

5-29-2018

Polar Opposites: Assessing the State of Environmental Law in the World's Polar Regions


Mark P. Nevitt

University of Pennsylvania Law School, nevitt63@law.upenn.edu

Robert V. Percival

University of Maryland Francis King Carey School of Law, rpercival@law.umaryland.edu

Follow this and additional works at: <http://lawdigitalcommons.bc.edu/bclr>

 Part of the [Environmental Law Commons](#), [International Law Commons](#), [Military, War, and Peace Commons](#), and the [Natural Resources Law Commons](#)

Recommended Citation

Mark P. Nevitt & Robert V. Percival, *Polar Opposites: Assessing the State of Environmental Law in the World's Polar Regions*, 59 B.C.L. Rev. 1655 (2018), <http://lawdigitalcommons.bc.edu/bclr/vol59/iss5/4>

This Article is brought to you for free and open access by the Law Journals at Digital Commons @ Boston College Law School. It has been accepted for inclusion in Boston College Law Review by an authorized editor of Digital Commons @ Boston College Law School. For more information, please contact nick.szydowski@bc.edu.

POLAR OPPOSITES: ASSESSING THE STATE OF ENVIRONMENTAL LAW IN THE WORLD’S POLAR REGIONS

MARK P. NEVITT & ROBERT V. PERCIVAL

INTRODUCTION	1657
I. THE ARCTIC REGION: GROWING IN IMPORTANCE BUT LACKING A COMPREHENSIVE & BINDING LEGAL REGIME	1660
<i>A. The Arctic Region: In Need of a Well-Established and Understood Definition</i>	1660
<i>B. The Arctic Council: A Source of Cooperation and Stability for the Region with an Evolving and Important Role in Arctic Governance</i>	1663
<i>C. The United Nations Convention on Law of the Sea (“UNCLOS”) and Future Arctic Governance</i>	1667
1. UNCLOS: A Promising but Ultimately Imperfect Mechanism to Resolve Competing Arctic Sovereignty Issues	1668
2. Additional International Environmental Agreements Will Take on Increased Importance in the Arctic	1673
II. ANTARCTICA: AN ENVIRONMENTAL LAW SUCCESS STORY ANCHORED BY THE ANTARCTIC TREATY SYSTEM	1675
<i>A. Defining Antarctica</i>	1675
<i>B. Antarctic Treaty System</i>	1676
<i>C. Regulation of Mineral Extraction in Antarctica</i>	1678
<i>D. Protocol on Environmental Protection to the Antarctic Treaty (“Madrid Protocol”)</i>	1680
III. THE FUTURE OF ARCTIC GOVERNANCE AND THE RISE OF GLOBAL ENVIRONMENTAL LAW.....	1682
<i>A. Comparing and Contrasting the Polar Regions</i>	1682
<i>B. The Rise of Global Environmental Law and Its Significance in the Polar Regions</i>	1686
1. Global Environmental Law and Arctic Indigenous Peoples.....	1686
2. Global Environmental Law and International Maritime Organization (IMO) Adoption of Polar Codes	1688
IV. THE FIVE KEY FACTORS AFFECTING THE FUTURE OF ARCTIC GOVERNANCE.....	1690
<i>A. First Factor: UNCLOS and the CLCS’s Long-Term Viability to Decide Competing Continental Shelf Claims</i>	1690
1. The United States Has Not Ratified UNCLOS, Nor Is There a Timeline to Do So	1691
2. The CLCS’s Ability to Issue Binding Recommendations Accepted by Arctic Stakeholders Remains Uncertain	1692
<i>B. Second Factor: Russia Ambitions and Russia-NATO Relations in the Arctic</i>	1693
<i>C. Third Factor: The True Pace of Climate Change and “Stationarity” in the Arctic</i>	1696
<i>D. Fourth Factor: Energy Prices, Regulatory Permitting and Extraction Costs</i>	1697
<i>E. Fifth Factor: Divergent Interests Between Arctic Coastal States, Arctic Non-Coastal States, and Non-Arctic States</i>	1698
CONCLUSION	1698
APPENDIX	1700

POLAR OPPOSITES: ASSESSING THE STATE OF ENVIRONMENTAL LAW IN THE WORLD'S POLAR REGIONS

MARK P. NEVITT*
ROBERT V. PERCIVAL**

Abstract: Climate change is fundamentally transforming both the Arctic and Antarctic polar regions. Yet these regions differ dramatically in their governing legal regimes. For the past sixty years the Antarctic Treaty System, a traditional “hard law” international law treaty system, effectively de-militarized the Antarctic region and halted competing sovereignty claims. In contrast, the Arctic region lacks a unifying Arctic treaty and is governed by the newer “soft law” global environmental law model embodied in the Arctic Council’s collaborative work. Now climate change is challenging this model. It is transforming the geography of both polar regions, breaking away massive ice sheets in Antarctica, melting the polar ice cap in the Arctic, opening maritime trade routes, and renewing the possibility for natural resource extraction. Will the Arctic experience a peaceful future similar to its sister polar region, or will it emerge as a polar “wild west” with increasing geopolitical tension between the Arctic states? Will a new polar Cold War emerge between Russia and the other four North Atlantic Treaty Organization Arctic coastal nations? This Article addresses these questions—and others—while making three new contributions to legal scholarship. First, we closely examine the different legal models in both the Arctic and Antarctica, discerning what lessons the ATS—one of the most successful international agreements in history—can be applied to the Arctic. Second, we analyze the unique significance played by global environmental law in the context of the polar regions, best embodied by the collaborative work of the Arctic Council. Third, in light of the uncertainty posed by climate change and the potential for rising geo-

© 2018, Mark P. Nevitt & Robert V. Percival. All rights reserved.

* Sharswood Fellow at the University of Pennsylvania Law School. A former active duty Navy Judge Advocate General who served in the rank of commander, he has served in a variety of legal assignments within the Department of Defense, most recently serving as the Deputy Director of Administrative Law for the Office of the Judge Advocate General (Navy). He received his J.D. and LL.M. from Georgetown and B.S.E. from the University of Pennsylvania (Wharton). He would like to thank the University of Pennsylvania Law School librarians, particularly Mr. Alvin Dong and Mr. Ben Meltzer for their outstanding research and editing assistance.

** Professor of Law and Director of the Environmental Law Program, University of Maryland Francis King Carey School of Law. He would like to thank Robin Cleland (Maryland Law, Class of 2017) for research assistance with this Article and faculty from Maryland Carey Law and the Florida State College of Law for valuable comments at faculty workshops that reviewed previous drafts of this Article.

political tensions, we provide a new framework to analyze future Arctic governance to include the five key factors that will determine the Arctic's future.

INTRODUCTION

The planet's polar regions are the most environmentally sensitive areas on earth with the harshest climatic conditions. Yet they differ dramatically in their topography as well as their governing legal regimes. Although the Arctic Ocean lies at the heart of the Arctic polar region, the continent of Antarctica—the coldest, driest, and windiest landmass on earth—dominates the Antarctic polar region. Free from any military activities and competing sovereignty claims, Antarctica has been a place of peace and stability for more than a half century. This is largely due to the remarkable international environmental law success of the Antarctic Treaty System (“ATS”), a series of forward-looking international agreements that de-militarized Antarctica and halted competing sovereignty claims.¹ The ATS “hard law” regime prohibits access to Antarctica's vast potential mineral resources, effectively establishing a “land without a sovereign” and worldwide nature reserve. In contrast, the Arctic region lacks a comprehensive and Arctic-specific treaty binding on all Arctic stakeholders and is largely governed by the work of the Arctic Council and a loose hodgepodge of “soft law” agreements.

But climate change is challenging this construct. It is transforming the polar regions in fundamental ways, calling into question the existing Arctic soft law model. Indeed, the Inter-Governmental Panel on Climate Change states that climate change's most immediate and intense effects are already appearing in the polar regions, areas already warming at twice the rate of the rest of the planet.² In July 2017, an ice sheet the size of Delaware broke away from the continent of Antarctica, potentially foreshadowing the beginning of a massive polar ice sheet fragmentation with an unknown impact on global sea level rise.³ Indeed, the Arctic polar ice caps are melting at the fastest rate in recorded history, re-making trade routes, removing the ice cap “ceiling,” and opening the possibility for massive oil and gas extraction.⁴ Highlighting this remarka-

¹ Melissa A. Verhaag, Note, *It Is Not Too Late: The Need for a Comprehensive International Treaty to Protect the Arctic Environment*, 15 GEO. INT'L ENVTL. L. REV. 555, 571 (2003) (describing the Antarctica Treaty as “[a]rguably the most successful international treaty in existence”).

² Don Walsh, *The Arctic Ocean—Hot Times in a Cold Place*, PROCEEDINGS MAG., July 2017, at 91, 91 (stating that the Arctic is warming twice as fast as the rest of the planet and detailing the rate of ice loss and decrease in ice thickness).

³ Sean Greene, *Antarctica Shed a Block of Ice the Size of Delaware, but Scientists Think the Real Disaster Could Be Decades Away*, L.A. TIMES (July 13, 2017, 4:00 AM), <http://www.latimes.com/science/sciencenow/la-sci-sn-larson-ice-sheet-20170713-htmlstory.html> [<https://perma.cc/7KN3-Z9KQ>].

⁴ Joseph F.C. DiMento, *Environmental Governance of the Arctic: Law, Effect, Now Implementation*, 6 U.C. IRVINE L. REV. 23, 25–26 (2016).

ble change, a cruise ship with 900 passengers recently navigated the Northwest Passage in the Arctic—the largest such journey of a vessel that size in recorded human history.⁵

Natural resources abound in the Arctic, home to an estimated one-fifth of the world's oil and gas resources. Most reside offshore and lie untapped.⁶ Although lower worldwide oil prices have temporarily halted a massive Arctic oil rush, private industry remains interested in the Arctic as a future source of valuable oil, gas, and mineral resources.⁷ In light of the diverse impacts of climate change, the work of the consensus-based Arctic Council, an intergovernmental forum for the eight Arctic states, has taken on increased importance. The precise legal contours of which nation has the unadulterated rights to access these resources, however, remain unclear.

Long-term uncertainty looms in the Arctic as global warming rapidly shrinks the Arctic ice pack and opens navigational waterways.⁸ We ultimately foresee an increased competition for oil and mineral exploitation, competing continental shelf claims, and greater potential for environmental damage in light of increased shipping traffic in the Arctic.⁹ Additional questions arise: Will the future Arctic resemble a new global “wild west” as nations compete and confront one another for its untapped resources? Or will the Arctic have a more peaceful and stable future mirroring the stability enjoyed by Antarctica

⁵ Rachel Waldholz, *In Warmer Climate, a Luxury Cruise Sets Sail Through Northwest Passage*, NAT'L PUB. RADIO (Aug. 27, 2016, 6:38 AM), <https://www.npr.org/2016/08/27/491337521/in-warmer-climate-a-luxury-cruise-sets-sail-through-northwest-passage> [<https://perma.cc/XK4W-HEKL>].

⁶ See DiMento, *supra* note 4, at 25.

⁷ See *Env'tl. Def. Fund v. Massey*, 986 F.2d 528, 529 (D.C. Cir. 1993) (stating that Antarctica is a “continent without a sovereign”). Drilling for oil in the Arctic has been mitigated, somewhat, by the lower cost of oil. See Emily Atkin, *Shell Can Now Begin Drilling in the Arctic*, THINK PROGRESS (July 23, 2015, 2:14 PM), <https://thinkprogress.org/shell-can-now-begin-drilling-in-the-arctic-66a4508d31eb/> [<https://perma.cc/KPT2-CX4E>] (reporting on the Obama Administration's granting of Shell to begin exploratory drilling in the Chukchi Sea, about 140 miles from Alaska's northwest shoreline); Steven Lee Myers & Clifford Krauss, *Melting Ice Isn't Opening Arctic to Oil Bonanza*, N.Y. TIMES (Sept. 7, 2015), <https://www.nytimes.com/2015/09/08/world/europe/melting-ice-isnt-opening-arctic-to-oil-bonanza.html?mcubz=0> [<https://perma.cc/N4DZ-S5X4>] (reporting that, despite rapidly melting ice, it is still difficult for countries to extract oil and natural gas from the Arctic Circle).

⁸ By accelerating the melting of the polar ice cap and Antarctic ice shelves, climate change is fundamentally changing the geography of both polar regions. The Arctic Climate Impact Assessment stated that “the most rapid and severe climate change on earth” is occurring in the Arctic. ARCTIC CLIMATE IMPACT ASSESSMENT, IMPACTS OF A WARMING ARCTIC 10 (2004). Climate change is dramatically impacting the two polar regions. See *generally id.*

⁹ Some commentators have noted that the lack of a clear and binding governing Arctic legal regime may cause the Arctic to “erupt in an armed mad dash for its resources” See *generally* LAURENCE C. SMITH, THE NEW NORTH: THE WORLD IN 2050 (2011) (discussing the overlapping effects of climate change, population growth, and globalization on our planet's future); Scott G. Borgerson, *Arctic Melt-down: The Economic and Security Implications of Global Warming*, FOREIGN AFFAIRS (Mar./Apr. 2008), <https://www.foreignaffairs.com/articles/arctic-antarctic/2008-03-02/arctic-meltdown> [<https://perma.cc/9CAD-8M2X>] (discussing the political and economic implications of rapid global warming); Verhaag, *supra* note 1 (discussing the environmental vulnerability of the Arctic).

for the past sixty years? Is the “soft law” and consensus-based Arctic governance model sufficient to address this historic geopolitical and environmental shift or, ultimately, will a “hard law” solution such as a comprehensive and binding Arctic Treaty be required to mitigate geopolitical tensions and competing sovereignty interests?¹⁰ This Article examines these questions, and others, by deciphering what lessons—if any—Antarctica can teach the Arctic. It also provides a new framework, highlighting the five key factors—discussed below—that will have an increasingly important impact on the future of Arctic governance. We assert that although the ATS system cannot be replicated in the Arctic, important lessons can be drawn from the ATS success, which should serve as an inspiration and polar muse for future Arctic governance matters.

First and foremost, the Arctic’s changing geography reinforces the need for the United States to ratify the United Nations Convention on the Law of the Sea (“UNCLOS”).¹¹ This will ensure a seat at the table for the United States in continental shelf deliberations—critical to finalize competing continental shelf claims among the Arctic nations. Second, we assert that global environmental law will continue to play an outsized role in both polar regions. As calls for negotiating an over-arching Arctic Treaty have been met with skepticism, Arctic stakeholders have taken several proactive and incremental steps via the Arctic Council to improve environmental protection. Indeed, these initiatives are consistent with global environmental law’s emphasis on private and public partnerships that emerge organically from the “bottom-up.” Third, we assert that the Arctic region’s future hinges on five key factors: (1) UNCLOS’s long-term ability to solve competing continental shelf claims; (2) long-term Russian military ambitions in the Arctic; (3) the true pace of climate change in the polar regions; (4) the future cost of extracting oil and minerals from the Arctic; and (5) potentially divergent geopolitical interests between Arctic coastal states, non-coastal states and non-Arctic states. As of this writing, lower global oil prices have temporarily stalled the race to exploit Arctic resources—but this may not be a permanent state of affairs. As such, this is *the* opportune time to strengthen environmental protection and governance in the Arctic.

Part I provides an overview of the Arctic region, addressing its geography and environment as well as providing an overview of its soft law system, ex-

¹⁰ See Sarah E. Light, *The Military-Environmental Complex*, 52 B.C. L. REV. 879, 919 (2014) (describing the U.S. Department of Defense recognizing the Arctic as a “potential new area[] of conflict” upon receiving news that Russian naval vessels were “patrolling newly opened shipping lanes in the Arctic Ocean”). See generally Jean Galbraith & David Zaring, *Soft Law as Foreign Relations Law*, 99 CORNELL L. REV. 735 (2014) (examining the effectiveness of using soft law as foreign relations law before concluding that soft law should be recognized as a viable way for executive agencies to engage in foreign relations).

¹¹ United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter UNCLOS].

emplified by the increasingly important work of the Arctic Council.¹² Part II provides an overview of Antarctica, including its geography, environment, and a summary of the ATS.¹³ After analyzing and comparing the legal regimes governing the two polar regions, Part III looks to the role of global environmental law in the Arctic while offering initial recommendations to improve environmental protection and to defuse future conflicts in the polar regions.¹⁴ Part IV surveys the five critical factors that will have the greatest impact on future Arctic governance, and offers initial recommendations to neutralize any potential rising tensions.¹⁵

I. THE ARCTIC REGION: GROWING IN IMPORTANCE BUT LACKING A COMPREHENSIVE & BINDING LEGAL REGIME

A. The Arctic Region: In Need of a Well-Established and Understood Definition

The Arctic region encompasses a diverse maritime-centric area bordering several nations that is home to almost four million people. The terms “Arctic” and “Arctic region,” however, lack a universally accepted definition among lawyers and scientists.¹⁶ Under the Arctic’s most commonly used definition, it encompasses all “the land and sea area north of the Arctic Circle”—defined as latitude 66.34° North.¹⁷ But another Arctic definition includes all the land and sea area where the average temperature is below ten degrees Celsius in July (the warmest month of the year there).¹⁸ This definition creates an irregularly shaped circle that excludes Finland and Sweden.¹⁹ An Arctic Council working group, the Arctic Monitoring and Assessment Programme (“AMAP”), has adopted yet another definition of the Arctic region to encompass “the terrestrial and marine areas north of the Arctic Circle (66°32’ N), and north of 62°N in Asia and 60°N in North America, modified to include the marine areas of the Aleutian chain, Hudson Bay, and parts of the North Atlantic”²⁰

¹² See *infra* notes 16–118 and accompanying text.

