exhibits high percentages of rural coastal population, high numbers of collapsed and overexploited fish stocks, as well as high proportions of catch from bottom impacting gear. Reported landings of commercial fish species show major changes over the past century, from a system dominated by Atlantic cod landings to one defined by prawn, implying 'fishing down' of the food web. As northern prawn now constitute the majority of the reported landings, a potentially large amount of fish bycatch is unreported.⁶⁸ None of the four transboundary fisheries agreements⁶⁹ appears to have formal linkages across the different stages of policy development or with the Arctic Council. There is a governance opportunity for the Arctic Council to function as an overall policy coordinating organization for the key transboundary issues within the LME.

The Inuit Circumpolar Council–Greenland (ICC) submitted a proposal for including the North Water Polynya as a transnational EBSA at the CBD workshop referenced above, but this submission was not considered by the workshop.⁷⁰ The ICC selection was based on a preceding workshop with Greenlandic and Canadian participation, incorporating indigenous knowledge as well as scientific data.

Areas Beyond National Jurisdiction

With respect to areas beyond national jurisdiction (ABNJ), several opportunities for enhanced international cooperation and coordination could be explored.⁷¹ These include a binding agreement to prevent unregulated commercial fishing in the Central Arctic Ocean (CAO), creation of a CAO science reserve, creation of Particularly Sensitive Sea Areas (PSSAs) or Special Areas under the auspices of the International Maritime Organization (IMO), as well as requiring development of IEAs with respect to commercial activities. Also of interest are the ongoing United Nations General Assembly discussions regarding development of a legally-binding implementing

⁶⁸ *Canadian Eastern Arctic-West Greenland*, ONE SHARED OCEAN http://onesharedocean.org/LME_18_Canadian_Eastern_Arctic_-_West_Greenland (last visited Aug. 31, 2016).

⁶⁹ NAFO, International Commission for the Conservation of Atlantic Tuna (ICCAT), NAMMCO, and NASCO.

⁷⁰ U.N. Env't. Programme (UNEP), Convention on Biological Diversity, Report of the Arctic Regional Workshop to Facilitate the Description of Ecologically or Biologically Significant Marine Areas, UNEP/CBD/EBSA/WS/2014/1/5, at 23 (May 20, 2014). The Global Environment Facility (GEF) may be a source of support. GEF has been asked to fund a number of projects in northern Russia including protection of the marine environment and assessment of the impacts of climate change. The GEF considers parts of the Arctic a "still sometimes forgotten region" and it now recognizes the "growing importance of the Arctic as an indicator region of global environmental health and the important role that the regions Indigenous peoples can play in implementing selected global conventions, particularly the CBD. For more information, see *Global Environment Facility (GEF)*, INUIT CIRCUMPOLAR COUNCIL CANADA, <http://www.inuitcircumpolar.com/global-environment-facility-gef.html> (last visited Aug. 31, 2016).

⁷¹ See, e.g., Rosemary Rayfuse, *Protecting Marine Biodiversity in Polar Areas Beyond National Jurisdiction*, 17(1) REV. OF EUR. CMTY. & INT'L ENVTL. L. 3, 3–13 (2008) (advocating for an international agreement for conservation and management of marine biodiversity in CAO areas beyond national jurisdiction).

agreement (IA) dealing with biodiversity beyond national jurisdiction.⁷² While this proposed IA could be of great significance, negotiations are not expected to get underway before late 2017 and agreement on proposed text or terms is not likely in the near future.⁷³

CAO FISHERIES

As climate change continues to reduce ice cover, the potential grows for increased fishing activity in the CAO, i.e. marine ABNJ.⁷⁴ There are several international frameworks for fisheries management, including UNCLOS and the 1995 UN Fish Stocks Agreement, but no specific mechanisms to regulate fishing in the CAO, with the exception of the area covered by the Convention Area of the North-East Atlantic Fisheries Commission (NEAFC), approximately 8% of the CAO.⁷⁵ Recognizing the need for proactive measures, the five Arctic coastal states (A5) recently adopted a nonbinding declaration to prevent unregulated fishing in the CAO.⁷⁶ At the August 2015 GLACIER conference in Alaska,⁷⁷ the U.S. invited participants to proceed towards a broader international binding agreement.⁷⁸ Subsequently, delegations from the A5, Iceland, the E.U., China, Japan, and the Republic of Korea met for negotiations in Washington D.C. in December 2015.⁷⁹

