

ICES, PICES, and the Arctic Council Task Force on Arctic Marine Cooperation

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In May 2015 the Arctic Council established the Task Force on Arctic Marine Cooperation (TFAMC).¹ The Task Force’s overall mandate is to assess the need and recommend possible mechanisms for closer cooperation between Arctic Council members on Arctic marine issues. The narrower, scientific aspects of this mandate—to assess the need for a mechanism to “coordinate efforts to improve scientific understanding of Arctic marine areas”²—beg at least one question: Should the Arctic have its own dedicated marine science entity or should it draw instead on existing institutions to provide scientific advice for managing multiple uses and users? Asked differently: Is there a need for an “Arctic ICES”

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1. Iqaluit Declaration 2015, Ninth Ministerial Meeting of the Arctic Council, ¶ 43, Apr. 24, 2015, https://oaarchive.arctic-council.org/bitstream/handle/11374/662/ACMMCA09_Iqaluit_2015_Iqaluit_Declaration_low_resolution_web.pdf [https://perma.cc/9WHW-M9JR].

2. Arctic Council, *Senior Arctic Officials’ Rep. to Ministers* 78 (Apr. 24, 2015) [hereinafter 2015 *SAO Report*], https://oaarchive.arctic-council.org/bitstream/handle/11374/494/ACMMCA09_Iqaluit_2015_Iqaluit_SAO_Report_to_Ministers_formatted_v.pdf.pdf.

(International Council for the Exploration of the Sea)³ or an “Arctic PICES” (North Pacific Marine Science Organization)?⁴

ICES and PICES are intergovernmental organizations that pursue marine science in their respective geographic regions, but touch on only parts of the Arctic and sub-Arctic. Indeed, no single science cooperation organization is dedicated exclusively to conducting or coordinating marine science activity for an integrated understanding of the entire Arctic marine area. The terms of their respective founding conventions dictate that ICES works globally but primarily in the North Atlantic,⁵ while PICES works exclusively in the temperate and sub-Arctic regions of the North Pacific Ocean. PICES works “especially northward from 30 degrees North Latitude.”⁶ Other relevant science organizations include the International Arctic Science Committee (IASC) and the Pacific Arctic Group (PAG) organized under IASC. IASC works not only in marine science, but in all branches of Arctic science.⁷

This Article examines PICES and ICES because the Terms of Reference that establish the TFAMC mention them by name. The Task Force is to investigate “the relationship between the work of a cooperative mechanism and the work of other institutions or mechanisms serving similar functions in adjacent or overlapping areas (such as AOOS, OSPAR, HELCOM, ICES and PICES, among others).”⁸ Other observing or monitoring networks not named explicitly are clearly an appropriate focus for the Task Force but are not covered in this Article.

3. Convention for the International Council for the Exploration of the Sea, Sept. 12, 1964, 652 U.N.T.S. 237 [hereinafter ICES Convention], http://www.ices.dk/explore-us/who-we-are/Documents/ICES_Convention_1964.pdf [<https://perma.cc/9FK7-ZXA8>].

4. Convention for a North Pacific Marine Science Organization, Dec. 12, 1990, S. TREATY DOC. NO. 102-9 and S. Exec. Rep. No. 137-18 [hereinafter PICES Convention], <https://www.pices.int/about/convention.aspx> [<https://perma.cc/4XCE-S9Q8>].

5. ICES Convention, *supra* note 3, art. 2 (“The Council shall be concerned with the Atlantic Ocean and its adjacent seas and primarily concerned with the North Atlantic.”).

6. PICES Convention, *supra* note 4, art. II (specifying that PICES’s geographic range is the “temperate and sub-Arctic region of the North Pacific Ocean and its adjacent seas, especially northward from thirty degrees North latitude[.]. . . Activities of the Organization, for scientific reasons, may extend farther southward in the North Pacific Ocean[.]” and stating no explicit permission or prohibition regarding extending PICES’s scientific work northward).

7. *About PAG*, PACIFIC ARCTIC GRP. [PAG], <http://pag.arcticportal.org/about-pag> [<https://perma.cc/V25P-S29L>] (last visited Feb. 27, 2016). The PAG Terms of Reference state: “The Pacific Arctic Region is loosely defined as the area lying between Russia and Alaska (Bering Strait) and extends northward including the Beaufort Gyre and Arctic Ocean and south including the Bering Sea. The area also includes seasonally ice-covered seas. PAG activities may extend beyond these boundaries based on project objectives.” *Id.*

8. 2015 *SAO Report*, *supra* note 2, at 78. All five entities have international membership. *See id.* The SAO Report also named AOOS—the Alaska Ocean Observing System. AOOS is not included in the present Article because its membership is limited to one country. AOOS is, however, exemplary for involving a wide range of stakeholders and facilitating transparency and access to data from industry, government, indigenous groups and others, multiplying the data’s effectiveness through layered maps, cross references, and annotations. The Oslo-Paris Commission (OSPAR), and the Helsinki Commission-Baltic Marine Environment Protection Commission (HELCOM) are not included in this Article because their primary focus is not marine science.

Parts II and III below briefly reference activity by ICES, PICES, and the Arctic Council AMAP Working Group. Their existing relationships suggest ways in which any mechanism recommended by the TFAMC could interact with observing and monitoring programs such as the Global Ocean Observation System, the Sustained Arctic Observing Network, and related work of the PAG, IASC, and other marine science organizations.

Scientists were the driving force behind creation of ICES and PICES.⁹ Scientists, not diplomats or fisheries managers, first articulated scientific needs that were not being met in these regions.¹⁰ For ICES and PICES, changes in marine science, international law, and geopolitics played a critical role in their formation and development.¹¹ Because similar factors were at play in the Arctic Council's creation of the TFAMC, Part I of this Article begins by surveying developments in international law, geopolitics, and marine science that precipitated the creation of ICES and PICES. Part II then introduces the Task Force, emphasizing that its mandate is much broader than simply assessing the need for an Arctic marine science organization. Turning to the Arctic Council's signature work of scientific assessments, Part III of this Article distinguishes them from ICES's and PICES's independent, peer-reviewed scientific investigations. Part IV then examines how ICES and PICES already support legal, policy, and management initiatives for the Arctic Ocean and its adjacent seas, even as their combined mandates do not span the entire Arctic marine area.

This Article concludes that creating an Arctic ICES or an Arctic PICES as an immediate outcome of the TFAMC's work would be premature. It suggests instead (1) a process for determining whether a new arctic marine science organization is needed, and (2) providing a flexible forum to convene representatives of existing marine science organizations in changing configurations as needed to address concerns of the Arctic Council member states and Permanent Participants. Lessons learned from such gatherings could inform subsequent efforts to establish a science organization dedicated to an integrated scientific understanding of the marine Arctic as a whole.

This Article is based primarily on publicly available records produced by ICES and PICES, including founding documents, original and subsequent mandates and statements of purpose, work plans, and project descriptions where available. Other sources include publications and record of governments, treaty bodies and international organizations that engage with PICES and ICES, and

9. See, e.g., Warren S. Wooster & Sara F. Tjossem, *Scientific Cooperation in the North Pacific: The PICES Project*, 6 SAN DIEGO INT'L L.J. 191, 193–95 (2004).

10. HELEN M. ROZWADOWSKI, *THE SEA KNOWS NO BOUNDARIES: A CENTURY OF MARINE SCIENCE UNDER ICES* 9–10, 13–14 (2002); see, e.g., SARA TJOSSEM, *THE JOURNEY TO PICES: SCIENTIFIC COOPERATION IN THE NORTH PACIFIC* 18–21, 34–37, 42–47 (2005) (emphasizing this point repeatedly); see *id.* at 10 (addressing the role of scientists in the formation of ICES).

11. TJOSSEM, *supra* note 10, at 10–11.

secondary literature treating these topics. Special attention is given to joint projects between ICES and PICES relevant to Arctic marine science.