¹³ See *infra* notes 119–185 and accompanying text.

¹⁴ See *infra* notes 186–232 and accompanying text. It is beyond the scope of the Article to provide an in-depth analysis of all the difficulties of environmental cleanup in the Arctic. But the underlying harsh conditions and distance from sophisticated cleanup resources make environmental pollution cleanup and remediation particularly difficult. See Verhaag, *supra* note 1, at 559–60 (listing six reasons why the Arctic’s environmental concerns are “more acute than in most other areas of the globe”).

¹⁵ See *infra* notes 233–279 and accompanying text.

¹⁶ RONALD O’ROURKE, CONG. RESEARCH SERV., R41153, CHANGES IN THE ARCTIC: BACKGROUND AND ISSUES FOR CONGRESS 1–2 (2014).

¹⁷ *Id.*

¹⁸ *Id.* at 4.

¹⁹ See *infra* note 27 and accompanying figure.

²⁰ *Id.* at 5.

Within U.S. law, “Arctic” is defined in the 1984 Arctic Research and Policy Act, as incorporating a large area *below* the Arctic Circle to include the Aleutian Island chain.²¹ It states:

As used in this title, the term “Arctic” means all U.S. and foreign territory north of the Arctic Circle and all U.S. territory north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwin Rivers; all contiguous areas, including the Arctic Ocean and the Beaufort, Bering and Chuckhi Seas, and the Aleutian island chains.²²

Eight nations—Canada, Denmark (via Greenland), Finland, Iceland, Norway, Russia, Sweden, and the United States (via Alaska) have boundaries within the Arctic Circle.²³ These eight nations, often called the “Arctic nations,” are longstanding members of the Arctic Council.²⁴ Within these eight Arctic nations, five Arctic coastal states (Canada, Denmark, Norway, Russia, and the United States) have continental shelves in the Arctic, however it is defined.²⁵ As discussed below, determining the extent of a nation’s continental shelf is critically important for oil, gas, and mineral extraction rights. Unlike Antarctica, which has no permanent population, indigenous people reside in seven of the eight Arctic nations. Indigenous peoples have inhabited the Arctic for thousands of years—and their communities are increasingly vulnerable to climate change’s impacts.²⁶

The Arctic Ocean—illustrated in Figure 1 of the Appendix²⁷—is the world’s smallest ocean, yet it dominates the Arctic region, forming an increasingly vital maritime connection between the northern Atlantic and northern Pacific Ocean. Its circular basin is nearly 150% larger than the United States.²⁸ And the Arctic Ocean’s “deep central basin . . . is almost completely surrounded by the coastal States’ continental shelves”—similar to five orange wedges merging at the North Pole.²⁹ No other place on earth witnesses such a geopolit-

²¹ *Id.* at 2.

²² 15 U.S.C. § 4111 (2012). The Arctic Research and Policy Act was passed to provide a comprehensive policy on research needs in the Arctic, and “designated the National Science Foundation . . . as the lead federal agency for implementing Arctic research policy” O’ROURKE, *supra* note 16, at 5.

²³ O’ROURKE, *supra* note 16, at 1–2. Of note, no accepted definition of the Arctic *excludes* the lower two-thirds of Alaska or the Bering Sea and Bering Strait. *Id.*

²⁴ *Id.* at 2.

²⁵ *Id.*

²⁶ *Id.* at 36–41.

²⁷ PAT: THE FREE, OPEN SOURCE, PORTABLE ATLAS, <https://ian.macky.net/pat/map/arct/arctblu2.gif> [<https://perma.cc/K8NL-22BG>].

²⁸ Christopher C. Joyner, *The Legal Regime for the Arctic Ocean*, 18 J. TRANSNAT’L L. & POL’Y 195, 201 (2009).

²⁹ See Brent Carpenter, Comment, *Warm Is the New Cold: Global Warming, Oil, UNCLOS Article 76, and How an Arctic Treaty Might Stop a New Cold War*, 39 ENVTL. L. 215, 231 & n.134 (2009) (citing Arthur Grantz, *Treatment of Ridges and Borderlands Under Article 76 of the United Nations*

ical convergence. The major seaports are Prudhoe Bay in the United States, Churchill in Canada, and Murmansk in Russia.³⁰ The Chukchi Sea provides access to the northern Pacific Ocean and is of major strategic interest to Russia and the United States.³¹

The Arctic is warming twice as fast as the rest of the planet, altering the Arctic's unique geophysical character at a rapidly accelerating rate.³² Consider climate change's impact on the Arctic's perennial drifting polar ice pack. The size of the Arctic icepack has historically fluctuated, shrinking in the summer but freezing over during the winter months.³³ It averages between two and three meters of thickness and covers the Arctic throughout much of the year.³⁴ But this, too, is starting to change as the icepack fluctuations have become

Convention on Law of the Sea: The Example of the Arctic Ocean, in LEGAL AND SCIENTIFIC ASPECTS OF CONTINENTAL SHELF LIMITS 201, 203 (Myron H. Nordquist et al. eds., 2004).

³⁰ Unlike Russia, the United States currently does not have a major military facility or airfield bordering the Arctic Ocean, nor are there immediate plans to build one. See David Vine, *Where in the World Is the U.S. Military?*, POLITICO (July/Aug. 2015), www.politico.com/magazine/story/2015/06/us-military-bases-around-the-world-119321 [<https://perma.cc/HT45-V8SC>] (providing a map of U.S. military bases outside of the U.S.).

³¹ *The World Factbook: Arctic Ocean*, CENT. INTELLIGENCE AGENCY (2018) [hereinafter *CIA: Arctic Ocean*], <https://www.cia.gov/library/publications/the-world-factbook/geos/xq.html> [<https://perma.cc/SD9Y-KZPP>].

³² Walsh, *supra* note 2, at 91. Consistent with broader principles of international environmental law, the Arctic Council members have "common but differentiated [i.e. greater] responsibilities" to the world environment. See U.N. Conference on Environment and Development, The Rio Declaration on Environment and Development, Principle 7, U.N. Doc A/CONF.151/26 (June 3–14, 1992) (providing that countries must work to reverse environmental degradation based upon their individual contributions to such degradation).

³³ *CIA: Arctic Ocean*, *supra* note 31. The CIA further states:

Canada and the United States dispute how to divide the Beaufort Sea and the status of the Northwest Passage but continue to work cooperatively to survey the Arctic continental shelf; Denmark (Greenland) and Norway have made submissions to the Commission on the Limits of the Continental Shelf (CLCS) and Russia is collecting additional data to augment its 2001 CLCS submission; record summer melting of sea ice in the Arctic has renewed interest in maritime shipping lanes and sea floor exploration; Norway and Russia signed a comprehensive maritime boundary agreement in 2010.

Id.

³⁴ *Environment: Trends*, NAT'L SNOW & ICE DATA CTR. (2018), <http://nsidc.org/cryosphere/seaice/environment/trends.html> [<https://perma.cc/99RB-XWDJ>]. In addition, UNCLOS has a provision for "ice-covered areas." It states:

Coastal states have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence.

UNCLOS, *supra* note 11, art. 234.

more dramatic. Climate change is altering the ice pack's size: its surface size has decreased by an average three percent every ten years, and its thickness has decreased by at least sixty-five percent over the last four decades.³⁵

The summer ice pack has receded even more in recent years, opening up shipping lines and navigational waterways for the first time in human history. Mariners since the fifteenth century have been fascinated by the Arctic region's geography with an eye toward discovering shorter trade routes between Europe and Asia. Two seasonal waterways—the Northwest Passage through Canada and the somewhat lesser known but increasingly important Northern Sea route alongside Russia—can be found in the Arctic. The Northwest Passage contains several possible routes, all running through the Canadian Arctic Islands and linking trade from northeast Asia through North America to the northern Atlantic.³⁶ The Northern Sea Route hugs the Russian coastline. This route is of particular importance for Russia as it provides the shortest maritime link between the eastern and western part of the country, offering a potential shortcut to Europe and the Atlantic.³⁷

The fifteenth century dream is now becoming a twenty-first century reality. For the first time in history, the Northwest Passage and Northern Sea Route are becoming increasingly viable and witnessing a significant uptick in traffic. Indeed, a 900-passenger cruise ship successfully made the Northwest Passage journey through the Arctic Ocean in the summer of 2016—the first time that a vessel of that size made the journey in recorded history.³⁸

B. The Arctic Council: A Source of Cooperation and Stability for the Region with an Evolving and Important Role in Arctic Governance

The Arctic Council, the confederation of the eight Arctic nations, plays a critically important role in Arctic governance. The Arctic Council's genesis began modestly, but has demonstrated an ability to evolve and expand its role over time to meet emergent Arctic challenges. Arctic governance can be traced to the end of the Cold War when former Soviet Secretary General Mikhail Gorbachev called upon all of the Arctic nations to develop a more formalized international Arctic governance structure.³⁹ Two years following Gorbachev's

³⁵ Walsh, *supra* note 32, at 91.

³⁶ O'ROURKE, *supra* note 16, at 19. In 2013, the first bulk carrier (carrying coal) successfully sailed from western Canada to Finland via the Northwest Passage. *Id.*

³⁷ CIA: *Arctic Ocean*, *supra* note 31.

³⁸ Marc Thiessen, *Thanks to Melting Ice, Cruise Ship Travels Northwest Passage*, U.S. NEWS & WORLD REP. (Sept. 9, 2016, 9:21 AM), <https://www.usnews.com/news/news/articles/2016-09-09/giant-cruise-ship-makes-historic-voyage-in-melting-arctic> [<https://perma.cc/T6RL-DJSG>].

³⁹ Heather Exner-Pirot, *How Gorbachev Shaped Future Arctic Policy 25 Years Ago*, ANCHORAGE DAILY NEWS (Oct. 1, 2012), <https://www.adn.com/arctic/article/how-gorbachev-shaped-future-arctic-policy-25-years-ago/2012/10/01/> [<https://perma.cc/A7HQ-ELRA>].

call to action, the Exxon Valdez oil spill tragedy devastated the near Arctic region off the Alaskan coast. This heightened global awareness of the Arctic region's fragile environment, exposing the world's inability to respond to environmental disasters in the region. Arctic nations followed through on Gorbachev's earlier proposal in adopting the 1991 Rovaniemi Declaration in Rovaniemi, Finland.⁴⁰ This established the AMAP to monitor the levels of, and assess the effects of, pollutants in the Arctic environment.⁴¹ It also established the Arctic Environmental Protection Strategy ("AEPS")—a concrete effort to proactively identify and solve environmental problems in the Arctic.⁴²

Although short-lived, the AEPS laid the groundwork for future Arctic collaboration, culminating in the 1996 signing of the Ottawa Declaration.⁴³ This formally established the Arctic Council as a "high level forum" for "promoting cooperation, coordination, and interaction among the Arctic states . . ." ⁴⁴ The AEPS's legacy and environmental focus can be seen in the Arctic Council's construct and focus.⁴⁵ Indeed, all eight AEPS signatories signed the Ottawa Declaration and many of the AEPS working groups established by the AEPS are incorporated within the Arctic Council.⁴⁶ Within the Arctic Council, five of the Arctic coastal states (Canada, Denmark, Norway, Russia, and the United States) have a continental shelf in the Arctic Ocean that offers the potential to harvest oil, natural gas, and minerals pursuant to maritime boundaries and procedures set forth in UNCLOS.⁴⁷ The three non-coastal states (Finland, Iceland, and Sweden) lack an Arctic continental shelf and are effectively precluded from submitting continental shelf claims.⁴⁸

The organizational setup of the Arctic Council is somewhat unique: it only meets on a biennial basis and there is no permanent staff or dedicated fund-

⁴⁰ Arctic Environmental Protection Strategy: Declaration on the Protection of the Arctic Environment, June 14, 1991, 30 I.L.M. 1624 [hereinafter Rovaniemi Declaration].

⁴¹ *Id.* ¶ 6.1.

⁴² Arctic Environmental Protection Strategy, June 14, 1991, 30 I.L.M. 1627.

⁴³ Declaration on the Establishment of the Arctic Council, Sept. 19, 1996, 35 I.L.M. 1387 [hereinafter Ottawa Declaration].

⁴⁴ *Id.* art. 1(a).

⁴⁵ See Rovaniemi Declaration, *supra* note 40, preface (stating that signatory countries commit to implementing AEPS).

⁴⁶ Ottawa Declaration, *supra* note 43, art. 1(a) n.1. The working group setup is also somewhat unusual as each working group operates with its own secretariat, focus, and from a different locale. *Id.* art. 6.

⁴⁷ O'ROURKE, *supra* note 16, at 2, 11–13; see David Fagundes, *Crystals in the Public Domain*, 50 B.C. L. REV. 139, 148–49, 171(2009) (asserting that UNCLOS "sharply defines the ocean spaces within which different legal regimes operate").

⁴⁸ The U.S. Senate, however, has not ratified UNCLOS and there is not a clear legal basis for the United States to submit a Commission on the Limits of the Continental Shelf ("CLCS") claim pursuant to UNCLOS. *Id.* at 17. The three non-coastal Arctic states were not invited to participate in the Ilulissat Declaration meeting, presumably because they lacked the ability to make hydrocarbon claims. *Id.*

ing source, and the responsibility for hosting these meetings is rotated sequentially among the eight member States.⁴⁹ All decisions of the Arctic Council are by consensus of the members, made after full consultation.⁵⁰ Unlike the ATS, discussed in Part II, the Arctic Council's permanent voting members only include nations resident to the Arctic.⁵¹ Of increasing importance to address geopolitical tensions, the Arctic Council also lacks a mandate to tackle *all* Arctic issues. For example, it lacks the mandate to address issues of sovereignty, natural resource exploitation, and military activities.⁵² Though the Arctic Council has shown an ability to evolve to meet emerging issues, a significant void nevertheless persists in its ability to comprehensively address all Arctic issues as they arise.⁵³

But the Arctic Council's somewhat unconventional governance structure does provide certain advantages. First, it provides a home and voice for both non-governmental organizations and indigenous people who have inhabited the Arctic for thousands of years. Indeed, the Ottawa Declaration expressly designates certain indigenous tribes as permanent participants (non-voting) within the Arctic Council.⁵⁴ And permanent observer status has recently been granted to non-Arctic nations, including China.⁵⁵ Second, the Arctic Council serves as a collaborative forum to address Arctic issues as they arise. In doing so, it has demonstrated the capacity to evolve and expand over time. Serving akin to an "Arctic United Nations," it can operate in an incremental and cooperative fashion consistent with broader principles of global environmental law discussed in Part III.

As an outgrowth of the AEPS, the Arctic Council focuses primarily on environmental matters. But this, too, has started to expand as two recent Arctic Council-engineered agreements created binding legal obligations for the Arctic signatories.⁵⁶ For example, in May 2011 the Arctic Council adopted the Arctic

⁴⁹ Ottawa Declaration, *supra* note 43, art. 5.

⁵⁰ *Id.* art. 7.

⁵¹ *Id.* art. 2.

⁵² "The Arctic Council should not deal with matters related to military security." *Id.* art. 1(a) n.1.

⁵³ *See id.* (acting as an example of a major Arctic issue that the Arctic Council is unequipped to fully resolve).

⁵⁴ *Id.* art. 2. The permanent participants consist of the Aleut International Association, the Arctic Athabaskan Council, the Gwich'in Council International, the Inuit Circumpolar Council, the Russian Association of Indigenous Peoples of the North, and the Saami Council. *Permanent Participants, ARCTIC COUNCIL* (July 6, 2015), <http://arctic-council.org/index.php/en/about-us/permanent-participants> [<https://perma.cc/56YY-H9UZ>]. Permanent observer status was recently granted to six countries: China, India, Italy, Japan, Singapore, and South Korea. O'ROURKE, *supra* note 16, at 5.

⁵⁵ O'ROURKE, *supra* note 16, at 53.