Consistent with the 2008 Ilulissat Declaration,⁸⁰ this discussion has been framed as a matter for the sovereign states to resolve and these negotiations have occurred outside the purview of the Arctic Council. This exclusion highlights both the barrier for the Council in informing negotiations and the opportunity for the Council to facilitate the larger discussion of what the CAO governance structure should look like. Effective management of CAO fisheries (and other resources) can only be achieved cooperatively and it involves important topics such as cooperative governance of the Arctic, the relations among Arctic states, and the relations between Arctic and non-Arctic states, such as China.⁸¹ The Arctic Council may provide an appropriate forum to help integrate an EBM focus into these discussions.

⁷² The proposed implementing agreement would cover topics such as marine protected areas, environmental impact assessments, prospecting for marine genetic resources and procedures for technology sharing and would apply to the high seas area of the Arctic Ocean. G.A. Res. 69/292, U.N. Doc. A/RES/69/292 (July 6, 2015); see Robert Blasiak & Nobuyuki Yagi, *Shaping an International Agreement on Marine Biodiversity Beyond Areas of National Jurisdiction: Lessons from High Seas Fisheries*, 71 MAR. POL. 210, 210–16 (2016).

⁷³ Young, *supra* note 12 (stating that it seems doubtful at this stage whether all the Arctic coastal states would accept the terms of such an agreement).

⁷⁴ Blasiak & Yagi, *supra* note 72.

⁷⁵ Grace Shephard et al., *Assessing the Added Value of the Recent Declaration on Unregulated Fishing for Sustainable Governance of the Central Arctic Ocean*, 66 MAR. POL. 50–57 (2016).

⁷⁶ *Arctic Nations Sign Declaration to Prevent Unregulated Fishing in the Central Arctic Ocean*, U.S. DEP'T OF STATE, <http://www.state.gov/r/pa/prs/ps/2015/07/244969.htm> (July 16, 2015).

⁷⁷ *Conference on Global Leadership in the Arctic: Cooperation, Innovation, Engagement, and Resilience (GLACIER)*, U.S. DEP'T OF STATE, <http://www.state.gov/e/oes/glacier/index.html> (last visited Aug. 31, 2016).

⁷⁸ *Chair's Summary: Conference on Global Leadership in the Arctic*, U.S. DEP'T OF STATE, <http://www.state.gov/r/pa/prs/ps/2015/09/246511.htm> (Sept. 1, 2015).

⁷⁹ Shephard, *supra* note 75.

⁸⁰ In 2008, the A5 issued a declaration affirming their commitment to the orderly settlement of overlapping claims in the Arctic and that UNCLOS “provides a solid foundation for the responsible management of the Arctic Ocean” and that there is “no need to develop a new comprehensive legal regime to govern the Arctic Ocean.” *The Ilulissat Declaration, Arctic Ocean Conference, Ilulissat, Greenland, 27-29 May 2008, available at* http://www.oceanlaw.org/downloads/arctic/Ilulissat_Declaration.pdf.

⁸¹ Min Pan & Henry Huntington, *A Precautionary Approach to Fisheries in the Central Arctic Ocean: Policy, science, and China*, 63 MAR. POL. 153–57 (2016).

PARTICULARLY SENSITIVE SEA AREA

The Arctic Marine Shipping Assessment's (AMSA) report on Specially Designated Marine Areas surveys the need for internationally designated areas in the CAO that receive protection from the risks posed by shipping.⁸² To ensure the protection of an increasingly important and vulnerable core sea ice area, the report recommends a Particularly Sensitive Sea Area (PSSA) designation by the International Maritime Organization (IMO),⁸³ with areas to be avoided as an Associated Protective Measure. However, no Arctic state has embraced this recommendation.⁸⁴

The IMO criteria for PSSAs is similar to the CBD criteria for EBSAs. As with EBSAs, an opportunity exists for the Arctic Council to coordinate national and regional efforts to incorporate PSSAs into LME management plans that transcend national borders.