I. MARINE SCIENCE AND INTERNATIONAL LAW: FROM “ICES” TO “A PACIFIC ICES” TO “AN ARCTIC (P)ICES”?

ICES is the world’s oldest intergovernmental marine science organization, formed in 1902 as the International Council for the Exploration of the Sea.¹² Today its main objective is to increase scientific knowledge of the marine environment and its living resources and to use this knowledge to provide requested management advice to “competent authorities.”¹³ Those authorities include member state governments and international organizations and commissions.¹⁴ By contrast PICES, founded in 1992, “lacks the formal advisory role” of ICES¹⁵ but does identify “research priorities and problems” in the PICES convention area “as well as appropriate methods for their solution” and “consider[s] requests to develop scientific advice.”¹⁶ PICES’s core mission, to better understand the North Pacific marine environment through integrative ecosystem studies, incorporates—but goes beyond—fisheries science.¹⁷ Although ICES works closely with regional seas agreements to provide management advice, no corresponding regional marine conservation agreements exist for the North Pacific. Furthermore, PICES does not consider its role to include providing management advice.¹⁸ All eight Arctic Council states belong to ICES. Only three—Canada, Russia and the United States—belong to PICES, as coastal states of the northern Pacific Ocean.¹⁹

12. PAME, REPORT ON THE INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA (ICES) 2 (2013) [hereinafter PAME ICES Paper 2013]; ROZWADOWSKI, *supra* note 10, at 40; TJSSEM, *supra* note 10, at 10.

13. INT’L COUNCIL FOR THE EXPL. OF THE SEA, ICES STOCKTAKING OF ITS ROLE AND CAPABILITIES IN OCEAN AND COASTAL 1 (2012) [hereinafter ICES STOCKTAKING], http://www.ices.dk/explore-us/Documents/Position%20papers/ICES_Stocktaking_in_support_the_Inter-Agency_report_.pdf [https://perma.cc/KJ7Y-UPW3]; *see also* PAME ICES Paper 2013, *supra* note 12, at 2.

14. ICES STOCKTAKING, *supra* note 13, at 1. Examples of these international organizations and commissions include “the North East Atlantic Fisheries Commission (NEAFC), the North Atlantic Salmon Conservation Organization (NASCO), the Oslo-Paris Commission (OSPAR), the Helsinki Commission - Baltic Marine Environment Protection Commission (HELCOM), and the European Commission (EC).” *Id.*

15. ROZWADOWSKI, *supra* note 10, at 3.

16. PICES Convention, *supra* note 4, art. V, paras. 1(a), (d); James E. Stewart, *A Brief Review of the International Council for the Exploration of the Sea (ICES) on the Occasion of the Formation of the North Pacific Marine Science Organization*, 48 CAN. J. FISHERIES & AQUATIC SCI. 2543, 2543 (1991).

17. *See, e.g.*, TJSSEM, *supra* note 10, at 11–12, 22–23, 25, 49, 105.

18. *See* PAME ICES Paper 2013, *supra* note 12, at 6; ROZWADOWSKI, *supra* note 10, at 3.

19. The three other PICES member states are Japan, China, and the Republic of Korea. PICES full membership offers almost a mirror image of OSPAR by including the three Arctic Council members that are not contracting parties to OSPAR.

The brief timeline that follows discusses how some of the major trends in geopolitics, marine science, and international law evolved over the nine decades between the creation of ICES in 1902 and PICES in 1992, and how these trends influenced the founding of the two organizations. These factors remain instructive almost a quarter century later as the Arctic Council TFAMC assesses the need for a marine science organization for the Arctic in 2015 and beyond.

Established at a time of growing internationalism, ICES responded to concerns about overfishing of plaice, herring, and other stocks in the North Atlantic²⁰ by providing “scientifically derived management advice” to member states.²¹ Scientists interested in greater understanding of the region and managers requiring science to support their countries’ economic needs now had a forum to work together, thus helping ICES shape the fields of oceanography and fisheries science in their early years and improving communication between the disciplines over time.²²

Established only three years after the Hague International Peace Conference of 1899,²³ ICES was also a product of contemporary geopolitics and international law. Major wars on the European and North American continents were nonexistent, World War I was not yet visible on the horizon, and states were beginning to convene for purposes other than settling military conflicts.²⁴ High seas fishery freedoms covered a vast portion of the world’s oceans, and it would be another eighty years before the United Nations Convention on the Law of the Sea (LOS Convention)²⁵ established the groundbreaking legal construct of an Exclusive Economic Zone (EEZ). Just as the EEZ shifted how states think about sharing jurisdiction at sea, the 1882 North Sea Convention was an important—if not exact—analogue and foundation for ICES’s creation. Even though it never entered into force, the North Sea Convention was an early exercise in voluntary and limited relinquishment of national jurisdiction between several states that would be founding members of ICES.²⁶

20. ROZWADOWSKI, *supra* note 10, at 212; Stewart, *supra* note 16, at 2547.

21. TJOSSEM, *supra* note 10, at 10.

22. *Id.*; Stewart, *supra* note 16, at 2546.

23. For a centennial assessment of the Hague Peace Conferences, see Symposium, *The Hague Peace Conferences*, 94 AM. J. INT’L L. 1 (2000). On the conferences generally, see THE HAGUE PEACE CONFERENCES OF 1899 AND 1907 AND INTERNATIONAL ARBITRATION: REPORTS AND DOCUMENTS (Shabtai Rosenne ed., 2001); and Betsy Baker, *Hague Peace Conferences (1899 and 1907)*, in MAX-PLANCK-INSTITUTE FOR COMPARATIVE AND PUBLIC INTERNATIONAL LAW (Rudolf Bernhardt & Rüdiger Wolfrum eds., 2009), in ENCYCLOPEDIA OF PUBLIC INTERNATIONAL LAW (Elsevier Science Ltd 2010).

24. See generally MARIITI KOSKENNIEMI, *THE GENTLE CIVILIZER OF NATIONS: THE RISE AND FALL OF INTERNATIONAL LAW 1870–1960* (2001); George H. Aldrich & Christine M. Chinkin, *A Century of Achievement and Unfinished Work*, 94 AM. J. INT’L L. 90, 91 (2000).

25. United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397, <https://treaties.un.org/doc/Publication/UNTS/Volume%201833/volume-1833-A-31363-English.pdf> [<https://perma.cc/A36S-Q7AS>].

26. ROZWADOWSKI, *supra* note 10, at 13.

ICES was sufficiently successful in convening managers and scientists to address North Atlantic marine issues such that, as early as 1926, scientists began asking whether a “Pacific ICES” was needed.²⁷ Concern over the dearth of information on fisheries, and about the North Pacific generally, prompted their inquiry, but multiple factors hindered formation of a Pacific ICES at the time. These included the Great Depression, relatively less developed fisheries organizations in the Pacific as compared to other parts of the world, especially the Atlantic, and the Pacific Ocean’s sheer size (two times larger than the entire Atlantic) with the attendant diversity of political and economic interests of Asian, Russian, and North American coastal states.²⁸ It would take until 1992 for PICES to be formed.

Sara Tjossem, a historian of science, evokes succinctly how, over the course of the twentieth century, an expanding internationalism combined with changing perceptions of natural resources and the rise of the global environmental movement have shaped marine science: “In the late nineteenth century, ‘global’ environmental problems were virtually unknown. Nature, predominantly viewed as a source of exploitable resources, had by the late twentieth century been recast as a ‘life-sustaining global ecosystem.’”²⁹

These factors helped to shift ICES’s predominant focus from fisheries science to broader inquiries and to lay the groundwork for PICES.³⁰ With the end of World War II and the birth of the United Nations in 1945, the UN’s newly established special agencies addressed questions of fisheries (Food and Agriculture Organization), oceanography (Intergovernmental Oceanographic Commission), and ocean-related meteorology (World Meteorological Organization), but not necessarily as related endeavors.³¹ They also tended to focus on developing, rather than developed, countries like those in the North Pacific.³²

In 1964 ICES was reconstituted as an intergovernmental organization with

27. Tjossem, *supra* note 10, at 10–11.

28. *Id.* at 11.