⁵⁶ Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic, May 12, 2011, T.I.A.S. No. 13-119 [hereinafter Arctic Search and Rescue Agreement]. The need for a stronger Arctic Council was reaffirmed in 2015 through the signing of the Iqaluit Declaration that "establish[ed] a Task Force to assess future needs for a regional seas program for . . . increased cooperation in Arctic marine areas," and "work towards a legally-binding agreement on scientific coopera-

Search and Rescue Agreement, which set up a framework for the Arctic states to assist lost mariners.⁵⁷ The Arctic nations later followed up with an agreement entitled Cooperation on Marine Oil Pollution Preparedness and Response, and developed guidance on oil spill response and marine pollution response in the Arctic.⁵⁸ In addition, the five Arctic coastal states have also taken steps to regulate trawling in Arctic waters newly free of ice, signing an agreement to regulate fishery trawling in the “doughnut hole” area of the Arctic Ocean that is encircled by exclusive economic zones of the Arctic coastal countries.⁵⁹ In doing so, the Arctic nations emphasized the importance of taking a precautionary approach to Arctic waters as they become more accessible.⁶⁰

In 2017, Finland assumed the Council’s chairmanship, succeeding the United States, who chaired the Arctic Council from 2015–2017.⁶¹ When the United States chaired the Council, Secretary of State John Kerry re-emphasized the threat of climate change to the Arctic and noted that the Council’s member states and observers account for sixty percent of global greenhouse gas emissions. In a joint statement with Canada discussing Arctic policy,

tion” Arctic Council, Iqaluit Declaration ¶¶ 43–44, Apr. 24, 2015, https://oaarchive.arctic-council.org/bitstream/handle/11374/662/EDOCS-3431-v1-ACMMCA09_Iqaluit_2015_Iqaluit_Declaration_original_scanned_signed_version.PDF?sequence=7&isAllowed=y [<https://perma.cc/2J5Z-67TJ>]. Furthermore, Arctic Council agreements do not run into domestic roadblocks to implementation. The trend in recent years is for the United States to enter into sole executive agreements, which are widely accepted to have the same legal import as treaties. *See, e.g., United States v. Pink*, 315 U.S. 203, 223 (1942) (noting that “international compacts and agreements” have “similar dignity” to Article II treaties). At least one commentator has recommended that the United States accede to UNCLOS via a congressional-executive agreement, bypassing the two-thirds Senate advice and consent requirement for treaties. *See generally* Andrew King, *Thawing a Frozen Treaty: Protecting United States Interests in the Arctic with a Congressional-Executive Agreement on the Law of the Sea*, 34 HASTINGS CONST. L.Q. 329 (2007).

⁵⁷ Arctic Search and Rescue Agreement, *supra* note 56.

⁵⁸ Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic, May 15, 2013, https://oaarchive.arctic-council.org/bitstream/handle/11374/529/EDOCS-2068-v1-ACMMSE08_KIRUNA_2013_agreement_on_oil_pollution_preparedness_and_response_signed_Appendices_Original_130510.PDF?sequence=6&isAllowed=y [<https://perma.cc/Z7TZ-MRBP>] [hereinafter Oil Pollution and Response Agreement]. Though not military agreements per se, the two agreements appear to go beyond the strict environmental mandate. The Arctic Search and Rescue Agreement may include military assets and the Oil Pollution and Response agreement addresses matters of environmental security. *Id.* art. 1 (providing that the agreement’s objective is to bolster the Arctic Council members’ “cooperation, coordination, and mutual assistance” in preparing for and responding to oil pollution); Arctic Search and Rescue Agreement, *supra* note 56, at app. II (listing Arctic Council nations’ coast guards and national defense agencies as search and rescue agencies).

⁵⁹ Andrew E. Kramer, *Russia and U.S. Find Common Cause in Arctic Pact*, N.Y. TIMES (May 19, 2015), <https://www.nytimes.com/2015/05/20/world/russia-and-us-find-common-cause-in-arctic-pact.html?mcubz=3> [<https://perma.cc/4QBA-PKTJ>].

⁶⁰ Kramer, *supra* note 59.

⁶¹ *Exploring Common Solutions: Finland’s Chairmanship 2017–2019*, ARCTIC COUNCIL, <http://www.arctic-council.org/index.php/en/about-us/arctic-council/fin-chairmanship> [<https://perma.cc/P6FA-GAQC>].

the United States advanced a “shared Arctic leadership model” which outlined four objectives: (1) “[c]onserving Arctic biodiversity through science-based decision making”; (2) “[i]ncorporating Indigenous science and traditional knowledge into decision-making”; (3) “[b]uilding a sustainable Arctic community” (with special attention to low impact shipping corridors, fisheries regulation and a science based approach to oil and gas); and (4) “[s]upporting strong Arctic communities.”⁶² The Obama administration suggested similar goals in a joint statement released with the Nordic States, but focused more on maintaining efforts that are already in place as opposed to redefining the approach.⁶³

C. The United Nations Convention on Law of the Sea (“UNCLOS”) and Future Arctic Governance

UNCLOS, the world’s “Constitution of the Seas,” provides the legal architecture for world maritime governance.⁶⁴ Its jurisdictional provisions and procedures are of increasing importance to the Arctic as the “only place on the planet where the borders of five countries . . . come together . . . ‘the way sections of an orange meet at the stem.’”⁶⁵ The Arctic nations have successfully cooperated in attempting to resolve the overlapping Exclusive Economic Zone (“EEZ”) and continental shelf claims. The EEZ pertains to economic rights on the surface and *above* the seabed whereas the continental shelf is below the

⁶² Press Release, Office of the Press Sec’y, White House, U.S.-Canada Joint Statement on Climate, Energy, and Arctic Leadership (Mar. 10, 2016), <https://www.whitehouse.gov/the-press-office/2016/03/10/us-canada-joint-statement-climate-energy-and-arctic-leadership> [<https://perma.cc/V3DK-5LZ4>].

⁶³ Press Release, Office of the Press Sec’y, White House, U.S.-Nordic Leaders’ Joint Statement, (May 13, 2016), <https://obamawhitehouse.archives.gov/the-press-office/2016/05/13/us-nordic-leaders-summit-joint-statement> [<https://perma.cc/Q96P-6GWG>].

⁶⁴ See generally UNCLOS, *supra* note 11 (providing a comprehensive international legal framework for the use of the world’s oceans).

⁶⁵ King, *supra* note 56, at 331. The United States’ current position on sovereignty matters in the Arctic is expressed in a U.S. Navy publication, *The Commander’s Handbook on the Law of Naval Operations*, reaffirming fundamental freedom of navigation principles within the Arctic without specifically acknowledging competing claims over natural resource exploitation in the Arctic. It states:

The United States considers that the waters, ice pack, and airspace of the Arctic region beyond the lawfully claimed territorial seas of littoral nations have international status and are open to navigation by the ships and aircraft of all nations. Although several nations have, at times, attempted to claim sovereignty over the Arctic on the basis of discovery, historic use, contiguity (proximity), or the so-called “sector” theory, those claims are not recognized in international law. Accordingly, all ships and aircraft enjoy the freedoms of high seas navigation and overflight on, over, and under the waters and ice pack of the Arctic region beyond the lawfully claimed territorial seas of littoral states.

U.S. NAVY ET AL., *THE COMMANDER’S HANDBOOK ON THE LAW OF NAVAL OPERATIONS* ¶ 2.6.5.1, NWP 1-14M/MCWP 5-12/COMDTPUB P5800.7A (July ed. 2007) [hereinafter *COMMANDER’S HANDBOOK*].

surface and on the seabed and soil itself (i.e., where the oil and gas reside).⁶⁶ The relatively small size of the Arctic Ocean and its unique North Pole convergence creates challenges when determining the scope and breadth of each nation's continental shelf. In fact, approximately half of the Arctic's ocean floor is comprised of continental shelf, the largest percentage of any one of the world's oceans.⁶⁷

1. UNCLOS: A Promising but Ultimately Imperfect Mechanism to Resolve Competing Arctic Sovereignty Issues

UNCLOS establishes a comprehensive maritime jurisdiction regime over the territorial sea, contiguous zone, EEZ, high seas, continental shelf, and an area set aside for the common heritage of mankind. It fully applies to the Arctic Ocean and its nearby waters. Most importantly for future Arctic governance, it puts in place a process for nations to resolve their respective continental shelf claims.⁶⁸

UNCLOS's first maritime jurisdiction, the territorial sea, extends the sovereignty of the coastal state to twelve nautical miles from the coastal baseline.⁶⁹ Within the territorial sea, the coastal state has, in effect, complete sovereignty over the surface and seabed to include all the living and nonliving resources.⁷⁰ The contiguous zone is the second maritime zone beyond the territorial sea. Extending twelve nautical miles from the territorial sea, it extends seaward from the coastal baseline up to twenty-four nautical miles where the coastal nation exercises special authority over fiscal, immigration, customs, and sanitary matters.⁷¹ Within the contiguous zone, ships and aircraft enjoy high seas freedoms, to include aircraft over-flight rights.⁷² After the contiguous zone lies the third offshore maritime regime, the EEZ. The EEZ extends 200 nautical miles from a nation's coastal baseline or 188 miles seaward beyond a state's twelve-mile territorial sea.⁷³ The Arctic nations have largely worked together to resolve their overlapping EEZ claims, of increasing importance to Arctic nations as they enjoy sole exploitation rights over all living and nonliving resources within their respective EEZ.⁷⁴ The fourth and furthest zone from

⁶⁶ O'ROURKE, *supra* note 16, at 27–29.

⁶⁷ CIA: *Arctic Ocean*, *supra* note 31.

⁶⁸ UNCLOS, *supra* note 11, arts. 186–191.

⁶⁹ *Id.* arts. 2–3.

⁷⁰ *Id.* arts. 2, 56.

⁷¹ *Id.* art. 33.

⁷² COMMANDER'S HANDBOOK, *supra* note 65, ¶ 1.3.3; UNCLOS, *supra* note 11, art. 36.

⁷³ UNCLOS, *supra* note 11, art. 57. Though not a signatory to UNCLOS, the United States established a 200-nautical mile EEZ by Presidential Proclamation 5030 on March 10, 1983. Proclamation No. 5030, 48 Fed. Reg. 10,605 (Mar. 10, 1983). *But see* O'ROURKE, *supra* note 16, at 59 (asserting that 95% of the Arctic claims to mineral resources are not in dispute).

⁷⁴ *See* UNCLOS, *supra* note 11, art. 56. In the EEZ, a coastal state has

the coastal state, the high seas, lie outward from the EEZ. The high seas are set aside to be “reserved for peaceful purposes”⁷⁵ and all nations of the world enjoy complete and total freedom of navigation of the high seas.⁷⁶ The high seas may overlap with a nation’s continental shelf below the surface, which is geographically limited by UNCLOS to 350 nautical miles.⁷⁷

Below the surface and on the seabed, the continental shelf overlaps with the four maritime jurisdictions discussed above. The continental shelf consists of “mineral and other non-living resources of the sea-bed and subsoil,” of central importance to the untapped mineral, oil and gas interests in the Arctic.⁷⁸ Under UNCLOS, the continental shelf “may not extend beyond 350 nautical miles from the baseline of the territorial sea is measured or 100 nautical miles from the 2,500-meter isobath, whichever is greater.”⁷⁹ Coastal nations can exercise sovereign rights over the continental shelf for “purpose[s] of exploring . . . and exploiting its natural resources”⁸⁰ and have “exclusive right to authorize and regulate drilling on the continental shelf for all purposes.”⁸¹

Although there have been calls from environmental groups (Greenpeace and others) to set aside the Arctic region as a worldwide nature reserve, UNCLOS already contemplates such an area within its existing maritime regime structure in the so-called “Area” beyond the national jurisdiction of any nation.⁸² A fifth maritime zone, the “Area” lies beyond any nation’s continental shelf and is defined as “the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction . . . [whose resources] are the common heritage of mankind.”⁸³ Here, mineral rights are part of the Area.⁸⁴ Yet, determin-

sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds

Id.

⁷⁵ *Id.* art. 88.

⁷⁶ *Id.* art. 87.

⁷⁷ *Id.* arts. 76, 86. For example, as a geological matter, it is estimated that the United States’ continental shelf (via Alaska) may extend upward of 600 nautical miles. But as a legal matter, it cannot exceed 350 nautical miles under the limitations set forth in UNCLOS. *Id.* art. 76.

⁷⁸ *Id.* art. 77(4).

⁷⁹ COMMANDER’S HANDBOOK, *supra* note 65, ¶ 1.7; *see also* UNCLOS, *supra* note 11, art. 76, ¶ 5.

⁸⁰ UNCLOS, *supra* note 11, art. 77, ¶ 1. Further, “[t]he rights of the coastal State over the continental shelf do not depend on occupation, effective or notional, or on any express proclamation.” *Id.* art. 77, ¶ 3.

⁸¹ *Id.* art. 81.

⁸² *Id.* preamble, art. 136.

⁸³ *Id.*

ing the “Arctic Area” still requires a legally binding ruling on the size and breadth of each of the five Arctic coastal states’ continental shelves, which has yet to occur.

Determining the length and breadth of a nation’s continental shelf is key to ascertaining the validity of each coastal state’s legal claim to the associated natural resource exploitation rights.⁸⁵ UNCLOS provides both general and specific guidance for nations making continental shelf determinations (“delimitation”) among states. The general guidance states:

The delimitation of the continental shelf between States with opposite or adjacent coasts shall be effected by agreement on the basis of international law, as referred to in Article 38 of the Statute of the International Court of Justice, in order to achieve an equitable solution.⁸⁶

UNCLOS details a more specific continental shelf delimitation procedure under Article 76.⁸⁷ Article 76 outlines a four-step process.⁸⁸ Of particular im-

⁸⁴ *Id.* art. 136. This provision was not without controversy. Despite leading UNCLOS negotiations, the United States objected to the common heritage of mankind language and has yet to ratify UNCLOS. See O’ROURKE, *supra* note 16, at 11.

⁸⁵ See UNCLOS, *supra* note 11, art. 76.

⁸⁶ *Id.* art. 83, ¶ 1. Article 38 of the Statute of the International Court of Justice (“ICJ”) states that the ICJ will decide disputes—such as competing maritime claims—by applying:

- a. international conventions, whether general or particular, establishing rules expressly recognized by the contesting states;
- b. international custom, as evidence of a general practice accepted as law;
- c. the general principles of law recognized by civilized nations;
- d. subject to the provisions of Article 59, judicial decisions and the teachings of the most highly qualified publicists of the various nations, as subsidiary means for the determination of rules of law.

Statute of the International Court of Justice art. 38(1), June 26, 1945, 59 Stat. 1055, 33 U.N.T.S. 993.

⁸⁷ UNCLOS, *supra* note 11, art. 76. UNCLOS states:

1. The continental shelf of a coastal State comprises the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend up to that distance.
2. The continental shelf of a Coastal states shall not extend beyond the limits provided for in paragraphs 4 to 6.
3. The continental margin comprises the submerged prolongation of the land mass of the coasts’ State, and consists of the seabed and subsoil of the shelf, the slope, and the rise. It does not include the deep ocean floor with its oceanic ridges or subsoil thereof.
4. (a) For the purposes of the Convention, the coastal State shall establish the outer edge of the continental margin wherever the margin extends beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, by either:
 - (i) a line delineated in accordance with paragraph 7 by reference to the outermost fixed points at each of which the thickness of sedimentary rocks is at least 1 per cent of the shortest distance from such point to the foot of the continental slope; or

portance is the undefined term “natural prolongation” that remains a continual source of contention and uncertainty.⁸⁹ The Arctic states are now turning to this UNCLOS procedure to make their case for an expanded continental shelf.

The Commission on the Limits of the Continental Shelf (“CLCS”) is central to the Article 76 process for adjudicating continental shelf claims.⁹⁰ But its long-term viability to formally resolve all claims remains to be seen. Denmark (via Greenland), Norway, and Russia have all made one or more submissions to the CLCS to adjudicate competing continental shelf claims; Canada has made a partial submission.⁹¹ Both Denmark (via Greenland) and Russia claim that their continental shelf extends to the North Pole.⁹² To date, the CLCS has received six submissions asserting continental shelf claims in the Arctic, but has only acted on one of them.⁹³ Russia submitted the first Article 76 claim in 2001 but this was rejected for lack of scientific support.⁹⁴ It resubmitted this claim on August 3, 2015.⁹⁵ In its new submission to the CLCS, the Russian government claimed a continental shelf of more than 460,000 miles of the Arctic. Norway submitted an Article 76 claim in 2006 and Denmark submitted a claim in 2014. Table 1, below, summarizes CLCS claims.⁹⁶

(ii) a line delineated in accordance with paragraph 7 by reference to fixed points not more than 60 nautical miles from the foot of the continental slope.

(b) In the absence of evidence to the contrary, the foot of the continental slope shall be determined as the point of maximum change in the gradient at its base.

Id. art. 76(1)–(4).

⁸⁸ See Carpenter, *supra* note 29, at 224–27. Article 76 applies throughout the world and not just the Arctic. See UNCLOS, *supra* note 11, art. 76 (lacking a specific limitation to the Arctic region).