⁸² ARCTIC COUNCIL, ARCTIC MARINE SHIPPING ASSESSMENT 2009 REPORT (2009), available at https://oaarchive.arctic-council.org/bitstream/handle/11374/54/AMSA_2009_Report_2nd_print.pdf.

⁸³ A PSSA is an area that needs special protection through action by IMO because of its significance for recognized ecological or socio-economic or scientific reasons and which may be vulnerable to damage by international maritime activities.

⁸⁴ ARCTIC COUNCIL, *supra* note 57, at 16. Although no Arctic State has embraced this recommendation, the Maritime Safety Committee of the IMO adopted five Areas to be Avoided in the Aleutian Islands. The recommendation came out of an Aleutian Islands Risk Assessment, a project staffed and run locally, which may be a model for the type of local participation necessary in EBM. For more information, see *Aleutian Islands Risk Assessment, Phase A Summary Report* (Aug. 2011), available at http://www.aleutianriskassessment.com/images/110826AIRA_SummaryReportvFINALr_1.pdf; *Aleutian Islands Risk Assessment, Phase B Final Program Report* (Mar. 2016), available at http://www.aleutianriskassessment.com/images/160310_AIRA_Phase_B_Final_Program_Report.pdf.

VI. Examples to Learn from: Institutional and Scientific

The Task Force was given a mandate to “consider future needs for strengthened cooperation on Arctic marine areas, as well as mechanisms to meet these needs, and to make recommendations on the nature and scope of any such mechanisms.”⁸⁵ Recognizing that the Task Force heard presentations by ICES, PICES, the International Arctic Science Committee (IASC), OSPAR, HELCOM, and the Sargasso Sea Commission, this paper will not focus on these examples. In addition, detailed case studies exist for the Baltic Sea LME⁸⁶ and the Benguela Current Commission.⁸⁷

Looking beyond these examples, the following examples may provide useful starting points for the Task Force to develop case studies and/or scenarios to assist with their recommendations for mechanisms to promote strengthened cooperation in managing Arctic marine areas.

JOINT NORWEGIAN-RUSSIAN COMMISSION ON ENVIRONMENTAL PROTECTION

The Joint Norwegian-Russian Commission on Environmental Protection (Joint Commission) provides valuable lessons in using science as a tool of diplomacy. Russian and Norwegian governmental and scientific experts cooperate under the auspices of the Joint Commission to develop a common knowledge base and understanding of the entire Barents Sea ecosystem. To enhance sectoral coordination, several working groups were established and background reports describing the ecosystem, industries and communities were produced, including studies of the effects of these activities and other external pressures. In addition, an assessment of environmental goals and management objectives was made and knowledge gaps were identified.⁸⁸ Joint Norwegian-Russian status reports on the Barents Sea ecosystem are produced annually and environmental monitoring is also a joint effort, with a current focus on developing a

⁸⁵ ARCTIC COUNCIL, *supra* note 11, at 76–77.

⁸⁶ Jan Thulin, *The Recovery and Sustainability of the Baltic Sea Large Marine Ecosystem*, in SUSTAINING THE WORLD'S LARGE MARINE ECOSYSTEMS 63–75 (2009).

⁸⁷ Michael O'Toole, *Ocean Governance in the Benguela Large Marine Ecosystem – Establishing the Benguela Current Commission*, in SUSTAINING THE WORLD'S LARGE MARINE ECOSYSTEMS 51–62 (2009).

⁸⁸ John Richard Hansen, *Norwegian–Russian Environmental Cooperation in the Barents Sea. Toward Development of a Coordinated Ecosystem Based Management*, BARENTS OBSERVER (Aug. 11, 2015), <http://barentsobserver.com/en/2015/08/norwegian-russian-environmental-cooperation-barents-sea-toward-development-coordinated>.

suite of indicators reflecting the state of all ecosystem components and the level of anthropogenic pressure they experience.⁸⁹ These status and monitoring reports are housed on Barents Portal, an instrument implemented under the Joint Commission designed for the mutual exchange and presentation of information and environmental data relevant to the integrated environmental management of the Barents Sea.⁹⁰ Barents Portal serves as a tool for further cooperation on EBM in the Barents Sea.