29. *See id.* at 24 n.42 (citing archival correspondence from Keith Ketchen, Pacific Biological Station, to Warren Wooster on April 4, 1978). Both men were key players in PICES’s founding. *See id.* at 24–37.

30. Rozwadowski, *supra* note 10, at 3; Tjossem, *supra* note 10, at 11.

31. Wooster & Tjossem, *supra* note 9, at 192. Wooster and Tjossem discuss how interest in PICES arose in the 1970s based on the fact that relevant international organizations “seldom focused on” issues important to the North Pacific. *Id.* Wooster and Tjossem mention the Fisheries and Agriculture Organization, established by the Constitution of the United Nations Food and Agriculture Organization, Quebec, on Oct. 16, 1945; the Intergovernmental Oceanographic Commission, established by Regulation 2.31 of the UNESCO General Conference, at the eleventh session in November and December of 1960, and in conformity with the recommendation of the Intergovernmental Conference on Oceanic Research, Copenhagen in July 11–16, 1960; and the World Meteorological Organization, established by the Convention of the World Meteorological Organization, Washington DC, on Oct. 11, 1947. *Id.*

32. Wooster & Tjossem, *supra* note 9, at 196.

its own convention and legal personality.³³ Professor and science historian Helen Rozwadowski chronicles ICES's shift, beginning in the mid-1960s, from understanding environmental science as "the study of marine animals in relation to their environment" to focusing on pollution research in response to public concern about the cleanliness of European waters.³⁴ Responding to similar global concerns, in 1966 the Intergovernmental Maritime Consultative Organization, predecessor to the International Maritime Organization, established the Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP).³⁵

ICES also charted its new course at a time when recently decolonized countries asserted growing interest in regaining control over their living and nonliving natural resources.³⁶ In 1967 Arvid Pardo, Malta's first ambassador to the United Nations following independence from Britain, urged the General Assembly to treat the seabed beyond national jurisdiction and its resources as the common heritage of mankind.³⁷ His speech proved to be a major impetus for launching negotiations on what would become the 1982 LOS Convention.³⁸ From the 1970s to the 1990s, international law experienced a proliferation of multilateral environmental agreements that moved increasingly from single-sector or single-species foci to more integrated ways of addressing environmental threats.³⁹

PICES was created in 1992—a decade after the LOS Convention was opened for signature. PICES was, in part, a product of the regime shift that the LOS Convention introduced with the creation of the 200 nautical mile EEZ.⁴⁰

33. ROZWADOWSKI, *supra* note 10, at 175.

34. *Id.* at 177–213. Rozwadowski notes that fisheries biologist Rachel Carson, in her international bestseller, *The Sea Around Us*, which describes the "origins, geology, physics, and ecology of the oceans," acknowledged the support of many scientists with close ties to ICES who were in turn influenced by Carson's subsequent work on pollution. *Id.* at 212 (discussing RACHEL L. CARSON, *THE SEA AROUND US* (1979)). Stewart discusses ICES's increased work on pollution starting in 1966 but notes its importance to ICES as early as 1902. Stewart, *supra* note 16, at 2548.

35. For a brief introduction to GESAMP's work, see PATRICIA BIRNIE ET AL., *INTERNATIONAL LAW AND THE ENVIRONMENT* 380–81 (3d ed. 2009); and INSTITUTIONAL DIMENSIONS OF GLOB. ENVTL. CHANGE, *MANAGERS OF GLOBAL CHANGE: THE INFLUENCE OF INTERNATIONAL ENVIRONMENTAL BUREAUCRACIES* 146–47 (Frank Biermann & Bernd Siebenhuner eds., 2009) [hereinafter *MANAGERS OF GLOBAL CHANGE*].

36. *See, e.g.*, G.A. Res. 1803 (XVII), at 15 (Dec. 14, 1962).

37. U.N. GAOR, 22nd Sess., 1515th mtg. at 1–15, U.N. Doc. A/C.1/PV.1515 (Nov. 1, 1967). Pardo's statement was reprinted in H.R. REP. No. 90-999, at 267, 284–85 (App. 9) (1967), and cited in Edward J. Dempsey, *The World Ocean: A Plan for International Action*, 18 CATH. U. L. REV. 491, 507 n.72 (1969).

38. *See, e.g.*, David D. Caron, *Municipal Legislation for Exploitation of the Deep Seabed*, 8 OCEAN DEV. & INT'L L. 259, 261 (1980); Daniel S. Cheever, *The Role of International Organization in Ocean Development*, 22 INT'L ORG. 629 (1968).

39. On the proliferation of multilateral environmental agreements, see TJSSEM, *supra* note 10, at 11; and U.N. ENV'T PROGRAMME DIV. OF ENVTL. LAW & CONVENTIONS, *AUDITING THE IMPLEMENTATION OF MULTILATERAL ENVIRONMENTAL AGREEMENTS (MEAs): A PRIMER FOR AUDITORS* 7–8 (2010).

40. TJSSEM, *supra* note 10, at 21–24 (tracing these developments).

EEZs drastically altered management of living resources by coastal states⁴¹ and the ability of distant water fishing fleets to operate in areas no longer designated as high seas.⁴² Marine scientists were the driving force behind the creation of PICES, seeking explicitly to provide better scientific understanding of new marine and coastal areas now under the national jurisdiction of North Pacific Ocean littoral states.⁴³ PICES was also established the same year as the UN Conference on Environment and Development (UNCED), which devoted special attention to ocean issues.⁴⁴ Discussions at UNCED that continue to shape ocean stewardship today include a shift from focusing on controlling sources of marine pollution to preventing environmental degradation and protecting ecosystems.⁴⁵

PICES's early years benefitted from the end of the Cold War and the ability of international scientific studies to gain data on areas previously off limits.⁴⁶ The Arctic Environment Protection Strategy (AEPS), established in 1991, and its 1996 successor, the Arctic Council, were also a product of these times.⁴⁷ Their founding is outlined in Part III below, with special attention to their connections to scientific inquiry.

What developments in geopolitics, international law, and marine science should be considered today when asking whether the Arctic needs its own marine science organization (whether modeled after ICES, PICES, or some other organization)? The geopolitics of the Arctic are still on a solidly peaceful trajectory, yet they are affected in indeterminate ways by a variety of factors. These include, but are not limited to, the United States's delayed leadership on climate policy,⁴⁸ Russia's annexation of Crimea,⁴⁹ and the dynamic of the Arctic Ocean

41. See, e.g., Alf Håkon Hoel et al., *Ocean Governance and Institutional Change*, in *A SEA CHANGE: THE EXCLUSIVE ECONOMIC ZONE AND GOVERNANCE INSTITUTIONS FOR LIVING MARINE RESOURCES* 3, 3–16 (Syma A. Ebbin et al. eds., 2010).

42. WOOSTER & TJSSEM, *supra* note 9, at 191–92. On U.S. interests in the region at the time, see Edward L. Miles & David L. Fluharty, *U.S. Interests in the North Pacific*, 22 *OCEAN DEV. & INT'L L.* 315 (1991). On diplomatic and international developments earlier in the twentieth century regarding the limits of coastal state jurisdiction and its close connection to fisheries issues in the North Pacific, see Harry N. Scheiber, *Japan, The North Atlantic Triangle, and the Pacific Fisheries: A Perspective on the Origins of Modern Ocean Law, 1930–1953*, 6 *SAN DIEGO INT'L L.J.* 27, 36 (2004).

43. See WOOSTER & TJSSEM, *supra* note 9, at 192, for a discussion of scientists' perceived need for a regional marine science organization in the context of the tension between fisheries management science (conducted regionally by the North Pacific Anadromous Fish Commission) and broader scientific inquiry into environmental and ecosystem research, which those proponents perceived as lacking.