⁸⁹ See Carpenter, *supra* note 29, at 216–18 (describing numerous claims made by Arctic coastal states to extend the boundaries of their continental shelves based upon the argument that certain ridges are a natural prolongation of their continental shelves).

⁹⁰ O’ROURKE, *supra* note 16, at 11–12. The CLCS has received a total of seventy-eight claims since UNCLOS entered into force; the vast majority of those claims have been submitted the past ten years. *Submissions to the CLCS*, UNITED NATIONS, DIV. FOR OCEAN AFFAIRS AND THE LAW OF THE SEA (last updated Oct. 26, 2017), http://www.un.org/depts/los/clcs_new/commission_submissions.htm [<https://perma.cc/PY83-2VS2>].

⁹¹ *CIA: Arctic Ocean*, *supra* note 31.

⁹² O’ROURKE, *supra* note 16, at 17–18. Independent of the CLCS, Norway and Russia have signed a bilateral maritime boundary agreement. Although the United States and Canada dispute how to divide the Beaufort Sea, (as well as the status of certain Canadian waters—of central importance to the Northwest Passage) the United States is actually assisting Canada’s submission to the CLCS. *Id.*

⁹³ The CLCS has only issued a recommendation on Norway’s claim. See *Submissions to the CLCS*, *supra* note 90 (listing the submissions and recommendations submitted to the CLCS as of October 26, 2017). If the United States was eligible to make an Article 76 claim, it is anticipated that a natural prolongation claim north of Alaska could be the size of California. Carpenter, *supra* note 29, at 233.

⁹⁴ Andrew Kramer, *Russia Stakes New Claim to Expanse in Arctic*, N.Y. TIMES, Aug. 4, 2014, at A4 (noting Russia was advised to “reconsider and resubmit its claim”).

⁹⁵ Carpenter, *supra* note 29, at 232; *Submissions to the CLCS*, *supra* note 90. The previous recommendations of the CLCS to Russia have not been made public. Carpenter, *supra* note 29, at 232.

⁹⁶ This pertains to the CLCS process. Outside of the UNCLOS-designed CLCS process, customary international law and governing ICJ jurisprudence would serve as a fallback to guide any Arctic

Table 1. Arctic Continental Shelf Claims⁹⁷

Nation	Year	Claim & Status
Russia	Dec. 2001	Russia advised by CLCS to “reconsider and resubmit its claim.”* Claim resubmitted in 2015 (Decision Pending).
Norway	Nov. 2006	Submission addressed the outer limits of the continental shelf in three areas: (1) Loop Hole in the Barents Sea; (2) the Western Nansen Basin in the Arctic Ocean; and the (3) “Banana Hole” in the Norwegian and Greenland Seas. Recommendations from CLCS finalized March 2009.**
Canada	Dec. 2013	Partial Submission to the CLCS regarding the Atlantic Ocean, but noted that a submission over the Arctic Ocean will be forthcoming in 2018. (Not yet submitted)
Denmark	Nov. 2013	Claim to <i>Northeast</i> continental shelf of Greenland. (Decision Pending)
Denmark	Dec. 2014	Claim to <i>Northern</i> continental shelf of Greenland. (Decision Pending)
Russia	Aug. 2015	Partial resubmission of the 2001 claim. This claim would expand Russia’s total territory by 463,000 square miles in the “doughnut hole” of international waters encircled by existing economic zone boundaries. (Decision Pending)***
* Kramer, <i>supra</i> note 94. ** See COMM’N ON THE LIMITS OF THE CONTINENTAL SHELF, SUMMARY OF THE RECOMMENDATIONS OF THE COMMISSION ON THE LIMITS OF THE CONTINENTAL SHELF (Mar. 27, 2009), http://www.un.org/depts/los/clcs_new/submissions_files/nor06/nor_rec_summ.pdf [https://perma.cc/29E8-JWNU]. *** Kramer, <i>supra</i> note 94.		

Despite the long-term uncertainty concerning UNCLOS’s ability to resolve continental shelf and other areas of concern in the Arctic, the Arctic coastal states recently reinforced UNCLOS’s prominent role in resolving disputes in the Arctic. In 2008, outside the auspices of the Arctic Council, the five Arctic coastal states (Canada, Denmark, Norway, Russia, and the United States) signed the Ilulissat Declaration in the face of rising tensions over hydrocarbon deposit rights.⁹⁸ In doing so, all five Arctic coastal states reaffirmed

territorial dispute. *See, e.g.*, North Sea Continental Shelf (F.R.G./Den.; F.R.G./Neth.), 1969 I.C.J. 3 (Feb. 20) (adjudicating a dispute over delimitation of the North Sea continental shelf arising from Special Agreements between Germany and Denmark, and Germany and Norway). Prior ICJ opinions on maritime claims indicate that maritime boundary disputes must be made “in accordance with equitable principles, and taking account of all the relevant circumstances” *Id.* at 53–54. Though this does provide a certain amount of flexibility, the enforcement of ICJ opinions remains a continual concern. *See, e.g.*, *Medellin v. Texas*, 552 U.S. 491, 508 (2008) (holding that an ICJ decision will not have “immediate legal effect in the courts of U.N. members”).

⁹⁷ This Table is permanently available at <http://www.bc.edu/content/dam/bc1/schools/law/pdf/law-review-content/BCLR/59-5/nevit-percival-graphics.pdf> [<https://perma.cc/TQ22-835B>].

⁹⁸ The Ilulissat Declaration at the Arctic Ocean Conference 1–2 (May 28, 2008), http://www.oceanlaw.org/downloads/arctic/Ilulissat_Declaration.pdf [<https://perma.cc/V9FT-8SQ3>] (The

their policy to resolve their disputes in a cooperative manner, renewing their commitment to orderly settling overlapping territorial claims via UNCLOS processes. Further, the Ilulissat Declaration reaffirmed UNCLOS's central importance to the Arctic, asserting that the Arctic coastal states do not need a separate Arctic Treaty or similar comprehensive international legal regime outside the work of UNCLOS or the Arctic Council.⁹⁹

2. Additional International Environmental Agreements Will Take on Increased Importance in the Arctic

The Arctic's legal landscape has been described as "a complex lattice-work of international and national laws in which the applicable law is often highly location-dependent."¹⁰⁰ Many international environmental agreements described below apply worldwide but have an outsized impact in the Arctic. Beyond UNCLOS, these agreements include the Polar Bear Treaty,¹⁰¹ London Dumping Act,¹⁰² International Convention for the Prevention of Pollution from ships,¹⁰³ Safety of Life at Sea ("SOLAS"),¹⁰⁴ and Convention on the International Regulations for Preventing Collisions at Sea ("COLREGS").¹⁰⁵

The 1973 Polar Bear Treaty remains the oldest Arctic-specific treaty in existence, placing legally binding requirements on Arctic activities that harm the polar bear.¹⁰⁶ Signed in 1973 by the five Arctic nations with the largest polar bear populations (Canada, Denmark, Norway, Russia, and the United States), the Polar Bear Treaty requires each of the five parties to commit to "manage [their] polar bear populations in accordance with sound conservation

UNCLOS "framework provides a solid foundation for responsible management by the five coastal States and other users of this Ocean through national implementation and application of relevant provisions. We therefore see no need to develop a new comprehensive international legal regime to govern the Arctic Ocean.")

⁹⁹ *Id.*

¹⁰⁰ See Peter H. Oppenheimer & Brian Israel, *Arctic Region*, in INTERNATIONAL ENVIRONMENTAL LAW: THE PRACTITIONER'S GUIDE TO THE LAWS OF THE PLANET 933 (Roger Martella & J. Brett Grosko eds., 2014).

¹⁰¹ Agreement on the Conservation of Polar Bears, Nov. 15, 1973, 27 U.S.T. 3918 [hereinafter Polar Bear Treaty]. The signatories of the Polar Bear Treaty mirror the Arctic coastal states (Canada, Denmark, Norway, Russia, and the United States). *Id.*

¹⁰² Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Dec. 29, 1972, 26 U.S.T. 2403, 1046 U.N.T.S. 138 [hereinafter London Dumping Act].

¹⁰³ Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, 1973 (with Annexes, Final Act and International Convention), Feb. 17, 1978, 1340 U.N.T.S. 61 [hereinafter Prevention of Pollution from Ships].

¹⁰⁴ International Convention for the Safety of Life at Sea, Nov. 1, 1974, 32 U.S.T. 47, 1184 U.N.T.S. 277 [hereinafter SOLAS].

¹⁰⁵ Convention on the International Regulations for Preventing Collisions at Sea, Oct. 20, 1972, 28 U.S.T. 3459, 1050 U.N.T.S. 16. [hereinafter COLREGS].

¹⁰⁶ Polar Bear Treaty, *supra* note 101.

practices based on the best available scientific data.”¹⁰⁷ It expressly prohibits killing, hunting, and capturing polar bears, except in limited circumstances.¹⁰⁸

The 1973 International Convention for the Prevention of Pollution from Ships, as modified by its 1978 Protocol (“MARPOL 73/78”) has the goal of eliminating the international pollution of the marine environment.¹⁰⁹ It specifically addresses Arctic activities. MARPOL 73/78 contains six annexes and fills in gaps left by the 1972 London Dumping Convention, described below.¹¹⁰ Similarly, the London Dumping Convention obligates contracting parties to take steps to “prevent the pollution of the sea by the dumping of waste and other matter that is liable to create hazards to human health, [and] to harm living resources”¹¹¹ There are designated “special areas” within MARPOL that place higher pollution standards based upon ecological and technical characteristics that are unique to that area. Within MARPOL, three of these special area annexes apply to Antarctica (oil, noxious liquid substances, and garbage) but none currently apply to the Arctic.¹¹²

The 1974 SOLAS Convention, as modified by its 1978 and 1988 Protocols, ensures that signatory flag states comply with a certain minimum level of safety precautions.¹¹³

The COLREGS, commonly known as the “International Rules of the Road” complements UNCLOS, operationalizing many of its navigational provisions. It provides detailed rules relating to vessel operation, traffic separation, rights of way, rules of the road and actions to avoid collisions.¹¹⁴ These rules apply to all international waters (beyond the territorial sea).¹¹⁵ Except in cases where a coastal nation has established different rules over its sovereign waters, COLREGS also applies in each nation’s territorial sea and inland waters.¹¹⁶ COLREGS will take on increased importance in the Arctic with the rise of shipping traffic in the region.¹¹⁷ COLREGS also lack Arctic-specific provisions.¹¹⁸

¹⁰⁷ *Id.* art. II.

¹⁰⁸ *Id.* arts. I, III.

¹⁰⁹ Prevention of Pollution from Ships, *supra* note 103, at Resolutions 1, 3.

¹¹⁰ *Id.* annexes I–VI.

¹¹¹ London Dumping Act, *supra* note 102, art. 1.

¹¹² Prevention of Pollution from Ships, *supra* note 103, annexes I, II, V.

¹¹³ See SOLAS, *supra* note 104 (including numerous regulations on equipment, proper navigation of ships, and general hazard prevention); see also 1988 Protocols Relating to the Safety of Life at Sea and Load Line Conventions, Nov. 11, 1988, S. Treaty Doc. No. 102-2 (1991) (transmitting the 1988 SOLAS Protocol to the U.S. Senate).

¹¹⁴ COLREGS, *supra* note 105, rules 1–38.

¹¹⁵ *Id.* art. III.

¹¹⁶ *Id.*

¹¹⁷ The United States has adopted COLREGS provisions with U.S. Navy Regulations stating that Navy ships “shall diligently observe the International Rules for Preventing Collisions at Sea” 32 C.F.R. § 700.1139 (2018).

¹¹⁸ See generally COLREGS, *supra* note 105 (lacking any reference to the Arctic throughout the document).

An Arctic or polar annex could be added into COLREGS to provide additional safety measures in light of the increased maritime traffic in the region.

II. ANTARCTICA: AN ENVIRONMENTAL LAW SUCCESS STORY ANCHORED BY THE ANTARCTIC TREATY SYSTEM

A. *Defining Antarctica*

The ATS encompasses the area below sixty degrees south latitude including both land and sea.¹¹⁹ As shown in Figure 2 of the Appendix,¹²⁰ the continent itself is largely circular in shape and measures 5.5 million square miles, ten percent of Earth's total land area.¹²¹ A vast ice sheet that is up to four kilometers thick covers ninety-eight percent of this land area.¹²² The ice sheet contains roughly three quarters of the world's fresh water.¹²³ Yet, Antarctica is also the driest continent on the planet, receiving 1.2 to 2 inches of rainfall annually, which is less than that of the Sahara Desert.¹²⁴ Climatic conditions are harsh, with average winter temperatures ranging from negative thirty degrees Celsius on the coast to negative seventy degrees inland.¹²⁵ These temperatures do not include the chilling effect of prevailing high winds.¹²⁶ In the summer, temperatures can rise to around fifty degrees Fahrenheit in the warmest part of the continent.¹²⁷

A century ago, expeditions to Antarctica made Amundsen, Scott, Mawson, and Shackleton household names. Today Antarctica's pristine environment attracts tourists to what is the coldest, windiest, and highest continent on earth. The cold and inhospitable climate means Antarctica is home to relatively few terrestrial plant species; there are about 800 species of land plants—about 350 of which are lichens—and no trees, grasses, or shrubs are present.¹²⁸

No terrestrial vertebrate species are native to Antarctica. Only about thirty species of terrestrial fauna are present—the largest of these, the wingless midge, is only about three millimeters long.¹²⁹ There are about fifty species of birds present in Antarctica. The most abundant by far are penguins, accounting

¹¹⁹ The Antarctic Treaty art. VI, Dec. 1, 1959, 12 U.S.T. 794, 402 U.N.T.S. 71 [hereinafter Antarctic Treaty]; CHRISTOPHER C. JOYNER, GOVERNING THE FROZEN COMMONS: THE ANTARCTIC REGIME AND ENVIRONMENTAL PROTECTION 21 (1998).

¹²⁰ PAT: THE FREE, OPEN SOURCE, PORTABLE ATLAS, <https://ian.macky.net/pat/map/anta/antablu2.gif> [<https://perma.cc/4RAM-4A5F>].

¹²¹ JOYNER, *supra* note 119, at 3.

¹²² *Id.* at 6.

¹²³ *Id.*

¹²⁴ *Id.* at 4–5.

¹²⁵ *Id.* at 5.

¹²⁶ *Id.* at 4.

¹²⁷ *Id.*

¹²⁸ *Id.* at 5–6.

¹²⁹ *Id.* at 6.

for about sixty-five percent of Antarctic bird stock or ninety percent of total bird biomass. Other abundant species include albatrosses and petrels.¹³⁰

Marine life in the Southern Ocean around Antarctica is rich and abundant. Strong currents and frontal zones churn up nutrients from bottom water, stimulating photosynthesis. The availability of light is the single most important factor in the extent of primary production. There is hardly any daylight during winter months and light cannot penetrate through ice. The most productive areas of the ocean are along the continental shelf and in the Antarctic Convergence zone.¹³¹

B. Antarctic Treaty System

The Antarctic Treaty ("AT") was signed on December 1, 1959 and entered into force on June 23, 1961.¹³² It has two main objectives: (1) restricting the use of Antarctica to peaceful purposes; and (2) promoting scientific research.¹³³ Some scholars view the AT as a product of Cold War tensions between the United States and the Soviet Union.¹³⁴ Although neither the United States nor Russia officially claimed any part of Antarctica, both were expressing strong interest in doing so. In 1947, the United States actually had a resolution called "Operation Highjump, the purpose of which was to establish the strongest possible basis for a territorial claim to as much of the continent as possible."¹³⁵

Global scientific cooperation during the International Geophysical Year ("IGY") of 1957–58 sparked interest in negotiating what became the AT.¹³⁶ This year of scientific interchange is widely believed to have smoothed the way for the AT as "the friendship and cooperation that emerged from the IGY fostered a belief among claimant governments that disputes over sovereignty could be set aside in the interest of peace and mutual scientific benefits."¹³⁷

The twelve countries that participated in the IGY (Argentina, Australia, Belgium, Chile, France, Great Britain, Japan, New Zealand, Norway, South Africa, the Soviet Union, and the United States) signed the AT in 1959. The treaty suspends territorial sovereignty claims made by seven countries (includ-

¹³⁰ *Id.* at 12.

¹³¹ *Id.* at 9.

¹³² The Antarctic Treaty, *supra* note 119; JOYNER, *supra* note 119, at 21, 64.

¹³³ JOYNER, *supra* note 119, at 56.

¹³⁴ "The Cold War between the United States and the former Soviet Union was a chief impetus behind the successful efforts to assemble a binding agreement governing Antarctica." David W. Floren, Comment, *Antarctic Mining Regimes: An Appreciation of the Attainable*, 16 J. ENVTL. LITIG. 467, 469 (2001) (citation omitted).

¹³⁵ *Id.* (internal quotation marks omitted).

¹³⁶ JOYNER, *supra* note 119, at 21.