These Joint Commission efforts complement other bilateral undertakings on marine cooperation, such as a 2002 pilot study conducted in Northwest Russia as part of a project between Russia and Norway concerning harmonization with OSPAR's Coordinated Environmental Monitoring Program (CEMP) guidelines on monitoring of hazardous substances in sediments and biota.⁹¹ A 2011 Memorandum of Understanding on Scientific Collaboration between the Research Council of Norway and the Russian Foundation for Basic Research led to a 2012 call for proposals for projects to strengthen integrated management of the Barents Sea. All proposed projects were required to incorporate direct scientific collaboration between Norwegian and Russian research groups.

NORTH PACIFIC ANADROMOUS FISH COMMISSION

The North Pacific Anadromous Fish Commission (NPAFC) is an international inter-governmental organization established in 1992 by the Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean.⁹² The member countries are Canada, Japan, South Korea, Russia, and the United States. As defined in the Convention, the primary objective of the NPAFC is to promote the conservation of anadromous stocks in the Convention Area.⁹³

NPAFC serves as an example of a treaty-based agreement and structure that according to many observers has worked very well since its inception in its efforts to collect and standardize data, communicate this data among nations, enforce high seas fishing regulations, and coordinate scientific research. NPAFC addressed overexploitation of salmon in the North Pacific Ocean by banning directed fishing of salmon beyond territorial limits. Bilateral agreements, such as the Canada–United States Pacific Salmon Treaty, have allocated harvest of salmon populations that straddle territorial boundaries. However, others suggest that because NPAFC has a narrow focus and is made up exclusively of representatives from member states, it may not be able to effectively address EBM in the North Pacific Ocean.⁹⁴

⁸⁹ NORWEGIAN POLAR INST., FINAL REPORT 2012–2015 JOINT RUSSIAN-NORWEGIAN MONITORING PROJECT–OCEAN 3, BRIEF REPORT SERS. NO. 30 (Mar. 2015), *available at* https://www.afsc.noaa.gov/Arctic_fish_stocks_third_meeting/meeting_reports/Appendix-A9-Final_report_Joint_Russian_Norwegian_Monitoring_Project-Ocean3-Npolar_30_2015.pdf.

⁹⁰ *About Barentsportal*, BARENTS PORTAL (Mar. 2016), <http://www.barentsportal.com/barentsportal/index.php/en/>.

⁹¹ The Joint Norwegian-Russian Comm'n on Env'tl. Prot., *Monitoring of Hazardous Substances in the White Sea and Pechora Sea: Harmonisation with OSPAR's Coordinated Environmental Monitoring Programme (CEMP)* (2011), *available at* <http://www.miljodirektoratet.no/old/klif/publikasjoner/2757/ta2757.pdf>.

⁹² *About NPAFC*, N. PACIFIC ANADROMOUS FISH COMM'N, *available at* http://www.npafc.org/new/about_npafc.html (last visited Aug. 31, 2016).

⁹³ The Convention Area is the international waters of the North Pacific Ocean and its adjacent seas north of 33° North beyond the exclusive economic zones of the coastal states.

⁹⁴ Carrie Holt et al., *International Cooperation Among Nation-States of the North Pacific Ocean on the Problem of Competition Among Salmon for a Common Pool of Prey Resources*, 32 MAR. POL. 607–17 (2008) (arguing

COMMISSION FOR THE CONSERVATION OF ANTARCTIC MARINE LIVING RESOURCES

The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) was established by international convention in 1982, under the auspices of the Antarctic Treaty System, in response to historical overharvest and increased commercial interest in Antarctic krill, a keystone species of the Antarctica LME.⁹⁵ Twenty-four nations and the European Union are members of CCAMLR, each involved in fishing or scientific study in the Antarctica LME. International cooperation and collaboration is central to CCAMLR governance, particularly given the global nature of the threats facing this LME (many of which are the same as those facing the Arctic LMEs), including climate change and consequent ecological destabilization, invasive species, ocean acidification and fishing and tourism pressures from nearby and distant nations. CCAMLR advances international cooperation by developing a consensus from its members and advocating for measures that improve ecosystem health. Achievements include significant reduction in seabird mortality, the world's first high seas MPA, and a comprehensive ecosystem monitoring program.⁹⁶