44. See U.N. Conference on Environment and Development, *Protection of the Oceans, All Kinds of Seas, Including Enclosed and Semi-Enclosed Seas, and Coastal Areas and the Protection, Rational Use and Development of their Living Resources*, U.N. Doc. A/CONF.151/26 (Vol. II) (Aug. 13, 1992), http://www.un.org/depts/los/consultative_process/documents/A21-Ch17.htm [<https://perma.cc/2Z9N-YHLL>].

45. MANAGERS OF GLOBAL CHANGE, *supra* note 35, at 384–85.

46. See TJSSEM, *supra* note 10, at 68.

47. See E.C.H. KESKITALO, *NEGOTIATING THE ARCTIC: THE CONSTRUCTION OF AN INTERNATIONAL REGION* 43–46 (2004).

48. See, e.g., Matto Mildemberger, *The United States is No Longer a Climate Laggard*, *YALE ISPS*

coastal states—Canada, Denmark (Greenland), Norway, Russia, and the United States—agreeing to a moratorium on commercial fishing that does not yet, but is expected by 2017 to, include Iceland and non-Arctic states with distant water fishing fleets.⁵⁰

In international and domestic law, EEZs—instrumental in PICES’s formation—have become well-established management tools around the Arctic and the globe. The international community has now turned to seeking durable solutions for areas beyond national jurisdiction, a subject for which ICES and PICES have established a joint objective.⁵¹ Related issues that challenge both marine science and international law include management of high seas fisheries⁵² and areas beyond national jurisdiction in the Arctic.⁵³ Ecosystem based management, emergent when PICES was established, is a cornerstone of the Arctic Council’s Arctic Marine Strategic Plan (AMSP) for 2015–2025⁵⁴ and its work overall.⁵⁵

The AMSP has been identified as a potential road map for creation of an Arctic marine cooperation agreement if not for an Arctic marine science organization.⁵⁶ The AMSP identifies four goals:

(July 15, 2015), <http://isps.yale.edu/news/blog/2015/07/the-united-states-is-no-longer-a-climate-laggard> [<http://perma.cc/SVH6-4VFE>].

49. See, e.g., Mikkel Runge Olesen, *Cooperation or Conflict in the Arctic: A Literature Review* (Danish Inst. for Int’l Studies, Working Paper No. 08, 2014), http://pure.diiis.dk/ws/files/70921/wp2014_08_Runge_Olesen_for_web.pdf [<http://perma.cc/2L2U-QCC7>].

50. See, e.g., Steven Lee Myers, *Sea Warming Leads to Ban on Fishing in the Arctic*, N.Y. TIMES, July 17, 2015, at A6; Eilís Quinn, *Iceland Blasts Arctic Five for Exclusion from Fishing Agreement*, RADIO CAN. INT’L: EYE ON THE ARCTIC (July 30, 2015), <http://www.rcinet.ca/eye-on-the-arctic/2015/07/30/iceland-blasts-arctic-five-for-exclusion-from-fishing-agreement> [<http://perma.cc/ZN4A-Q5HC>].

51. ICES STOCKTAKING, *supra* note 13, at 7. Part of the ICES-PICES Strategic Initiative on Climate Change Impacts on Marine Ecosystems includes objective 3.a, to “Create and Implement an Institutional and Legal Framework to Protect Habitats and Biodiversity Beyond National Jurisdiction.” *Id.*

52. See Erik Molenaar, *Status and Reform of International Arctic Fisheries Law*, in ARCTIC MARINE GOVERNANCE: OPPORTUNITIES FOR TRANSATLANTIC COOPERATION 103, 106–07, 111–12, 115–16 (Elizabeth Tedsen et al. eds., 2014).

53. On the consensus to work towards a new legally binding implementing agreement (on biodiversity beyond national jurisdiction) under the Law of the Sea Convention, see *Summary of the Ninth Meeting of the Working Group on Marine Biodiversity Beyond Areas of National Jurisdiction*, 25 EARTH NEGOTS. BULL. NO. 94, at 1 (2015), which discusses the need for an agreement or instrument to implement effective strategies for the conservation and sustainable use of marine environments beyond national jurisdiction.

54. Arctic Council, *Arctic Marine Strategic Plan 2015–2025: Protecting Marine and Coastal Ecosystems in a Changing Arctic* (2015) [hereinafter *AMSP 2015–2025*], <https://oarchive.arctic-council.org/handle/11374/413> [<https://perma.cc/FB2B-57VE>].

55. See Arctic Council, *Ecosystem-Based Management in the Arctic: Rep. Submitted to Senior Arctic Officials by the Expert Group on Ecosystem-based Management* (2013), <https://oarchive.arctic-council.org/handle/11374/122> [<https://perma.cc/RS3U-W8VR>]. Arctic Council ministers welcomed and approved this report at the Eighth Ministerial Meeting of the Arctic Council. See Arctic Council, *Kiruna Declaration* (2013) [hereinafter *Kiruna Declaration*], <http://oarchive.arctic-council.org/handle/11374/93> [<https://perma.cc/B37A-KLK3>].

56. Betsy Baker & Brooks Yeager, *Coordinated Ocean Stewardship in the Arctic: Needs, Challenges*

Goal 1: Improve knowledge of the Arctic marine environment, and continue to monitor and assess current and future impacts on Arctic marine ecosystems.

Goal 2: Conserve and protect ecosystem function and marine biodiversity to enhance resilience and the provision of ecosystem services.

Goal 3: Promote safe and sustainable use of the marine environment, taking into account cumulative environmental impacts.

Goal 4: Enhance the economic, social and cultural well-being of Arctic inhabitants, including Arctic indigenous peoples and strengthen their capacity to adapt to changes in the Arctic marine environment.⁵⁷

In addressing the first three goals, the Arctic Council can draw directly on relevant information produced by ICES and PICES for other purposes, even though it is not a direct consumer of those organizations' science products. A number of ICES and PICES projects—undertaken jointly or by only one of the organizations—address Arctic issues. Part IV below discusses examples of these projects and the extent to which a new Arctic marine science organization is needed to speak to AMSP goals for those parts of the Arctic that fall outside the geographic coverage of ICES and PICES.

II. ARCTIC COUNCIL TASK FORCE ON ARCTIC MARINE COOPERATION AND ITS SCIENCE MANDATE

At their meeting in Iqaluit (Canada) on April 24, 2015, the Arctic Council Ministers “establish[ed] a Task Force to assess future needs for a regional seas program or other mechanism, as appropriate, for increased cooperation in Arctic marine areas.”⁵⁸ The Senior Arctic Officials (SAOs) for all eight Arctic States, in their Report to the Ministers, deemed it useful to conduct “[a] cross-cutting effort that would look broadly at how our cooperation [within the Arctic Council] is working and how we might enhance collaborative efforts in the Arctic marine environment.”⁵⁹ Science cooperation is not even mentioned on the first page of the Task Force’s terms of reference. The SAOs simply recommended establishing a task force to: (1) identify future needs for cooperation in the Arctic marine environment; (2) recommend *whether* the Council should “begin negotiations on a cooperation mechanism for Arctic marine areas”; and (3) make other recommendations that the task force deemed appropriate.⁶⁰

The Terms of Reference specified three broad categories of questions about a possible marine cooperation mechanism: its Mandate and Scope, Relationship to

and Possible Models for an Arctic Ocean Coordinating Agreement, 4 TRANSNAT’L ENVTL. L. 359, 359, 382 (2015), http://journals.cambridge.org/abstract_S2047102515000151 [<https://perma.cc/6GJ9-T86Z>] (follow “PDF” hyperlink).

57. *AMSP 2015–2025*, *supra* note 54, at 5.

58. Iqaluit Declaration 2015, *supra* note 1, at 5.

59. 2015 *SAO Report*, *supra* note 2, at 77.