¹³⁷ *Id.* at 55.

ing overlapping claims by Argentina, Chile, and the United Kingdom).¹³⁸ Article 4 of the AT is of central importance. It states:

No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting, or denying a claim to territorial sovereignty in Antarctica or create any rights of sovereignty in Antarctica. No new claim, or enlargement of an existing claim, to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force.¹³⁹

This provision is central to the long-term success of the AT as it effectively halted new sovereignty claims over Antarctica.

Passed during a time of military tension between the United States and the Soviet Union, the AT was the first arms control agreement of the Cold War. The AT prohibits in Antarctica “any measures of a military nature, such as the establishment of military bases and fortifications, the carrying out of military maneuvers, as well as the testing of any type of weapons.”¹⁴⁰ Nuclear explosions are specifically prohibited in Antarctica.¹⁴¹

The AT protects freedom of scientific investigation while subjecting scientific personnel to the jurisdiction of their respective governments. Important protections for Antarctic plants and wildlife were added by the Agreed Measures for the Conservation of Antarctic Fauna and Flora, adopted as an annex to the treaty in 1964,¹⁴² and the Convention for the Conservation of Antarctic Seals,¹⁴³ which entered into force in 1978.

When the AT was negotiated, multiple scientific stations had already been established on the continent and surrounding islands. Waste disposal practices at these bases initially were quite haphazard, including at the large U.S. base on McMurdo Sound.¹⁴⁴ The United States actually operated a small nuclear power plant at the station between 1962 and 1972, which had to be decommissioned prematurely due to continuing safety issues.¹⁴⁵ A campaign by Greenpeace to expose open dumping of wastes at McMurdo helped spur improved waste disposal practices.¹⁴⁶

¹³⁸ *Id.* at 57.

¹³⁹ The Antarctic Treaty, *supra* note 119, art. IV, ¶ 2.

¹⁴⁰ *Id.* art. I, ¶ 1.

¹⁴¹ *Id.* art. V, ¶ 1.

¹⁴² Agreed Measures for the Conservation of Antarctic Fauna and Flora, June 2, 1964, 17 U.S.T. 991; Timo Koivurova, *Environmental Protection in the Arctic and Antarctic: Can the Polar Regimes Learn from Each Other?*, 33 INT'L J. LEGAL INFO. 204, 212–13 (2005).

¹⁴³ Conservation of Antarctic Seals, June 1, 1972, 29 U.S.T. 441; Koivurova, *supra* note 142, at 207.

¹⁴⁴ JOYNER, *supra* note 119, at 21.

¹⁴⁵ *Id.* at 59 n.15.

¹⁴⁶ Malcolm W. Browne, *In Once-Pristine Antarctica, a Complicated Cleanup Begins*, N.Y. TIMES, Dec. 19, 1989, at C1.

In 1993, the Environmental Defense Fund won a lawsuit against the National Science Foundation to block construction of a waste incinerator at McMurdo without an environmental impact statement. The D.C. Circuit held that because Antarctica was not the territory of any one sovereign, the principle against extraterritorial application of domestic law (here the National Environmental Policy Act) did not apply.¹⁴⁷ Writing for the court, Judge Mikva focused on the unique legal status of Antarctica. Noting that Antarctica is an “international anomaly” and “the only continent on earth which has never been, and is not now, subject to the sovereign rule of any nation,” Judge Mikva classified Antarctica as a true “global common” analogous to outer space.¹⁴⁸

C. Regulation of Mineral Extraction in Antarctica

The original ATS did not provide for any system to regulate mineral extraction in Antarctica.¹⁴⁹ In the years after the Treaty came into force, there was a growing awareness among the Consultative Parties that the gap needed to be filled; in 1981, the Parties officially agreed to prepare an agreement governing mineral extraction.¹⁵⁰ After six years of Special Consultative meetings, the final text of the Convention on the Regulation of Antarctic Mineral Resource Activities (“CRAMRA”) was adopted on June 2, 1988.¹⁵¹

At the time the Parties started negotiations, there was widespread agreement among government representatives and industry specialists that mineral exploitation was not imminent both because it was technologically infeasible and because commercially exploitable deposits either did not exist or were unknown.¹⁵² Instead, the Parties acknowledged that it would be easier to negotiate a minerals regime before any important deposits were found because discovery of minerals would tend to entrench sovereignty claims.¹⁵³ In spite of

¹⁴⁷ *Env'tl. Def. Fund, Inc. v. Massey*, 986 F.2d 528, 535–37 (D.C. Cir. 1993).

¹⁴⁸ *Id.* at 529 (internal quotation marks omitted). In doing so, Judge Mikva specifically mentioned the Antarctica Treaty where “the United States and 39 other nations have agreed not to assert any territorial claims to the continent or to establish rights of sovereignty there.” *Id.*

¹⁴⁹ F.G. Larminie, *Mineral Resources: Commercial Prospects for Antarctic Minerals*, in THE ANTARCTIC TREATY REGIME: LAW, ENVIRONMENT, AND RESOURCES 176, 176 (Gillian D. Triggs ed., 1987); Gillian D. Triggs, *The Antarctic Treaty Regime: Minerals Regulation*, in ANTARCTIC TREATY REGIME, *supra*, at 161, 162 [hereinafter Triggs, *AT Regime*].

¹⁵⁰ A.D. Watts, *The Convention on the Regulation of Antarctic Mineral Resource Activities 1988*, 39 INT'L & COMP. L.Q. 169, 170 (1990).

¹⁵¹ Convention on the Regulation of Antarctic Mineral Resource Activities, June 2, 1988, 27 I.L.M. 859; JOYNER, *supra* note 119, at 73.

¹⁵² See Watts, *supra* note 150, at 169 (noting that, as of 1990, the extent to which there are mineral resources in Antarctica is “largely speculative”); Gillian D. Triggs, *Negotiation of a Minerals Regime*, in ANTARCTIC TREATY REGIME, *supra* note 149, at 182, 182 (stating that hostile climate, costs of exploration, lack of infrastructure, and lack of technology make the search for Antarctic minerals especially difficult).

¹⁵³ Watts, *supra* note 150, at 169–70.

seemingly insurmountable technological constraints and lack of actual evidence, speculation of an Antarctic mineral rush had been growing in the 1970s. Indeed, “spectacular claims were made for a ‘Middle East’ in the Antarctic, including an assertion by the *Wall Street Journal* that oil reserves reported by the United States Geological Survey almost matched the proven reserves of the entire United States.”¹⁵⁴

Six years of negotiation resulted in a comprehensive agreement that covered prospecting, exploration, and exploitation of mineral resources.¹⁵⁵ Even though it did not ban mining, CRAMRA’s measures to protect the environment were not insignificant. “[I]t stipulated a series of strict environmental conditions that future operators might find hard to satisfy” and “arguably contained some of the most stringent safeguards in any treaty on the environment.”¹⁵⁶

But CRAMRA’s fatal flaw lies in the fact that mineral exploitation is intimately connected with territorial sovereignty.¹⁵⁷ In order to maintain their claims, claimant states would have to assert their authority to regulate mining activity. But other nations like the United States and Russia refused to recognize these sovereignty claims and reacted poorly to attempts by national governments to regulate.¹⁵⁸ Because the ATS kicked the can of worms that is sovereignty disputes down the road, disagreements about mining activities would have the potential to undermine the whole treaty.¹⁵⁹

Although no mining activity seemed imminent, CRAMRA clearly envisioned that mining activity could potentially take place in the future. One principal motivation for opposing CRAMRA “was a legitimate fear that the regime . . . would make it too affordable for the industry to resist leaping into immediate activity. The adoption of a regulated regime like CRAMRA would significantly lower uncertainty costs, facilitate investment, and permit untested technologies to risk massive environmental harm.”¹⁶⁰ This stiffened the resistance of the environmental community.

The worst environmental disaster in Antarctic history occurred in January 1989 when the *Bahia Paraiso*, an Argentine naval supply ship, hit a submerged rock off the United States’ Palmer Research Station, spilling 250,000 gallons of diesel into the ocean and “kill[ing] thousands of krill and scores of penguins and other seabirds”¹⁶¹ The abandonment of CRAMRA and the adoption of the Madrid Protocol, however, was not due exclusively to environmental concern.

¹⁵⁴ Triggs, *AT Regime*, *supra* note 149, at 182 (internal quotation marks omitted).

¹⁵⁵ JOYNER, *supra* note 119, at 73.

¹⁵⁶ S.K.N. Blay, *New Trends in the Protection of the Antarctic Environment: The 1991 Madrid Protocol*, 86 AM. J. INT’L L. 377, 377 (1992).

¹⁵⁷ Watts, *supra* note 150, at 181–82.

¹⁵⁸ *Id.*

¹⁵⁹ Triggs, *AT Regime*, *supra* note 149, at 183.

¹⁶⁰ Floren, *supra* note 134, at 485.

¹⁶¹ JOYNER, *supra* note 119, at 150.

In addition to the awareness that, for the foreseeable future, any mineral extraction activities in the Antarctic would be devoid of commercial significance, the major factors were: (1) fears that CRAMRA would disturb the sensitive balance of sovereignty in the Antarctic; (2) a political-ideological critique of the Consultative Parties, from a group of developing countries in the UN; (3) pressures from environmental NGOs; and (4) domestic policy considerations which related to the above factors.¹⁶²

This resistance culminated in Australia announcing its opposition to the Convention.¹⁶³ Australia was joined by France a few months later.¹⁶⁴ The withdrawal of Australia and France instantly killed the convention because although it had been adopted in 1988, in order for it to go into force, it had to be ratified by the sixteen consultative parties, which included all of the claimant states (including Australia and France).¹⁶⁵ Australia and France countered with another proposal that eventually became the Madrid Protocol.

D. Protocol on Environmental Protection to the Antarctic Treaty ("Madrid Protocol")

The most important environmental protections for Antarctica are found in the Protocol on Environmental Protection to the AT, known as the Madrid Protocol.¹⁶⁶ The Protocol, which was adopted in 1991, designates the continent as a "natural reserve, devoted to peace and science"¹⁶⁷ and imposes strict measures to protect the Antarctic environment, including a ban on all mining.¹⁶⁸ The Madrid Protocol was negotiated with remarkable speed, emerging out of just three meetings in 1990 and 1991 before it was adopted on October 4, 1991.¹⁶⁹ Not only does it ban mining altogether, but it also contains far-reaching measures for environmental protection.¹⁷⁰

¹⁶² Davor Vidas, *The Polar Marine Environment in Regional Cooperation*, in *PROTECTING THE POLAR MARINE ENVIRONMENT: LAW AND POLICY FOR POLLUTION PREVENTION* 78, 90 (Davor Vidas ed., 2000).

¹⁶³ Blay, *supra* note 156, at 378.

¹⁶⁴ *Id.*

¹⁶⁵ *Id.* at 396; see Douglas M. Zang, Note, *Frozen in Time: The Antarctic Mineral Resource Convention*, 76 CORNELL L. REV. 722, 731–32 (1991).

¹⁶⁶ Protocol on Environmental Protection to the Antarctic Treaty, Oct. 4, 1991, 30 I.L.M. 1455 [hereinafter Madrid Protocol]; see Barry Hunt Dubner, *On the Basis for Creation of a New Method of Defining International Jurisdiction in the Arctic Ocean*, 13 MO. ENVTL. L. & POL'Y REV. 1, 17–18 (2005) (stating that the Madrid Protocol "raised the environment to a primary concern of the [ATS]").

¹⁶⁷ Madrid Protocol, *supra* note 166, art. 2.

¹⁶⁸ *Id.* art. 7 (prohibiting "[a]ny activity relating to mineral resources, other than scientific research").

¹⁶⁹ See *id.*; JOYNER, *supra* note 119, at 78.

¹⁷⁰ JOYNER, *supra* note 119, at 79.

The Madrid Protocol states that all activities should conform to environmental principles, including prior assessment of their environmental impacts. It provides for the establishment of a Committee for Environmental Protection to advise the Antarctic Treaty Consultative Meeting, and it requires the development of contingency plans to respond to environmental emergencies.¹⁷¹ Annex III governs which wastes that can be discharged within and which have to be removed from Antarctica. It also regulates human waste and incineration, and mandates the implementation of waste management plans.¹⁷² Annex IV governs how ships dispose of waste, and the practices it adopts are largely in harmony with corresponding MARPOL annexes.¹⁷³ Annex V governs “area protection and management,” providing that “any area, including any marine area, may be designated as an Antarctic Specially Protected Area or an Antarctic Specially Managed Area.”¹⁷⁴

The key to the success of the AT has been its ability to defuse claims of national sovereignty over Antarctica. The Madrid Protocol’s ban on mining prevents commercial pressures from threatening the continued vitality of the ATS. But some commentators doubt the effectiveness of the Protocol if and when minerals are found. One notes that when minerals are eventually discovered, “the Protocol will prove to be fundamentally unrealistic, and its chances of survival will be virtually nil.”¹⁷⁵ With the demise of CRAMRA, there will not be any regulatory regime in place to govern mineral extraction in Antarctica. “The Antarctic environment will be basically unprotected and the Antarctic Treaty System will face the greatest crisis of its lifetime.”¹⁷⁶ Another asks “[w]hat will happen to environmental concerns when opportunities for potentially large economic gains are made plainly available for governments willing to exploit the Antarctic environment? The answer is self-evident and leaves but scant room for optimism among concerned conservationists.”¹⁷⁷

In the early twentieth century, extensive whaling by vessels from several countries decimated whale populations in Antarctica.¹⁷⁸ Many have recovered,

¹⁷¹ *Id.*

¹⁷² Madrid Protocol, *supra* note 166, annex III.

¹⁷³ *Id.* annex IV.

¹⁷⁴ *Id.* annex V. Entry into an Antarctic Specially Managed Area does not require a permit, but entry into an Antarctic Specially Protected Area (which may exist within the Managed Area) does. See *id.*, art. 4, ¶¶ 3–4.

¹⁷⁵ Francisco Orrego Vicuña, *The Effectiveness of the Protocol on Environmental Protection to the Antarctic Treaty*, in GOVERNING THE ANTARCTIC: THE EFFECTIVENESS AND LEGITIMACY OF THE ANTARCTIC TREATY SYSTEM 174, 198 (Olav S. Stokke & Davor Vidas ed., 1997).

¹⁷⁶ Francisco Orrego Vicuña, *The Protocol on Environmental Protection to the Antarctic Treaty: Questions of Effectiveness*, 7 GEO. INT’L ENVTL. L. REV. 1, 11 (1994).

¹⁷⁷ Christopher C. Joyner, *Protection of the Antarctic Environment: Rethinking the Problems and Prospects*, 19 CORNELL INT’L L.J. 259, 270 (1986).

¹⁷⁸ Charles Homans, *The Most Senseless Environmental Crime of the 20th Century*, PAC. STANDARD MAG. (Nov. 12, 2013), [https://psmag.com/social-justice/the-senseless-environment-crime-of-the-](https://psmag.com/social-justice/the-senseless-environment-crime-of-the-20th-century)

but spotting blue whales, the heaviest creatures ever to inhabit the earth, is still a rare event.¹⁷⁹ In March 2014 the International Court of Justice (“ICJ”) ruled that Japanese whaling in Antarctic waters violated the International Whaling Commission’s ban on commercial whaling.¹⁸⁰ Japan was taken to the ICJ by Australia and New Zealand, which argued that Japanese whaling had been so extensive that it could not possibly qualify for the exception for whaling for purposes of scientific research.¹⁸¹ Japan has pledged to resume whaling with a scaled-back program that will kill only minke whales.¹⁸²

Enforcement of strict measures to protect the Antarctic environment depends crucially on cooperation by many governments and private entities. In December 2014 the New Zealand navy confronted a boat illegally catching sea bass (toothfish) in Antarctic waters. Rough waters prevented New Zealand authorities from boarding the vessel, rumored to be owned by a Spanish crime syndicate. The New Zealand navy informed Interpol in hopes of preventing the boats from offloading their illegal catch.¹⁸³ Ultimately Sea Shepherd, an NGO, chased the vessel for 110 days over 10,250 nautical miles before it was scuttled off the west coast of Africa.¹⁸⁴ In 2011 the International Maritime Organization banned the use of heavy fuel oils by ships in Antarctic waters.¹⁸⁵

III. THE FUTURE OF ARCTIC GOVERNANCE AND THE RISE OF GLOBAL ENVIRONMENTAL LAW

A. Comparing and Contrasting the Polar Regions

Commonalities and contrasts mark the polar regions: both are of similar size, share a similar climate, and are geographically isolated. And climate change is having an outsized effect on both polar regions, which harbor signif-

20th-century-russia-whaling-67774 [https://perma.cc/9QXM-QZXU] (detailing the decimation of various whale species due to commercial hunting in the twentieth century).

¹⁷⁹ *Id.*

¹⁸⁰ Whaling in the Antarctic (Austl. v. Japan; N.Z. intervening), Judgment, 2014 I.C.J. Rep. 226 ¶ 247 (Mar. 31).

¹⁸¹ *Id.* ¶ 228.