As a pioneer in the use of an EBM approach, CCAMLR offers potential lessons for EBM in the Arctic. For example, CCAMLR has applied the precautionary approach to achieve scientific consensus despite uncertainties and to advance proactive management decisions that aim to minimize the risk of long-term adverse effects.⁹⁷ CCAMLR scientists are global leaders in developing models that incorporate key effects of uncertainty into their analyses and translating this into management advice. However, management in the region lacks comprehensive ecosystem objectives, indicators, and management strategies to incorporate the total ecosystem impacts into a broader context.⁹⁸

The Antarctic Treaty provides a precedent for the establishment of a two-tiered approach to membership in a multilateral environmental agreement.⁹⁹ The Arctic states could draw from the experience of Antarctic governance and the differentiated participation in the Treaty among several categories of states.¹⁰⁰ The development of the Antarctic Treaty System is a useful

that managing the problem of salmon competition for prey resources will require a multi-stakeholder arrangement, and will involve complicated negotiations and regulatory tasks that would be extremely difficult for the NPAFC given its structure, culture, and mission).

⁹⁵ The Antarctic LME is defined by the Antarctic convergence, separating the colder Antarctic surface waters from the warmer sub-Antarctic waters to the north.

⁹⁶ *Achievements and Challenges*, CCAMLR, <https://www.ccamlr.org/en/organisation/achievements-and-challenges> (last modified April 2, 2014).

⁹⁷ AJ Constable et al., *Managing Fisheries to Conserve the Antarctic Marine Ecosystem: Practical Implementation of the Convention on the Conservation of Antarctic Marine Living Resources*, 57 ICES J. MAR. Sci. 778, 778–91 (2000).

⁹⁸ Mary Ruckelshaus et al., *Marine Ecosystem-based Management in Practice: Scientific and Governance Challenges*, 58 BioSci. 53, 53–63 (2008).

⁹⁹ The Antarctic Treaty provides for accession by any state but only the original signatories and states that demonstrate their ability to conduct substantial scientific activities are entitled to fully take part in the proceedings of the bodies established under the Treaty.

¹⁰⁰ Sébastien Duyck, *Drawing Lessons for Arctic Governance from the Antarctic Treaty System*, 3 Yearbook of Polar L. Eds. 683, 683–713 (Gudmundur Alfredsson & Timo Koivurova eds., 2011).

example of how parties have addressed concerns such as legitimacy and inclusiveness while maintaining objective criteria for full participation of additional states to the regime.¹⁰¹

TRILATERAL COOPERATION ON THE PROTECTION OF THE WADDEN SEA

The Wadden Sea Trilateral Cooperation, an effort by Denmark, Germany and the Netherlands, is a unique example of effective transboundary ecosystem-based collaboration in order to conserve a World Heritage Site.¹⁰² The cooperation began in 1978 through a high-level conference among ministers of the three nations, which share coastline along the Wadden Sea. The cooperation has no implementing authority, but acts as a mechanism for the countries to exchange information and identify opportunities for cohesive management regimes to improve ecosystem health. In 2010, the three nations revised the priorities to focus on climate change, invasive species, and the health of bird and fish populations.¹⁰³ The effort has facilitated the harmonization of data collection and management strategies, and provided political support for national and local management efforts. However, the cooperation did not achieve local participation from the outset and incorporation of stakeholder input continues to be a challenge. An additional lesson learned is that including experts and government authorities from a wide range of relevant areas is essential to ensure that EBM is inclusive of the ecological and socio-economic dimensions of the system.¹⁰⁴

CO-MANAGEMENT IN THE CANADIAN ARCTIC

In the Canadian Arctic, indigenous land claims served as a catalyst for co-management institutional arrangements,¹⁰⁵ leading to greater collaboration and participation of Arctic communities in decision-making. This collaboration includes efforts to combine science with local and indigenous knowledge to solve problems in which neither science nor indigenous knowledge is sufficient by itself.¹⁰⁶ These experiences with knowledge co-production in Canada's Arctic may provide lessons for effective transboundary marine EBM, including how to cope with change and develop adaptive responses to minimize risk and enhance resiliency.