60. *Id.*

Arctic Council, and Legal Form. It also required that a final report be available no later than the 2017 Ministerial that concludes the U.S. chairmanship of the Arctic Council.⁶¹ In establishing the Task Force, the Arctic Council designated the United States and Norway as cochairs. Iceland has since joined as the third cochair.

By constituting the Task Force, the Arctic Council has not committed to establishing a cooperation mechanism, much less an Arctic marine science organization. Those two possible outcomes should be clearly distinguished and neither should be assumed. The Task Force, after considering “future needs for strengthened cooperation for Arctic marine areas,” shall simply recommend to the SAOs “the nature and scope of any . . . mechanisms” to meet those needs.⁶² The Terms of Reference make clear that a central task of the TFAMC is to *assess the need for* a cooperation entity, so as to inform a later decision by the Arctic States whether or not to pursue negotiation of a cooperation mechanism.⁶³ The Mandate explicitly instructs the Task Force to consider how such a cooperation mechanism might overlap, if at all, with existing entities, including existing marine science organizations such as ICES and PICES.⁶⁴ It does not explicitly direct the Task Force to consider whether to create an Arctic marine science organization. Thus, creation of an Arctic marine science organization may or may not be a mechanism the Task Force recommends.

If established, a broader Arctic marine cooperation entity would likely cover cooperation not only in Arctic marine science but also in other areas.⁶⁵ The TFAMC was asked to “explore the need for deepened cooperation in a range of areas,” including possible sharing of best practices for ocean management in formal and informal ways.⁶⁶ This Article focuses on the science-related questions posed to the Task Force, including whether any cooperation mechanisms should “promote and coordinate efforts to improve scientific understanding of Arctic marine areas such as ocean acidification, marine debris effects, sea ice monitoring, etc.”⁶⁷ This Article does not discuss in any detail three other issues raised in the TFAMC Mandate:⁶⁸ the geographic scope of a cooperation entity, its relationship

61. *Id.* at 78.

62. *Id.* at 77.

63. *Id.*

64. *Id.* at 78.

65. The TFAMC is distinct from the Task Force on Science Cooperation established at the 2013 Kiruna Ministerial Meeting. The TFAMC mandate is much broader and science coordination is only one of its many potential focal points. By contrast, the Scientific Cooperation Task Force is working “towards an arrangement on improved scientific research cooperation among the eight Arctic States,” focusing on how “shared efforts could improve scientific cooperation including sharing of data and metadata, facilitating the movement of people, samples and equipment across borders for the purposes of conducting research, facilitating logistics and access to research areas, and facilitating access to research facilities.” *Kiruna Declaration, supra* note 55, at 5.

66. 2015 *SAO Report, supra* note 2, at 77–78.

67. *Id.* at 78.

68. *Id.* at 77 (“In conducting the needs analysis, the Task Force should provide answers to the

to the Arctic Council, and whether or not it should be legally binding.⁶⁹

Traditional and local knowledge do not appear in the TFAMC terms of reference, which mention only “scientific understanding” of the Arctic marine areas.⁷⁰ The omission does not preclude the Task Force from considering traditional and local knowledge, which the Arctic Council itself acknowledges can impart essential understanding of the Arctic region. In the 2013 Kiruna Declaration, the Arctic Council Ministers recognized that “the use of traditional and local knowledge is essential to a sustainable future in the Arctic, and decide[d] to develop recommendations to integrate traditional and local knowledge in the work of the Arctic Council.”⁷¹ Two years later, at the same ministerial that established the TFAMC, the 2015 Iqaluit Declaration welcomed recommendations prepared by the Permanent Participants,⁷² known as the Ottawa Principles.⁷³ Ottawa Principle 2 states “Traditional Knowledge enhances and illuminates the holistic and shared understanding of the Arctic environment which promotes and provides a more complete knowledge base for the work of the Arctic Council.”⁷⁴ Ottawa Principle 9 defines science and traditional knowledge as different but “complementary systems and sources of knowledge” that “when appropriately used together may generate new knowledge and may inform decision making, policy development and the work of the Arctic Council.”⁷⁵

In the Arctic, few formal mechanisms exist for management authorities to request and use Traditional Knowledge and science together.⁷⁶ An Arctic marine cooperation entity could provide a forum for the Arctic Council member states and Permanent Participants to work with both systems of knowledge in identifying and addressing the most pressing issues for a healthy Arctic Ocean. As Finnish scholar Paula Kankaanpää has noted: “[t]he Arctic Council is the only international body to offer a platform for multi-level and cross-sectoral cooperation in the Arctic. It provides a mechanism for integrating multiple ways

basic questions outlined below, which are by no means exhaustive.”).

69. For a more detailed discussion of geographic scope, see Baker & Yeager, *supra* note 56, at 376–78.

70. 2015 *SAO Report*, *supra* note 2, at 78.

71. *Kiruna Declaration*, *supra* note 55, at 2.

72. *Application of Traditional Knowledge in the Arctic Council*, INUIT CIRCUMPOLAR COUNCIL CAN., <http://www.inuitcircumpolar.com/application-of-traditional-knowledge-in-the-arctic-council.html> [https://web.archive.org/web/20150905134046/http://www.inuitcircumpolar.com/application-of-traditional-knowledge-in-the-arctic-council.html] (last visited Feb. 10, 2016).

73. Arctic Council Permanent Participants, *Ottawa Traditional Knowledge Principles* [hereinafter *Ottawa Principles*], <http://www.arcticpeoples.org/images/2015/ottradknowlprinc.pdf> [https://perma.cc/7EXQ-A426] (last visited Feb. 10, 2016).

74. *Id.* ¶ 2 (princ. 2).

75. *Id.* ¶ 9 (princ. 9) (“Traditional Knowledge and science are different yet complementary systems and sources of knowledge, and when appropriately used together may generate new knowledge and may inform decision making, policy development and the work of the Arctic Council.”).

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

of producing information and knowledge for governmental and scientific assessments, as well as for various other interest groups.”⁷⁷

These special characteristics of the Arctic Council—manifested in its long history of producing and consuming knowledge about the Arctic—should inform any recommendations by the Task Force, whether or not they include establishing an Arctic marine science organization.

III. THE ARCTIC COUNCIL AS PRODUCER AND CONSUMER OF SCIENTIFIC KNOWLEDGE

The Arctic Council’s origins are inextricably tied to scientific efforts to understand the Arctic environment. The Council’s predecessor was the Arctic Environment Protection Strategy (AEPS), a Finnish initiative that responded to Mikhail Gorbachev’s groundbreaking 1990 Murmansk speech—a speech that is attributed with significantly advancing the thaw in international relations in the Arctic.⁷⁸ An important element of Gorbachev’s call for the Arctic to be a zone of peace was to urge scientific cooperation between sub-Arctic states.⁷⁹ The AEPS initiative operated from 1991–1996 with scientific monitoring of environmental conditions in the Arctic as a core activity.⁸⁰ In 1996, the eight Arctic states established the Arctic Council as a high-level discussion forum that subsumed and continued the work of the AEPS. The Council’s founding document is the 1996 Ottawa Declaration,⁸¹ a nontreaty agreement that created no international legal personality for the Council.⁸² The Ottawa Declaration also incorporated a special but nonvoting status of Permanent Participant for representatives of the Arctic’s indigenous peoples.⁸³

The Arctic Council addresses a wide range of science issues affecting the entire Arctic but is neither a management nor a scientific authority.⁸⁴ The Arctic Council produces significant scientific assessments through its six Working

77. Paula Kankaanpää, *The Arctic Council—from Knowledge Production to Influencing Policy Making*, 4 Y.B. POLAR L. 59, 72 (2012).

78. See KESKITALO, *supra* note 47, at 43–44.

79. *Id.*

80. *Id.* at 44.

81. Declaration on the Establishment of the Arctic Council, 35 I.L.M. 1387, Sept. 19, 1996 [hereinafter Ottawa Declaration], <http://library.arcticportal.org/1270/> [<https://perma.cc/RMU5-XCVD>].