¹⁸² Justin McCurry, *Japan Set to Wade into Diplomatic Row by Bypassing Ban on Whaling*, THE GUARDIAN (Sept. 4, 2014, 3:39 AM), <https://www.theguardian.com/world/2014/sep/04/japan-diplomatic-row-bypassing-whaling-ban-antarctic> [https://perma.cc/5GYN-UCHQ].

¹⁸³ *Antarctic Toothfish Poaching Ships Shrug off New Zealand Navy*, THE GUARDIAN (Jan. 21, 2015, 8:39 AM), <https://www.theguardian.com/environment/2015/jan/21/antarctic-toothfish-poaching-ships-shrug-off-new-zealand-navy> [https://perma.cc/8GPY-9889].

¹⁸⁴ Ian Urbina, *A Renegade Trawler, Hunted for 10,000 Miles by Vigilantes*, N.Y. TIMES (July 28, 2015), <https://www.nytimes.com/2015/07/28/world/a-renegade-trawler-hunted-for-10000-miles-by-vigilantes.html?mcubz=0> [https://perma.cc/4TQ4-CUTL].

¹⁸⁵ Press Briefing: 44, Int’l Maritime Org., Antarctic Fuel Oil Ban and North American ECA MARPOL Amendments Enter into Force on 1 August 2011 (July 29, 2011), <http://www.imo.org/en/MediaCentre/pressbriefings/pages/44-marpol-amends.aspx#Woyd8lInyScg> [https://perma.cc/JR6A-Q3EB].

icant natural resources (oil, gas, and minerals in the Arctic; minerals in Antarctica). But they are geographical opposites, which inform geopolitical norms: the Arctic region encompasses “an ocean surrounded by continents” whereas the Antarctic region encompasses “a continent surrounded by oceans.” The Arctic has two rapidly growing trade routes that have the potential to transform worldwide maritime shipping traffic. Although both regions are geographically isolated, Antarctica is significantly more so, with no permanent population and less than 50,000 visitors per year, nearly twenty percent of whom do not disembark from their ships.¹⁸⁶ The Arctic region is geopolitically much more complex, with land and territories belonging to different nations and indigenous peoples.

Further, both polar regions face enormous environmental challenges due to climate change.¹⁸⁷ In Antarctica, the ATS ban on commercial exploitation has preserved a pristine environment unlike anything on earth. Yet, the melting of the Arctic ice sheets is non-linear and influenced by the “albedo effect”—the more the ice melts, the warmer the water becomes, accelerating and aggravating the melting process.¹⁸⁸ As this climate change exposes more previously ice-covered areas, private industry is becoming increasingly interested in accessing the Arctic’s untapped natural resources.¹⁸⁹

The ATS now includes twenty-nine nations as consultative parties and twenty-four nations as non-consultative parties.¹⁹⁰ The Arctic Council includes eight permanent members with full voting rights, as well as non-voting other governmental organizations and indigenous tribes.¹⁹¹ The diverse permanent population that calls the Arctic home is of critical importance for future environmental governance in the Arctic.¹⁹² The Arctic polar region is home to nearly four million people in seven countries, each subject to the jurisdiction of

¹⁸⁶ News Release, Int’l Ass’n of Antarctica Tour Operators, Antarctic Tourism Figures Released as IAATO’s 25th Anniversary Meeting Begins (2016), <https://iaato.org/documents/10157/1278700/News+Release+IAATO+2016+opens++Final.pdf/f48971b5-3e58-4ec1-a0e2-e37eb5d59263> [<https://perma.cc/DAE7-YX5X>].

¹⁸⁷ See Walsh, *supra* note 2, at 91; Jugal K. Patel & Justin Gillis, *An Iceberg the Size of Delaware Just Broke Away from Antarctica*, N.Y. TIMES (July 12, 2017), <https://www.nytimes.com/interactive/2017/06/09/climate/antarctica-rift-update.html> [<https://perma.cc/V5SJ-RL2Z>] (providing an example of climate change affecting the icepack in Antarctica).

¹⁸⁸ See, e.g., David Wallace-Wells, *The Uninhabitable Earth*, N.Y. MAG. (July 9, 2017, 9:00 PM), <http://nymag.com/daily/intelligencer/2017/07/climate-change-earth-too-hot-for-humans.html> [<https://perma.cc/52BE-S5QL>] (describing the albedo effect).

¹⁸⁹ See, e.g., Mark Jarashow et al., Note, *UNCLOS and the Arctic: The Path of Least Resistance*, 30 FORDHAM INT’L L.J. 1587, 1587–88 (2007) (detailing the “rush” to claim the untapped wealth in the Arctic that is becoming more accessible due to global climate change).

¹⁹⁰ *Parties*, SECRETARIAT OF THE ANTARCTIC TREATY SYS. (2011), http://www.ats.aq/devAS/ats_parties.aspx?lang=e [<https://perma.cc/GF5K-78G4>].

¹⁹¹ See O’ROURKE, *supra* note 16, at 2, 40.

¹⁹² Erika Lennon, *A Tale of Two Poles: A Comparative Look at the Legal Regimes in the Arctic and the Antarctic*, SUSTAINABLE DEV. L. & POL’Y, Spring 2008, at 32, 32.

their respective host nation.¹⁹³ These populations are increasingly vulnerable to climate change's effects and will bear the brunt of climate change's costs.¹⁹⁴ Since the AT's entry into force, there has been an increase in global awareness of environmental justice issues and the critically important role that non-state actors and indigenous peoples play in international environmental agreements. Table 2, below, presents a snapshot of the two polar regions.

Table 2. Comparative Geographies of the Arctic and Antarctica¹⁹⁵

	Arctic	Antarctica
Climate	Polar	Polar
Size	5.5 million square miles*	5.4 million square miles**
Geography	Maritime-based with some land mass	Land-based with some maritime aspects
Interested States	8***	53****
Natural Resources	Significant Oil and Gas Resources	Significant Mineral Resources
Military activities prohibited?	No	Yes
Permanent Population?	Yes	No*****

* This is based upon the MIT Woods Hole definition of "Arctic."
 ** This includes only the land continent of Antarctica and not the entire Antarctic polar region.
 *** Although more than eight nations are interested parties to the Arctic, this number reflects the eight Arctic nations that are members of the Arctic Council. There are also twelve non-Arctic states that are increasingly playing a role in the Arctic Council, including China. See, e.g., Hans H. Hertell, *Arctic Melt: The Tipping Point for an Arctic Treaty*, 21 GEO. INT'L ENVTL. L. REV. 565 (2008).
 **** Reflects number of Parties to the Antarctic Treaty. *The Antarctic Treaty*, SECRETARIAT OF THE ANTARCTIC TREATY SYS., <http://www.ats.aq/e/ats.htm> [<https://perma.cc/U7RF-R9Q8>].
 ***** There are no permanent inhabitants in Antarctica, although there are numerous long-term residents at several scientific research centers. From 2016–2017, Antarctica received around 45,083 visitors, nearly 17% of whom did not leave their ships. See *Tourism Statistics: 2016–2017 Statistics*, INT'L ASS'N OF ANTARCTIC TOUR OPERATORS, <http://iaato.org/tourism-statistics> [<https://perma.cc/W587-TNW4>] (providing annual data on tourists who stay on their ships ("Cruise Only") and those who disembark ("Landed"), broken down by nationality).

In large part because of the geographic differences, the two polar regions have emerged as polar opposites in their respective legal regimes. In light of the ATS success and increasing interest in the Arctic, questions naturally arise.

¹⁹³ O'ROURKE, *supra* note 16, at 53.

¹⁹⁴ One study commissioned by the U.S. Army Corps of Engineers estimated that 178 communities in Alaska are at risk due to soil erosion exacerbated by climate change. U.S. ARMY CORPS OF ENGINEERS: ALASKA DIST., ALASKA BASELINE EROSION ASSESSMENT: STUDY FINDINGS AND TECHNICAL REPORT 3-2 to -7 (Mar. 2009).

¹⁹⁵ This Table is permanently available at <http://www.bc.edu/content/dam/bc1/schools/law/pdf/law-review-content/BCLR/59-5/nevit-percival-graphics.pdf> [<https://perma.cc/TQ22-835B>].

Should the Arctic region move to an Antarctica model and be preserved as a maritime wilderness, similar to the AT?¹⁹⁶ This common heritage of mankind formulation does not appeal to Arctic coastal states who are eager to exploit its significant untapped resources, but this approach is favored by non-Arctic states such as China.¹⁹⁷ Further, the “Arctic as wilderness area” model is also impractical due to the heightened interest in the Arctic’s resources and the existing maritime jurisdictional regimes set forth in UNCLOS. Indeed, under UNCLOS, the surface area beyond the nation’s EEZ is already set aside for peaceful purposes.¹⁹⁸ And the area on the subsurface beyond the continental shelf is outside the national jurisdiction of any one nation and part of the “common heritage of mankind.”¹⁹⁹ Once the continental shelf claims are finally adjudicated by the CLCS, a “doughnut hole” will emerge as a default commons Arctic Area.²⁰⁰

Nevertheless, when looking for a model for Arctic governance, the ATS success should not be dismissed out of hand. A remarkable and enduring example of nations coming together to preserve and protect a common treasure, the ATS should serve as an enlightened model for future Arctic management. But its long-term success is also not ensured. The Madrid Protocol’s prohibition of mining in Antarctica is not necessarily permanent. Climate change, too, is beginning to dramatically impact access to Antarctica and undermine the stability of its ice shelf.²⁰¹ As nations rush to expand their presence on the continent, many believe this uniquely successful legal regime will not persist indefinitely as new economic opportunities emerge.²⁰² Efforts to amend the AT to create an opening for resource extraction in the Antarctic should be resisted. In 2048, fifty years after the Madrid Protocol entered into force, any consultative party may call for a review.²⁰³ If no action is taken, the ban will contin-

¹⁹⁶ See Antarctic Treaty, *supra* note 119, art. IV, ¶ 2 (stating that no acts while the treaty is in force will support any contracting country’s claim of sovereignty).

¹⁹⁷ See *The Roar of Ice Cracking: Will Asian Countries Consolidate or Disrupt Arctic Stability?*, THE ECONOMIST (Feb. 2, 2013), <https://www.economist.com/news/international/21571127-will-asian-countries-consolidate-or-disrupt-arctic-stability-roar-ice-cracking> [<https://perma.cc/NT8M-YE4A>] [hereinafter *Roar of Ice Cracking*].

¹⁹⁸ UNCLOS, *supra* note 11, art. 88.

¹⁹⁹ *Id.* preamble, art. 1, ¶ 1(1).

²⁰⁰ See Kramer, *supra* note 59.

²⁰¹ See Patel & Gillis, *supra* note 187 (discussing how a glacier the size of Delaware broke away from Antarctica).

²⁰² Simon Romero, *Countries Rush for Upper Hand in Antarctica*, N.Y. TIMES (Dec. 29, 2015), <https://www.nytimes.com/interactive/2015/12/29/world/countries-rush-for-upper-hand-antarctica.html> [<https://perma.cc/U3L5-QBBF>]. At least thirty nations now operate sixty-seven permanent research bases in Antarctica, though many of these are only occupied during the summer months. *Antarctic Stations—Bases—Currently Occupied*, COOL ANTARCTICA, https://www.coolantarctica.com/Community/antarctic_bases.php [<https://perma.cc/EP5C-E7MY>].

²⁰³ Madrid Protocol, *supra* note 166, art. 25, ¶ 2.

ue.²⁰⁴ If a country desires to leave the Protocol, however, section 5(b) of Article 25 contains a “walk-out clause.”²⁰⁵ Theoretically, a country could propose a revision to allow mining on the continent. If this revision is not adopted in three years, that country has the power to unilaterally leave the Protocol and presumably commence mining activities. Efforts should be made to preserve the current global consensus in favor of preservation of Antarctica’s natural resources.²⁰⁶

B. The Rise of Global Environmental Law and Its Significance in the Polar Regions

The ATS was adopted at a time when legally binding international treaties were more in vogue and there was less understanding and weight placed on non-state actors and indigenous peoples.²⁰⁷ Indeed, since the passage of the AT in 1959 there has been an evolutionary shift in international environmental awareness and global environmental law governance, away from “hard law” international treaties toward “bottom up” and “soft law” cooperative approaches involving private and public partnerships.²⁰⁸ Even countries with very different legal and political traditions are borrowing law and regulatory innovations from one another, blurring traditional distinctions between international and domestic law, and between private and public law. This phenomenon has been described by scholars as “global environmental law.”²⁰⁹ Multilateral treaties, though an important and enduring component of international environmental law, no longer provide the sole option to solve complex environmental issues.

1. Global Environmental Law and Arctic Indigenous Peoples

Arctic environmental governance has evolved in a manner that reflects this new global environmental reality. In fact, the Arctic Council grew out of an earlier environmental partnership and has demonstrated an ability to devel-

²⁰⁴ See *id.*

²⁰⁵ *Id.* art. 25, ¶ 5(b).

²⁰⁶ See *id.*

²⁰⁷ See, e.g., UNITED NATIONS, MULTILATERAL TREATIES DEPOSITED WITH THE SECRETARY-GENERAL (AS OF 27 MAY 2016), https://treaties.un.org/doc/source/events/2016/Treaties/list_english.pdf [<https://perma.cc/Q6NW-EEZJ>] (providing a catalog of over 300 treaties deposited with the U.N. since 1945).

²⁰⁸ See Robert V. Percival, *Global Law and the Environment*, 86 WASH. L. REV. 579, 584–99, 633 (2011) (discussing the rise of soft law in the context of transnational responses to global climate change and emissions from global maritime operations).

²⁰⁹ See Tseming Yang & Robert V. Percival, *The Emergence of Global Environmental Law*, 36 ECOLOGY L.Q. 615, 619–41 (2009) (defining “global environmental law”).

op legally binding agreements that address emerging Arctic issues.²¹⁰ And its soft law focus should complement and not subtract from the legal framework and processes set forth in UNCLOS. This is visible via the collaborative nature of the Arctic Council's work and private sector initiatives designed to control the environmental impact of tourism. We believe that the Arctic Council's work will continue to evolve and serve as a testing ground for global environmental law's ability to solve thorny international environmental issues across a diverse set of stakeholders. Indeed, the Arctic Council has already demonstrated an ability to collaborate and address myriad emerging problems. This holds great promise for the future of Arctic governance.²¹¹

Global environmental law provides several advantages, which fit within the existing Arctic governance model. For example, it more easily accommodates state and non-state actors and has lower barriers to stakeholder entry.²¹² This is of particular relevance for the Arctic, which includes numerous indigenous peoples. The Arctic Council affords six organizations representing Arctic indigenous tribes permanent participant status, and it grants observer status to non-Arctic states, intergovernmental and inter-parliamentary organization, and non-governmental organizations.²¹³ Hard law treaties have comparably higher legal barriers to entry whose signatories are often limited to state actors.²¹⁴

The Arctic Council model is well situated to address the concerns of the myriad indigenous populations who reside in the Arctic. Their voice is of central importance for long-term Arctic cooperation and governance. But their legal status varies widely from nation to nation, adding an additional yet another layer of complexity.²¹⁵ And they often adhere to their own custom, traditions and tribal laws. For example, indigenous peoples have inhabited Alaska in the Arctic region for thousands of years. Under U.S. domestic law, native tribes residing in the United States possess certain sovereign powers with Na-

²¹⁰ See, e.g., Oil Pollution and Response Agreement, *supra* note 58 (acting as an example of the Arctic Council reacting to oil pollution in the Arctic); Arctic Search and Rescue Agreement, *supra* note 56 (acting as an example of the Arctic Council reacting to the need for increased cooperation in Arctic search and rescue missions).

²¹¹ See generally Edward T. Canuel, *The Four Arctic Law Pillars: A Legal Framework*, 46 GEO. J. INT'L L. 735 (2015) (describing the gradual emerging of both a hard and soft law regime in the Arctic).

²¹² See Percival, *supra* note 208, at 582–84 (explaining why the concept of global environmental law has become more popular in recent years).

²¹³ Ottawa Declaration, *supra* note 43, ¶¶ 2–3.

²¹⁴ The Vienna Convention on Treaties does not specifically prohibit non-state actors and indigenous people from entering into international agreements, but this practice has not been widespread. See Vienna Convention on the Law of Treaties, May 23, 1969, 1155 U.N.T.S. 331 (lacking any specific provision that precludes the inclusion of non-state actors and indigenous people from entering into hard law international agreements).