A co-management case study of beluga entrapment in Husky Lakes, Northwest Territories¹⁰⁷ illustrates this improved decision-making through evolving institutional networks and linkages (vertical and horizontal).¹⁰⁸ A collaborative workshop to address future entrapment brought

¹⁰¹ *Id.*

¹⁰² *Organisational Structure, About Us*, COMMON WADDEN SEA SECRETARIAT, <http://www.waddensea-secretariat.org/trilateral-cooperation/organisational-structure> (last visited Aug. 31, 2016).

¹⁰³ Steven Yaffee, *Marine Ecosystem-Based Management in Practice* (2012), available at <http://webservices.itcs.umich.edu/drupal/mebm/?q=node/69>.

¹⁰⁴ *Id.*

¹⁰⁵ Co-management institutions are legally constituted, with formal mandates, and have significant scope to regulate resource access, to approve plans and designations, and to set policy. Canada's Nunavut treaty sets out rules for governing the territory's environment and, although the Inuit have title to only 20% of the landmass, they are partners in all institutions of land, water, and wildlife management.

¹⁰⁶ Derek Armitage et al., *Co-management and the Co-production of Knowledge: Learning to Adapt in Canada's Arctic*, 21 GLOBAL ENV'T. CHANGE 995, 995–2004 (2011).

¹⁰⁷ The relevant land claim agreement is the *Inuvialuit Final Agreement* of 1984 in the western Arctic in which the main co-management body is the Fisheries Joint Management Committee.

¹⁰⁸ *Id.* (describing the changes in the composition and efficacy of the co-management network).

together scientists, Inuvialuit hunters and leaders, and government managers to discuss a wide range of issues related to beluga entrapment. The social learning and plan that emerged through this process contributed to the development of adaptive capacity necessary to deal with a wide range of social and ecological uncertainties associated with a rapidly changing Arctic.¹⁰⁹

¹⁰⁹ *Id.* The Beluga Entrapment Action Plan produced from this workshop included a monitoring plan and whale deterrence camp with an indigenous knowledge education component, thus furthering adaptive capacity.

VII. Conclusions and Recommendations

Climate change and resulting impacts on Arctic marine ecosystems present great challenges as well as opportunities for enhanced cooperation. Ecosystem-based marine management is an iterative process that will take time, public engagement and support, political commitment, and sufficient financial investment. Given the rapidity of change underway in the Arctic marine environment, this work should be a priority. As discussed above, key recommendations for the Task Force include the following:

- Promote creation of a centralized Arctic marine EBM data portal and a formal EBM reporting structure within the Arctic Council.
- Continue having the Arctic Council serve as an "Arctic voice" speaking on behalf of the Arctic states in international forums on EBM.
- Develop an approach to enhance collaboration between MPAs and EBM expert groups.
- Encourage having the Arctic Council create a forum for sharing best practices on Arctic LMEs. Consider having the Arctic Council act as the overall policy coordinating organization for transboundary issues within Arctic LMEs.
- Consider having the Arctic Council pursue initiatives with regard to EBM in ABNJ.
- Use scenario analysis identifying boundaries and detailed ecosystems challenges to identify areas of consensus on EBM strategies. Use existing case summaries to help identify details of scenarios.