82. See Evan T. Bloom, *Establishment of the Arctic Council*, 93 AM. J. INT’L L. 712, 714 (1999).

83. Ottawa Declaration, *supra* note 81, ¶ 2.

84. The Arctic Council’s recent forays into providing a forum for its members to negotiate binding treaties, and other structural developments such as establishing a permanent secretariat, have led Molenaar to refer to an emerging Arctic Council regime. See, e.g., E.J. Molenaar, *Current and Prospective Roles of the Arctic Council System Within the Context of the Law of the Sea*, 27 INT’L J. MARINE & COASTAL L. 553, 554 (2012).

Groups,⁸⁵ but has never had the mandate or mission to engage in its own original scientific research. Writing in 2012, Kankaanpää observes:

The Arctic Council has produced a wealth of science-based information in various formats . . . [:] assessment reports, overview reports, brochures, guidelines, training, contact networks, capacity building, technical reports, political recommendations, and acting as an “Arctic voice.” Particularly over the past five years, the Arctic Council has followed the global trend and has produced an increasing amount of assessments on Arctic development and its impact on the environment and peoples.⁸⁶

Arctic Council scientific assessments are arguably its most visible and widely disseminated publications. They include the seminal 2004 Arctic Climate Impact Assessment (AMAP with CAFF), the influential 2009 Arctic Marine Shipping Assessment (PAME), and two 2013 reports: the Arctic Ocean Acidification Assessment (AMAP) and Arctic Biodiversity Assessment (CAFF).⁸⁷ The recommendations contained in these assessments have the potential to serve as the basis for better-coordinated marine management, Arctic-wide or regionally. Even as individual states continue to carry out management or monitoring activities either unilaterally or under bilateral or multilateral agreements, they can draw on related recommendations in these assessments.

While it is true that none of the Arctic Council Working Groups engages in its own original science, AMAP’s work is notable for following its own strict peer reviewed scientific procedures while leveraging scientific activity in each of the member states.⁸⁸ Since 1991 AMAP has coordinated and harmonized monitoring programs for persistent organic pollutants, heavy metals, and other harmful substances “run under the auspices of normal national monitoring programs from which states have extracted special national implementation plans for AMAP. The data is compiled within AMAP Thematic Data Centers (TDCs) and AMAP publishes the results of the work in regular thematic assessment reports.”⁸⁹ The parallels are not exact, but AMAP’s reliance on national monitoring plans may

85. Four working groups already existed under the AEPS: the Arctic Monitoring and Assessment Program (AMAP); the Conservation of Arctic Flora and Fauna Program (CAFF); Emergency Prevention, Preparedness and Response Working Group (EPPR); and Protection of the Arctic Marine Environment Working Group (PAME). After the Arctic Council was created, it added the Sustainable Development Working Group (SDWG) in 1998 and the Arctic Contaminants Action Program (ACAP) in 2006. *See Working Groups*, ARCTIC COUNCIL, <http://www.arctic-council.org/index.php/en/about-us/working-groups> [https://perma.cc/D3UP-KKC4] (last visited Feb. 10, 2016).

86. Kankaanpää, *supra* note 77, at 65. Kankaanpää laments the great volume of Arctic Council products available only in the gray literature and scattered across various working group websites. *Id.* at 65 n.11.

87. For a list of Arctic Council assessments relevant to the marine Arctic, see the 2015–2025 Arctic Marine Strategic Plan. *AMSP 2015–2025*, *supra* note 54, at 7.

88. *See* Kankaanpää, *supra* note 77, at 68. The author sees these attributes of AMAP as unique among the six Arctic Council working groups. *See id.*

89. Kankaanpää, *supra* note 77, at 68 (footnote omitted).

provide a partial model for how an Arctic marine cooperation entity could draw on monitoring and other science produced by ICES and PICES, or by a new Arctic-wide marine science organization.

AMAP's harmonized monitoring protocols are the result of state and nonstate entities collaborating on common outcomes. Kankaanpää sees AMAP and the Arctic Council as examples of "boundary organizations," which "provide opportunities and incentives for creation and use of commonly prepared products ('boundary objects') such as assessments as well as common best practices or agreements that engage more frequent and productive co-operation by different knowledge groups in [sic] different sides of the boundary ('standardized packages')."90

Any broader Arctic marine cooperation mechanism established under the Arctic Council could connect different knowledge groups, such as ICES and PICES, for specific purposes, whether acting as a boundary organization or otherwise. The sui generis character of the Arctic Council as a high-level forum rather than an international organization makes it well suited to do so. Established by declaration rather than treaty, the Arctic Council still acts only by decision of its member states and follows clear rules of procedure.⁹¹ Nonetheless it enjoys more flexibility than multilateral treaty bodies to adjust its substantive focus and operating mechanisms—for example, by establishing a Task Force.⁹² One benefit of any cooperation mechanism established as a result of the TFAMC process could be to improve and regularize how the Arctic Council connects different knowledge producers, including treaty-based science bodies like ICES and PICES that address issues relevant to the Arctic marine area.

IV. ICES, PICES, AND THE ARCTIC COUNCIL: PRESENT AND POTENTIAL INTERACTIONS

ICES and PICES already work together on Arctic issues and have connections, formal and otherwise, to the work of the Arctic Council. This Part identifies important examples of collaboration between ICES and PICES, and of their work with the Arctic Council, to suggest how the TFAMC might determine

90. Kankaanpää, *supra* note 77, at 72 (citing David H. Guston, *Boundary Organizations in Environmental Policy and Science: An Introduction*, 26 SCI., TECH. & HUM. VALUES 399, 399–408 (2001)).

91. See generally Molenaar, *supra* note 84. The author discusses different aspects of the Arctic Council's Rules of Procedure. *Id.* at 569–78. Koivurova questions the recent move toward more treaty-based functions under Arctic Council auspices as a surprisingly quick retreat from the benefits of the soft law approach under which the Council has operated since its inception. See Timo Koivurova, *Increasing Relevance of Treaties: The Case of the Arctic [Agora: The End of Treaties?]*, AM. SOC. INT'L L.: AJIL UNBOUND (May 6, 2014, 3:03 PM), <http://www.asil.org/blogs/increasing-relevance-treaties-case-arctic-agora-end-treaties> [https://perma.cc/AA3H-WSJZ].

92. On the Arctic Council's flexibility in establishing working groups, task forces, programs and projects, see Timo Koivurova & Md. Waliul Hasanat, *The Climate Policy of the Arctic Council*, in 50 ENVIRONMENT AND POLICY: CLIMATE GOVERNANCE IN THE ARCTIC 51, 58 n.26 (Timo Koivurova et al. eds., 2009).

whether a new Arctic-wide marine science organization would benefit the Arctic Ocean.

In contrast to the Arctic Council's science-based assessments and recommendations on Arctic marine issues, ICES and PICES conduct original scientific research.⁹³ ICES and PICES have distinct mandates and enjoy well-established reputations as premier intergovernmental marine scientific organizations in their respective geographic areas. As discussed in Part I of this Article, ICES provides science-based management advice to governments and international organizations whereas PICES engages in scientific studies in its region but by design does not generate fisheries or other management advice.⁹⁴ Even when combining their geographic range, however, much of the Arctic Ocean remains outside the scope of their work, since ICES covers only the North Atlantic portion of the Arctic Ocean and PICES only the Pacific Ocean north of thirty degrees north.⁹⁵

The ICES Council is the organization's governing body and is responsible for decision and policy making. Two delegates from each of the twenty member states serve on the Council.⁹⁶ Three committees, the Advisory Committee, the Science Committee, and the Finance Committee, carry out ICES's work alongside ICES's multiple expert groups. Of ICES's expert groups, the Arctic Fisheries is the only one focusing exclusively on the Arctic.⁹⁷

PICES operates through a Governing Council and four Scientific Committees. Two of the PICES Governing Council's functions are "(a) to identify research priorities and problems pertaining to the area concerned, as well as appropriate methods for their solution" and "(d) to consider requests to develop scientific advice pertaining to the area concerned."⁹⁸ The four Scientific Committees—Fishery Science, Biological Oceanography, Marine Environment Quality, and Physical Oceanography and Climate—are responsible for "the planning, direction, and overseeing of major themes within the Organization's general scientific aims."⁹⁹

In 2014 the PICES Governing Council issued a decision on Arctic-based activities in which its members agreed that PICES does not need to initiate Arctic-related activities but could engage in "modest cost activities that pertain to Arctic

93. The author has previously discussed the work of ICES and PICES in the context of an "Arctic Ocean Coordinating Agreement." See Baker & Yeager, *supra* note 56, at 377, 389–91.