²¹⁵ This necessarily implicates each host nation's domestic law provisions governing tribal nations and their associated rights.

tive American jurisdictions “separate but dependent” on the United States.²¹⁶ Although the 1971 Alaska Native Claims Act effectively eliminated tribal title and land and water claims, governmental policy stresses the need to consult tribal governments, to the greatest extent practicable and legally permitted, prior to taking actions that affect federally recognized tribal governments.²¹⁷

In light of the diverse group of stakeholders across nations, indigenous people, non-governmental organizations and public and private institutions, global environmental law will only take on increased importance in the Arctic. Additionally, the “soft law” provisions that are the hallmark of global environmental law have the inherent flexibility to evolve organically and harden into legal obligations. Consider the successful signing of both the 2011 Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic and 2013 Agreement on Marine Pollution and Response. Both grew out of the work of the Arctic Council, placed legal obligations on Arctic states, and appear to address additional issues beyond the mere environmental mandate.²¹⁸

2. Global Environmental Law and International Maritime Organization (IMO) Adoption of Polar Codes

Outside the work of the Arctic Council, the IMO has taken steps to address shipboard safety and design in the polar regions. The IMO Assembly has adopted a Resolution to develop guidelines for ships operating in polar waters that would go beyond the guidelines set forth in the SOLAS and MARPOL Conventions (Polar Code).²¹⁹ In November 2014, the IMO adopted the “International Code for Ships Operating in Polar Waters,” and related amendments to SOLAS.²²⁰ These new regulations apply to both the Arctic and Antarctica,

²¹⁶ *Cherokee Nation v. Georgia*, 30 U.S. (5 Pet.) 1, 17 (1831) (“[T]ribes which reside within the acknowledged boundaries of the United States . . . may more correctly perhaps be denominated domestic dependent nations.”); see also Canuel, *supra* note 211, at 746 (“In effect, Native American jurisdictions are nations, ‘separate but dependent’ on the United States.”). See generally Taylor Reinhard, *Advancing Tribal Law Through “Treatment as a State” Under the Obama Administration: American Indians May Also Find Help from Their Legal Relative Louisiana—No Blood Quantum Necessary*, 23 TUL. ENVTL. L.J. 537 (2009) (describing tribal rights and their role in U.S. environmental protection).

²¹⁷ 43 U.S.C. § 1601 (2012); see Exec. Order No. 13175, 65 Fed. Reg. 67,249–52 (Nov. 6, 2000) (establishing a policy where U.S. agencies should, in a timely manner, consult with tribal officials in matters implicating tribal rights). See generally Alaska Native Claims Settlement Act, 43 U.S.C. §§ 1601–1629h (1971).

²¹⁸ See Oil Pollution and Response Agreement, *supra* note 58; Arctic Search and Rescue Agreement, *supra* note 56.

²¹⁹ *Shipping in Polar Waters: Adoption of an International Code for Ships Operating in Polar Waters (Polar Code)*, INT’L MARITIME ORG. (2018), <http://www.imo.org/en/MediaCentre/HotTopics/polar/Pages/default.aspx> [<https://perma.cc/C7SH-9X7U>].

²²⁰ Int’l Maritime Org., *International Code for Ships Operating in Polar Waters*, Res. MSC.385(94) (Nov. 21, 2014) <http://www.imo.org/en/MediaCentre/HotTopics/polar/Documents/>

with the goal of providing additional protection for seafarers and passengers operating in the harsh polar environments.

These Polar Codes will be implemented via both SOLAS and MARPOL and cover ship design, operational and training concerns, as well as the protection of the polar environment.²²¹ The regulations strengthened restrictions on waste disposal by ships operating in these waters beginning in January 2017.²²² The new rules ban all discharges of oil residues from ship engines and chemicals used to clean ships and their tanks.²²³ They require food waste to be ground up and disposed at least fourteen miles from land or the nearest ice formation.²²⁴ The new rules complement the rules on ship design and equipment for vessels operating in polar waters adopted by the IMO in November 2014.²²⁵ Environmental groups welcomed the new rules, while arguing that a ban on ships using bunker fuel, which already applies in Antarctic waters, should be extended to Arctic waters.²²⁶ Some countries, led by Russia, blocked the proposal to ban bunker fuels in Arctic waters when it was made several years before.²²⁷

Private sector efforts have also sought to bolster environmental safeguards in the polar regions. Beginning in 1991, tour operators formed the International Association of Antarctic Tour Operators (“IAATO”), a private, self-regulating organization that now has more than 100 members.²²⁸ IAATO has developed a strict code of conduct designed to “keep Antarctica pristine,” to “protect Antarctic wildlife,” and to require tourists to “respect protected areas.”²²⁹ This code strictly regulates what tourists can do in Antarctica to minimize their environmental impact.²³⁰ A similar organization, the Association of Arctic Expedition Cruise Operators was formed in 2003.²³¹ It has formulated extensive guidelines to regulate tourist activity in the Arctic. These include operational guidelines that are mandatory for tour operators and guidelines

POLAR%20CODE%20TEXT%20AS%20ADOPTED%20BY%20MSC%20AND%20MEPC.pdf [https://perma.cc/WK5B-3V5J] [hereinafter Polar Code].

²²¹ Polar Code, *supra* note 220.

²²² *Id.*

²²³ *Id.* Part II-A, ¶ 1.1.1.

²²⁴ *Id.* ¶ 5.2.1.

²²⁵ *Id.* Part I-A, ¶ 1.1.

²²⁶ Costas Paris, *United Nations Installs New Rules for Polar Ship Routes*, WALL ST. J., May 16–17, 2015, at B3.

²²⁷ *Id.*

²²⁸ INT’L ASS’N OF ANTARCTICA TOUR OPERATORS, <https://iaato.org/home> [https://perma.cc/RS9Q-HYHR].

²²⁹ *Guidelines for Visitors to the Antarctic*, INT’L ASS’N OF ANTARCTICA TOUR OPERATORS, <https://iaato.org/documents/10157/13325/Visitor+Guidelines+%28English%29.pdf> [https://perma.cc/53AD-UGW8].

²³⁰ *Id.*

²³¹ ASS’N OF ARCTIC EXPEDITION CRUISE OPERATORS, <https://www.aeco.no/> [https://perma.cc/2DKL-6SM2].

governing tourist encounters with Arctic wildlife, biosecurity guidelines, and rules for visiting specific Arctic sites.²³² These private initiatives illustrate new ways in which global environmental law is developing.

IV. THE FIVE KEY FACTORS AFFECTING THE FUTURE OF ARCTIC GOVERNANCE

There is widespread consensus that the ATS has played the central role in ensuring peace and stability in Antarctica.²³³ If this global success story could be replicated in the Arctic, present and future generations would benefit. But Antarctica is just different enough from the Arctic to make this unworkable. Antarctica is a continent, not an ocean, it lacks native indigenous populations, it is significantly more isolated, it possesses fewer natural resources, and is of less military value. It is also a product of a time in history predating the rise of global environmental law.

Will the work of the Arctic Council and the legal processes set forth in UNCLOS be enough to stabilize the Arctic in the face of massive geographic and environmental change? Perhaps. But this will depend on a multiplicity of factors. We believe that the long-term environmental and geopolitical stability in the Arctic will depend on five key factors in particular: (1) the ability of UNCLOS and the CLCS to finally adjudicate competing continental shelf claims; (2) long-term Russian military ambition in the Arctic and Russia's corresponding relationship with the four Arctic coastal state NATO members; (3) the true pace of climate change in the Arctic; (4) the impact of changing prices of oil and gas on the economics of Arctic resource extraction; and (5) the potential for division among the myriad Arctic stakeholders. These factors are discussed in greater detail below.

A. First Factor: UNCLOS and the CLCS's Long-Term Viability to Decide Competing Continental Shelf Claims

The first key factor, the ability of UNCLOS and the CLCS to finalize competing continental shelf claims will come to the fore as the CLCS begins to issue opinions in response to the uptick in Arctic continental shelf submissions. UNCLOS already provides the hard law legal architecture for the Arctic with a ready-made process to solve competing continental shelf claims. As of this writing, 168 nations have ratified UNCLOS, including all of the Arctic states and members of the Arctic Council, with the exception of the United States.²³⁴ But

²³² *Guidelines*, ASS'N OF ARCTIC EXPEDITION CRUISE OPERATORS, <https://www.aeco.no/guidelines/> [<https://perma.cc/K8DX-E69F>].

²³³ See, e.g., Lennon, *supra* note 192, at 33 (stating that the ATS promoted peace in Antarctica).

²³⁴ *Chronological Lists of Ratifications of, Accession, and Successions to the Convention and Related Agreements*, UNITED NATIONS, DIV. FOR OCEAN AFFAIRS AND THE LAW OF THE SEA (Nov. 6,

uncertainty remains regarding the CLCS's ability to serve as the one-stop adjudicatory body in the Arctic. Indeed, the long-term viability for the CLCS to adjudicate all claims in a peaceful, effective, and internationally accepted manner remains to be seen in light of the two related sub-factors outlined below.

1. The United States Has Not Ratified UNCLOS, Nor Is There a Timeline to Do So

One of the five Arctic coastal states, the United States, has yet to ratify UNCLOS. Hence, it remains unclear whether the United States could even make a claim via the CLCS process (it has yet to do so).²³⁵ As the Arctic polar icecap melts and nations assert their autonomy over the seabed, the CLCS process should, in theory, incentivize nations to ratify UNCLOS. In light of its growing importance in the Arctic, the United States' focus should continue to be on ratifying UNCLOS, thus ensuring a seat at the table for future Arctic governance issues. The United States should then follow up with its own CLCS submission outlining the scope and breadth of Alaska's continental shelf, completing the critical fifth wedge of the "Arctic orange." But this is unlikely to occur, and could undermine the UNCLOS and CLCS architecture.

In the most recent Arctic strategy, President Obama reiterated the desire for the United States to accede to UNCLOS in order to "maximize legal certainty and best secure international recognition of our sovereign rights . . ." ²³⁶ But there is no timeline or foreseeable plan to ratify it as the current administration has not made similar statements on Arctic policy. Further, there is no apparent desire among the Arctic coastal states to sign a more comprehensive AT.²³⁷ In the absence of U.S. Senate ratification, and in light of the environmental and national security impacts of a changing Arctic environment, some have argued that the United States should accede to UNCLOS via a congressional-executive agreement or executive agreement that implements key UNCLOS provisions that resolve sovereignty claims.²³⁸ This would not necessari-

2017), http://www.un.org/depts/los/reference_files/chronological_lists_of_ratifications.htm [<https://perma.cc/F6HQ-5EQ7>]. There has been some discussion of bypassing Senate ratification and having UNCLOS apply to the United States via a congressional-executive agreement. Although the United States has yet to ratify UNCLOS, it does accept the "balance of interests relating to traditional uses of the oceans—such as navigation and over-flight." Statement on United States Oceans Policy, 1 PUB. PAPERS 378, 379 (Mar. 10, 1983).

²³⁵ See O'ROURKE, *supra* note 16, at 11–12.

²³⁶ WHITE HOUSE, NATIONAL STRATEGY FOR THE ARCTIC REGION 9 (May 2013), https://obamawhitehouse.archives.gov/sites/default/files/docs/nat_arctic_strategy.pdf [<https://perma.cc/JGB5-AWFE>].

²³⁷ See Ilulissat Declaration, *supra* note 98 (stating that the signatory nations remain committed to the law of the sea).

²³⁸ See King, *supra* note 56, at 329–30 (proposing that a congressional-executive agreement on the Arctic is in the best interest of the United States).

ly require Senate ratification as the President could potentially assert that this falls within his Article II foreign relations and Commander in Chief's powers. Although it is beyond the scope of this Article to comprehensively address the different types of international agreements under constitutional law, problems would still remain in the unlikely event that the President sought to bypass the Senate: the agreement would necessarily be limited in scope and would face the threat of being undone by future presidents.²³⁹

Ratification has the wide support of the military, which already complies with the major UNCLOS navigational provisions and treats them as customary international law.²⁴⁰ Despite wide support for its ratification by all former U.S. Presidents, business leaders, and environmentalists, a clear path for its ratification does not exist. Decades after UNCLOS was launched, the Arctic nations who already have acceded to UNCLOS cannot and should not hold their breath.

2. The CLCS's Ability to Issue Binding Recommendations Accepted by Arctic Stakeholders Remains Uncertain

Second, the long-term legal effect of CLCS recommendations remains unknown. The twenty-one member CLCS—comprised only of UNCLOS signatories—“*make[s] recommendations to coastal states The limits of the shelf established by a coastal State on the basis of these recommendations shall be final and binding.*”²⁴¹ A CLCS determination would likely only be binding on the state submitting the claim.²⁴² In practice, it is only after the coastal state *accepts* the CLCS recommendation that it is final and binding.²⁴³ What if other states object? What is the process if a submitting state disagrees with the CLCS's recommendation? If the coastal state objects to another

²³⁹ For example, the United States led the effort to sign the Paris Treaty on climate change. It was signed by President Obama in 2015. Paris Agreement, Dec. 12, 2015, T.I.A.S. No. 16-1104. This agreement was meticulously crafted to bypass the Senate and not implicate congressional authority. Valerie Richardson, *White House Defends Obama Evading Senate on Paris Climate Deal*, WASH. TIMES (Aug. 29, 2016), <https://www.washingtontimes.com/news/2016/aug/29/obama-will-bypass-senate-ratify-paris-climate-acco/> [<https://perma.cc/6S5C-HGJY>]. In 2017, President Trump announced that the United States will withdraw from the Paris Climate Accord in 2020—the soonest possible date it can do so. *Paris Climate Deal: Trump Pulls US Out of 2015 Accord*, BBC NEWS (June 1, 2017), <http://www.bbc.com/news/world-us-canada-40127326> [<https://perma.cc/8BEC-N7Y9>].

²⁴⁰ See CHIEF OF NAVAL OPERATIONS, THE UNITED STATES NAVY ARCTIC ROADMAP FOR 2014 TO 2030, at 23 (Feb. 2014), http://www.navy.mil/docs/USN_arctic_roadmap.pdf [<https://perma.cc/B7Z9-FHBT>] (“[C]ontinu[ing] to advocate for U.S. accession to the United Nations Convention on the Law of the Sea (UNCLOS)” as part of the U.S. Navy’s Arctic Roadmap Implementation Plan).

²⁴¹ UNCLOS, *supra* note 11, art. 76, ¶ 8 (emphasis added).

²⁴² See Carpenter, *supra* note 29, at 237 (arguing that it is more likely that a CLCS delineation is “final and binding” only upon the submitting State”). The CLCS process has not yet achieved the status of customary international law.

²⁴³ *Id.*

coastal state's delineation, it remains unclear what the process is to resolve such differences.²⁴⁴ And the CLCS appeals process remains unclear. In sum, it is only when all five members of the "Arctic orange" submit claims, that the CLCS would have a full picture of the competing claims and could then issue recommendations that take all of them into account. Time will tell if the CLCS will be able to meet this underlying uncertainty.

B. Second Factor: Russia Ambitions and Russia-NATO Relations in the Arctic

The second factor, Russia's military ambitions in the Arctic and corresponding Russian-NATO relations have re-emerged in recent years and will continue to take on increased importance. Geopolitically, Russia has the most to gain in the opening of the Arctic and its seaways. Russia possesses the largest Arctic continental shelf of any nation (with enormous natural gas stores) and the Northeast Passage travels through Russian maritime waters, hugging its coast. And, the only border between Russia and the United States is in the Arctic region. Although the Arctic was a Cold War hotspot in the 1970s and 1980s, the United States and Soviet Union have found areas of agreement in the Arctic through the signing of the 1990 Maritime Boundary Dispute Agreement.

Determining the precise contours of Russia's continental shelf claim remains *the* central unresolved issue for Arctic oil and gas extraction. In 2007, with great media attention, a Russian submarine planted a flag on the seabed beneath the North Pole.²⁴⁵ Widely reported in the media but dismissed by legal scholars and many world leaders, this seemingly isolated event may have ominously foreshadowed Russian military involvement elsewhere.²⁴⁶ Russia's Lomonosov Ridge, an area whose maximum width is 1,000 miles in an area of nearly 1.5 million miles, is of critical importance to future Arctic governance.²⁴⁷ The Lomonosov Ridge could feasibly provide Russia with half of the Arctic for natural resource exploitation.²⁴⁸ Russia recently submitted a follow-up submission to the CLCS in 2015, asserting that two ridges in the Arctic Ocean were a natural prolongation of Russian land territory.²⁴⁹

Future Russian-NATO relations highlight the Arctic Council's Achilles heel: its express prohibition on addressing matters of military security.²⁵⁰ Of

²⁴⁴ UNCLOS only asserts that parties must use peaceful means to resolve international maritime disputes. UNCLOS, *supra* note 11, art. 279.

²⁴⁵ Joyner, *supra* note 28, at 198.

²⁴⁶ O'ROURKE, *supra* note 16, at 17.

²⁴⁷ Joyner, *supra* note 28, at 198.

²⁴⁸ O'ROURKE, *supra* note 16, summary; *see also* Walsh, *supra* note 32, at 91 (describing the planting of the Russian flag and how it was not taken seriously by legal experts).

²⁴⁹ *Submissions to the CLCS*, *supra* note 90.