Glossary of Terms

ABA	Arctic Biodiversity Assessment
ABNJ	Areas Beyond National Jurisdiction
AMAP	Arctic Monitoring and Assessment Program Working Group
AMSP	Arctic Marine Strategic Plan
CAFF	Conservation of Arctic Flora and Fauna Working Group
CAO	Central Arctic Ocean
CBD	Convention on Biological Diversity
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
EA-EG	Ecosystem Approach to Management Expert Group (of PAME)
EBM	Ecosystem-based management
EBSA	Ecologically and Biologically Significant Area
EEZ	Exclusive Economic Zone
HELCOM	Helsinki Commission
IASC	International Arctic Science Committee
ICCAT	International Commission for the Conservation of Atlantic Tuna
ICES	International Council for the Exploration of the Sea
IMO	International Maritime Organization
IUCN	International Union for the Conservation of Nature
LME	Large Marine Ecosystem
MARPOL	International Convention for the Prevention of Pollution from Ships (of the IMO)
MPA	Marine Protected Area
NAFO	Northwest Atlantic Fisheries Organization

NAMMCO	North Atlantic Marine Mammal Commission
NASCO	North Atlantic Salmon Conservation Organization
NEAFC	North-East Atlantic Fisheries Commission
NPAFC	North Pacific Anadromous Fish Commission
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PAME	Protection of the Arctic Marine Environment Working Group
PICES	North Pacific Marine Science Organization
PSSA	Particularly Sensitive Sea Area
UNEP	United Nations Environment Program

Appendix

RECENT AND ONGOING ARCTIC COUNCIL INITIATIVES PERTAINING TO EBM

1. 2004 Arctic Climate Impact Assessment (AMAP with CAFF)
2. 2007 Arctic Oil and Gas Assessment (AMAP)
3. 2009 Arctic Marine Shipping Assessment (PAME)
 - a. Particularly Sensitive Sea Areas (PSSAs)
4. 2013 Arctic Ocean Review Final Report (PAME)
5. 2013 Arctic Ocean Acidification Assessment (AMAP)
6. 2013 Report from Expert Group on Ecosystem Based Management
7. Arctic Marine Strategic Plan (AMSP) 2015-2025
 - a. 4 main goals
 - i. Improve knowledge, monitoring and assessment.
 - ii. Protect ecosystem functions, biodiversity and resilience.
 - iii. Promote safe and sustainable uses.
 - iv. Enhance economic, cultural, and social wellbeing of Arctic inhabitants.
8. Actions for Arctic Biodiversity 2013-2021
 - a. Arctic Invasive Species Strategy
 - b. CAFF working with PAME on marine components (2015-2017): Develop strategy for prevention and management; include indigenous observing networks
 - c. (2017-2019): incorporate common protocols into Circumpolar Biodiversity Monitoring Program (CBMP) monitoring plans
 - d. Develop strategy; build a baseline of data available; consider trends in extinction risk; build a risk atlas; develop response options and management recommendations
 - e. 2013 Arctic Biodiversity Assessment
 - i. Necessity of taking ecosystem-based approach to management
9. Arctic Resilience Assessment
 - a. Arctic Resilience Interim Report 2013
 - b. Led by Stockholm Environment Institute and Stockholm Resilience Centre

- c. Final scientific report, Executive Summary Sept 2016
 - d. Synthesis for Arctic Leaders- spring 2017
 - e. 18 potential Arctic regime shifts in progress
 - f. 25 case studies, responses to major SES change
10. Circumpolar Biodiversity Monitoring Program (CAFF)
- a. Publish data via the Arctic Biodiversity Data Service, and other publications such as annual Arctic Report Card
11. Circumpolar Local Environmental Observer (CLEO) Network
- a. LEO- connects Arctic indigenous knowledge to science, research, policy and regulatory communities
 - b. ACAP Project- establish Circumpolar LEO
 - i. Phase 1- develop framework for expansion of LEO Network in Arctic
 - 1. Establish North American regional chapter of LEO in US and Canadian Arctic
 - ii. Phase 2- establish additional country, regional hubs in LEO Network
 - 1. Bring on additional partners, engage other AC working groups; catalogue activity in Fenno-Scandinavian region for linkages
 - iii. Phase 3- link all LEO hubs into Circumpolar LEO
12. Framework for a Pan-Arctic Network of Marine Protected Areas (2015)
- a. PAME workplan (2015-2017)
 - i. Inventory and mapping of existing MPAs- PAME, CAFF, Secretariat
13. Ecosystem-based approach Progress Report (2015)
- a. Joint expert group (AMAP, CAFF, PAME, SDWG) to develop tools
14. Sustained Arctic Observing Networks (SAON)