94. See ICES Convention, *supra* note 3, at art. 2; PICES Convention, *supra* note 4, at art. II.

95. ICES Convention, *supra* note 3, art. 2; PICES Convention, *supra* note 4, art. II.

96. ICES ANNUAL REPORT 2012, INT'L COUNCIL FOR THE EXPL. OF THE SEA, 5 (Celine Byrne et al. eds., 2013), <http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Annual%20Report/ANNUAL%20REPORT%202012%20WEB.pdf> [<https://perma.cc/R32Z-55ZS>].

97. PAME ICES Paper 2013, *supra* note 12, at 4–6.

98. PICES Convention, *supra* note 4, art. V, para. 1, § (d).

99. Organization Structure 2014–2015, N. PAC. MARINE SCI. ORG., https://pices.int/about/organization_structure_3.aspx [<https://perma.cc/5AAK-VV9E>] (last visited Feb. 10, 2016).

interactions with the PICES convention area.”¹⁰⁰

This decision was based on “comments from Contracting Parties on PICES involvement in Arctic-based activities.”¹⁰¹ It is unclear whether this decision can be revisited in later years, but it does reflect PICES’s fundamental restraint and understanding that the Arctic is beyond its primary realm of responsibility. This welcome approach, combined with PICES’s clear history and mandate of not providing management advice, may be a more appropriate model for any new Arctic-wide science organization.

At the inter-organizational level, the Arctic Council has not yet acted on ICES’s application for observer status. ICES is, however, an observing organization of the Arctic Council AMAP working group.¹⁰² AMAP and ICES have collaborated on a number of projects¹⁰³ and as early as 2013 floated “the possibility of creating a framework where secretariat representatives from marine organizations such as ICES and AMAP could meet more regularly to exchange information and work on concrete tasks.”¹⁰⁴ PICES has not sought observer status at the Arctic Council. In 2014 the PICES Governing Council included AMAP in its revised Standing List of International and Regional Organizations and Programs.¹⁰⁵

Collaboration on ocean acidification research provides a current example of links between the Arctic Council and the work of PICES and ICES. A program

100. PICES, 2014 Governing Council Decisions, at 2014/S/2, GC-2014 [hereinafter *Governing Council Decisions*] https://www.pices.int/publications/annual_reports/Ann_Rpt_14/2014-GC-decisions.pdf [<https://perma.cc/G6NK-UP8C>].

101. *Id.*

102. *AMAP Strategic Framework 2010+*, ARCTIC MONITORING & ASSESSMENT PROGRAMME 9 (Aug. 2010), <http://www.amap.no/documents/download/242> [<https://perma.cc/8BAZ-3VNM>]; see *How We Work: Scientific Cooperation*, ICES CIEM, <http://www.ices.dk/explore-us/how-we-work/Pages/Scientific-cooperation.aspx> [<https://perma.cc/S53C-YZSE>] (last visited Feb. 10, 2016).

103. See AMAP, 27th WG mtg. ¶ 14.11 (Sept. 16, 2013), www.amap.no/documents/download/1736 [<https://perma.cc/RP2E-JT5W>] [hereinafter *Torshavn Minutes*]. The report refers to “a meeting held between the ICES Secretariat and the AMAP WG Chair and Secretariat” (minutes are Doc. WG27/14.11/1), at which AMAP invited ICES to contribute to the AACAC. ICES invited AMAP to send experts to several relevant ICES working groups including the Study Group on Ocean Acidification (SGOA), the Working Group on Integrative, Physical-biological and Ecosystem Modelling (WGIPEM), the Joint PICES/ICES Workshop on Global Assessment of the Implications of Climate Change on the Spatial Distribution of Fish and Fisheries (WKSICCME), the Study Group on Integration of Economics, Stock Assessment and Fisheries Management (SGIMM), the Steering Group on Regional Sea Programmes (SSGRSP), and the Workshop on Benchmarking Integrated Ecosystem Assessment (WKBEMIA). *Id.*

104. *Torshavn Minutes*, *supra* note 103, at 25 (“The demand for this kind of network will be further investigated through informal channels, and will start in a simple version with a small number of representatives and organizations.”).

105. *Governing Council Decisions*, *supra* note 100 (listing dozens of organizations, including AMAP, Alaska Ocean Observing System, Bering Sea Ecosystem Study, Ecosystem Studies of Sub-Arctic Seas*, Global Ocean Observing System, International Arctic Science Committee, International Council for the Exploration of the Sea*, North Pacific Research Board*, Pacific Arctic Group, without indicating what the * signifies).

planned for the 2015 PICES Annual Science Meeting includes a session on Arctic Ocean Acidification (AOA), which indicates that AMAP's AOA work will be a key focus of the Ocean Acidification Observation Network for the North Pacific and adjacent areas of the Arctic Ocean.¹⁰⁶ For ICES's part, in 2012, "the ICES Study Group on Ocean Acidification [SGOA] adopted a resolution to contact other 'relevant international initiatives' on ocean acidification, including any undertaken by the Arctic Council."¹⁰⁷ This led to ICES's 2013 invitation to AMAP to send experts to the SGOA.¹⁰⁸

The ICES-PICES Strategic Initiative on Climate Change Impacts on Marine Ecosystems (SICCME), while not Arctic-specific, is "a collaboration created to respond to the need for credible, objective, and innovative science advice on the impacts of climate change on marine ecosystems."¹⁰⁹ Among its objectives are "[a]ctions resulting in Policy, Legal and Institutional Reforms for effective Ocean Governance, including in the High Seas, and strengthening the institutional framework, mandate and coordination of UN bodies with marine competencies."¹¹⁰

Tracking the actual participation of ICES and PICES experts in all working groups and interactions with each other and the Arctic Council is beyond the scope of this paper. The apparent increase in the volume of such interactions in recent years does, however, suggest the need to evaluate which topics of interest to the Arctic Council these interactions address, and which they do not. This evaluation should be a cooperative effort of the TFAMC, ICES, and PICES, ideally with input from other relevant Arctic marine science organizations.

The central role of scientists in establishing PICES and ICES should guide the work of the TFAMC. Scientists were the driving force behind founding both ICES and PICES and should play a central role in assessing the need for any new Arctic-wide marine science organization.¹¹¹ In terms of participation, this can occur through scientists serving on the national delegations to the meetings, through including ICES, PICES, and other Arctic marine scientists as "invited experts,"¹¹² and possibly, through engaging with the Arctic science research boards and commissions of the Arctic Council member states. In terms of substance, a possible focus of the Task Force or its invited science experts could be to study the extent to which PICES, ICES, and other marine science organizations are already providing scientific results needed to implement the

106. *PICES 2015 Annual Meeting*, N. PAC. MARINE SCI. ORG., <https://www.pices.int/meetings/annual/PICES-2015/2015-sci-program.aspx> [<https://perma.cc/CF7H-SARR>] (last visited Feb. 10, 2016).

107. PAME ICES Paper 2013, *supra* note 12, at 6 (citation omitted).

108. Torshavn Minutes, *supra* note 103, at 24–25.

109. ICES STOCKTAKING, *supra* note 13, at 5.

110. *Id.* at 7, objective 3.