²⁵⁰ Ottawa Declaration, *supra* note 43, art. 1(a) n.1.

the five Arctic coastal states, four are members of NATO.²⁵¹ A period of relative calm followed in the aftermath of the Cold War with few military maneuvers by NATO or Russia in the Arctic. Under Article 5 of the NATO Defense Treaty, NATO members are obligated to come to the defense of other members in the event of an armed attack.²⁵²

Russia recently has turned its attention to the Arctic in earnest, investing in military infrastructure to include the establishment of a new naval base in the Arctic.²⁵³ Outside the Arctic, Russia has shown a willingness to challenge sovereign borders in Crimea and the Ukraine.²⁵⁴ Though it is impossible to predict whether Russian aggression in Crimea or the Ukraine will be mirrored in the Arctic, Russia does not have a rosy view of NATO's Arctic role, recently designating NATO as "the primary national security threat in the Arctic"²⁵⁵

Even though the United States possesses the largest military with the strongest capability in the world, its capabilities and capacity to operate are wanting in the Arctic. Russia has invested in significant military infrastructure in the Arctic in recent years while the United States has lagged far behind. The United States has shown an increased interest in the Arctic through the release of several policy documents, but funding and Arctic operational capabilities have not kept pace.²⁵⁶ Although the new Secretary of Defense, James Mattis,

²⁵¹ Canada, Denmark, Norway, and the United States are all NATO members. *NATO Member Countries*, NORTH ATLANTIC TREATY ORG. (last updated Jan. 4, 2018) https://www.nato.int/cps/en/natohq/nato_countries.htm [<https://perma.cc/ZE64-EDJ3>].

²⁵² North Atlantic Treaty art. 5, Apr. 4, 1949, 63 Stat. 2241, 34 U.N.T.S. 243.

²⁵³ O'ROURKE, *supra* note 16, at 1; Robbie Gramer, *Here's What Russia's Military Build-Up in the Arctic Looks Like*, FOREIGN POL'Y (Jan. 25, 2017, 8:00 AM), <http://foreignpolicy.com/2017/01/25/heres-what-russias-military-build-up-in-the-arctic-looks-like-trump-oil-military-high-north-infographic-map/> [<https://perma.cc/MBQ4-MA5E>] (noting that in recent years Russia "unveiled a new Arctic command, four new Arctic brigade combat teams, 14 new operational airfields, 16 deepwater ports, and 40 icebreakers with an additional 11 in development").

²⁵⁴ See John Simpson, *Russia's Crimea Plan Detailed, Secret and Successful*, BBC NEWS (Mar. 19, 2014), <http://www.bbc.com/news/world-europe-26644082> [<https://perma.cc/AJ9K-D8S5>].

²⁵⁵ STACY CLOSSON, KENNAN INST., RUSSIAN FOREIGN POLICY IN THE ARCTIC: BALANCING COOPERATION AND COMPETITION, KENNAN CABLE NO. 24 (June 2017), <https://www.wilsoncenter.org/publication/kennan-cable-no24-russian-foreign-policy-the-arctic-balancing-cooperation-and> [<https://perma.cc/8JHB-PGJ7>].

²⁵⁶ Examples include the May 2013 National Strategy for the Arctic Region and the Department of Defense's November 2013 Arctic Strategy. WHITE HOUSE, *supra* note 236, at 4 ("We seek an Arctic Region that is stable and free of conflict . . ."); U.S. DEP'T OF DEF., ARCTIC STRATEGY (Nov. 2013) https://www.defense.gov/Portals/1/Documents/pubs/2013_Arctic_Strategy.pdf [<https://perma.cc/QCH8-6U9S>]; see also Exec. Order No. 13,580, 76 Fed. Reg. 41,989 (July 12, 2011) (establishing the Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska); Exec. Order No. 13,547, 75 Fed. Reg. 43,023 (July 19, 2010) (establishing "a national policy to ensure the protection, maintenance, and restoration of the health of the ocean, coastal, and Great Lakes ecosystems" in the wake of the Deepwater Horizon oil spill); Exec. Order No. 12,501, 50 Fed. Reg. 4,191 (Jan. 28, 1985) (establishing the Arctic Research Commission). In January 2015 President Obama signed an executive order entitled, "Enhancing Coordination of National Efforts in the Arctic"

recently reiterated the Arctic's importance to the Department of Defense in congressional testimony,²⁵⁷ the United States lacks sufficient icebreaking capacity, critical to operating effectively and continually in the Arctic. Russia possesses relatively strong military capabilities in the Arctic, with forty icebreakers (many nuclear powered) and military air and sea bases on the Arctic.²⁵⁸ The other four Arctic coastal states are original members of the NATO military alliance and could feasibly counteract any future Russian military aggression in the Arctic.²⁵⁹ In sum, rising military tensions would expose the Arctic Council's express prohibition addressing matters of military security.

Operating military vessels in the Arctic is uniquely dangerous with its harsh conditions and an environment particularly susceptible to degradation in the event of an oil spill or similar disaster. The U.S. Coast Guard is currently reviewing shipping routes through the Bering Strait with an eye to formalize a vessel traffic separation scheme between the United States and Russia.²⁶⁰ In the absence of a binding Arctic agreement, the Arctic Eight and other nations that routinely operate in the Arctic could adopt a similar "Arctic Incidents at Sea Agreement" ("INCSEA") that could be modeled after the U.S./Soviet INCSEA agreement that was signed in 1972 with specific provisions.²⁶¹ It "serves to enhance mutual knowledge and understanding of military activities; to reduce the possibility of conflict by accident, miscalculation, or the failure of communication; and to increase stability in times of both calm and crisis."²⁶² The original INCSEA agreement has proven successful in reducing risks of collision at sea between U.S. and Russian naval vessels.²⁶³

An Arctic INCSEA would open up a valuable military-to-military dialogue and could alleviate rising tensions in the region as military vessels increasingly operate in the Arctic. The U.S. Coast Guard has sought agreement

that established an Arctic Executive Steering Committee to better coordinate U.S. efforts in the Arctic. Exec. Order No. 13,689, 80 Fed. Reg. 4,191 (Jan. 21, 2015).

²⁵⁷ See Gramer, *supra* note 253 (Secretary of Defense James Mattis said, in confirmation hearings, "[t]he Arctic is key strategic terrain. Russia is taking aggressive steps to increase its presence there. I will prioritize the development of an integrated strategy for the Arctic . . .").

²⁵⁸ *Id.* In contrast, the United States only has one operational icebreaker for use in the Arctic. *Id.*

²⁵⁹ See *NATO Member Countries*, *supra* note 251. Of note, Sweden recently brought back the military draft and both Sweden and Finland are debating whether to join NATO. See Paul Watson, *A Melting Arctic Could Spark a New Cold War*, TIME (May 12, 2017), <http://time.com/4773238/russia-cold-war-united-states-artic-donald-trump-barack-obama-vladimir-putin/> [<https://perma.cc/LPX2-M4XA>].

²⁶⁰ O'ROURKE, *supra* note 16, at 23; see also Myers & Krauss, *supra* note 7 (discussing the difficulties energy companies have had thus far in extracting oil from the Arctic).

²⁶¹ Agreement Between the Government of the United States of America and the Government of the Union of Soviet Socialist Republics on the Prevention of Incidents On and Over the High Seas, May 25, 1972, 23 U.S.T. 1168, 852 U.N.T.S. 151.

²⁶² *Id.* at narrative.

²⁶³ COMMANDER'S HANDBOOK, *supra* note 60, ¶ 2.10.1 This also includes aircraft. *Id.*

with Russia to establish a traffic separation scheme for the Bering Strait.²⁶⁴ It would fall outside the Arctic Council, but it could be signed by the eight Arctic nations that commonly operate in the region.

*C. Third Factor: The True Pace of Climate Change and
“Stationarity” in the Arctic*

The third factor—the pace of climate change and its ultimate impact in the Arctic region and the world—will have an immediate effect on the economics, health, and infrastructure of the Arctic indigenous peoples.²⁶⁵ Some studies have suggested that the flooding and erosion caused by climate change will force Arctic villages to retreat and relocate.²⁶⁶ Scientists already assess that the earth is warming at twice the overall rate in the polar regions.²⁶⁷ Will this pace of change accelerate as ice caps melt?

Consider one example: climate change’s impact on Greenland and the unintended consequences emerging as Greenland’s ice sheet melts. Greenland remains one of the most sparsely populated land masses on the earth, but as its ice sheet melts valuable minerals can be harvested for the first time in human history. Outside investors (many from China) are flooding into Greenland, creating a division between Greenland—whose population sees this as economic opportunity—and its sovereign power, Denmark—which is concerned about the environmental impact of the harvesting.²⁶⁸ Indeed, if this independence movement keeps its momentum, Greenland may emerge as the first nation born from climate change.

In other contexts, scientists have expressed continual concern about the scientific community’s ability to plan for climate change’s impact. For example, scientists have historically planned and modeled water resource management patterns based upon the concept of “stationarity.” Stationarity is “the idea that natural systems fluctuate within an unchanging envelope of variability”²⁶⁹ In part due to the melting of ice sheets and the rapid increase in water run-off from ice-free land, scientists have declared “stationarity dead.” Indeed,

²⁶⁴ O’ROURKE, *supra* note 16, at 23.

²⁶⁵ *Id.* at 38–40.

²⁶⁶ *Id.* at 39.

²⁶⁷ *Id.* at 66; Walsh, *supra* note 2, at 91.

²⁶⁸ See Mia Bennet, *Denmark’s Strategy for the Arctic*, RADIO CAN. INT’L (Nov. 14, 2011), <http://www.rcinet.ca/eye-on-the-arctic/2011/11/14/denmarks-strategy-for-the-arctic/> [<https://perma.cc/Y7LS-YAHF>] (describing Denmark’s commitment to sustainable and environmentally-friendly economic growth); Matt Birney, *Greenland Minerals Sitting on Rare Earths Sleeping Giant*, BUS. NEWS: W. AUSTL. (Feb. 7, 2018, 6:20 AM), <https://www.businessnews.com.au/article/Greenland-Minerals-sitting-on-rare-earths-sleeping-giant> [<https://perma.cc/PJ6H-SHZL>] (describing the investor influx in Greenland).

²⁶⁹ P.C.D. Milly et al., *Stationarity Is Dead: Whither Water Management?*, 319 SCIENCE 573, 573 (2008).

it no longer serves as a suitable default assumption for water resource management and planning.²⁷⁰

The dramatic changes in Arctic ice sheet melting—as well as the rapid deterioration of the Antarctic ice sheet—suggest that we are entering uncharted territory for planning for the polar regions' future. Similar to water resource management projections, will stationarity be declared dead in the Arctic? Scientists already estimate that the polar regions are twice as vulnerable to climate change as other places in the world and the rapidly melting ice caps continue to surprise scientists.²⁷¹ Stationarity, in turn, appears to be on life support in the polar regions. The race for the Arctic's resources and new trade routes will depend, in large part, on the pace of anthropogenic change in the Arctic, an increasingly unknown, wild, and critical variable.

D. Fourth Factor: Energy Prices, Regulatory Permitting and Extraction Costs

The fourth key factor—the cost of natural resource extraction in the Arctic and oil and natural gas prices—will drive the Arctic economy and most of the Arctic's activity. For now, the primary protection for Arctic waters may be the precipitous drop in the price of oil that has made it less economically viable to drill there. In September 2015, Royal Dutch Shell became the latest company to suspend Arctic oil exploration after spending more than \$7 billion over the course of nearly a decade.²⁷² Multiple other major oil companies previously had stopped Arctic exploration, some announcing that it was too risky to drill in such a harsh environment. Although Exxon Mobil found oil in Russia's Kara Sea, economic sanctions imposed after Russian incursions in the Ukraine forced Exxon to halt its operations there.²⁷³

But, President Trump has re-opened the door for massive Arctic drilling, exclaiming that dramatic job growth would result from a recent executive order that overturned President Obama's offshore Arctic drilling ban.²⁷⁴ Oil prices are a global commodity with rapidly fluctuating prices—when oil prices inevitably rise, focus will turn once again to the Arctic and its vast untapped resources. Now is an opportune time to consider how to improve environmental governance in the Arctic, because oil prices remain low. But for how long?

²⁷⁰ *Id.* at 573–74.

²⁷¹ Walsh, *supra* note 2, at 91.

²⁷² Karolin Schaps, *Royal Dutch Shell Pulls Plug on Arctic Exploration*, REUTERS (Sept. 28, 2015, 1:48 AM), <https://www.reuters.com/article/us-shell-alaska/royal-dutch-shell-pulls-plug-on-arctic-exploration-idUSKCN0RS0EX20150928> [<https://perma.cc/5J9Y-6ZFR>].

²⁷³ Myers & Krauss, *supra* note 7.

²⁷⁴ See Exec. Order No. 13,795, 82 Fed. Reg. 20,815 (Apr. 28, 2017).

E. Fifth Factor: Divergent Interests Between Arctic Coastal States, Arctic Non-Coastal States, and Non-Arctic States

Lastly, the rush for resources in the Arctic is beginning to highlight the competing divisions between the three key Arctic actors: (1) Arctic Council coastal states; (2) Arctic Council non-coastal states; and (3) non-Arctic states. This could potentially undermine the region's stability.

Only “[t]he coastal State exercises control over the continental shelf sovereign rights for the purpose of exploring it and exploiting its natural resources.”²⁷⁵ The three non-coastal states (Finland, Iceland, and Sweden) that are members of the Arctic Council cannot make CLCS submissions. When the five Arctic coastal states signed the Ilulissat Declaration in 2008 outside the auspices of the Arctic Council, they expressly rejected proposals to negotiate a separate Arctic Treaty because UNCLOS was adequate to resolve sovereignty conflicts in the Arctic.²⁷⁶ Non-Arctic states such as China, Singapore, and Italy are knocking on the Arctic door, seeking a seat at the Arctic Council table as the impacts of climate change impact the rest of the world.²⁷⁷ The expanding interest from increasingly diverse stakeholders could strain and stress the existing governance model—will the Arctic Council be up for the challenge?

CONCLUSION

For more than half a century the ATS has protected the polar environment on the southernmost end of the planet as a scientific reserve. It is unrealistic to believe that this approach could be replicated in the Arctic, because several countries already exercise sovereignty over most of it.

Because the Arctic is mostly ocean, UNCLOS provides a strong international law building block for environmental governance. In light of the Arctic's increasing importance to trade and the economy, the U.S. Senate should move swiftly to ratify UNCLOS. Although the long-term success of the CLCS to adjudicate competing claims remains uncertain, it remains the most promising venue to do so. And it provides the best hope for peaceful resolution of sovereign claims to Arctic waters. The Obama administration's National Strategy for the Arctic Region recognized that “[o]nly by joining [UNCLOS] can we max-

²⁷⁵ UNCLOS, *supra* note 11, art. 77, ¶ 1.

²⁷⁶ See Ilulissat Declaration, *supra* note 98 (“[T]he law of the sea provides for important rights and obligations concerning the delineation of the outer limits of the continental shelf . . .”).

²⁷⁷ For example, Singapore resides at the equator and is also at sea-level, making it increasingly concerned about sea level rise. China, too, has been active in seeking Arctic Council membership and has mining interests in Greenland. *Roar of Ice Cracking*, *supra* note 197. In January 2018, China issued its first Arctic strategy, declaring itself a “Near-Arctic State” with great interest in developing Arctic resources. Eva Dou, *A New Cold War? China Declares Itself a ‘Near-Arctic State,’* WALL ST. J. (Jan. 26, 2018, 6:15 AM), <https://www.wsj.com/articles/a-new-cold-war-china-declares-itself-a-near-arctic-state-1516965315> [<https://perma.cc/W4UX-9WXN>].

imize legal certainty and best secure international recognition of our sovereign rights with respect to the U.S. extended continental shelf in the Arctic and elsewhere.²⁷⁸ Nevertheless, despite calls from environmentalists, military, and scientists to ratify UNCLOS, there is no current plan to do so.

The Arctic Council's ability to evolve has been encouraging—whether it is up to the task of being the clearinghouse for all Arctic issues remains to be seen. The Council should be used to help ensure that any future resource extraction and transportation activities in the Arctic do not cause unreasonable damage to the environment. The Arctic nations seem content with the Arctic Council process, which has worked well thus far due to continued cooperation by Arctic nations.

As a geopolitical matter, it is unclear what the future holds for the Arctic. Previous dire predictions about “armed brinkmanship” in the Arctic have not come to fruition.²⁷⁹ Nevertheless, the Arctic will remain a fragile and harsh environment with increased maritime traffic and interest from natural resource extractors. The Arctic states—through the Arctic Council—should continue to build upon the Council's work and find areas of mutual collaboration in line with broader principles of environmental justice and precaution. Negotiation of an Arctic Treaty patterned on the ATS may not be realistic, but continued inter-governmental cooperation certainly is essential.

²⁷⁸ WHITE HOUSE, *supra* note 236, at 9.

²⁷⁹ Borgerson, *supra* note 9.

APPENDIX

Figure 1. The Arctic Region



Figure 2. Antarctica