111. *See supra* Part I.

112. 2015 *SAO Report*, *supra* note 2, at 77 (specifying TFAMC members as "[r]epresentatives from the Arctic States, Permanent Participants, observers, and invited experts as may be necessary").

Arctic Council's 2015–2025 Arctic Marine Strategic Plan.

In terms of process and institutional structure, it is far too early to recommend for or against an Arctic-wide marine science organization, but it is possible to consider alternatives to establishing an entirely new organization. One possibility would be to amend the geographic scope of ICES or PICES to cover all of the Arctic Ocean. The restraint of PICES's 2014 Governing Council decision to pursue only modest Arctic activity beyond its geographic reach¹¹³ suggests that PICES would not be as open to such a change as would ICES.

The possibility of expanding ICES's geographic scope to include all of the Arctic, however, raises several questions beyond the fundamental query of whether there are scientific grounds or expertise within ICES for such an expansion. Legally, an initial question is whether enough of the member states would support an amendment as required under the ICES Convention and rules of procedure.¹¹⁴ Another question is whether an expanded geographic scope would automatically entail an advisory role on Arctic marine living resources. This is a potentially fraught question for Arctic and non-Arctic states alike, especially given the absence of a fishery or fishery management organization for most areas of the Arctic.¹¹⁵ This question gives rise to another: If ICES's geographic area were expanded to include all of the marine Arctic, would the Arctic Council simply be added to the list of "competent authorities" who can request advice, or would it have a special status, and, if so, what would that status be? Variations on these questions would also apply in designing any new Arctic-wide marine science organization.

The questions raised above—regarding scientists' participation, scientific substance, and organizational process—easily fall within the terms of reference of the Task Force on Arctic Marine Cooperation. The first two questions, however, are practical prerequisites to addressing the third category of process and structure. This sequence is true whether negotiators would be creating a new marine science organization or revising the mandates of those that already exist.

113. See *supra* text accompanying note 100.

114. The ICES Convention contains no provisions regarding its amendment; without specific reference to the ICES Convention, Rule 13 (vii) of the ICES Rules of Procedure states that it shall be the duty of the Bureau "to present to the Council for approval with such observations and amendments as it may deem appropriate." INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA [ICES], RULES OF PROCEDURE, at 5, ICES Doc. CM 2014 (Oct. 22 2014), http://www.ices.dk/explore-us/who-we-are/Documents/ICES_Rules_of_Procedure.pdf [<https://perma.cc/CC9D-66MQ>]. The Bureau is the Executive Committee of ICES. See ICES Convention, *supra* note 3, art. 11.

115. On gaps and possibilities for Arctic fisheries organizations, see, for example, Ted McDorman, *Marine Living Resources: Fisheries Resources*, in PROTECTION OF THE ARCTIC MARINE ENVIRONMENT, THE ARCTIC OCEAN REVIEW MAY 2013 FINAL REPORT 45, 46–48 (2013), http://www.pame.is/images/03_Projects/AOR/Reports/126082_pame_sept_2.pdf [<https://perma.cc/A3YA-NC53>]; Erik J. Molenaar, *Arctic Fisheries and International Law: Gaps and Options to Address Them*, 6 CARBON & CLIMATE L. REV. 63 (2012).

CONCLUSION

The Arctic Council Task Force on Arctic Marine Cooperation established in 2015 was asked to do three things: identify future needs for cooperation in the Arctic marine environment, recommend whether the Council should “begin negotiations on a cooperation mechanism for Arctic marine areas,” and make other recommendations that the Task Force deems appropriate.¹¹⁶ The Task Force was not explicitly asked to assess the need for an Arctic-wide marine science organization (MSO). Indeed, by constituting the Task Force, the Arctic Council did not commit to establishing a cooperation mechanism, much less an Arctic MSO, but only to producing recommendations on how the Arctic Council can best further increased cooperation in the Arctic marine area. The need for an Arctic-wide MSO is not a determination that the Task Force should make on its own but rather, if at all, in close consultation with marine scientists active in the Arctic. The Task Force should also consult closely with the Arctic Council Permanent Participants about the possibility of creating an organization in which marine science and Traditional Knowledge both inform understanding of management needs in the Arctic marine area.

The founding histories of ICES—the International Council for the Exploration of the Sea—and PICES—the North Pacific Marine Science Organization—offer useful lessons to the Task Force. Just as scientists were the driving force behind the formation of ICES and PICES, they should be the arbiters of the scientific need for any new Arctic-wide MSO. Similarly, just as developments in law, science, and geopolitics informed ICES’s formation in 1902 and PICES’s creation in 1992, an understanding of similar trends today must form the backdrop for any determination of the need for an Arctic-wide MSO. The Arctic Marine Strategic Plan (AMSP) has identified some of those developments by establishing the Arctic Council’s priorities for action in the region. The Task Force should supplement those priorities with (i) a robust exploration of how existing marine science organizations cooperate with each other and with Traditional Knowledge holders to increase understanding of the relationship between the Arctic marine area and climate change, (ii) new thinking about how to share national best practices and protections in and beyond national jurisdiction, and (iii) how to strengthen ecosystem approaches to conserving the biodiversity and other assets of the Arctic marine area. A significant development since 1902, and even since 1992, that the Task Force should consider is the increased recognition of Traditional Knowledge as a source of essential information for understanding Arctic sustainability and natural processes.¹¹⁷

116. 2015 *SAO Report*, *supra* note 2, at 77–78.

117. See, e.g., *supra* notes 72–74; Ray Barnhardt, *Introduction to Indigenous Knowledge, Climate Change and Sustainability*, in *NORTH BY 2020: PERSPECTIVES ON ALASKA’S CHANGING SOCIAL-ECOLOGICAL SYSTEMS* 56, 63 (Amy Lauren Lovcraft & Hajo Eicken eds., 2011); Todd Radenbaugh & Sarah Wingert Pederson, *Values of Nushagak Bay: Past, Present, Future*, in *NORTH BY 2020:*

Creating an Arctic MSO as part of the TFAMC process would be premature, even if such an entity would help the Arctic Council implement the AMSP. The Task Force should focus first on options for creating a regular mechanism for existing Arctic organizations—marine science and otherwise—to interact with each other in a more organized and targeted way. The Arctic Council, ICES, and PICES already work with each other through various channels, but only on an ad hoc basis through a patchwork of agreements and projects. Creating a regular mechanism for their interaction with each other and with other institutions would help identify geographic and substantive areas not adequately covered by the combined geographic and substantive reach of those institutions. Experience gained in the creation and early years of any such coordination mechanism could in turn inform the creation of an Arctic-wide MSO if and when the need for it becomes clear. Such experience will be essential to providing answers to questions only touched on in this Article: Is it, for example, scientifically and politically desirable to establish a formal relationship for providing science advice to the Arctic Council? If so, should an Arctic MSO be a hybrid of ICES, which has a formal mandate to provide management advice to competent authorities, and PICES, which eschews that role, or should its structure be something entirely new?

The developments in science, geopolitics, and international law from which ICES, PICES, and the Arctic Council emerged, and how those institutions interact, should inform any cooperation mechanism recommended by the TFAMC. By also studying these influences for the many other institutions that might support greater cooperation in the Arctic marine area, the Task Force can generate structures not yet tried but with great potential to strengthen that cooperation. As Kankaanpää observes:

The Arctic Council is increasingly . . . becoming a true boundary-spanning forum, an institution that actively works to construct informal and new arenas, to foster user-producer dialogues, define products jointly, and . . . possesses the capacity to promote science and policy discussions across sectors, disciplines, between different levels, and interest groups, which will most likely be its main future asset.¹¹⁸

PERSPECTIVES ON ALASKA'S CHANGING SOCIAL-ECOLOGICAL SYSTEMS, *supra* at 95, 96.

118. Kankaanpää, *supra* note 77, at 76.

